

JACOB

NO. 1 IN PIPEWORK SYSTEMS

THE CATALOGUE





THE PDF CATALOGUE GIVES YOU A FAST ROUTE...



... to the table of contents

Just one click to the table of contents: The doorway to our range of products – your one-stop shop for modular pipe systems. Try it out!

... to our products

Quickly find your product of choice: To save you the page-turning, we have made the table of contents “clickable”.

This way, you can quickly find what you are looking for.

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... backwards and forwards

Navigating the chapters is easy and intuitive.

The chapter icons on every left-hand side lead you back to the table of contents.

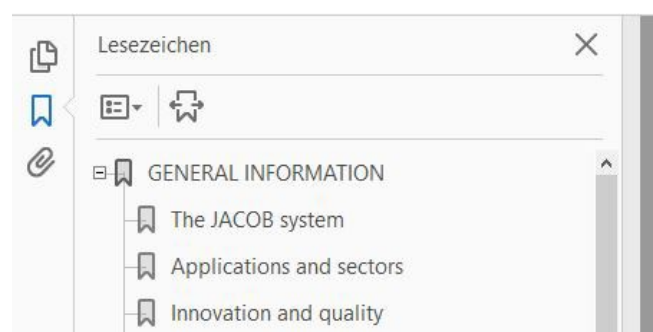
The chapter section symbols to the right can be clicked on, allowing easy navigation within a chapter.

GENERAL INFORMATION
The JACOB system



... using bookmarks

You can move directly to any chapter or page using the structure tree.







CONTACT US
+49 571 9558-201



EFFICIENT SALES

A warehouse with over 1 million articles ensures that our standard parts are available at any time. Within a very short time if sent by express. Thanks to our ultra-modern production processes, we also manufacture individual parts to your specification. This guarantees great planning and project reliability for your pipework system.



CUSTOMER SERVICE

Do you have any questions about planning your pipework system? Or about the right material to use? Or about the performance of particular components? No matter what you need before, during and after the purchase of a JACOB pipework system – our customer service is always on hand to help you!



A DIRECT PERSONAL LINK

Our team is available to give you their personal attention. Please don't hesitate to call us if you have any questions, criticisms or suggestions which you would like to share with us, or if you need support or would like to place an order – we will be pleased to assist you in person.



SOCIAL MEDIA

Be up to date at any time: our Facebook page will keep you informed each day about innovations, trade fair presence and much more besides. It's also easy to start up a conversation with us there. We look forward to your posts!



YOUTUBE CHANNEL

On JACOB's YouTube channel you will find numerous videos about our products and innovations from our company. Our explanatory videos inform you quickly and easily about how our modular pipework system works and what advantages our products have.



THE INFORMATIVE WEBSITE

It's worth a visit: Have a look at our website. No matter whether you want to find out what's new or are looking for technical background knowledge on JACOB products: you will find what you're looking for on our website.



THE NEW WEBSHOP

The JACOB online shop has it all: our new online shop has all the features you are used to from large e-commerce providers. Whether you want to check availability, use the project management tool, see your ordering history or track delivery with the track & trace feature – we've never had such a user-friendly online shop before.



THE WHOLE WORLD

JACOB is proud to have such a big global team behind it. With our subsidiaries and reps, we are on the ground worldwide and so are just as globally present as you are.



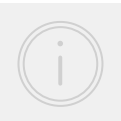
NO.1 IN PIPEWORK SYSTEMS



Order number key



Worldwide presence



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THERE ARE THREE FACTORS WHICH ARE
DECISIVE FOR JACOB'S SUCCESS:
INNOVATION – QUALITY – SERVICE

DEAR CUSTOMERS AND PARTNERS,

Since Friedrich Jacob founded our factory over 90 years ago, the company has stood for great products and a dedicated workforce. We are rightly proud of this. Today, there are three factors which are still decisive for JACOB's success: Innovation – Quality – Service.

It was on the basis of an **innovation** that JACOB was founded in the first place. The idea was to no longer manufacture pipework on an individual basis, but to mass-produce components to form a modular system. Even today, the company is shaped by innovations: These range from fast and reliable connections with QUICK CONNECT, hygienic transport with FOOD GRADE and reliable protection from contamination through DETECTABLE DESIGN – the advances we make are for the benefit of our customers. And we have plenty of other ideas as well!

For us, **quality** means first and foremost the quality of our products. Using the most modern production methods and perfectly coordinated materials, we ensure that our pipework systems do exactly what the name JACOB suggests. But quality for us also means the pragmatism and dependability that comes with a family run enterprise.

Our service means that we are always there for our customers. We want to make our products as accessible and easy to handle as possible – from placing an order to servicing them.

One example of this is our new online shop. This not only offers all the features of a modern e-commerce shop but also has numerous convenience features that are tailored to your needs and simplify and speed up your order. Another example is our logistics centre which makes us even faster and more reliable than ever. Service for us also means being there on the ground wherever our customers need us. We are therefore have 40 agencies and five subsidiaries all over the world.

JACOB would be pleased to support you with your projects. No matter whether you order from this catalogue or from our online shop (www.jacob-shop.com): JACOB is and remains your dependable partner.

Patrick Jacob

Dr. Uwe Braun



JACOB IS WHEN INNOVATION,
QUALITY AND SERVICE RESULT
IN A PERFECT WHOLE



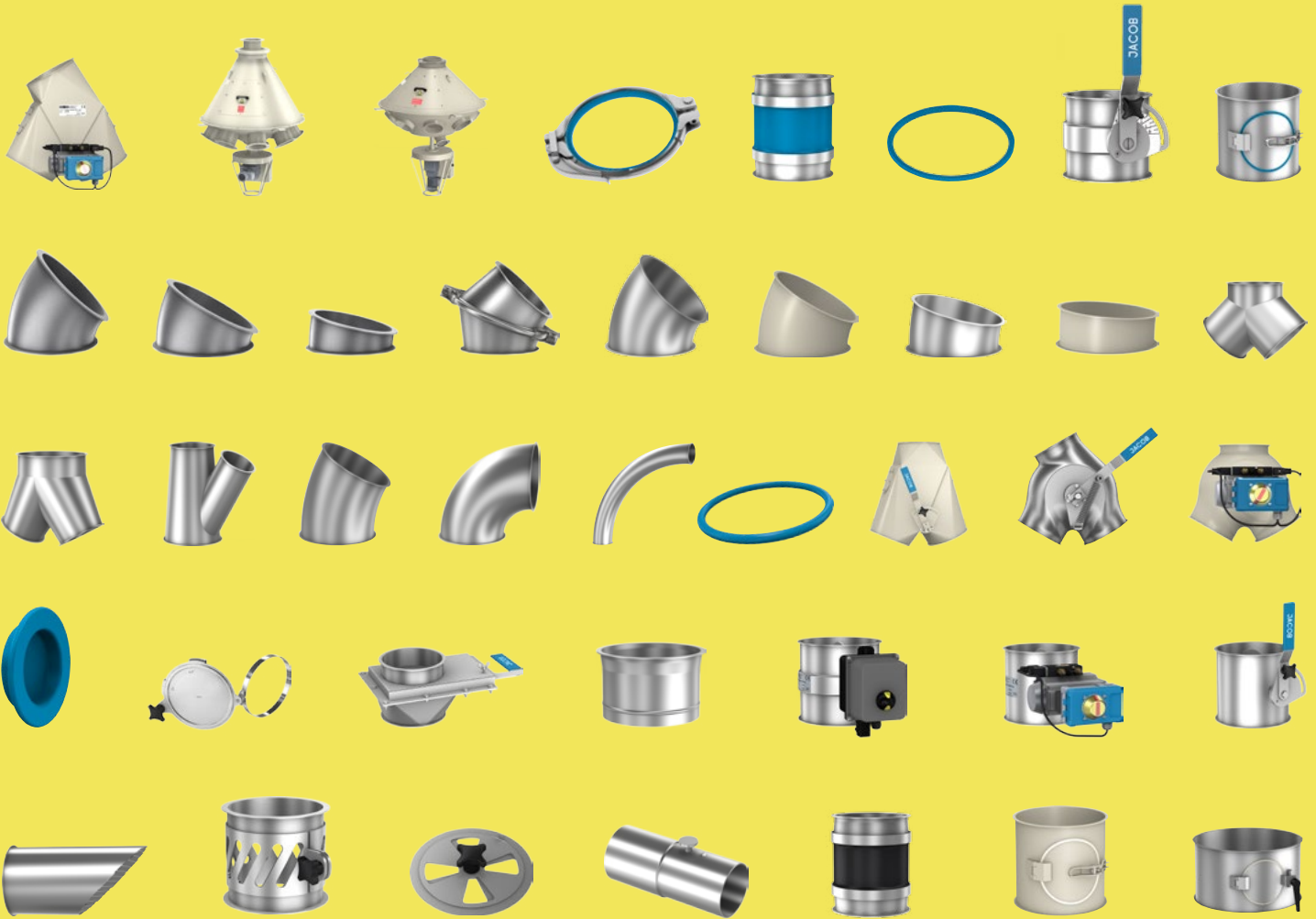
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GENERAL INFORMATION

The JACOB system



JACOB DIVERSITY

- Over 8,500 standard parts
- Diameter 60 – 1600 mm
- Wall thicknesses from 1 to 3 mm
- Stainless steel: shotblasted
- Mild steel: powder-coated or hot-dip galvanised







GENERAL INFORMATION

The JACOB system



Explanatory video
modular
pipework system

THE JACOB SYSTEM

There's a system behind what JACOB does: top quality standards, an outstanding innovative spirit and an uncompromising choice of materials. Profound knowledge of the industry, customer orientation and expertise based on more than 90 years' experience. International customer support, excellent service and round-the-clock availability. The result is perfect modular pipe systems and satisfied customers throughout the world.

THE DIFFERENCE

Other pipe systems are specially produced for a project and welded together on site. JACOB has come up with a far more efficient way: Standard modular parts with lipped ends are fitted with a U-shaped seal and joined together with a pull-ring. This system is fast, tight and flexible.

THE PRINCIPLE

The pipe components have a machine-lipped end turned out at right angles. The U-shaped seal is fitted over one of these lipped ends. A pull-ring is used to join the two pipe components together. This is either attached with two bolts or – if a QUICK CONNECT pull-ring is used – in one easy movement. For special applications, JACOB also supplies its pipes with a welded flange or a loose flange connection.

RELIABILITY

Anyone who thinks that this easy connection principle is second-rate compared to welded pipe systems is mistaken. These connections can be used at differential pressures of up to 0.5 bar and form a condensation leak-proof seal, making them ideally suited for extracting oil mist. There are even special versions of JACOB pipework systems that are up to 10 bar shock explosion proof.



THE DIVERSITY

JACOB components can be used to configure even the most complex pipe systems. Our range of products comprises of 8,000 standardised parts. And if that's not enough, we are pleased to manufacture customised parts for you, which will allow you, for example, to connect our pipe system to your existing systems and machines.

FLEXIBILITY AND INSTALLATION-FRIENDLY

Our pipe system guarantees the utmost flexibility due to its modular design. Existing systems can be freely expanded and modified.

Our pull-ring system can be assembled and dismantled in a matter of seconds. This reduces downtime, saves assembly costs and enables your installations to be cleaned efficiently.

DELIVERY CAPABILITY

We currently store over 1,000,000 parts in our logistics centre. We have additional warehouses at our subsidiary companies and agencies and so offer you fast availability of €15,000,000 worth of parts throughout the world. Pipe diameters of up to DN 400 mm can normally be dispatched straight from our logistics centre in Porta Westfalica.

QUALITY

We offer you a pipe system of the very highest quality. We develop and build key elements of our machinery, such as flanging machines, ourselves in order to guarantee the outstanding leaktightness and longevity of our products. We invest continually in new production technologies, machinery and processes to expand our quality leadership on an ongoing basis.



BULK GOODS HANDLING

Gravity chute systems



DUST EXTRACTION AND EXHAUST AIR

Environmental technology



LOW PRESSURE CONVEYING

Product and air conveying





APPLICATIONS AND SECTORS

JACOB pipework systems are condensation leak-proof and the materials and workmanship are of outstanding quality. These properties make them the perfect choice for numerous applications and sectors.

The JACOB pipework system offers flexibility in use in virtually every sector, from conveying sensitive foodstuffs or pharmaceutical products, or conveying granulates in the chemical or plastics industry, right up to extracting dust or oil mist in the automotive or metal-working industry.

All sectors which involve conveying raw materials and products or extracting contaminated air will benefit from installation-friendly JACOB pipework systems. They are particularly appreciated in the following sectors due to their high quality, tightness and their flexibility:

CONVEYING BULK GOODS

Grains in any form	Food, beverage and tobacco	Chemicals, pharmaceuticals, plastics
Cereals	Spices	Polyamides
Concentrated feed	Coffee	Intermediate products
Seeds	Tobacco	Pharmaceuticals
	Sugar	Granulate
	Rice	
	Animal feed and pet food	
	Confectionery	

DUST EXTRACTION AND EXHAUST AIR

Metal-working	Food, beverage and tobacco	Chemicals, pharmaceuticals, plastics
Degreasing systems	Dusts	Dusts
Oil mist	Fumes	Lacquers
Welding fumes		Fumes
Grind dusts		

LOW PRESSURE CONVEYING

Recycling	Wood and paper	Chemicals	Air conditioning
Electronics	Paper	Polystyrene	Printing companies
Plastic	Wood	PU foam	Cleanrooms
Glass	Wood shavings		Cereal cooling
	Pellets		



GENERAL INFORMATION

Innovation and quality





INNOVATIONS AND QUALITY

Innovations are our way of helping our customers to move forward – quality is a matter of course.



FOOD GRADE LINE

JACOB sets standards in food safety. Our new FOOD GRADE line of products complies with both the European EC 1935/2004 regulations and the American FDA guidelines. All components that come into contact with food are made exclusively of high grade stainless steels. In addition, we use adhesive-free vulcanised U-shaped seals and ring seals: They are more resistant to chemicals, temperature and tearing than glued rings.



THE DETECTABLE DESIGN RANGE

Foreign particles in a product are not acceptable in many sectors. Up to now, it was practically impossible to trace gaskets and seals, or even just parts of them, in the product flow. JACOB has succeeded in incorporating miniscule particles in the compound that the gaskets or seals are made of. If gaskets or seals get into the product flow, such as during maintenance work, these can now be reliably detected by metal detectors and then removed. This makes the DETECTABLE DESIGN range an indispensable safety factor.



THE QUICK CONNECT PRINCIPLE

JACOB pipework systems take less time to install than conventional systems. Using the QUICK CONNECT pull-ring makes it even quicker, however. It only takes a few quick turns of the hand to join two sections of pipe together or to separate them again. This is a great advantage! This is particularly the case with pipe systems that require to be dismantled regularly for cleaning and maintenance.

EXPLOSION SAFETY AND ELECTROSTATIC CONTINUITY

JACOB pipework systems, if configured accordingly, are shock explosion proof to 3 or 10 bar overpressure. Particularly when conveying solids and gases that have a tendency to explode, this is an important safety factor. To ensure that this does not happen, JACOB pipework systems can be installed in such a way that they are completely electrostatically conductive.



GENERAL INFORMATION

Online shop for convenient ordering





JACOB online shop

ONLINE SHOP FOR CONVENIENT ORDERING

Unique in the sector: The new JACOB online shop (www.jacob-shop.com). You have been able to shop with us for a long time – but now you enjoy the convenience that up to now only big internet traders have been able to offer.

AVAILABILITY

Our online shop is open all hours. Whenever you are working on planning an installation, whenever you are looking for a spare part and wish to order it: the entire JACOB online shop is at your disposal right round the clock.

TRANSPARENCY

Availability is shown in real time. So you can be sure that the item you have ordered really is in stock. And if the delivery is on its way, you can use the “track & trace” function any time to find out where it is and how long it will take. If you need something in a hurry, our next-day service will get it to you the following working day.

CONVENIENCE

The JACOB online shop is easy to use. Enter your contact details, manage your projects, enter your own customer item number when ordering or view your order history any time. You can also order special components by uploading your data and place express orders.

www.jacob-shop.com



GENERAL INFORMATION

Materials and finishing





MATERIALS

High-grade materials, perfect workmanship: This is the basis for the particular quality of our products.

Pipework and press-formed components in mild steel

Mainly the following materials:

- DD11 (1.0332) to DIN EN 10111
- DD11 (1.0335) to DIN EN 10111
- DD11 (1.0330) to DIN EN 10130
- DC04 (1.0338) to DIN EN 10130

Corrosion protection through powder coating, priming (spray painted) or hot-dip galvanising

Flanges and mounting brackets in structural grade carbon steel

S235JR (1.0038) to DIN EN 10025-2

Corrosion protection through powder coating, priming (spray painted) or hot-dip galvanising

Pipework and press-formed components in stainless steel

Suitable for moderate to medium corrosive environmental conditions (CRC 2 to DIN EN 1993-1-4).

Primarily for use in the food industry. Mainly the following materials:

- 1.4301 (X5CrNi18-10), AISI 304, ASTM A240, A480, A 666
- 1.4307 (X2CrNi18-9), AISI 304L, ASTM A240, A480, A 666

To restore the corrosion resistance and to create a uniform surface finish, these materials are stainless steel shotblasted as standard. Temperature-resistant to 300°C.

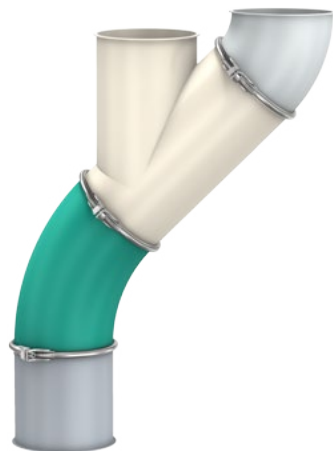
Available on request

Stainless steels for higher corrosive environmental conditions (CRC 3 to DIN EN 1993-1-4).

Primarily for use in the chemical and pharmaceutical industry.

- 1.4404 (X2CrNiMo17-12-2) AISI 316L, ASTM A 240
- 1.4571 (X6CrNiMoTi17-12-2), AISI 316Ti, ASTM A 240

As standard, components are pickled in a bath and passivated by storing in the open air to restore their corrosion resistance. Prices and delivery time on request. Other materials that are not explicitly mentioned can also be offered after examining their processability.



FINISHING

To prevent damage due to corrosion in mild steels, our components are protected to enable them to withstand the general ambient conditions. JACOB has different product groups to offer for this purpose for the stainless steel modular pipework system: powder-coated, spray primed or galvanised components.

Corrosion protection through powder-coating or spray priming

Powder-coating:

- Pretreatment: Thin film iron phosphate coating
- Powder coating primer from DN 60 to 630 mm
- Silk gloss, smooth polyester resin binder-based powder coating
- Its constituents comply with the Food and Drug Administration (FDA) requirements of regulation 21 CFR 175.300 for direct contact with food
- Temperature resistance: from -60°C to +120°C
- Electrostatically conductive
- Colour similar to RAL 7032 (pebble grey)
- Coating thickness on the outside: average layer thickness 55 µm
- Coating thickness on the inside: optically covered as temporary corrosion protection

Priming (spray painted):

- Generally used with pipework > DN 630 mm
- Inner and outer priming
- Coating thickness: average layer thickness 45 µm
- Colour similar to RAL 7032 (pebble grey)
- Inside and outside optically covered as temporary corrosion protection

More colours:

- Choose from more than 3,000 colour and effect variations
- Final outside painting of pipe components and pressed components in a coating thickness of approx. 80 µm

Options:

- Structured coatings and high-gloss effects
- UV protection
- Inner coating free from spray mist possible at additional cost with spray priming



Corrosion protection through hot-dip galvanisation

- Pipe components described as “galvanised” are all hot-dip galvanised
- Hot-dip galvanising to DIN EN ISO 1461
- Average layer thickness (minimum values) depends on the thickness of the steel:
 - <1.5 mm: 45 µm
 - ≥1.5 mm to ≤3 mm: 55 µm
 - ≥3 mm to ≤6 mm: 70 µm
- Temperature-resistant to 200°C
- During hot-dip galvanisation, irregularities may occur in the colour and structure of the surface

Corrosion protection through electro galvanisation

- E.g. for pull-rings, air regulators, ball joints and other accessories
- Galvanisation according to DIN EN ISO 19598 (Fe//Zn8//An//T0) colourless to iridescent colour
- Layer thickness approx. 10 µm
- Temperature-resistant to 120°C



GENERAL INFORMATION

Types of connection and dimensions

OUR CONNECTIONS AND DIMENSIONS

Our modular pipework system is distinguished by its diversity and its top quality. We have the right type of connection in our range for virtually all applications involving bulk goods conveying, air and dust exhaust extraction, and low-pressure conveying: from the JACOB pull-ring system and loose flange system to welded-on flanged pipework.

Nominal diameters and dimensions are given in millimetres.

Inside diameter The JACOB pull-ring system



DN (mm)	ND (inch)	Ø d with a wall thickness of				Lip width 6 mm	QUICK CONNECT pull-ring	Pull-ring without sealant	Pull-ring with sealant	Pull ring one-part with sealant
		S=1 mm	S=1.5 mm	S=2 mm	S=3 mm					
60	2¼		57			■	■			
80	3	78	77	76		■	■		■	
100	4	100	100	99		■	■	■	■	
120	5	120	120	119	118	■	■	■	■	
140	5½	136	136	135		■	■	■		
150	6	150	150	149	148	■	■	■	■	
175	7	175	175	174	173	■	■	■	■	
200	8	200	200	199	198	■	■	■	■	
224	9	220	220	219		■	■	■		
250	10	250	250	249	248	■	■	■		
280	11	278	277	276		■	■	■		
300	12	300	300	299	298	■	■	■		
315	12½	313	312	311		■	■	■		
350	14	350	350	349	348	■	■	■		
400	16	400	399	398	396	■	■	■		
450	18	450	449	448	446	■	□	■		
500	20	500	499	498	496	■	□	■		
560	22		559	558	556	■	□	■		
630	25		629	628	626	■	□	■		
710	28			707	705					
800	31½			797	795					
900	35½			897	895					
1000	39			997	995					
1120	44			1117	1115					
1250	49			1247	1245					
1400	55				1398					
1600	63				1598					

DN = Nominal diameter

■ Standard

□ Optional, use depends on application



Tolerances:

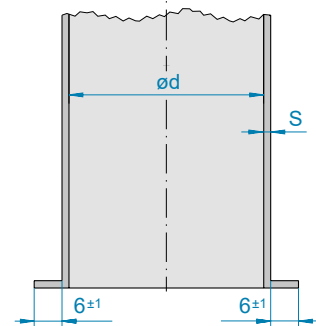
- Pipe diameter and roundness – DIN EN 10296-1
- Lengths and angles – DIN ISO 2768-1 – tolerance class V
- Excluded: Segments and transition pieces with a gradient, angle tolerance $\pm 1^\circ$
- The wall thickness of drawn or ground partial areas may differ
- JACOB flanges similar to DIN 24154-2 (DN 120, 150, 300, 350 not included in the DIN standard)

The JACOB flange system

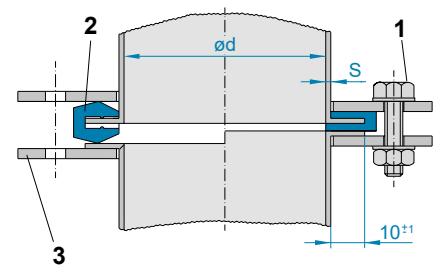


DN (mm)	ND (inch)	Lip width		Loose flange	Welded flange	10 bar shock explosion proof
		6 mm	10 mm			
60	2¼	■		□	□	
80	3	■		□	□	■
100	4	■		□	□	■
120	5	■		□	□	■
140	5½	■		□	□	
150	6	■		□	□	■
175	7	■		□	□	■
200	8	■		□	□	■
224	9	■		□	□	
250	10	■		□	□	■
280	11	■		□	□	
300	12	■		□	□	■
315	12½	■		□	□	■
350	14		■	■	□	□
400	16		■	■	□	□
450	18		■	■	□	□
500	20		■	■	□	□
560	22		■	■	□	□
630	25		■	■	□	□
710	28		■	■	□	
800	31½		■	■	□	
900	35½		■	■	□	
1000	39		■	■	□	
1120	44		■	■	□	
1250	49		■	■	□	
1400	55				■	
1600	63				■	

DN = Nominal diameter
 ■ Standard
 □ Optional, use depends on application
 ■ Price on request



JACOB pipework system with a lip for pull-ring connection



JACOB loose flange system

- 1 Mounting bolts
- 2 U-shaped seal for 10 mm lip
- 3 Loose flange to DIN 24154-2

S = Wall thickness
 Ød = Internal diameter



GENERAL INFORMATION

History and international





OUR FAMILY-OWNED ENTERPRISE

Our business has been in the family since it was founded in 1924. This makes JACOB particularly flexible and so is able to work in partnership and react fast to customers' needs and the demands of the market. Our company stands out with its clear values and sense of responsibility. We are conscious of the fact that JACOB owes its existence and success to its workforce. This is why we are committed to all the people who work at JACOB, in the same way that they are dedicated to the company.

OUR HISTORY

Even in the nineteen-fifties, JACOB turned its focus to the manufacture of pipework systems and developed a modular system which is distinguished by its connections using flanged lips, U-shaped seals and pull-rings. We have continued to perfect this principle right up to today and have become market leaders in our industry.

OUR EXPERTISE

The secret of JACOB's exceptional quality lies in our expertise, which we have built up over more than 60 years' experience with modular pipework systems. JACOB has a large number of in-house developed and self-built tools for accurately producing pressed components, such as drawn bends, valves and pull-rings. Added to this, we have designed and built our own machines for the lip flanging process and high-performance automated manufacturing. In tandem with our innovative development department, we are therefore able to guarantee flawless engineering and a consistently high standard of quality.



THE WHOLE WORLD

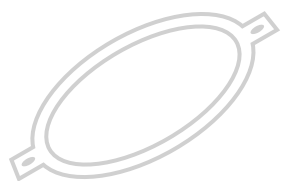
JACOB is a globally active company which supports its customers all over the world with its five subsidiaries in Germany, France, Italy, the UK and the USA, and a presence in some 40 countries. We are able to count reputable customers from all sectors of industry both in Germany and abroad among our long-standing and satisfied customers. Expanding this leading position and building on the confidence that our customers place in us is our goal.









- JACOB locations
- JACOB subsidiaries
- JACOB headquarters



JACOB PULL-RING SYSTEM:
EASY TO INSTALL,
MAXIMUM TIGHTNESS



THE PULL-RING SYSTEM


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Explanatory video

PULL-RINGS



DN	QUICK CONNECT pull-ring ¹⁾ 	Pull-ring without sealant ¹⁾	Pull-ring with sealant	One-part pull-ring with sealant
60		■		
80	■	■	■	■
100	■	■	■	■
120	■	■	■	■
140	■	■	■	
150	■	■	■	■
175	■	■	■	■
200	■	■	■	■
224	■	■	■	
250	■	■	■	
280	■	■	■	
300	■	■	■	
315	■	■	■	
350	■	■	■	
400	■	■	■	
450	□	□	■	
500		□	■	
560		□	■	
630		□	■	

1) Use in conjunction with U-shaped gasket

■ Standard

□ Optional, use depends on application

Pull-rings made of mild steel are electro-galvanised in the standard quality. Stainless steel pull-rings are stainless steel shotblasted. Electrolytic polishing or ball-polishing is also available on request.



Details of leakage values for the pull-ring system with U-shaped gasket

QUICK CONNECT PULL-RINGS AND PULL-RINGS WITHOUT SEALANT

Highlights: The JACOB pull-ring system is very easy to assemble and gives the pipework system its high stability and leak-tightness due to its high-quality construction. Both pull-rings have been tested in conjunction with JACOB U-shaped seals. The air leakage per connection, measured at a differential pressure of 0.5 bar – e.g. with a diameter of 300 mm – is far below the admissible values of DIN EN 12237, class D.

Application: Up to a diameter of DN 300 mm, our pull-ring system with a U-shaped seal, if configured accordingly, is condensation leak-proof and so is ideal for applications such as extracting oil mist. As a rule, our pull-ring connections with a U-shaped seal can be used for conveying bulk goods and for ventilation systems at over-pressures of up to 50,000 Pa (500 mbar, 5,000 mm WG). Vacuum applications are possible on request, depending on the product selected.

PULL-RINGS WITH FACTORY-FITTED MASTIC SEALANT

Application: The elastic sealant in the pull-ring is EC 1935/2004 compliant and can be used in contact with food product in the temperature range between -40°C and +100°C.

This pull-ring is used for bulk goods conveyed by gravity and ventilation systems with low differential pressures and without condensates. For higher demands concerning sealing properties and the resistance of the connection, pull-rings with U-shaped seals should be preferred.

U-SHAPED SEALS

Our U-shaped seals combine an ideal profile with the perfect choice of materials.

The benefits:

- Tear-resistant, compliant with food regulations (FOOD GRADE) and resistant to many aggressive chemicals thanks to vulcanisation
- Maximum tightness through an ideal profile
- Resistant to a broad range of substances due to large selection of materials available
- Metal-detectable and FOOD GRADE thanks to special materials (DETECTABLE DESIGN line)



NBR	Silicone	F	Silicone	F D	EPDM	F ¹⁾	Viton (FKM)	F
grey white	beige		blue		black		reddish brown	
EC 1935/2004	FOOD GRADE: EC 1935/2004 plus FDA		FOOD GRADE: EC 1935/2004 plus FDA		FOOD GRADE: EC 1935/2004 plus FDA ¹⁾		FOOD GRADE: EC 1935/2004 plus FDA	
-20°C to +100°C	-60°C to +250°C		-60°C to +250°C		-30°C to +120°C		-18°C to +230°C	
glued	vulcanised		vulcanised		vulcanised		vulcanised	
			metal-detectable		electrostatically conductive			

1) We would like to point out that only certain diameters are FDA compliant, other diameters are currently under review. See page 33 for details

Refer to the technical information at the beginning of this chapter and in the installation instructions (see next page) for more details. The temperatures given indicate the permanent temperature resistance. U-shaped seals must be tested by the user to ensure they are sufficiently resistant to the working conditions. Our team would be pleased to assist you with selecting the right U-shaped seal. We can send you samples on request.



Without contact caps



With contact caps

EARTHING BRIDGES

The innovative solution from JACOB for electrostatic continuity.

Suitable for retrofitting to our pull-ring system without welding and drilling. The stainless steel earthing bridge can be used as an alternative to the earthing wire or the conductive EPDM U-shaped seal.

Both versions of earthing bridge have been tested by DEKRA EXAM GmbH, a specialist unit for explosion protection.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



THE PULL-RING SYSTEM

Installation instructions



Installation instructions for the pull-ring system

INSTALLATION OF PULL-RING CONNECTIONS WITH A U-SHAPED SEAL

Pull-rings are used in conjunction with U-shaped seals to connect pipe components and pressed components with a 6 mm lip. The use of different U-shaped seal profiles enables the same pull-ring to be used with 1 to 2 mm thick pipe components and pressed components.

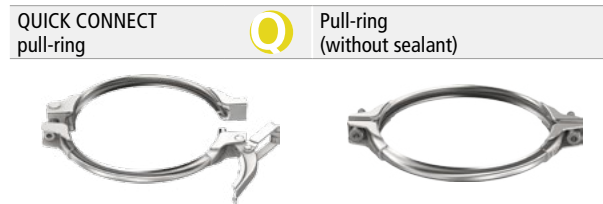
To meet the different requirements of every system, JACOB offers a comprehensive and wide-ranging standard range which covers most requirements.

U-shaped seals

Pipe component B	Profile for 1 mm wall thickness			Profile for 2 and 3 mm wall thickness			
	1 mm	1.5 mm	2 mm	1.5 mm	2 mm	2 mm	3 mm
1 mm	■	■	■				
1.5 mm	■	■			■		
2 mm	■			■	■		■
3 mm						■	■

Refer to page 29 for more technical information on pull-rings.

Pull-rings



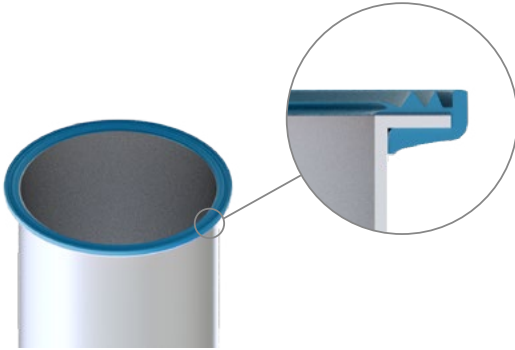
Refer to page 28 for more technical information on pull-rings.

GENERAL INSTALLATION INFORMATION ON CREATING LEAK-PROOF CONNECTIONS

- Repair damaged lipped ends (align)
- Eliminate any unevenness from the lipped end
- Assemble the pipework tension-free
- Ensure when fitting the pull-ring that the U-shaped seal does not form any loops
- Support horizontal pipework roughly every 4 metres. If there are several short pipe components in the pipeline, the interval between supports should be reduced
- Attach branch pipes so that they do not generate any tension in the main pipeline
- Tighten the bolts of two-part pull-rings evenly on both sides
- Re-tighten the pull-rings after 24 hours to ensure they are as leak-proof as possible

INSTALLATION OF PULL-RING CONNECTIONS WITH A U-SHAPED SEAL

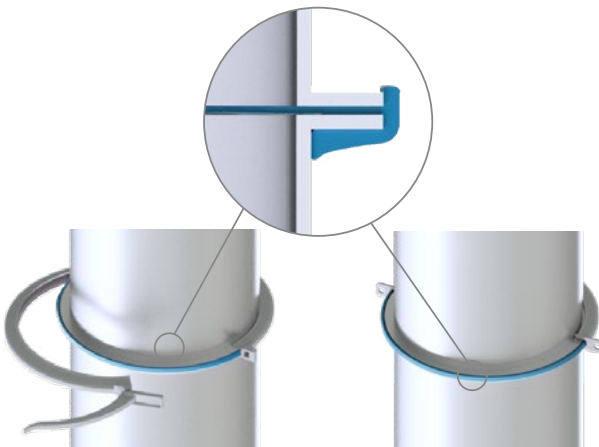
Note: To connect JACOB pipe components with a 6 mm lip. A U-shaped seal and a pull-ring are needed for each connection. You need a 6 mm hexagon cap screwdriver to mount the pull-rings.



Step 1

Attach a U-shaped seal over one of the lipped pipe ends.

- The U-shaped seal must be slightly stretched to enable it to be attached
- The profiled side must face the pipe component that is being connected



Step 2

Position the connecting pipe and slide one pull-ring half over the lipped pipe end.

QUICK CONNECT pull-ring

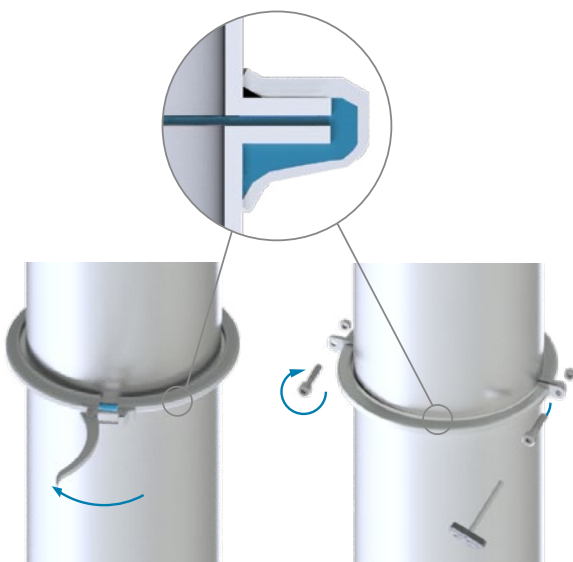
First, attach the pull-ring half without the toggle clip

Two-part pull-ring

We recommend separating the two halves of the pull-ring beforehand

Ensure that the pipe components are properly aligned and the U-shaped seal is in the right position.

Note: We recommend that when fitting horizontal pipelines where condensate occurs, any points at which the U-shaped seal is glued should be positioned on top, and the connecting points of the pull-ring halves are horizontal. This ensures the maximum possible tightness at the lowest point of the connection.



Step 3

Press the second pull-ring half onto the lipped pipe ends.

N.B.:

When closing the pull-ring, the U-shaped seal must not form any loops.

QUICK CONNECT pull-ring

- Place the clasp over the closing hook and close the clip
- To prevent the connection from loosening accidentally (such as due to vibration) tighten the bolt with a 10 Nm torque on the mounting face

Two-part pull-ring

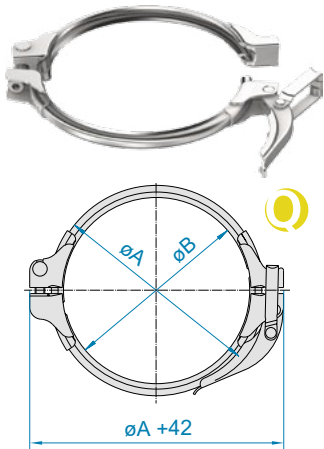
- Tighten the bolts evenly with a torque of 10 Nm

N.B.: A bolt tightening torque of 10 Nm is necessary for the QUICK CONNECT pull-ring, or 25 Nm for the two-part pull-ring, for shock explosion proof connection of up to 3 bar over-pressure.



THE PULL-RING SYSTEM

Pull-rings



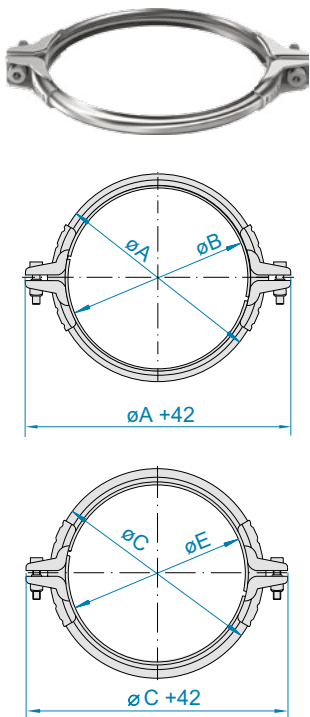
QUICK CONNECT PULL-RINGS

3085

- Pull-rings for use in conjunction with U-shaped seal for 1 and 2 mm pipework system
- Up to DN 300 mm, shock explosion proof to 3 bar
- Please also read and take into account the technical information given at the beginning of this chapter

Pull-rings for 1 and 2 mm wall thickness

DN	Ø A	Ø B	kg	Electro-galvanised	Stainless steel
				Item no.	€
80	100	80	0.35	12082903	12083903
100	123	103	0.37	12102903	12103903
120	143	123	0.40	12122903	12123903
140	159	139	0.45	12142903	12143903
150	173	153	0.47	12152903	12153903
175	198	178	0.49	12172903	12173903
200	223	203	0.51	12202903	12203903
224	243	223	0.55	12222903	12223903
250	273	253	0.58	12252903	12253903
280	301	281	0.61	12282903	12283903
300	323	303	0.62	12302903	12303903
315	336	316	0.63	12312903	12313903
350	373	353	0.68	12352903	12353903
400	423	403	0.74	12402903	12403903
450	472	450	0.79	12452903	12453903



PULL-RINGS WITHOUT SEALANT

3060

- Pull-rings for use in conjunction with U-shaped seal for 1 and 2 mm pipework system
- From DN 80 to 300 mm, shock explosion proof to 3 bar
- Pull-ring for 3 mm wall thickness, in conjunction with U-shaped seal made of NBR or silicone for 2 mm pipe-work system
- Please also read and take into account the technical information given at the beginning of this chapter

Pull-rings for 1 and 2 mm wall thickness

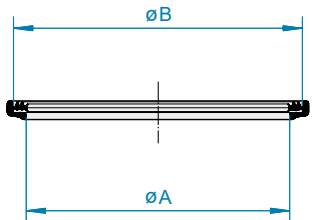
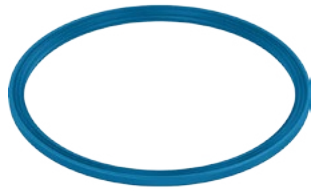
Pull-rings for 3 mm wall thickness

DN	Ø A	Ø B	kg	Electro-galvanised	Stainless steel	Ø C	Ø E	Electro-galvanised	Stainless steel
				Item no.	€			Item no.	€
60	81	60	0.30	12062383	12063383				
80	101	80	0.31	12082383	12083383				
100	125	104	0.33	12102383	12103383				
120	145	124	0.36	12122383	12123383	151	126	12122926	12123926
140	161	140	0.37	12142383	12143383				
150	175	154	0.39	12152383	12153383	181	156	12152926	12153926
175	200	179	0.42	12172383	12173383	206	181	12172926	12173926
200	225	204	0.45	12202383	12203383	231	206	12202926	12203926
224	245	224	0.47	12222383	12223383				
250	275	254	0.51	12252383	12253383	281	256	12252926	12253926
280	302	281	0.55	12282383	12283383				
300	325	304	0.57	12302383	12303383	331	306	12302926	12303926
315	337	316	0.58	12312383	12313383				
350	375	354	0.63	12352383	12353383	381	356	12352926	12353926
400	425	404	0.68	12402383	12403383	431	406	12402926	12403926
450	478	450	0.73	12452383	12453383				
500	524	500	0.78	12502383	12503383				
560	586	560	0.83	12562383	12563383				
630	656	632	0.90	12632383	12633383				

QUICK CONNECT

■ Pull-rings with a U-shaped seal, in conjunction with the pipe components indicated in the catalogue, shock explosion proof tested up to 3 bar.

U-shaped seals



U-SHAPED SEALS

3070

- For use in conjunction with JACOB pull-rings and pipe-work system with a 6 mm lip
- **U-shaped seals for 1 mm pipework system**, also for connecting 1 mm to 1.5 mm, 1 mm to 2 mm and 1.5 mm to 1.5 mm thick pipe components
- **U-shaped seals for 2 mm pipework system**, also for connecting 2 mm to 1.5 mm thick pipe components
- For 3 mm thick pipe components, the use of U-shaped seals made of NBR or silicone is recommended for a 2 mm pipework system
- Please also read and take into account the technical information given at the beginning of this chapter

2

U-shaped seals for 1 mm pipework system

DN	ØA	ØB	NBR grey		Silicone beige F		Silicone blue F D		EPDM black F ¹⁾		FKM reddish brown F	
			Item no.	€	Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	69	100669517		1006795109		10067951091		1006895159		100699519	
80	81	93	100869517		1008795109		10087951091		1008895159		100899519	
100	103	115	101069517		1010795109		10107951091		1010895159		101099519	
120	123	135	101269517		1012795109		10127951091		1012895159		101299519	
140	139	151	101469517		1014795109		10147951091		1014895159		101499519	
150	153	165	101569517		1015795109		10157951091		1015895159		101599519	
175	178	190	101769517		1017795109		10177951091		1017895159		101799519	
200	203	215	102069517		1020795109		10207951091		1020895159		102099519	
224	223	235	102269517		1022795109		10227951091		1022895159		102299519	
250	253	265	102569517		1025795109		10257951091		1025895159		102599519	
280	280	292	102869517		1028795109		10287951091		1028895159		102899519	
300	303	315	103069517		1030795109		10307951091		1030895159		103099519	
315	315	327	103169517		1031795109		10317951091		1031895159		103199519	
350	353	365	103569517		1035795109		10357951091		1035895159		103599519	
400	403	415	104069517		1040795109		10407951091		1040895159		104099519	
450	450	470	104569517		1045795109		10457951091		1045895159		104599519	
500	500	516	105069517		1050795109		10507951091		1050895159		105099519	
560	560	578	105669517		1056795109		10567951091		1056895159		105699519	
630	632	648	106369517		1063795109		10637951091		1063895159		106399519	

U-shaped seals for 2 mm pipe system, NBR and silicone also suitable for 3 mm pipe system

DN	ØA	ØB	NBR grey		Silicone beige F		Silicone blue F D		EPDM black F ²⁾		FKM reddish brown F	
			Item no.	€	Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	81	93	100869527		1008795209		10087952091		1008895259		100893869	
100	103	115	101069527		1010795209		10107952091		1010895259		101093869	
120	123	135	101269527		1012795209		10127952091		1012895259		101293869	
140	139	151	101469527		1014795209		10147952091		1014895259		101493869	
150	153	165	101569527		1015795209		10157952091		1015895259		101593869	
175	178	190	101769527		1017795209		10177952091		1017895259		101793869	
200	203	215	102069527		1020795209		10207952091		1020895259		102093869	
224	223	235	102269527		1022795209		10227952091		1022895259		102293869	
250	253	265	102569527		1025795209		10257952091		1025895259		102593869	
280	280	292	102869527		1028795209		10287952091		1028895259		102893869	
300	303	315	103069527		1030795209		10307952091		1030895259		103093869	
315	315	327	103169527		1031795209		10317952091		1031895259		103193869	
350	353	365	103569527		1035795209		10357952091		1035895259		103593869	
400	403	415	104069527		1040795209		10407952091		1040895259		104093869	
450	450	470	104569527		1045795209		10457952091		1045895259		104593869	
500	500	516	105069527		1050795209		10507952091		1050895259		105093869	
560	560	578	105669527		1056795209		10567952091		1056895259		105693869	
630	632	648	106369527		1063795209		10637952091		1063895259		106393869	

VULCANISED AND MORE TEAR-RESISTANT QUALITY.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable

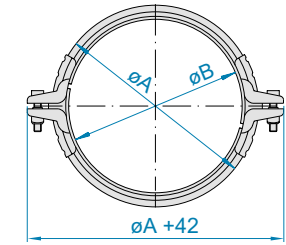
1) DN 60, 80, 100, 120 and 150 mm are FDA compliant. Other diameters are currently under review.

2) DN 80, 100, 120 and 150 mm are FDA compliant. Other diameters are currently under review.

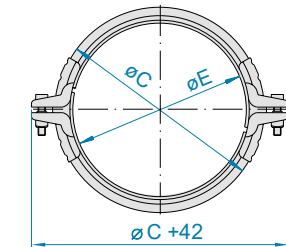


THE PULL-RING SYSTEM

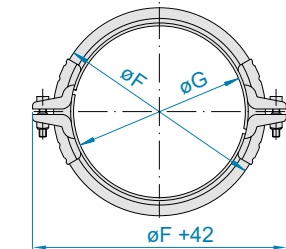
Pull-rings with mastic sealant



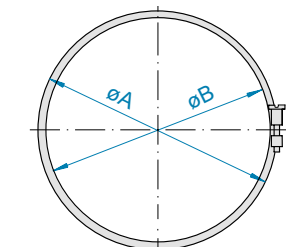
for 1 mm



for 2 mm



for 3 mm



Product similar to picture

PULL-RING WITH SEALANT

3050

- All versions electro-galvanised
- Pull-rings for 1 mm also suitable for connecting 1 mm to 1.5 mm or 2 mm thick pipe components
- Pull-rings for 2 mm also suitable for connecting 2 mm to 1.5 mm thick pipe components
- In larger diameters, pull-rings for 3 mm are used for all wall thicknesses

Pull-rings for 1, 2 and 3 mm wall thickness

DN	Ø A	Ø B	kg	For 1 mm pipework system		Ø C	Ø E	For 2 mm pipework system		Ø F	Ø G	For 3 mm pipework system	
				Item no.	€			Item no.	€			Item no.	€
80	99	80	0.23	11082381		100	80	11082382					
100	121	102	0.26	11102381		123	103	11102382					
120	141	122	0.28	11122381		143	123	11122382	145	124	11122383		
140	157	138	0.30	11142381		159	139	11142382					
150	171	152	0.33	11152381		173	153	11152382	175	154	11152383		
175			0.34	11172382		198	178	11172382	200	179	11172383		
200			0.38	11202382		223	203	11202382	225	204	11202383		
224			0.40	11222382		243	223	11222382	244	223	11222383		
250			0.42	11252382		275	254	11252382	275	254	11252383		
280			0.47	11282382		302	281	11282382					
300			0.50	11302382		325	304	11302382	325	304	11302383		
315			0.53	11312383		337	316	11312383					
350			0.68	11352383				11352383	375	354	11352383		
400			0.75	11402383				11402383	423	402	11402383		
450			0.81	11452383				11452383	473	452	11452383		
500			0.88	11502383				11502383	523	502	11502383		
560			0.95					11562383	583	562	11562383		
630			1.05					11632383	653	632	11632383		

ONE-PART PULL-RINGS WITH SEALANT

3055

- All versions galvanised
- Pull-rings for 1 mm also suitable for connecting 1 mm to 1.5 mm thick pipe components

Pull-rings for 1 mm wall thickness

DN	Ø A	Ø B	kg	1 mm	
				Item no.	€
80	97	80	0.04	11082372	
100	119	102	0.05	11102372	
120	139	122	0.06	11122372	
150	169	152	0.07	11152372	
175	194	177	0.08	11172372	
200	219	202	0.09	11202372	



EARTHING BRIDGES WITHOUT CONTACT CAPS

1400

- Engineered by JACOB for electrostatic continuity
- Patented and tested
- Recommended in conjunction with the two-part pull-ring with or without sealant (pages 32 and 34)
- Independent of the temperature and resistance
- Recommended for use in conjunction with galvanised pipe components or stainless steel surfaces
- Please also read and take into account the technical information given at the beginning of this chapter

Item no.	€/pack of ten
11003792	



EARTHING BRIDGES WITH CONTACT CAPS

- Engineered by JACOB for electrostatic continuity
- Patented and tested
- Recommended in conjunction with the two-part pull-ring with or without sealant (pages 32 and 34)
- Contact caps made of electrostatically conductive EPDM
- Recommended for use in conjunction with powder-coated pipe components in JACOB standard RAL 7032 (pebble grey), electrostatically conductive
- Please also read and take into account the technical information given at the beginning of this chapter

Item no.	€/pack of ten
11003793	



ALLEN KEYS

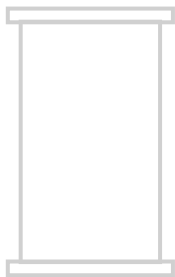
4030

- Size 5 Allen key for assembling one-part pull-ring
- Size 6 Allen key for assembling QUICK CONNECT pull-ring, pull-ring without sealant and pull-ring with sealant

	Item no.	€
Size 5 for one-part pull-rings	10002361	
Size 6 for two-part pull-rings	10002362	



JACOB PIPES – THE SOUND BASIS
FOR YOUR PIPEWORK SYSTEM



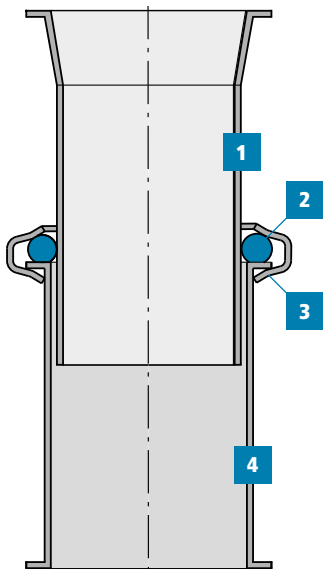
PIPES

Technical information	38	
Pipes	40	
Welding ends	45	
Push-in pipes	46	
Ring seals	49	
Pipes with spigots	49	



WELDED PIPES

The cornerstone of the modular pipework system – our certification according to the DIN EN ISO 3834-3 welding quality management system and automated welding processes guarantee top serial production quality. Straight pipes are available in diameters ranging from 60 to 630 mm with a 6 mm lip in various materials with a wall thickness of 1 to 3 mm. Please refer to chapter 1, on page 20 for information on inside diameters. At your request we manufacture customised special lengths, supply pipes with flanges or produce finishes to your specification as far as technically possible – from special colours to pickled stainless steel.



PUSH-IN PIPES

The easy solution for creating special lengths on site within a modular system. Push-in pipes are available in different lengths and are fitted with a ring seal. They are inserted into a welded pipe as far as required and then fixed in place with a pull-ring. The push-in pipe should be inserted at least 50 mm into the straight pipe, and the minimum length that is bridged is 45 mm. The easiest way of creating a special length – without sawing, welding or lip flanging!

This connection is **not** shock explosion proof. Admissible over-pressure 100 mbar (1000 mm WG, 10,000 Pa).

Push-in pipes are not telescopic pipes that can be adjusted during operation. When push-in pipes are installed horizontally, support must be provided directly on the pipe before or the pipe after the push-in pipe. In vertical pipework, the pipe under the push-in pipe must be supported. Use in pipework conveying foodstuffs is not recommended. Please also read and take into account our push-in pipe installation instructions.

- 1 Push-in pipe
- 2 Ring seal
- 3 Standard pull-ring
(cf. chapter 2)
- 4 Straight pipe



Push-in pipe installation instructions



RING SEALS FOR PUSH-IN PIPES

- Tear-resistant, FOOD GRADE and resistant to many aggressive chemicals thanks to vulcanisation
- Resistance to a broad range of substances due to large selection of materials available
- Metal-detectable and FOOD GRADE thanks to special materials (DETECTABLE DESIGN line)



NBR	Silicone F	Silicone F D	EPDM	Viton (FKM) F ¹⁾
grey white	beige	blue	black	red
EC 1935/2004	FOOD GRADE: EC 1935/2004 plus FDA	FOOD GRADE: EC 1935/2004 plus FDA	FOOD GRADE: EC 1935/2004 plus FDA ¹⁾	FOOD GRADE: EC 1935/2004 plus FDA
-20°C to +100°C	-60°C to +250°C	-60°C to +250°C	-30°C to +120°C	-18°C to +230°C
glued	vulcanised	vulcanised	vulcanised	vulcanised
		metal-detectable	electrostatically conductive	

1) We would like to point out that only certain diameters are FDA compliant, other diameters are currently under review. See page 49 for details



PIPES WITH SPIGOTS

The ideal solution for incorporating sensors in the modular pipework system.

JACOB offers 200 mm long pipe components as standard with a 6 mm lip, made of various materials, with different spigots. Special lengths and other spigots are available on request.

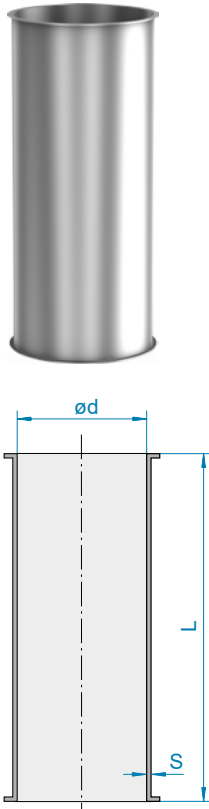
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



WELDED PIPES

- L = actual length
- Ø d = internal diameter of 2 mm parts
- All pipes with a 6 mm lip
- Special lengths and colours available on request
- Lengths of 2 m up to 12 m available on request



PIPES 2000 MM



1010

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
60	57	1984	4.30	11061010*					
80	76	1984	7.80	11081010		12081010			
100	99	1984	10.15	11101010		12101010			
120	119	1984	11.85	11121010		12121010		13121010	
140	135	1984	13.15	11141010		12141010			
150	149	1984	15.05	11151010		12151010		13151010	
175	174	1984	17.25	11171010		12171010		13171010	
200	199	1984	19.25	11201010		12201010		13201010	
224	219	1984	21.65	11221010		12221010			
250	249	1984	24.45	11251010		12251010		13251010	
280	278	1984	27.40	11281010					
300	299	1984	29.05	11301010		12301010		13301010	
315	313	1984	31.00	11311010					
350	349	1984	34.50	11351010		12351010		13351010	
400	398	1984	39.40	11401010		12401010		13401010	
450	448	1984	44.30	11451010		12451010		13451010	
500	498	1984	49.30	11501010		12501010		13501010	
560	558	1984	56.20			12561010		13561010	
630	628	1988	64.00			12631010		13631010	


*1.5 mm

Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm galvanised		2 mm galvanised		1 mm stainless steel 		2 mm stainless steel 	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	1984	4.30	11062010*				11063010*			
80	76	1984	7.80	11082010		12082010		11083010			
100	99	1984	10.15	11102010		12102010		11103010		12103010	
120	119	1984	11.85	11122010		12122010		11123010		12123010	
140	135	1984	13.15	11142010		12142010		11143010			
150	149	1984	15.05	11152010		12152010		11153010		12153010	
175	174	1984	17.25	11172010		12172010		11173010		12173010	
200	199	1984	19.25	11202010		12202010		11203010		12203010	
224	219	1984	21.65	11222010		12222010		11223010			
250	249	1984	24.45	11252010		12252010		11253010		12253010	
280	278	1984	27.40	11282010						11283010	
300	299	1984	29.05	11302010		12302010		11303010		12303010	
315	313	1984	31.00	11312010						11313010	
350	349	1984	34.50	11352010		12352010		11353010		12353010	
400	398	1984	39.40	11402010		12402010		11403010		12403010	
450	448	1984	44.30	11452010		12452010		11453010		12453010	
500	498	1984	49.30	11502010		12502010		11503010		12503010	
560	558	1984	56.20			12562010				12563010	
630	628	1988	64.00			12632010				12633010	

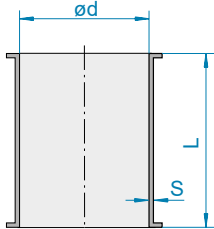
*1.5 mm

 FOOD GRADE
EC 1935/2004 plus FDA compliant

 Shock explosion proof tested
up to 3 bar



PIPES 1000 MM



Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
60	57	984	2.10	11061020*					
80	76	984	3.80	11081020		12081020			
100	99	984	4.95	11101020		12101020			
120	119	984	5.85	11121020		12121020		13121020	
140	135	984	6.55	11141020		12141020			
150	149	984	7.25	11151020		12151020		13151020	
175	174	984	8.55	11171020		12171020		13171020	
200	199	984	9.45	11201020		12201020		13201020	
224	219	984	10.75	11221020		12221020			
250	249	984	12.05	11251020		12251020		13251020	
280	278	984	13.70	11281020					
300	299	984	14.25	11301020		12301020		13301020	
315	313	984	14.40	11311020					
350	349	984	16.55	11351020		12351020		13351020	
400	398	984	18.95	11401020		12401020		13401020	
450	448	984	21.65	11451020		12451020		13451020	
500	498	984	24.60	11501020		12501020		13501020	
560	558	984	28.10			12561020		13561020	
630	628	984	29.85			12631020		13631020	

*1.5 mm

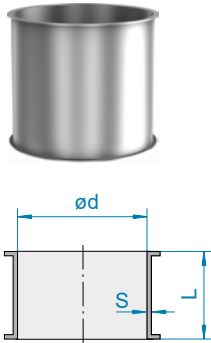
Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm galvanised		2 mm galvanised		1 mm stainless steel F		2 mm stainless steel F	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	984	2.10	11062020*						11063020*	
80	76	984	3.80	11082020		12082020		11083020			
100	99	984	4.95	11102020		12102020		11103020		12103020	
120	119	984	5.85	11122020		12122020		11123020		12123020	
140	135	984	6.55	11142020		12142020		11143020			
150	149	984	7.25	11152020		12152020		11153020		12153020	
175	174	984	8.55	11172020		12172020		11173020		12173020	
200	199	984	9.45	11202020		12202020		11203020		12203020	
224	219	984	10.75	11222020		12222020		11223020			
250	249	984	12.05	11252020		12252020		11253020		12253020	
280	278	984	13.70	11282020						11283020	
300	299	984	14.25	11302020		12302020		11303020		12303020	
315	313	984	14.40	11312020						11313020	
350	349	984	16.55	11352020						11353020	
400	398	984	18.95	11402020						11403020	
450	448	984	21.65	11452020						11453020	
500	498	984	24.60	11502020						11503020	
560	558	984	28.10			12562020			12563020		
630	628	984	29.85			12632020			12633020		

*1.5 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



PIPES 500 MM



1010

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
60	57	486	1.03	11061030*					
80	76	486	1.90	11081030		12081030			
100	99	486	2.55	11101030		12101030			
120	119	486	2.90	11121030		12121030		13121030	
140	135	486	3.25	11141030		12141030			
150	149	486	3.65	11151030		12151030		13151030	
175	174	486	4.35	11171030		12171030		13171030	
200	199	486	4.85	11201030		12201030		13201030	
224	219	486	5.30	11221030		12221030			
250	249	486	5.95	11251030		12251030		13251030	
280	278	486	6.80	11281030					
300	299	486	7.25	11301030		12301030		13301030	
315	313	486	7.70	11311030					
350	349	486	8.45	11351030		12351030		13351030	
400	398	486	9.55	11401030		12401030		13401030	
450	448	486	10.75	11451030		12451030		13451030	
500	498	486	12.05	11501030		12501030		13501030	
560	558	486	14.10			12561030		13561030	
630	628	486	15.80			12631030		13631030	


*1.5 mm

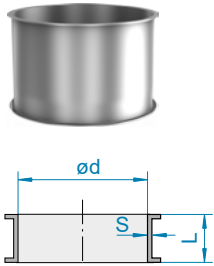
Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm galvanised		2 mm galvanised		1 mm stainless steel 		2 mm stainless steel 	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	486	1.03	11062030*						11063030*	
80	76	486	1.90	11082030		12082030		11083030			
100	99	486	2.55	11102030		12102030		11103030		12103030	
120	119	486	2.90	11122030		12122030		11123030		12123030	
140	135	486	3.25	11142030		12142030		11143030			
150	149	486	3.65	11152030		12152030		11153030		12153030	
175	174	486	4.35	11172030		12172030		11173030		12173030	
200	199	486	4.85	11202030		12202030		11203030		12203030	
224	219	486	5.30	11222030		12222030		11223030			
250	249	486	5.95	11252030		12252030		11253030		12253030	
280	278	486	6.80	11282030				11283030			
300	299	486	7.25	11302030		12302030		11303030		12303030	
315	313	486	7.70	11312030				11313030			
350	349	486	8.45	11352030				11353030		12353030	
400	398	486	9.55	11402030				11403030		12403030	
450	448	486	10.75	11452030				11453030		12453030	
500	498	486	12.05	11502030				11503030		12503030	
560	558	486	14.10			12562030				12563030	
630	628	486	15.80			12632030				12633030	

*1.5 mm

 **FOOD GRADE**
EC 1935/2004 plus FDA compliant

 Shock explosion proof tested
up to 3 bar



PIPES 200 MM



1010

Powder-coated (dimensions for 2 mm pipework)


DN	Ø d	L	kg	1 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
60	57	200	0.45	11061040*					
80	76	200	0.70	11081040		12081040			
100	99	200	1.00	11101040		12101040			
120	119	200	1.20	11121040		12121040		13121040	
140	135	200	1.40	11141040		12141040			
150	149	200	1.50	11151040		12151040		13151040	
175	174	200	1.80	11171040		12171040		13171040	
200	199	200	2.05	11201040		12201040		13201040	
224	219	200	2.20	11221040		12221040			
250	249	200	2.55	11251040		12251040		13251040	
280	278	200	2.90	11281040					
300	299	200	2.95	11301040		12301040		13301040	
315	313	200	3.30	11311040					
350	349	200	3.70	11351040		12351040		13351040	
400	398	200	4.10	11401040		12401040		13401040	


*1.5 mm

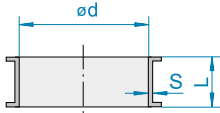
Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm galvanised		2 mm galvanised		1 mm stainless steel 		2 mm stainless steel 	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	200	0.45	11062040*						11063040*	
80	76	200	0.70	11082040		12082040		11083040			
100	99	200	1.00	11102040		12102040		11103040		12103040	
120	119	200	1.20	11122040		12122040		11123040		12123040	
140	135	200	1.40	11142040		12142040		11143040			
150	149	200	1.50	11152040		12152040		11153040		12153040	
175	174	200	1.80	11172040		12172040		11173040		12173040	
200	199	200	2.05	11202040		12202040		11203040		12203040	
224	219	200	2.20	11222040		12222040		11223040			
250	249	200	2.55	11252040		12252040		11253040		12253040	
280	278	200	2.90	11282040				11283040			
300	299	200	2.95	11302040		12302040		11303040		12303040	
315	313	200	3.30	11312040				11313040			
350	349	200	3.70	11352040				11353040		12353040	
400	398	200	4.10	11402040				11403040		12403040	

*1.5 mm

 FOOD GRADE
EC 1935/2004 plus FDA compliant

 Shock explosion proof tested
up to 3 bar



PIPES 50 MM



1010

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
60	57	50	0.12	11061050*					
80	76	50	0.15	11081050		12081050			
100	99	50	0.30	11101050		12101050			
120	119	50	0.40	11121050		12121050		13121050	
140	135	50	0.45	11141050		12141050			
150	149	50	0.50	11151050		12151050		13151050	
175	174	50	0.55	11171050		12171050		13171050	
200	199	50	0.60	11201050		12201050		13201050	
224	219	50	0.65	11221050		12221050			
250	249	50	0.75	11251050		12251050		13251050	
280	278	50	0.90	11281050					
300	299	50	0.90	11301050		12301050		13301050	
315	313	50	1.00	11311050					


*1,5 mm

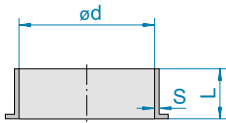
Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm galvanised		2 mm galvanised		1 mm stainless steel 		2 mm stainless steel 	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	50	0.12	11063050*							
80	76	50	0.15	11082050		12082050		11083050			
100	99	50	0.30	11102050		12102050		11103050		12103050	
120	119	50	0.40	11122050		12122050		11123050		12123050	
140	135	50	0.45	11142050		12142050		11143050		12143050	
150	149	50	0.50	11152050		12152050		11153050		12153050	
175	174	50	0.55	11172050		12172050		11173050		12173050	
200	199	50	0.60	11202050		12202050		11203050		12203050	
224	219	50	0.65	11222050		12222050		11223050		12223050	
250	249	50	0.75	11252050		12252050		11253050		12253050	
280	278	50	0.90	11282050				11283050			
300	299	50	0.90	11302050		12302050		11303050		12303050	
315	313	50	1.00	11312050				11313050			

*1,5 mm

 FOOD GRADE
EC 1935/2004 plus FDA compliant

 Shock explosion proof tested
up to 3 bar



WELDING ENDS 55 MM, FLANGED ON ONE SIDE

1020

- Flanged on one side with a 6 mm lip
- For connection to existing pipe systems or machinery on site

Steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	2 mm steel uncoated		3 mm steel uncoated		2 mm galvanised	
				Item no.	€	Item no.	€	Item no.	€
60	57	55	0.14	11060060*					
80	76	55	0.15	12080060					
100	99	55	0.35	12100060				12102060	
120	119	55	0.40	12120060		13120060		12122060	
140	135	55	0.45	12140060				12142060	
150	149	55	0.45	12150060		13150060		12152060	
175	174	55	0.55	12170060		13170060		12172060	
200	199	55	0.60	12200060		13200060		12202060	
224	219	55	0.70	12220060				12222060	
250	249	55	0.75	12250060		13250060		12252060	
280	276	55	0.80	12280060					
300	299	55	0.85	12300060		13300060		12302060	
315	311	55	0.90	12310060					
350	349	55	1.05	12350060		13350060			
400	398	55	1.15	12400060		13400060			
450	448	55	1.40	12450060		13450060			
500	498	55	1.55	12500060		13500060			
560	558	55	1.70	12560060		13560060			
630	628	55	1.90	12630060		13630060			

*1.5 mm

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated		2 mm stainless steel	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	55	0.14	11061060						11063060*	
80	76	55	0.15	11081060		12081060				12083060	
100	99	55	0.35			12101060				12103060	
120	119	55	0.40			12121060		13121060		12123060	
140	135	55	0.45			12141060				12143060	
150	149	55	0.45			12151060		13151060		12153060	
175	174	55	0.55			12171060		13171060		12173060	
200	199	55	0.60			12201060		13201060		12203060	
224	219	55	0.70			12221060				12223060	
250	249	55	0.75			12251060		13251060		12253060	
280	276	55	0.80							12283060	
300	299	55	0.85			12301060		13301060		12303060	
315	311	55	0.90							12313060	
350	349	55	1.05			12351060		13351060		12353060	
400	398	55	1.15			12401060		13401060		12403060	
450	448	55	1.40			12451060		13451060		12453060	
500	498	55	1.55			12501060		13501060		12503060	
560	558	55	1.70			12561060		13561060		12563060	
630	628	55	1.90			12631060		13631060		12633060	

*1.5 mm



PUSH-IN PIPES

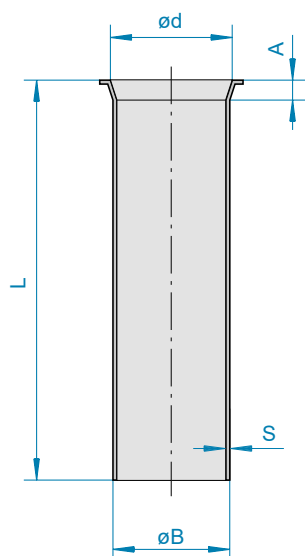
Push-in pipes in 1 to 3 mm wall thickness

For combining with:

- QUICK CONNECT pull-ring or pull-ring without sealant for 1 and 2 mm pipework (page 32)
- Ring seal (page 49)

PUSH-IN PIPES 1000 MM

1030



Powder-coated (dimensions for 1.5 mm pipework)

DN	ø d	A	ø B	L	kg	1 mm powder-coated		1.5 mm powder-coated	
						Item no.	€	Item no.	€
60	57	34	54	990	2.20			11061110	
80	77	34	74	990	2.70	11081110			
100	100	34	96	990	3.50			11101110	
120	120	34	116	990	4.30			11121110	
140	136	34	132	990	4.60			11141110	
150	150	34	146	990	5.40			11151110	
175	175	34	171	990	6.20			11171110	
200	200	34	196	990	7.00			11201110	
224	220	34	216	990	7.60			11221110	
250	250	34	246	990	8.80			11251110	
280	277	34	272	990	10.00			11281110	
300	300	34	296	990	10.70			11301110	
315	312	34	307	990	11.30			11311110	
350	350	50	346	990	12.40			11351110	
400	399	50	396	990	14.20			11401110	

Galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	ø d	A	ø B	L	kg	1.5 mm galvanised		1 mm stainless steel		1.5 mm stainless steel		2 mm stainless steel	
						Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	34	54	990	2.20	11062110					11063110		
80	77	34	74	990	2.70	11082110*		11083110					
100	100	34	96	990	3.50	11102110		11103110					12103110
120	120	34	116	990	4.30	11122110		11123110					12123110
140	136	34	132	990	4.60	11142110		11143110					
150	150	34	146	990	5.40	11152110		11153110					12153110
175	175	34	171	990	6.20	11172110		11173110					12173110
200	200	34	196	990	7.00	11202110		11203110					12203110
224	220	34	216	990	7.60	11222110		11223110					
250	250	34	246	990	8.80	11252110		11253110					12253110
280	277	34	272	990	10.00	11282110				11283110			
300	300	34	296	990	10.70	11302110		11303110					12303110
315	312	34	307	990	11.30	11312110				11313110			
350	350	50	346	990	12.40	11352110		11353110					12353110
400	399	50	396	990	14.20	11402110		11403110					12403110

*1 mm



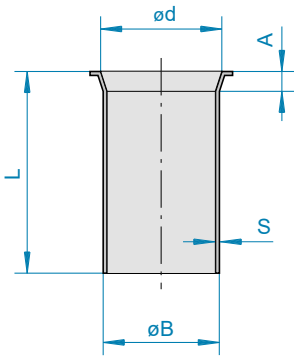
Push-in pipe installation instructions

FOOD GRADE
EC 1935/2004 plus FDA compliant



PUSH-IN PIPES 500 MM




1030



Powder-coated (dimensions for 1.5 mm pipework)

DN	Ø d	A	Ø B	L	kg	1 mm powder-coated		1.5 mm powder-coated		3 mm powder-coated	
						Item no.	€	Item no.	€	Item no.	€
60	57	34	54	492	1.10				11061120		
80	77	34	74	492	1.40				11081120		
100	100	34	96	492	1.80					11101120	
120	120	34	116	492	2.10					11121120	
140	136	34	132	492	2.45					11141120	
150	150	34	146	492	2.65					11151120	13151120
175	175	34	171	492	3.10					11171120	13171120
200	200	34	196	492	3.50					11201120	13201120
224	220	34	216	492	3.90					11221120	
250	250	34	246	492	4.50					11251120	13251120
280	277	34	272	492	5.00					11281120	
300	300	34	296	492	5.40					11301120	13301120
315	312	34	307	492	5.70					11311120	
350	350	50	346	492	6.20					11351120	
400	399	50	396	492	7.20					11401120	

Galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	A	Ø B	L	kg	1.5 mm galvanised		1 mm stainless steel 		1.5 mm stainless steel 		2 mm stainless steel 	
						Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	34	54	492	1.10	11062120					11063120		
80	77	34	74	492	1.40	11082120*		11083120					
100	100	34	96	492	1.80	11102120		11103120					12103120
120	120	34	116	492	2.10	11122120		11123120					12123120
140	136	34	132	492	2.45	11142120		11143120					
150	150	34	146	492	2.65	11152120		11153120					12153120
175	175	34	171	492	3.10	11172120		11173120					12173120
200	200	34	196	492	3.50	11202120		11203120					12203120
224	220	34	216	492	3.90	11222120		11223120					
250	250	34	246	492	4.50	11252120		11253120					12253120
280	277	34	272	492	5.00	11282120				11283120			
300	300	34	296	492	5.40	11302120		11303120					12303120
315	312	34	307	492	5.70	11312120				11313120			
350	350	50	346	492	6.20	11352120		11353120					12353120
400	399	50	396	492	7.20	11402120		11403120					12403120

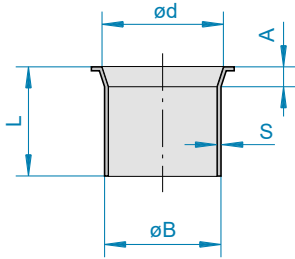
*1 mm

 FOOD GRADE
EC 1935/2004 plus FDA compliant



PIPES

Push-in pipes






PUSH-IN PIPES 200 MM

1030

Powder-coated (dimensions for 1.5 mm pipework)

DN	Ød	A	ØB	L	kg	1 mm powder-coated		1.5 mm powder-coated	
						Item no.	€	Item no.	€
60	57	34	54	200	0.41			11061130	
80	77	34	74	200	0.60	11081130			
100	100	34	96	200	0.75			11101130	
120	120	34	116	200	0.85			11121130	
140	136	34	132	200	0.95			11141130	
150	150	34	146	200	1.10			11151130	
175	175	34	171	200	1.30			11171130	
200	200	34	196	200	1.50			11201130	
224	220	34	216	200	1.55			11221130	
250	250	34	246	200	1.90			11251130	
280	277	34	272	200	2.10			11281130	
300	300	34	296	200	2.45			11301130	
315	312	34	307	200	2.50			11311130	

Galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	Ød	A	ØB	L	kg	1.5 mm galvanised		1 mm stainless steel 		1.5 mm stainless steel 		2 mm stainless steel 	
						Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	34	54	200	0.41	11062130					11063130		
80	77	34	74	200	0.60	11082130*		11083130					
100	100	34	96	200	0.75	11102130		11103130				12103130	
120	120	34	116	200	0.85	11122130		11123130				12123130	
140	136	34	132	200	0.95	11142130		11143130					
150	150	34	146	200	1.10	11152130		11153130				12153130	
175	175	34	171	200	1.30	11172130		11173130				12173130	
200	200	34	196	200	1.50	11202130		11203130				12203130	
224	220	34	216	200	1.55	11222130		11223130					
250	250	34	246	200	1.90	11252130		11253130				12253130	
280	277	34	272	200	2.10	11282130				11283130			
300	300	34	296	200	2.45	11302130		11303130				12303130	
315	312	34	307	200	2.50	11312130				11313130			

*1 mm

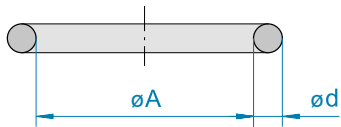
 **FOOD GRADE**
EC 1935/2004 plus FDA compliant



RING SEALS FOR PUSH-IN PIPES

3020

- Use in conjunction with push-in pipes and QUICK CONNECT pull-ring or pull-ring without sealant
- The use of silicone ring seals is recommended with a 3 mm wall thickness



FOR USE IN CONJUNCTION WITH PUSH-IN PIPE AND PULL-RING.

Ring seals to seal push-in pipes from 1 to 3 mm wall thickness

DN	$\varnothing d$	$\varnothing A$	NBR grey		Silicone beige F		Silicone blue F D		EPDM black F ¹⁾		FKM reddish brown F	
			Item no.	€	Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	7	53	100661557		1006715509		10067155091		1006815559		100691559	
80	9	68	100861557		1008715509		10087155091		1008815559		100891559	
100	9	87	101061557		1010715509		10107155091		1010815559		101091559	
120	9	106	101261557		1012715509		10127155091		1012815559		101291559	
140	9	121	101461557		1014715509		10147155091		1014815559		101491559	
150	9	138	101561557		1015715509		10157155091		1015815559		101591559	
175	9	162	101761557		1017715509		10177155091		1017815559		101791559	
200	9	186	102061557		1020715509		10207155091		1020815559		102091559	
224	9	205	102261557		1022715509		10227155091		1022815559		102291559	
250	9	233	102561557		1025715509		10257155091		1025815559		102591559	
280	9	258	102861557		1028715509		10287155091		1028815559		102891559	
300	9	281	103061557		1030715509		10307155091		1030815559		103091559	
315	9	293	103161557		1031715509		10317155091		1031815559		103191559	
350	9	328	103561557		1035715509		10357155091		1035815559		103591559	
400	9	376	104061557		1040715509		10407155091		1040815559		104091559	

3

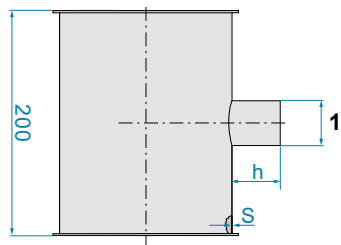


PIPES 200 MM WITH SPIGOTS

1035

- For installation of sensors on site
- Spigot length
 - ½ inch: h = 34 mm
 - 1 inch: h = 43 mm
 - 1½ inch: h = 48 mm
- Special lengths and other spigots available on request

2 mm powder-coated, length 200 mm



1 Spigot with inner thread

DN	$\varnothing d$	Spigot ½ inch		Spigot 1 inch		Spigot 1½ inch	
		Item no.	€	Item no.	€	Item no.	€
60	57	110610400901*		110610400902*			
80	76	120810400901		120810400902		120810400903	
100	99	121010400901		121010400902		121010400903	
120	119	121210400901		121210400902		121210400903	
140	136	121410400901		121410400902		121410400903	
150	149	121510400901		121510400902		121510400903	
175	174	121710400901		121710400902		121710400903	
200	199	122010400901		122010400902		122010400903	
224	220	122210400901		122210400902		122210400903	
250	249	122510400901		122510400902		122510400903	
280	276	122810400901		122810400902		122810400903	
300	299	123010400901		123010400902		123010400903	

*1.5 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

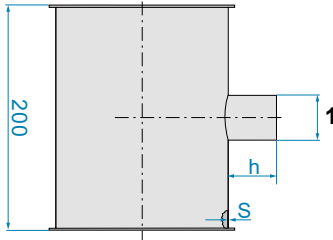
D DETECTABLE DESIGN
Metal-detectable

1) **DN 60, 80, 100 and 120 mm are FDA compliant. Other diameters are currently under review.**



PIPES

Pipes with spigots



1 Spigot with inner thread

2 mm galvanised, length 200 mm

DN	Ø d	Spigot ½ inch		Spigot 1 inch		Spigot 1½ inch	
		Item no.	€	Item no.	€	Item no.	€
60	57	110620400901*		110620400902*			
80	76	120820400901		120820400902		120820400903	
100	99	121020400901		121020400902		121020400903	
120	119	121220400901		121220400902		121220400903	
140	136	121420400901		121420400902		121420400903	
150	149	121520400901		121520400902		121520400903	
175	174	121720400901		121720400902		121720400903	
200	199	122020400901		122020400902		122020400903	
224	220	122220400901		122220400902		122220400903	
250	249	122520400901		122520400902		122520400903	
280	276	122820400901		122820400902		122820400903	
300	299	123020400901		123020400902		123020400903	

*1.5 mm

2 mm stainless steel, length 200 mm

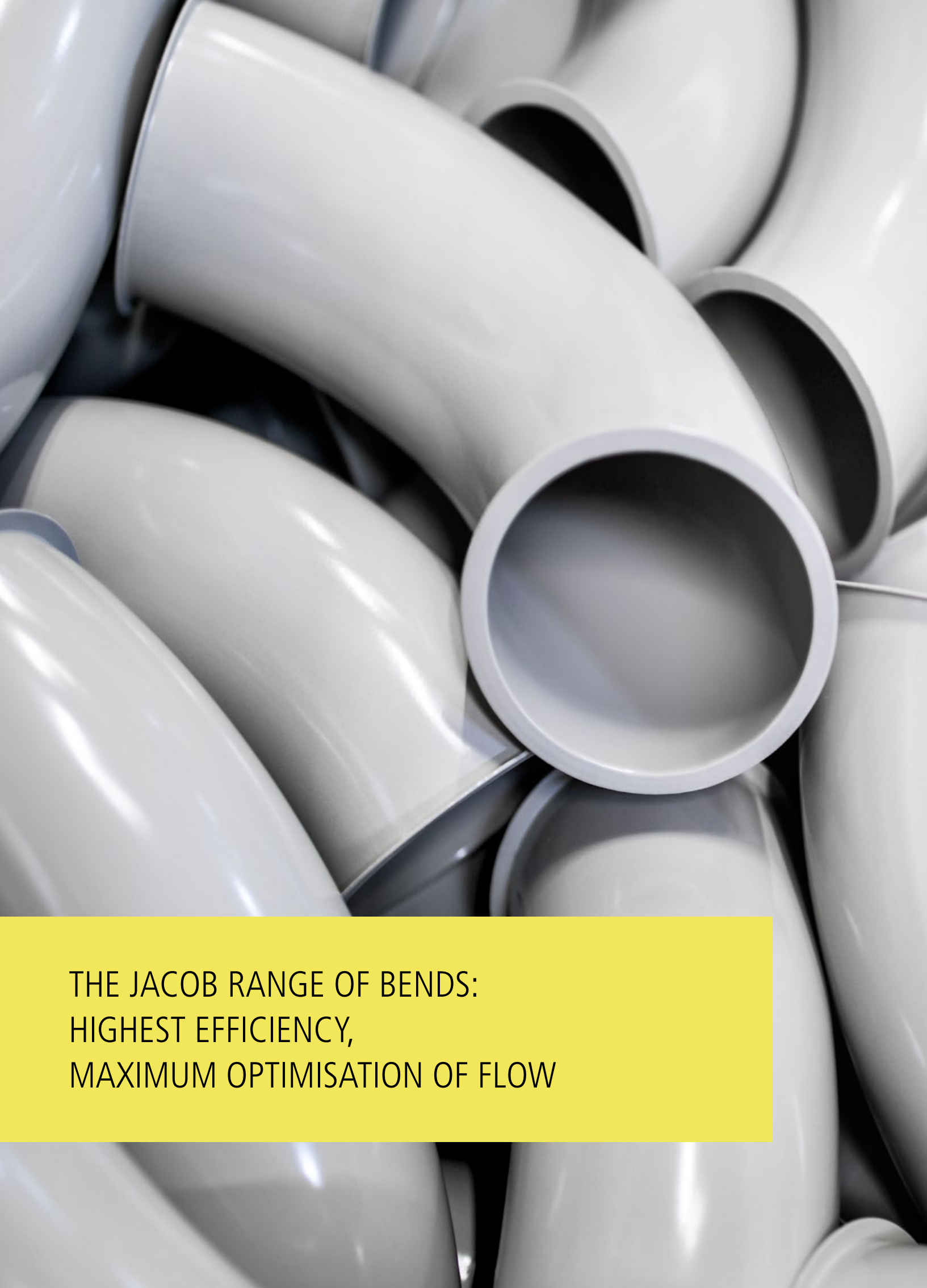
DN	Ø d	Spigot ½ inch		Spigot 1 inch		Spigot 1½ inch	
		Item no.	€	Item no.	€	Item no.	€
60	57	110630400901*		110630400902*			
80	76	120830400901		120830400902		120830400903	
100	99	121030400901		121030400902		121030400903	
120	119	121230400901		121230400902		121230400903	
140	136	121430400901		121430400902		121430400903	
150	149	121530400901		121530400902		121530400903	
175	174	121730400901		121730400902		121730400903	
200	199	122030400901		122030400902		122030400903	
224	220	122230400901		122230400902		122230400903	
250	249	122530400901		122530400902		122530400903	
280	276	122830400901		122830400902		122830400903	
300	299	123030400901		123030400902		123030400903	

*1.5 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant



3



THE JACOB RANGE OF BENDS:
HIGHEST EFFICIENCY,
MAXIMUM OPTIMISATION OF FLOW



THE RANGE OF PIPE BENDS

Technical information	54	
Segments	56	
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Adjustable elbows	67	
Pipe ball joints	67	



SEGMENTS AND BENDS

Perfect flow properties pay off! If the product flow is ideally guided through direction-changing elements, the flow resistance, and so also the wear, are significantly reduced. This results in: energy savings, longer maintenance intervals, shorter downtimes and so lower costs. We achieve this with our innovative manufacturing technology. We produce bends from pressed half shells or pressed segments. Automated production stages, particularly during welding, ensure a uniformly high level of quality.

Maximum flexibility for planning and implementation: from bends for restricted spaces with a radius of $R = 1D$ up to drawn bends with a large radius. All parts have a 6 mm lip and can be combined with all JACOB pipework using our pull-ring system.

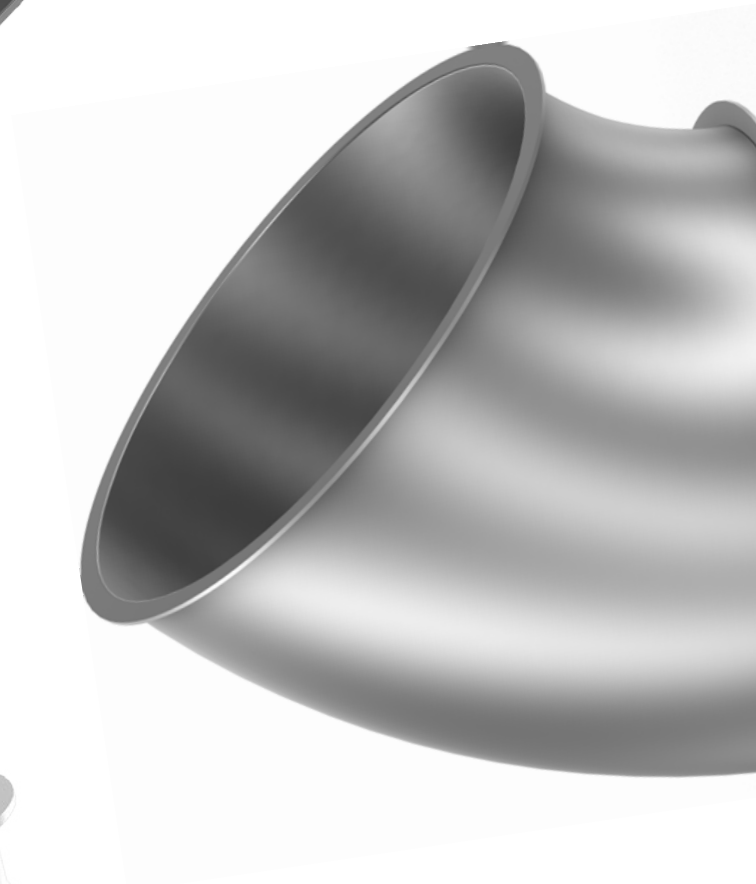
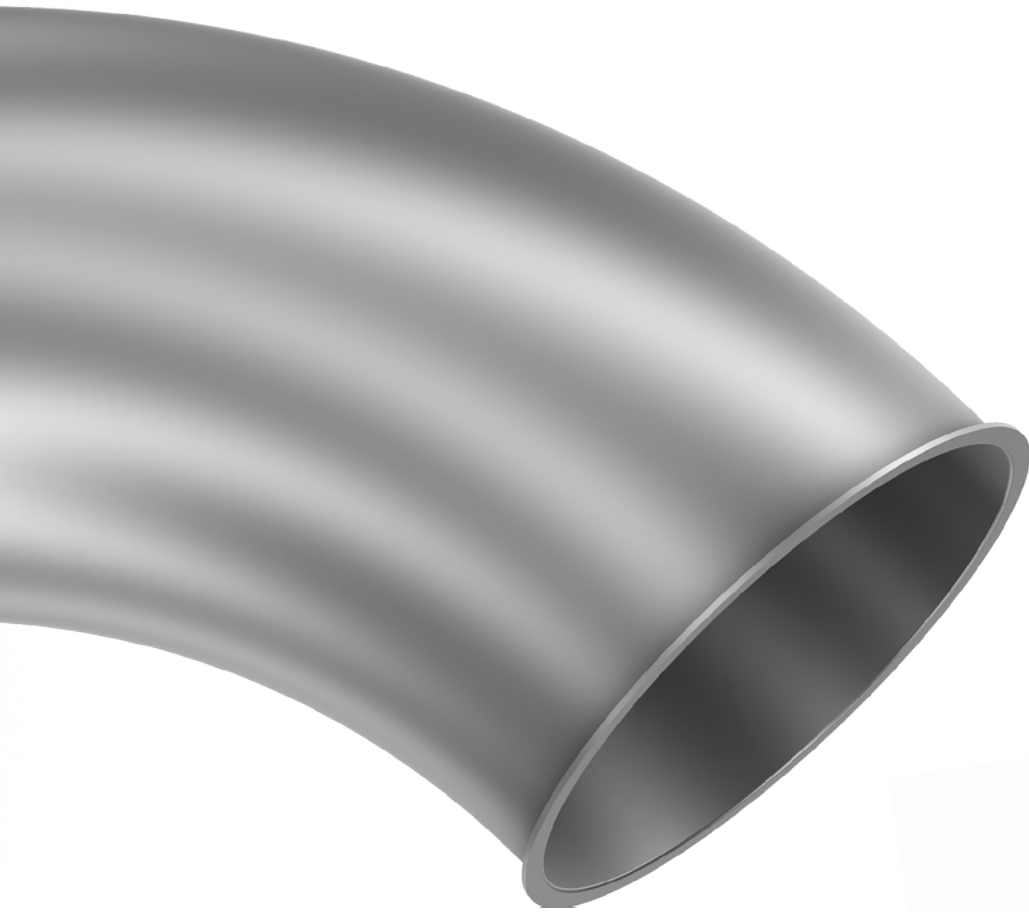
Are you looking for the right angle or radius for your application? No problem with the JACOB pipework system! Whether by using our flexible adjustable elbows and pipe ball joints or by counter-rotating two segments: a wide range of different angles can easily be achieved with parts from our standard range. We can produce special radius segment-bends on demand.

The unique JACOB flexibility makes it possible to implement numerous special requirements that our customers request: from bends with welded-on flanges to a wide range of special colours – this is no problem at all with our unique in-depth production range.

Overview of segment and bend versions

DN	Segments		Bends			
	5°	15°, 30°, 45°	R = 1D 90°	R = 2D 30°	R = 2D 90°, 60°, 45°	Long radius 15°, 30°, 45°, 60°, 90°
60	■	■	■	■	■	
80–120	■	■	■	■	■	■
140	■	■	■	■	■	
150–200	■	■	■	■	■	■
224	■	■	■	■	■	
250	■	■	■	■	■	■
280	■	■	■	■	■	
300	■	■	■	■	■	■
315	■	■	■	■	■	
350–400	■	■	■	■	■	
450–630	■	■	■	■	■	

- Lobster back version, segments/bends made up of one or more lobster back segments with a straight back
- Pressed segment version, pressed segments and bends
- Pressed segments and bends, bends made up of several pressed segments
- Bends with long radius, drawn from pipes with longitudinally welded pipes

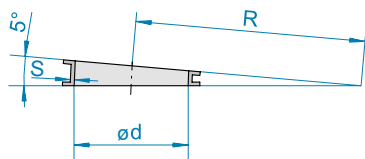


4



THE RANGE OF PIPE BENDS

Segments



SEGMENTS 5°

1110

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
80	76	310	0.10	11081300					
100	99	320	0.20	11101300		12101300			
120	119	360	0.25	11121300		12121300		13121300	
140	135	460	0.35	11141300*					
150	149	500	0.45	11151300		12151300		13151300	
175	174	560	0.55	11171300		12171300		13171300	
200	199	690	0.65	11201300		12201300		13201300	
224	219	560	0.70	11221300*					
250	249	635	0.75	11251300		12251300		13251300	
280	276	560	0.90	11281300*					
300	299	625	0.95	11301300		12301300		13301300	
315	311	600	0.95	11311300*					
350	349	350	0.80	11351300*		12351300		13351300	
400	398	400	0.95	11401300*		12401300		13401300	
450	448	450	1.40	11451300*		12451300		13451300	
500	498	500	1.45	11501300*		12501300		13501300	
560	558	560	1.60			12561300		13561300	
630	628	630	2.15			12631300		13631300	

*1.5 mm

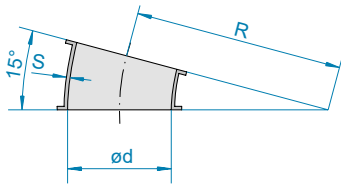
Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1 mm galvanised		2 mm galvanised		1 mm stainless steel		2 mm stainless steel	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	76	310	0.10	11082300				11083300			
100	99	320	0.20	11102300		12102300		11103300		12103300	
120	119	360	0.25	11122300		12122300		11123300		12123300	
140	135	460	0.35	11142300*		12142300		11143300*			
150	149	500	0.45	11152300		12152300		11153300		12153300	
175	174	560	0.55	11172300		12172300		11173300		12173300	
200	199	690	0.65	11202300		12202300		11203300		12203300	
224	219	560	0.70	11222300*		12222300		11223300*			
250	249	635	0.75	11252300		12252300		11253300		12253300	
280	276	560	0.90	11282300*				11283300*			
300	299	625	0.95	11302300		12302300		11303300		12303300	
315	311	600	0.95	11312300*				11313300*			
350	349	350	0.80	11352300*				11353300		12353300	
400	398	400	0.95	11402300*				11403300		12403300	
450	448	450	1.40	11452300*				11453300		12453300	
500	498	500	1.45	11502300*				11503300		12503300	
560	558	560	1.60			12562300				12563300	
630	628	630	2.15			12632300				12633300	

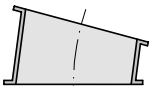
*1.5 mm

FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



■ 1 pressed segment 15°



■ 1 lobster back segment 15°

SEGMENTS 15°

1120

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1 mm powder-coated		2 mm powder-coated		3 mm powder-coated			
				Item no.	€	Item no.	€	Item no.	€		
60	57	120	0.10	11061310*							
80	76	130	0.10	11081310							
100	99	130	0.20	11101310		12101310					
120	119	155	0.30	11121310		12121310		13121310			
140	135	185	0.30	11141310*							
150	149	250	0.55	11151310		12151310		13151310			
175	174	280	0.75	11171310		12171310		13171310			
200	199	270	0.80	11201310		12201310		13201310			
224	219	220	0.55	11221310*							
250	249	310	1.05	11251310		12251310		13251310			
280	276	280	1.25	11281310*							
300	299	310	1.30	11301310		12301310		13301310			
315	311	315	1.60	11311310*							
350	349	350	1.75	11351310*		12351310		13351310			
400	398	400	2.35	11401310*		12401310		13401310			
450	448	450	2.95	11451310*		12451310		13451310			
500	498	500	3.50	11501310*		12501310		13501310			
560	558	560	4.40			12561310		13561310			
630	628	630	5.60			12631310		13631310			

*1.5 mm

Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1 mm galvanised		2 mm galvanised		1 mm stainless steel F		2 mm stainless steel F	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	120	0.10	11062310*				11063310*			
80	76	130	0.10	11082310				11083310			
100	99	130	0.20	11102310		12102310		11103310		12103310	
120	119	155	0.30	11122310		12122310		11123310		12123310	
140	135	185	0.30	11142310*		12142310		11143310*			
150	149	250	0.55	11152310		12152310		11153310		12153310	
175	174	280	0.75	11172310		12172310		11173310		12173310	
200	199	270	0.80	11202310		12202310		11203310		12203310	
224	219	220	0.55	11222310*		12222310		11223310			
250	249	310	1.05	11252310		12252310		11253310		12253310	
280	276	280	1.25	11282310*				11283310*			
300	299	310	1.30	11302310		12302310		11303310		12303310	
315	311	315	1.60	11312310*				11313310*			
350	349	350	1.75	11352310*				11353310		12353310	
400	398	400	2.35	11402310*				11403310		12403310	
450	448	450	2.95	11452310*				11453310		12453310	
500	498	500	3.50	11502310*				11503310		12503310	
560	558	560	4.40			12562310				12563310	
630	628	630	5.60			12632310				12633310	

*1.5 mm

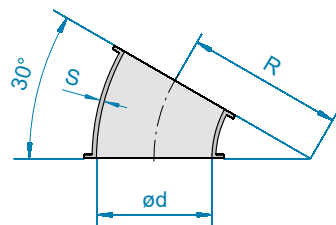
F FOOD GRADE
EC 1935/2004 plus FDA compliant

■ Shock explosion proof tested
up to 3 bar

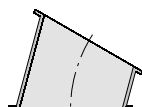


THE RANGE OF PIPE BENDS

Segments



1 pressed segment 30°



1 lobster back segment 30°

SEGMENTS 30°

1130

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
80	76	100	0.10	11081320					
100	99	95	0.30	11101320		12101320			
120	119	110	0.40	11121320		12121320		13121320	
140	135	140	0.45	11141320*					
150	149	175	0.70	11151320		12151320		13151320	
175	174	208	1.05	11171320		12171320		13171320	
200	199	180	1.05	11201320		12201320		13201320	
224	219	195	0.95	11221320*					
250	249	230	1.55	11251320		12251320		13251320	
280	276	283	2.30	11281320*					
300	299	230	1.90	11301320		12301320		13301320	
315	311	315	2.95	11311320*					
350	349	350	3.30	11351320*		12351320		13351320	
400	398	400	4.10	11401320*		12401320		13401320	
450	448	450	5.60	11451320*		12451320		13451320	
500	498	500	6.60	11501320*		12501320		13501320	
560	558	560	8.50			12561320		13561320	
630	628	630	10.50			12631320		13631320	

*1.5 mm

Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1 mm galvanised		2 mm galvanised		1 mm stainless steel		2 mm stainless steel	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	76	100	0.10	11082320				11083320			
100	99	95	0.30	11102320		12102320		11103320		12103320	
120	119	110	0.40	11122320		12122320		11123320		12123320	
140	135	140	0.45	11142320*		12142320		11143320*			
150	149	175	0.70	11152320		12152320		11153320		12153320	
175	174	208	1.05	11172320		12172320		11173320		12173320	
200	199	180	1.05	11202320		12202320		11203320		12203320	
224	219	195	0.95	11222320*		12222320		11223320			
250	249	230	1.55	11252320		12252320		11253320		12253320	
280	276	283	2.30	11282320*				11283320*			
300	299	230	1.90	11302320		12302320		11303320		12303320	
315	311	315	2.95	11312320*				11313320*			
350	349	350	3.30	11352320*				11353320		12353320	
400	398	400	4.10	11402320*				11403320		12403320	
450	448	450	5.60	11452320*				11453320		12453320	
500	498	500	6.60	11502320*				11503320		12503320	
560	558	560	8.50			12562320				12563320	
630	628	630	10.50			12632320				12633320	

*1.5 mm

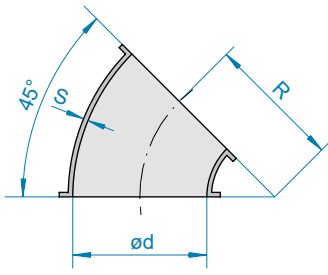
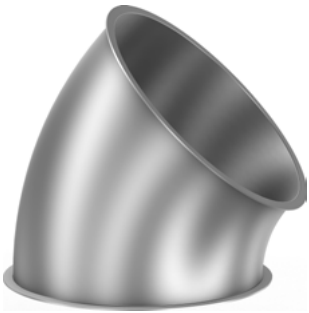
FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar

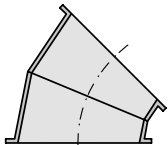


SEGMENTS 45°

1140



1 pressed segment 45°



2 lobster back segments:
2 x 22.5°

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
80	76	80	0.15	11081330					
100	99	83	0.35	11101330		12101330			
120	119	88	0.50	11121330		12121330		13121330	
140	135	112	0.50	11141330*					
150	149	150	0.90	11151330		12151330		13151330	
175	174	160	1.20	11171330*		12171330		13171330	
200	199	195	1.55	11201330*		12201330		13201330	
224	219	155	1.10	11221330*					
250	249	195	1.95	11251330*		12251330		13251330	
280	276	280	3.55	11281330*					
300	299	205	2.50	11301330*		12301330		13301330	
315	311	315	4.30	11311330*					
350	349	350	4.90	11351330*		12351330		13351330	
400	398	400	6.50	11401330*		12401330		13401330	
450	448	450	8.15	11451330*		12451330		13451330	
500	498	500	10.00	11501330*		12501330		13501330	
560	558	560	12.40			12561330		13561330	
630	628	630	16.10			12631330		13631330	

*1.5 mm

Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1 mm galvanised		2 mm galvanised		1 mm stainless steel		2 mm stainless steel	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	76	80	0.15	11082330				11083330			
100	99	83	0.35	11102330		12102330		11103330		12103330	
120	119	88	0.50	11122330		12122330		11123330		12123330	
140	135	112	0.50	11142330*		12142330		11143330*			
150	149	150	0.90	11152330		12152330		11153330		12153330	
175	174	160	1.20	11172330*		12172330		11173330*		12173330	
200	199	195	1.55	11202330*		12202330		11203330*		12203330	
224	219	155	1.10	11222330*		12222330		11223330*			
250	249	195	1.95	11252330*		12252330		11253330*		12253330	
280	276	280	3.55	11282330*				11283330*			
300	299	205	2.50	11302330*		12302330		11303330*		12303330	
315	311	315	4.30	11312330*				11313330*			
350	349	350	4.90	11352330*				11353330*		12353330	
400	398	400	6.50	11402330*				11403330*		12403330	
450	448	450	8.15	11452330*				11453330*		12453330	
500	498	500	10.00	11502330*				11503330*		12503330	
560	558	560	12.40			12562330				12563330	
630	628	630	16.10			12632330				12633330	

*1.5 mm

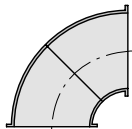
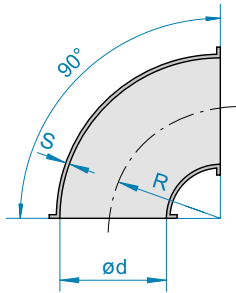
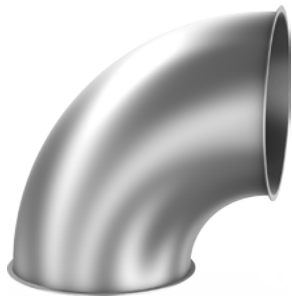
FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar

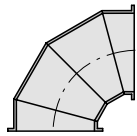


THE RANGE OF PIPE BENDS

Bends



2 pressed segments 45°



4 lobster back segments:
2 x 30° / 2 x 15°

BENDS R = 1D, 90°

1220

- DN 140, 224 and 300 mm R ≠ 1D

Powder-coated (dimensions for 1.5 mm pipework)

DN	Ø d	R	kg	1 mm powder-coated		1.5 mm powder-coated		2 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
80	77	80	0.40	11081339					
100	100	100	0.43	11101339					
120	120	120	1.00	11121339					
140	136	125	1.20			11141339			
150	150	150	0.92	11151339					
175	174	175	2.00			11171339			
200	200	200	2.42			11201339			
224	220	165	2.60			11221339			
250	250	250	4.00			11251339			
280	277	280	5.00			11281339			
300	300	210	5.00			11301339			
315	312	315	6.20			11311339			
350	350	350	8.00			11351339			
400	399	400	10.00			11401339			
450	449	450	13.00			11451339			
500	499	500	16.00			11501339			
560	558	560	26.00					12561339	
630	628	630	23.00					12631339	

Galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	R	kg	1 mm galvanised		1.5 mm galvanised		1 mm stainless steel F		2 mm stainless steel F	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	77	80	0.40	11082339				11083339			
100	100	100	0.43	11102339				11103339			
120	120	120	1.00	11122339				11123339			
140	136	125	1.20			11142339		11143339*			
150	150	150	0.92	11152339				11153339			
175	174	175	2.00			11172339		11173339*			
200	200	200	2.42			11202339		11203339*			
224	220	165	2.60			11222339		11223339*			
250	250	250	4.00			11252339		11253339*			
280	277	280	5.00			11282339		11283339*			
300	300	210	5.00			11302339		11303339*			
315	312	315	6.20			11312339		11313339*			
350	350	350	8.00			11352339		11353339*			
400	399	400	10.00			11402339		11403339*			
450	449	450	13.00			11452339		11453339*			
500	499	500	16.00			11502339		11503339*			
560	558	560	26.00				12562339*			12563339	
630	628	630	23.00				12632339*			12633339	

*2 mm

*1.5 mm

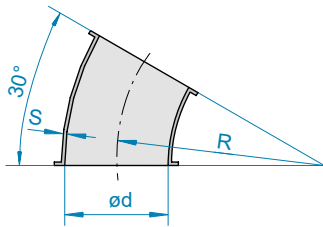
F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar

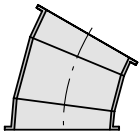


BENDS R = 2D, 30°

1230



■ 1 pressed segment 30°



■ 3 lobster back segments:
1 x 15° / 2 x 7.5°

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
60	57	120	0.25	11061343					
80	76	160	0.35	11081343*		12081343			
100	99	200	0.60	11101343*		12101343			
120	119	240	0.80	11121343		12121343		13121343	
140	135	280	1.00	11141343		12141343			
150	149	300	1.25	11151343		12151343		13151343	
175	174	350	1.65	11171343		12171343		13171343	
200	199	400	2.10	11201343		12201343		13201343	
224	219	448	2.65	11221343		12221343			
250	249	500	3.50	11251343		12251343		13251343	
280	277	560	4.40	11281343					
300	299	600	4.60	11301343		12301343		13301343	
315	312	630	5.50	11311343					
350	349	700	6.35			12351343		13351343	
400	398	800	8.50			12401343		13401343	
450	448	900	10.70			12451343		13451343	
500	498	1000	13.20			12501343		13501343	
560	558	1120	15.90			12561343		13561343	
630	628	1260	19.00			12631343		13631343	

*1 mm

Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised		1 mm stainless steel		2 mm stainless steel	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	120		11062343				11063343*			
80	76	160	0.35	11082343*		12082343		11083343			
100	99	200	0.60	11102343*		12102343		11103343		12103343	
120	119	240	0.80	11122343		12122343		11123343		12123343	
140	135	280	1.00	11142343		12142343		11143343		12143343	
150	149	300	1.25	11152343		12152343		11153343		12153343	
175	174	350	1.65	11172343		12172343		11173343*		12173343	
200	199	400	2.10	11202343		12202343		11203343*		12203343	
224	219	448	2.65	11222343		12222343		11223343*			
250	249	500	3.50	11252343		12252343		11253343*		12253343	
280	277	560	4.40	11282343				11283343*			
300	299	600	4.60	11302343		12302343		11303343*		12303343	
315	312	630	5.50	11312343				11313343*			
350	349	700	6.35			12352343				12353343	
400	398	800	8.50			12402343				12403343	
450	448	900	10.70	11452343						12453343	
500	498	1000	13.20	11502343						12503343	
560	558	1120	15.90	11562343						12563343	
630	628	1260	19.00	11632343						12633343	

*1 mm

*1.5 mm

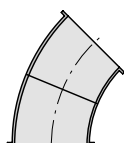
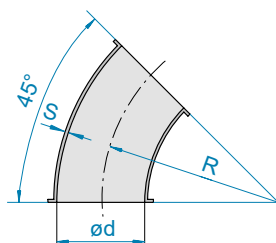
FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar

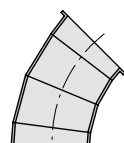


THE RANGE OF PIPE BENDS

Bends



■ 2 pressed segments 22.5°



■ 4 lobster back segments:
2 x 15° / 2 x 7.5°

BENDS R = 2D, 45°

1240

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
60	57	120	0.40	11061344					
80	76	160	0.50	11081344*		12081344			
100	99	200	0.85	11101344*		12101344			
120	119	240	1.15	11121344		12121344		13121344	
140	135	280	1.45	11141344		12141344			
150	149	300	1.80	11151344		12151344		13151344	
175	174	350	2.25	11171344		12171344		13171344	
200	199	400	3.00	11201344		12201344		13201344	
224	219	448	3.90	11221344		12221344			
250	249	500	4.80	11251344		12251344		13251344	
280	277	560	6.55	11281344					
300	299	600	7.20	11301344		12301344		13301344	
315	312	630	8.15	11311344					
350	349	700	9.80			12351344		13351344	
400	398	800	12.70			12401344		13401344	
450	448	900	16.00			12451344		13451344	
500	498	1000	19.80			12501344		13501344	
560	558	1120	23.90			12561344		13561344	
630	628	1260	29.60			12631344		13631344	

*1 mm

Galvanised and stainless steel (dimensions for 2 mm pipework)

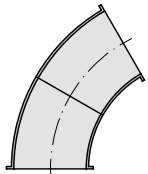
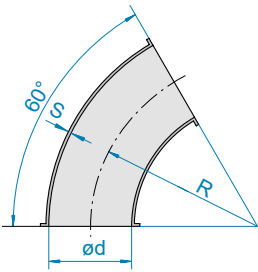
DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised		1 mm stainless steel		2 mm stainless steel	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	120	0.40	11062344				11063344*			
80	76	160	0.50	11082344*		12082344		11083344			
100	99	200	0.85	11102344*		12102344		11103344		12103344	
120	119	240	1.15	11122344		12122344		11123344		12123344	
140	135	280	1.45	11142344		12142344		11143344		12143344	
150	149	300	1.80	11152344		12152344		11153344*		12153344	
175	174	350	2.25	11172344		12172344		11173344		12173344	
200	199	400	3.00	11202344		12202344		11203344*		12203344	
224	219	448	3.90	11222344		12222344		11223344*			
250	249	500	4.80	11252344		12252344		11253344*		12253344	
280	277	560	6.55	11282344				11283344*			
300	299	600	7.20	11302344		12302344		11303344*		12303344	
315	312	630	8.15	11312344				11313344*			
350	349	700	9.80			12352344				12353344	
400	398	800	12.70			12402344				12403344	
450	448	900	16.00	11452344						12453344	
500	498	1000	19.80	11502344						12503344	
560	558	1120	23.90	11562344						12563344	
630	628	1260	29.60	11632344						12633344	

*1 mm

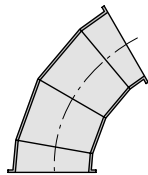
*1.5 mm

FOOD GRADE
EC 1935/2004 plus FDA compliant

■ Shock explosion proof tested
up to 3 bar



2 pressed segments 30°



4 lobster back segments:
2x20°/2x10°

BENDS $R = 2D, 60^\circ$

1250

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
60	57	120	0.50	11061346					
80	76	160	0.65	11081346*		12081346			
100	99	200	1.10	11101346*		12101346			
120	119	240	1.50	11121346		12121346		13121346	
140	135	280	2.05	11141346		12141346			
150	149	300	2.40	11151346		12151346		13151346	
175	174	350	3.15	11171346		12171346		13171346	
200	199	400	4.10	11201346		12201346		13201346	
224	219	448	5.20	11221346		12221346			
250	249	500	6.90	11251346		12251346		13251346	
280	277	560	8.80	11281346					
300	299	600	9.30	11301346		12301346		13301346	
315	312	630	10.80	11311346					
350	349	700	13.00	11351346		12351346		13351346	
400	398	800	16.90			12401346		13401346	
450	448	900	21.30			12451346		13451346	
500	498	1000	26.40			12501346		13501346	
560	558	1120	31.90			12561346		13561346	
630	628	1260	37.90			12631346		13631346	

*1 mm

Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised		1 mm stainless steel		2 mm stainless steel	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	120	0.50	11062346				11063346*			
80	76	160	0.65	11082346*		12082346		11083346			
100	99	200	1.10	11102346*		12102346		11103346		12103346	
120	119	240	1.50	11122346		12122346		11123346		12123346	
140	135	280	2.05	11142346		12142346		11143346		12143346	
150	149	300	2.40	11152346		12152346		11153346		12153346	
175	174	350	3.15	11172346		12172346		11173346*		12173346	
200	199	400	4.10	11202346		12202346		11203346*		12203346	
224	219	448	5.20	11222346		12222346		11223346*			
250	249	500	6.90	11252346		12252346		11253346*		12253346	
280	277	560	8.80	11282346				11283346*			
300	299	600	9.30	11302346		12302346		11303346*		12303346	
315	312	630	10.80	11312346				11313346*			
350	349	700	13.00			12352346				12353346	
400	398	800	16.90			12402346				12403346	
450	448	900	21.30	11452346						12453346	
500	498	1000	26.40	11502346						12503346	
560	558	1120	31.90	11562346						12563346	
630	628	1260	37.90	11632346						12633346	

*1 mm

*1.5 mm

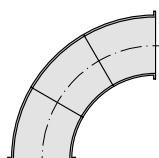
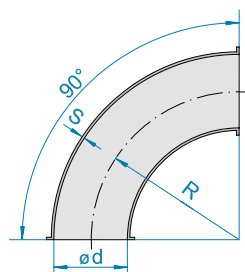
FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar

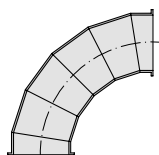


THE RANGE OF PIPE BENDS

Bends



3 pressed segments 30°



6 lobster back segments:
4 x 18° / 2 x 9°

BENDS R = 2D, 90°

1260

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
				Item no.	€	Item no.	€	Item no.	€
60	57	120	0.75	11061349					
80	76	160	0.95	11081349*		12081349			
100	99	200	1.55	11101349*		12101349			
120	119	240	2.20	11121349		12121349		13121349	
140	135	280	3.05	11141349		12141349			
150	149	300	3.50	11151349		12151349		13151349	
175	174	350	4.60	11171349		12171349		13171349	
200	199	400	6.10	11201349		12201349		13201349	
224	219	448	7.80	11221349		12221349			
250	249	500	9.70	11251349		12251349		13251349	
280	277	560	12.70	11281349					
300	299	600	13.50	11301349		12301349		13301349	
315	312	630	16.30	11311349					
350	349	700	19.60			12351349		13351349	
400	398	800	25.00			12401349		13401349	
450	448	900	32.00			12451349		13451349	
500	498	1000	39.30			12501349		13501349	
560	558	1120	47.90			12561349		13561349	
630	628	1260	56.90			12631349		13631349	

*1 mm

Galvanised and stainless steel (dimensions for 2 mm pipework)

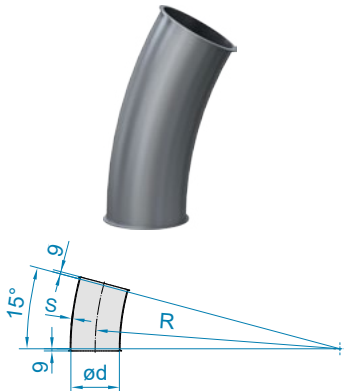
DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised		1 mm stainless steel F	2 mm stainless steel F
				Item no.	€	Item no.	€	Item no.	€
60	57	120	0.75	11062349				11063349*	
80	76	160	0.95	11082349*		12082349		11083349	
100	99	200	1.55	11102349*		12102349		11103349	12103349
120	119	240	2.20	11122349		12122349		11123349	12123349
140	135	280	3.05	11142349		12142349		11143349	12143349
150	149	300	3.50	11152349		12152349		11153349	12153349
175	174	350	4.60	11172349		12172349		11173349*	12173349
200	199	400	6.10	11202349		12202349		11203349*	12203349
224	219	448	7.80	11222349		12222349		11223349*	
250	249	500	9.70	11252349		12252349		11253349*	12253349
280	277	560	12.70	11282349				11283349*	
300	299	600	13.50	11302349		12302349		11303349*	12303349
315	312	630	16.30	11312349				11313349*	
350	349	700	19.60			12352349			12353349
400	398	800	25.00			12402349			12403349
450	448	900	32.00	11452349					12453349
500	498	1000	39.30	11502349					12503349
560	558	1120	47.90	11562349					12563349
630	628	1260	56.90	11632349					12633349

*1 mm

*1.5 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



BENDS LONG RADIUS, 15°

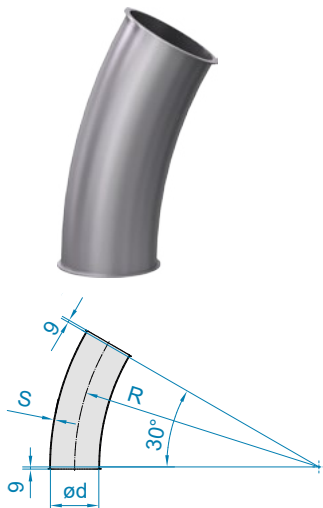
1262

- DN 80, 250 and 300 mm R = 4D
- DN 100, 120, 150, 175 and 200 mm R = 5D

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	ø d	R	kg	2 mm powder-coated		2 mm stainless steel		F
				Item no.	€	Item no.	€	
80	76	500	3.40	120813511		120833511		
100	99	500	4.10	121013511		121033511		
120	119	600	5.70	121213511		121233511		
150	149	750	13.50	131513511*		121533511		
175	175	875	12.40	131713511*		121733511		
200	199	1000	26.20	132013511*		132033511*		
250	249	1000	32.80	132513511*		132533511*		
300	299	1200	46.40	133013511*		133033511*		

*3 mm



BENDS LONG RADIUS, 30°

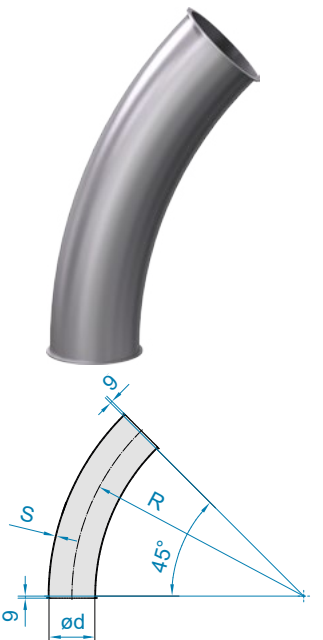
1264

- DN 80, 250 and 300 mm R = 4D
- DN 100, 120, 150, 175 and 200 mm R = 5D

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	ø d	R	kg	2 mm powder-coated		2 mm stainless steel		F
				Item no.	€	Item no.	€	
80	76	500	3.40	120813531		120833531		
100	99	500	4.10	121013531		121033531		
120	119	600	5.70	121213531		121233531		
150	149	750	13.50	131513531*		121533531		
175	175	875	12.40	131713531*		121733531		
200	199	1000	26.20	132013531*		132033531*		
250	249	1000	32.80	132513531*		132533531*		
300	299	1200	46.40	133013531*		133033531*		

*3 mm



BENDS LONG RADIUS, 45°

1266

- DN 80, 250 and 300 mm R = 4D
- DN 100, 120, 150, 175 and 200 mm R = 5D

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	ø d	R	kg	2 mm powder-coated		2 mm stainless steel		F
				Item no.	€	Item no.	€	
80	76	500	3.40	120813541		120833541		
100	99	500	4.10	121013541		121033541		
120	119	600	5.70	121213541		121233541		
150	149	750	13.50	131513541*		121533541		
175	175	875	12.40	131713541*		121733541		
200	199	1000	26.20	132013541*		132033541*		
250	249	1000	32.80	132513541*		132533541*		
300	299	1200	46.40	133013541*		133033541*		

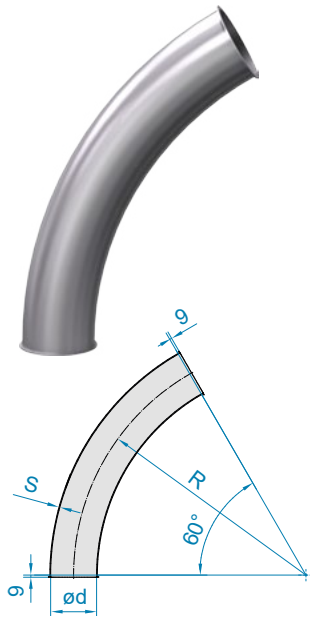
*3 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant



THE RANGE OF PIPE BENDS

Bends



BENDS LONG RADIUS, 60°

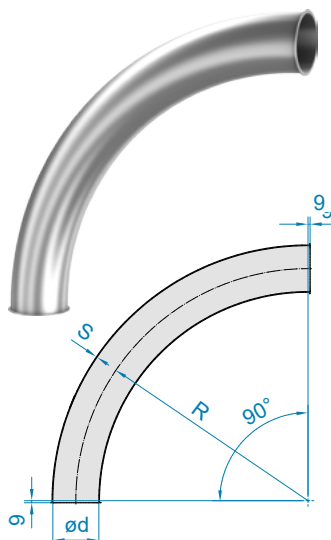
1268

- DN 80, 250 and 300 mm R = 4D
- DN 100, 120, 150, 175 and 200 mm R = 5D

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	2 mm powder-coated		2 mm stainless steel		F
				Item no.	€	Item no.	€	
80	76	500	3.40	120813561		120833561		
100	99	500	4.10	121013561		121033561		
120	119	600	5.70	121213561		121233561		
150	149	750	13.50	131513561*		121533561		
175	175	875	12.40	131713561*		121733561		
200	199	1000	26.20	132013561*		132033561*		
250	249	1000	32.80	132513561*		132533561*		
300	299	1200	46.40	133013561*		133033561*		

*3 mm



BENDS LONG RADIUS, 90°

1270

- DN 80, 250 and 300 mm R = 4D
- DN 100, 120, 150, 175 and 200 mm R = 5D

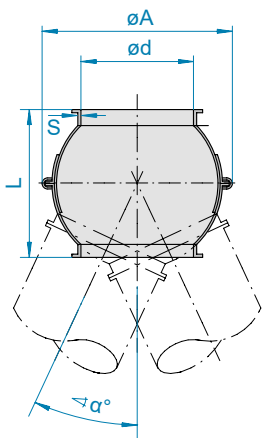
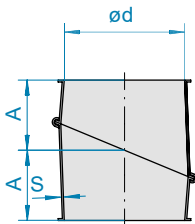
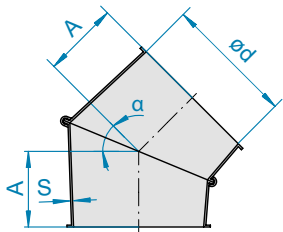
Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	2 mm powder-coated		2 mm stainless steel		F
				Item no.	€	Item no.	€	
80	76	500	3.40	120813591		120833591		
100	99	500	4.10	121013591		121033591		
120	119	600	5.70	121213591		121233591		
150	149	750	13.50	131513591*		121533591		
175	175	875	12.40	131713591*		121733591		
200	199	1000	26.20	132013591*		132033591*		
250	249	1000	32.80	132513591*		132533591*		
300	299	1200	46.40	133013591*		133033591*		

*3 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Adjustable elbows / pipe ball joints



ADJUSTABLE ELBOWS

1145

- Version with galvanised pull-ring and U-shaped seal
- Pre-assembled in the factory
- 2 segments can also be adjusted by counter-rotating

Powder-coated and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	A	α	kg	1.5 mm powder-coated with NBR		1.5 mm powder-coated with EPDM		1.5 mm stainless steel with silicone, blue	
					Item no.	€	Item no.	€	Item no.	€
100	100	70	55°	1.5	1110133503		1110133502		1110333501	
120	120	60	45°	1.6	1112133503		1112133502		1112333501	
150	150	80	45°	2.4	1115133503		1115133502		1115333501	
175	175	100	45°	3.0	1117133503		1117133502		1117333501	
200	200	120	45°	3.5	1120133503		1120133502		1120333501	
250	250	140	45°	4.6	1125133503		1125133502		1125333501	



4

PIPE BALL JOINTS

2125

Galvanised and stainless steel (dimensions for 2 mm pipework)

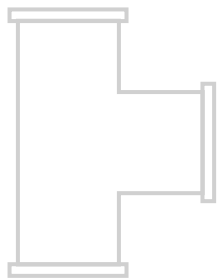
DN	Ø d	Ø A	α	L	kg	2 mm electro-galvanised		2 mm stainless steel	
						Item no.	€	Item no.	€
100	99	150	25°	130	1.50	12102730		12103730	
120	119	150	15°	115	1.60	12122730		12123730	
150	149	200	18°	160	2.35	12152730		12153730	
175	174	250	25°	200	3.70	12172730		12173730	
200	199	250	15°	170	3.50	12202730		12203730	
250	249	300	16°	190	4.60	12252730		12253730	



- F** FOOD GRADE
EC 1935/2004 plus FDA compliant
- D** DETECTABLE DESIGN
Metal-detectable



JACOB BRANCH PIECES: ALMOST EVERYTHING
AVAILABLE IN STANDARD QUALITY, EVERYTHING
ELSE AT THE CUSTOMER'S REQUEST



BRANCH PIECES

Technical information	70	
T-pieces	72	
Forks	73	
Symmetrical forks	78	



BRANCH PIECES

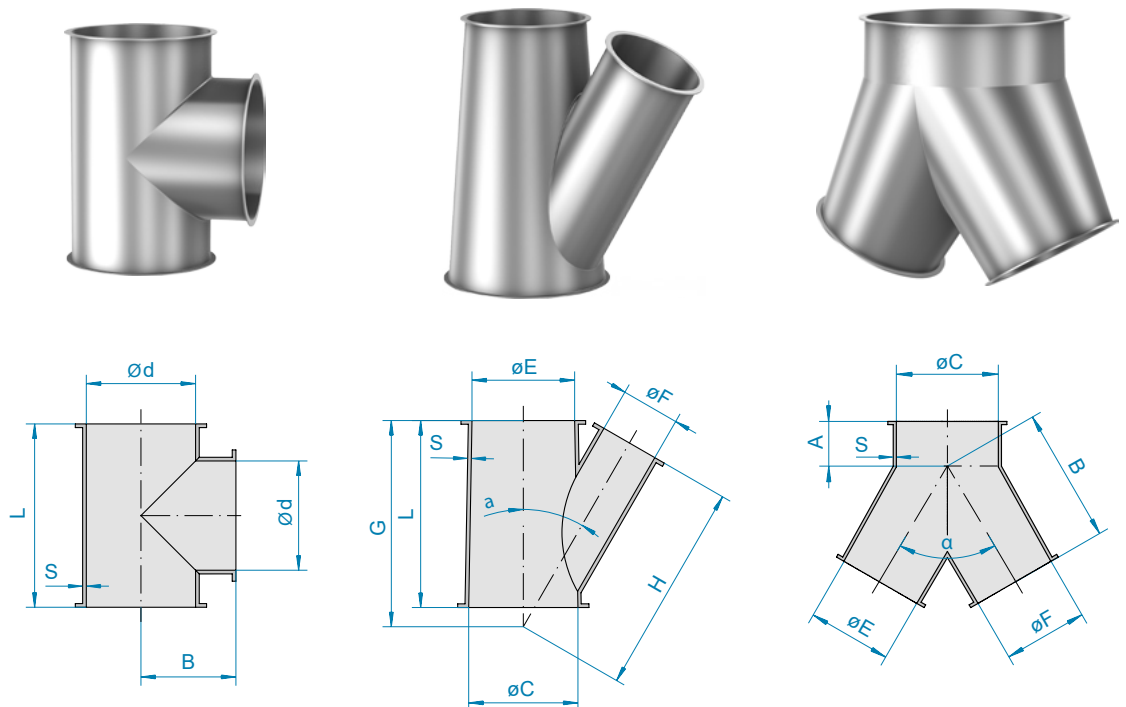
Branch pieces turn a straightforward pipe into a complex pipework system. They are therefore key elements during planning and implementation.

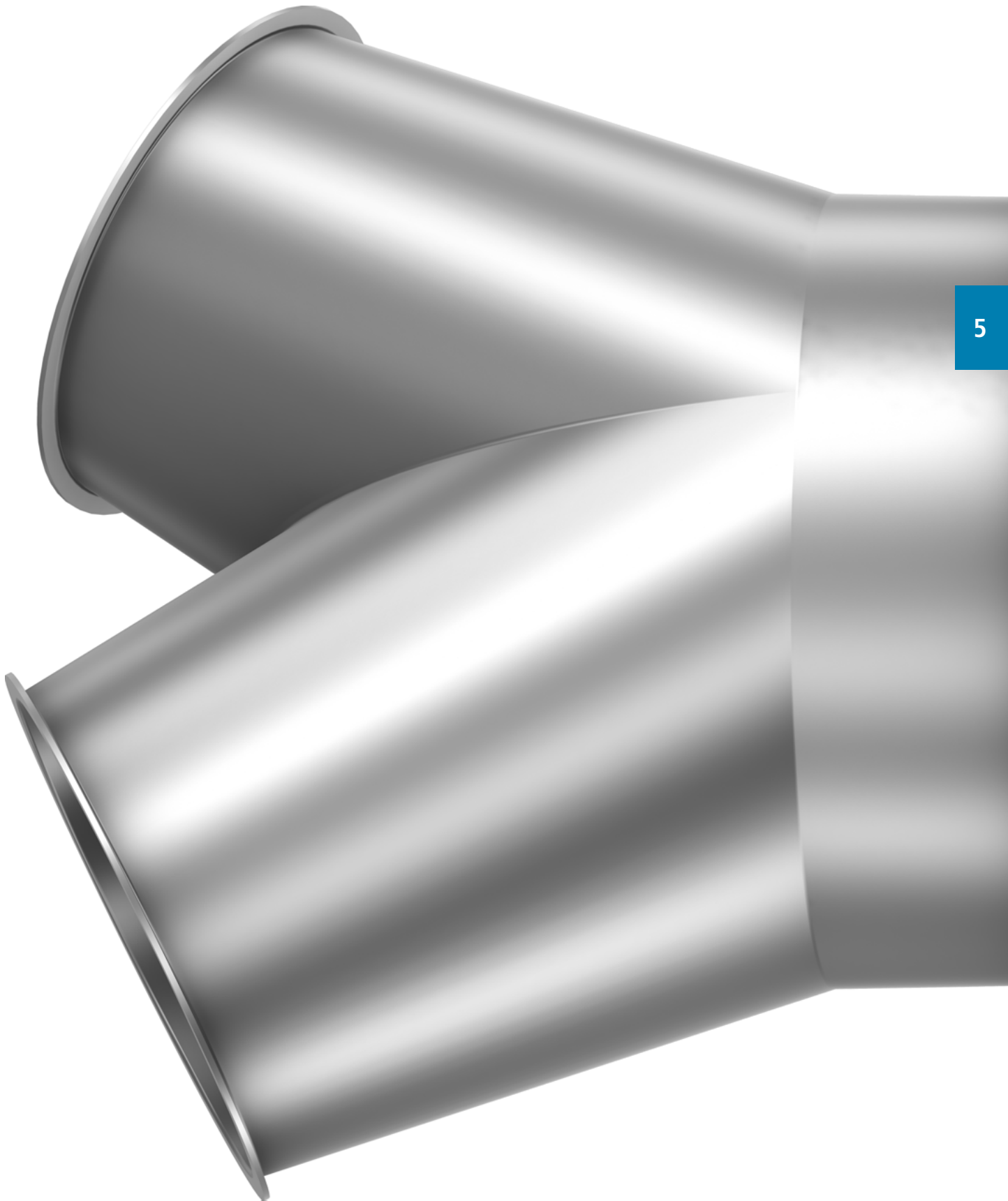
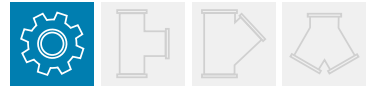
To meet the particular requirements of each system, JACOB offers a comprehensive and wide-ranging standard range which covers most requirements. If this does not meet your particular needs, we also manufacture individual parts to customers' specification. This is possible due to up-to-the-minute technologies, such as fully-automated laser welding equipment, which can carry out precise customised and small-scale production as well as on an industrial scale.

We can therefore manufacture your own individual branch piece – from a wide range of special colours as well as with different flanges, special lengths and individual angles.

T-PIECES, FORKS AND SYMMETRICAL FORKS ACCORDING TO YOUR INDIVIDUAL DIMENSIONS

We manufacture forks, T-pieces and symmetrical forks to your specifications if you inform us of the dimensions of the material and the wall thickness you require. Prices and delivery time on request.



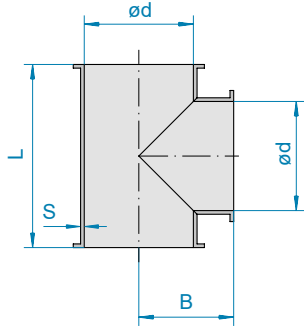


5



BRANCH PIECES

T-pieces



T-PIECES 90°

1070

- Other combinations of diameter and wall thickness available on request

Powder-coated and galvanised (dimensions for 1.5 mm pipework)

DN	Ø d	B	L	kg	1.5 mm powder-coated		2 mm powder-coated		1.5 mm galvanised		2 mm galvanised	
					Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	60	130	0.55	11061240					11062240		
80	77	70	150	0.60	11081240					11082240		
100	100	100	200	1.00	11101240					11102240		
120	120	110	220	1.20	11121240					11122240		
140	136	120	240	1.40	11141240					11142240		
150	150	125	250	1.65	11151240					11152240		
175	175	137.5	275	2.05	11171240					11172240		
200	200	150	300	2.55	11201240					11202240		
224	220	162.5	325	2.90	11221240					11222240		
250	250	175	350	3.50	11251240					11252240		
280	277	190	380	4.30	11281240					11282240		
300	300	200	400	4.70	11301240					11302240		
315	312	210	420	5.30	11311240					11312240		
350	350	275	550	8.10	11351240					11352240		
400	399	300	600	9.90	11401240					11402240		
450	449	325	650	12.75	11451240					11452240		
500	499	350	700	14.10	11501240					11502240		
560	558	380	760	22.15			12561240					12562240
630	628	415	830	26.80			12631240					12632240

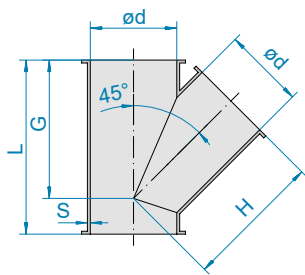
Stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	B	L	kg	1.5 mm stainless steel		2 mm stainless steel	
					Item no.	€	Item no.	€
60	57	60	130	0.55	11063240			
80	77	70	150	0.60	11083240			
100	100	100	200	1.00	11103240		12103240	
120	120	110	220	1.20	11123240		12123240	
140	136	120	240	1.40	11143240			
150	150	125	250	1.65	11153240		12153240	
175	175	137.5	275	2.05	11173240		12173240	
200	200	150	300	2.55	11203240		12203240	
224	220	162.5	325	2.90	11223240			
250	250	175	350	3.50	11253240		12253240	
280	277	190	380	4.30	11283240			
300	300	200	400	4.70	11303240		12303240	
315	312	210	420	5.30	11313240			
350	350	275	550	8.10	11353240		12353240	
400	399	300	600	9.90	11403240		12403240	
450	449	325	650	12.75	11453240		12453240	
500	499	350	700	14.10	11503240		12503240	
560	558	380	760	22.15			12563240	
630	628	415	830	26.80			12633240	

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar

Forks



FORKS 45°



1050

- Other combinations of diameters available on request
- Conical forks available on request
- From DN 350 mm, dimensions for 2 mm pipework

Powder-coated (dimensions for 1.5 mm pipework)


DN	Ø d	G	H	L	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
						Item no.	€	Item no.	€	Item no.	€
60	57	115	115	145	0.50	11061220					
80	77	123	137	160	0.75	11081220					
100	100	177	176	215	1.15	11101220					
120	120	187	185	240	1.20	11121220		12121220		13121220	
140	136	216	219	280	1.60	11141220		12141220		13141220	
150	150	234	231	300	2.10	11151220		12151220		13151220	
175	175	269	266	340	2.20	11171220		12171220		13171220	
200	200	309	306	390	4.10	11201220		12201220		13201220	
224	220	334	336	420	5.70	11221220		12221220		13221220	
250	250	358	352	450	5.40	11251220		12251220		13251220	
280	277	400	400	500	6.90	11281220					
300	300	418	412	520	7.80	11301220		12301220		13301220	
315	312	450	450	560	8.70	11311220					
350	349	498	472	615	15.00	11351220		12351220		13351220	
400	398	557	533	685	17.75	11401220		12401220		13401220	
450	448	662	623	800	22.80	11451220		12451220		13451220	
500	498	701	674	850	27.20	11501220		12501220		13501220	
560	558	789	786	950	38.00			12561220		13561220	
630	628	885	890	1060	48.00			12631220		13631220	

Galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	G	H	L	kg	1.5 mm galvanised		2 mm galvanised		1 mm stainless steel 		2 mm stainless steel 	
						Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	115	115	145	0.50	11062220				11063220*			
80	77	123	137	160	0.75	11082220				11083220			
100	100	177	176	215	1.15	11102220		12102220		11103220		12103220	
120	120	187	185	240	1.20	11122220		12122220		11123220		12123220	
140	136	216	219	280	1.60	11142220		12142220		11143220		12143220	
150	150	234	231	300	2.10	11152220		12152220		11153220		12153220	
175	175	269	266	340	2.20	11172220		12172220		11173220		12173220	
200	200	309	306	390	4.10	11202220		12202220		11203220		12203220	
224	220	334	336	420	5.70	11222220		12222220		11223220		12223220	
250	250	358	352	450	5.40	11252220		12252220		11253220		12253220	
280	277	400	400	500	6.90	11282220				11283220*			
300	300	418	412	520	7.80	11302220		12302220		11303220		12303220	
315	312	450	450	560	8.70	11312220				11313220*			
350	349	498	472	615	15.00	11352220				11353220*		12353220	
400	398	557	533	685	17.75	11402220				11403220*		12403220	
450	448	662	623	800	22.80	11452220				11453220*		12453220	
500	498	701	674	850	27.20	11502220				11503220*		12503220	
560	558	789	786	950	38.00	11562220						12563220	
630	628	885	890	1060	48.00	11632220						12633220	

*1.5 mm

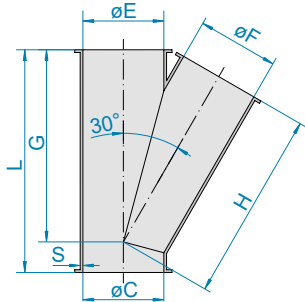
 FOOD GRADE
EC 1935/2004 plus FDA compliant

 Shock explosion proof tested
up to 3 bar

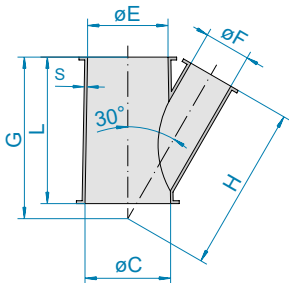


BRANCH PIECES

Forks



Fork 30°



Conical fork 30°

FORKS 30°

1060/1080

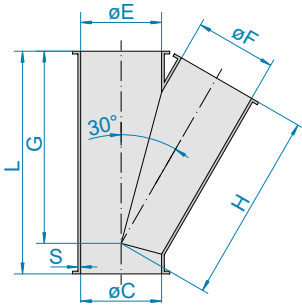
- Diameters C, E, F = nominal diameters, for inside diameters see chapter 1, Connecting systems and dimensions

- Other combinations of diameter, angles and wall thickness available on request

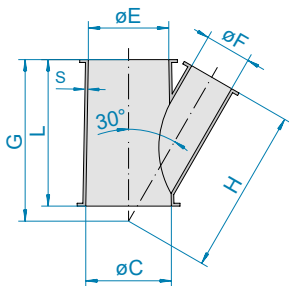
Powder-coated (dimensions for 1.5 mm pipework)

DN C - E - F	G	H	L	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
					Item no.	€	Item no.	€	Item no.	€
60-60-60	170	170	200	0.80	11061230					
80-60-60	170	170	200	0.95	11081255					
80-80-80	209	216	240	1.32	11081230					
100-80-80	237	236	250	1.25	11101255					
100-100-80	239	248	250	1.35	11101258					
100-100-100	262	248	300	1.70	11101230		12101230			
120-80-80	258	259	255	1.35	11121286					
120-100-80	260	261	255	1.45	11121257					
120-100-100	267	267	290	1.75	11121255					
120-120-80	256	258	250	1.50	11121258					
120-120-120	299	296	340	2.20	11121230		12121230		13121230	
140-100-100	290	292	300	1.95	11141255					
140-120-80	274	278	255	1.65	11141257					
140-120-100	291	293	300	2.00	11141256					
140-140-80	275	284	255	1.70	11141258					
140-140-140	336	334	390	2.80	11141230					
150-100-100	291	294	290	2.10	11151254					
150-120-100	293	296	290	2.05	11151256					
150-120-120	323	324	340	2.45	11151255					
150-140-80	286	292	255	1.75	11151287					
150-150-80	282	288	250	1.85	11151258					
150-150-150	355	350	410	3.05	11151230		12151230		13151230	
175-120-120	343	347	340	2.70	11171285					
175-140-120	344	348	340	2.70	11171286					
175-150-80	302	311	250	1.90	11171258					
175-150-100	315	321	290	2.40	11171257					
175-150-120	345	349	340	2.80	11171256					
175-150-150	375	373	410	3.80	11171255					
175-175-175	392	383	450	4.00	11171230		12171230		13171230	
200-140-140	387	401	390	3.60	11201285					
200-150-120	365	373	340	2.70	11201286					
200-150-150	395	396	410	5.00	11201255					
200-175-100	336	346	290	2.70	11201258					
200-175-120	366	374	340	3.10	11201257					
200-175-150	396	398	410	4.10	11201256					
200-200-80	330	348	255	2.50	11201253					
200-200-100	348	358	300	3.00	11201254					
200-200-200	463	457	530	5.60	11201230		12201230		13201230	
224-150-150	410	424	410	4.00	11221255					
224-175-140	406	423	390	4.00	11221256					
224-200-100	364	377	300	3.00	11221258					
224-200-120	384	395	340	3.30	11221257					
224-224-224	510	510	580	6.90	11221230					

Shock explosion proof tested up to 3 bar



■ Fork 30°



Conical fork 30°

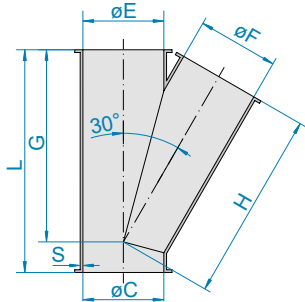
■ Shock explosion proof tested up to 3 bar

DN C - E - F	G	H	L	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
					Item no.	€	Item no.	€	Item no.	€
250-200-150	438	446	410	4.60	11251286					
250-200-175	453	455	450	5.80	11251256					
250-200-200	503	513	530	6.10	11251255					
250-224-120	409	424	340	4.20	11251288					
250-224-140	433	455	390	4.40	11251287					
250-250-80	374	398	255	2.90	11251253					
250-250-100	392	409	300	3.50	11251254					
250-250-250	547	544	620	8.00	11251230		12251230		13251230	
280-280-280	610	610	690	10.00	11281230					
300-224-224	575	584	580	7.70	11301285					
300-250-140	475	493	390	4.90	11301288					
300-250-150	476	495	410	5.30	11301258					
300-250-175	496	505	450	5.90	11301257					
300-250-200	546	563	530	7.10	11301256					
300-250-250	587	580	620	8.70	11301255					
300-300-80	417	448	255	3.30	11301253					
300-300-100	435	459	300	4.10	11301254					
300-300-300	640	640	720	11.25	11301230		12301230		13301230	
315-315-315	690	690	780	12.70	11311230					
350-250-250	627	627	620	9.60	11351255					
350-300-150	524	546	410	6.10	11351288					
350-300-200	590	613	530	7.90	11351257					
350-300-224	619	636	580	8.90	11351286					
350-300-250	630	630	620	9.90	11351256					
350-350-350	728	717	820	14.40	11351230		12351230		13351230	
400-300-250	670	677	620	10.40	11401256					
400-300-300	721	724	720	12.40	11401255					
400-350-175	583	609	450	7.40	11401288					
400-350-224	663	686	580	10.20	11401287					
400-400-400	826	825	925	18.65	11401230		12401230		13401230	
450-350-300	764	774	720	14.80	11451256					
450-350-350	809	811	820	17.50	11451255					
450-400-200	676	713	530	10.70	11451258					
450-400-250	716	730	620	12.80	11451257					
450-450-450	945	930	1050	23.60	11451230		12451230		13451230	
500-400-350	853	861	820	18.20	11501256					
500-400-400	909	914	925	22.70	11501255					
500-450-224	749	786	580	13.00	11501288					
500-450-300	810	827	720	17.00	11501257					
500-500-500	1038	1027	1150	28.80	11501230		12501230		13501230	
560-560-560	1180	1175	1300	54.00			12561230		13561230	
630-630-630	1301	1304	1430	64.00			12631230		13631230	

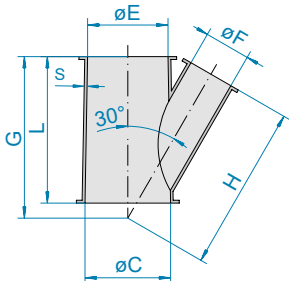


BRANCH PIECES

Forks



Fork 30°



Conical fork 30°

FORKS 30°

1060/1080

- Other combinations of diameter, angles and wall thickness available on request
- Diameters C, E, F: Nominal diameters, for inside diameters see chapter 1, Connecting systems and dimensions

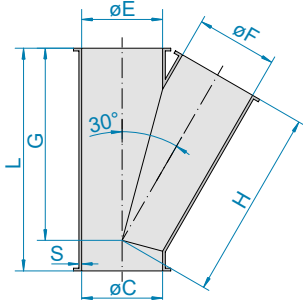
Galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN C - E - F	G	H	L	kg	1.5 mm galvanised		2 mm galvanised		1 mm stainless steel F		2 mm stainless steel F	
					Item no.	€	Item no.	€	Item no.	€	Item no.	€
60-60-60	170	170	200	0.80	11062230				11063230*			
80-60-60	170	170	200	0.95	11082255				11083255*			
80-80-80	209	216	240	1.32	11082230				11083230			
100-80-80	237	236	250	1.25	11102255				11103255		12103255	
100-100-80	239	248	250	1.35	11102258				11103258		12103258	
100-100-100	262	248	300	1.70	11102230		12102230		11103230		12103230	
120-80-80	258	259	255	1.35	11122286				11123286		12123286	
120-100-80	260	261	255	1.45	11122257				11123257		12123257	
120-100-100	267	267	290	1.75	11122255				11123255		12123255	
120-120-80	256	258	250	1.50	11122258				11123258		12123258	
120-120-120	299	296	340	2.20	11122230		12122230		11123230		12123230	
140-100-100	290	292	h300	1.95	11142255				11143255		12143255	
140-120-80	274	278	255	1.65	11142257				11143257		12143257	
140-120-100	291	293	300	2.00	11142256				11143256		12143256	
140-140-80	275	284	255	1.70	11142258				11143258		12143258	
140-140-140	336	334	390	2.80	11142230		12142230		11143230			
150-100-100	291	294	290	2.10	11152254				11153254			
150-120-100	293	296	290	2.05	11152256				11153256		12153256	
150-120-120	323	324	340	2.45	11152255				11153255		12153255	
150-140-80	286	292	255	1.75	11152287				11153287		12153287	
150-150-80	282	288	250	1.85	11152258				11153258		12153258	
150-150-150	355	350	410	3.05	11152230		12152230		11153230		12153230	
175-120-120	343	347	340	2.70	11172285				11173285		12173285	
175-140-120	344	348	340	2.70	11172286				11173286		12173286	
175-150-80	302	311	250	1.90	11172258				11173258		12173258	
175-150-100	315	321	290	2.40	11172257				11173257		12173257	
175-150-120	345	349	340	2.80	11172256				11173256		12173256	
175-150-150	375	373	410	3.80	11172255				11173255		12173255	
175-175-175	392	383	450	4.00	11172230		12172230		11173230		12173230	
200-140-140	387	401	390	3.60	11202285				11203285		12203285	
200-150-120	365	373	340	2.70	11202286				11203286		12203286	
200-150-150	395	396	410	5.00	11202255				11203255		12203255	
200-175-100	336	346	290	2.70	11202258				11203258		12203258	
200-175-120	366	374	340	3.10	11202257				11203257		12203257	
200-175-150	396	398	410	4.10	11202256				11203256		12203256	
200-200-80	330	348	255	2.50	11202253				11203253		12203253	
200-200-100	348	358	300	3.00	11202254				11203254		12203254	
200-200-200	463	457	530	5.60	11202230		12202230		11203230		12203230	
224-150-150	410	424	410	4.00	11222255				11223255		12223255	
224-175-140	406	423	390	4.00	11222256				11223256		12223256	
224-200-100	364	377	300	3.00	11222258				11223258		12223258	
224-200-120	384	395	340	3.30	11222257				11223257		12223257	
224-224-224	510	510	580	6.90	11222230		12222230		11223230			

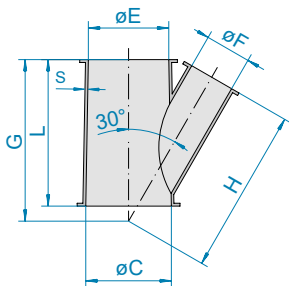
*1.5 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



■ Fork 30°



Conical fork 30°

DN C - E - F	G	H	L	kg	1.5 mm galvanised		2 mm galvanised		1 mm stainless steel F		2 mm stainless steel F	
					Item no.	€	Item no.	€	Item no.	€	Item no.	€
250-200-150	438	446	410	4.60	11252286				11253286		12253286	
250-200-175	453	455	450	5.80	11252256				11253256		12253256	
250-200-200	503	513	530	6.10	11252255				11253255		12253255	
250-224-120	409	424	340	4.20	11252288				11253288		12253288	
250-224-140	433	455	390	4.40	11252287				11253287		12253287	
250-250-80	374	398	255	2.90	11252253				11253253			
250-250-100	392	409	300	3.50	11252254				11253254		12253254	
250-250-250	547	544	620	8.00	11252230		12252230		11253230		12253230	
280-280-280	610	610	690	10.00	11282230				11283230			
300-224-224	575	584	580	7.70	11302285				11303285		12303285	
300-250-140	475	493	390	4.90	11302288				11303288		12303288	
300-250-150	476	495	410	5.30	11302258				11303258		12303258	
300-250-175	496	505	450	5.90	11302257				11303257		12303257	
300-250-200	546	563	530	7.10	11302256				11303256		12303256	
300-250-250	587	580	620	8.70	11302255				11303255		12303255	
300-300-80	417	448	255	3.30	11302253				11303253			
300-300-100	435	459	300	4.10	11302254				11303254		12303254	
300-300-300	640	640	720	11.25	11302230		12302230		11303230		12303230	
315-315-315	690	690	780	12.70	11312230				11313230			
350-250-250	627	627	620	9.60	11352255				11353255*		12353255	
350-300-150	524	546	410	6.10	11352288				11353288		12353288	
350-300-200	590	613	530	7.90	11352257				11353257*		12353257	
350-300-224	619	636	580	8.90	11352286				11353286*		12353286	
350-300-250	630	630	620	9.90	11352256				11353256*		12353256	
350-350-350	728	717	820	14.40	11352230				11353230*		12353230	
400-300-250	670	677	620	10.40	11402256				11403256*		12403256	
400-300-300	721	724	720	12.40	11402255				11403255*		12403255	
400-350-175	583	609	450	7.40	11402288				11403288		12403288	
400-350-224	663	686	580	10.20	11402287				11403287*		12403287	
400-400-400	826	825	925	18.65	11402230				11403230*		12403230	
450-350-300	764	774	720	14.80	11452256				11453256*		12453256	
450-350-350	809	811	820	17.50	11452255				11453255*		12453255	
450-400-200	676	713	530	10.70	11452258				11453258*		12453258	
450-400-250	716	730	620	12.80	11452257				11453257*		12453257	
450-450-450	945	930	1050	23.60	11452230				11453230*		12453230	
500-400-350	853	861	820	18.20	11502256				11503256*		12503256	
500-400-400	909	914	925	22.70	11502255				11503255*		12503255	
500-450-224	749	786	580	13.00	11502288				11503288*		12503288	
500-450-300	810	827	720	17.00	11502257				11503257*		12503257	
500-500-500	1038	1027	1150	28.80	11502230				11503230*		12503230	
560-560-560	1180	1175	1300	54.00	11562230						12563230	
630-630-630	1301	1304	1430	64.00	11632230						12633230	

*1.5 mm

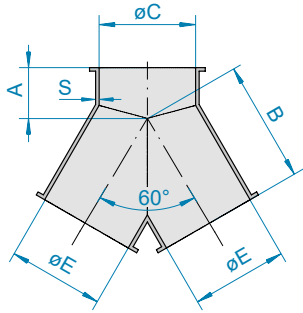
F FOOD GRADE
EC 1935/2004 plus FDA compliant

■ Shock explosion proof tested
up to 3 bar

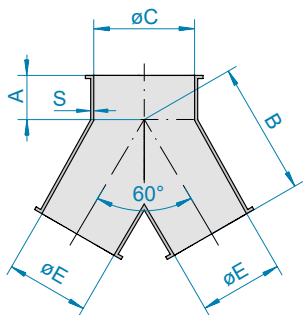


BRANCH PIECES

Symmetrical forks



■ Symmetrical fork 60°



■ Conical symmetrical fork 60°

F FOOD GRADE
EC 1935/2004 plus FDA compliant

■ Shock explosion proof tested
up to 3 bar

SYMMETRICAL FORKS 60°

1090/1095

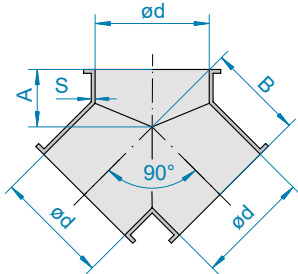
- Other combinations of diameter, angles and wall thickness available on request

Powder-coated and galvanised (dimensions for 1.5 mm pipework)

DN C - E - E	A	B	ØC	ØE	kg	1.5 mm powder-coated		1.5 mm galvanised	
						Item no.	€	Item no.	€
80-80-80	40	120	77	77	0.80	11081270		11082270	
100-80-80	40	130	100	77	0.85	11101275		11102275	
100-100-100	50	120	100	100	1.00	11101270		11102270	
120-100-100	50	150	120	100	1.25	11121275		11122275	
120-120-120	50	150	120	120	1.50	11121270		11122270	
140-100-100	50	150	136	100	1.25	11141275		11142275	
140-140-140	70	165	136	136	2.00	11141270		11142270	
150-100-100	50	170	150	100	1.40	11151276		11152276	
150-120-120	50	170	150	120	1.65	11151275		11152275	
150-150-150	75	175	150	150	2.20	11151270		11152270	
175-120-120	50	200	175	120	2.00	11171276		11172276	
175-175-175	80	210	175	175	3.10	11171270		11172270	
200-140-140	60	200	200	136	2.35	11201276		11202276	
200-150-150	60	200	200	150	2.50	11201275		11202275	
200-200-200	90	240	200	200	4.00	11201270		11202270	
224-150-150	60	220	220	150	2.65	11221275		11222275	
224-224-224	90	275	220	220	5.00	11221270		11222270	
250-200-200	60	250	250	200	3.50	11251275		11252275	
250-250-250	100	300	250	250	6.20	11251270		11252270	
300-224-224	70	300	300	220	4.80	11301276		11302276	
300-300-300	120	360	300	300	8.90	11301270		11302270	
350-250-250	70	300	350	250	5.30	11351275		11352275	
400-300-300	70	350	399	300	6.20	11401275		11402275	
450-350-350	80	400	449	350	9.20	11451275		11452275	
500-400-400	80	450	499	399	11.40	11501275		11502275	

Stainless steel (dimensions for 1.5 mm pipework)

DN C - E - E	A	B	ØC	ØE	kg	1 mm stainless steel	F	2 mm stainless steel	F
						Item no.	€	Item no.	€
80-80-80	40	120	77	77	0.80	11083270			
100-80-80	40	130	100	77	0.85	11103275		12103275	
100-100-100	50	120	100	100	1.00	11103270		12103270	
120-100-100	50	150	120	100	1.25	11123275		12123275	
120-120-120	50	150	120	120	1.50	11123270		12123270	
140-100-100	50	150	136	100	1.25	11143275		12143275	
140-140-140	70	165	136	136	2.00	11143270		12143270	
150-100-100	50	170	150	100	1.40	11153276		12153276	
150-120-120	50	170	150	120	1.65	11153275		12153275	
150-150-150	75	175	150	150	2.20	11153270		12153270	
175-120-120	50	200	175	120	2.00	11173276		12173276	
175-175-175	80	210	175	175	3.10	11173270		12173270	
200-140-140	60	200	200	136	2.35	11203276		12203276	
200-150-150	60	200	200	150	2.50	11203275		12203275	
200-200-200	90	240	200	200	4.00	11203270		12203270	
224-150-150	60	220	220	150	2.65	11223275		12223275	
224-224-224	90	275	220	220	5.00	11223270		12223270	
250-200-200	60	250	250	200	3.50	11253275		12253275	
250-250-250	100	300	250	250	6.20	11253270		12253270	
300-224-224	70	300	300	220	4.80	11303276		12303276	
300-300-300	120	360	300	300	8.90	11303270		12303270	
350-250-250	70	300	350	250	5.30	11353275		12353275	
400-300-300	70	350	399	300	6.20	11403275		12403275	
450-350-350	80	400	449	350	9.20	11453275		12453275	
500-400-400	80	450	499	399	11.40	11503275		12503275	



SYMMETRICAL FORKS 90°

1100

- Other combinations of diameter, angles and wall thickness available on request

Powder-coated and galvanised (dimensions for 1.5 mm pipework)

DN	Ø d	A	B	kg	1.5 mm powder-coated		3 mm powder-coated		1.5 mm galvanised	
					Item no.	€	Item no.	€	Item no.	€
80	77	40	80	0.55	11081260				11082260	
100	100	60	100	0.85	11101260				11102260	
120	120	75	110	1.10	11121260		13121260		11122260	
140	136	75	120	1.30	11141260				11142260	
150	150	75	125	1.45	11151260		13151260		11152260	
175	175	75	140	1.75	11171260		13171260		11172260	
200	200	90	170	2.50	11201260		13201260		11202260	
224	220	100	190	3.00	11221260				11222260	
250	250	100	200	3.50	11251260		13251260		11252260	
300	300	120	220	4.40	11301260		13301260		11302260	
350	350	120	250	5.65	11351260				11352260	
400	399	150	270	7.00	11401260				11402260	
450	449	150	300	8.45	11451260				11452260	
500	499	175	325	10.20	11501260				11502260	

Stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	A	B	kg	1 mm stainless steel	1.5 mm stainless steel	2 mm stainless steel
					Item no.	€	Item no.
80	77	40	80	0.55	11083260		
100	100	60	100	0.85	11103260		12103260
120	120	75	110	1.10	11123260		12123260
140	136	75	120	1.30	11143260		12143260
150	150	75	125	1.45	11153260		12153260
175	175	75	140	1.75	11173260		12173260
200	200	90	170	2.50	11203260		12203260
224	220	100	190	3.00	11223260		12223260
250	250	100	200	3.50	11253260		12253260
300	300	120	220	4.40	11303260		12303260
350	350	120	250	5.65		11353260	12353260
400	399	150	270	7.00		11403260	12403260
450	449	150	300	8.45		11453260	12453260
500	499	175	325	10.20		11503260	12503260

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



JACOB TRANSITION PIECES AND ADAPTERS:
CONNECTING YOUR MACHINES
WITH OUR PIPEWORK SYSTEM



TRANSITION PIECES AND ADAPTERS

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TRANSITION PIECES AND ADAPTERS

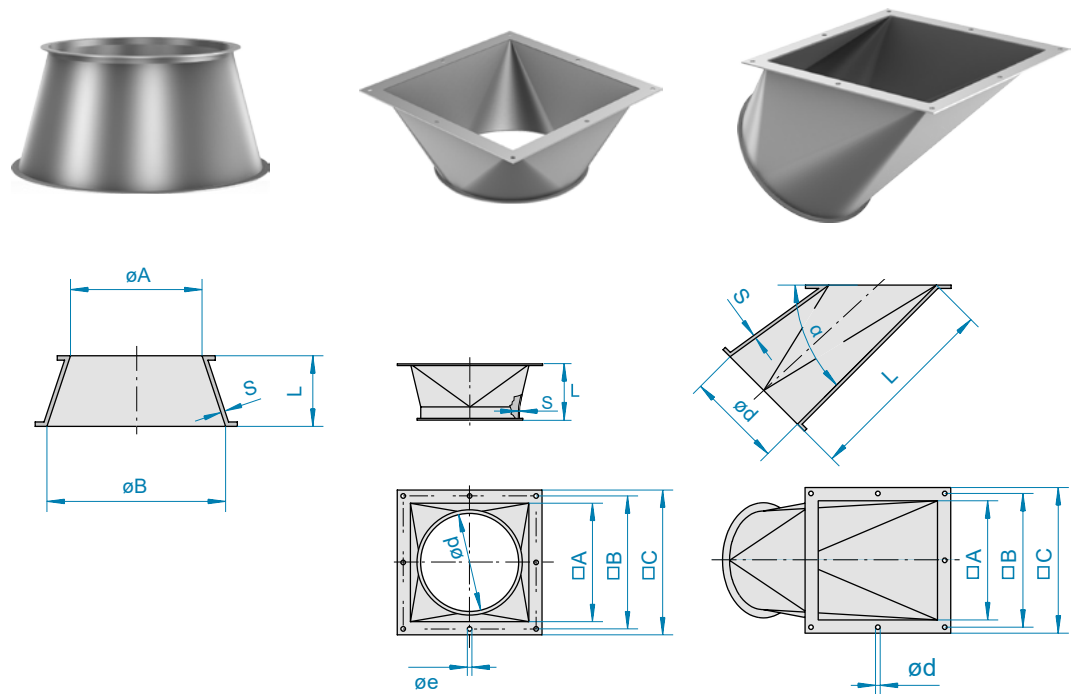
Technical information

JACOB TRANSITION PIECES AND ADAPTERS

How to be well-connected: With our comprehensive range of cone pieces, transition pieces and adapters, we create the connection between your JACOB pipework system and your machinery. And since nothing is as individual as these transition pieces, we can manufacture them to your specification right from batch sizes of 1. These special components have one thing in common with all lines from this large-scale production: the same consistently high quality.

CONE PIECES AND TRANSITION PIECES TO YOUR INDIVIDUAL MEASUREMENTS

We manufacture forks, cone pieces and transition pieces to your specification if you inform us of the dimensions, of the material and the wall thickness you require. Prices and delivery time on request





FLAT GASKETS



NBR	Silicone	F	Silicone	F D
grey white	beige		blue	
EC 1935/2004	FOOD GRADE: EC 1935/2004 plus FDA compliant		FOOD GRADE: EC 1935/2004 plus FDA compliant	
-30°C to +80°C	-30°C to +230°C		-30°C to +200°C	
			metal-detectable	

Our flat gaskets for connecting pipe components with welded-on flanges or transition pieces:

- More tear-proof and FOOD GRADE
- Metal-detectable (DETECTABLE DESIGN)
- Other materials available on request



COMPENSATORS

Material: Conductive EPDM, black

- Temperature resistance: -30°C to +100°C
- Admissible differential pressure: 0.1 bar
- Not suitable for contact with food
- Electrostatically conductive

Compensator connections made of VA, material 1.4301, with press-formed connection to extruded polyurethane sleeve, opaque, 1 mm thick.

- FOOD GRADE: EC 1935/2004 plus FDA compliant
- Temperature resistance: -20°C to +90°C

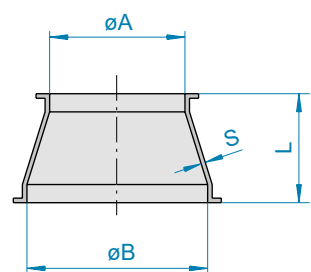
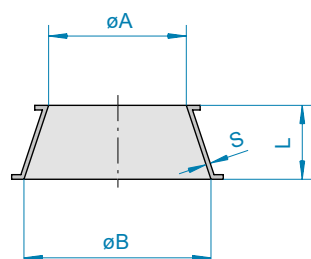
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TRANSITION PIECES AND ADAPTERS

Cone pieces



■ Cone end partly cylindrical

CONE PIECES

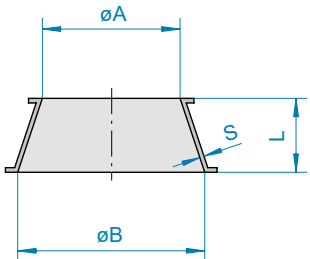
1330

- Diameter A + B = internal diameter with wall thickness of 1.5 mm
- Cone end partly cylindrical
- From DN 450 to 560 mm, dimensions for 2 mm pipework

Powder-coated (dimensions for 1.5 mm pipework)

DN	ØA	ØB	L	kg	1.5 mm powder-coated		3 mm powder-coated	
					Item no.	€	Item no.	€
60-80	57	77	60	0.17	11001488			
60-100	57	100	100	0.25	11001492			
80-100	77	100	100	0.35	11001450			
80-120	77	120	80	0.35	11001478			
80-140	77	136	120	0.55	11001479			
80-150	77	150	140	0.65	11001489			
100-120	100	120	60	0.30	11001451			
100-140	100	136	100	0.50	11001459			
100-150	100	150	95	0.50	11001452			
100-175	100	175	120	0.70	11001464			
100-200	100	200	120	0.75	11001453			
100-250	100	250	200	1.45	11001454			
120-140	120	136	100	0.55	11001466			
120-150	120	150	150	0.85	11001455		13001455	
120-175	120	175	100	0.65	11001456		13001456	
120-200	120	200	120	0.80	11001457		13001457	
120-250	120	250	150	1.20	11001458		13001458	
140-150	136	150	100	0.60	11001467			
140-175	136	175	100	0.65	11001468			
140-200	136	200	150	1.05	11001469			
150-175	150	175	100	0.60	11001460		13001460	
150-200	150	200	100	0.75	11001461		13001461	
150-224	150	220	150	1.15	11001472			
150-250	150	250	150	1.10	11001462		13001462	
150-300	150	300	200	1.85	11001463		13001463	
175-200	175	200	100	0.80	11001465		13001465	
175-224	175	220	100	0.85	11001473			
200-224	200	220	100	0.85	11001474			
200-250	200	250	120	1.10	11001470		13001470	
200-300	200	300	150	1.55	11001471		13001471	
224-250	220	250	100	1.00	11001476			
224-300	220	300	150	1.60	11001477			
250-280	250	277	120	1.30	11001960			
250-300	250	300	150	1.65	11001475		13001475	
250-350	250	350	200	2.20	11001484		13001484	
280-300	277	300	100	1.22	11001961			
300-315	300	312	100	1.30	11001962			
300-350	300	350	200	2.55	11001480		13001480	
300-400	300	399	200	2.75	11001481		13001481	
315-350	312	350	120	1.65	11001963			
350-400	350	399	200	2.95	11001482		13001482	

■ Shock explosion proof tested up to 3 bar



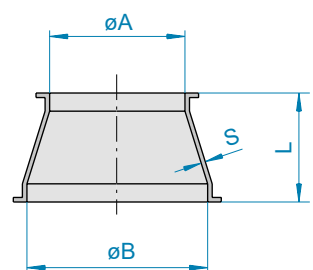
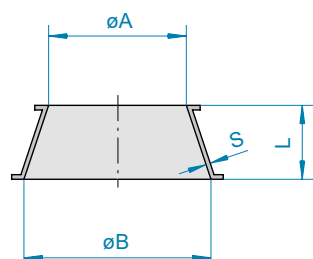
DN	$\varnothing A$	$\varnothing B$	L	kg	1.5 mm powder-coated		3 mm powder-coated	
					Item no.	€	Item no.	€
350-450	350	449	200	3.15	11001483		13001483	
400-450	399	449	200	3.40	11001485		13001485	
400-500	399	499	250	4.40	11001486		13001486	
450-500	449	499	200	3.70	11001487		13001487	
450-560	448	558	250	6.70	12001495*		13001495	
500-560	498	558	250	7.00	12001496*		13001496	
500-630	498	628	300	8.90	12001497*		13001497	
560-630	558	628	300	9.50	12001498*		13001498	

*2 mm



TRANSITION PIECES AND ADAPTERS

Cone pieces



■ End of cone in cylindrical shape

CONE PIECES

1330

- Diameter A + B = internal diameter with wall thickness of 1.5 mm
- Cone end partly cylindrical
- From DN 450 to 560 mm, dimensions for 2 mm pipework

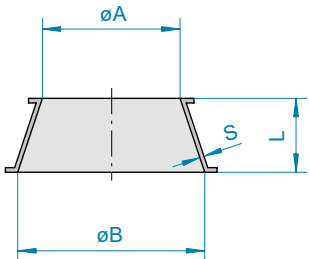
Galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	ØA	ØB	L	kg	1.5 mm galvanised		2 mm galvanised		1 mm stainless steel		2 mm stainless steel	
					Item no.	€	Item no.	€	Item no.	€	Item no.	€
60-80	57	77	60	0.17					11003488*			
60-100	57	100	100	0.25	11002492				11003492			
80-100	77	100	100	0.35	11002450				11003450			
80-120	77	120	80	0.35	11002478				11003478			
80-140	77	136	120	0.55	11002479				11003479			
80-150	77	150	140	0.65	11002489				11003489			
100-120	100	120	60	0.30	11002451				11003451		12003451	
100-140	100	136	100	0.50	11002459				11003459			
100-150	100	150	95	0.50	11002452				11003452		12003452	
100-175	100	175	120	0.70	11002464				11003464		12003464	
100-200	100	200	120	0.75	11002453				11003453		12003453	
100-250	100	250	200	1.45	11002454				11003454		12003454	
120-140	120	136	100	0.55	11002466				11003466			
120-150	120	150	150	0.85	11002455				11003455		12003455	
120-175	120	175	100	0.65	11002456				11003456		12003456	
120-200	120	200	120	0.80	11002457				11003457		12003457	
120-250	120	250	150	1.20	11002458				11003458		12003458	
140-150	136	150	100	0.60	11002467				11003467			
140-175	136	175	100	0.65	11002468				11003468			
140-200	136	200	150	1.05	11002469				11003469			
150-175	150	175	100	0.60	11002460				11003460		12003460	
150-200	150	200	100	0.75	11002461				11003461		12003461	
150-224	150	220	150	1.15	11002472				11003472			
150-250	150	250	150	1.10	11002462				11003462		12003462	
150-300	150	300	200	1.85	11002463				11003463		12003463	
175-200	175	200	100	0.80	11002465				11003465		12003465	
175-224	175	220	100	0.85	11002473				11003473			
200-224	200	220	100	0.85	11002474				11003474		12003474	
200-250	200	250	120	1.10	11002470				11003470		12003470	
200-300	200	300	150	1.55	11002471				11003471		12003471	
224-250	220	250	100	1.00	11002476				11003476			
224-300	220	300	150	1.60	11002477				11003477		12003477	
250-280	250	277	120	1.30	11002960				11003960*			
250-300	250	300	150	1.65	11002475				11003475		12003475	
250-350	250	350	200	2.20	11002484				11003484		12003484	
280-300	277	300	100	1.22	11002961				11003961*			
300-315	300	312	100	1.30	11002962				11003962*			
300-350	300	350	200	2.55	11002480				11003480		12003480	
300-400	300	399	200	2.75	11002481				11003481		12003481	

*1.5 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

■ Shock explosion proof tested
up to 3 bar



DN	$\varnothing A$	$\varnothing B$	L	kg	1.5 mm galvanised		2 mm galvanised		1 mm stainless steel		2 mm stainless steel	
					Item no.	€	Item no.	€	Item no.	€	Item no.	€
315-350	312	350	120	1.65	11002963				11003963*			
350-400	350	399	200	2.95	11002482				11003482		12003482	
350-450	350	449	200	3.15	11002483				11003483		12003483	
400-450	399	449	200	3.40	11002485				11003485		12003485	
400-500	399	499	250	4.40	11002486				11003486		12003486	
450-500	449	499	200	3.70	11002487				11003487		12003487	
450-560	448	558	250	6.70			12002495				12003495	
500-560	498	558	250	7.00			12002496				12003496	
500-630	498	628	300	8.90			12002497				12003497	
560-630	558	628	300	9.50			12002498				12003498	

*1.5 mm



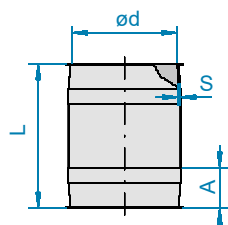
TRANSITION PIECES AND ADAPTERS

Compensators/connecting flanges



Conductive EPDM, black

AU, transparent



COMPENSATORS

1348

- Please also read and take into account the technical information given at the beginning of this chapter

Powder-coated, galvanised and stainless steel

DN	$\varnothing d$	A	S	L	kg	2 mm powder-coated (EPDM, black)		2 mm galvanised (EPDM, black)		2 mm stainless steel (EPDM, black)		2 mm stainless steel (AU, transparent) F	
						Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	78	55	1	200	0.52	11081707*		11082707*		11083707*		11083171*	
100	99	55	2	200	1.00	12101707		12102707		12103707		12103171	
120	119	55	2	200	1.16	12121707		12122707		12123707		12123171	
140	135	55	2	200	1.30	12141707		12142707		12143707		12143171	
150	149	55	2	200	1.42	12151707		12152707		12153707		12153171	
175	174	55	2	200	1.65	12171707		12172707		12173707		12173171	
200	199	55	2	200	1.88	12201707		12202707		12203707		12203171	
224	219	55	2	200	2.06	12221707		12222707		12223707		12223171	
250	249	55	2	200	2.34	12251707		12252707		12253707		12253171	
300	299	55	2	200	2.80	12301707		12302707		12303707		12303171	

*1 mm



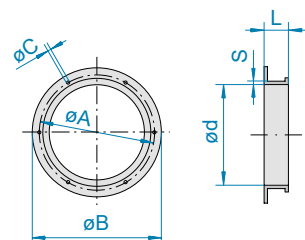
AVAILABLE IN THE DETECTABLE DESIGN LINE.



CONNECTING FLANGES

1310

- For combining with a counter flange for connecting flanges and a flat gasket for counter flanges (see page 89)
- Not suitable for combining with flanges according to DIN 24154-2



E = No. of holes

Powder-coated (dimensions for 1.5 mm pipework)

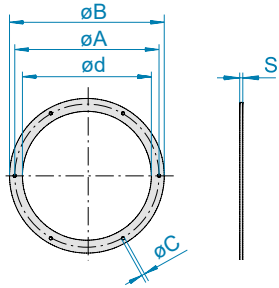
DN	$\varnothing d$	$\varnothing A$	$\varnothing B$	C	E	L	kg	1.5 mm powder-coated		3 mm powder-coated	
								Item no.	€	Item no.	€
80	77	108	123	6	6	35	0.27	11081431			
100	100	130	150	6	6	28	0.23	11101431			
120	120	150	170	6	6	28	0.28	11121431		13121431	
150	150	180	202	6	6	36	0.40	11151431		13151431	
175	175	205	228	6	6	40	0.49	11171431		13171431	
200	200	230	250	6	6	37	0.52	11201431		13201431	
250	250	280	300	6	6	48	0.75	11251431		13251431	

Galvanised and stainless steel

DN	$\varnothing d$	$\varnothing A$	$\varnothing B$	C	E	L	kg	1.5 mm galvanised		1.5 mm stainless steel F	
								Item no.	€	Item no.	€
80	77	108	123	6	6	35	0.27	11082431		11083431	
100	100	130	150	6	6	28	0.23	11102431		11103431	
120	120	150	170	6	6	28	0.28	11122431		11123431	
150	150	180	202	6	6	36	0.40	11152431		11153431	
175	175	205	228	6	6	40	0.49	11172431		11173431	
200	200	230	250	6	6	37	0.52	11202431		11203431	
250	250	280	300	6	6	48	0.75	11252431		11253431	

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



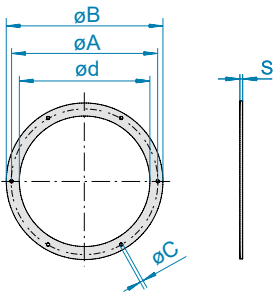
E = No. of holes

COUNTER FLANGES FOR ROUND CONNECTING FLANGES

1311

- Counter flange to match connecting flange (see page 88)
- For use in conjunction with a square flat gasket (see below)

DN	Ø d	Ø A	Ø B	Ø C	E	S	kg	Steel S235 JR (ST 37-2)		Stainless steel 1.4301 F	
								Item no.	€	Item no.	€
80	82	108	122	6	6	5	0.25	10080710		10083710	
100	105	130	155	6	6	5	0.40	10100710		10103710	
120	125	150	175	6	6	5	0.46	10120710		10123710	
150	155	180	205	6	6	5	0.55	10150710		10153710	
175	180	205	230	6	6	5	0.63	10170710		10173710	
200	205	230	255	6	6	5	0.71	10200710		10203710	
250	255	280	305	6	6	5	0.86	10250710		10253710	



E = No. of holes

FLAT GASKETS FOR COUNTER FLANGES (ROUND) FOR CONNECTING FLANGES

1312

- Flat gasket to match connecting flange (page 88) and counter flange (see above)
- Please also read and take into account the technical information given at the beginning of this chapter
- Not suitable for use in combination with flanges according to DIN 24154-2

DN	Ø d	Ø A	Ø B	Ø C	E	S	NBR grey white		Silicone, beige F		Silicone, blue F D	
							Item no.	€	Item no.	€	Item no.	€
80	78	108	122	6	6	3	10086731		10087731		1008773101	
100	99	130	155	6	6	3	10106731		10107731		1010773101	
120	119	150	175	6	6	3	10126731		10127731		1012773101	
150	149	180	205	6	6	3	10156731		10157731		1015773101	
175	174	205	230	6	6	3	10176731		10177731		1017773101	
200	199	230	255	6	6	3	10206731		10207731		1020773101	
250	249	280	305	6	6	3	10256731		10257731		1025773101	

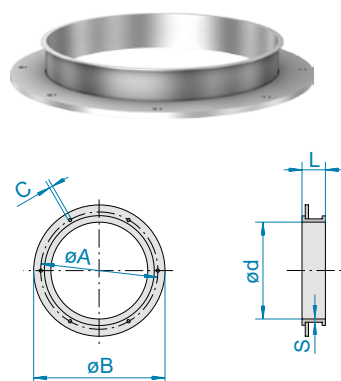
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TRANSITION PIECES AND ADAPTERS

Connecting flanges



E = No. of holes

CONNECTING FLANGE WITH LOOSE FLANGE

1315

- Loose flange acc. to DIN 24154-2
- From DN 450 mm, dimensions for 2 mm pipework
- Lipped ends for use with flange according to DIN 25154-2 and U-shaped gasket
- Up to DN 350 in conjunction with U-shaped gasket for 6 mm lip (see page 33)
- From DN 350 in conjunction with U-shaped gasket for 10 mm lip or flat gasket (see pages 230/231)

Powder-coated (dimensions for 1.5 mm pipework)

DN	Ø d	Ø A	Ø B	Ø C	E	L	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
								Item no.	€	Item no.	€	Item no.	€
60	57	102	128	9.5	4	50	0.51	11061432					
80	77	118	142	9.5	4	50	0.62	11081432					
100	100	139	165	9.5	4	50	0.70	11101432					
120	120	165	185	9.5	4	50	0.84	11121432					
140	136	182	212	11.5	8	50	1.06	11141432					
150	150	200	225	11.5	8	50	1.18	11151432					
175	175	219	250	11.5	8	50	1.34	11171432					
200	200	241	275	11.5	8	50	1.48	11201432					
224	220	265	295	11.5	8	50	1.65	11221432					
250	250	292	325	11.5	8	50	1.82	11251432					
280	277	332	363	11.5	8	50	2.07	11281432					
300	300	366	395	11.5	8	50	2.31	11301432			13301432		
315	312	366	398	11.5	8	50	2.48	11311432					
350	350	405	436	11.5	8	50	2.93	11351432			13351432		
400	399	448	485	11.5	12	50	3.57	11401432			13401432		
450	448	497	535	11.5	12	50	5.52		12451432		13451432		
500	498	551	585	11.5	12	50	5.98		12501432		13501432		
560	558	629	665	14.0	16	50	6.73		12561432		13561432		
630	628	698	735	14.0	16	50	7.86		12631432		13631432		

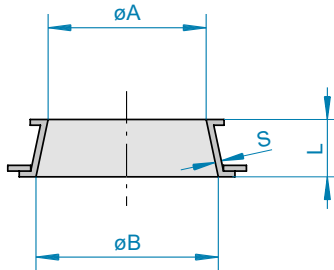
Galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	A	B	C	E	L	kg	1.5 mm galvanised		2 mm galvanised		1.5 mm stainless steel F		2 mm stainless steel F	
								Item no.	€	Item no.	€	Item no.	€	Item no.	€
60	57	102	128	9.5	4	50	0.51	11062432				11063432			
80	77	118	142	9.5	4	50	0.62	11082432				11083432			
100	100	139	165	9.5	4	50	0.70	11102432				11103432			
120	120	165	185	9.5	4	50	0.84	11122432				11123432			
140	136	182	212	11.5	8	50	1.06	11142432				11143432			
150	150	200	225	11.5	8	50	1.18	11152432				11153432			
175	175	219	250	11.5	8	50	1.34	11172432				11173432			
200	200	241	275	11.5	8	50	1.48	11202432				11203432			
224	220	265	295	11.5	8	50	1.65	11222432				11223432			
250	250	292	325	11.5	8	50	1.82	11252432				11253432			
280	277	332	363	11.5	8	50	2.07	11282432				11283432			
300	300	366	395	11.5	8	50	2.31	11302432				11303432			
315	312	366	398	11.5	8	50	2.48	11312432				11313432			
350	350	405	436	11.5	8	50	2.93	11352432				11353432			
400	399	448	485	11.5	12	50	3.57	11402432				11403432			
450	448	497	535	11.5	12	50	5.52		12452432				12453432		
500	498	551	585	11.5	12	50	5.98		12502432				12503432		
560	558	629	665	14.0	16	50	6.73		12562432				12563432		
630	628	698	735	14.0	16	50	7.86		12632432				12633432		

F FOOD GRADE
EC 1935/2004 plus FDA compliant

■ DN 350 to 630 mm with 10 mm lip.
Combination with U-shaped seal for
10 mm lip (refer to page 230)

Connecting flanges/transition pieces



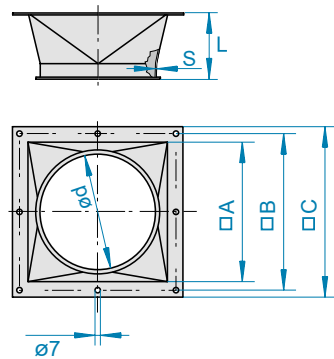
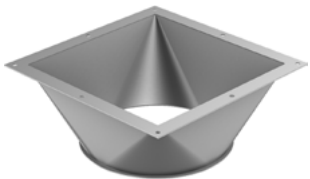
ADAPTERS WITH LOOSE FLANGE

1320

- Flange to DIN 25154-2
- Galvanised: DN 120–125 mm, DN 150–160 mm, DN 280–300 mm with welded-on flange
- Powder-coated and stainless steel: DN 280-300 with welded-on flange
- Lipped ends in conjunction with flange according to DIN 25154-2 and U-shaped seal for 6 mm lip (see page 33)

Powder-coated, galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	$\varnothing A$	$\varnothing B$	L	kg	1.5 mm powder-coated		1.5 mm galvanised		1 mm stainless steel	
					Item no.	€	Item no.	€	Item no.	€
120-125	120	126	50	0.95	11001441		11002441		11003441	
150-160	150	161	50	1.30	11001443		11002443		11003443	
175-180	175	181	50	1.45	11001445		11002445		11003445	
250-280	250	282	50	3.05	11001446		11002446		11003446	
300-280	300	282	50	3.10	11001447		11002447		11003447	
300-315	300	317	50	3.50	11001448		11002448		11003448	



SPOUTS FROM SQUARE TO ROUND

1280

- Special models and individual flange dimensions on request
- For use in conjunction with a square flat gasket
- Lipped on one side for use with JACOB pull-ring system

Powder-coated and galvanised (dimensions for 1.5 mm pipework)

DN	$\varnothing d$	A	B	C	E	L	kg	1.5 mm powder-coated		3 mm powder-coated		1.5 mm galvanised	
								Item no.	€	Item no.	€	Item no.	€
80	77	100	120	140	8	50	0.36	11081400				11082400	
100	100	120	140	160	8	60	0.45	11101400				11102400	
120	120	140	164	180	8	70	0.63	11121400		13121400		11122400	
150	150	180	202	220	8	85	0.90	11151400		13151400		11152400	
175	175	200	225	245	8	145	1.50	11171400		13171400		11172400	
200	200	250	270	290	8	115	1.80	11201400		13201400		11202400	
250	250	300	325	345	8	150	2.70	11251400		13251400		11252400	
300	300	350	375	395	8	210	3.90	11301400		13301400		11302400	

Stainless steel (dimensions for 1.5 mm pipework)

DN	$\varnothing d$	A	B	C	E	L	kg	1.5 mm stainless steel		2 mm stainless steel	
								Item no.	€	Item no.	€
80	77	100	120	140	8	50	0.36	11083400			
100	100	120	140	160	8	60	0.45	11103400		12103400	
120	120	140	164	180	8	70	0.63	11123400		12123400	
150	150	180	202	220	8	85	0.90	11153400		12153400	
175	175	200	225	245	8	145	1.50			12173400	
200	200	250	270	290	8	115	1.80			12203400	
250	250	300	325	345	8	150	2.70			12253400	
300	300	350	375	395	8	210	3.90			12303400	

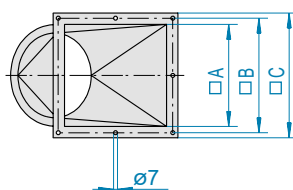
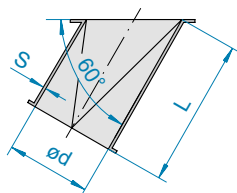
E = No. of holes

F FOOD GRADE
EC 1935/2004 plus FDA compliant



TRANSITION PIECES AND ADAPTERS

Transition pieces / counter flanges



E = No. of holes

SPOUTS FROM SQUARE TO ROUND / 60°

1290

- Other gradients and individual flange dimensions on request
- For use in conjunction with a square flat gasket
- Lipped on one side for use with JACOB pull-ring system

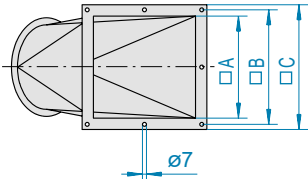
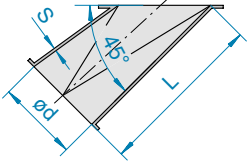
Powder-coated and galvanised (dimensions for 1.5 mm pipework)

DN	ø d	A	B	C	E	L	kg	1.5 mm powder-coated		3 mm powder-coated		1.5 mm galvanised	
								Item no.	€	Item no.	€	Item no.	€
80	77	100	120	140	7	190	0.75	11081410				11082410	
100	100	120	140	160	7	190	0.90	11101410				11102410	
120	120	140	164	180	7	215	1.20	11121410		13121410		11122410	
150	150	180	202	220	7	260	1.80	11151410		13151410		11152410	
175	175	200	225	245	7	275	2.25	11171410		13171410		11172410	
200	200	250	270	290	7	265	2.40	11201410		13201410		11202410	
250	250	300	325	345	7	345	4.05	11251410		13251410		11252410	
300	300	350	375	395	7	475	6.60	11301410		13301410		11302410	

Stainless steel (dimensions for 1.5 mm pipework)

DN	ø d	A	B	C	E	L	kg	1.5 mm stainless steel		2 mm stainless steel	
								Item no.	€	Item no.	€
80	77	100	120	140	7	190	0.75	11083410			
100	100	120	140	160	7	190	0.90	11103410		12103410	
120	120	140	164	180	7	215	1.20	11123410		12123410	
150	150	180	202	220	7	260	1.80	11153410		12153410	
175	175	200	225	245	7	275	2.25			12173410	
200	200	250	270	290	7	265	2.40			12203410	
250	250	300	325	345	7	345	4.05			12253410	
300	300	350	375	395	7	475	6.60			12303410	

F FOOD GRADE
EC 1935/2004 plus FDA compliant



E = No. of holes

SPOUTS FROM SQUARE TO ROUND/45 °

1300

- Other gradients and individual flange dimensions on request
- For use in conjunction with a square flat gasket
- Lipped on one side for use with JACOB pull-ring system

Powder-coated and galvanised (dimensions for 1.5 mm pipework)

DN	Ø d	A	B	C	E	L	kg	1.5 mm powder-coated		3 mm powder-coated		1.5 mm galvanised	
								Item no.	€	Item no.	€	Item no.	€
80	77	100	120	140	7	160	0.60	11081420				11082420	
100	100	120	140	160	7	180	0.75	11101420				11102420	
120	120	140	164	180	7	190	0.90	11121420		13121420		11122420	
150	150	180	202	220	7	295	1.95	11151420		13151420		11152420	
175	175	200	225	245	7	300	2.40	11171420		13171420		11172420	
200	200	250	270	290	7	325	2.75	11201420		13201420		11202420	
250	250	300	325	345	7	395	4.65	11251420		13251420		11252420	
300	300	350	375	395	7	450	5.55	11301420		13301420		11302420	

Stainless steel (dimensions for 1.5 mm pipework)

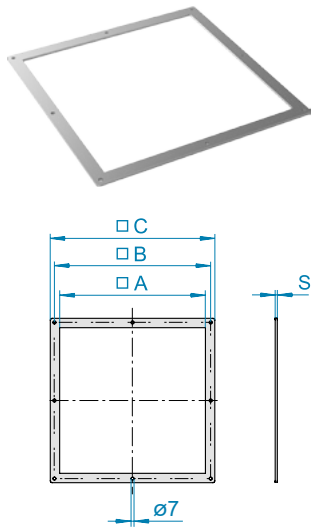
DN	Ø d	A	B	C	E	L	kg	1.5 mm stainless steel		2 mm stainless steel	
								Item no.	€	Item no.	€
80	77	100	120	140	7	160	0.60	11083420			
100	100	120	140	160	7	180	0.75	11103420		12103420	
120	120	140	164	180	7	190	0.90	11123420		12123420	
150	150	180	202	220	7	295	1.95	11153420		12153420	
175	175	200	225	245	7	300	2.40			12173420	
200	200	250	270	290	7	325	2.75			12203420	
250	250	300	325	345	7	395	4.65			12253420	
300	300	350	375	395	7	450	5.55			12303420	

F FOOD GRADE
EC 1935/2004 plus FDA compliant



TRANSITION PIECES AND ADAPTERS

Transition pieces / counter flanges



E = No. of holes

COUNTER FLANGES FOR SPOUTS FROM SQUARE TO ROUND

1301

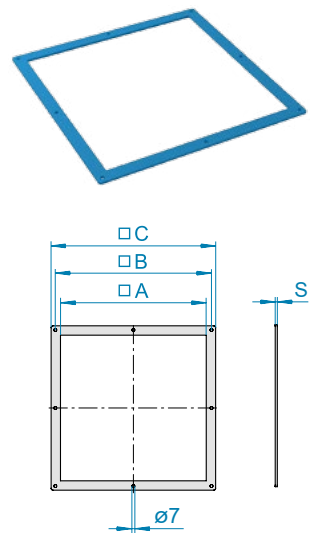
- Counter flange to match spouts from square to round
- For use in conjunction with a square flat gasket

DN	A	B	C	E	S	kg	Steel S235 JR (ST 37-2)		Stainless steel 1.4301 F	
							Item no.	€	Item no.	€
80	100	120	140	8	5	0.38	10080714		10083714	
100	120	140	160	8	5	0.44	10100714		10103714	
120	140	164	180	8	5	0.50	10120714		10123714	
150	180	202	220	8	5	0.63	10150714		10153714	
175	200	225	245	8	5	0.79	10170714		10173714	
200	250	270	290	8	5	0.85	10200714		10203714	
250	300	325	345	8	5	1.14	10250714		10253714	
300	350	375	395	8	5	1.30	10300714		10303714	

FLAT GASKETS FOR SPOUTS FROM SQUARE TO ROUND

1302

- Flat gasket to match square to round spout and counter flange for spout
- Please also read and take into account the technical information given at the beginning of this chapter

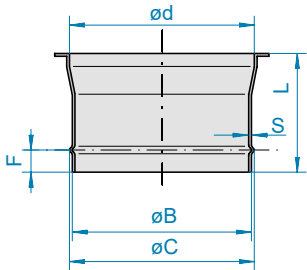


E = No. of holes

DN	A	B	C	E	S	NBR grey white		Silicone, beige F		Silicone, blue F D	
						Item no.	€	Item no.	€	Item no.	€
80	100	120	140	8	3	10086732		10087732		1008773201	
100	120	140	160	8	3	10106732		10107732		1010773201	
120	140	164	180	8	3	10126732		10127732		1012773201	
150	180	202	220	8	3	10156732		10157732		1015773201	
175	200	225	245	8	3	10176732		10177732		1017773201	
200	250	270	290	8	3	10206732		10207732		1020773201	
250	300	325	345	8	3	10256732		10257732		1025773201	
300	350	375	395	8	3	10306732		10307732		1030773201	

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable




HOSE CONNECTIONS

1340

- For use in conjunction with PU hose and special hose clamp

Powder-coated, galvanised and stainless steel (dimensions for 1 mm pipework)

DN	$\varnothing d$	$\varnothing B$	$\varnothing C$	F	S	L	kg	1 mm powder-coated		1 mm galvanised		1 mm stainless steel 	
								Item no.	€	Item no.	€	Item no.	€
60-50	57	50	51		1	80	0.20	110614990*		110624990*		110634990*	
60	57	60	61		1	80	0.20	11061499 *		11062499 *		11063499 *	
80	78	78	80	15	1	88	0.20	11081499		11082499		11083499	
100	100	95	100	15	1	100	0.25	11101499 *		11102499 *		11103499	
120	120	122	125	15	1	100	0.30	11121499		11122499		11123499	
140	136	138	140	15	1	100	0.35	11141499		11142499		11143499	
150	150	145	150	20	1	100	0.40	11151499 *		11152499 *		11153499	
175	175	177	180	20	1	100	0.45	11171499		11172499		11173499	
200	200	198	200	20	1	100	0.50	11201499		11202499		11203499	
224	220	222	225	20	1	100	0.57	11221499		11222499		11223499	
250	250	248	250	20	1	100	0.65	11251499		11252499		11253499	
280	278	276	278	20	1	100	0.76	11281499		11282499		11283499	
300	300	298	300	20	1	100	0.84	11301499		11302499		11303499	
315	313	315	317	20	1	100	0.86	11311499		11312499		11313499	

*1.5 mm



SPECIAL HOSE CLAMPS

3170

- For use in conjunction with hose connections and JACOB PU hose

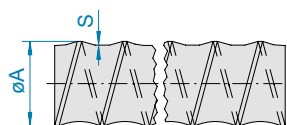
DN	Galvanised		Stainless steel	
	Item no.	€	Item no.	€
50	10052162		10053162	
60	10062162		10063162	
80	10082162		10083162	
100	10102162		10103162	
120	10122162		10123162	
140	10142162		10143162	
150	10152162		10153162	
175	10172162		10173162	
200	10202162		10203162	
224	10222162		10223162	
250	10252162		10253162	
280	10282162		10283162	
300	10302162		10303162	
315	10312162		10313162	

 **FOOD GRADE**
EC 1935/2004 plus FDA compliant



TRANSITION PIECES AND ADAPTERS

Flexible hoses and accessories



PU HOSES

3160

- Material: Polyether polyurethane with spring steel wire
- Properties: highly abrasion resistant, oil and fuel resistant, inside largely smooth, transparent
- Temperature range: -40°C to +100°C
- Not suitable for conveying water vapour
- Suitable for short-term contact with foodstuffs without fatty substances (max. 4 hours, max. +40°C)
- FOOD GRADE: EC 1935/2004 plus FDA compliant
- Pressure resistance on request
- Bending radius: Minimum R = 1 D or larger

Lengths 1, 2, 3 and 5 m (sold by whole metres only)

DN	ØA	S	kg/m	Length 1 m		Length 2 m		Length 3 m		Length 5 m	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
50	58	0.7	0.41	10050165910		10050165920		10050165930		10050165950	
60	68	0.7	0.49	10060165910		10060165920		10060165930		10060165950	
80	88	0.7	0.76	10080165910		10080165920		10080165930		10080165950	
100	110	0.7	0.95	10100165910		10100165920		10100165930		10100165950	
120	129	0.7	1.12	10120165910		10120165920		10120165930		10120165950	
140	149	0.7	1.38	10140165910		10140165920		10140165930		10140165950	
150	161	0.7	1.48	10150165910		10150165920		10150165930		10150165950	
175	185	0.7	1.85	10170165910		10170165920		10170165930		10170165950	
200	214	0.7	2.30	10200165910		10200165920		10200165930		10200165950	
224	235	0.7	2.55	10220165911		10220165921		10220165930		10220165950	
250	260	0.7	3.02	10250165911		10250165920		10250165930		10250165950	
280	290	0.7	3.16	10280165910		10280165920		10280165930		10280165950	
300	310	0.7	3.20	10300165910		10300165920		10300165930		10300165950	
315	325	0.7	3.40	10310165911		10310165920		10310165930		10310165950	

Lengths 7, 9, 10 and 15 m (sold by whole metres only)

DN	ØA	S	kg/m	Length 7 m		Length 9 m		Length 10 m		Length 15 m	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
50	58	0.7	0.41	10050165970		10050165990		100501659110		100501659115	240.00
60	68	0.7	0.49	10060165970		10060165990		100601659110		100601659115	246.00
80	88	0.7	0.76	10080165970		10080165990		100801659110		100801659115	336.00
100	110	0.7	0.95	10100165970		10100165990		101001659110		101001659115	436.50
120	129	0.7	1.12	10120165970		10120165990		101201659110		101201659115	537.00
140	149	0.7	1.38	10140165970		10140165990		101401659110		101401659115	567.00
150	161	0.7	1.48	10150165970		10150165990		101501659110		101501659115	624.00
175	185	0.7	1.85	10170165970		10170165990		101701659110		101701659115	681.00
200	214	0.7	2.30	10200165970		10200165990		102001659110		102001659115	753.00
224	235	0.7	2.55	10220165970		10220165990		102201659110		102201659115	861.00
250	260	0.7	3.02	10250165970		10250165990		102501659110		102501659115	1062.00
280	290	0.7	3.16	10280165970		10280165990		102801659110		102801659115	1110.00
300	310	0.7	3.20	10300165970		10300165990		103001659110		103001659115	1178.00
315	325	0.7	3.40	10310165970		10310165990		103101659110		103101659115	1239.00

F FOOD GRADE
EC 1935/2004 plus FDA compliant



HOSE CLAMPS

3165

- For fixing flexible sleeves

DN	Stainless steel	
	Item no.	€
60	10063163	
80	10083163	
100	10103163	
120	10123163	
140	10143163	
150	10153163	
175	10173163	
200	10203163	
224	10223163	
250	10253163	
300	10303163	

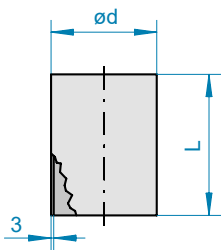


FLEXIBLE SLEEVES FOR HOSE CONNECTIONS

1345

- Material: Conductive EPDM, black
- Electrostatically conductive
- Temperature resistance: -30°C to +120°C
- Pressure resistance on request

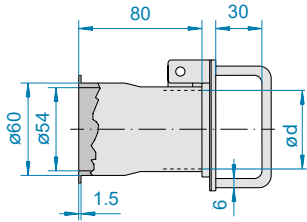
DN	Ø d	L	kg	Conductive EPDM black	
				Item no.	€
60	60	200	0.19	100681705	
80	80	200	0.21	100881705	
100	100	200	0.26	101081705	
120	125	200	0.32	101281705	
140	140	200	0.37	101481705	
150	150	200	0.40	101581705	
175	175	200	0.46	101781705	
200	200	200	0.53	102081705	
224	225	200	0.59	102281705	
250	250	200	0.66	102581705	
300	300	200	0.79	103081705	





TRANSITION PIECES AND ADAPTERS

Flexible hoses and accessories

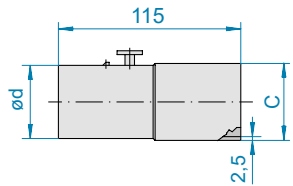


HOSE SOCKETS

3175

- With cover for hose plug
- The version with 80 mm diameter differs from the illustration

DN	Electro-galvanised		Stainless steel	
	Item no.	€	Item no.	€
60	10062860		10063860	
80	10082860			

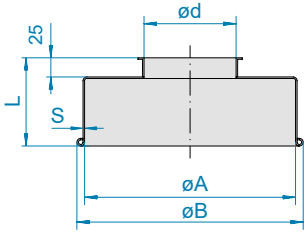
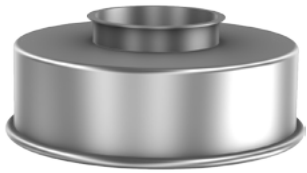


HOSE PLUGS

3180

- 45 mm and 50 mm diameters are suitable for 60 mm hose socket

DN	C	Electro-galvanised		Stainless steel	
		Item no.	€	Item no.	€
45	45	100628651		100638651	
50	50	100628650		100638650	
80	80	100828650			



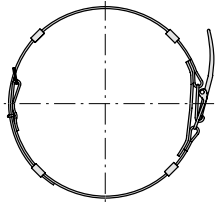
BAGGING SPOUTS

1350

- For use in conjunction with a bag clamp

Powder-coated, galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	Ø A	Ø B	L	1.5 mm powder-coated		1.5 mm galvanised		1.5 mm stainless steel	
					Item no.	€	Item no.	€	Item no.	€
80	77	275	295	115	11081585		11082585		11083585	
100	100	275	295	115	11101585		11102585		11103585	
120	120	275	295	115	11121585		11122585		11123585	
150	150	275	295	115	11151585		11152585		11153585	
175	175	275	295	115	11171585		11172585		11173585	
200	200	275	295	115	11201585		11202585		11203585	
250	250	275	295	115	11251585		11252585		11253585	
300	300	300	311	115	11301585		11302585		11303585	

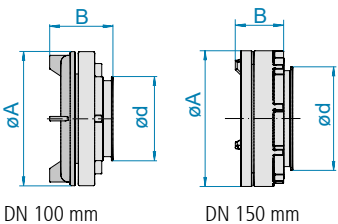


BAG CLAMPS

4010

- Made from leather for bagging spout
- Bag clamp no. 10080581 can be used for bagging spout with 80-300 mm diameter
- For attachment on site

DN min / max	Item no.	€
250-320	10080581	
420-500	10080582	



PNEUMATIC FILL AND VACUUM COUPLINGS

1460

- Pressure coupling aluminium
- Sealing cap plastic
- Chain galvanised steel
- With 6 mm lip for connecting to JACOB pull-ring system

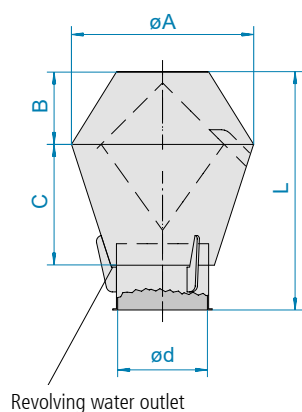
DN	Ø d	Ø A	B	kg	Aluminium	
					Item no.	€
100	113	182	85	1.26	10100870	
150	164	215	91	3.02	10150870	

F FOOD GRADE
EC 1935/2004 plus FDA compliant



TRANSITION PIECES AND ADAPTERS

Jet caps and rain caps



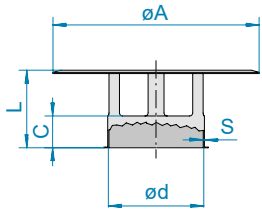
JET CAPS

1430

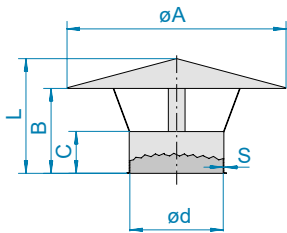
- Diameters from 350 mm with welded-on flange acc. to DIN 24154-2, but without counter-flange (see chapter 11 for matching flanges)

Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	$\varnothing d$	$\varnothing A$	B	C	L	kg	2 mm galvanised		2 mm stainless steel	
							Item no.	€	Item no.	€
80	76	230	110	188	360	3.20	12082805		12083805	
100	99	230	110	152	325	3.40	12102805		12103805	
120	119	260	125	169	355	5.20	12122805		12123805	
140	135	310	130	222	415	6.60	12142805		12143805	
150	149	310	130	200	390	7.40	12152805		12153805	
175	174	360	160	237	460	9.50	12172805		12173805	
200	199	460	200	322	620	12.50	12202805		12203805	
224	219	515	235	368	695	14.50	12222805		12223805	
250	249	515	235	322	650	18.80	12252805		12253805	
280	276	570	245	305	566	18.00	12282805		12283805	
300	299	575	255	335	680	18.50	12302805		12303805	
315	311	590	255	327	680	20.00	12312805		12313805	
350	349	645	275	448	848	25.50	12352805		12353805	
400	398	715	295	480	915	29.50	12402805		12403805	
450	448	820	320	588	1040	49.50	12452805		12453805	
500	498	870	320	588	1040	53.50	12502805		12503805	
560	558	990	372	703	1208	71.00	12562805		12563805	
630	628	1140	442	776	1434	95.00	12632805		12633805	
710	707	1290	502	901	1627	118.00	12712805		12713805	
800	797	1440	520	1020	1790	142.00	12802805		12803805	



Version DN 80 to 200 mm



Version from DN 224 mm

RAIN CAPS

1440

- Take local building regulations into account, alternatively use a jet cap

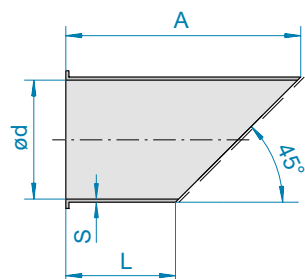
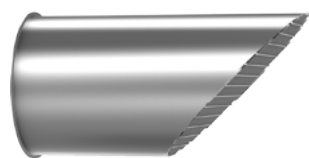
Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	$\varnothing d$	$\varnothing A$	B	C	L	kg	1.5 mm galvanised		2 mm galvanised		1.5 mm stainless steel		2 mm stainless steel	
							Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	77	180		50	92	0.60	11082850				11083850			
100	100	225		50	102	0.90	11102850				11103850			
120	120	270		50	112	1.30	11122850				11123850			
140	136	325		50	122	1.70	11142850				11143850			
150	150	325		50	127	1.80	11152850				11153850			
175	175	375		50	140	2.30	11172850				11173850			
200	200	425		50	152	2.90	11202850				11203850			
224	220	525	205	106	275	6.10	11222850				11223850			
250	250	525	205	106	275	6.40	11252850				11253850			
280	277	596	220	106	300	6.60	11282850				11283850			
300	300	625	230	156	315	6.20	11302850				11303850			
315	312	655	230	106	320	10.54	11312850				11313850			
350	350	750	300	156	395	14.70	11352850				11353850			
400	399	850	320	156	435	15.20	11402850				11403850			
450	448	950	340	150	470	22.00			12452850			12453850		
500	498	1050	410	200	550	27.70			12502850			12503850		
560	558	1150	435	200	590	27.00			12562850			12563850		
630	628	1300	470	200	645	32.00			12632850			12633850		



TRANSITION PIECES AND ADAPTERS

Air outlet pipes and perforated sheet metal



AIR OUTLET PIPES 45°

1450

- With bird-guard, mesh size 20 x 20 x 2 mm

Galvanised (dimensions for 1.5 mm)

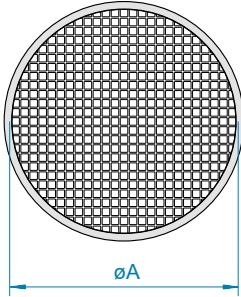
DN	Ø d	A	L	kg	1.5 mm galvanised		2 mm galvanised	
					Item no.	€	Item no.	€
80	77	280	200	0.90	11082880*			
100	100	300	200	1.20	11102880			
120	120	320	200	1.50	11122880			
140	136	340	200	1.90	11142880			
150	150	350	200	2.20	11152880			
175	175	375	200	2.60	11172880			
200	200	400	200	3.20	11202880			
224	220	424	200	3.70	11222880			
250	250	450	200	4.40	11252880			
280	277	480	200	5.40	11282880			
300	300	500	200	6.00	11302880			
315	312	515	200	7.20	11312880			
350	350	550	200	8.20	11352880			
400	399	600	200	10.20	11402880			
450	449	650	200	12.40	11452880			
500	499	700	200	14.90	11502880			
560	558	760	200	23.70			11562880	
630	628	830	200	29.20			11632880	

*1 mm

Stainless steel (dimensions for 1.5 mm)

DN	Ø d	A	L	kg	1.5 mm stainless steel		2 mm stainless steel	
					Item no.	€	Item no.	€
80	77	280	200	0.90	11083880			
100	100	300	200	1.20	11103880			
120	120	320	200	1.50	11123880			
140	136	340	200	1.90	11143880			
150	150	350	200	2.20	11153880			
175	175	375	200	2.60	11173880			
200	200	400	200	3.20	11203880			
224	220	424	200	3.70	11223880			
250	250	450	200	4.40	11253880			
280	277	480	200	5.40	11283880*			
300	300	500	200	6.00	11303880			
315	312	515	200	7.20	11313880*			
350	350	550	200	8.20	11353880			
400	399	600	200	10.20	11403880			
450	449	650	200	12.40	11453880			
500	499	700	200	14.90	11503880			
560	558	760	200	23.70			12563880	
630	628	830	200	29.20			12633880	

*1 mm



PERFORATED SHEET METAL

1380

- With NBR U-shaped seal for 2 mm
- 69% free space, hole size 10 x 10 mm
- NBR: Temperature resistance: -20°C to +100°C, food grade standard, in accordance with EC 1935/2004
- On request: Silicone seal, temperature resistance -60°C to +250°C
- FOOD GRADE: EC 1935/2004 plus FDA compliant

DN	ØA	kg	1 mm stainless steel	
			Item no.	€
80	92	0.01	11083716	
100	114	0.05	11103716	
120	134	0.05	11123716	
140	150	0.05	11143716	
150	164	0.10	11153716	
175	189	0.10	11173716	
200	214	0.11	11203716	
224	238	0.11	11223716	
250	264	0.11	11253716	
280	294	0.13	11283716	
300	314	0.14	11303716	
315	326	0.15	11313716	
350	364	0.15	11353716	
400	414	0.15	11403716	

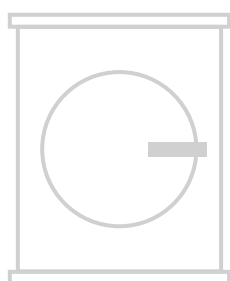


AVAILABLE IN THE DETECTABLE DESIGN LINE.



JACOB INSPECTION PIPE COMPONENTS:
CLEANING AND MAINTENANCE
IN NEXT TO NO TIME





INSPECTION PIPE COMPONENTS

Technical information	106	
Inspection pipes	108	
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Inspection T-pieces	110	
Rubber covers	111	
Plexiglass pipes	112	



INSPECTION PIPE COMPONENTS

Control is better: Inspection pipe components allow you to keep an eye on the inside of your JACOB pipework system too. Special pipe components provide unhindered access and let you carry out inspections, maintenance and cleaning without having to dismantle the complete surrounding area. Like all other pipework elements, the inspection pipe components are manufactured to the same high JACOB standard of quality.

SEALS FOR INSPECTION PIPES AND RUBBER COVERS

Seals for inspection pipes



NBR	Silicone F	Silicone F D
grey white	beige	blue
EC 1935/2004	FOOD GRADE: EC 1935/2004 plus FDA compliant	FOOD GRADE: EC 1935/2004 plus FDA compliant
-20°C to +100°C	-60°C to +250°C	-60°C to +250°C
glued	vulcanised	vulcanised
		metal-detectable

Seals for cleaning pipes



EPDM (sponge rubber)	Foam silicone F	Foam silicone F D
light grey	white	blue
	FOOD GRADE: EC 1935/2004 plus FDA compliant	FOOD GRADE: EC 1935/2004 plus FDA compliant
-35°C to +110°C	-60°C to +180°C	-60°C to +180°C
glued	vulcanised	vulcanised
		metal-detectable

Rubber covers for inspection T-pieces



NBR	TPE F	Silicone F	Silicone F D
dark grey	white	translucent beige	blue
	FOOD GRADE: EC 1935/2004 plus FDA compliant	FOOD GRADE: EC 1935/2004 plus FDA compliant	FOOD GRADE: EC 1935/2004 plus FDA compliant
-30°C to +90°C	-30°C to +100°C	-60°C to +200°C	-60°C to +200°C
			metal-detectable

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



7

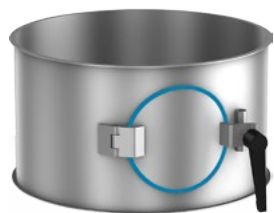


INSPECTION PIPE COMPONENTS

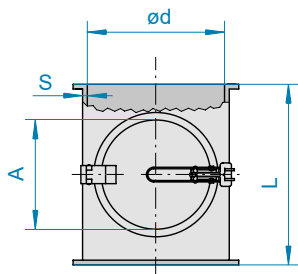
Inspection pipes



DN 80 to 315 mm



DN 350 to 400 mm



INSPECTION PIPES

2010

- Galvanised and powder-coated in standard range with NBR seal
- Stainless steel in standard range with silicone seal
- Other materials available on request
- Reinforced shock explosion proof version up to 3 bar on request

Powder-coated and galvanised (dimensions for 1.5 mm pipework)

DN	Ø d	A	L	kg	1.5 mm powder-coated		3 mm powder-coated		1.5 mm galvanised	
					Item no.	€	Item no.	€	Item no.	€
80	77	80	200	1.05	11081190				11082190	
100	100	115	200	1.25	11101190				11102190	
120	120	115	200	1.45	11121190		13121190		11122190	
140	136	115	200	1.55	11141190				11142190	
150	150	115	200	1.65	11151190		13151190		11152190	
175	175	115	200	1.85	11171190		13171190		11172190	
200	200	115	200	2.00	11201190		13201190		11202190	
224	220	115	200	2.25	11221190				11222190	
250	250	115	200	2.40	11251190		13251190		11252190	
280	277	115	200	2.60	11281190				11282190	
300	300	115	200	2.65	11301190		13301190		11302190	
315	312	115	200	2.85	11311190				11312190	
350	350	115	200	3.20	11351190		13351190		11352190	
400	399	115	200	3.55	11401190		13401190		11402190	

Stainless steel (dimensions for 1.5 mm pipework)

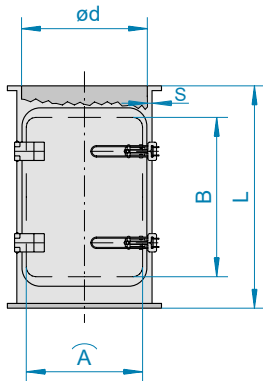
DN	Ø d	A	L	kg	1 mm stainless steel	F	1.5 mm stainless steel	F	2 mm stainless steel	F
					Item no.	€	Item no.	€	Item no.	€
80	77	80	200	1.05	11083190					
100	100	115	200	1.25	11103190				12103190	
120	120	115	200	1.45	11123190				12123190	
140	136	115	200	1.55	11143190					
150	150	115	200	1.65	11153190				12153190	
175	175	115	200	1.85	11173190				12173190	
200	200	115	200	2.00	11203190				12203190	
224	220	115	200	2.25	11223190					
250	250	115	200	2.40	11253190				12253190	
280	277	115	200	2.60			11283190			
300	300	115	200	2.65	11303190				12303190	
315	312	115	200	2.85			11313190			
350	350	115	200	3.20	11353190				12353190	
400	399	115	200	3.55	11403190				12403190	



AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



CLEANING PIPES

2020

- Galvanised and powder-coated in standard range with EPDM (sponge rubber) seal
- Stainless steel with foam silicone seal
- Other materials available on request
- Not recommended for extracting exhaust air containing condensates

Powder-coated and galvanised (dimensions for 1.5 mm pipework)

DN	$\varnothing d$	\widehat{A}	B	L	kg	1.5 mm powder-coated		2 mm powder-coated		1.5 mm galvanised	
						Item no.	€	Item no.	€	Item no.	€
200	200	224	350	486	4.70	11201195				11202195	
224	220	224	350	486	5.20	11221195				11222195	
250	250	224	350	486	5.85	11251195				11252195	
280	277	224	350	486	6.60	11281195				11282195	
300	300	350	350	486	7.00	11301195				11302195	
315	312	350	350	486	7.35	11311195				11312195	
350	350	350	350	486	8.40	11351195				11352195	
400	399	350	350	486	9.10	11401195				11402195	
450	448	500	350	486	11.60			12451195		12452195*	
500	498	500	350	486	12.80			12501195		12502195*	
560	558	500	350	486	14.30			12561195		12562195*	
630	628	500	350	486	16.00			12631195		12632195*	

*2 mm

Stainless steel (dimensions for 1.5 mm pipework)

DN	$\varnothing d$	\widehat{A}	B	L	kg	1.5 mm stainless steel		2 mm stainless steel	
						Item no.	€	Item no.	€
200	200	224	350	486	4.70	11203195			
224	220	224	350	486	5.20	11223195			
250	250	224	350	486	5.85	11253195			
280	277	224	350	486	6.60	11283195			
300	300	350	350	486	7.00	11303195			
315	312	350	350	486	7.35	11313195			
350	350	350	350	486	8.40	11353195			
400	399	350	350	486	9.10	11403195			
450	448	500	350	486	11.60			12453195	
500	498	500	350	486	12.80			12503195	
560	558	500	350	486	14.30			12563195	
630	628	500	350	486	16.00			12633195	



AVAILABLE IN THE DETECTABLE DESIGN LINE.

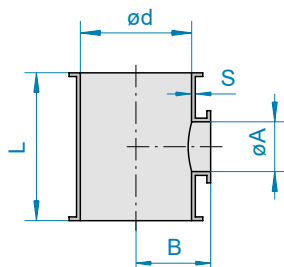
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



INSPECTION PIPE COMPONENTS

Inspection T-pieces



INSPECTION T-PIECES

1040

- For use in conjunction with a rubber cover
- Alternatively: Combined with a blank off cover and JACOB pull-ring
- Refer to dimension A to select the right rubber cover or blank off cover

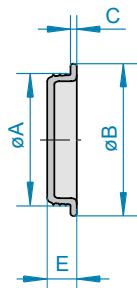
Powder-coated (dimensions for 1.5 mm pipework)

DN	Ø d	Ø A	B	L	kg	1.5 mm powder-coated		2 mm powder-coated		3 mm powder-coated	
						Item no.	€	Item no.	€	Item no.	€
100	100	100	79	165	0.75	11101200					
120	120	100	89	165	0.80	11121200				13121200	
150	150	120	100	198	1.20	11151200				13151200	
175	175	150	114	225	1.55	11171200		12171200		13171200	
200	200	150	125	225	1.80	11201200		12201200		13201200	
250	250	150	150	225	2.20	11251200		12251200		13251200	
300	300	150	177	225	2.55	11301200		12301200		13301200	

Galvanised and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	Ø A	B	L	kg	1.5 mm galvanised		1 mm stainless steel	F	2 mm stainless steel	F
						Item no.	€	Item no.	€	Item no.	€
100	100	100	79	165	0.75	11102200		11103200		12103200	
120	120	100	89	165	0.80	11122200		11123200		12123200	
150	150	120	100	198	1.20	11152200		11153200		12153200	
175	175	150	114	225	1.55	11172200		11173200		12173200	
200	200	150	125	225	1.80	11202200		11203200		12203200	
250	250	150	150	225	2.20	11252200		11253200		12253200	
300	300	150	177	225	2.55	11302200		11303200		12303200	

F FOOD GRADE
EC 1935/2004 plus FDA compliant



RUBBER COVERS

3030

- For use in conjunction with inspection T-pieces or JACOB pipework in the appropriate diameter
- To select the right rubber cover, please refer to dimension A of the inspection T-piece
- Refer to the beginning of the chapter for more information on materials

NBR and TPE

DN	ØA	ØB	C	E	kg	NBR (-30°C to +90°C)		TPE (-30°C to +100°C)	
						Item no.	€	Item no.	€
80	79	99	5	20	0.10			1008520309	
100	101	121	5	21	0.15	10106203		1010520309	
120	121	141	5	22	0.20	10126203		1012520309	
150	151	171	6	24	0.35	10156203		1015520309	
175	176	197	6	29	0.45	10176203		1017520309	
200	201	221	6	26	0.60	10206203		1020520309	
250	251	271	7	30	0.90	10256203		1025520309	
300	301	321	7	32	1.35	10306203		1030520309	

Silicone

DN	ØA	ØB	C	E	kg	Silicone (-60°C to +200°C)		Silicone (blue) (-60°C to +200°C)	
						Item no.	€	Item no.	€
80	79	99	5	20	0.10	10087203		1008720301	
100	102	121	5	21	0.15	10107203		1010720301	
120	123	141	5	22	0.20	10127203		1012720301	
150	151	171	6	24	0.35	10157203		1015720301	
175	176	197	6	25	0.45	10177203		1017720301	
200	202	221	6	26	0.60	10207203		1020720301	
250	252	271	7	30	0.90	10257203		1025720301	
300	302	321	7	32	1.35	10307203		1030720301	

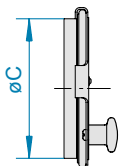
ADDITIONAL RUBBER COVER LOCKS

3040

- For use in conjunction with inspection T-pieces and rubber covers

Electro-galvanised

DN	ØC	kg	2 mm electro-galvanised	Item no.	€
100	100	0.30	for inspection T-pieces DN 100 and 120 mm	11102210	
120	120	0.35	for inspection T-pieces DN 150 mm	11122210	
150	150	0.55	for inspection T-pieces DN 175 to 300 mm	11152210	



F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



INSPECTION PIPE COMPONENTS

Plexiglass pipes



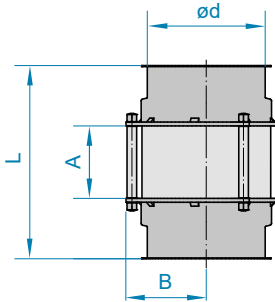
PLEXIGLASS PIPES WITH SOCKETS AND ROD SPACERS

1390

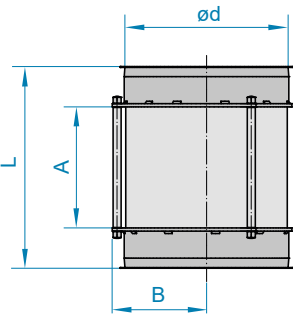
- Including sockets with a lip
- NEW: with rod spacers for a stronger construction
- Temperature-resistant to 70°C
- Plexiglass pipes must not be installed in load bearing situations
- DN 60 to 150 mm and DN 200 mm made of seamless plexiglass
- FOOD GRADE: EC 1935/2004 plus FDA compliant
- DN 175 and 250 mm with glued plexiglass, foodstuff compliant in accordance with FDA

Powder-coated, galvanised and stainless steel (dimensions for 1 mm pipework)

DN	Ø d	A	B	L	kg	1 mm powder-coated		1 mm electro-galvanised		1 mm stainless steel		F
						Item no.	€	Item no.	€	Item no.	€	
80	78	75	62	200	0.80	11081725		11082725		11083725		
100	100	75	72	200	0.90	11101725		11102725		11103725		
120	120	75	83	200	1.10	11121725		11122725		11123725		
150	150	75	97	200	1.30	11151725		11152725		11153725		
175	175	100	104	200	1.50	11171725		11172725		11173725		
200	200	150	117	250	1.90	11201725		11202725		11203725		
250	250	150	142	250	2.30	11251725		11252725		11253725		

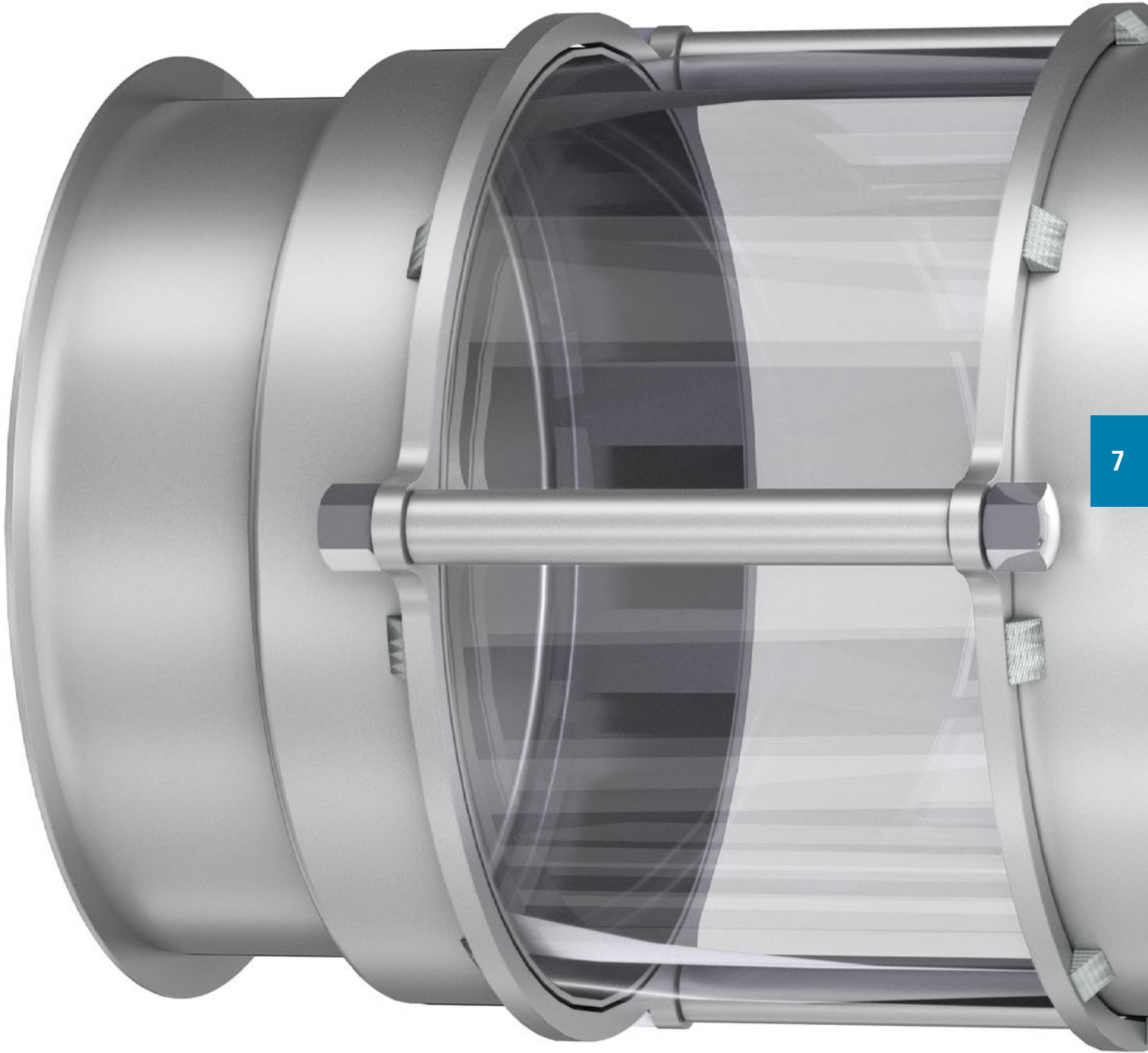


DN 80 to 150 mm



DN 175 to 250 mm

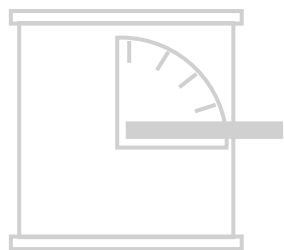
F FOOD GRADE
EC 1935/2004 plus FDA compliant



7



AIR FLOW AND PRODUCT TRANSPORT
TO SUIT YOUR SYSTEM: PERFECTLY
REGULATED AT ALL TIMES



CONTROL VALVES

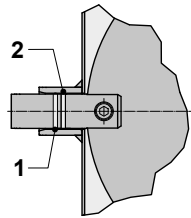
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Non-return valves	129	
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Silo/Redler outlet slide gates	133	



THROTTLE VALVES

JACOB throttle valves and regulators precisely control the air flow and product transport and can be flexibly incorporated in our pull-ring system thanks to their lipped ends.

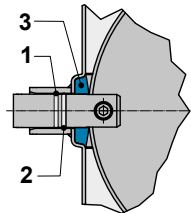
We have a wide portfolio of standard products – from manually adjustable throttle valves and pneumatic rotary actuators to electrically operated adjustable drives. Other drives and larger diameters are available on request. We reserve the right to alter design specifications.



Cross-section of throttle valve without seal, valve open
1 EPDM
2 Viton

THROTTLE VALVES WITHOUT SEAL WHEN CLOSED

- Diameters of 60 – 400 mm
- Hand-operated, made of powder-coated, galvanised and stainless steel
- Pneumatically operated with a rotary actuator, and electrically operated with an electric motor, in powder-coated and stainless steel
- Both shafts are sealed with an O-ring made of Viton and a conductive EPDM seal to discharge charges on the inner flap to the housing
- Neither of the O-ring seals are in contact with the product
- FOOD GRADE stainless steel version dually compliant for contact with food in accordance with EC 1935/2004 plus FDA
- Versions with a diameter over 350 mm are alternatively available with loose flanges. Refer to chapter 11 for details



Cross-section of throttle valve with seal, valve open
1 EPDM
2 Viton
3 Silicone rubber

THROTTLE VALVES WITH SEAL WHEN CLOSED

- Diameters of 80 – 400 mm
- Hand-operated, pneumatically operated with a rotary actuator, and electrically operated with an electric motor, powder-coated and stainless steel
- Up to a diameter of 200 mm, the valve is tested as shock explosion proof externally up to 3 bar over-pressure
- Electric shock explosion proof in a closed condition in conjunction with a pneumatic rotary actuator. Compressed air connection with 5 bar minimum operating pressure
- The standard quality with an inner valve seal is made of silicone rubber
- Both shafts are sealed with an O-ring made of Viton and a conductive EPDM seal to discharge charges on the inner flap to the housing
- Neither of the O-ring seals are in contact with the product
- FOOD GRADE stainless steel version dually compliant with EC 1935/2004 plus FDA for contact with food, including all parts in contact with foodstuffs and any sealing materials and glues
- Please refer to chapter 11 for information on special throttle valve versions with a seal in diameters of over 400 mm

Throttle valves with and without a seal: Shafts are sealed with O-ring seals Throttle valves with a seal: Inner valve seal made of silicone rubber

O-ring EPDM	O-ring Viton	Valve seal made of silicone rubber	F
black	green	opaque	
not in contact with the product	not in contact with the product	FOOD GRADE: EC 1935/2004 plus FDA compliant	
-40°C to +150°C	-20°C to +200°C	-60°C to +180°C	
conductive		vulcanised	



Special versions available – prices on request

- Housing available in various types of stainless steel, such as 1.4571
- Versions for higher temperatures on request
- Actuation possible 100 mm away from the housing for higher temperature protection
- Actuators, solenoid valves and limit switches according to customers' specifications
- Larger diameters available on request
- Versions with loose flanges or welded flanges, e.g. in accordance with DIN 24154-2
- Special colours
- Other actuators on request

ACTUATORS FOR THROTTLE VALVES



Pneumatic AIR TORQUE rotary actuators (IP 65)

Required air pressure 5 bar. Switch-over time for 90° < 3 seconds. On the rotary actuator a 5/2-way spring-return valve (1 coil) with manual air switch, with an angle push-in fitting for an 8 x 1 PU hose. Standard version closed when there is no power supply.

2 potential-free micro switches 4 to 250 V with spring-free gold contacts for SPS controls and suitable for amperages up to 5 A, solenoid and limit switches wired into limit switch. Solenoid valve and limit switch wired on terminals in a limit switch box.



Electrically operated BELIMO valve actuators (IP 42)

Overload proof, in standard version without limit switches. The valve remains under tension in the respective end position. Consumption approx. 4 watt. Switch-over time for 90° approx. 150 seconds. Valves larger than DN 300 mm without a seal and larger than DN 200 mm with a seal are not fitted with a BELIMO actuator in standard quality. Larger diameters available on request. Flexibly adjustable limit switches for switching off and remote controlling, or as a continuously adjustable actuator, are available at additional cost.



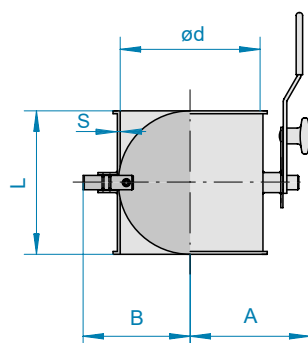
Electrically operated AIR TORQUE adjustable drives (IP 65)

1-phase, with emergency hand operation. Switch-over time for 90° for throttle valves without a seal approx. 11-12 seconds, throttle valves with a seal approx. 12-23 seconds, 2 limit switches integrated in the actuator. Prices for additional limit switch, potentiometer or position controller on request.



ATEX

Depending on the actuator, ATEX versions in category 2/3 G/D for the surroundings of the valves are available at additional cost. Inside the valve housing, Zone 0 or 20 is admitted for versions without an inner valve seal. For versions with a seal, ATEX versions up to and including DN 300 mm are also admitted inside Zone 0 or 20, but from DN 300 mm, only Zone 20 is admitted. If Zone 0 is required, conductive EPDM seal without food quality are necessary. Dusts and gases with a minimum ignition energy < 3 mJ are not admissible. All throttle valves in ATEX version are supplied with earthing lugs as standard.



THROTTLE VALVES, HAND-OPERATED



- Larger diameters available on request
- Refer to chapter 11 for version with loose flange
- For manual continuous flow regulation

Powder-coated and galvanised (dimensions for 1.5 mm pipework)

DN	Ø d	A	B	L	kg	1.5 mm powder-coated		1.5 mm galvanised	
						Item no.	€	Item no.	€
60	57	79	63	60	0.70	11061566			
80	77	90	74	100	0.90	11081566		11082566	
100	100	101	85	100	1.10	11101566		11102566	
120	120	124	103	120	1.90	11121560		11122560	
140	136	132	111	140	2.20	11141560		11142560	
150	150	139	118	150	2.40	11151560		11152560	
175	175	152	130	175	3.00	11171560		11172560	
200	200	164	143	200	3.50	11201560		11202560	
224	220	174	153	200	3.90	11221560		11222560	
250	250	189	168	200	4.50	11251560		11252560	
280	277	203	181	200	5.00	11281560		11282560	
300	300	214	193	200	5.50	11301560		11302560	
315	312	220	199	200	6.50	11311560*		11312560*	
350	350	239	218	200	7.50	11351560*		11352560*	
400	399	264	242	200	9.00	11401560*		11402560*	

*2 mm

Stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	A	B	L	kg	1.5 mm stainless steel 		2 mm stainless steel 	
						Item no.	€	Item no.	€
60	57	79	63	60	0.70	11063566			
80	77	90	74	100	0.90	11083566			
100	100	101	85	100	1.10	11103566		12103566	
120	120	124	103	120	1.90	11123560		12123560	
140	136	132	111	140	2.20	11143560			
150	150	139	118	150	2.40	11153560		12153560	
175	175	152	130	175	3.00	11173560		12173560	
200	200	164	143	200	3.50	11203560		12203560	
224	220	174	153	200	3.90	11223560			
250	250	189	168	200	4.50	11253560		12253560	
280	277	203	181	200	5.00			12283560	
300	300	214	193	200	5.50	11303560		12303560	
315	312	220	199	200	6.50			12313560	
350	350	239	218	200	7.50			11353560	
400	399	264	242	200	9.00			11403560	



THROTTLE VALVES WITH PNEUMATIC ROTARY ACTUATOR

2095

- 5/2-way solenoid valve (1-coil)
- 2 mechanical limit switches and solenoid valve wired in a limit switch box
- Switch-over time for 90°: < 3 seconds
- Throttle valve defaults to closed when current is cut
- Larger diameters available on request

Powder-coated and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	A	B	C	L	kg	1.5 mm powder-coated		1.5 mm stainless steel	
							Item no.	€	Item no.	€



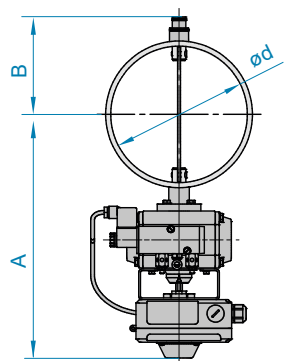
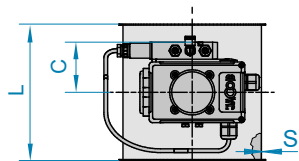
Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC

60	57	280	63	79	60	3.30	5662060344	6662060344
80	77	303	87	79	100	3.60	5662080344	6662080344
100	100	315	99	79	100	3.90	5662100344	6662100344
120	120	325	109	79	120	4.30	5852120344	6852120344
140	136	333	117	79	140	4.70	5852140344	6852140344
150	150	340	124	79	150	5.00	5852150344	6852150344
175	175	352	136	84	175	6.60	5852170344	6852170344
200	200	364	149	84	200	7.40	5852200344	6852200344
224	220	374	159	84	200	7.90	5852220344	6852220344
250	250	388	174	84	200	8.60	5852250344	6852250344
280	277	403	188	84	200	9.10	5852280344	6852280344
300	300	414	199	84	200	9.80	5852300344	6852300344
315	312	422	205	84	200	10.20	5852310344*	6852310344*
350	350	460	224	84	200	10.90	5852350344*	6852350344*
400	399	485	248	84	200	12.30	5852400344*	6852400344*

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

60	57	280	63	79	60	3.30	5662060345	6662060345
80	77	303	87	79	100	3.60	5662080345	6662080345
100	100	315	99	79	100	3.90	5662100345	6662100345
120	120	325	109	79	120	4.30	5852120345	6852120345
140	136	333	117	79	140	4.70	5852140345	6852140345
150	150	340	124	79	150	5.00	5852150345	6852150345
175	175	352	136	84	175	6.60	5852170345	6852170345
200	200	364	149	84	200	7.40	5852200345	6852200345
224	220	374	159	84	200	7.90	5852220345	6852220345
250	250	388	174	84	200	8.60	5852250345	6852250345
280	277	403	188	84	200	9.10	5852280345	6852280345
300	300	414	199	84	200	9.80	5852300345	6852300345
315	312	422	205	84	200	10.20	5852310345*	6852310345*
350	350	460	224	84	200	10.90	5852350345*	6852350345*
400	399	485	248	84	200	12.30	5852400345*	6852400345*

*2 mm





CONTROL VALVES

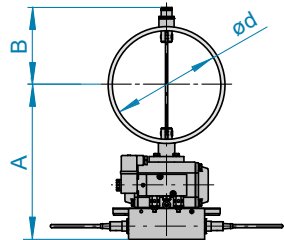
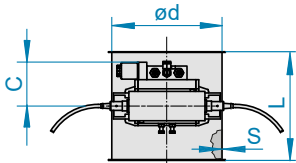
Throttle valves



THROTTLE VALVES WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2095

- Switch-over time for 90°: < 3 seconds
- Designed inside with equipment category 1 G/D, outside with equipment category 3 D
- Control with 5/2-way solenoid valve and 2 inductive limit switches 24 V DC
- Without terminal box
- Terminal box and limit switch box on request
- Throttle valve defaults to closed when current is cut
- Larger diameters available on request



Powder-coated and stainless steel (dimensions for 1.5 mm pipework)

DN	ø d	A	B	C	L	kg	1.5 mm powder-coated		1.5 mm stainless steel	
							Item no.	€	Item no.	€

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

60	57	280	63	79	60	3.30	56620603455		66620603455	
80	77	303	87	79	100	3.60	56620803455		66620803455	
100	100	315	99	79	100	3.90	56621003455		66621003455	
120	120	325	109	79	120	4.30	58521203455		68521203455	
140	136	333	117	79	140	4.70	58521403455		68521403455	
150	150	340	124	79	150	5.00	58521503455		68521503455	
175	175	352	136	84	175	6.60	58521703455		68521703455	
200	200	364	149	84	200	7.40	58522003455		68522003455	
224	220	374	159	84	200	7.90	58522203455		68522203455	
250	250	388	174	84	200	8.60	58522503455		68522503455	
280	277	403	188	84	200	9.10	58522803455		68522803455	
300	300	414	199	84	200	9.80	58523003455		68523003455	
315	312	422	205	84	200	10.20	58523103455*		68523103455*	
350	350	460	224	84	200	10.90	58523503455*		68523503455*	
400	399	485	248	84	200	12.30	58524003455*		68524003455*	

*2 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant



THROTTLE VALVES WITH ELECTRICALLY-OPERATED VALVE ACTUATOR

2105

- Switch-over time for 90°: approx. 150 seconds
- Limit switch indication at additional cost
- With external control voltage 0 to 10 V DC on request

Powder-coated and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	A	B	L	kg	1.5 mm powder-coated		1.5 mm stainless steel	
						Item no.	€	Item no.	€

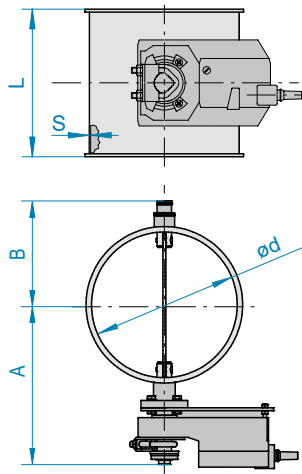


Valve actuator, make BELIMO, voltage 230 V AC

60	57	145	63	60	3.60	5662060551	6662060551
80	77	166	87	100	3.90	5662080551	6662080551
100	100	179	99	100	4.20	5662100551	6662100551
120	120	189	109	120	4.60	5852120551	6852120551
140	136	197	117	140	5.00	5852140551	6852140551
150	150	204	124	150	5.20	5852150551	6852150551
175	175	216	136	175	5.60	5852170551	6852170551
200	200	229	149	200	6.40	5852200551	6852200551
224	220	239	159	200	6.80	5852220551	6852220551
250	250	254	174	200	7.40	5852250551	6852250551
280	277	403	188	200	8.10	5852280551	6852280551
300	300	277	199	200	8.70	5852300551	6852300551

Valve actuator, make BELIMO, voltage 24 V DC/AC

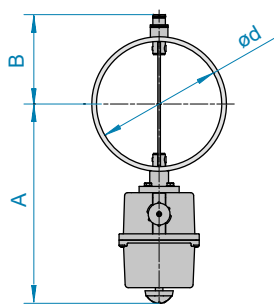
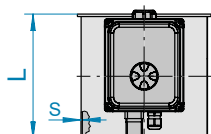
60	57	145	63	60	3.60	5662060552	6662060552
80	77	166	87	100	3.90	5662080552	6662080552
100	100	179	99	100	4.20	5662100552	6662100552
120	120	189	109	120	4.60	5852120552	6852120552
140	136	197	117	140	5.00	5852140552	6852140552
150	150	204	124	150	5.20	5852150552	6852150552
175	175	216	136	175	5.60	5852170552	6852170552
200	200	229	149	200	6.40	5852200552	6852200552
224	220	239	159	200	6.80	5852220552	6852220552
250	250	254	174	200	7.40	5852250552	6852250552
280	277	403	188	200	8.10	5852280552	6852280552
300	300	277	199	200	8.70	5852300552	6852300552





CONTROL VALVES

Throttle valves



THROTTLE VALVES WITH ELECTRICALLY-OPERATED ADJUSTABLE DRIVE

2107

- Adjustable drive, make AIR TORQUE
- Including 2 limit switches
- Switch-over time for 90°: approx. 11-12 seconds
- ATEX version on request
- Larger diameters available on request

Powder-coated and stainless steel (dimensions for 1.5 mm pipework)

DN	Ø d	A	B	L	kg	1.5 mm powder-coated		1.5 mm stainless steel		
						Item no.	€	Item no.	€	

Adjustable drive, make AIR TORQUE, voltage 230 V AC

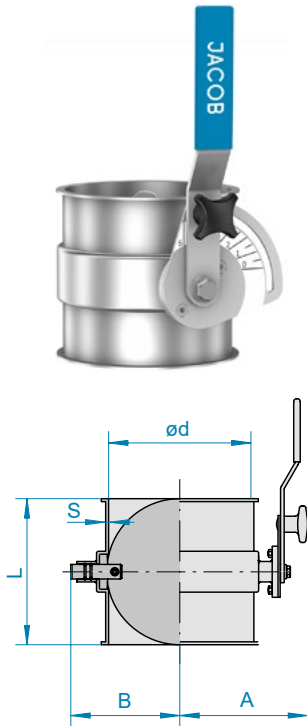
60	57	240	63	60	2.80	5662060773		6662060773		
80	77	250	75	100	3.00	5662080773		6662080773		
100	99	262	85	200	3.20	5662100773		6662100773		
120	119	277	103	200	3.70	5852120773		6852120773		
140	135	285	111	200	4.00	5852140773		6852140773		
150	149	293	118	200	4.20	5852150773		6852150773		
175	174	305	131	200	4.70	5852170773		6852170773		
200	199	317	143	200	5.30	5852200773		6852200773		
224	219	327	153	200	5.70	5852220773		6852220773		
250	249	342	168	200	6.30	5852250773		6852250773		
280	276	357	182	200	6.80	5852280773		6852280773		
300	299	368	193	200	7.30	5852300773		6852300773		
315	311	374	199	200	8.40	5852310773*		6852310773*		
350	349	393	218	200	9.40	5852350773*		6852350773*		
400	398	418	242	200	10.80	5852400773*		6852400773*		

Adjustable actuator, make AIR TORQUE, voltage 24 V DC/AC

60	57	240	63	60	2.80	5662060774		6662060774		
80	77	250	75	100	3.00	5662080774		6662080774		
100	99	262	85	200	3.20	5662100774		6662100774		
120	119	277	103	200	3.70	5852120774		6852120774		
140	135	285	111	200	4.00	5852140774		6852140774		
150	149	293	118	200	4.20	5852150774		6852150774		
175	174	305	131	200	4.70	5852170774		6852170774		
200	199	317	143	200	5.30	5852200774		6852200774		
224	219	327	153	200	5.70	5852220774		6852220774		
250	249	342	168	200	6.30	5852250774		6852250774		
280	276	357	182	200	6.80	5852280774		6852280774		
300	299	368	193	200	7.30	5852300774		6852300774		
315	311	374	199	200	8.40	5852310774*		6852310774*		
350	349	393	218	200	9.40	5852350774*		6852350774*		
400	398	418	242	200	10.80	5852400774*		6852400774*		

*2 mm

FOOD GRADE
EC 1935/2004 plus FDA compliant



THROTTLE VALVES, HAND-OPERATED

2080

- Silicone rubber seal
- Temperature resistance: -60°C to +180°C
- Larger diameters available on request

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	A	B	L	kg	2 mm powder-coated		2 mm stainless steel		F
						Item no.	€	Item no.	€	
80	77	121	83	100	1.80	12081577*		12083577		
100	99	133	93	100	2.20	12101577		12103577		
120	119	143	103	120	2.60	12121577		12123577		
140	135	151	111	140	2.90	12141577		12143577		
150	149	158	116	150	3.20	12151577		12153577		
175	174	170	131	175	3.90	12171577		12173577		
200	199	183	143	200	4.60	12201577		12203577		
224	219	193	153	200	5.10	12221577		12223577		
250	249	208	168	200	5.80	12251577		12253577		
280	276	222	182	200	6.40	12281577		12283577		
300	299	233	193	200	7.22	12301577		12303577		
315	311	272	220	200	10.50	12311577		12313577		
350	349	291	239	200	12.00	12351577		12353577		
400	398	316	264	200	14.20	12401577		12403577		

*1.5 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

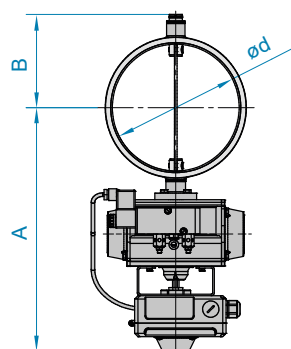
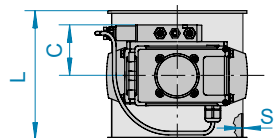
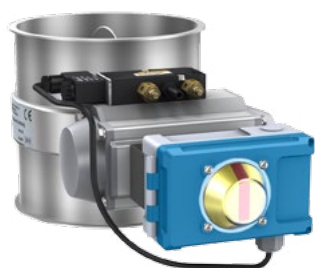
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



CONTROL VALVES

Throttle valves with seal



THROTTLE VALVES WITH PNEUMATIC ROTARY ACTUATOR

2090

- 5/2-way solenoid valve (1 coil)
- 2 mechanical limit switches and solenoid valve wired in a limit switch box
- Switch-over time for 90°: < 3 seconds
- Silicone rubber seal
- Throttle valve defaults to closed when current is cut
- Larger diameters available on request

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	A	B	C	L	kg	2 mm powder-coated		2 mm stainless steel		F
							Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC

80	76	303	87	79	100	3.60	5772080344		6772080344	
100	99	315	99	79	100	3.90	5772100344		6772100344	
120	119	325	109	79	120	4.30	5772120344		6772120344	
140	135	333	117	79	140	4.70	5772140344		6772140344	
150	149	340	124	79	150	5.00	5772150344		6772150344	
175	174	352	136	84	175	6.60	5772170344		6772170344	
200	199	385	149	84	200	7.40	5772200344		6772200344	
224	219	395	159	84	200	7.90	5772220344		6772220344	
250	249	410	174	84	200	8.60	5772250344		6772250344	
280	276	413	188	84	200	9.60	5772280344		6772280344	
300	299	439	199	84	200	9.80	5772300344		6772300344	
315	311	455	220	84	200	14.10	5772310344		6772310344	
350	349	474	239	84	200	18.20	5772350344		6772350344	
400	399	499	264	84	200	20.70	5772400344		6772400344	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

80	76	303	87	79	100	3.60	5772080345		6772080345	
100	99	315	99	79	100	3.90	5772100345		6772100345	
120	119	325	109	79	120	4.30	5772120345		6772120345	
140	135	333	117	79	140	4.70	5772140345		6772140345	
150	149	340	124	79	150	5.00	5772150345		6772150345	
175	174	352	136	84	175	6.60	5772170345		6772170345	
200	199	385	149	84	200	7.40	5772200345		6772200345	
224	219	395	159	84	200	7.90	5772220345		6772220345	
250	249	410	174	84	200	8.60	5772250345		6772250345	
280	276	413	188	84	200	9.60	5772280345		6772280345	
300	299	439	199	84	200	9.80	5772300345		6772300345	
315	311	455	220	84	200	14.10	5772310345		6772310345	
350	349	474	239	84	200	18.20	5772350345		6772350345	
400	399	499	264	84	200	20.70	5772400345		6772400345	



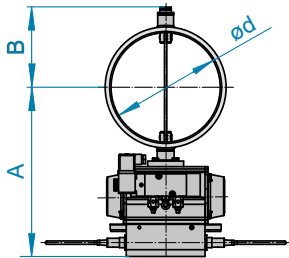
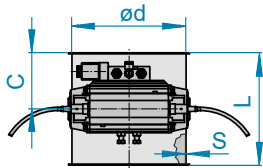
DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable

■ DN 80 to 200 mm shock explosion proof externally up to 3 bar, and electric shock explosion proof in a closed condition. Compressed air connection with 5 bar minimum operating pressure



THROTTLE VALVES WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2090

- Switch-over time for 90°: < 3 seconds
- Silicone rubber seal
- Designed inside with equipment category 1 G/D, and outside with equipment category 3 D
- Control with 5/2-way solenoid valve and 2 inductive limit switches 24 V DC
- Without terminal box
- Terminal box and limit switch box on request
- Throttle valve defaults to closed when current is cut
- Larger diameters available on request

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	A	B	C	L	kg	2 mm powder-coated		2 mm stainless steel		F
							Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

80	76	303	87	79	100	3.60	57720803455		67720803455	
100	99	315	99	79	100	3.90	57721003455		67721003455	
120	119	325	109	79	120	4.30	57721203455		67721203455	
140	135	333	117	79	140	4.70	57721403455		67721403455	
150	149	340	124	79	150	5.00	57721503455		67721503455	
175	174	352	136	84	175	6.60	57721703455		67721703455	
200	199	385	149	84	200	7.40	57722003455		67722003455	
224	219	395	159	84	200	7.90	57722203455		67722203455	
250	249	410	174	84	200	8.60	57722503455		67722503455	
280	276	413	188	84	200	9.60	57722803455		67722803455	
300	299	439	199	84	200	9.80	57723003455		67723003455	
315	311	455	220	84	200	14.10	57723103455		67723103455	
350	349	474	239	84	200	18.20	57723503455		67723503455	
400	399	499	264	84	200	20.70	57724003455		67724003455	



DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

8

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable

DN 80 to 200 mm shock explosion proof externally up to 3 bar, and electric shock explosion proof in a closed condition. Compressed air connection with 5 bar minimum operating pressure



CONTROL VALVES

Throttle valves with seal



THROTTLE VALVES WITH ELECTRICALLY-OPERATED VALVE ACTUATOR

2100

- Switch-over time for 90°: approx. 150 seconds
- Limit switch indication at additional cost
- With external control voltage 0 to 10 V DC on request
- Silicone rubber seal

Powder-coated and stainless steel (dimensions for 2 mm pipework)

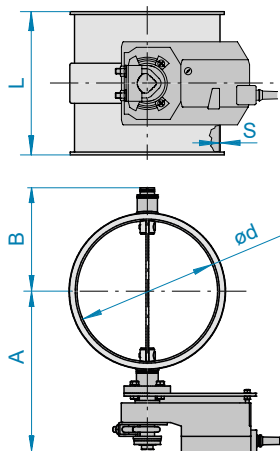
DN	Ø d	A	B	L	kg	2 mm powder-coated		2 mm stainless steel		
						Item no.	€	Item no.	€	

Valve actuator, make BELIMO, voltage 230 V AC

80	76	166	86	100	3.90	5772080551		6772080551		
100	99	179	98	100	4.20	5772100551		6772100551		
120	119	189	108	120	4.60	5772120551		6772120551		
140	135	197	116	140	5.00	5772140551		6772140551		
150	149	204	123	150	5.20	5772150551		6772150551		
175	174	216	135	175	5.80	5772170551		6772170551		
200	199	229	148	200	6.60	5772200551		6772200551		

Valve actuator, make BELIMO, voltage 24 V DC/AC

80	76	166	86	100	3.90	5772080552		6772080552		
100	99	179	98	100	4.20	5772100552		6772100552		
120	119	189	108	120	4.60	5772120552		6772120552		
140	135	197	116	140	5.00	5772140552		6772140552		
150	149	204	123	150	5.20	5772150552		6772150552		
175	174	216	135	175	5.80	5772170552		6772170552		
200	199	229	148	200	6.60	5772200552		6772200552		



AVAILABLE IN THE DETECTABLE DESIGN LINE.

FOOD GRADE
EC 1935/2004 plus FDA compliant

DETECTABLE DESIGN
Metal-detectable



THROTTLE VALVES WITH ELECTRICALLY-OPERATED ADJUSTABLE ACTUATOR

2102

- Including 2 limit switches
- Switch-over time for 90°: approx. 12-22 seconds
- ATEX version on request
- Silicone rubber seal
- Larger diameters available on request

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	Ø d	A	B	L	kg	2 mm powder-coated		2 mm stainless steel	
						Item no.	€	Item no.	€

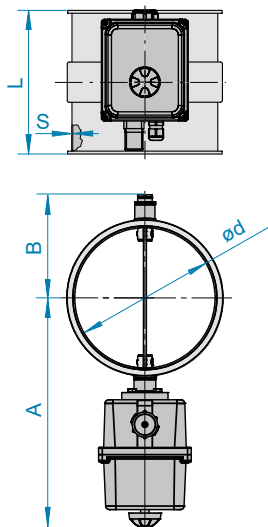


Adjustable drive, make AIR TORQUE, voltage 230 V AC

80	77	256	82	100	3.40	5772080773	6772080773
100	99	267	93	100	3.70	5772100773	6772100773
120	119	277	103	120	4.10	5772120773	6772120773
140	135	285	111	140	4.50	5772140773	6772140773
150	149	293	118	150	4.80	5772150773	6772150773
175	174	305	131	175	5.40	5772170773	6772170773
200	199	317	143	200	6.20	5772200773	6772200773
224	219	327	153	200	6.60	5772220773	6772220773
250	249	342	168	200	7.30	5772250773	6772250773
280	276	356	182	200	8.00	5772280773	6772280773
300	299	368	193	200	8.60	5772300773	6772300773
315	311	386	220	200	11.60	5772310773	6772310773
350	349	405	239	200	13.00	5772350773	6772350773
400	398	430	264	200	15.00	5772400773	6772400773

Adjustable actuator, make AIR TORQUE, voltage 24 V DC/AC

80	77	256	82	100	3.40	5772080774	6772080774
100	99	267	93	100	3.70	5772100774	6772100774
120	119	277	103	120	4.10	5772120774	6772120774
140	135	285	111	140	4.50	5772140774	6772140774
150	149	293	118	150	4.80	5772150774	6772150774
175	174	305	131	175	5.40	5772170774	6772170774
200	199	317	143	200	6.20	5772200774	6772200774
224	219	327	153	200	6.60	5772220774	6772220774
250	249	342	168	200	7.30	5772250774	6772250774
280	276	356	182	200	8.00	5772280774	6772280774
300	299	368	193	200	8.60	5772300774	6772300774
315	311	386	220	200	11.60	5772310774	6772310774
350	349	405	239	200	13.00	5772350774	6772350774
400	398	430	264	200	15.00	5772400774	6772400774



DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable

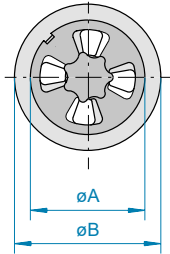
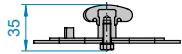


CONTROL VALVES

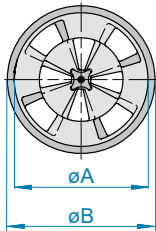
Adjustable blank-off covers and air bleeds

ADJUSTABLE BLANK-OFF COVERS

2030



DN 80 to 200 mm



DN 224 to 300 mm

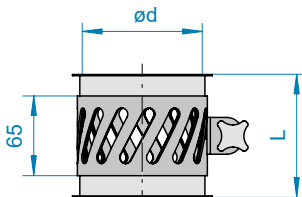
Powder-coated and stainless steel

DN	ØA	ØB	kg	Opening surfaces %	1.5 mm powder-coated		1.5 mm stainless steel	
					Item no.	€	Item no.	€
80	70	92	0.14	12	11081522		11083522	
100	90	115	0.19	17	11101522		11103522	
120	110	135	0.25	21	11121522		11123522	
140	126	151	0.30	25	11141522		11143522	
150	140	165	0.34	26	11151522		11153522	
175	165	190	0.44	29	11171522		11173522	
200	190	215	0.56	31	11201522		11203522	
224	210	235	0.65	31	11221522		11223522	
250	240	265	0.81	33	11251522		11253522	
280	270	292	0.97	34	11281522		11283522	
300	290	315	1.12	35	11301522		11303522	



AIR BLEEDS

2040



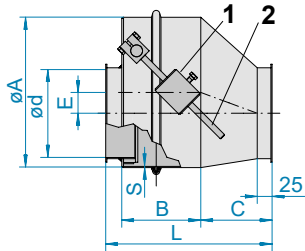
Powder-coated and stainless steel

DN	Ø d	L	kg	1 mm powder-coated		1 mm stainless steel	
				Item no.	€	Item no.	€
80	78	100	0.39	11081523		11083523	
100	100	100	0.47	11101523		11103523	
120	120	100	0.55	11121523		11123523	
140	136	100	0.61	11141523		11143523	
150	150	100	0.67	11151523		11153523	
175	175	100	0.76	11171523		11173523	
200	200	100	0.88	11201523		11203523	



F FOOD GRADE
EC 1935/2004 plus FDA compliant

Adjustable blank-off covers and air bleeds/ Air and pipe slide gates



- 1 Lever arm adjustable 360°
- 2 Adjustable weight on lever arm

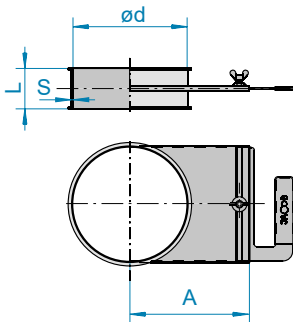
NON-RETURN VALVES

2060

- Lever arm and weights adjustable
- Inner seal NR-SBR from -40°C to +70°C
- U-shaped seal NBR from -20°C to +100°C
- FOOD GRADE version and other seals on request

Powder-coated and stainless steel (dimensions for 2 mm pipework)

DN	$\varnothing d$	$\varnothing A$	B	C	E	L	kg	2 mm powder-coated		2 mm stainless steel F	
								Item no.	€	Item no.	€
80	76	150	95	90	20	210	4.30	12081575		12083575	
100	99	175	115	90	22.5	230	4.90	12101575		12103575	
120	119	200	130	100	25	255	6.25	12121575		12123575	
150	149	250	135	120	35	280	8.30	12151575		12153575	
175	174	300	150	140	47.5	315	10.50	12171575		12173575	
200	199	300	185	140	35	350	11.60	12201575		12203575	
250	249	350	225	165	35	415	15.10	12251575		12253575	
300	299	450	260	195	55	480	22.70	12301575		12303575	



PIPE REGULATOR GATES

2110

- Only for granular products
- Only for installation in inclined pipelines with the operating mechanism facing upwards

Powder-coated and stainless steel (dimensions for 2 mm pipework)

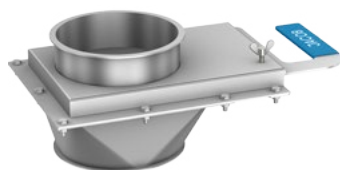
DN	$\varnothing d$	A	L	kg	2 mm powder-coated		2 mm stainless steel F	
					Item no.	€	Item no.	€
100	99	100	70	1.10	12101610		12103610	
120	119	120	70	1.40	12121610		12123610	
150	149	150	70	2.00	12151610		12153610	
175	174	180	70	2.75	12171610		12173610	
200	199	200	70	3.10	12201610		12203610	
250	249	250	70	4.60	12251610		12253610	
300	299	300	70	7.10	12301610		12303610	

F FOOD GRADE
EC 1935/2004 plus FDA compliant



CONTROL VALVES

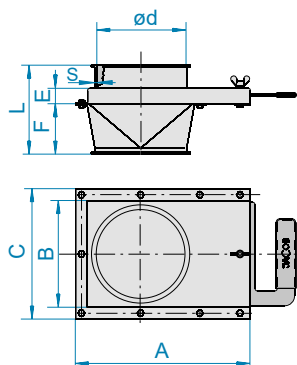
Air and pipe slide gates



PIPE SLIDE GATES, HAND-OPERATED

2120

- Stainless steel: Silicone slide plate seal
- Powder-coated and galvanised version: Felt seal
- Stainless steel version: temperature resistant from -60°C to +250°C and FOOD GRADE: compliant with EC 1935/2004 plus FDA



Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	A	B	C	E	F	L	kg	1 mm powder-coated		2 mm powder-coated	
									Item no.	€	Item no.	€
80	78	225	120	160	28	103	153	1.85	11081620			
100	99	225	120	160	28	60	108	2.05			12101620	
120	119	251	140	180	28	70	138	3.00			12121620	
150	149	295	180	220	25	85	152	4.20			12151620	
175	174	320	200	245	28	145	212	5.80			12171620	
200	199	410	250	290	26	115	182	7.60			12201620	
250	249	432	300	345	30	150	217	9.50			12251620	
300	299	512	350	395	30	210	277	13.50			12301620	

Galvanised (dimensions for 2 mm pipework)

DN	Ø d	A	B	C	E	F	L	kg	1 mm galvanised		2 mm galvanised	
									Item no.	€	Item no.	€
80	78	225	120	160	28	103	153	1.85	11082620			
100	99	225	120	160	28	60	108	2.05			12102620	
120	119	251	140	180	27	70	138	3.00			12122620	
150	149	295	180	220	25	85	152	4.20			12152620	
175	174	320	200	245	28	145	212	5.80			12172620	
200	199	410	250	290	26	115	182	7.60			12202620	
250	249	432	300	345	30	150	217	9.50			12252620	
300	299	512	350	395	30	210	277	13.50			12302620	

Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	A	B	C	E	F	L	kg	1 mm stainless steel F		2 mm stainless steel F	
									Item no.	€	Item no.	€
80	78	225	120	160	28	103	153	1.85	11083620			
100	99	225	120	160	28	60	108	2.05			12103620	
120	119	251	140	180	27	70	138	3.00			12123620	
150	149	295	180	220	25	85	152	4.20			12153620	
175	174	320	200	245	28	145	212	5.80			12173620	
200	199	410	250	290	26	115	182	7.60			12203620	
250	249	432	300	345	30	150	217	9.50			12253620	
300	299	512	350	395	30	210	277	13.50			12303620	



DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

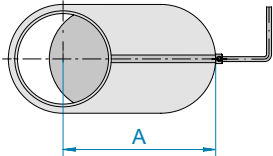
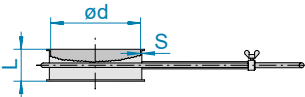
D DETECTABLE DESIGN
Metal-detectable



AIR FLOW CONTROL GATES



- Only for air pipelines

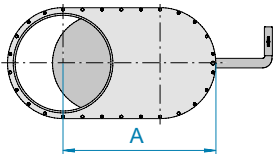
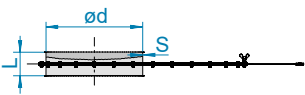


DN 80 to 300 mm

Powder-coated (dimensions for 1.5 mm pipework)

DN	Ø d	A	L	kg	1.5 mm powder-coated		2 mm powder-coated	
					Item no.	€	Item no.	€
80	78	148	50	0.75	11081525			
100	100	175	58	1.10	11101525			
120	120	205	58	1.30	11121525			
140	136	242	70	1.70	11141525			
150	150	250	70	1.80	11151525			
175	175	290	70	2.55	11171525			
200	200	335	70	3.40	11201525			
224	220	392	70	3.90	11221525			
250	250	410	100	4.60	11251525			
300	299	485	100	7.90			12301525	

Electro-galvanised and stainless steel (dimensions for 1.5 mm pipework)



DN 350 to 500 mm

DN	Ø d	A	L	kg	1.5 mm electro-galvanised		2 mm electro-galvanised		1.5 mm stainless steel	
					Item no.	€	Item no.	€	Item no.	€
80	78	148	50	0.75	11082525					
100	100	175	58	1.10	11102525					
120	120	205	58	1.30	11122525					
140	136	242	70	1.70	11142525					
150	150	250	70	1.80	11152525					
175	175	290	70	2.55	11172525					
200	200	335	70	3.40	11202525					
224	220	392	70	3.90	11222525					
250	250	410	100	4.60	11252525					
300	299	485	100	7.90			12302525		12303525*	
350	349	560	100	15.50			12352525		12353525	
400	398	636	100	18.80			12402525		12403525	
450	448	710	100	22.50			12452525		12453525	
500	498	795	100	28.80			12502525		12503525	

* 2 mm

F FOOD GRADE
EC 1935/2004 plus FDA
compliant



CONTROL VALVES

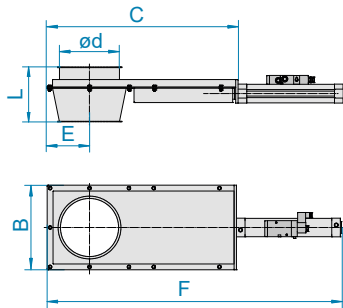
Air and pipe slide gates




PIPE SLIDE GATES, PNEUMATICALLY OPERATED

2290

- Including cylinder, make FESTO
- 5/2-way solenoid valve (1-coil) with auxiliary hand operation and 2 limit switches, potential-free
- ATEX version on request
- For shutting off granular bulk goods without over-pressure in the pipework system
- Slide gate closes when the electricity supply is cut
- Stainless steel: Silicone slide plate seal: -60°C to +250°C
- Powder-coated version: Felt seal
- Other cylinders available on request
- Other diameters available on request



Pipe slide gates, including cylinder, powder-coated and stainless steel

DN	Ø d	B	C	E	F	L	kg	2 mm powder-coated		2 mm stainless steel 	
								Item no.	€	Item no.	€
Control voltage 230 V AC											
100	99	165	372	80	650	104	5.90	5602100221		6602100221	
120	119	185	415	90	692	138	6.90	5602120221		6602120221	
150	149	225	505	110	782	152	9.20	5602150221		6602150221	
175	174	250	555	123	882	212	11.00	5602170221		6602170221	
200	199	295	645	148	1055	182	19.90	5602200221		6602200221	
250	249	350	780	173	1210	217	22.20	5602250221		6602250221	
300	299	400	880	198	1360	277	28.40	5602300221		6602300221	

Control voltage 24 V DC


100	99	165	372	80	650	104	5.90	5602100223		6602100223	
120	119	185	415	90	692	138	6.90	5602120223		6602120223	
150	149	225	505	110	782	152	9.20	5602150223		6602150223	
175	174	250	555	123	882	212	11.00	5602170223		6602170223	
200	199	295	645	148	1055	182	19.90	5602200223		6602200223	
250	249	350	780	173	1210	217	22.20	5602250223		6602250223	
300	299	400	880	198	1360	277	28.40	5602300223		6602300223	



DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

 FOOD GRADE
EC 1935/2004 plus FDA compliant

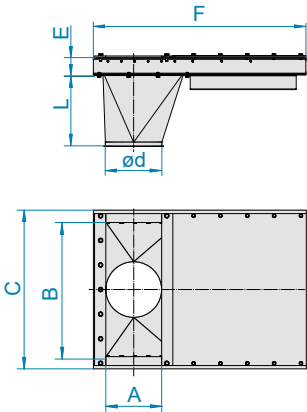
 DETECTABLE DESIGN
Metal-detectable



SILO (REDLER) OUTLET SLIDE GATES, PNEUMATICALLY OPERATED

2300/2305

- Including cylinder, make FESTO
- 5/2-way solenoid valve (1-coil) with auxiliary hand operation and 2 limit switches, potential-free
- Slide plate runs on ball bearings in a U-frame
- Steel, primed, powder coating on request
- For shutting off granular bulk goods without over-pressure in the pipework system
- Slide gate closes when the electricity supply is cut
- FOOD GRADE version, powder coating, ATEX version or other cylinders on request
- Other dimensions available on request



Redler outlet slide gates (cross-slide), primed steel, colour RAL 7032 (dimensions including spout)

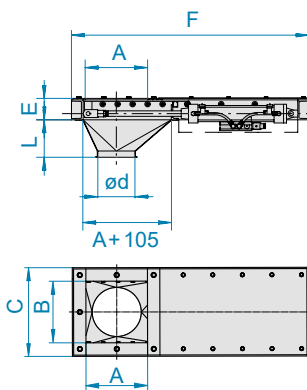
DN	Ø d	A	B	C	E	F	L	kg	Without spout		With 2 mm spout	
									Item no.	€	Item no.	€

Control voltage 230 V AC

200	199	200	600	710	86	852	360	65	5710200121	€	5712200121	€
250	249	250	600	710	86	952	320	73	5710250121	€	5712250121	€
300	299	300	600	710	86	1052	270	78	5710300121	€	5712300121	€

Control voltage 24 V DC

200	199	200	600	710	86	852	360	65	5710200123	€	5712200123	€
250	249	250	600	710	86	952	320	73	5710250123	€	5712250123	€
300	299	300	600	710	86	1052	270	78	5710300123	€	5712300123	€



Redler outlet slide gates (cross-slide), primed steel, colour RAL 7032 (dimensions including spout)

DN	Ø d	A	B	C	E	F	L	kg	Without spout		With 2 mm spout	
									Item no.	€	Item no.	€

Control voltage 230 V AC

150	149	200	200	310	86	852	150	40	5760150121	€	5762150121	€
200	199	250	250	360	86	952	150	46	5760200121	€	5762200121	€
250	249	300	300	410	86	1052	150	52	5760250121	€	5762250121	€

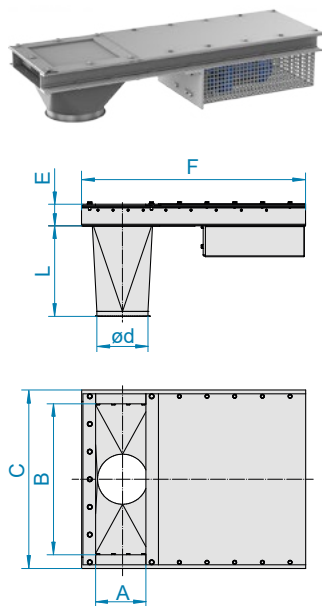
Control voltage 24 V DC

150	149	200	200	310	86	852	150	40	5760150123	€	5762150123	€
200	199	250	250	360	86	952	150	46	5760200123	€	5762200123	€
250	249	300	300	410	86	1052	150	52	5760250123	€	5762250123	€



CONTROL VALVES

Silo / Redler outlet slide gates



SILO / REDLER OUTLET SLIDE GATES, ELECTRICALLY-OPERATED

2310/2315

- Including worm-gear motor 380/400 V, 50 Hz and 2 mechanical limit switches
- Slide plate runs on ball bearings in a U-frame
- Steel, primed, powder coating on request
- For shutting off granular bulk goods without over-pressure in the pipework system
- FOOD GRADE version, powder coating or ATEX version available on request
- Other dimensions available on request

Redler outlet slide gates (cross-slide), primed steel, colour RAL 7032 (dimensions including spout)

DN	Ø d	A	B	C	E	F	L	kg	Without spout		With 2 mm spout	
									Item no.	€	Item no.	€
200	199	200	600	710	86	845	360	88	57102005		57122005	
250	249	250	600	710	86	995	320	91	57102505		57122505	
300	299	300	600	710	86	1145	270	103	57103005		57123005	

Silo outlet slide gates, primed steel, colour RAL 7032 (dimensions including spout)

DN	Ø d	A	B	C	E	F	L	kg	Without spout		With 2 mm spout	
									Item no.	€	Item no.	€
150	149	200	200	304	71	932	150	54	57601505		57621505	
200	199	250	250	354	71	1082	150	64	57602005		57622005	
250	249	300	300	404	71	1232	150	54	57602505		57622505	





THE RIGHT WAY FOR YOUR PRODUCT:
JACOB TWO-WAY DIVERTERS
FOR EVERY APPLICATION



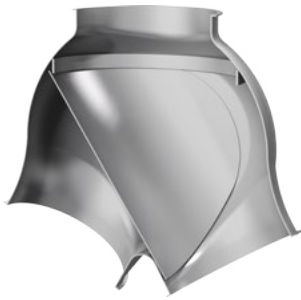
TWO-WAY DIVERTERS

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Two-way valves with seal	150	
Two-way distributors	156	



TWO-WAY DIVERTERS

Technical information



Cross-section: Two-way valves with inlet collar 60°, symmetrical



Example: Two-way valves with inlet collar 60°, symmetrical, hand-operated



Example: Two-way valves with inlet collar 50°, symmetrical, construction DN > 300 mm with welded flanges, pneumatically operated with a rotary actuator

JACOB TWO-WAY DIVERTERS

JACOB has various types of two-way diverters available to meet your requirements: From bulk goods conveying by gravity to pneumatic low pressure conveying, JACOB has just the right solution in its portfolio for distributing your product.

JACOB two-way diverters

	Two-way valves with inlet collar	Two-way valves with seal	Two-way distributors
Application	Gravity conveying bulk goods	Gravity conveying bulk goods Ventilation systems up to 0.1 bar	Gravity conveying bulk goods Ventilation systems up to 0.3 bar (version with more powerful actuator necessary from 0.1 bar upwards)
Seal	No inner flap seal	Standard range inner flap seal NBR or silicone No seal below shaft	Standard inner flap seal in NBR or silicone Standard shaft seal in silicone
Diameters and angles	DN 100 to 300 mm pressed component with lip, angle: 60° DN 350 and 400 mm from flanged pipework, angle: 50°	DN 100 to 300 mm pressed component with lip, angle: 60°	DN 100 to 300 mm with lip, angle: 60° or 45° DN 350 to 630 mm with welded flanges: Angle: 60° or 45°

TWO-WAY VALVES WITH INLET COLLAR

Construction: symmetrical and asymmetrical

Diameters and versions: DN 100 to 400 mm

DN 100 to 300 mm:

- Component pressed in tool (consisting of 2 half shells)
- Angle between outlets 60°
- With 6 mm lip for pull-ring connection
- Shaft seal with NBR double V-ring seal

DN > 300 mm:

- Angle between outlets 50°
- Inlet and outlets with welded flanges according to DIN 24154-2, but without counter-flange
- Shafts with ball bearings with Viton O-ring seal

Explosion protection: Version pneumatically operated with a rotary actuator: designed for ATEX category 1 G/D internally (gas zone 0 or dust zone 20), and category 3 D externally (dust zone 22), control with 5/2-way solenoid valve and 2 inductive limit switches 24 V DC. Terminal box or limit switch box on request. All two-way valves in ATEX version are supplied with earthing lugs as standard.

Materials: 2 and 3 mm powder-coated, 2 mm stainless steel

Actuation:

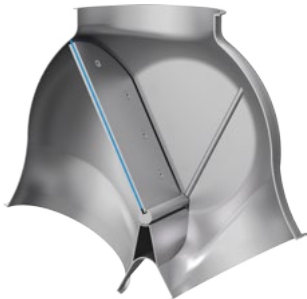
- Hand-operated, DN > 200 mm with additional lever lock, DN 350 and 400 mm without tension spring
- Fitted with pneumatic rotary actuator, make AIR TORQUE (refer also to actuators)
- Fitted with pneumatic cylinder, make FESTO (refer also to actuators)

Modularity: With 6 mm lip for pull-ring connection up to DN 300 mm. Installation dimensions are identical to two-way valves with a seal.



Applications: For gravity conveying of free-flowing – without backlog – non-glutinous, granular bulk goods. With powdery products, especially with over-pressure or under-pressure in the closed outlet, there could be leakages in the closed outlet. Only limited use in ventilation plants is recommended due to the absence of an inner flap seal. The product flow is by the inlet collar directing the product towards the centre of the flap, and in the outlet by covering the U-shaped inner flap towards the next pipe that follows.

FOOD GRADE: All metal components and sealing materials in stainless steel that are in contact with products are compliant with EC 1935/2004 plus FDA.



Cross-section: Two-way valves with inlet collar 60°, symmetrical



Example: Two-way valves with seal 60°, symmetrical, pneumatically operated with a rotary actuator

TWO-WAY VALVES WITH SEAL

Construction: symmetrical and asymmetrical

Diameters and versions: DN 100 to 300 mm

- Component pressed in tool (consisting of 2 half shells)
- Angle between outlets 60°
- On the side with formed beads to increase tightness, (except DN 175 mm)
- For hand-operated two-way valves, shaft sealing with NBR double V-ring seal
- For two-way valves with rotary actuator or cylinder: Shafts with ball bearings with Viton O-ring seal
- Two-way distributors should be used for diameters > DN 300 mm

Explosion protection: Version pneumatically operated with a rotary actuator: designed for ATEX category 1 D internally (dust zone 20), and category 3 D externally (dust zone 22), control with 5/2-way solenoid valve and 2 inductive limit switches 24 V DC. Further limit switches available on request. Without terminal box. Terminal box or limit switch box on request. All two-way valves in ATEX version are supplied with earthing lugs as standard.

Materials: 2 and 3 mm powder-coated, 2 mm stainless steel

Actuation:

- Hand-operated, with lever lock, can also be locked in intermediate position (increased seal wear is likely)
- Fitted with pneumatic rotary actuator, make AIR TORQUE (refer also to actuators)
- Fitted with pneumatic cylinder, make FESTO (refer also to actuators)

Modularity: With 6 mm lip for pull-ring connection. Installation dimensions are identical to two-way valves with an inlet collar.

Inner flap seal:

- Powder-coated two-way valves, standard version with intermediate NBR seal on 3-part inner flap
- Stainless steel two-way valves, standard version with intermediate silicone seal on 3-part inner flap

Silicone	F	NBR	F
opaque		grey white	
-60°C to +180°C		-30°C to +80°C	
FOOD GRADE: EC 1935/2004 plus FDA compliant		FOOD GRADE: EC 1935/2004 plus FDA compliant	
Thickness: 3 or 4 mm		Thickness: 3 or 4 mm	



DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

Applications: For gravity conveying of free-flowing bulk goods and in ventilation plants up to 0.1 bar. There is no seal underneath the shaft, so that in the case of higher tightness requirements towards the closed outlet the two-way distributor should be used.

FOOD GRADE: All metal components and sealing materials in stainless steel that are in contact with products are compliant with EC 1935/2004 plus FDA.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable

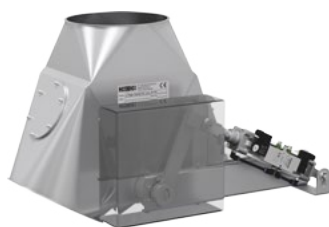


TWO-WAY DIVERTERS

Technical information



Cross-section: Two-way distributor 60° up to DN 300 mm, symmetrical



Example: Two-way distributor 60°, DN > 300 mm, symmetrical, pneumatically operated with cylinder



Example: Two-way distributor 60°, DN > 300 mm, symmetrical, pneumatically operated with cylinder and welded flanges

TWO-WAY DISTRIBUTORS

Construction: symmetrical and asymmetrical

Diameters and versions:

- DN 100 to 630 mm
- DN > 300 mm: Inlet and outlets with welded flanges according to DIN 24154-2
- Angle between outlets 45° or 60°
- The use of pneumatic actuators is recommended as they hold the inner flap better in the end position
- Below the shaft there is a silicone seal that can be re-adjusted from outside
- Shafts with ball bearings and a silicone flat ring-seal
- From DN 250-630 mm with inspection openings on both outlets for inspection purposes

Explosion protection: Version pneumatically operated with a rotary actuator: designed for ATEX category 1 G/D internally (gas zone 0 or dust zone 20), and category 3 D externally (dust zone 22), control with 5/2-way solenoid valve and 2 inductive limit switches 24 V DC. Further limit switches available on request. Without terminal box. Terminal box or limit switch box on request. All two-way distributors in ATEX version are supplied with earthing lugs as standard.

Materials: up to DN 400 mm: 2 mm powder-coated and stainless steel, from DN 450 mm: 3 mm powder-coated and stainless steel

Actuation:

- Hand-operated, DN 100-300 mm with lever lock, can also be locked in intermediate positions (increased seal wear)
- Fitted with pneumatic rotary actuator, DN 100-630 mm, make AIR TORQUE (refer also to actuators)
- Fitted with pneumatic cylinder, DN 100-630 mm, make FESTO (refer also to actuators)

Modularity: With 6 mm lip for pull-ring connection up to DN 300 mm.

Inner flap seal: 3-part straight inner flap with intermediate silicone seal. Other seal qualities on request (e.g.: NBR or EPDM)

Silicone	F	NBR	F
opaque		grey white	
-60°C to +180°C		-30°C to +80°C	
FOOD GRADE: EC 1935/2004 plus FDA compliant		FOOD GRADE: EC 1935/2004 plus FDA compliant	
Thickness: 3 or 4 mm		Thickness: 3 or 4 mm	



AVAILABLE IN THE DETECTABLE DESIGN LINE.

Applications: For gravity conveying of free-flowing bulk goods and ventilation plants up to 0.3 bar (if more powerful actuators are fitted). The 45° version is recommended for sensitive bulk goods or for products with bad flow properties.

FOOD GRADE: All metal components and sealing materials in stainless steel that are in contact with products are compliant with EC 1935/2004 plus FDA.

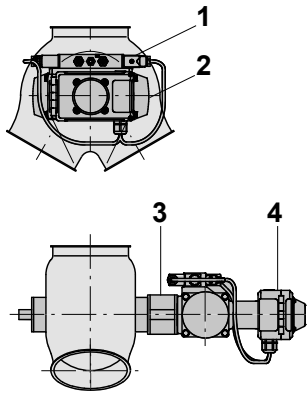
Special feature: All two-way distributors have an internal valve which can be dismantled without removing the distributor from the pipeline (for cleaning or replacing the seals)

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



ACTUATORS FOR TWO-WAY DIVERTERS



- 1 Solenoid valve
- 2 Rotary actuator
- 3 Panel
- 4 Limit switch box

Version fitted with pneumatic rotary actuator

- Rotary actuator, make AIR TORQUE, other makes are available on request
- With 5/2-way solenoid valve (2-coil) with auxiliary hand operation, in 24 V DC or in 230 V AC
- The solenoid valve is bolted directly to the actuator in accordance with Namur specification
- Complete with 2 exhaust throttles for speed adjustment and compressed air connection (angle push-in fitting) for an 8 x 1 PVC hose
- Required air pressure: min. 5 bar to max. 7 bar
- In case of power failure, the selected valve position remains unchanged
- Information on positions via 2 potential-free micro switches with spring-free gold contacts, suitable for PLC. Switching range 4-250 V AC/DC at 0.1 A
- Solenoid valve and limit switch are wired into terminals in the limit switch box that is positioned on the actuator. Protection category IP 65
- ATEX version:
 - Control with 5/2-way solenoid valve (2-coil) and 2 inductive limit switches 24 V DC
 - Designed to comply with ATEX category 3 D externally (dust zone 22)
 - Without terminal box
 - Terminal box or limit switch box on request
 - ATEX version supplied with earthing lugs as standard

Version fitted with pneumatic cylinder

- Cylinder, make FESTO, other makes are available on request
- With 5/2-way solenoid valve (2-coil) with auxiliary hand operation; fitted to the cylinder with a hose connection and available in 24 V DC or in 230 V AC with connection sockets, IP 65
- Complete with 2 exhaust throttles for speed adjustment and a hose connection for compressed air (angle push-in fitting) for an 8 x 1 PVC hose
- Required air pressure: 5 bar to max. 7 bar
- In case of power failure, the selected valve position remains unchanged
- Information on position via 2 potential-free limit switches with LEDs, which are positioned on the cylinder. With 2 m free cable end. 24 V version: Switching range 12-30 V DC at 500 mA, 230 V version: Switching range 4-230 V AC/DC at 120 mA. Protection category IP 67
- Standard version without terminal box, without wiring, with protective device made of polycarbonate





Installation of the actuator in asymmetrical components

With asymmetric components, the actuation is positioned on the right-hand side as standard according to the illustration. Installation on the left-hand side is possible at no extra charge at the customer's request.



Standard: Actuator unit right-side



Special: Actuator unit left-side

ACCESSORIES AND SPECIAL VERSIONS

Inspection openings

Installation of an inspection opening with a diameter of 115 mm possible for inspection purposes on all two-way valves from 150 mm upwards. Upwards of DN 250 mm, two-way distributors are fitted with two inspection openings as standard.



Manual cord device

For two-way valves with inlet collar, hand-operated up to DN 200 mm. The lever is available with an additionally screwed-on switch device for cord or chain operation.





Limit switches

Two limit switches positioned on a base plate opposite to the actuator side, with protective cover, without terminal box

Extra charge for version	Powder-coated	Stainless steel
	€	€
Siemens 3SE 5232-OHD03		
Pepperl & Fuchs type NBB 5-18GM50-E2		
Pepperl & Fuchs type NCB 5-18GM40-N0, ATEX Zone 21		
ATEX limit switch IFM IG 513A, ATEX category 3D		



Gear-motor

Prices for electrically-operated two-way diverters with gear-motor or cylinder and pneumatic actuators and limit switches in ex-proof version on request.

YOUR INDIVIDUAL TWO-WAY DIVERTERS

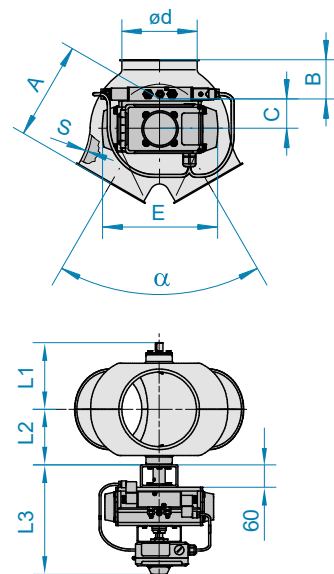
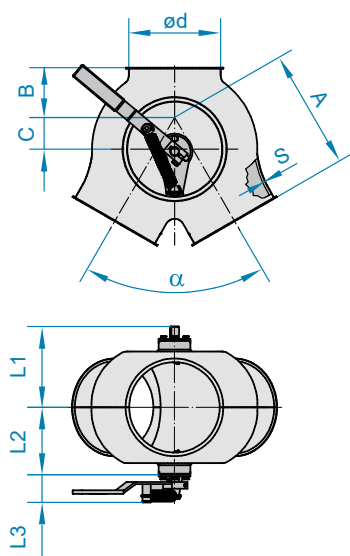
JACOB two-way diverters are available not only in a comprehensive standard range but also in a wide range of special versions:

- Electrical actuation
- Other materials
- Rotary actuators or cylinders at the customer's request
- Lining with a wide range of different wear protection materials (refer to chapter 14 for information on lined two-way valves with an inlet collar)
- Welded flanges: in JACOB standard (refer to chapter 11 for dimensions) or with customers' own dimensions. In this case, outlets and, if necessary, inlets are supplied in a longer version. Inlet and outlets can also be produced specially to match the diameter of connecting pipes
- Stainless steel in a pickled and passivated version
- Over 3,000 special colours (refer to chapter 1, Materials)
- ATEX-version: with terminal box or limit switch box, other inductive limit switches
- Viton shaft seal
- Fitting of inspection opening in small diameters on request (refer also to Technical information and accessories)
- Other inner flap seals for two-way valves with seal or two-way distributors
- More powerful actuators for use with differential pressures of up to 0.3 bar for two-way valves with seal or two-way distributors



TWO-WAY DIVERTERS

Two-way valves with inlet collar



TWO-WAY VALVES WITH INLET COLLAR, SYMMETRICAL, HAND-OPERATED

2130

- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel		F
								Item no.	€	Item no.	€	Item no.	€	
100	60°	135	50	41	118	88	60	12101502				12103502		
120	60°	160	50	54	129	99	60	12121502				12123502		
150	60°	200	80	60	146	116	60	12151502		13151502		12153502		
175	60°	218	63	75	159	129	60	12171505		13171505		12173505		
200	60°	265	110	70	178	148	60	12201505		13201505		12203505		
250	60°	305	115	82	199	169	60	12251505		13251505		12253505		
300	60°	385	145	110	225	195	60	12301502		13301502		12303502		
350	50°	520	95	185	345	300	90	12351505		13351505		12353505		
400	50°	580	105	195	378	333	90	12401505		13401505		12403505		

TWO-WAY VALVES WITH INLET COLLAR, SYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR

2150

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches
- Completely wired in limit switch box
- Other rotary actuators are available. Prices on request
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel		F
									Item no.	€	Item no.	€	Item no.	€	
Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC															
100	60°	135	50	41	215	129	88	297	5582100244					6582100244	
120	60°	160	50	54	215	129	99	297	5582120244					6582120244	
150	60°	200	80	60	215	146	116	297	5582150244		5583150244			6582150244	
175	60°	218	63	75	215	159	129	297	5582170144		5583170144			6582170144	
200	60°	265	110	70	290	178	148	302	5582200144		5583200144			6582200144	
250	60°	305	115	82	290	199	169	302	5582250144		5583250144			6582250144	
300	60°	385	145	110	290	225	195	302	5582300244		5583300244			6582300244	
350	50°	520	95	185	310	345	300	312	5582350144		5583350144			6582350144	
400	50°	580	105	195	310	378	333	312	5582400144		5583400144			6582400144	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

100	60°	135	50	41	215	129	88	297	5582100245					6582100245	
120	60°	160	50	54	215	129	99	297	5582120245					6582120245	
150	60°	200	80	60	215	146	116	297	5582150245		5583150245			6582150245	
175	60°	218	63	75	215	159	129	297	5582170145		5583170145			6582170145	
200	60°	265	110	70	290	178	148	302	5582200145		5583200145			6582200145	
250	60°	305	115	82	290	199	169	302	5582250145		5583250145			6582250145	
300	60°	385	145	110	290	225	195	302	5582300245		5583300245			6582300245	
350	50°	520	95	185	310	345	300	312	5582350145		5583350145			6582350145	
400	50°	580	105	195	310	378	333	312	5582400145		5583400145			6582400145	

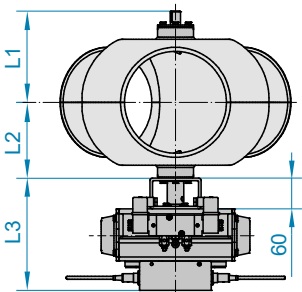
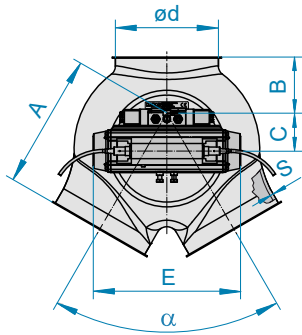
F FOOD GRADE
EC 1935/2004 plus FDA compliant



TWO-WAY VALVES WITH INLET COLLAR, SYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2150

- Control with 5/2-way solenoid valve (2-coil) and 2 inductive limit switches 24 V DC
- Designed to comply with ATEX category 1 G/D internally (gas zone 0 or dust zone 20), and category 3 D externally (dust zone 22)
- Without terminal box. Available on request
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel	
									Item no.	€	Item no.	€	Item no.	€

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

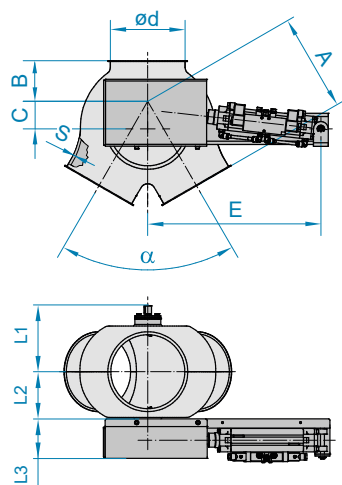
100	60°	135	50	41	216	118	88	203	55821002455				65821002455
120	60°	160	50	54	216	129	99	203	55821202455				65821202455
150	60°	200	80	60	216	146	116	203	55821502455		55831502455		65821502455
175	60°	218	63	75	216	159	129	203	55821701455		55831701455		65821701455
200	60°	265	110	70	290	178	148	220	55822001455		55832001455		65822001455
250	60°	305	115	82	290	199	169	220	55822501455		55832501455		65822501455
300	60°	385	145	110	290	225	195	220	55823002455		55833002455		65823002455
350	50°	520	95	185	310	345	300	230	55823501455		55833501455		65823501455
400	50°	580	105	195	310	378	333	230	55824001455		55834001455		65824001455

F FOOD GRADE
EC 1935/2004 plus FDA compliant



TWO-WAY DIVERTERS

Two-way valves with inlet collar



TWO-WAY VALVES WITH INLET COLLAR, SYMMETRICAL, FITTED WITH CYLINDER

2155

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches on the cylinder
- Other cylinders are available. Prices on request
- Please also read and take into account the technical information given at the beginning of this chapter

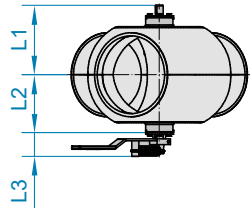
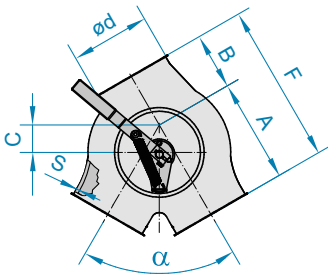
DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel		F	
									Item no.	€	Item no.	€	Item no.	€		
Cylinder, make FESTO, control voltage 230 V AC																
100	60°	135	56	41	440	129	88	88	5582100221					6582100221		
120	60°	160	50	54	440	129	99	88	5582120221					6582120221		
150	60°	200	80	60	440	146	116	88	5582150221		5583150221			6582150221		
175	60°	218	63	75	440	159	129	88	5582170121		5583170121			6582170121		
200	60°	265	110	70	470	178	148	88	5582200121		5583200121			6582200121		
250	60°	305	115	82	470	199	169	88	5582250121		5583250121			6582250121		
300	60°	385	145	110	470	225	195	88	5582300221		5583300221			6582300221		
350	50°	520	95	185	470	345	300	90	5582350121		5583350121			6582350121		
400	50°	580	105	195	470	378	333	90	5582400121		5583400121			6582400121		
Cylinder, make FESTO, control voltage 24 V DC																
100	60°	135	56	41	440	129	88	88	5582100223					6582100223		
120	60°	160	50	54	440	129	99	88	5582120223					6582120223		
150	60°	200	80	60	440	146	116	88	5582150223		5583150223			6582150223		
175	60°	218	63	75	440	159	129	88	5582170123		5583170123			6582170123		
200	60°	265	110	70	470	178	148	88	5582200123		5583200123			6582200123		
250	60°	305	115	82	470	199	169	88	5582250123		5583250123			6582250123		
300	60°	385	145	110	470	225	195	88	5582300223		5583300223			6582300223		
350	50°	520	95	185	470	345	300	90	5582350123		5583350123			6582350123		
400	50°	580	105	195	470	378	333	90	5582400123		5583400123			6582400123		

F FOOD GRADE
EC 1935/2004 plus FDA compliant



TWO-WAY VALVES WITH INLET COLLAR, ASYMMETRICAL, HAND-OPERATED

2140



- Standard version: Right-side mounting

- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	F	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel	
									Item no.	€	Item no.	€	Item no.	€
100	60°	135	65	41	200	118	88	60	12101512				12103512	
120	60°	160	70	54	230	129	99	60	12121512				12123512	
150	60°	200	100	60	300	146	116	60	12151512		13151512		12153512	
175	60°	218	90	75	308	159	129	60	12171517		13171517		12173517	
200	60°	265	145	70	410	178	148	60	12201517		13201517		12203517	
250	60°	305	155	82	460	199	169	60	12251517		13251517		12253517	
300	60°	385	190	110	575	225	195	60	12301512		13301512		12303512	
350	50°	520	150	185	670	345	300	90	12351515		13351515		12353515	
400	50°	580	170	195	750	378	333	90	12401515		13401515		12403515	

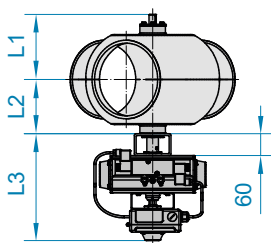
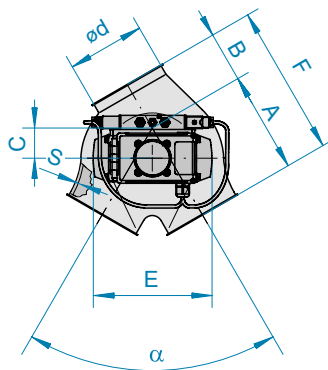
TWO-WAY VALVES WITH INLET COLLAR, ASYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR

2160



- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches
- Standard version: Right-side mounting
- Completely wired in limit switch box

- Other rotary actuators are available. Prices on request
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel	
										Item no.	€	Item no.	€	Item no.	€

Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC

100	60°	135	65	41	252	200	82	88	282	5592100244				6592100244	
120	60°	160	70	54	252	230	90	99	282	5592120244				6592120244	
150	60°	200	100	60	252	300	146	116	282	5592150244		5593150244		6592150244	
175	60°	218	90	75	252	308	159	129	282	5592170144		5593170144		6592170144	
200	60°	265	145	70	308	410	178	148	302	5592200144		5593200144		6592200144	
250	60°	305	156	82	308	460	199	169	302	5592250144		5593250144		6592250144	
300	60°	385	190	110	308	575	225	195	302	5592300244		5593300244		6592300244	
350	50°	520	150	185	342	670	325	300	334	5592350144		5593350144		6592350144	
400	50°	580	170	195	342	750	350	333	334	5592400144		5593400144		6592400144	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

100	60°	135	65	41	252	200	82	88	282	5592100245				6592100245	
120	60°	160	70	54	252	230	90	99	282	5592120245				6592120245	
150	60°	200	100	60	252	300	146	116	282	5592150245		5593150245		6592150245	
175	60°	218	90	75	252	308	159	129	282	5592170145		5593170145		6592170145	
200	60°	265	145	70	308	410	178	148	302	5592200145		5593200145		6592200145	
250	60°	305	156	82	308	460	199	169	302	5592250145		5593250145		6592250145	
300	60°	385	190	110	308	575	225	195	302	5592300245		5593300245		6592300245	
350	50°	520	150	185	342	670	325	300	334	5592350145		5593350145		6592350145	
400	50°	580	170	195	342	750	350	333	334	5592400145		5593400145		6592400145	

F FOOD GRADE
EC 1935/2004 plus FDA compliant



TWO-WAY DIVERTERS

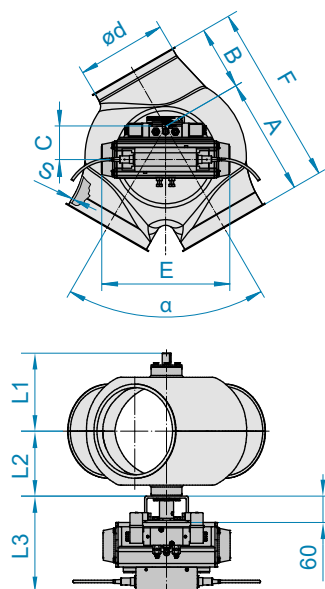
Two-way valves with inlet collar



TWO-WAY VALVES WITH INLET COLLAR, ASYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2160

- Control with 5/2-way solenoid valve (2-coil) and 2 inductive limit switches 24 V DC
- Designed to comply with ATEX category 1 G/D internally (gas zone 0 or dust zone 20), and category 3 D externally (dust zone 22)
- Without terminal box. Available on request
- Standard version: Right-side mounting
- Please also read and take into account the technical information given at the beginning of this chapter

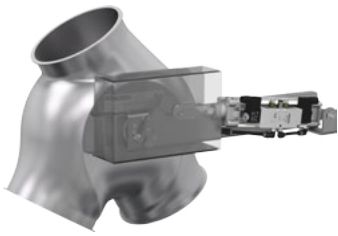


DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel	
										Item no.	€	Item no.	€	Item no.	€

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

100	60°	135	65	41	216	200	118	88	203	55921002455				65921002455
120	60°	160	70	54	216	230	129	99	203	55921202455				65921202455
150	60°	200	100	60	216	300	146	116	203	55921502455		55931502455		65921502455
175	60°	218	90	75	216	308	159	129	203	55921701455		55931701455		65921701455
200	60°	265	145	70	290	410	178	148	220	55922001455		55932001455		65922001455
250	60°	305	155	82	290	460	199	169	220	55922501455		55932501455		65922501455
300	60°	385	190	110	290	575	225	195	220	55923002455		55933002455		65923002455
350	50°	520	150	185	310	670	345	300	230	55923501455		55933501455		65923501455
400	50°	580	170	195	310	750	378	333	230	55924001455		55934001455		65924001455

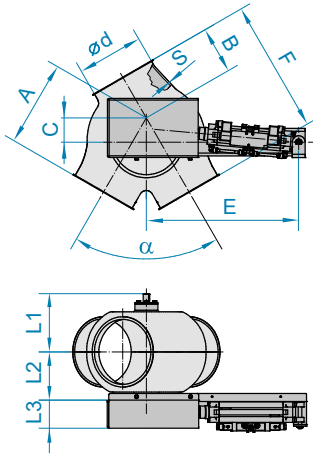
F FOOD GRADE
EC 1935/2004 plus FDA compliant



TWO-WAY VALVES WITH INLET COLLAR, ASYMMETRICAL, FITTED WITH CYLINDER

2165

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches on the cylinder
- Standard version: Right-side mounting
- Other cylinders are available. Prices on request
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel		F
										Item no.	€	Item no.	€	Item no.	€	

Cylinder, make FESTO, control voltage 230 V AC

100	60°	135	65	41	440	200	82	88	88	5592100221				6592100221			
120	60°	160	70	54	440	230	90	99	88	5592120221				6592120221			
150	60°	200	100	60	440	300	146	116	88	5592150221		5593150221		6592150221			
175	60°	218	90	75	440	308	159	129	88	5592170121		5593170121		6592170121			
200	60°	265	145	70	470	410	178	148	88	5592200121		5593200121		6592200121			
250	60°	305	156	82	470	460	199	169	88	5592250121		5593250121		6592250121			
300	60°	385	190	110	470	575	225	195	88	5592300221		5593300221		6592300221			
350	50°	520	150	185	470	670	325	300	90	5592350121		5593350121		6592350121			
400	50°	580	170	195	470	750	350	333	90	5592400121		5593400121		6592400121			

Cylinder, make FESTO, control voltage 24 V DC

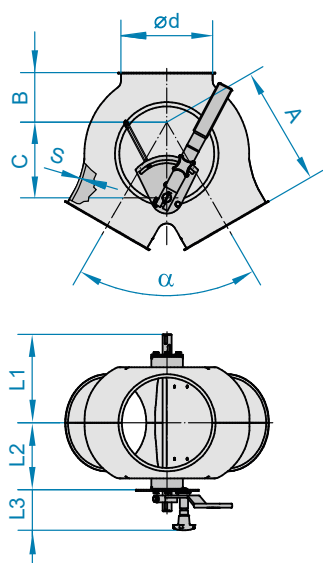
100	60°	135	65	41	440	200	82	88	88	5592100223				6592100223			
120	60°	160	70	54	440	230	90	99	88	5592120223				6592120223			
150	60°	200	100	60	440	300	146	116	88	5592150223		5593150223		6592150223			
175	60°	218	90	75	440	308	159	129	88	5592170123		5593170123		6592170123			
200	60°	265	145	70	470	410	178	148	88	5592200123		5593200123		6592200123			
250	60°	305	156	82	470	460	199	169	88	5592250123		5593250123		6592250123			
300	60°	385	190	110	470	575	225	195	88	5592300223		5593300223		6592300223			
350	50°	520	150	185	470	670	325	300	90	5592350123		5593350123		6592350123			
400	50°	580	170	195	470	750	350	333	90	5592400123		5593400123		6592400123			

F FOOD GRADE
EC 1935/2004 plus FDA compliant



TWO-WAY DIVERTERS

Two-way valves with seal



TWO-WAY VALVES WITH SEAL, SYMMETRICAL, HAND-OPERATED

2170

- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel		F
								Item no.	€	Item no.	€	Item no.	€	
100	60°	135	50	87	140	88	88	12101503				121035037		
120	60°	160	50	112	148	96	88	12121503				121235037		
150	60°	200	80	136	168	119	88	12151503		13151503		121535037		
175	60°	218	63	170	198	147	88	12171506		13171506		121735067		
200	60°	265	110	167	199	150	88	12201506		13201506		122035067		
250	60°	305	115	215	220	171	88	12251506		13251506		122535067		
300	60°	385	145	260	264	213	88	12301503		13301503		123035037		



AVAILABLE IN THE DETECTABLE DESIGN LINE.

TWO-WAY VALVES WITH SEAL, SYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR

2190



- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches
- Completely wired in limit switch box
- Other rotary actuators are available. Prices on request
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel		F
									Item no.	€	Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC

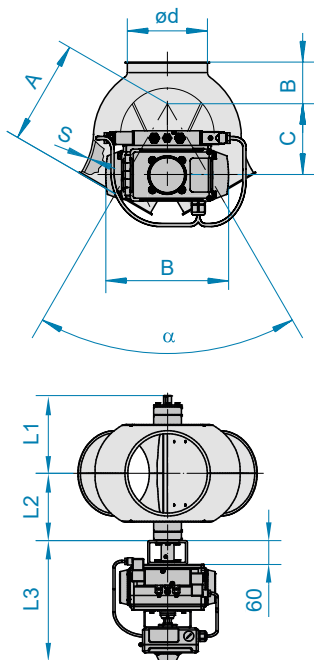
100	60°	135	50	87	193	140	110	265	5542100244				65421002744		
120	60°	160	50	112	193	148	118	265	5542120244				65421202744		
150	60°	200	80	136	193	168	138	265	5542150244		5543150244		65421502744		
175	60°	218	63	170	193	198	168	265	5542170144		5543170144		65421701744		
200	60°	265	110	167	225	199	169	275	5542200144		5543200144		65422001744		
250	60°	305	115	215	225	220	190	275	5542250144		5543250144		65422501744		
300	60°	385	145	260	225	264	234	275	5542300244		5543300244		65423002744		

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

100	60°	135	50	87	193	140	110	265	5542100245				65421002745		
120	60°	160	50	112	193	148	118	265	5542120245				65421202745		
150	60°	200	80	136	193	168	138	265	5542150245		5543150245		65421502745		
175	60°	218	63	170	193	198	168	265	5542170145		5543170145		65421701745		
200	60°	265	110	167	225	199	169	275	5542200145		5543200145		65422001745		
250	60°	305	115	215	225	220	190	275	5542250145		5543250145		65422501745		
300	60°	385	145	260	225	264	234	275	5542300245		5543300245		65423002745		



AVAILABLE IN THE DETECTABLE DESIGN LINE.



F FOOD GRADE
EC 1935/2004 plus FDA compliant

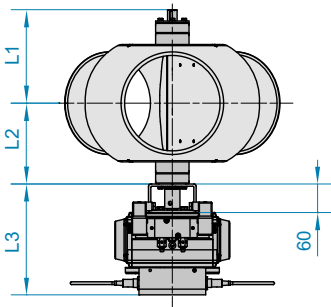
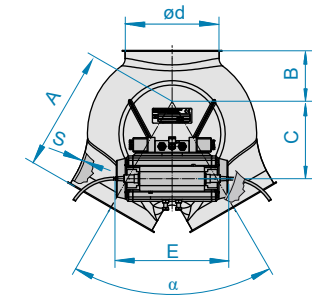
D DETECTABLE DESIGN
Metal-detectable



TWO-WAY VALVES WITH SEAL, SYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2190

- Control with 5/2-way solenoid valve (2-coil) and 2 inductive limit switches 24 V DC
- Designed to comply with ATEX category 1 D internally (dust zone 20), and category 3 D externally (dust zone 22)
- Two-way valves available on request
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel		F
									Item no.	€	Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

100	60°	135	50	87	210	140	110	220	55421002455			654210027455
120	60°	160	50	112	210	148	118	220	55421202455			654212027455
150	60°	200	80	136	210	168	138	220	55421502455	55431502455		654215027455
175	60°	218	63	170	210	198	168	220	55421701455	55431701455		654217017455
200	60°	265	110	167	241	199	169	233	55422001455	55432001455		654220017455
250	60°	305	115	215	241	220	190	233	55422501455	55432501455		654225017455
300	60°	385	145	260	241	245	215	233	55423002455	55433002455		654230027455



DETECTABLE
DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

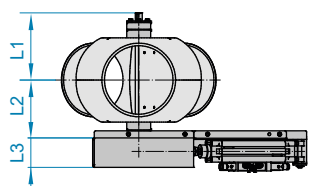
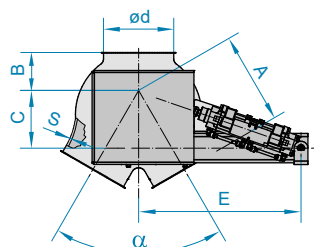
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

Two-way valves with seal



TWO-WAY VALVES WITH SEAL, SYMMETRICAL, FITTED WITH CYLINDER

2195

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches on the cylinder
- Other cylinders are available. Prices on request
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel	
									Item no.	€	Item no.	€	Item no.	€

Cylinder, make FESTO, control voltage 230 V AC

100	60°	135	50	87	440	140	110	88	5542100221				65421002721
120	60°	160	50	112	440	148	118	88	5542120221				65421202721
150	60°	200	80	136	440	168	138	88	5542150221		5543150221		65421502721
175	60°	218	63	170	440	198	168	88	5542170121		5543170121		65421701721
200	60°	265	110	167	470	199	169	88	5542200121		5543200121		65422001721
250	60°	305	115	215	470	220	190	88	5542250121		5543250121		65422501721
300	60°	385	145	260	470	264	234	88	5542300221		5543300221		65423002721

Cylinder, make FESTO, control voltage 24 V DC

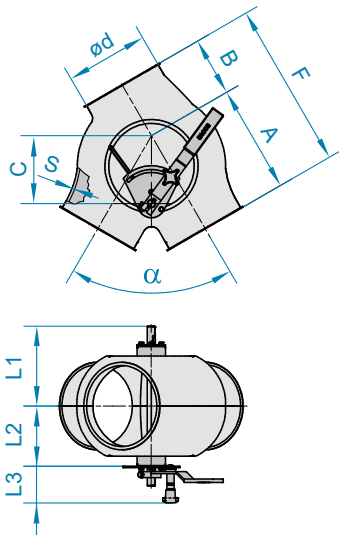
100	60°	135	50	87	440	140	110	88	5542100223				65421002723
120	60°	160	50	112	440	148	118	88	5542120223				65421202723
150	60°	200	80	136	440	168	138	88	5542150223		5543150223		65421502723
175	60°	218	63	170	440	198	168	88	5542170123		5543170123		65421701723
200	60°	265	110	167	470	199	169	88	5542200123		5543200123		65422001723
250	60°	305	115	215	470	220	190	88	5542250123		5543250123		65422501723
300	60°	385	145	260	470	264	234	88	5542300223		5543300223		65423002723



AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY VALVES WITH SEAL, ASYMMETRICAL, HAND-OPERATED

2180

- Standard version: Right-side mounting
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	F	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel	
									Item no.	€	Item no.	€	Item no.	€
100	60°	135	65	87	200	140	88	88	12101513				121035137	
120	60°	160	70	112	230	148	96	88	12121513				121235137	
150	60°	200	100	136	300	168	119	88	12151513		13151513		121535137	
175	60°	218	90	170	308	198	149	88	12171516		13171516		121735167	
200	60°	265	145	167	410	199	150	88	12201516		13201516		122035167	
250	60°	305	155	215	460	220	171	88	12251516		13251516		122535167	
300	60°	385	190	260	575	264	197	88	12301513		13301513		123035137	



AVAILABLE IN THE DETECTABLE DESIGN LINE.



TWO-WAY VALVES WITH SEAL, ASYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR

2200

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches
- Completely wired in limit switch box
- Other rotary actuators are available. Prices on request
- Standard version: Right-side mounting
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel	
										Item no.	€	Item no.	€	Item no.	€

Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC

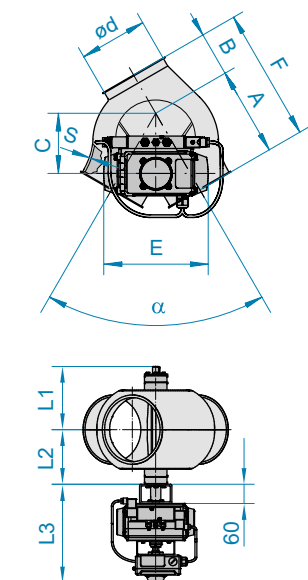
100	60°	135	65	87	193	200	140	110	265	5552100244				65521002744	
120	60°	160	70	112	193	230	148	118	265	5552120244				65521202744	
150	60°	200	100	136	193	300	168	138	265	5552150244		5553150244		65521502744	
175	60°	218	90	170	193	308	198	168	275	5552170144		5553170144		65521701744	
200	60°	265	145	167	225	410	199	169	275	5552200144		5553200144		65522001744	
250	60°	305	155	215	225	460	220	190	275	5552250144		5553250144		65522501744	
300	60°	385	190	260	225	575	264	234	275	5552300244		5553300244		65523002744	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

100	60°	135	65	87	193	200	140	110	265	5552100245				65521002745	
120	60°	160	70	112	193	230	148	118	265	5552120245				65521202745	
150	60°	200	100	136	193	300	168	138	265	5552150245		5553150245		65521502745	
175	60°	218	90	170	193	308	198	168	275	5552170145		5553170145		65521701745	
200	60°	265	145	167	225	410	199	169	275	5552200145		5553200145		65522001745	
250	60°	305	155	215	225	460	220	190	275	5552250145		5553250145		65522501745	
300	60°	385	190	260	225	575	264	234	275	5552300245		5553300245		65523002745	



AVAILABLE IN THE DETECTABLE DESIGN LINE.



F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

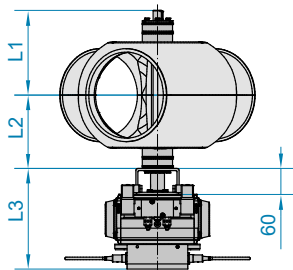
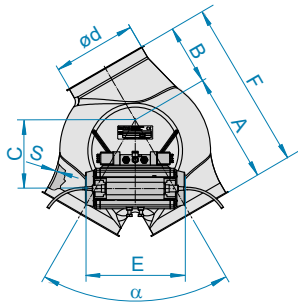
Two-way valves with seal



TWO-WAY VALVES WITH SEAL, ASYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2200

- Control with 5/2-way solenoid valve (2-coil) and 2 inductive limit switches 24 V DC
- Designed to comply with ATEX category 1 D internally (dust zone 20), and category 3 D externally (dust zone 22)
- Two-way valves available on request
- Standard version: Right-side mounting
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel		F
										Item no.	€	Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

100	60°	135	65	87	210	200	140	110	220	55521002455				655210027455			
120	60°	160	70	112	210	230	148	118	220	55521202455				655212027455			
150	60°	200	100	136	210	300	168	138	220	55521502455		55531502455		655215027455			
175	60°	218	90	170	210	308	198	168	220	55521701455		55531701455		655217017455			
200	60°	265	145	167	241	410	199	169	233	55522001455		55532001455		655220017455			
250	60°	305	155	215	241	460	220	190	233	55522501455		55532501455		655225017455			
300	60°	385	190	260	241	575	245	215	233	55523002455		55533002455		655230027455			



AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

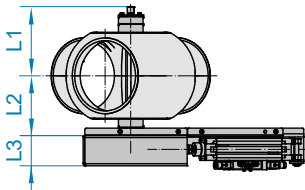
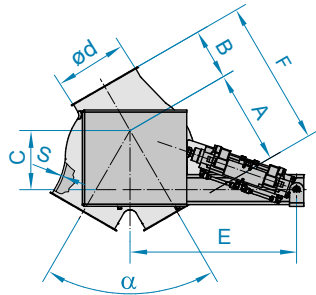
D DETECTABLE DESIGN
Metal-detectable



TWO-WAY VALVES WITH SEAL, ASYMMETRICAL, FITTED WITH CYLINDER

2205

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches on the cylinder
- Standard version: Right-side mounting
- Other cylinders are available. Prices on request
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		3 mm powder-coated		2 mm stainless steel		F
										Item no.	€	Item no.	€	Item no.	€	

Cylinder, make FESTO, control voltage 230 V AC

100	60°	135	65	87	440	200	140	110	88	5552100221				65521002721			
120	60°	160	70	112	440	230	148	118	88	5552120221				65521202721			
150	60°	200	100	136	440	300	168	138	88	5552150221		5553150221		65521502721			
175	60°	218	90	170	440	308	198	168	88	5552170121		5553170121		65521701721			
200	60°	265	145	167	470	410	199	169	88	5552200121		5553200121		65522001721			
250	60°	305	155	215	470	460	220	190	88	5552250121		5553250121		65522501721			
300	60°	385	190	260	470	575	264	234	88	5552300221		5553300221		65523002721			

Cylinder, make FESTO, control voltage 24 V DC

100	60°	135	65	87	440	200	140	110	88	5552100223				65521002723			
120	60°	160	70	112	440	230	148	118	88	5552120223				65521202723			
150	60°	200	100	136	440	300	168	138	88	5552150223		5553150223		65521502723			
175	60°	218	90	170	440	308	198	168	88	5552170123		5553170123		65521701723			
200	60°	265	145	167	470	410	199	169	88	5552200123		5553200123		65522001723			
250	60°	305	155	215	470	460	220	190	88	5552250123		5553250123		65522501723			
300	60°	385	190	260	470	575	264	234	88	5552300223		5553300223		65523002723			



AVAILABLE IN THE DETECTABLE DESIGN LINE.

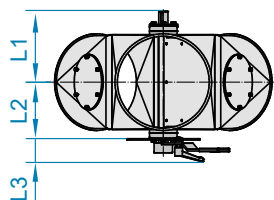
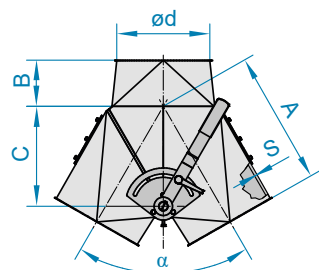
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

Two-way distributors



TWO-WAY DISTRIBUTORS 60°, SYMMETRICAL, HAND-OPERATED

2250

- The use of pneumatic actuators is recommended as they hold the inner flap better in the end position
- Shaft and inner flap with seal
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	L1	L2	L3	2 mm powder-coated		2 mm stainless steel		F
								Item no.	€	Item no.	€	
100	60°	220	65	128	117	82	75	12101508		12103508		
120	60°	240	70	145	127	92	75	12121508		12123508		
150	60°	250	75	168	142	107	75	12151508		12153508		
200	60°	300	105	218	164	132	75	12201508		12203508		
250	60°	370	130	277	205	160	75	12251508		12253508		
300	60°	435	150	326	230	185	75	12301508		12303508		



AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

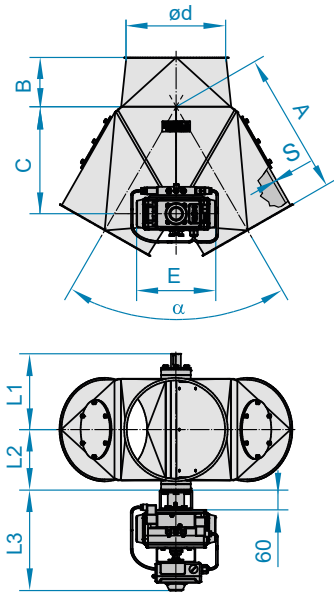
D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DISTRIBUTORS 60°, SYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR

2270

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches
- Completely wired in limit switch box
- Other rotary actuators are available. Prices on request
- Shaft and inner flap with seal
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		2 mm stainless steel		F
									Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC

100	60°	220	65	128	193	117	82	265	5982100144		6982100144		
120	60°	240	70	145	193	127	92	265	5982120144		6982120144		
150	60°	250	75	168	193	142	107	302	5982150144		6982150144		
200	60°	300	105	218	225	164	132	311	5982200144		6982200144		
250	60°	370	130	277	271	205	160	334	5982250144		6982250144		
300	60°	435	150	326	271	230	185	334	5982300144		6982300144		
350	60°	500	185	377	402	255	210	354	5982350144		6982350144		
400	60°	600	205	427	402	280	235	354	5982400144		6982400144		
450	60°	650	225	474	486	301	261	392	5983450144*		6983450144*		
500	60°	700	250	574	486	326	286	392	5983500144*		6983500144*		
560	60°	800	300	592	486	437	357	392	5983560144*		6983560144*		
630	60°	900	350	662	486	472	392	392	5983630144*		6983630144*		

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

100	60°	220	65	128	193	117	82	265	5982100145		6982100145		
120	60°	240	70	145	193	127	92	265	5982120145		6982120145		
150	60°	250	75	168	193	142	107	302	5982150145		6982150145		
200	60°	300	105	218	225	164	132	311	5982200145		6982200145		
250	60°	370	130	277	271	205	160	334	5982250145		6982250145		
300	60°	435	150	326	271	230	185	334	5982300145		6982300145		
350	60°	500	185	377	402	255	210	354	5982350145		6982350145		
400	60°	600	205	427	402	280	235	354	5982400145		6982400145		
450	60°	650	225	474	486	301	261	392	5983450145*		6983450145*		
500	60°	700	250	574	486	326	286	392	5983500145*		6983500145*		
560	60°	800	300	592	486	437	357	392	5983560145*		6983560145*		
630	60°	900	350	662	486	472	392	392	5983630145*		6983630145*		

*3 mm



DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

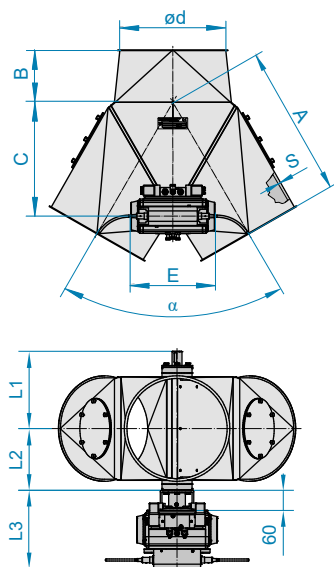
Two-way distributors



TWO-WAY DISTRIBUTORS 60°, SYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2270

- Control with 5/2-way solenoid valve (2-coil) and 2 inductive limit switches 24 V DC
- Designed to comply with ATEX category 1 G/D internally (gas zone 0 or dust zone 20), and category 3 D externally (dust zone 22)
- Without terminal box. Available on request
- Shaft and inner flap with seal
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		2 mm stainless steel		
									Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

100	60°	220	65	128	210	117	82	220	59821001455	€	69821001455	€	
120	60°	240	70	145	210	127	92	220	59821201455	€	69821201455	€	
150	60°	250	75	168	245	142	107	233	59821501455	€	69821501455	€	
200	60°	300	105	218	245	164	132	233	59822001455	€	69822001455	€	
250	60°	370	130	277	260	205	160	245	59822501455	€	69822501455	€	
300	60°	435	150	326	260	230	185	245	59823001455	€	69823001455	€	
350	60°	500	185	377	345	255	210	272	59823501455	€	69823501455	€	
400	60°	600	205	427	345	280	235	272	59824001455	€	69824001455	€	
450	60°	650	225	474	260	450	302	302	59834501455*	€	69834501455*	€	
500	60°	700	250	524	260	475	327	302	59835001455*	€	69835001455*	€	
560	60°	800	300	592	260	505	357	302	59835601455*	€	69835601455*	€	
630	60°	900	350	662	260	540	392	302	59836301455*	€	69836301455*	€	

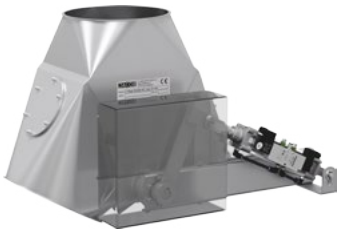
*3 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

FOOD GRADE
EC 1935/2004 plus FDA compliant

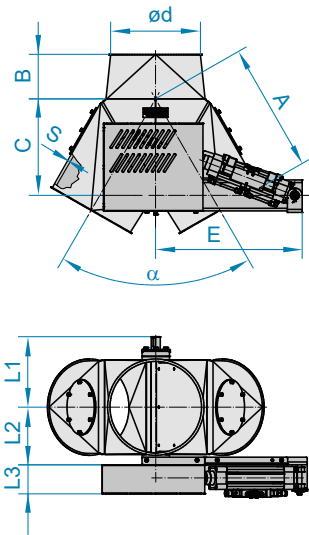
DETECTABLE DESIGN
Metal-detectable



TWO-WAY DISTRIBUTORS 60°, SYMMETRICAL, FITTED WITH CYLINDER

2275

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches on the cylinder
- Other cylinders are available. Prices on request
- Shaft and inner flap with seal
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		2 mm stainless steel	
									Item no.	€	Item no.	€

Cylinder, make FESTO, control voltage 230 V AC

100	60°	220	65	128	440	117	82	88	5982100121	6982100121
120	60°	240	70	145	440	127	92	88	5982120121	6982120121
150	60°	250	75	168	470	142	107	88	5982150121	6982150121
200	60°	300	105	218	470	164	132	88	5982200121	6982200121
250	60°	370	130	277	470	205	160	90	5982250121	6982250121
300	60°	435	150	326	470	230	185	90	5982300121	6982300121
350	60°	500	185	377	490	255	210	110	5982350121	6982350121
400	60°	600	205	427	490	280	235	110	5982400121	6982400121
450	60°	650	225	474	540	301	261	110	5983450121*	6983450121*
500	60°	700	250	574	540	326	286	110	5983500121*	6983500121*
560	60°	800	300	592	540	437	357	110	5983560121*	6983560121*
630	60°	900	350	662	540	472	392	110	5983630121*	6983630121*

Cylinder, make FESTO, control voltage 24 V DC

100	60°	220	65	128	440	117	82	88	5982100123	6982100123
120	60°	240	70	145	440	127	92	88	5982120123	6982120123
150	60°	250	75	168	470	142	107	88	5982150123	6982150123
200	60°	300	105	218	470	164	132	88	5982200123	6982200123
250	60°	370	130	277	470	205	160	90	5982250123	6982250123
300	60°	435	150	326	470	230	185	90	5982300123	6982300123
350	60°	500	185	377	490	255	210	110	5982350123	6982350123
400	60°	600	205	427	490	280	235	110	5982400123	6982400123
450	60°	650	225	474	540	301	261	110	5983450123*	6983450123*
500	60°	700	250	574	540	326	286	110	5983500123*	6983500123*
560	60°	800	300	592	540	437	357	110	5983560123*	6983560123*
630	60°	900	350	662	540	472	392	110	5983630123*	6983630123*

*3 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

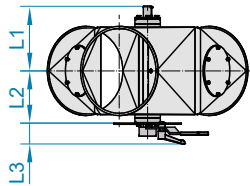
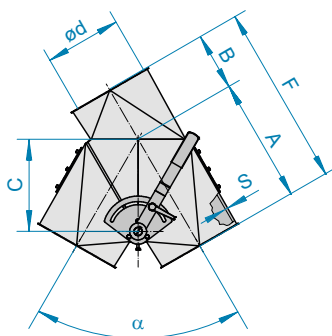
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

Two-way distributors



TWO-WAY DISTRIBUTORS 60°, ASYMMETRICAL, HAND-OPERATED

2260

- Standard version: Right-side mounting
- The use of pneumatic actuators is recommended as they hold the inner flap better in the end position
- Shaft and inner flap with seal
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	F	L1	L2	L3	2 mm powder-coated		2 mm stainless steel	
									Item no.	€	Item no.	€
100	60°	220	100	128	320	117	82	75	12101509		12103509	
120	60°	240	110	145	350	127	92	75	12121509		12123509	
150	60°	250	115	168	365	142	107	75	12151509		12153509	
200	60°	300	140	218	440	164	132	75	12201509		12203509	
250	60°	370	170	277	540	205	160	75	12251509		12253509	
300	60°	435	200	326	635	230	185	75	12301509		12303509	



DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

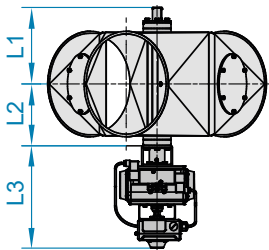
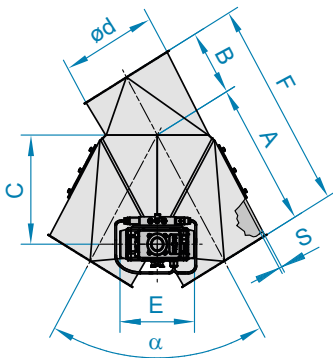
D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DISTRIBUTORS 60°, ASYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR

2280

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches
- Completely wired in limit switch box
- Other rotary actuators are available. Prices on request
- Standard version: Right-side mounting
- Shaft and inner flap with seal
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated	2 mm stainless steel	F
										Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC

100	60°	220	100	128	193	320	117	82	265	5992100144	6992100144	
120	60°	240	110	145	193	350	127	92	265	5992120144	6992120144	
150	60°	250	115	168	193	365	142	107	302	5992150144	6992150144	
200	60°	300	140	218	225	440	164	132	311	5992200144	6992200144	
250	60°	370	170	277	271	540	205	160	334	5992250144	6992250144	
300	60°	435	200	326	271	635	230	185	334	5992300144	6992300144	
350	60°	500	230	377	402	730	255	210	354	5992350144	6992350144	
400	60°	600	250	427	402	850	280	235	354	5992400144	6992400144	
450	60°	650	270	474	486	920	301	256	392	5993450144*	6993450144*	
500	60°	700	300	542	486	1000	326	288	392	5993500144*	6993500144*	
560	60°	800	350	592	486	1150	437	357	392	5993560144*	6993560144*	
630	60°	900	400	662	486	1300	472	392	392	5993630144*	6993630144*	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

100	60°	220	100	128	193	320	117	82	265	5992100145	6992100145	
120	60°	240	110	145	193	350	127	92	265	5992120145	6992120145	
150	60°	250	115	168	193	365	142	107	302	5992150145	6992150145	
200	60°	300	140	218	225	440	164	132	311	5992200145	6992200145	
250	60°	370	170	277	271	540	205	160	334	5992250145	6992250145	
300	60°	435	200	326	271	635	230	185	334	5992300145	6992300145	
350	60°	500	230	377	402	730	255	210	354	5992350145	6992350145	
400	60°	600	250	427	402	850	280	235	354	5992400145	6992400145	
450	60°	650	270	474	486	920	301	256	392	5993450145*	6993450145*	
500	60°	700	300	542	486	1000	326	288	392	5993500145*	6993500145*	
560	60°	800	350	592	486	1150	437	357	392	5993560145*	6993560145*	
630	60°	900	400	662	486	1300	472	392	392	5993630145*	6993630145*	

*3 mm



DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

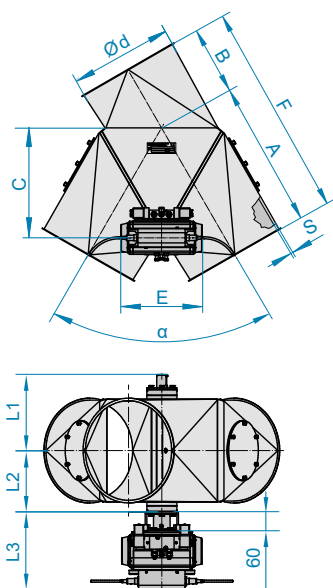
Two-way distributors



TWO-WAY DISTRIBUTORS 60°, ASYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2280

- Control with 5/2-way solenoid valve (2-coil) and 2 inductive limit switches 24 V DC
- Designed to comply with ATEX category 1 G/D internally (gas zone 0 or dust zone 20), and category 3 D externally (dust zone 22)
- Without terminal box. Available on request
- Shaft and inner flap with seal
- Standard version: Right-side mounting
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		2 mm stainless steel		F
										Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

100	60°	220	100	128	210	320	117	82	220	59921001455	69921001455
120	60°	240	110	145	210	350	127	92	220	59921201455	69921201455
150	60°	250	115	168	245	365	142	107	233	59921501455	69921501455
200	60°	300	140	218	245	440	164	132	233	59922001455	69922001455
250	60°	370	170	277	260	540	205	160	245	59922501455	69922501455
300	60°	435	200	326	260	635	230	185	245	59923001455	69923001455
350	60°	500	230	377	345	730	255	210	272	59923501455	69923501455
400	60°	600	250	427	345	850	280	235	272	59924001455	69924001455
450	60°	650	270	474	260	920	450	302	302	59934501455*	69934501455*
500	60°	700	300	524	260	1000	475	327	302	59935001455*	69935001455*
560	60°	800	350	592	260	1150	505	357	302	59935601455*	69935601455*
630	60°	900	400	662	260	1300	540	392	302	59936301455*	69936301455*

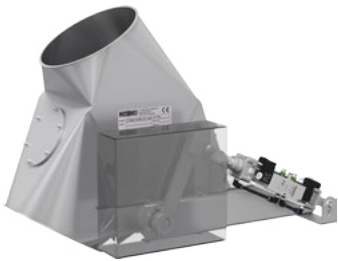
*3 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

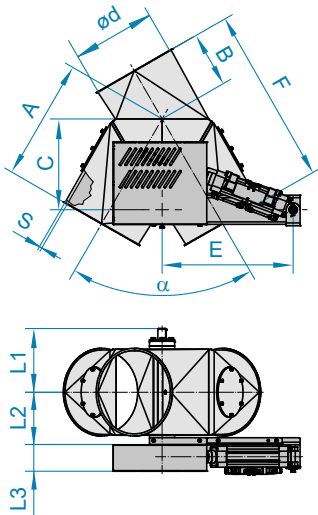
D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DISTRIBUTORS 60°, ASYMMETRICAL, FITTED WITH CYLINDER

2285

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches on the cylinder
- Standard version: Right-side mounting
- Other cylinders are available. Prices on request
- Shaft and inner flap with seal
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		2 mm stainless steel	
										Item no.	€	Item no.	€

Cylinder, make FESTO, control voltage 230 V AC

100	60°	220	100	128	440	320	117	82	88	5992100121	6992100121
120	60°	240	110	145	440	350	127	92	88	5992120121	6992120121
150	60°	250	115	168	470	365	142	107	88	5992150121	6992150121
200	60°	300	140	218	470	440	164	132	88	5992200121	6992200121
250	60°	370	170	277	470	540	205	160	90	5992250121	6992250121
300	60°	435	200	326	470	635	230	185	90	5992300121	6992300121
350	60°	500	230	377	490	730	255	210	110	5992350121	6992350121
400	60°	600	250	427	490	850	280	235	110	5992400121	6992400121
450	60°	650	270	474	540	920	301	256	110	5993450121*	6993450121*
500	60°	700	300	542	540	1000	326	288	110	5993500121*	6993500121*
560	60°	800	350	592	540	1150	437	357	110	5993560121*	6993560121*
630	60°	900	400	662	540	1300	472	392	110	5993630121*	6993630121*

Cylinder, make FESTO, control voltage 24V DC

100	60°	220	100	128	440	320	117	82	88	5992100123	6992100123
120	60°	240	110	145	440	350	127	92	88	5992120123	6992120123
150	60°	250	115	168	470	365	142	107	88	5992150123	6992150123
200	60°	300	140	218	470	440	164	132	88	5992200123	6992200123
250	60°	370	170	277	470	540	205	160	90	5992250123	6992250123
300	60°	435	200	326	470	635	230	185	90	5992300123	6992300123
350	60°	500	230	377	490	730	255	210	110	5992350123	6992350123
400	60°	600	250	427	490	850	280	235	110	5992400123	6992400123
450	60°	650	270	474	540	920	301	256	110	5993450123*	6993450123*
500	60°	700	300	542	540	1000	326	288	110	5993500123*	6993500123*
560	60°	800	350	592	540	1150	437	357	110	5993560123*	6993560123*
630	60°	900	400	662	540	1300	472	392	110	5993630123*	6993630123*

*3 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

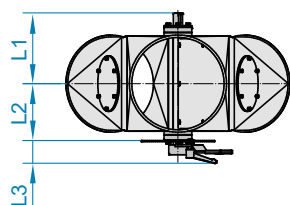
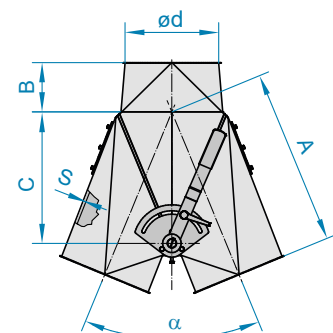
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

Two-way distributors



TWO-WAY DISTRIBUTORS 45°, SYMMETRICAL, HAND-OPERATED

2210

- The use of pneumatic actuators is recommended as they hold the inner flap better in the end position
- Shaft and inner flap with seal
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	L1	L2	L3	2 mm powder-coated		2 mm stainless steel	
								Item no.	€	Item no.	€
100	45°	260	65	165	117	82	75	12101518		12103518	
120	45°	280	70	185	127	92	75	12121518		12123518	
150	45°	315	75	225	142	107	75	12151518		12153518	
175	45°	350	90	255	151	119	75	12171518		12173518	
200	45°	400	105	289	164	132	75	12201518		12203518	
250	45°	480	130	356	205	160	75	12251518		12253518	
300	45°	570	160	426	230	185	75	12301518		12303518	



AVAILABLE IN THE DETECTABLE DESIGN LINE.

FOOD GRADE
EC 1935/2004 plus FDA compliant

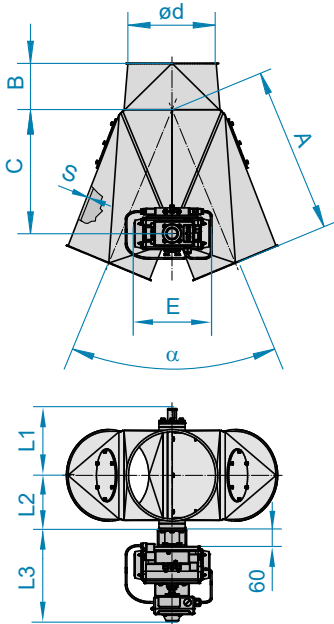
DETECTABLE DESIGN
Metal-detectable



TWO-WAY DISTRIBUTORS 45°, SYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR

2230

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches
- Completely wired in limit switch box
- Shaft and inner flap with seal
- Other rotary actuators are available. Prices on request
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		2 mm stainless steel		F
									Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC

100	45°	260	65	165	193	117	82	265	5922100144		6922100144		
120	45°	280	70	185	193	127	107	265	5922120144		6922120144		
150	45°	315	75	225	193	142	107	265	5922150144		6922150144		
175	45°	350	90	255	225	150	119	275	5922170144		6922170144		
200	45°	400	105	289	225	164	132	311	5922200144		6922200144		
250	45°	480	130	356	342	205	160	334	5922250144		6922250144		
300	45°	570	160	426	342	230	185	334	5922300144		6922300144		
350	45°	618	185	495	402	238	208	354	5922350144		6922350144		
400	45°	698	205	558	402	263	233	354	5922400144		6922400144		
450	45°	800	225	624	486	450	302	392	5923450144*		6923450144*		
500	45°	880	250	686	486	475	327	392	5923500144*		6923500144*		

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

100	45°	260	65	165	193	117	82	265	5922100145		6922100145		
120	45°	280	70	185	193	127	107	265	5922120145		6922120145		
150	45°	315	75	225	193	142	107	265	5922150145		6922150145		
175	45°	350	90	255	225	150	119	275	5922170145		6922170145		
200	45°	400	105	289	225	164	132	311	5922200145		6922200145		
250	45°	480	130	356	342	205	160	334	5922250145		6922250145		
300	45°	570	160	426	342	230	185	334	5922300145		6922300145		
350	45°	618	185	495	402	238	208	354	5922350145		6922350145		
400	45°	698	205	558	402	263	233	354	5922400145		6922400145		
450	45°	800	225	624	486	450	302	392	5923450145*		6923450145*		
500	45°	880	250	686	486	475	327	392	5923500145*		6923500145*		

*3 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

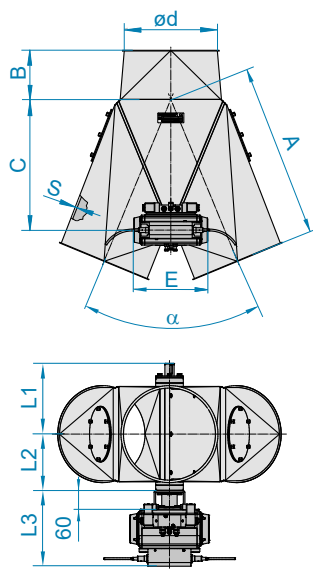
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

Two-way distributors



TWO-WAY DISTRIBUTORS 45°, SYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2230

- Control with 5/2-way solenoid valve (2-coil) and 2 inductive limit switches 24 V DC
- Designed to comply with ATEX category 1 G/D internally (gas zone 0 or dust zone 20), and category 3 D externally (dust zone 22)
- Without terminal box. Available on request
- DN > 300 mm with welded flanges
- Shaft and inner flap with seal
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		2 mm stainless steel		
									Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

100	45°	260	65	165	210	117	82	220	59221001455	69221001455
120	45°	280	70	185	210	127	92	220	59221201455	69221201455
150	45°	315	75	225	245	142	107	233	59221501455	69221501455
175	45°	350	90	255	245	151	119	233	59221701455	69221701455
200	45°	400	105	289	245	164	132	233	59222001455	69222001455
250	45°	480	130	356	260	205	160	245	59222501455	69222501455
300	45°	570	160	426	260	230	185	245	59223001455	69223001455
350	45°	618	185	495	345	238	210	272	59223501455	69223501455
400	45°	698	205	558	345	263	235	272	59224001455	69224001455
450	45°	800	225	624	260	450	302	302	59234501455*	69234501455*
500	45°	880	250	700	260	475	327	302	59235001455*	69235001455*

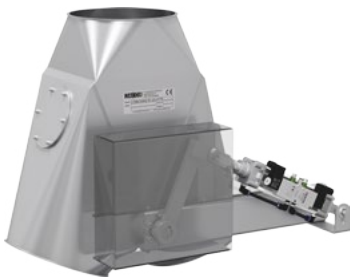
*3 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

FOOD GRADE
EC 1935/2004 plus FDA compliant

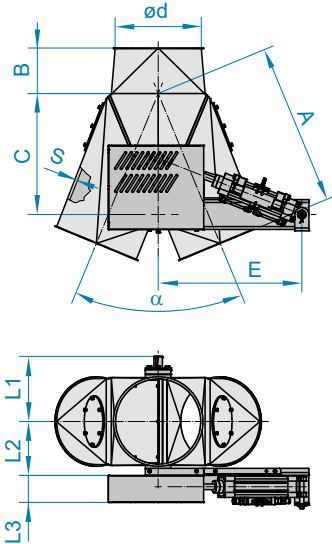
DETECTABLE DESIGN
Metal-detectable



TWO-WAY DISTRIBUTORS 45°, SYMMETRICAL, FITTED WITH CYLINDER

2235

- Standard version: Right-side mounting
- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches on the cylinder
- Shaft and inner flap with seal
- Other cylinders are available. Prices on request
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	L1	L2	L3	2 mm powder-coated		2 mm stainless steel	
									Item no.	€	Item no.	€

Cylinder, make FESTO, control voltage 230 V AC

100	45°	260	65	165	440	117	82	88	5922100121		6922100121	
120	45°	280	70	185	440	127	92	88	5922120121		6922120121	
150	45°	315	75	225	470	142	107	88	5922150121		6922150121	
175	45°	350	90	255	470	150	119	88	5922170121		6922170121	
200	45°	400	105	289	470	164	132	88	5922200121		6922200121	
250	45°	480	130	356	470	205	160	90	5922250121		6922250121	
300	45°	570	160	426	470	230	185	90	5922300121		6922300121	
350	45°	618	185	495	490	238	208	110	5922350121		6922350121	
400	45°	698	205	558	490	263	233	110	5922400121		6922400121	
450	45°	800	205	624	540	450	302	110	5923450121*		6923450121*	
500	45°	880	250	686	540	475	327	110	5923500121*		6923500121*	

Cylinder, make FESTO, control voltage 24 V DC

100	45°	260	65	165	440	117	82	88	5922100123		6922100123	
120	45°	280	70	185	440	127	92	88	5922120123		6922120123	
150	45°	315	75	225	470	142	107	88	5922150123		6922150123	
175	45°	350	90	255	470	150	119	88	5922170123		6922170123	
200	45°	400	105	289	470	164	132	88	5922200123		6922200123	
250	45°	480	130	356	470	205	160	90	5922250123		6922250123	
300	45°	570	160	426	470	230	185	90	5922300123		6922300123	
350	45°	618	185	495	490	238	208	110	5922350123		6922350123	
400	45°	698	205	558	490	263	233	110	5922400123		6922400123	
450	45°	800	205	624	540	450	302	110	5923450123*		6923450123*	
500	45°	880	250	686	540	475	327	110	5923500123*		6923500123*	

*3 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

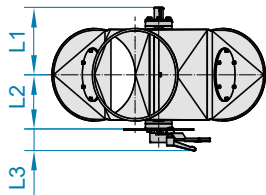
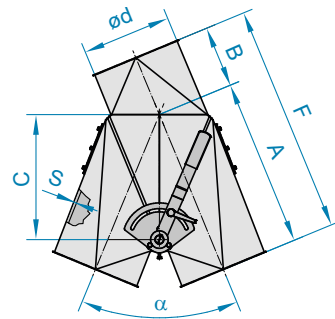
F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

Two-way distributors



TWO-WAY DISTRIBUTORS 45°, ASYMMETRICAL, HAND-OPERATED

2220

- Standard version: Right-side mounting
- Shaft and inner flap with seal
- The use of pneumatic actuators is recommended as they hold the inner flap better in the end position
- Please also read and take into account the technical information given at the beginning of this chapter

DN	α	A	B	C	F	L1	L2	L3	2 mm powder-coated		2 mm stainless steel	
									Item no.	€	Item no.	€
100	45°	260	100	165	360	117	82	75	12101519		12103519	F
120	45°	280	110	185	390	127	92	75	12121519		12123519	
150	45°	315	115	225	430	142	107	75	12151519		12153519	
175	45°	350	125	255	475	151	119	75	12171519		12173519	
200	45°	400	140	289	540	164	132	75	12201519		12203519	
250	45°	480	170	356	650	205	160	75	12251519		12253519	
300	45°	570	210	426	780	230	185	75	12301519		12303519	



AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

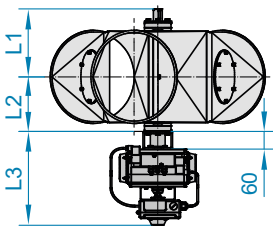
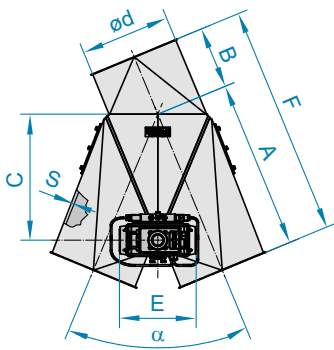
D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DISTRIBUTORS 45°, ASYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR

2240

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches
- Completely wired in limit switch box
- Standard version: Right-side mounting
- Shaft and inner flap with seal
- Other rotary actuators are available. Prices on request
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		2 mm stainless steel	
										Item no.	€	Item no.	€

Pneumatic rotary actuator, make AIR TORQUE, control voltage 230 V AC

100	45°	260	100	165	193	360	117	82	265	5912100144		6912100144	
120	45°	280	110	185	193	390	127	92	265	5912120144		6912120144	
150	45°	315	115	225	193	430	142	107	265	5912150144		6912150144	
175	45°	350	125	255	225	475	151	119	275	5912170144		6912170144	
200	45°	400	140	289	225	540	164	132	311	5912200144		6912200144	
250	45°	480	170	356	342	650	205	160	334	5912250144		6912250144	
300	45°	570	210	426	342	780	230	185	334	5912300144		6912300144	
350	45°	618	230	495	402	848	238	208	354	5912350144		6912350144	
400	45°	698	250	558	402	948	263	233	354	5912400144		6912400144	
450	45°	800	270	624	486	1070	450	302	392	5913450144*		6913450144*	
500	45°	880	300	686	486	1180	475	327	392	5913500144*		6913500144*	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC

100	45°	260	100	165	193	360	117	82	265	5912100145		6912100145	
120	45°	280	110	185	193	390	127	92	265	5912120145		6912120145	
150	45°	315	115	225	193	430	142	107	265	5912150145		6912150145	
175	45°	350	125	255	225	475	150	119	275	5912170145		6912170145	
200	45°	400	140	289	225	540	164	132	311	5912200145		6912200145	
250	45°	480	170	356	342	650	205	160	334	5912250145		6912250145	
300	45°	570	210	426	342	780	230	185	334	5912300145		6912300145	
350	45°	618	230	495	402	848	238	208	354	5912350145		6912350145	
400	45°	698	250	558	402	948	263	233	354	5912400145		6912400145	
450	45°	800	270	624	486	1070	450	302	392	5913450145*		6913450145*	
500	45°	880	300	686	486	1180	475	327	392	5913500145*		6913500145*	

*3 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DIVERTERS

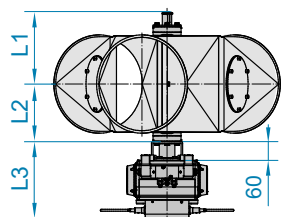
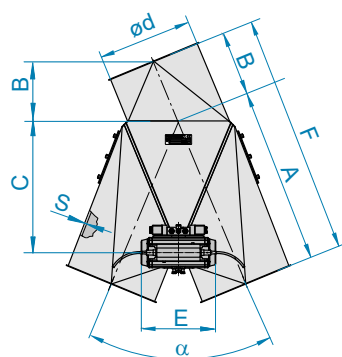
Two-way distributors



TWO-WAY DISTRIBUTORS 45°, ASYMMETRICAL, FITTED WITH PNEUMATIC ROTARY ACTUATOR, ATEX

2240

- Control with 5/2-way solenoid valve (2-coil) and 2 inductive limit switches 24 V DC
- Standard version: Right-side mounting
- Designed to comply with ATEX category 1 G/D internally (gas zone 0 or dust zone 20), and category 3 D externally (dust zone 22)
- Without terminal box. Available on request
- Shaft and inner flap with seal
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		2 mm stainless steel		F
										Item no.	€	Item no.	€	

Pneumatic rotary actuator, make AIR TORQUE, control voltage 24 V DC, ATEX version

100	45°	260	100	165	210	360	117	82	220	59121001455		69121001455		
120	45°	280	110	185	210	390	127	92	220	59121201455		69121201455		
150	45°	315	115	225	245	430	142	107	233	59121501455		69121501455		
175	45°	350	125	255	245	475	151	119	233	59121701455		69121701455		
200	45°	400	140	289	245	540	164	132	233	59122001455		69122001455		
250	45°	480	170	356	260	650	205	160	245	59122501455		69122501455		
300	45°	570	210	426	260	780	230	185	245	59123001455		69123001455		
350	45°	618	230	495	345	848	238	210	272	59123501455		69123501455		
400	45°	698	250	558	345	948	263	235	272	59124001455		69124001455		
450	45°	800	270	624	260	1070	450	302	302	59134501455*		69134501455*		
500	45°	880	300	700	260	1180	475	327	302	59135001455*		69135001455*		

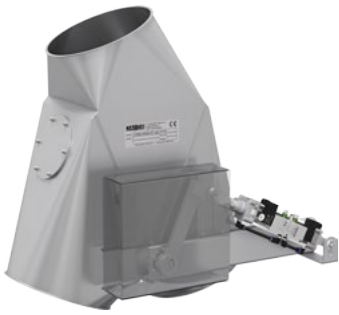
*3 mm



AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

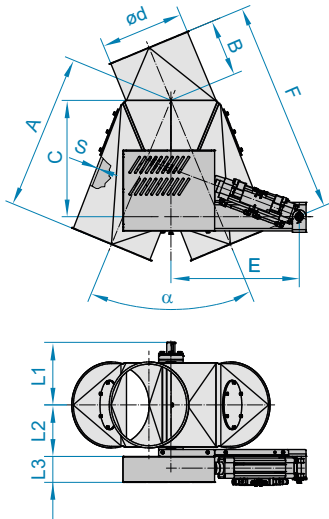
D DETECTABLE DESIGN
Metal-detectable



TWO-WAY DISTRIBUTORS 45°, ASYMMETRICAL, FITTED WITH CYLINDER

2245

- Control with 5/2-way solenoid valve (2-coil) and 2 limit switches on the cylinder
- Standard version: Right-side mounting
- Shaft and inner flap with seal
- Other cylinders are available. Prices on request
- DN > 300 mm with welded flanges
- Please also read and take into account the technical information given at the beginning of this chapter



DN	α	A	B	C	E	F	L1	L2	L3	2 mm powder-coated		2 mm stainless steel	
										Item no.	€	Item no.	€

Cylinder, make FESTO, control voltage 230 V AC

100	45°	260	100	165	440	360	117	82	88	5912100121		6912100121	
120	45°	280	110	185	440	390	127	92	88	5912120121		6912120121	
150	45°	315	115	225	470	430	142	107	88	5912150121		6912150121	
175	45°	350	125	255	470	475	150	119	88	5912170121		6912170121	
200	45°	400	140	289	470	540	164	132	88	5912200121		6912200121	
250	45°	480	170	356	470	650	205	160	90	5912250121		6912250121	
300	45°	570	210	426	470	780	230	185	90	5912300121		6912300121	
350	45°	618	230	495	490	848	238	208	110	5912350121		6912350121	
400	45°	698	250	558	490	948	263	233	110	5912400121		6912400121	
450	45°	800	270	624	540	1070	450	302	110	5913450121*		6913450121*	
500	45°	880	300	686	540	1180	475	327	110	5913500121*		6913500121*	

Cylinder, make FESTO, control voltage 24 V DC

100	45°	260	100	165	440	360	117	82	88	5912100123		6912100123	
120	45°	280	110	185	440	390	127	92	88	5912120123		6912120123	
150	45°	315	115	225	470	430	142	107	88	5912150123		6912150123	
175	45°	350	125	255	470	475	150	119	88	5912170123		6912170123	
200	45°	400	140	289	470	540	164	132	88	5912200123		6912200123	
250	45°	480	170	356	470	650	205	160	90	5912250123		6912250123	
300	45°	570	210	426	470	780	230	185	90	5912300123		6912300123	
350	45°	618	230	495	490	848	238	208	110	5912350123		6912350123	
400	45°	698	250	558	490	948	263	233	110	5912400123		6912400123	
450	45°	800	270	624	540	1070	450	302	110	5913450123*		6913450123*	
500	45°	880	300	686	540	1180	475	327	110	5913500123*		6913500123*	

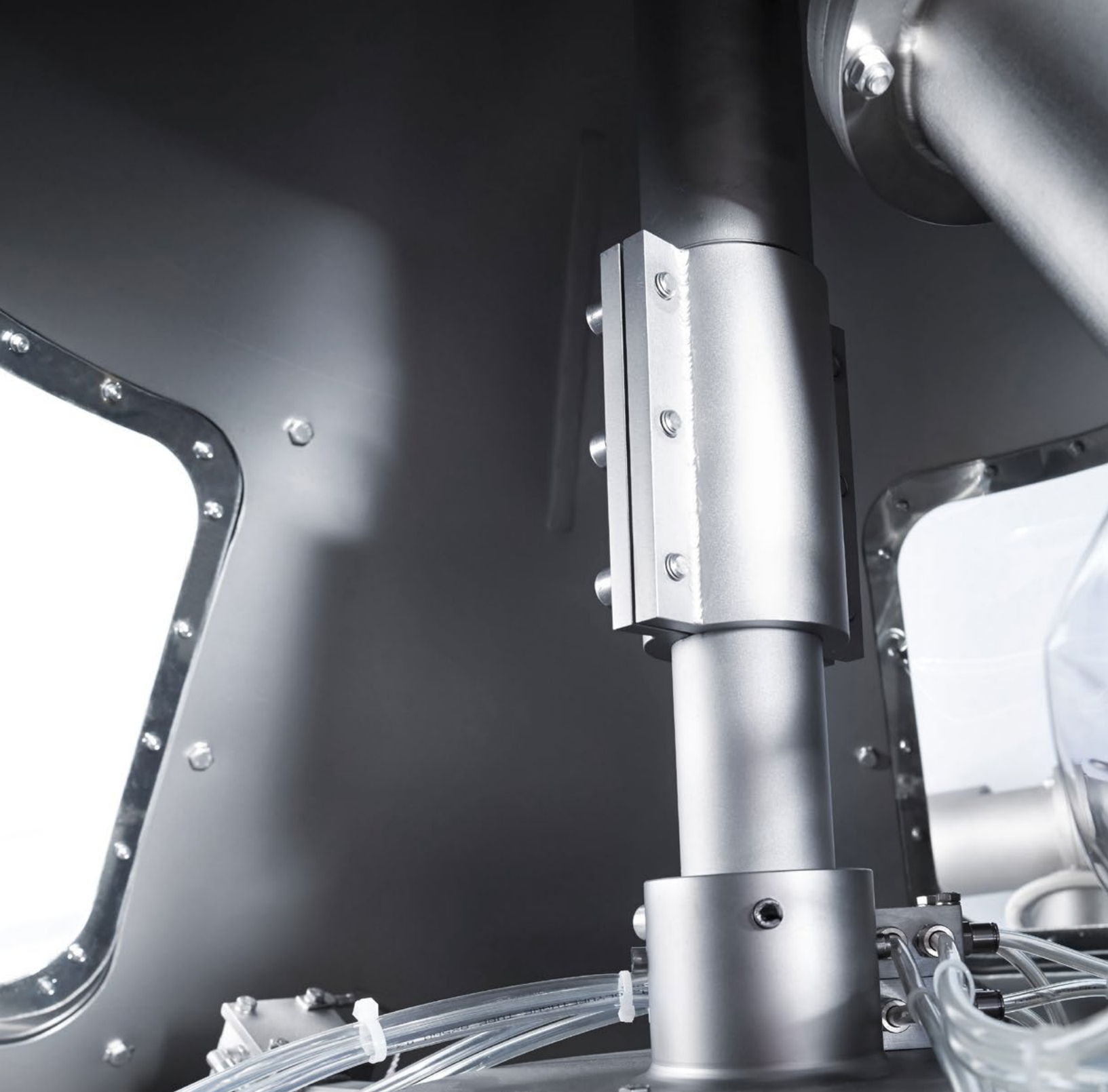
*3 mm



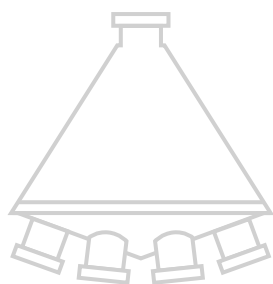
AVAILABLE IN THE DETECTABLE DESIGN LINE.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



JACOB MULTI-WAY DISTRIBUTORS –
FOR FLEXIBLE DISTRIBUTION
OF YOUR BULK GOODS



MULTI-WAY DISTRIBUTORS

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MULTI-WAY DISTRIBUTORS

Technical information

MULTI-WAY DISTRIBUTORS

JACOB multi-way distributors are the compact solution for conveying bulk goods to many different machines or silos in the course of the production process. JACOB has a range of multi-way distributors with up to 2 x 20 outlets available in its standard portfolio in order to meet a variety of requirements.



TURN-HEAD DISTRIBUTORS 45° AND 60°

Versions and applications

Primed steel version. For distributing granular bulk goods, such as grain, by gravity without over-pressure inside the pipework system and with no demand for dust-tightness internally.

Feeding from the top through the turn-pipe towards the required outlet inside a closed casing.

Rotary pipe seal pressed on with two pressure springs. Support by means of four lugs fixed to the lower funnel circumference according to data sheet.

Electrically operated with a gear motor, motor current 380-400 volt, 3-phase, 50 Hz.

2.3 rpm	1.2 rpm
DN 100 mm, 4-18 outlets	DN 100 mm, 20 outlets
DN 120 mm, 4-14 outlets	DN 120 mm, 16-20 outlets
DN 150 mm, 4-12 outlets	DN 150 mm, 14-20 outlets
DN 175 mm, 4-10 outlets	DN 175 mm, 12-20 outlets
DN 200 mm, 4-10 outlets	DN 200 mm, 12-20 outlets
	DN 250 mm, 4-16 outlets
	DN 300 mm, 4-14 outlets

Positioning with mechanical limit switches, wired on terminals in a connection box. Turn-head distributor must not be operated when transporting material.

Your individual turn-head distributor

We have numerous versions available on request to meet the requirements of your particular system:

- Proximity switches
- Additional electric pressing and position control of the turn-pipe outlet position with proximity switches, affixed in the lower funnel
- JACOB FOOD GRADE: Product-contacting parts made of stainless steel available at additional cost
- Second inspection door available on demand
- Deliverable in blue silicone, metal-detectable
- ATEX versions on request
- Wear protection lining
- Other drives



DOUBLE TURN-HEAD DISTRIBUTORS 45° AND 60°

Versions and applications

Primed steel version. For distributing granular bulk goods, such as grain, by gravity without over-pressure inside the pipework system and with no demand for dust-tightness internally.

Feeding from the top through two counter-rotating turn-pipes towards the required outlet inside a closed casing.

Rotary pipe seal pressed on with two pressure springs. Support by means of four lugs fixed to the lower funnel circumference according to data sheet.

Electrically operated with a gear-motor, 1.2 rpm, motor current 380-400 volt, 3-phase, 50 Hz. Positioning with mechanical limit switches, wired on terminals in a connection box. Turn-head distributor must not be operated when transporting material.

Your individual turn-head distributor

We have numerous versions available on request to meet the requirements of your particular system:

- Proximity switches
- Additional electric pressing and position control of the turn-pipe outlet position with proximity switches, affixed in the lower funnel
- JACOB FOOD GRADE: Product-contacting parts made of stainless steel available at additional cost
- Second inspection door available on demand
- ATEX versions on request
- Wear protection lining
- Other drives

TURN-HEAD DISTRIBUTORS 45° AND 60°, DUST-TIGHT VERSION

Versions and applications

For distributing bulk goods by gravity up to a maximum of 1 bar over-pressure inside the pipework system.

Feeding from the top through the turn-pipe towards the required outlet inside a closed casing.

Sealing of the turn-pipe outlet by means of pneumatic pressing onto outlet sleeve. Support by means of four lugs fixed to the lower funnel circumference according to data sheet.

Electrically operated with a gear-motor, 1.2 rpm, motor current 380-400 volt, 3-phase, 50 Hz. Positioning with mechanical limit switches, solenoid valve and pressure controller wired on terminals in a connecting box.

Necessary operating pressure min. 6 bar. Turn-head distributor must not be operated when transporting material.

Please indicate control voltage when ordering.



Your individual turn-head distributor

We have numerous versions available on request to meet the requirements of your particular system:

- Proximity switches
- Other mounting positions
- Additional electric pressing and position control of the turn-pipe outlet position with proximity switches, affixed in the lower funnel
- JACOB FOOD GRADE: Product-contacting parts made of stainless steel available at additional cost
- Second inspection door available on demand
- Seals in DETECTABLE DESIGN line: Blue silicone, metal-detectable
- ATEX versions on request
- Wear protection lining
- Other drives
- Cover to blank off outlets that are not in use

SWIVEL PIPE SWITCHES

Versions and applications

For pneumatic conveying of bulk goods. Over-pressure inside the pipework system up to diameter 150 mm max. 3 bar, diameter 200 and 250 mm max. 2 bar. Necessary operating pressure min. 6 bar. Swivel pipe switch must not be operated when transporting material.

Feeding from the top through the swivel pipe towards the required outlet inside a closed casing. Sealing of swivel pipe outlet by means of pneumatic pressing-on of the telescopic pipe onto the outlet sleeve, outlets not in use pneumatically blanked off. Support by means of four lugs fixed to the lower funnel circumference according to data sheet.

Electrically operated with a gear motor, 1.2 rpm, motor current 380-400 volt, 3-phase, 50 Hz. Positioning with mechanical limit switches, solenoid valve and pressure controller wired on terminals in a connecting box.

Please indicate control voltage when ordering.

Your individual swivel pipe switch

We have numerous versions available on request to meet the requirements of your particular system:

- Proximity switches
- Other mounting positions
- Additional electric pressing and position control of the turn-pipe outlet position with proximity switches, affixed in the lower funnel
- FOOD GRADE: Product-contacting parts made of stainless steel available at additional cost
- Second inspection door available on demand
- ATEX versions on request
- Wear protection lining
- Other drives

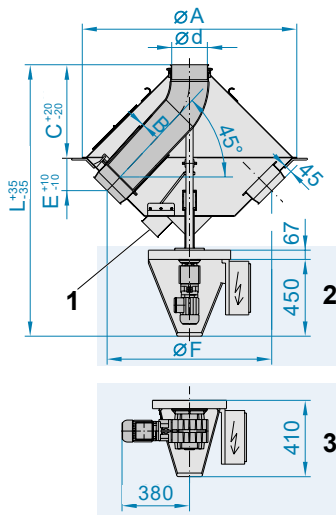


10



MULTI-WAY DISTRIBUTORS

Turn-head distributors



- 1 Spillage outlet
- 2 Gear-motor 2.3 rpm
- 3 Gear-motor 1.2 rpm

TURN-HEAD DISTRIBUTORS 45°

2320

- All dimensions are approximate
- Standard values for flow rates for granular products with a bulk density of 750 kg/m³, with a moisture content of max. 15 %
- A = 800 mm: Spillage outlet = DN 100 mm
- A > 800 mm: Spillage outlet = DN 120 mm
- Lower funnel circumference according to data sheet
- Please also read and take into account the technical information given at the beginning of this chapter

4 and 6 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	4 outlets		6 outlets	
										Item no.	€	Item no.	€
100	98	800	3.6	365	138	626	1358	77	8	5104104501		5106104501	
120	118	800	4.0	355	155	590	1348	79	12	5104124501		5106124501	
150	148	800	4.5	340	155	590	1333	80	25	5104154501		5106154501	
175	173	1200	5.4	520	173	940	1576	134	45	5104174501		5106174501	
200	198	1200	6.3	510	183	920	1568	141	65	5104204501		5106204501	
250	248	1200	6.3	485	219	850	1540	155	100	5104254501		5106254501	
300	298	1200	7.1	480	212	860	1538	165	150	5104304501		5106304501	

8 outlets

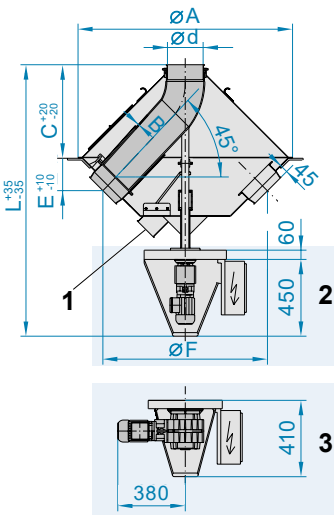
DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	800	3.6	365	138	626	1358	77	8	5108104501	
120	118	800	4.0	355	155	590	1348	79	12	5108124501	
150	148	1200	4.5	535	155	974	1593	129	25	5108154501	
175	173	1200	5.4	520	173	940	1576	134	45	5108174501	
200	198	1200	6.3	510	183	920	1568	141	65	5108204501	
250	248	1600	6.3	685	219	1250	1945	248	100	5108254501	
300	298	1600	7.1	680	212	1260	1940	260	150	5108304501	

10 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	800	3.6	365	138	626	1358	77	8	5110104501	
120	118	1200	4.0	550	155	974	1608	120	12	5110124501	
150	148	1200	4.5	535	155	974	1593	129	25	5110154501	
175	173	1200	5.4	520	173	940	1576	134	45	5110174501	
200	198	1200	6.3	510	183	920	1568	141	65	5110204501	
250	248	1600	6.3	685	219	1250	1945	248	100	5110254501	
300	298	1600	7.1	680	212	1260	1940	260	150	5110304501	

12 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	1200	3.6	560	138	1009	1616	116	8	5112104501	
120	118	1200	4.0	550	155	974	1608	120	12	5112124501	
150	148	1200	4.5	535	155	974	1593	129	25	5112154501	
175	173	1600	5.4	720	173	1340	1980	240	45	5112174501	
200	198	1600	6.3	710	183	1320	1970	250	65	5112204501	
250	248	2280	6.3	1035	219	1930	2230	410	100	5112254501	
300	298	2280	7.1	1010	212	1945	2205	430	150	5112304501	



- 1 Spillage outlet
- 2 Gear-motor 2.3 rpm
- 3 Gear-motor 1.2 rpm

14 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	1200	3.6	560	138	1009	1616	116	8	5114104501	
120	118	1200	4.0	550	155	974	1608	120	12	5114124501	
150	148	1600	4.5	735	155	1373	1957	230	25	5114154501	
175	173	1600	5.4	720	173	1340	1980	240	45	5114174501	
200	198	1600	6.3	710	183	1320	1970	250	65	5114204501	
250	248	2280	6.3	1035	219	1930	2230	410	100	5114254501	
300	298	2280	7.1	1010	212	1945	2205	430	150	5114304501	

16 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	1200	3.6	560	138	1009	1616	116	8	5116104501	
120	118	1600	4.0	750	155	1374	1972	225	12	5116124501	
150	148	1600	4.5	735	155	1373	1957	230	25	5116154501	
175	173	1600	5.4	720	173	1340	1980	240	45	5116174501	
200	198	2280	6.3	1060	183	2000	2255	400	65	5116204501	
250	248	2280	6.3	1035	219	1930	2230	410	100	5116254501	

18 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	1200	3.6	560	138	1009	1616	116	8	5118104501	
120	118	1600	4.0	750	155	1374	1972	225	12	5118124501	
150	148	1600	4.5	735	155	1373	1957	230	25	5118154501	
175	173	2280	5.4	1070	173	2022	2255	382	45	5118174501	
200	198	2280	6.3	1060	183	2000	2255	400	65	5118204501	

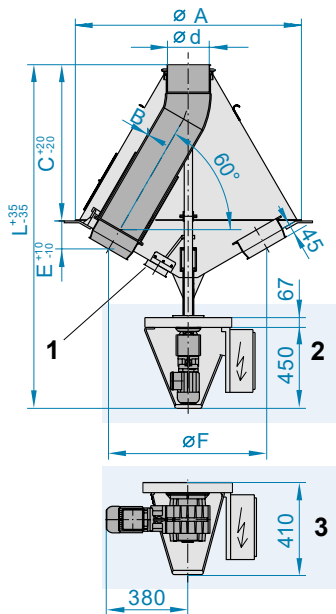
20 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	1600	3.6	760	138	1408	1983	220	8	5120104501	
120	118	1600	4.0	750	155	1374	1972	225	12	5120124501	
150	148	2280	4.5	1085	155	2057	2240	362	25	5120154501	
175	173	2280	5.4	1070	173	2022	2255	382	45	5120174501	
200	198	2280	6.3	1060	183	2000	2255	400	65	5120204501	



MULTI-WAY DISTRIBUTORS

Turn-head distributors



- 1 Spillage outlet
- 2 Gear-motor 2.3 rpm
- 3 Gear-motor 1.2 rpm

TURN-HEAD DISTRIBUTORS 60°

2330

- All dimensions are approximate
- Standard values for flow rates for granular products with a bulk density of 500 kg/m³, with a moisture content of max. 15 %
- A = 800 mm: Spillage outlet = DN 100 mm
- A > 800 mm: Spillage outlet = DN 120 mm
- Lower funnel circumference according to data sheet
- Please also read and take into account the technical information given at the beginning of this chapter

4 and 6 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	4 outlets		6 outlets	
										Item no.	€	Item no.	€
100	98	800	3.6	590	112	560	1518	82	4	5104106001		5106106001	
120	118	800	4.0	570	120	540	1498	84	6	5104126001		5106126001	
150	148	800	4.5	545	125	520	1473	85	12	5104156001		5106156001	
175	173	1200	5.4	860	130	875	1898	153	22	5104176001		5106176001	
200	198	1200	6.3	835	135	855	1873	153	32	5104206001		5106206001	
250	248	1200	6.3	790	150	805	1688	167	50	5104256001		5106256001	
300	298	1200	7.1	745	160	770	1643	182	75	5104306001		5106306001	

8 outlets

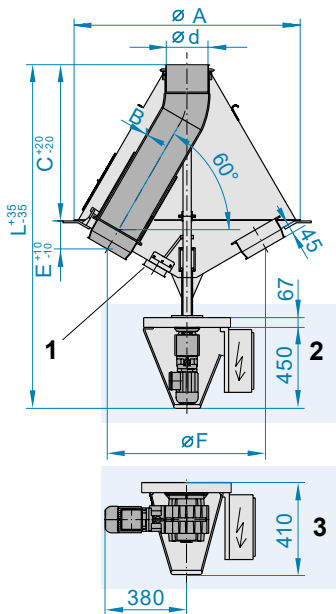
DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	800	3.6	590	112	560	1518	82	4	5108106001	
120	118	800	4.0	570	120	540	1498	84	6	5108126001	
150	148	1200	4.5	880	125	910	1918	140	12	5108156001	
175	173	1200	5.4	860	130	875	1898	153	22	5108176001	
200	198	1200	6.3	835	135	855	1873	153	32	5108206001	
250	248	1600	6.3	1140	150	1205	2158	267	50	5108256001	
300	298	1600	7.1	1095	160	1170	2113	287	75	5108306001	

10 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	800	3.6	590	112	560	1518	82	4	5110106001	
120	118	1200	4.0	905	120	930	1943	134	6	5110126001	
150	148	1200	4.5	880	125	910	1918	140	12	5110156001	
175	173	1200	5.4	860	130	875	1898	153	22	5110176001	
200	198	1600	6.3	1185	135	1255	2303	265	32	5110206001	
250	248	1600	6.3	1140	150	1205	2158	267	50	5110256001	
300	298	2280	7.1	1700	160	1850	2918	460	75	5110306001	

12 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	kg	t/h	Item no.	€
100	98	1200	3.6	925	112	950	1963	127	4	5112106001	
120	118	1200	4.0	905	120	930	1943	134	6	5112126001	
150	148	1200	4.5	880	125	910	1918	140	12	5112156001	
175	173	1600	5.4	1210	130	1275	2328	250	22	5112176001	
200	198	1600	6.3	1185	135	1255	2303	265	32	5112206001	
250	248	2280	6.3	1745	150	1885	2963	435	50	5112256001	
300	298	2280	7.1	1700	160	1850	2918	460	75	5112306001	



- 1 Spillage outlet
- 2 Gear-motor 2.3 rpm
- 3 Gear-motor 1.2 rpm

14 outlets

DN	Ød	ØA	B	C	E	ØF	L	kg	t/h	Item no.	€
100	98	1200	3.6	925	112	950	1963	127	4	5114106001	
120	118	1200	4.0	905	120	930	1943	134	6	5114126001	
150	148	1600	4.5	1230	125	1310	2348	240	12	5114156001	
175	173	1600	5.4	1210	130	1275	2328	250	22	5114176001	
200	198	1600	6.3	1185	135	1255	2303	265	32	5114206001	
250	248	2280	6.3	1745	150	1885	2963	435	50	5114256001	
300	298	2280	7.1	1700	160	1850	2918	460	75	5114306001	

16 and 18 outlets

DN	Ød	ØA	B	C	E	ØF	L	kg	t/h	16 outlets		18 outlets	
										Item no.	€	Item no.	€
100	98	1200	3.6	925	112	950	1963	127	4	5116106001		5118106001	
120	118	1600	4.0	1255	120	1330	2373	235	6	5116126001		5118126001	
150	148	1600	4.5	1230	125	1310	2348	240	12	5116156001		5118156001	
175	173	2280	5.4	1815	130	1954	3133	405	22	5116176001		5118176001	
200	198	2280	6.3	1790	135	1937	3108	430	32	5116206001		5118206001	
250	248	2280	6.3	1745	150	1885	2963	435	50	5116256001			

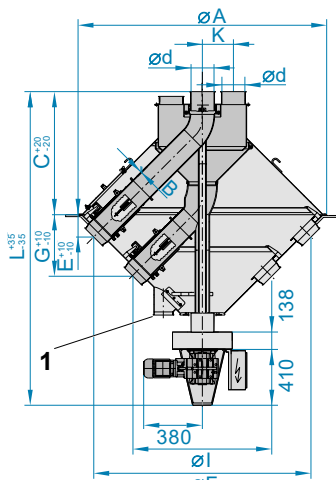
20 outlets

DN	Ød	ØA	B	C	E	ØF	L	kg	t/h	Item no.	€
100	98	1600	3.6	1275	112	1350	2393	227	4	5120106001	
120	118	1600	4.0	1255	120	1330	2373	235	6	5120126001	
150	148	2280	4.5	1835	125	2019	3153	380	12	5120156001	
175	173	2280	5.4	1815	130	1954	3133	405	22	5120176001	
200	198	2280	6.3	1790	135	1937	3108	430	32	5120206001	



MULTI-WAY DISTRIBUTORS

Double turn-head distributors



1 Spillage outlet

DOUBLE TURN-HEAD DISTRIBUTORS 45°

2340

- All dimensions are approximate
- Standard values for flow rates for granular products with a bulk density of 750 kg/m³, with a moisture content of max. 15 %
- Lower funnel circumference according to data sheet
- Spillage outlet DN 120 mm
- Please also read and take into account the technical information given at the beginning of this chapter

2 x 8 and 2 x 10 outlets

DN	Ø d	Ø A	B	C	E	Ø F	G	I	K	L	kg	t/h	2 x 8 outlets		2 x 10 outlets	
													Item no.	€	Item no.	€
120	118	1600	4.0	820	150	1375	345	990	160	2220	345	12	52081245	€	52101245	€
150	148	1600	4.5	810	160	1370	395	895	190	2210	350	25	52081545	€	52101545	€
175	173	2280	5.4	1145	170	2040	430	1515	215	2385	550	45	52081745	€	52101745	€
200	198	2280	6.3	1135	180	2020	475	1435	240	2375	562	65	52082045	€	52102045	€
250	248	2280	6.3	1110	210	1960	530	1325	290	2900	577	100	52082545	€	52102545	€

2 x 12 outlets

DN	Ø d	Ø A	B	C	E	Ø F	G	I	K	L	kg	t/h	Item no.	€
120	118	1600	4.0	820	150	1375	345	990	160	2220	345	12	52121245	€
150	148	1600	4.5	810	160	1370	395	895	190	2210	350	25	52121545	€
175	173	2280	5.4	1145	170	2040	430	1515	215	2385	550	45	52121745	€
200	198	2280	6.3	1135	180	2020	475	1435	240	2375	562	65	52122045	€

2 x 14 and 2 x 16 outlets

DN	Ø d	Ø A	B	C	E	Ø F	G	I	K	L	kg	t/h	2 x 14 outlets		2 x 16 outlets	
													Item no.	€	Item no.	€
120	118	1600	4.0	820	150	1375	345	990	160	2220	345	12	52141245	€	52161245	€
150	148	2280	4.5	1160	160	2075	395	1595	190	2400	540	25	52141545	€	52161545	€
175	173	2280	5.4	1145	170	2040	430	1515	215	2385	550	45	52141745	€	52161745	€
200	198	2280	6.3	1135	180	2020	475	1435	240	2375	562	65	52142045	€	52162045	€

2 x 18 and 2 x 20 outlets

DN	Ø d	Ø A	B	C	E	Ø F	G	I	K	L	kg	t/h	2 x 18 outlets		2 x 20 outlets	
													Item no.	€	Item no.	€
120	118	2280	4.0	1170	150	2075	345	1690	160	2410	532	12	52181245	€	52201245	€
150	148	2280	4.5	1160	160	2075	395	1595	190	2400	540	25	52181545	€	52201545	€
175	173	2280	5.4	1145	170	2040	430	1515	215	2385	550	45	52181745	€		€



DOUBLE TURN-HEAD DISTRIBUTORS 60°

2350

- All dimensions are approximate
- Standard values for flow rates for granular products with a bulk density of 500 kg/m³, with a moisture content of max. 15 %
- Lower funnel circumference according to data sheet
- Spillage outlet DN 120 mm
- Please also read and take into account the technical information given at the beginning of this chapter

2 x 8 outlets

DN	Ød	ØA	B	C	E	ØF	G	I	K	L	kg	t/h	Item no.	€
120	118	1600	4.0	1285	115	1325	265	805	160	2420	350	6	52081260	
150	148	1600	4.5	1255	120	1310	305	680	190	2390	355	12	52081560	
175	173	2280	5.4	1835	130	1975	335	1285	215	3170	566	22	52081760	
200	198	2280	6.3	1825	135	1960	365	1170	240	3160	580	32	52082060	
250	248	2280	6.3	1765	155	1890	425	1000	290	3100	597	50	52082560	

2 x 10 and 2 x 12 outlets

DN	Ød	ØA	B	C	E	ØF	G	I	K	L	kg	t/h	2 x 10 outlets		2 x 12 outlets	
													Item no.	€	Item no.	€
120	118	1600	4.0	1285	115	1325	265	805	160	2420	350	6	52101260	€	52121260	€
150	148	2280	4.5	1860	120	2010	305	1380	190	3195	555	12	52101560	€	52121560	€
175	173	2280	5.4	1835	130	1975	335	1285	215	3170	566	22	52101760	€	52121760	€
200	198	2280	6.3	1825	135	1960	365	1170	240	3160	580	32	52102060	€	52122060	€

2 x 14 and 2 x 16 outlets

DN	Ød	ØA	B	C	E	ØF	G	I	K	L	kg	t/h	2 x 14 outlets		2 x 16 outlets	
													Item no.	€	Item no.	€
120	118	2280	4.0	1890	115	2025	265	1505	160	3225	545	6	52141260	€	52161260	€
150	148	2280	4.5	1860	120	2010	305	1380	190	3195	555	12	52141560	€	52161560	€
175	173	2280	5.4	1835	130	1975	335	1285	215	3170	566	22	52141760	€	52161760	€

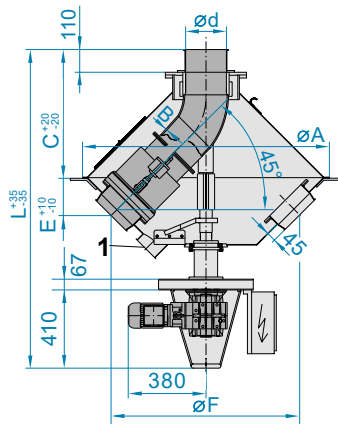
2 x 18 and 2 x 20 outlets

DN	Ød	ØA	B	C	E	ØF	G	I	K	L	kg	t/h	2 x 18 outlets		2 x 20 outlets	
													Item no.	€	Item no.	€
120	118	2280	4.0	1890	115	2025	265	1505	160	3225	545	6	52181260	€	52201260	€
150	148	2280	4.5	1860	120	2010	305	1380	190	3195	555	12	52181560	€	52201560	€



MULTI-WAY DISTRIBUTORS

Turn-head distributors, dust-tight version



1 Spillage outlet

TURN-HEAD DISTRIBUTORS, DUST-TIGHT 45°

2360

- All dimensions are approximate
- Spillage outlet = DN 120 mm
- Lower funnel circumference according to data sheet
- Please also read and take into account the technical information given at the beginning of this chapter

4 and 6 outlets

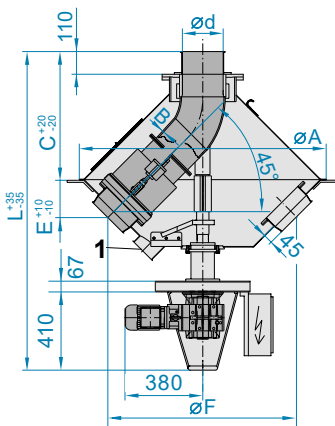
DN	Ø d	Ø A	B	C	E	Ø F	L	4 outlets		6 outlets	
								Item no.	€	Item no.	€
100	98	1200	5.0	643	138	1014	1617	54041045		54061045	
120	118	1200	5.0	621	155	980	1595	54041245		54061245	
150	148	1200	5.6	640	155	980	1614	54041545		54061545	
175	173	1200	5.4	622	173	944	1596	54041745		54061745	
200	198	1200	6.3	626	183	924	1600	54042045		54062045	
250	248	1600	6.3	784	219	1252	1960	54042545		54062545	
300	298	1600	7.1	817	219	1252	1993	54043045		54063045	

8 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	643	138	1014	1617	54081045	
120	118	1200	5.0	621	155	980	1595	54081245	
150	148	1200	5.6	640	155	980	1614	54081545	
175	173	1200	5.4	622	173	944	1596	54081745	
200	198	1200	6.3	626	183	924	1600	54082045	
250	248	1600	6.3	784	219	1252	1960	54082545	
300	298	1600	7.1	817	219	1252	1993	54083045	

10 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	643	138	1014	1617	54101045	
120	118	1200	5.0	621	155	980	1595	54101245	
150	148	1200	5.6	640	155	980	1614	54101545	
175	173	1200	5.4	622	173	944	1596	54101745	
200	198	1600	6.3	826	183	1324	2002	54102045	
250	248	1600	6.3	784	219	1252	1960	54102545	



1 Spillage outlet

12 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	643	138	1014	1617	54121045	
120	118	1200	5.0	621	155	980	1595	54121245	
150	148	1200	5.6	640	155	980	1614	54121545	
175	173	1600	5.4	822	173	1344	1998	54121745	
200	198	1600	6.3	826	183	1324	2002	54122045	

14 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	643	138	1014	1617	54141045	
120	118	1200	5.0	621	155	980	1595	54141245	
150	148	1600	5.6	840	155	1380	2016	54141545	
175	173	1600	5.4	822	173	1344	1998	54141745	

16 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	643	138	1014	1617	54161045	
120	118	1600	5.0	821	155	1380	1997	54161245	
150	148	1600	5.6	840	155	1380	2016	54161545	
175	173	1600	5.4	822	173	1344	1998	54161745	

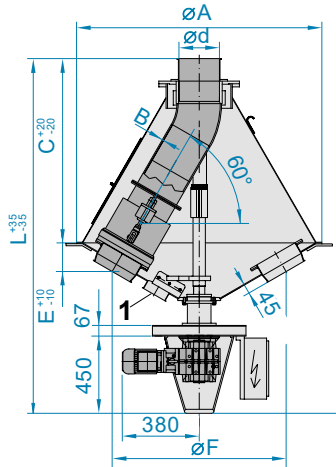
18 and 20 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	18 outlets		20 outlets	
								Item no.	€	Item no.	€
100	98	1600	5.0	843	138	1414	2019	54181045		54201045	
120	118	1600	5.0	821	155	1380	1997	54181245		54201245	



MULTI-WAY DISTRIBUTORS

Turn-head distributors, dust-tight version



1 Spillage outlet

TURN-HEAD DISTRIBUTORS, DUST-TIGHT 60°

2370

- All dimensions are approximate
- Spillage outlet = DN 120 mm
- Lower funnel circumference according to data sheet
- Please also read and take into account the technical information given at the beginning of this chapter

4 and 6 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	4 outlets		6 outlets	
								Item no.	€	Item no.	€
100	98	1200	5.0	970	112	958	1889	54041060		54061060	
120	118	1200	5.0	946	120	932	1865	54041260		54061260	
150	148	1200	5.6	939	125	914	1858	54041560		54061560	
175	173	1200	5.4	910	135	880	1829	54041760		54061760	
200	198	1200	6.3	910	140	862	1829	54042060		54062060	
250	248	1600	6.3	1215	155	1210	2250	54042560		54062560	
300	298	1600	7.1	1196	165	1176	2231	54043060		54063060	

8 outlets

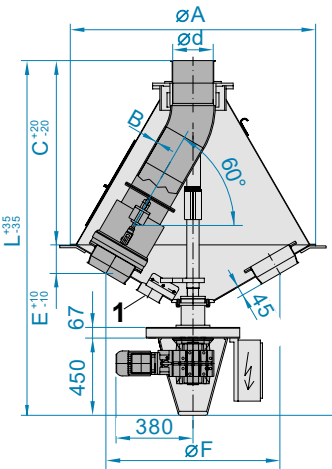
DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	970	112	958	1889	54081060	
120	118	1200	5.0	946	120	932	1865	54081260	
150	148	1200	5.6	939	125	914	1858	54081560	
175	173	1200	5.4	910	135	880	1829	54081760	
200	198	1200	6.3	910	140	862	1829	54082060	
250	248	1600	6.3	1215	155	1210	2250	54082560	
300	298	1600	7.1	1196	165	1176	2231	54083060	

10 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	970	112	958	1889	54101060	
120	118	1200	5.0	946	120	932	1865	54101260	
150	148	1200	5.6	939	125	914	1858	54101560	
175	173	1200	5.4	910	135	880	1829	54101760	
200	198	1600	6.3	1256	140	1262	2291	54102060	
250	248	1600	6.3	1215	155	1210	2250	54102560	
300	298	2280	7.1	1785	165	1856	3016	54103060	

12 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	970	112	958	1889	54121060	
120	118	1200	5.0	946	120	932	1865	54121260	
150	148	1600	5.6	1285	125	1314	2320	54121560	
175	173	1600	5.4	1257	135	1280	2292	54121760	
200	198	1600	6.3	1256	140	1262	2291	54122060	
250	248	2280	6.3	1804	155	1890	3035	54122560	
300	298	2280	7.1	1785	165	1856	3016	54123060	



1 Spillage outlet

14 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	970	112	958	1889	54141060	
120	118	1200	5.0	946	120	932	1865	54141260	
150	148	1600	5.6	1285	125	1314	2320	54141560	
175	173	1600	5.4	1257	135	1280	2292	54141760	
200	198	2280	6.3	1845	140	1942	3076	54142060	
250	248	2280	6.3	1804	155	1890	3035	54142560	
300	298	2280	7.1	1785	165	1856	3016	54143060	

16 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	Item no.	€
100	98	1200	5.0	970	112	958	1889	54161060	
120	118	1600	5.0	1293	120	1332	2328	54161260	
150	148	1600	5.6	1285	125	1314	2320	54161560	
175	173	2280	5.4	1845	135	1960	3076	54161760	
200	198	2280	6.3	1845	140	1942	3076	54162060	
250	248	2280	6.3	1804	155	1890	3035	54162560	

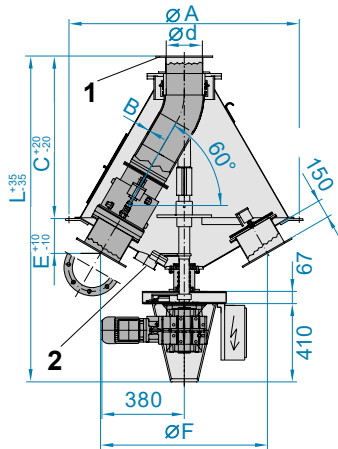
18 and 20 outlets

DN	Ø d	Ø A	B	C	E	Ø F	L	18 outlets		20 outlets	
								Item no.	€	Item no.	€
100	98	1600	5.0	1316	112	1358	2351	54181060		54201060	
120	118	1600	5.0	1293	120	1332	2328	54181260		54201260	
150	148	2280	5.6	1874	125	1994	3105	54181560		54201560	
175	173	2280	5.4	1845	135	1960	3076	54181760		54201760	
200	198	2280	6.3	1845	140	1942	3076	54182060		54202060	



MULTI-WAY DISTRIBUTORS

Swivel pipe switches



- 1 Inlet and outlets with welded-on flanges according to DIN 1092-1, PN 10
 2 Spillage outlet

SWIVEL PIPE SWITCHES 60°

2340

- All dimensions are approximate
- Inlet and outlets with welded-on flanges according to DIN EN 1092-1, PN 10, 10 mm thick
- Hole pattern axial-free to inspection flap (without counter flange)
- Spillage outlet = DN 120 mm
- Lower funnel circumference according to data sheet
- Please also read and take into account the technical information given at the beginning of this chapter

4 and 6 outlets

DN	$\varnothing d$	$\varnothing A$	B	C	E	$\varnothing F$	L	4 outlets		6 outlets	
								Item no.	€	Item no.	€
80	80	1200	5.0	998	193	1096	1917	53040860		53060860	
100	99	1200	8.0	970	203	1064	1889	53041060		53061060	
120	118	1200	8.0	946	211	1038	1865	53041260		53061260	
150	148	1200	10.0	939	216	1020	1858	53041560		53061560	
200	197	1200	11.0	910	231	968	1829	53042060		53062060	

8 outlets

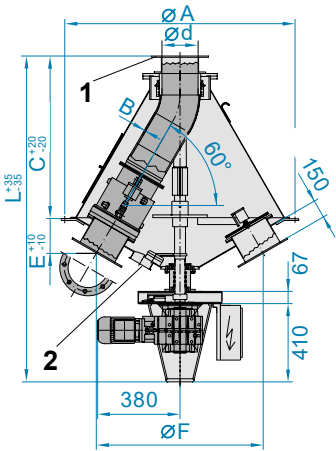
DN	$\varnothing d$	$\varnothing A$	B	C	E	$\varnothing F$	L	8 outlets	
								Item no.	€
80	80	1200	5.0	998	193	1096	1917	53080860	
100	99	1200	8.0	970	203	1064	1889	53081060	
120	118	1200	8.0	946	211	1038	1865	53081260	
150	148	1200	10.0	939	216	1020	1858	53081560	
200	197	1200	11.0	910	231	968	1829	53082060	

10 and 12 outlets

DN	$\varnothing d$	$\varnothing A$	B	C	E	$\varnothing F$	L	10 outlets		12 outlets	
								Item no.	€	Item no.	€
80	80	1200	5.0	998	193	1096	1917	53100860		53120860	
100	99	1200	8.0	970	203	1064	1889	53101060		53121060	
120	118	1200	8.0	946	211	1038	1865	53101260		53121260	
150	148	1200	10.0	939	216	1020	1858	53101560			
200	197	1600	11.0	1256	231	1368	2291	53102060		53122060	



14 outlets

DN	$\varnothing d$	$\varnothing A$	B	C	E	$\varnothing F$	L	14 outlets	
								Item no.	€
80	80	1200	5.0	998	193	1096	1917	53140860	
100	99	1200	8.0	970	203	1064	1889	53141060	




- 1 Inlet and outlets with welded-on flanges according to DIN 1092-1, PN 10
- 2 Spillage outlet



4 and 6 outlets, product-contacting parts made of stainless steel

DN	Ø d	Ø A	B	C	E	Ø F	L	4 outlets 		6 outlets 	
								Item no.	€	Item no.	€
80	80	1200	4.5	998	193	1096	1917	63040860		63060860	
100	99	1200	7.1	970	203	1064	1889	63041060		63061060	
120	118	1200	9.5	946	211	1038	1865	63041260		63061260	
150	148	1200	8.5	939	216	1020	1858	63041560		63061560	
200	197	1200	11.0	910	231	968	1829	63042060		63062060	


8 outlets, product-contacting parts made of stainless steel

DN	Ø d	Ø A	B	C	E	Ø F	L	8 outlets 	
								Item no.	€
80	80	1200	4.5	998	193	1096	1917	63080860	
100	99	1200	7.1	970	203	1064	1889	63081060	
120	118	1200	9.5	946	211	1038	1865	63081260	
150	148	1200	8.5	939	216	1020	1858	63081560	
200	197	1200	11.0	910	231	968	1829	63082060	

10 and 12 outlets, product-contacting parts made of stainless steel

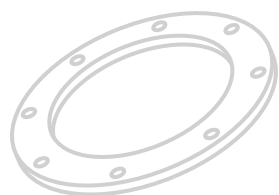
DN	Ø d	Ø A	B	C	E	Ø F	L	10 outlets 		12 outlets 	
								Item no.	€	Item no.	€
80	80	1200	4.5	998	193	1096	1917	63100860		63120860	
100	99	1200	7.1	970	203	1064	1889	63101060		63121060	
120	118	1200	9.5	946	211	1038	1865	63101260		63121260	
150	148	1200	8.5	939	216	1020	1858	63101560			
200	197	1600	11.0	1256	231	1368	2291	63102060		63122060	

14 outlets, product-contacting parts made of stainless steel

DN	Ø d	Ø A	B	C	E	Ø F	L	14 outlets 	
								Item no.	€
80	80	1200	4.5	998	193	1096	1917	63140860	
100	99	1200	7.1	970	203	1064	1889	63141060	



THE WHOLE JACOB DIVERSITY –
WITH LOOSE AND WELDED FLANGES



THE FLANGE RANGE

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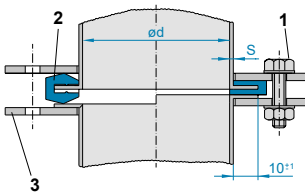


FOR LARGE DIAMETERS: FLANGES

The whole world of JACOBS diversity is also available with a flange connection. Larger diameters with a high level of tightness are available in particular for large ventilation systems extracting dust, oil mist or other condensates. JACOBS's range of flanges provides the ideal solution for this purpose.

IMPLEMENTATION

JACOBS flanged pipework is available in wall thicknesses from 1 to 3 mm. Pipe components and pressed components for loose flange connections from DN 350 to 1250 mm are provided with a 10 mm lip. The flanges are pre-fitted and are connected with a U-shaped seal and nuts and bolts. The U-shaped seal for loose flanges is fitted over one of the lipped ends. The flanges are then bolted to each other. Diameters 1400 and 1600 mm are provided with welded-on flanges in the standard version.



JACOBS loose flange system

- 1 Mounting bolts
 - 2 U-shaped seal for 10 mm lip
 - 3 Loose flange to DIN 24154-2
- S = Wall thickness
 $\varnothing d$ = Internal diameter

Mild steel:

DN 350 to 630 mm:

- Surface powder-coated, conductive, RAL 7032 (pebble grey) or galvanised
- Electrostatic continuity can be achieved through the use of the EPDM U-shaped seal or the earthing lug with earthing wire

DN 710 to 1600 mm:

- Corrosion protection: Surface spray-primed in colour RAL 7032 (pebble grey) or galvanised
- Priming coat is not conductive
- Electrostatic continuity can be achieved through the use of earthing lugs in conjunction with earthing wire

DN 1400 to 1600 mm:

- Standard version with 3 mm wall thickness
- With welded-on flanges
- Surface spray-primed in colour RAL 7032 (pebble grey) or galvanised

All mass-produced parts made of mild steel are delivered with earthing lugs to safeguard the loose flanges.

Stainless steel:

DN 350 to 1250 mm:

- Version with galvanised loose flanges
- Alternatively: Loose flange in shotblasted stainless steel
- Surface shotblasted
- For diameters $>DN$ 630 mm, surface pickled and passivated, depending on order volume

DN 1400 to 1600 mm

- Standard version with 3 mm wall thickness
- With welded-on stainless steel flanges
- All stainless steel parts $>DN$ 1250 mm are pickled and passivated

Refer to chapter 1, Materials and finishing, for more information on materials and tolerances.

See chapter 1, types of connection and dimensions, for an overview of internal diameters.

SEALS

JACOBS has U-shaped seals and ring seals in a variety of materials to obtain the best possible seal even with the loose flange system.

- Tear-resistant, FOOD GRADE and resistant to many aggressive chemicals thanks to vulcanisation
- Maximum tightness through an ideal profile
- Resistance to a broad range of substances due to large selection of materials available
- Metal-detectable and FOOD GRADE thanks to special materials (DETECTABLE DESIGN line)

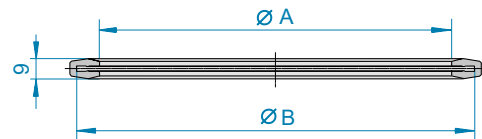


U-shaped seals for loose flange system with 10 mm lip



NBR	Silicone F	Silicone F D	EPDM	Viton (FKM) F
grey white	beige	blue	black	reddish brown
EC 1935/2004	FOOD GRADE: EC 1935/2004 plus FDA compliant	FOOD GRADE: EC 1935/2004 plus FDA compliant	EC 1935/2004	FOOD GRADE: EC 1935/2004 plus FDA compliant
-20°C to +100°C	-60°C to +250°C	-60°C to +250°C	-30°C to +120°C	-18°C to +230°C
glued	vulcanised	vulcanised	vulcanised	vulcanised
		metal-detectable	electrostatically conductive	

Profile for loose flange pipework with a 10 mm lip



Use for 1-3 mm pipework system

For connecting:

- 2 pipe components with loose flange from > DN 350 mm with 10 mm lip
- Pipe component with a welded flange in conjunction with a pipe component with a loose flange

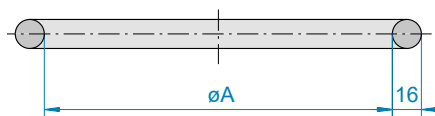
A U-shaped seal (chapter 2) must be used for pipe components with a loose flange diameter of up to 350 mm and a 6 mm lip

Ring seals for push-in pipes with a flange connection



NBR	Silicone F	Silicone F D	EPDM	Viton (FKM) F
grey white	beige	blue	black	reddish brown
EC 1935/2004	FOOD GRADE: EC 1935/2004 plus FDA compliant	FOOD GRADE: EC 1935/2004 plus FDA compliant	EC 1935/2004	FOOD GRADE: EC 1935/2004 plus FDA compliant
-20°C to +100°C	-60°C to +250°C	-60°C to +250°C	-30°C to +120°C	-18°C to +230°C
glued	vulcanised	vulcanised	vulcanised	vulcanised
		metal-detectable	electrostatically conductive	

Profile diameter: 16 mm



Use for 1-3 mm pipework system

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



Flat seals for loose flanges and welded flanges



NBR	Silicone F	Silicone F D	EPDM
grey white	opaque	blue	black
EC 1935/2004 up to DN 1000 mm	FOOD GRADE: EC 1935/2004 and FDA up to DN 1000 mm	FOOD GRADE: EC 1935/2004 and FDA up to DN 1000 mm	
-30°C to +80°C	-60°C to +230°C	-60°C to +230°C	-40°C to +100°C
Adhesive-free up to DN 1000 mm	Adhesive-free up to DN 1000 mm	Adhesive-free up to DN 1000 mm	Adhesive-free up to DN 1000 mm
from DN 1120 mm glued from segments	from DN 1120 mm glued from segments	from DN 1120 mm glued from segments	from DN 1120 mm glued from segments
		metal-detectable	electrostatically conductive

- Thickness: DN 350 to 800 mm: 3 mm, DN 900 to 1600 mm: 4 mm
- Temperatures apply for adhesive-free silicone seals up to DN 1000 mm

Seals for cleaning pipes

- In stainless steel version, door sealed with silicone seal (beige)
- Alternatively, also available in DETECTABLE DESIGN line with blue silicone seal
- In version with powder-coated or galvanised surfaces, door sealed with NBR seal



NBR	Silicone F	Silicone F D
grey white	beige	blue
EC 1935/2004	FOOD GRADE: EC 1935/2004 plus FDA compliant	FOOD GRADE: EC 1935/2004 plus FDA compliant
-20°C to +100°C	-60°C to +250°C	-60°C to +250°C
glued	vulcanised	vulcanised
		metal-detectable

APPLICATIONS

Use in the area of bulk goods conveying and ventilation systems at over-pressures of 50,000 Pa (500 mbar, 5000 mm WG). DN 900 to 1250 mm with loose flanges are only recommended for use in air. In the case of higher tightness requirements, we recommend welded-on flanges from diameters of 900 mm.

Pipes in 1 mm wall thickness and cleaning pipes for ventilation systems up to 100 mbar over-pressure can be used.

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



EXPLOSION PROTECTION

Flanged pipework was tested in the following configuration up to 3 bar over-pressure:

Pipes	2 mm thick up to DN 800 mm
Segments 5° to 45°	2 mm thick up to DN 800 mm
Bends 30° to 90°	2 mm thick up to DN 800 mm
T-pieces	2 mm thick up to DN 500 mm, 3 mm thick up to DN 800 mm
Forks 30° and 45°	2 mm thick up to DN 500 mm, 3 mm thick up to DN 630 mm
Cone pieces	2 mm thick up to DN 630 mm, 3 mm thick up to DN 800 mm
Symmetrical forks 60°	2 mm thick up to DN 500 mm, 3 mm thick up to DN 800 mm
Symmetrical forks 90°	3 mm thick up to DN 630 mm

- For shock explosion proof pipe connections, bolt quality 8.8 is required
- Bolt torque: M 10 = 40 Nm, M 12 = 60 Nm

Cleaning pipes are not available in a shock explosion proof version. Alternatively, inspection pipes (diameter of opening 115 mm) up to DN 630 mm pipe diameter can be delivered in a special version.

YOUR INDIVIDUAL PIPEWORK SYSTEM

We can supply your individual pipework system on request. Prices on request.

- JACOB pipework system with welded-on flanges
- Over 3,000 special colours
- Earthing lugs on request
- Additional diameters and wall thicknesses
- Stainless steel with pickled and passivated surface, including up to a diameter of 1250 mm
- Stainless steel in other steel qualities, e.g. 1.4571, AISI 316Ti with flanges in pickled and passivated stainless steel
- 3 mm pipes and pressed components on request, stainless steel only available with welded-on flanges

THROTTLE VALVES

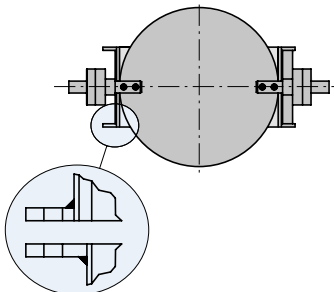
- Diameters: DN 350 to 1250 mm
- DN 350 to 800 mm available with loose flange according to DIN 24154-2
- From DN 900 mm, 3 mm wall thickness with welded-on flanges according to DIN 24154-2
- Shafts with ball bearings and sealed with Viton O-rings
- DN 350 and 400 mm also available with 6 mm lip, see chapter 8

Special versions available – prices on request

- From DN 400 mm to DN 1000 mm with glued silicone inner flap seal and welded-on flanges according to DIN 24154-2, but without counter-flange (see drawing)
- Version with pneumatic or electric actuator

INSTALLATION INFORMATION

- Mounting bolts in installation kit: see page 226
- Bolt torque: M10 = 40 Nm, M 12 = 60 Nm

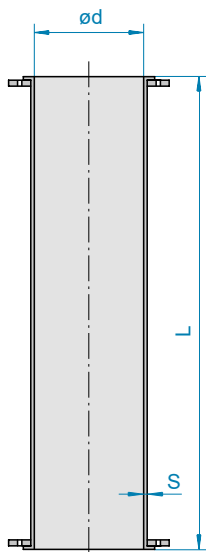


Special version: Throttle valve from DN 400 mm with glued silicone seal
 – Without cross-section constriction
 – Shaft with ball bearings and sealed with a Viton O-ring



THE FLANGE RANGE

Welded pipes



The pipe length and diameter DN are nominal dimensions, the actual length is indicated in L

PIPES 2000 MM

6010

- Both sides with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed

Powder-coated and galvanised (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm powder-coated		2 mm powder-coated		1 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	1976	40.60	21351010		22351010		21352010		22352010	
400	398	1976	46.20	21401010		22401010		21402010		22402010	
450	448	1976	52.10	21451010		22451010		21452010		22452010	
500	498	1976	57.90	21501010		22501010		21502010		22502010	
560	558	1976	64.70			22561010				22562010	
630	628	1980	75.00			22631010				22632010	
710	707	1980	84.00			22711010				22712010	
800	797	1980	100.00			22801010				22802010	
900	897	1980	108.92			229910104090				229920104090	
1000	998	1980	121.14			229910104100				229920104100	
1120	1118	1980	146.60			229910104112				229920104112	
1250	1248	1980	163.46			229910104125				229920104125	
1400	1398	2000	253.10			239910105140*				239920105140*	
1600	1598	2000	288.86			239910105160*				239920105160*	

*3 mm

Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	Stainless steel with galvanised loose flanges F				Stainless steel with stainless steel loose flange, shotblasted F			
				1 mm		2 mm		1 mm		2 mm	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	1976	40.60	21353010		22353010		213530103		223530103	
400	398	1976	46.20	21403010		22403010		214030103		224030103	
450	448	1976	52.10	21453010		22453010		214530103		224530103	
500	498	1976	57.90	21503010		22503010		215030103		225030103	
560	558	1976	64.70			22563010				225630103	
630	628	1980	75.00			22633010				226330103	
710	707	1980	84.00			22713010				227130103	
800	797	1980	100.00			22803010					
900	897	1980	108.92			229930104090					
1000	998	1980	121.14			229930104100					
1120	1118	1980	146.60			229930104112					
1250	1248	1980	163.46			229930104125					
1400	1398	2000	253.10							239930105140*	
1600	1598	2000	288.86							239930105160*	

*3 mm

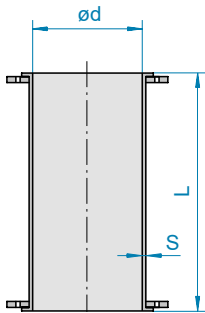
F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



PIPES 1000 MM

6010



The pipe length and diameter DN are nominal dimensions, the actual length is indicated in L

Powder-coated and galvanised (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm powder-coated		2 mm powder-coated		1 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	976	22.70	21351020		22351020		21352020		22352020	
400	398	976	25.30	21401020		22401020		21402020		22402020	
450	448	976	29.40	21451020		22451020		21452020		22452020	
500	498	976	33.20	21501020		22501020		21502020		22502020	
560	558	976	36.60			22561020				22562020	
630	628	976	45.00			22631020				22632020	
710	707	980	48.00			22711020				22712020	
800	797	980	56.00			22801020				22802020	
900	897	980	63.63			229910204090				229920204090	
1000	998	980	70.77			229910204100				229920204100	
1120	1118	980	90.20			229910204112				229920204112	
1250	1248	980	100.53			229910204125				229920204125	
1400	1398	1000	147.55			239910205140*				239920205140*	
1600	1598	1000	168.23			239910205160*				239920205160*	

*3 mm

Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	Stainless steel with galvanised loose flanges F				Stainless steel with stainless steel loose flange, shotblasted F			
				1 mm		2 mm		1 mm		2 mm	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	976	22.70	21353020		22353020		213530203		223530203	
400	398	976	25.30	21403020		22403020		214030203		224030203	
450	448	976	29.40	21453020		22453020		214530203		224530203	
500	498	976	33.20	21503020		22503020		215030203		225030203	
560	558	976	36.60			22563020				225630203	
630	628	976	45.00			22633020				226330203	
710	707	980	48.00			22713020				227130203	
800	797	980	56.00			22803020					
900	897	980	63.63			229930204090					
1000	998	980	70.77			229930204100					
1120	1118	980	90.20			229930204112					
1250	1248	980	100.53			229930204125					
1400	1398	1000	147.55							239930205140*	
1600	1598	1000	168.23							239930205160*	

*3 mm

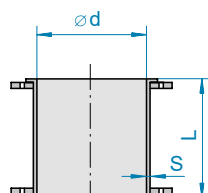
F FOOD GRADE
EC 1935/2004 plus FDA compliant

 Shock explosion proof tested
up to 3 bar



THE FLANGE RANGE

Welded pipes



The pipe length and diameter DN are nominal dimensions, the actual length is indicated in L

PIPES 500 MM

6010

Powder-coated and galvanised (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm powder-coated		2 mm powder-coated		1 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	478	14.60	21351030		22351030		21352030		22352030	
400	398	478	16.30	21401030		22401030		21402030		22402030	
450	448	478	18.50	21451030		22451030		21452030		22452030	
500	498	478	20.60	21501030		22501030		21502030		22502030	
560	558	478	22.60			22561030				22562030	
630	628	478	25.40			22631030				22632030	
710	707	480	32.00			22711030				22712030	
800	797	480	36.00			22801030				22802030	
900	897	480	40.98			229910304090				229920304090	
1000	998	480	45.60			229910304100				229920304100	
1120	1118	480	62.00			229910304112				229920304112	
1250	1248	480	69.07			229910304125				229920304125	
1400	1398	500	94.78			239910305140*				239920305140*	
1600	1598	500	107.92			239910305160*				239920305160*	

*3 mm

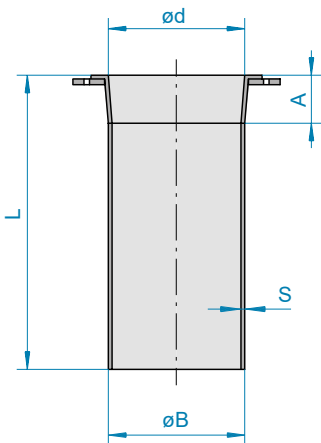
Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	L	kg	1 mm stainless steel with galvanised loose flanges F				2 mm stainless steel with stainless steel shotblasted loose flange F			
				1 mm		2 mm		1 mm		2 mm	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	478	14.60	21353030		22353030		213530303		223530303	
400	398	478	16.30	21403030		22403030		214030303		224030303	
450	448	478	18.50	21453030		22453030		214530303		224530303	
500	498	478	20.60	21503030		22503030		215030303		225030303	
560	558	478	22.60			22563030				225630303	
630	628	478	25.40			22633030				226330303	
710	707	480	32.00			22713030				227130303	
800	797	480	36.00			22803030					
900	897	480	40.98			229930304090					
1000	998	480	45.60			229930304100					
1120	1118	480	62.00			229930304112					
1250	1248	480	69.07			229930304125					
1400	1398	500	94.78							239930305140*	
1600	1598	500	107.92							239930305160*	

*3 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



PUSH-IN PIPES 1000 MM

6020

- For information on push-in pipe applications, see chapter 3
- One side with loose flange
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed
- Use in conjunction with ring seal and flange for push-in pipe

Powder-coated and galvanised (dimensions for 2 mm pipework)

DN	Ø d	A	Ø B	L	kg	1.5 mm powder-coated		2 mm powder-coated		1.5 mm galvanised		2 mm galvanised	
						Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	350	50	345	986	18.00	21351110		22351110		21352110		22352110	
400	399	50	394	986	22.00	21401110		22401110		21402110		22402110	
450	448	50	444	986	29.45	21451110		22451110		21452110		22452110	
500	498	50	494	986	29.40	21501110		22501110		21502110		22502110	
560	558	50	554	986	32.00			22561110				22562110	
630	628	50	624	986	36.00			22631110				22632110	
710	707	50	703	986	42.00			22711110				22712110	
800	797	100	792	986	40.00			22801110				22802110	

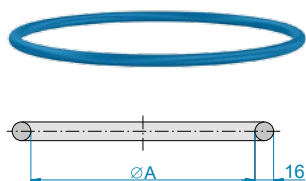
Stainless steel (dimensions for 1 mm pipework)

DN	Ø d	A	Ø B	L	kg	1 mm stainless steel with galvanised loose flanges		2 mm stainless steel with galvanised loose flange	
						Item no.	€	Item no.	€
350	350	50	345	986	18.00	21353110		22353110	
400	399	50	394	986	22.00	21403110		22403110	
450	448	50	444	986	29.45	21453110		22453110	
500	498	50	494	986	29.40	21503110		22503110	
560	558	50	554	986	32.00			22563110	
630	628	50	624	986	36.00			22633110	
710	707	50	703	986	42.00			22713110	
800	797	100	792	986	40.00			22803110	



THE FLANGE RANGE

Push-in pipes and accessories



RING SEALS FOR PUSH-IN PIPES WITH A FLANGE CONNECTION

6030

- Usable for 1-3 mm pipework system
- Use in conjunction with push-in pipe and flange for push-in pipe
- Protect pipework against axial displacement
- Admissible differential pressure: approx. 50 mbar
- Please also read and take into account the technical information given at the beginning of this chapter

Use for 1-3 mm pipework system

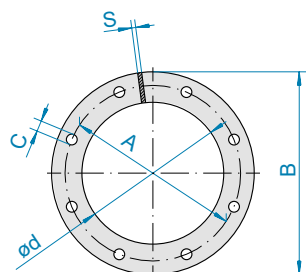
DN	ØA	kg	NBR grey		Silicone beige F		Silicone blue FD		EPDM black		FKM reddish brown F	
			Item no.	€	Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	327	0.34	203561177		2035711709		20357117091		2035811759		203591179	
400	373	0.38	204061177		2040711709		20407117091		2040811759		204091179	
450	421	0.42	204561177		2045711709		20457117091		2045811759		204591179	
500	468	0.48	205061177		2050711709		20507117091		2050811759		205091179	
560	524	0.54	205661177		2056711709		20567117091		2056811759		205691179	
630	591	0.60	206361177		2063711709		20637117091		2063811759		206391179	
710	666	0.69	207161177		2071711709		20717117091		2071811759		207191179	
800	761	0.78	208061177		2080711709		20807117091		2080811759		208091179	



FLANGES FOR PUSH-IN PIPES

6040

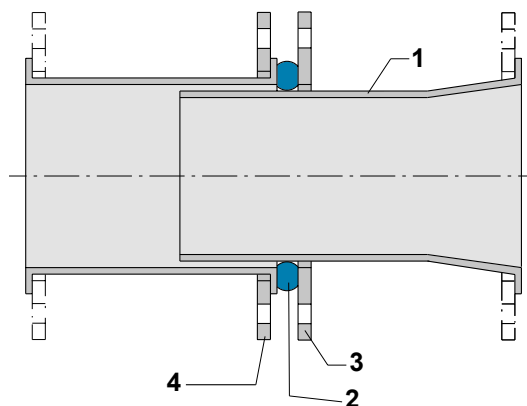
- Use in conjunction with ring seal for push-in pipe and standard pipe with loose flange
- Use 50 mm long mounting bolts



E = No. of holes

Powder-coated, galvanised and stainless steel

DN	Ød	A	B	C	E	S	kg	Powder-coated		Galvanised		Stainless steel	
								Item no.	€	Item no.	€	Item no.	€
350	348	405	438	11.5	8	8	3.46	20351724		20352724		20353724	
400	398	448	488	11.5	12	8	3.88	20401724		20402724		20403724	
450	448	497	538	11.5	12	8	4.33	20451724		20452724		20453724	
500	498	551	588	11.5	12	8	4.77	20501724		20502724		20503724	
560	556	629	656	14	16	8	5.86	20561724		20562724		20563724	
630	626	698	726	14	16	8	6.56	20631724		20632724		20633724	
710	705	775	805	14	16	8	7.34	20711724		20712724		20713724	
800	795	861	895	14	24	8	8.16	20801724		20802724		20803724	

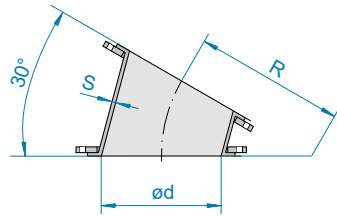


- 1 Push-in pipe
- 2 Ring seal for push-in pipe
- 3 Flange for push-in pipe
- 4 Straight pipe with loose flange

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable

Segments and bends



SEGMENTS 30°

6100

- Both sides with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel

- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated	
				Item no.	€	Item no.	€
350	349	438	9.40	21351320		22351320	
400	398	500	11.20	21401320		22401320	
450	448	563	14.40	21451320		22451320	
500	498	625	17.10	21501320		22501320	
560	558	700	17.00			22561320	
630	628	788	26.00			22631320	
710	707	888	30.00			22711320	
800	797	1000	38.00			22801320	
900	897	1126	43.88			229913204090	
1000	998	1250	51.89			229913204100	
1120	1118	1400	73.28			229913204112	
1250	1248	1563	86.79			229913204125	
1400	1398	1751	134.58			239913205140*	
1600	1598	2000	168.41			239913205160*	

*3 mm

Galvanised (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€
350	349	438	9.40	21352320		22352320	
400	398	500	11.20	21402320		22402320	
450	448	563	14.40	21452320		22452320	
500	498	625	17.10	21502320		22502320	
560	558	700	17.00			22562320	
630	628	788	26.00			22632320	
710	707	888	30.00			22712320	
800	797	1000	38.00			22802320	
900	897	1126	43.88			229923204090	
1000	998	1250	51.89			229923204100	
1120	1118	1400	73.28			229923204112	
1250	1248	1563	86.79			229923204125	
1400	1398	1751	134.58			239923205140*	
1600	1598	2000	168.41			239923205160*	

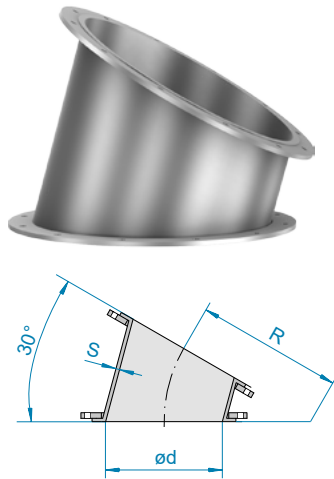
*3 mm

Shock explosion proof tested up to 3 bar



THE FLANGE RANGE

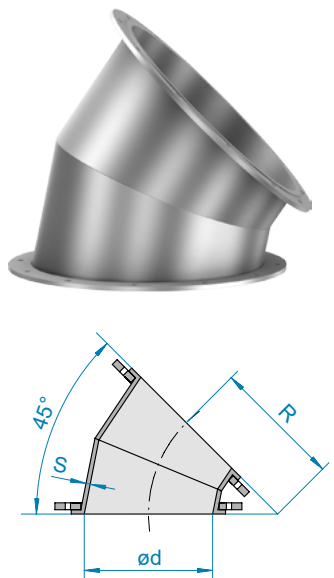
Segments and bends



Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	Stainless steel with galvanised loose flanges		F	Stainless steel with stainless steel loose flange, shotblasted	
				1.5 mm			2 mm	
				Item no.	€		Item no.	€
350	349	438	9.40	21353320	22353320		223533203	
400	398	500	11.20	21403320	22403320		224033203	
450	448	563	14.40	21453320	22453320		224533203	
500	498	625	17.10	21503320	22503320		225033203	
560	558	700	17.00		22563320		225633203	
630	628	788	26.00		22633320		226333203	
710	707	888	30.00		22713320		227133203	
800	797	1000	38.00		22803320			
900	897	1126	43.88		229933204090			
1000	998	1250	51.89		229933204100			
1120	1118	1400	73.28		229933204112			
1250	1248	1563	86.79		229933204125			
1400	1398	1751	134.58				239933205140*	
1600	1598	2000	168.41				239933205160*	

*3 mm



SEGMENTS 45°

6110

- Both sides with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed

Powder-coated (dimensions for 2 mm pipework)

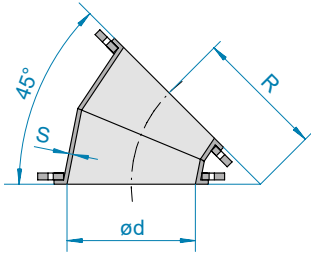
DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated	
				Item no.	€	Item no.	€
350	349	350	11.40	21351330		22351330	
400	398	400	13.30	21401330		22401330	
450	448	450	16.40	21451330		22451330	
500	498	500	19.00	21501330		22501330	
560	558	560	21.00			22561330	
630	628	630	27.00			22631330	
710	707	710	34.00			22711330	
800	797	800	42.00			22801330	
900	897	900	51.53			229913304090	
1000	998	1000	61.30			229913304100	
1120	1118	1120	85.15			229913304112	
1250	1248	1250	101.59			229913304125	
1400	1398	1400	162.30			239913305140*	
1600	1598	1600	204.68			239913305160*	

*3 mm

2 lobster back segments 22.5°

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested up to 3 bar



2 lobster back segments 22.5°

Galvanised (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€
350	349	350	11.40	21352330		22352330	
400	398	400	13.30	21402330		22402330	
450	448	450	16.40	21452330		22452330	
500	498	500	19.00	21502330		22502330	
560	558	560	21.00			22562330	
630	628	630	27.00			22632330	
710	707	710	34.00			22712330	
800	797	800	42.00			22802330	
900	897	900	51.53			229923304090	
1000	998	1000	61.30			229923304100	
1120	1118	1120	85.15			229923304112	
1250	1248	1250	101.59			229923304125	
1400	1398	1400	162.30			239923305140*	
1600	1598	1600	204.68			239923305160*	

*3 mm

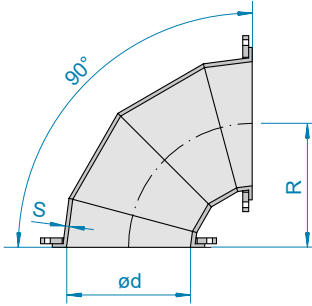
Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	Stainless steel with galvanised loose flanges F		Stainless steel with stainless steel loose flange, shotblasted F					
				1.5 mm		2 mm		1.5 mm		2 mm	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	350	11.40	21353330		22353330		213533303	237.00	223533303	
400	398	400	13.30	21403330		22403330		214033303	288.50	224033303	
450	448	450	16.40	21453330		22453330		214533303	314.50	224533303	
500	498	500	19.00	21503330		22503330		215033303	342.00	225033303	
560	558	560	21.00			22563330				225633303	
630	628	630	27.00			22633330				226333303	
710	707	710	34.00			22713330				227133303	
800	797	800	42.00			22803330					
900	897	900	51.53			229933304090					
1000	998	1000	61.30			229933304100					
1120	1118	1120	85.15			229933304112					
1250	1248	1250	101.59			229933304125					
1400	1398	1400	162.30							239933305140*	
1600	1598	1600	204.68							239933305160*	

*3 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



4 lobster back segments:
2x30°/2x15°

BENDS R = 1 D, 90°

6120

- Both sides with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel

- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated	
				Item no.	€	Item no.	€
350	349	350	16.00	21351339		22351339	
400	398	400	20.40	21401339		22401339	
450	448	450	24.40	21451339		22451339	
500	498	500	24.60	21501339		22501339	
560	558	560	36.00			22561339	
630	628	630	46.00			22631339	
710	707	710	56.00			22711339	
800	797	800	66.00			22801339	
900	897	900	82.77			229913394090	
1000	998	1000	99.85			229913394100	
1120	1118	1120	133.45			229913394112	
1250	1248	1250	161.74			229913394125	
1400	1398	1400	275.38			239913395140*	
1600	1598	1600	352.37			239913395160*	

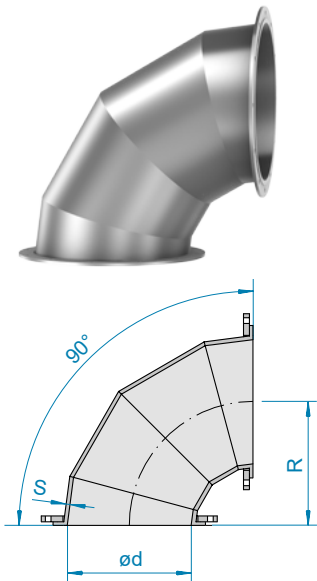
*3 mm

Galvanised (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€
350	349	350	16.00	21352339		22352339	
400	398	400	20.40	21402339		22402339	
450	448	450	24.40	21452339		22452339	
500	498	500	24.60	21502339		22502339	
560	558	560	36.00			22562339	
630	628	630	46.00			22632339	
710	707	710	56.00			22712339	
800	797	800	66.00			22802339	
900	897	900	82.77			229923394090	
1000	998	1000	99.85			229923394100	
1120	1118	1120	133.45			229923394112	
1250	1248	1250	161.74			229923394125	
1400	1398	1400	275.38			239923395140*	
1600	1598	1600	352.37			239923395160*	

*3 mm

Shock explosion proof tested up to 3 bar



4 lobster back segments:
2 x 30° / 2 x 15°

Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	Stainless steel with galvanised loose flanges		Stainless steel with stainless steel loose flange, shotblasted	
				1.5 mm		2 mm	
				Item no.	€	Item no.	€
350	349	350	16.00	21353339	22353339	213533393	223533393
400	398	400	20.40	21403339	22403339	214033393	224033393
450	448	450	24.40	21453339	22453339	214533393	224533393
500	498	500	24.60	21503339	22503339	215033393	225033393
560	558	560	36.00		22563339		225633393
630	628	630	46.00		22633339		226333393
710	707	710	56.00		22713339		227133393
800	797	800	66.00		22803339		228033393
900	897	900	82.77		229933394090		
1000	998	1000	99.85		229933394100		
1120	1118	1120	133.45		229933394112		
1250	1248	1250	161.74		229933394125		
1400	1398	1400	275.38				239933395140* 4127.00
1600	1598	1600	352.37				239933395160* 5216.00

*3 mm

BENDS R = 2 D, 30°

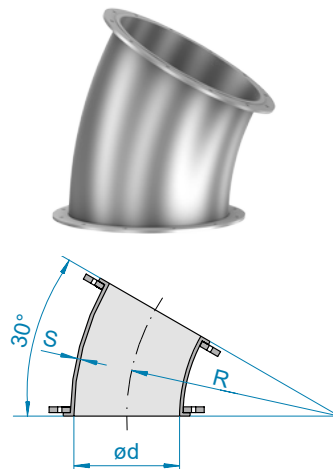
6130

- Both sides with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed

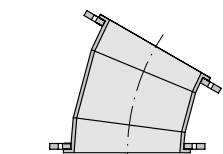
Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated	
				Item no.	€	Item no.	€
350	349	700	13.20			22351343	
400	398	800	15.20			22401343	
450	448	900	19.00	21451343		22451343	
500	498	1000	28.00	21501343		22501343	
560	558	1120	28.00			22561343	
630	628	1260	34.00			22631343	
710	707	1420	42.00			22711343	
800	797	1600	50.50			22801343	
900	897	1800	60.57			229913434090	
1000	998	2000	72.45			229913434100	
1120	1118	2240	99.08			229913434112	
1250	1248	2500	118.94			229913434125	
1400	1398	2800	194.92			239913435140*	
1600	1598	3200	247.28			239913435160*	

*3 mm



1 pressed segment 30°



3 lobster back segments:
1 x 15° / 2 x 7.5°

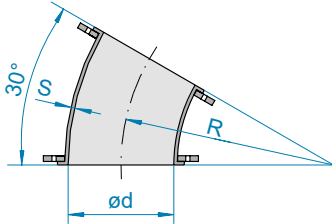
F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar

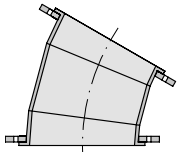


THE FLANGE RANGE

Segments and bends



1 pressed segment 30°



3 lobster back segments:
1 x 15°/2 x 7.5°

Galvanised (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€
350	349	700	13.20			22352343	
400	398	800	15.20			22402343	
450	448	900	19.00	21452343		22452343	
500	498	1000	23.00	21502343		22502343	
560	558	1120	28.00			22562343	
630	628	1260	34.00			22632343	
710	707	1420	42.00			22712343	
800	797	1600	50.50			22802343	
900	897	1800	60.57			229923434090	
1000	998	2000	72.45			229923434100	
1120	1118	2240	99.08			229923434112	
1250	1248	2500	118.94			229923434125	
1400	1398	2800	194.92			239923435140*	
1600	1598	3200	247.28			239923435160*	

*3 mm

Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	Stainless steel with galvanised loose flanges F				Stainless steel with stainless steel loose flange, shotblasted F			
				1.5 mm		2 mm		1.5 mm		2 mm	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	700	13.20			22353343		213533433	223533433		
400	398	800	15.20			22403343		214033433	224033433		
450	448	900	19.00	21453343		22453343		214533433	224533433		
500	498	1000	23.00	21503343		22503343		215033433	225033433		
560	558	1120	28.00			22563343			225633433		
630	628	1260	34.00			22633343			226333433		
710	707	1420	42.00			22713343			227133433		
800	797	1600	50.50			22803343					
900	897	1800	60.57			229933434090					
1000	998	2000	72.45			229933434100					
1120	1118	2240	99.08			229933434112					
1250	1248	2500	118.94			229933434125					
1400	1398	2800	194.92							239933435140*	
1600	1598	3200	247.28							239933435160*	

*3 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

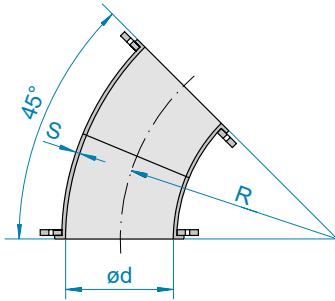
Shock explosion proof tested
up to 3 bar



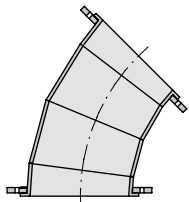
BENDS $R = 2 D$, 45°

6140

- Both sides with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed



■ 2 pressed segments 22.5°



■ 4 lobster back segments:
 $2 \times 15^\circ / 2 \times 7.5^\circ$

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated	
				Item no.	€	Item no.	€
350	349	700	17.12			22351344	
400	398	800	20.00			22401344	
450	448	900	24.20	21451344		22451344	
500	498	1000	29.50	21501344		22501344	
560	558	1120	37.00			22561344	
630	628	1260	39.20			22631344	
710	707	1420	54.00			22711344	
800	797	1600	72.76			22801344	
900	897	1800	81.66			229913444090	
1000	998	2000	98.48			229913444100	
1120	1118	2240	131.72			229913444112	
1250	1248	2500	159.59			229913444125	
1400	1398	2800	271.33			239913445140*	
1600	1598	3200	347.09			239913445160*	

*3 mm

Galvanised (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€
350	349	700	17.12			22352344	
400	398	800	20.00			22402344	
450	448	900	24.20	21452344		22452344	
500	498	1000	29.50	21502344		22502344	
560	558	1120	37.00			22562344	
630	628	1260	39.20			22632344	
710	707	1420	54.00			22712344	
800	797	1600	72.76			22802344	
900	897	1800	81.66			229923444090	
1000	998	2000	98.48			229923444100	
1120	1118	2240	131.72			229923444112	
1250	1248	2500	159.59			229923444125	
1400	1398	2800	271.33			239923445140*	
1600	1598	3200	347.09			239923445160*	

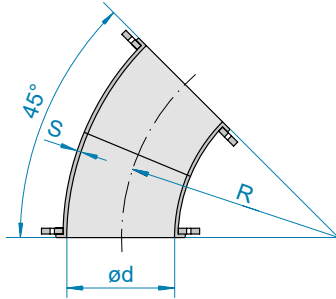
*3 mm

■ Shock explosion proof tested up to 3 bar

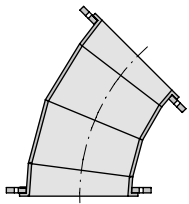


THE FLANGE RANGE

Segments and bends



2 pressed segments 22.5°



4 lobster back segments:
2x 15° / 2x 7.5°

Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	Stainless steel with galvanised loose flanges F		Stainless steel with stainless steel loose flange, shotblasted F					
				1.5 mm		2 mm		1.5 mm		2 mm	
				Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	700	17.12		22353344		213533443	223533443			
400	398	800	20.00		22403344		214033443	224033443			
450	448	900	24.20	21453344	22453344		214533443	224533443			
500	498	1000	29.50	21503344	22503344		215033443	225033443			
560	558	1120	37.00		22563344			225633443			
630	628	1260	39.20		22633344			226333443			
710	707	1420	54.00		22713344			227133443			
800	797	1600	72.76		22803344						
900	897	1800	81.66		229933444090						
1000	998	2000	98.48		229933444100						
1120	1118	2240	131.72		229933444112						
1250	1248	2500	159.59		229933444125						
1400	1398	2800	271.33					239933445140*			
1600	1598	3200	347.09					239933445160*			

*3 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



BENDS $R = 2 D$, 60°

6150



- Both sides with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel

- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed

Powder-coated (dimensions for 2 mm pipework)

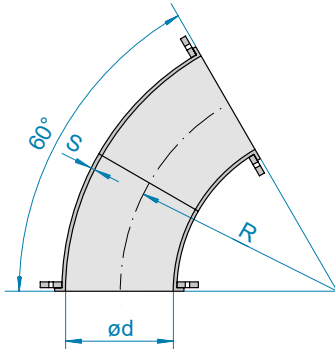
DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated	
				Item no.	€	Item no.	€
350	349	700	19.40			22351346	
400	398	800	23.80			22401346	
450	448	900	29.40	21451346		22451346	
500	498	1000	36.00	21501346		22501346	
560	558	1120	45.00			22561346	
630	628	1260	56.00			22631346	
710	707	1420	69.00			22711346	
800	797	1600	84.00			22801346	
900	897	1800	103.12			229913464090	
1000	998	2000	124.97			229913464100	
1120	1118	2240	164.95			229913464112	
1250	1248	2500	200.97			229913464125	
1400	1398	2800	349.13			239913465140*	
1600	1598	3200	448.69			239913465160*	

*3 mm

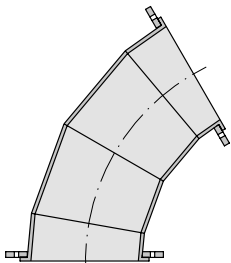
Galvanised (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€
350	349	700	19.40			22352346	
400	398	800	23.80			22402346	
450	448	900	29.40	21452346		22452346	
500	498	1000	36.00	21502346		22502346	
560	558	1120	45.00			22562346	
630	628	1260	56.00			22632346	
710	707	1420	69.00			22712346	
800	797	1600	84.00			22802346	
900	897	1800	103.12			229923464090	
1000	998	2000	124.97			229923464100	
1120	1118	2240	164.95			229923464112	
1250	1248	2500	200.97			229923464125	
1400	1398	2800	349.13			239923465140*	
1600	1598	3200	448.69			239923465160*	

*3 mm



■ 2 pressed segments 30°



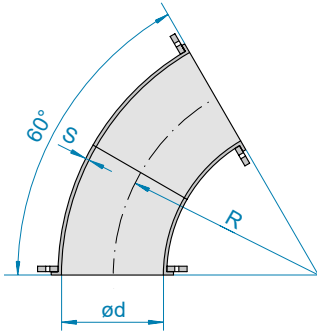
■ 4 lobster back segments:
 $2 \times 20^\circ / 2 \times 10^\circ$

■ Shock explosion proof tested up to 3 bar

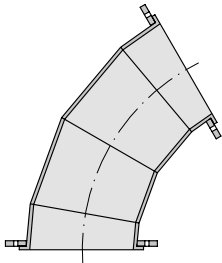


THE FLANGE RANGE

Segments and bends



■ 2 pressed segments 30°



■ 4 lobster back segments:
2 x 20° / 2 x 10°

Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	R	kg	Stainless steel with galvanised loose flanges F		Stainless steel with stainless steel loose flange, shotblasted F		
				1.5 mm		2 mm		
				Item no.	€	Item no.	€	Item no.
350	349	700	19.40		22353346		213533463	223533463
400	398	800	23.80		22403346		214033463	224033463
450	448	900	29.40	21453346	22453346		214533463	224533463
500	498	1000	36.00	21503346	22503346		215033463	225033463
560	558	1120	45.00		22563346			225633463
630	628	1260	56.00		22633346			226333463
710	707	1420	69.00		22713346			227133463
800	797	1600	84.00		22803346			
900	897	1800	103.12		229933464090			
1000	998	2000	124.97		229933464100			
1120	1118	2240	164.95		229933464112			
1250	1248	2500	200.97		229933464125			
1400	1398	2800	349.13					239933465140*
1600	1598	3200	448.69					239933465160*

*3 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

■ Shock explosion proof tested
up to 3 bar



BENDS $R = 2 D, 90^\circ$

6160



- Both sides with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel

- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed

Powder-coated (dimensions for 2 mm pipework)

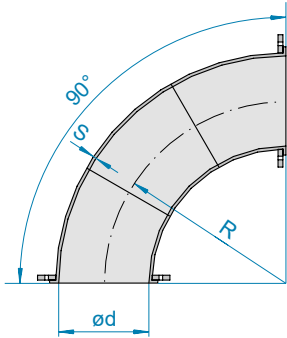
DN	Ø d	R	kg	1.5 mm powder-coated		2 mm powder-coated	
				Item no.	€	Item no.	€
350	349	700	25.20			22351349	
400	398	800	31.80			22401349	
450	448	900	41.50	21451349		22451349	
500	498	1000	48.60	21501349		22501349	
560	558	1120	62.00			22561349	
630	628	1260	68.80			22631349	
710	707	1420	94.00			22711349	
800	797	1600	120.00			22801349	
900	897	1800	145.24			229913494090	
1000	998	2000	176.95			229913494100	
1120	1118	2240	230.14			229913494112	
1250	1248	2500	282.16			229913494125	
1400	1398	2800	501.75			239913495140*	
1600	1598	3200	648.02			239913495160*	

*3 mm

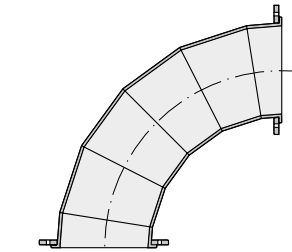
Galvanised (dimensions for 2 mm pipework)

DN	Ø d	R	kg	1.5 mm galvanised		2 mm galvanised	
				Item no.	€	Item no.	€
350	349	700	25.20			22352349	
400	398	800	31.80			22402349	
450	448	900	41.50	21452349		22452349	
500	498	1000	48.60	21502349		22502349	
560	558	1120	62.00			22562349	
630	628	1260	68.80			22632349	
710	707	1420	94.00			22712349	
800	797	1600	120.00			22802349	
900	897	1800	145.24			229923494090	
1000	998	2000	176.95			229923494100	
1120	1118	2240	230.14			229923494112	
1250	1248	2500	282.16			229923494125	
1400	1398	2800	501.75			239923495140*	
1600	1598	3200	648.02			239923495160*	

*3 mm



3 pressed segments 30°



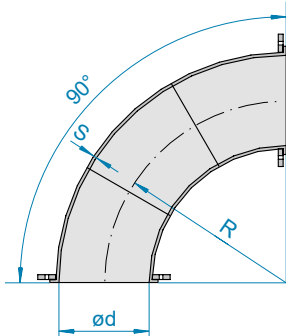
6 lobster back segments:
4 x 18° / 2 x 9°

Shock explosion proof tested
up to 3 bar

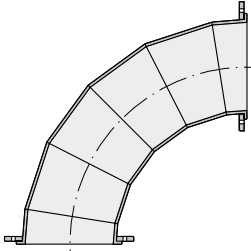


THE FLANGE RANGE

Segments and bends



3 pressed segments 30°



6 lobster back segments:
4 x 18° / 2 x 9°

Stainless steel with galvanised loose flanges (dimensions for 2 mm pipework)

DN	Ø d	R	kg	Stainless steel with galvanised loose flanges F			
				1.5 mm		2 mm	
				Item no.	€	Item no.	€
350	349	700	25.20			22353349	
400	398	800	31.80			22403349	
450	448	900	41.50	21453349		22453349	
500	498	1000	48.60	21503349		22503349	
560	558	1120	62.00			22563349	
630	628	1260	68.80			22633349	
710	707	1420	94.00			22713349	
800	797	1600	120.00			22803349	
900	897	1800	145.24			229933494090	
1000	998	2000	176.95			229933494100	
1120	1118	2240	230.14			229933494112	
1250	1248	2500	282.16			229933494125	

*3 mm

Stainless steel with stainless steel loose flange, shotblasted (dimensions for 2 mm pipework)

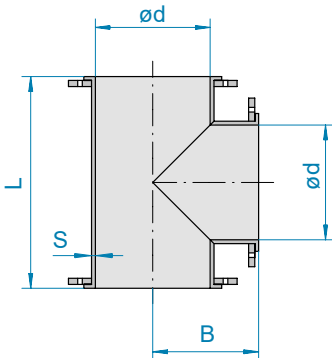
DN	Ø d	R	kg	Stainless steel with stainless steel loose flange, shotblasted F			
				1.5 mm		2 mm	
				Item no.	€	Item no.	€
350	349	700	26.00	213533493		223533493	
400	398	800	32.00	214033493		224033493	
450	448	900	41.00	214533493		224533493	
500	498	1000	50.00	215033493		225033493	
560	558	1120	62.00			225633493	
630	628	1260	76.00			226333493	
710	707	1420	94.00			227133493	
800	797	1600	120.00			228033493	
1400	1398	2800	501.75			239933495140 *	
1600	1598	3200	648.02			239933495160 *	

*3 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar

Branch pieces



T-PIECES

6060

- With loose flange on all sides
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed
- DN 560 and 800 mm: 3 mm wall thickness, available in shock explosion proof version up to 3 bar, prices on request

Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	B	L	kg	1.5 mm powder-coated		2 mm powder-coated	
					Item no.	€	Item no.	€
350	349	275	550	19.80	21351240		22351240	
400	398	300	600	24.00	21401240		22401240	
450	448	325	650	27.20	21451240		22451240	
500	498	350	700	32.20	21501240		22501240	
560	558	380	760	40.00			22561240	
630	628	415	830	46.40			22631240	
710	707	460	910	58.00			22711240	
800	797	500	1000	64.00			22801240	
900	897	550	1100	77.87			229912404090	
1000	998	600	1200	90.84			229912404100	
1120	1118	660	1320	124.06			229912404112	
1250	1248	725	1450	145.46			229912404125	
1400	1398	800	1600	225.33			239912405140 *	
1600	1598	900	1800	277.95			239912405160 *	

*3 mm

Galvanised (dimensions for 2 mm pipework)

DN	Ø d	B	L	kg	1.5 mm galvanised		2 mm galvanised	
					Item no.	€	Item no.	€
350	349	275	550	19.80	21352240		22352240	
400	398	300	600	24.00	21402240		22402240	
450	448	325	650	27.20	21452240		22452240	
500	498	350	700	32.20	21502240		22502240	
560	558	380	760	40.00			22562240	
630	628	415	830	46.40			22632240	
710	707	460	910	58.00			22712240	
800	797	500	1000	64.00			22802240	
900	897	550	1100	77.87			229922404090	
1000	998	600	1200	90.84			229922404100	
1120	1118	660	1320	124.06			229922404112	
1250	1248	725	1450	145.46			229922404125	
1400	1398	800	1600	225.33			239922405140 *	
1600	1598	900	1800	277.95			239922405160 *	

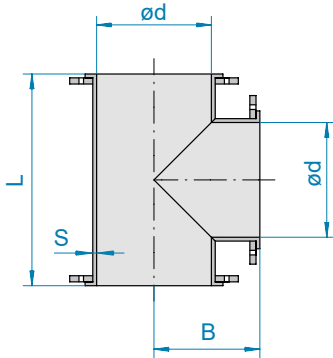
*3 mm

Shock explosion proof tested up to 3 bar





THE FLANGE RANGE

Branch pieces



Stainless steel (dimensions for 2 mm pipework)

DN	Ø d	B	L	kg	Stainless steel with galvanised loose flanges 		Stainless steel with stainless steel loose flange, shotblasted 					
					1.5 mm		2 mm		1.5 mm		2 mm	
					Item no.	€	Item no.	€	Item no.	€	Item no.	€
350	349	275	550	19.80	21353240	22353240	213532403	223532403				
400	398	300	600	24.00	21403240	22403240	214032403	224032403				
450	448	325	650	27.20	21453240	22453240	214532403	224532403				
500	498	350	700	32.20	21503240	22503240	215032403	225032403				
560	558	380	760	40.00		22563240		225632403				
630	628	415	830	46.40		22633240		226332403				
710	707	460	910	58.00		22713240		227132403				
800	797	500	1000	64.00		22803240						
900	897	550	1100	77.87		229932404090						
1000	998	600	1200	90.84		229932404100						
1120	1118	660	1320	124.06		229932404112						
1250	1248	725	1450	145.46		229932404125						
1400	1398	800	1600	225.33				239932405140*				
1600	1598	900	1800	277.95				239932405160*				

*3 mm

 **FOOD GRADE**
EC 1935/2004 plus FDA compliant

 Shock explosion proof tested
up to 3 bar



FORKS AND CONICAL FORKS 30°

6080

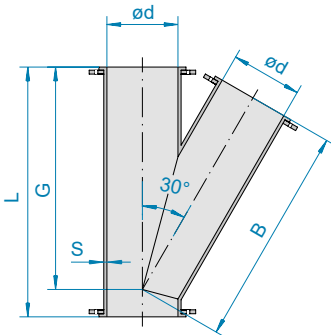


- DN < 350 mm with 6 mm lip for pull-ring connection (without flange)
- DN 560 and 630 mm: 3 mm wall thickness, available in shock explosion proof version up to 3 bar, prices on request
- With loose flange on all sides
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed
- Other combinations of diameters available on request

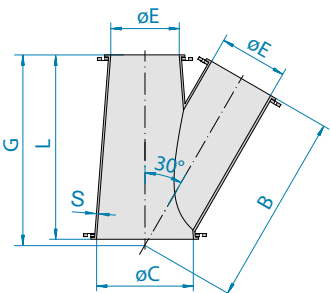
Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	B	Ø C	Ø E	G	L	kg	1.5 mm powder-coated		2 mm powder-coated	
								Item no.	€	Item no.	€
350- 250- 250		727	350	250	727	620	15.60	21351255		22351255	
350- 350- 350	349	817			828	920	27.75	21351230		22351230	
400- 300- 300		824	399	300	821	720	20.40	21401255		22401255	
400- 400- 400	398	925			926	1025	38.80	21401230		22401230	
450- 350- 350		911	449	350	909	920	36.40	21451255		22451255	
450- 450- 450	448	1030			1045	1150	48.00	21451230		22451230	
500- 400- 400		1014	499	399	1009	1025	44.00	21501255		22501255	
500- 500- 500	498	1127			1138	1250	56.00	21501230		22501230	
560- 400- 400		1071	558	399	1059	1025	47.60			22561255	
560- 560- 560	558	1275			1280	1400	72.00			22561230	
630- 450- 450		1213	628	448	1195	1150	58.80			22631255	
630- 630- 630	628	1404			1401	1530	84.60			22631230	
710- 500- 500		1327	707	498	1311	1250	72.00			22711255	
710- 710- 710	707	1665			1660	1800	116.00			22711230	
800- 560- 560		1507	797	558	1481	1400	87.00			22801255	
800- 800- 800	797	1823			1818	1970	140.00			22801230	
900- 900- 900	897	2030			2020	2200	165.60			229912304090	
1000-1000-1000	998	2190			2205	2400	194.60			229912304100	
1120-1120-1120	1118	2480			2490	2700	258.70			229912304112	
1250-1250-1250	1248	2710			2715	2950	308.46			229912304125	
1400-1400-1400	1398	2950			2955	3200	516.12			239912305140*	
1600-1600-1600	1598	3320			3335	3600	650.52			239912305160*	

*3 mm



Fork 30°



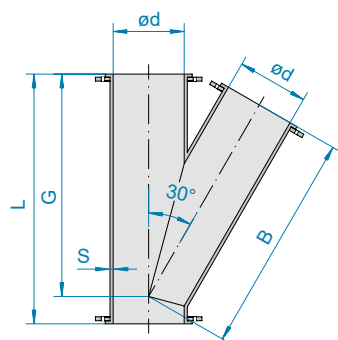
Conical fork 30°

Shock explosion proof tested up to 3 bar

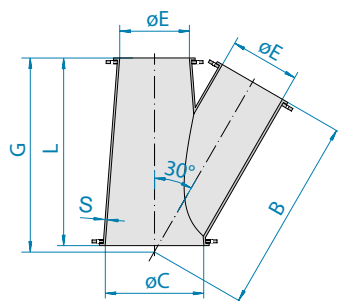


THE FLANGE RANGE

Branch pieces



█ Fork 30°



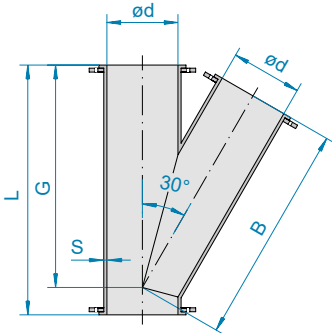
Conical fork 30°

Galvanised (dimensions for 2 mm pipework)

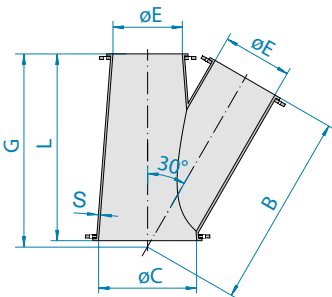
DN	Ø d	B	Ø C	Ø E	G	L	kg	1.5 mm galvanised		2 mm galvanised	
								Item no.	€	Item no.	€
350- 250- 250		727	350	250	727	620	15.60	21352255		22352255	
350- 350- 350	349	817			828	920	27.75	21352230		22352230	
400- 300- 300		824	399	300	821	720	20.40	21402255		22402255	
400- 400- 400	398	925			926	1025	38.80	21402230		22402230	
450- 350- 350		911	449	350	909	920	36.40	21452255		22452255	
450- 450- 450	448	1030			1045	1150	48.00	21452230		22452230	
500- 400- 400		1014	499	399	1009	1025	44.00	21502255		22502255	
500- 500- 500	498	1127			1138	1250	56.00	21502230		22502230	
560- 400- 400		1071	558	399	1059	1025	47.60			22562255	
560- 560- 560	558	1275			1280	1400	72.00			22562230	
630- 450- 450		1213	628	448	1195	1150	58.80			22632255	
630- 630- 630	628	1404			1401	1530	84.60			22632230	
710- 500- 500		1327	707	498	1311	1250	72.00			22712255	
710- 710- 710	707	1665			1660	1800	116.00			22712230	
800- 560- 560		1507	797	558	1481	1400	87.00			22802255	
800- 800- 800	797	1823			1818	1970	140.00			22802230	
900- 900- 900	897	2030			2020	2200	165.60			229922304090	
1000-1000-1000	998	2190			2205	2400	194.60			229922304100	
1120-1120-1120	1118	2480			2490	2700	258.70			229922304112	
1250-1250-1250	1248	2710			2715	2950	308.46			229922304125	
1400-1400-1400	1398	2950			2955	3200	516.12			239922305140 *	
1600-1600-1600	1598	3320			3335	3600	650.52			239922305160 *	

*3 mm

█ Shock explosion proof tested up to 3 bar



Fork 30°



Conical fork 30°

Stainless steel with galvanised loose flanges (dimensions for 2 mm pipework)

DN	Ø d	B	Ø C	Ø E	G	L	kg	Stainless steel with galvanised loose flanges F			
								1.5 mm		2 mm	
								Item no.	€	Item no.	€
350- 250- 250		727	350	250	727	620	15.60	21353255		22353255	
350- 350- 350	349	817			828	920	27.75	21353230		22353230	
400- 300- 300		824	399	300	821	720	20.40	21403255		22403255	
400- 400- 400	398	925			926	1025	38.80	21403230		22403230	
450- 350- 350		911	449	350	909	920	36.40	21453255		22453255	
450- 450- 450	448	1030			1045	1150	48.00	21453230		22453230	
500- 400- 400		1014	499	399	1009	1025	44.00	21503255		22503255	
500- 500- 500	498	1127			1138	1250	56.00	21503230		22503230	
560- 400- 400		1071	558	399	1059	1025	47.60			22563255	
560- 560- 560	558	1275			1280	1400	72.00			22563230	
630- 450- 450		1213	628	448	1195	1150	58.80			22633255	
630- 630- 630	628	1404			1401	1530	84.60			22633230	
710- 500- 500		1327	707	498	1311	1250	72.00			22713255	
710- 710- 710	707	1665			1660	1800	116.00			22713230	
800- 560- 560		1507	797	558	1481	1400	87.00			22803255	
800- 800- 800	797	1823			1818	1970	140.00			22803230	
900- 900- 900	897	2030			2020	2200	165.60			229932304090	
1000-1000-1000	998	2190			2205	2400	194.60			229932304100	
1120-1120-1120	1118	2480			2490	2700	258.70			229932304112	
1250-1250-1250	1248	2710			2715	2950	308.46			229932304125	
1400-1400-1400	1398	2950			2955	3200	516.12			239932305140*	
1600-1600-1600	1598	3320			3335	3600	650.52			239932305160*	

*3 mm with welded-on stainless steel flange, shotblasted

Stainless steel with stainless steel loose flange, shotblasted (dimensions for 2 mm pipework)

DN	Ø d	B	Ø C	Ø E	G	L	kg	Stainless steel with stainless steel loose flange, shotblasted F			
								1.5 mm		2 mm	
								Item no.	€	Item no.	€
350-250-250		727	350	250	727	620	15.60	213532553		223532553	
350-350-350	349	817			828	920	28.00	213532303		223532303	
400-300-300		824	399	300	821	720	20.00	214032553		224032553	
400-400-400	398	925			926	1025	39.40	214032303		224032303	
450-350-350		911	449	350	909	920	38.20	214532553		224532553	
450-450-450	448	1030			1045	1150	48.00	214532303		224532303	
500-400-400		1014	499	399	1009	1025	44.00	215032553		225032553	
500-500-500	498	1127			1138	1250	61.00	215032303		225032303	
560-400-400		1071	558	399	1059	1025	47.60			225632553	
560-560-560	558	1275			1280	1400	75.00			225632303	
630-450-450		1213	628	448	1195	1150	57.00			226332553	
630-630-630	628	1404			1401	1530	84.50	226332303*		236332303*	
710-500-500		1327	707	498	1311	1250	72.00			227132553	
710-710-710	707	1665			1660	1800	113.00	227132303*		237132303*	

* 2 mm

* 3 mm

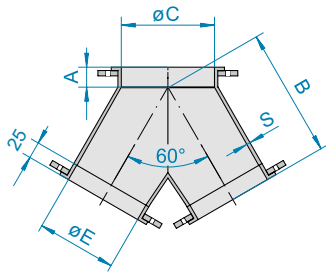
F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



THE FLANGE RANGE

Branch pieces



CONICAL FORKS 60°

6090

- DN < 350 mm with 6 mm lip for pull-ring connection (without flange)
- DN 560 to 800 mm: 3 mm wall thickness, available in shock explosion proof version up to 3 bar, prices on request
- With loose flange on all sides
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed
- Other combinations of diameters available on request

Powder-coated (dimensions for 2 mm pipework)

DN	A	B	ØC	ØE	kg	1.5 mm powder-coated		2 mm powder-coated	
						Item no.	€	Item no.	€
350- 250- 250	70	300	350	250	11.35	21351275		22351275	
400- 300- 300	70	350	399	300	12.00	21401275		22401275	
450- 350- 350	80	425	449	350	23.00	21451275		22451275	
500- 400- 400	80	475	499	399	33.50	21501275		22501275	
560- 400- 400	80	550	558	399	37.00			22561275	
630- 450- 450	150	600	628	448	40.40			22631275	
710- 500- 500	200	650	707	498	47.60			22711275	
800- 560- 560	200	700	797	558	59.00			22801275	
900- 630- 630	210	850	897	628	74.40			229912754090	
1000- 710- 710	220	930	998	707	87.96			229912754100	
1120- 800- 800	220	1040	1118	797	110.30			229912754112	
1250- 900- 900	220	1130	1248	897	128.22			229912754125	
1400-1000-1000	245	1230	1398	998	206.80			239912755140 *	
1600-1120-1120	245	1320	1598	1118	251.64			239912755160 *	

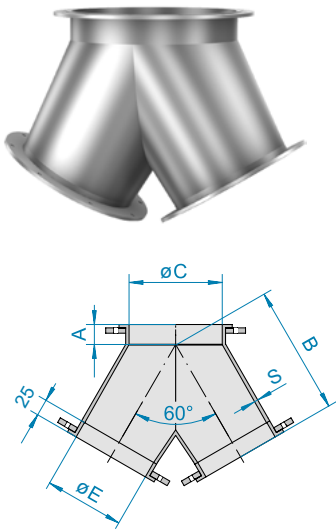
*3 mm

Galvanised (dimensions for 2 mm pipework)

DN	A	B	ØC	ØE	kg	1.5 mm galvanised		2 mm galvanised	
						Item no.	€	Item no.	€
350- 250- 250	70	300	350	250	11.35	21352275		22352275	
400- 300- 300	70	350	399	300	12.00	21402275		22402275	
450- 350- 350	80	425	449	350	23.00	21452275		22452275	
500- 400- 400	80	475	499	399	33.50	21502275		22502275	
560- 400- 400	80	550	558	399	37.00			22562275	
630- 450- 450	150	600	628	448	40.40			22632275	
710- 500- 500	200	650	707	498	47.60			22712275	
800- 560- 560	200	700	797	558	59.00			22802275	
900- 630- 630	210	850	897	628	74.40			229922754090	
1000- 710- 710	220	930	998	707	87.96			229922754100	
1120- 800- 800	220	1040	1118	797	110.30			229922754112	
1250- 900- 900	220	1130	1248	897	128.22			229922754125	
1400-1000-1000	245	1230	1398	998	206.80			239922755140 *	
1600-1120-1120	245	1320	1598	1118	251.64			239922755160 *	

*3 mm

Shock explosion proof tested up to 3 bar



Stainless steel with galvanized loose flanges (dimensions for 2 mm pipework)

DN	A	B	Ø C	Ø E	kg	Stainless steel with galvanized loose flanges F			
						1.5 mm		2 mm	
						Item no.	€	Item no.	€
350-250-250	70	300	350	250	11.35	21353275		22353275	
400-300-300	70	350	399	300	12.00	21403275		22403275	
450-350-350	80	425	449	350	23.00	21453275		22453275	
500-400-400	80	475	499	399	33.50	21503275		22503275	
560-400-400	80	550	558	399	37.00			22563275	
630-450-450	150	600	628	448	40.40			22633275	
710-500-500	200	650	707	498	47.60			22713275	
800-560-560	200	700	797	558	59.00			22803275	
900-630-630	210	850	897	628	74.40			229932754090	
1000-710-710	220	930	998	707	87.96			229932754100	
1120-800-800	220	1040	1118	797	110.30			229932754112	
1250-900-900	220	1130	1248	897	128.22			229932754125	
1400-1000-1000	245	1230	1398	998	206.80			239932755140 *	
1600-1120-1120	245	1320	1598	1118	251.64			239932755160 *	

*3 mm with welded-on stainless steel flange, shotblasted

Stainless steel with stainless steel loose flange, shotblasted (dimensions for 2 mm pipework)

DN	A	B	Ø C	Ø E	kg	Stainless steel with stainless steel loose flange, shotblasted F			
						1.5 mm		2 mm	
						Item no.	€	Item no.	€
350-250-250	70	300	350	250	14.37	213532753		223532753	
400-300-300	70	350	399	300	11.76	214032753		224032753	
450-350-350	80	425	449	350	32.90	214532753		224532753	
500-400-400	80	475	499	399	27.40	215032753		225032753	
560-400-400	80	550	558	399	37.00			225632753	
630-450-450	150	600	628	448	41.00			226332753	
710-500-500	200	650	707	498	47.60			227132753	

F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



THE FLANGE RANGE

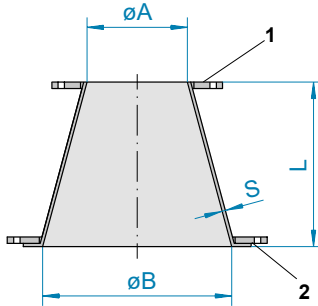
Transition pieces and adapters



CONE PIECES

6170

- DN < 350 mm with 6 mm lip for pull-ring connection (without flange)
- DN 630 to 710 mm: 3 mm wall thickness, available in shock explosion proof version up to 3 bar, prices on request
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges on both sides, in pickled and passivated stainless steel
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed
- Other combinations of diameters available on request



- 1 With welded-on flange to DIN 24154-2
 2 With loose flange to DIN 24154-2

Powder-coated (dimensions for 2 mm pipework)

DN	ØA	ØB	L	kg	1.5 mm powder-coated		2 mm powder-coated	
					Item no.	€	Item no.	€
300- 350	299	349	200	6.80	21001480		22001480	
300- 400	299	398	200	7.40	21001481		22001481	
350- 400	349	398	200	10.00	21001482		22001482	
350- 450	349	448	200	11.20	21001483		22001483	
400- 450	398	448	200	11.80	21001485		22001485	
400- 500	398	498	250	13.40	21001486		22001486	
450- 500	448	498	200	14.20	21001487		22001487	
450- 560	448	558	250	16.60			22001495	
500- 560	498	558	250	17.40			22001496	
500- 630	498	628	300	19.60			22001497	
560- 630	558	628	300	21.80			22001498	
630- 710	628	707	300	24.40			22001499	
710- 800	707	797	300	28.00			22001500	
900- 800	897	799	300	31.21			229918104090	
1000- 900	998	899	300	34.83			229918114100	
1120-1000	1118	1000	300	44.21			229918124112	
1250-1120	1248	1120	300	55.14			229918134125	
1400-1250	1398	1250	400	82.34			239918145140 *	
1600-1400	1598	1398	400	93.58			239918155160 *	

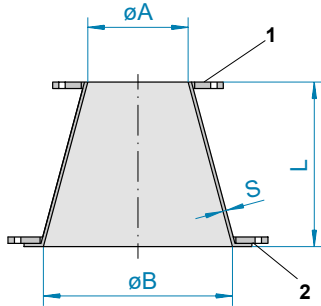
*3 mm

Galvanised (dimensions for 2 mm pipework)

DN	ØA	ØB	L	kg	1.5 mm galvanised		2 mm galvanised	
					Item no.	€	Item no.	€
300- 350	299	349	200	6.80	21002480		22002480	
300- 400	299	398	200	7.40	21002481		22002481	
350- 400	349	398	200	10.00	21002482		22002482	
350- 450	349	448	200	11.20	21002483		22002483	
400- 450	398	448	200	11.80	21002485		22002485	
400- 500	398	498	250	13.40	21002486		22002486	
450- 500	448	498	200	14.20	21002487		22002487	
450- 560	448	558	250	16.60			22002495	
500- 560	498	558	250	17.40			22002496	
500- 630	498	628	300	19.60			22002497	
560- 630	558	628	300	21.80			22002498	
630- 710	628	707	300	24.40			22002499	
710- 800	707	797	300	28.00			22002500	
900- 800	897	799	300	31.21			229928104090	
1000- 900	998	899	300	34.83			229928114100	
1120-1000	1118	1000	300	44.21			229928124112	
1250-1120	1248	1120	300	55.14			229928134125	
1400-1250	1398	1250	400	82.34			239928145140 *	
1600-1400	1598	1398	400	93.58			239928155160 *	

*3 mm

Shock explosion proof tested up to 3 bar



- 1 With welded-on stainless steel flange to DIN 24154-2
- 2 With loose flange to DIN 24154-2

Stainless steel with galvanised loose flanges (dimensions for 2 mm pipework)

DN	$\varnothing A$	$\varnothing B$	L	kg	Stainless steel with galvanised loose flanges F			
					1.5 mm		2 mm	
					Item no.	€	Item no.	€
300- 350	299	349	200	6.80	21003480		22003480	
300- 400	299	398	200	7.40	21003481		22003481	
350- 400	349	398	200	10.00	21003482		22003482	
350- 450	349	448	200	11.20	21003483		22003483	
400- 450	398	448	200	11.80	21003485		22003485	
400- 500	398	498	250	13.40	21003486		22003486	
450- 500	448	498	200	14.20	21003487		22003487	
450- 560	448	558	250	16.60			22003495	
500- 560	498	558	250	17.40			22003496	
500- 630	498	628	300	19.60			22003497	
560- 630	558	628	300	21.80			22003498	
630- 710	628	707	300	24.40			22003499	
710- 800	707	797	300	28.00			22003500	
900- 800	897	799	300	31.21			229938104090	
1000- 900	998	899	300	34.83			229938114100	
1120-1000	1118	1000	300	44.21			229938124112	
1250-1120	1248	1120	300	55.14			229938134125	
1400-1250	1398	1250	400	82.34			239938145140 *	
1600-1400	1598	1398	400	93.58			239938155160 *	

*3 mm with welded-on stainless steel flange, shotblasted

Stainless steel with stainless steel loose flange, shotblasted (dimensions for 2 mm pipework)

DN	$\varnothing A$	$\varnothing B$	L	kg	Stainless steel with stainless steel loose flange, shotblasted F			
					1.5 mm		2 mm	
					Item no.	€	Item no.	€
300-350	299	349	200	6.80	210034803		220034803	
300-400	299	398	200	7.40	210034813		220034813	
350-400	349	398	200	10.00	210034823		220034823	
350-450	349	448	200	11.00	210034833		220034833	
400-450	398	448	200	11.80	210034853		220034853	
400-500	398	498	250	13.40	210034863		220034863	
450-500	448	498	200	14.20	210034873		220034873	
450-560	448	558	250	16.60			220034953	
500-560	498	558	250	17.40			220034963	
500-630	498	628	300	19.60			220034973	
560-630	558	628	300	21.80			220034983	
630-710	628	707	300	24.40			220034993	

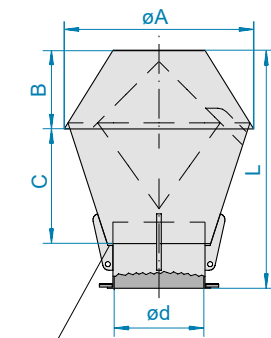
F FOOD GRADE
EC 1935/2004 plus FDA compliant

Shock explosion proof tested
up to 3 bar



THE FLANGE RANGE

Transition pieces and adapters



Revolving water outlet

JET CAPS

1430

- With welded-on flange to DIN 24154-2

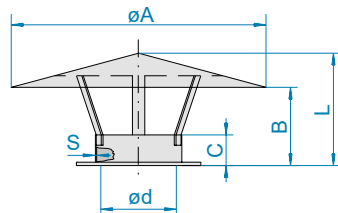
Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	$\varnothing d$	$\varnothing A$	B	C	L	kg	2 mm galvanised		2 mm stainless steel	
							Item no.	€	Item no.	€
350	349	645	275	448	865	33.00	12352805		12353805	
400	398	715	295	480	915	42.00	12402805		12403805	
450	448	820	320	588	1040	51.00	12452805		12453805	
500	498	870	320	588	1040	61.50	12502805		12503805	
560	558	990	372	703	1208	81.50	12562805		12563805	
630	628	1140	442	776	1434	112.00	12632805		12633805	
710	707	1290	502	901	1627	138.00	12712805		12713805	
800	797	1440	520	1020	1790	164.00	12802805		12803805	
900	897	1550	600	1150	2150	260.00	239928055090 *		239938055090 *	
1000	998	1800	700	1330	2400	328.00	239928055100 *		239938055100 *	
1120	1118	1825	1120	1100	2370	421.00	239928055112 *		239938055112 *	
1250	1248	1955	1190	1150	2470	452.00	239928055125 *		239938055125 *	
1400	1398	2210	1250	1220	2600	500.00	239928055140 *		239938055140 *	
1600	1598	2610	1470	1470	3140	589.00	239928055160 *		239938055160 *	

*3 mm

RAIN CAPS

6190

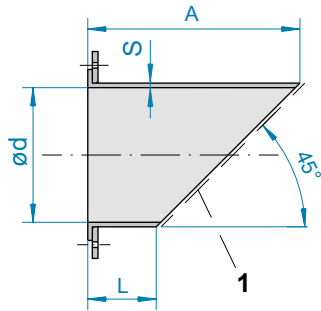


- With loose flange up to DN 1000 mm
- DN 1120 mm: 3 mm wall thickness, with welded-on flange to DIN 24154-2
- From DN 1250 mm, we recommend the use of jet caps
- Take local building regulations into account, alternatively use a jet cap

Galvanised and stainless steel (dimensions for 2 mm pipework)

DN	$\varnothing d$	$\varnothing A$	B	C	L	kg	2 mm galvanised		Stainless steel with galvanised loose flanges		2 mm Stainless steel with stainless steel loose flange, shotblasted	
							Item no.	€	Item no.	€	Item no.	€
350	349	750	300	150	395	23.70	22352850		22353850		223538503	
400	398	850	320	150	435	16.80	22402850		22403850		224038503	
450	448	950	340	150	470	25.90	22452850		22453850		224538503	
500	498	1050	410	200	550	31.50	22502850		22503850		225038503	
560	558	1150	435	200	590	34.00	22562850		22563850		225638503	
630	628	1300	470	200	645	42.00	22632850		22633850		226338503	
710	707	1400	500	250	700	52.00	22712850		22713850		227138503	
800	797	1500	530	250	760	59.92	22802850		22803850		228038503	
900	897	1800	550	250	793	87.20	229928504090		229938504090			
1000	998	2000	600	250	870	103.20	229928504100		229938504100			
1120	1118	2240	650	300	950	186.90	239928505112 *				239938505112 *	

*3 mm



1 Bird-guard

AIR OUTLET PIPES 45°

6200

- Bird-guard: Material thickness 2 mm, mesh size 20x20
- One side with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel

Galvanised (dimensions for 2 mm pipework)

DN	Ø d	A	L	kg	1.5 mm galvanised		2 mm galvanised	
					Item no.	€	Item no.	€
350	350	550	200	9.20	21352880			
400	399	600	200	10.80	21402880			
450	449	650	200	12.30	21452880			
500	499	700	200	10.60	21502880			
560	558	760	200	22.00			22562880	
630	628	830	200	26.00			22632880	
710	707	910	200	30.00			22712880	
800	797	1000	200	36.00			22802880	
900	897	1100	200	58.80			239928804090*	
1000	998	1200	200	69.12			239928804100*	
1120	1118	1320	200	90.75			239928804112*	
1250	1248	1450	200	107.40			239928804125*	
1400	1398	1600	200	117.29			239928805140*	
1600	1598	1800	200	146.03			239928805160*	

*3 mm

Stainless steel with galvanised loose flanges (dimensions for 2 mm pipework)

DN	Ø d	A	L	kg	Stainless steel with galvanised loose flanges			
					1 mm		2 mm	
					Item no.	€	Item no.	€
350	350	550	200	9.20	21353880			
400	399	600	200	10.80	21403880			
450	449	650	200	12.30	21453880			
500	499	700	200	10.60	21503880			
560	558	760	200	22.00			22563880	
630	628	830	200	26.00			22633880	
710	707	910	200	30.00			22713880	
800	797	1000	200	36.00			22803880	
900	897	1100	200	58.80			239938804090*	
1000	998	1200	200	69.12			239938804100*	
1120	1118	1320	200	90.75			239938804112*	
1250	1248	1450	200	107.40			239938804125*	
1400	1398	1600	200	117.29			239938805140*	
1600	1598	1800	200	146.03			239938805160*	

*3 mm



THE FLANGE RANGE

Transition pieces and adapters / Cleaning pipes

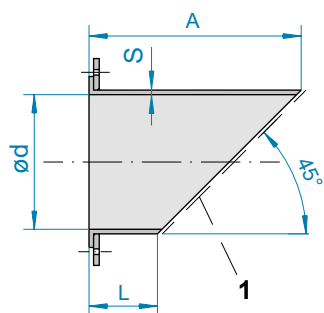


AIR OUTLET PIPES 45°

6200

Stainless steel with stainless steel loose flange, shotblasted (dimensions for 2 mm pipework)

DN	Ø d	A	L	kg	Stainless steel with stainless steel loose flange, shotblasted			
					1 mm		2 mm	
					Item no.	€	Item no.	€
350	350	550	200	9.20	213538803			
400	399	600	200	10.80	214038803			
450	449	650	200	12.30	214538803			
500	499	700	200	10.60	215038803			
630	628	830	200	26.00			226338803	
710	707	910	200	30.00			227138803	
800	797	1000	200	36.00			228038803	



1 Bird-guard
mesh size: 20x20 x 2 mm



CLEANING PIPES

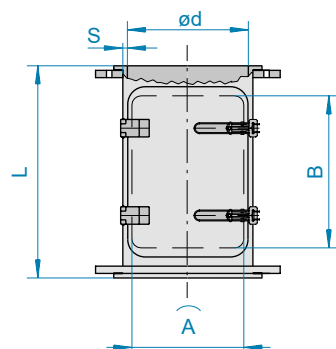
6050

- For seals, please also read and take into account the technical information given at the beginning of this chapter
- Both sides with loose flange
- DN 1400 and 1600 mm: 3 mm wall thickness, with welded-on flanges, in pickled and passivated stainless steel
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed
- Not recommended for extracting exhaust air containing condensates

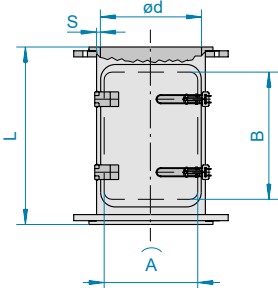
Powder-coated (dimensions for 2 mm pipework)

DN	Ø d	A	B	L	kg	1.5 mm powder-coated		2 mm powder-coated	
						Item no.	€	Item no.	€
350	350	350	350	478	14.50	21351195			
400	399	350	350	478	15.90	21401195			
450	448	500	350	478	20.00			22451195	
500	498	500	350	478	21.60			22501195	
560	558	500	350	478	25.00			22561195	
630	628	500	350	478	30.00			22631195	
710	707	500	350	478	34.00			22711195	
800	797	500	350	478	38.00			22801195	
900	897	500	350	478	41.48			229911954090	
1000	998	500	350	478	46.10			229911954100	
1120	1118	500	350	478	62.50			229911954112	
1250	1248	500	350	478	69.57			229911954125	
1400	1398	500	350	500	95.28			239911955140 *	
1600	1598	500	350	500	108.42			239911955160 *	

*3 mm



Cleaning pipes



Galvanised (dimensions for 2 mm pipework)

DN	Ø d	A	B	L	kg	1.5 mm galvanised		2 mm galvanised	
						Item no.	€	Item no.	€
350	350	350	350	478	14.50	21352195			
400	399	350	350	478	15.90	21402195			
450	448	500	350	478	20.00			22452195	
500	498	500	350	478	21.60			22502195	
560	558	500	350	478	25.00			22562195	
630	628	500	350	478	30.00			22632195	
710	707	500	350	478	34.00			22712195	
800	797	500	350	478	38.00			22802195	
900	897	500	350	478	41.48			229921954090	
1000	998	500	350	478	46.10			229921954100	
1120	1118	500	350	478	62.50			229921954112	
1250	1248	500	350	478	69.57			229921954125	
1400	1398	500	350	500	95.28			239921955140 *	
1600	1598	500	350	500	108.42			239921955160 *	

*3 mm

Stainless steel with galvanised loose flanges (dimensions for 2 mm pipework)

DN	Ø d	A	B	L	kg	Stainless steel with galvanised loose flanges F			
						1.5 mm		2 mm	
						Item no.	€	Item no.	€
350	350	350	350	478	14.50	21353195			
400	399	350	350	478	15.90	21403195			
450	448	500	350	478	20.00			22453195	
500	498	500	350	478	21.60			22503195	
560	558	500	350	478	25.00			22563195	
630	628	500	350	478	30.00			22633195	
710	707	500	350	478	34.00			22713195	
800	797	500	350	478	38.00			22803195	
900	897	500	350	478	41.48			229931954090	
1000	998	500	350	478	46.10			229931954100	
1120	1118	500	350	478	62.50			229931954112	
1250	1248	500	350	478	69.57			229931954125	
1400	1398	500	350	500	95.28			239931955140 *	
1600	1598	500	350	500	108.42			239931955160 *	

*3 mm with welded-on stainless steel flange, shotblasted

Stainless steel with stainless steel loose flange, shotblasted (dimensions for 2 mm pipework)

DN	Ø d	A	B	L	kg	Stainless steel with stainless steel loose flange, shotblasted F			
						1.5 mm		2 mm	
						Item no.	€	Item no.	€
350	350	350	350	478	14.50	213531953			
400	399	350	350	478	15.60	214031953			
450	448	500	350	478	16.00			224531953	
500	498	500	350	478	23.00			225031953	
560	558	500	350	478	29.50			225631953	
630	628	500	350	478	34.80			226331953	
710	707	500	350	478	38.50			227131953	

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable

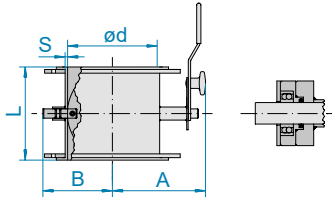
D DETECTABLE DESIGN

AVAILABLE IN THE DETECTABLE DESIGN LINE.



THE FLANGE RANGE

Throttle valves



■ Additionally with ball bearings and Viton O-ring seal

THROTTLE VALVES

6180

- Special version available with glued silicone inner seal, no cross-section constriction, prices on request
- Version with pneumatic or electric actuator
- Both sides with loose flange
- From DN 900 mm: 3 mm wall thickness, with welded-on flange to DIN 24154-2
- RAL 7032 (pebble grey): up to DN 630 mm powder-coated, from DN 710 mm spray-primed

Powder-coated, galvanised and stainless steel (dimensions for 2 mm pipework)

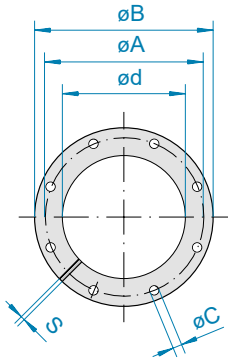
DN	Ø d	A	B	L	kg	2 mm powder-coated		2 mm galvanised	
						Item no.	€	Item no.	€
350	349	240	233	200	14.00	22351560			
400	398	265	258	200	16.20	22401560			
450	458	396	365	200	26.50	22451560			
500	498	421	391	200	29.60	22501560			
560	558	451	421	200	36.00	22561560			
630	628	486	456	200	41.00	22631560			
710	707	525	495	200	46.00	22711560			
800	797	570	540	200	52.00	22801560			
900	897	620	590	200	65.00	239915605090 *		239925605090 *	
1000	998	670	640	200	83.00	239915605100 *		239925605100 *	
1120	1118	810	675	200	104.00	239915605112 *		239925605112 *	
1250	1248	875	740	200	123.00	239915605125 *		239925605125 *	

*3 mm

DN	Ø d	A	B	L	kg	Stainless steel with galvanised loose flanges	2 mm stainless steel with stainless steel loose flange, shotblasted	
							Item no.	€
350	349	240	233	200	14.00	22353560	223535603	
400	398	265	258	200	16.20	22403560	224035603	
450	458	396	365	200	26.50	22453560	224535603	
500	498	421	391	200	29.60	22503560	225035603	
560	558	451	421	200	36.00	22563560	225635603	
630	628	486	456	200	41.00	22633560	226335603	
710	707	525	495	200	46.00	22713560	227135603	
800	797	570	540	200	52.00	22803560		
900	897	620	590	200	65.00		239935605090 *	
1000	998	670	640	200	83.00		239935605100 *	
1120	1118	810	675	200	104.00		239935605112 *	
1250	1248	875	740	200	123.00		239935605125 *	

*3 mm

F FOOD GRADE
EC 1935/2004 plus FDA compliant



E = No. of holes

FLANGES

1360

- Similar to DIN 24154-2
- DN 350 mm according to DIN 24154-2, diameter 355 mm

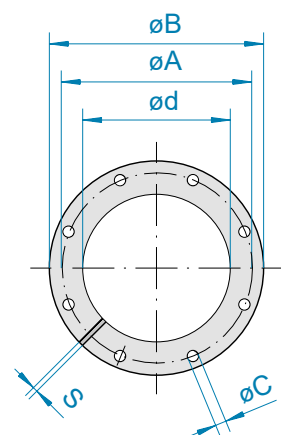
Powder-coated and galvanised

DN	Ø d	Ø A	Ø B	Ø C	E	S	kg	Powder-coated		Galvanised	
								Item no.	€	Item no.	€
60	62	102	128	9.5	4	5	0.40	10061711			
80	82	118	142	9.5	4	5	0.40	10081711		10082711	
100	105	139	165	9.5	4	5	0.46	10101711		10102711	
120	125	165	185	9.5	4	5	0.57	10121711		10122711	
140	142	182	212	11.5	8	5	0.73	10141711		10142711	
150	155	200	225	11.5	8	5	0.78	10151711		10152711	
160	162	200	232	11.5	8	5	0.82	10161711		10162711	
175	180	219	250	11.5	8	5	0.93	10171711		10172711	
200	205	241	275	11.5	8	5	0.99	10201711		10202711	
224	225	265	295	11.5	8	5	1.10	10221711		10222711	
250	255	292	325	11.5	8	5	1.21	10251711		10252711	
280	283	332	363	11.5	8	8	2.51	10281711		10282711	
300	305	366	395	11.5	8	8	3.00	10301711		10302711	
315	318	366	398	11.5	8	8	2.98	10311711		10312711	
350	356	405	436	11.5	8	8	3.10	10351711		10352711	
400	405	448	485	11.5	12	8	3.44	10401711		10402711	
450	455	497	535	11.5	12	8	3.90	10451711		10452711	
500	505	551	585	11.5	12	8	4.13	10501711		10502711	
560	565	629	665	14	16	8	5.90	10561711		10562711	
630	635	698	735	14	16	8	6.60	10631711		10632711	
710	715	775	815	14	16	8	7.40	10711711		10712711	
800	805	861	905	14	24	8	7.95	10801711		10802711	
900	904	958	1004	14	24	8	9.17	109917110090		109927110090	
1000	1005	1067	1105	14	24	8	10.20	109917110100		109927110100	
1120	1125	1200	1245	18	32	10	16.90	109917110112		109927110112	
1250	1255	1337	1375	18	32	10	18.80	109917110125		109927110125	
1400	1405	1475	1525	18	32	10	21.00	109917110140		109927110140	
1600	1605	1675	1725	18	40	10	23.80	109917110160		109927110160	



THE FLANGE RANGE

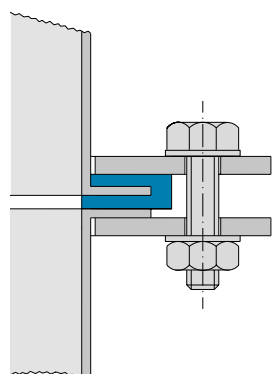
Flanges, seals and installation kit



E = No. of holes

Stainless steel

DN	$\varnothing d$	$\varnothing A$	$\varnothing B$	$\varnothing C$	E	S	kg	Stainless steel	
								Item no.	€
60	62	102	128	9.5	4	5	0.40	10063711	
80	82	118	142	9.5	4	5	0.40	10083711	
100	105	139	165	9.5	4	5	0.46	10103711	
120	125	165	185	9.5	4	5	0.57	10123711	
140	142	182	212	11.5	8	5	0.73	10143711	
150	155	200	225	11.5	8	5	0.78	10153711	
160	162	200	232	11.5	8	5	0.82	10163711	
175	180	219	250	11.5	8	5	0.93	10173711	
200	205	241	275	11.5	8	5	0.99	10203711	
224	225	265	295	11.5	8	5	1.10	10223711	
250	255	292	325	11.5	8	5	1.21	10253711	
280	283	332	363	11.5	8	8	2.51	10283711	
300	305	366	395	11.5	8	8	3.00	10303711	
315	318	366	398	11.5	8	8	2.98	10313711	
350	356	405	436	11.5	8	8	3.10	10353711	
400	405	448	485	11.5	12	8	3.44	10403711	
450	455	497	535	11.5	12	8	3.90	10453711	
500	505	551	585	11.5	12	8	4.13	10503711	
560	565	629	665	14	16	8	5.90	10563711	
630	635	698	735	14	16	8	6.60	10633711	
710	715	775	815	14	16	8	7.40	10713711	
800	805	861	905	14	24	8	7.95	10803711	
900	904	958	1004	14	24	8	9.17	109937110090	
1000	1005	1067	1105	14	24	8	10.20	109937110100	
1120	1125	1200	1245	18	32	10	16.90	109937110112	
1250	1255	1337	1375	18	32	10	18.80	109937110125	
1400	1405	1475	1525	18	32	10	21.00	109937110140	
1600	1605	1675	1725	18	40	10	23.80	109937110160	



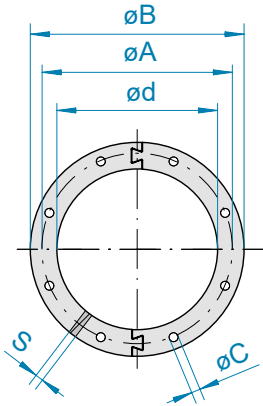
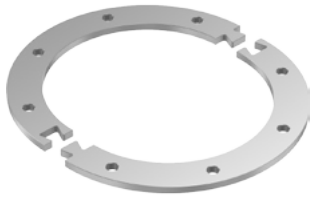
INSTALLATION KIT FOR JACOB FLANGES

1510

- Installation kit consisting of bolts, nuts and two washers per bolt
- Quantity to match the number of holes and flange thicknesses
- Bolts in compliance with DIN EN ISO 4017 (formerly DIN 933)
- Washers in compliance with DIN EN ISO 7090 (formerly DIN 125), 2 each per bolt
- Nuts in compliance with DIN EN ISO 4032 (formerly DIN 934)

Galvanised bolts, nuts and washers

DN	Bolts	Number	Item no.	€
60- 120	M 8x30	4	10062788	
140- 250	M 10x35	8	10142788	
280- 350	M 10x40	8	10282788	
400- 500	M 10x40	12	10402788	
560- 710	M 12x45	16	10562788	
800-1000	M 12x45	24	10802788	
1120-1400	M 16x50	32	109927880112	
1600	M 16x50	40	109927880160	



E = No. of holes

FLANGES 2-PART

1362

- Similar to DIN 24154-2

Powder-coated and galvanised

DN	$\varnothing d$	$\varnothing A$	$\varnothing B$	$\varnothing C$	E	S	kg	Powder-coated		Galvanised	
								Item no.	€	Item no.	€
80	82	118	142	9.5	4	8	0.40	10081713		10082713	
100	105	139	165	9.5	4	8	0.46	10101713		10102713	
120	125	165	185	9.5	4	8	0.57	10121713		10122713	
140	142	182	212	11.5	8	8	0.73	10141713		10142713	
150	155	200	225	11.5	8	8	1.25	10151713		10152713	
175	180	219	250	11.5	8	8	1.50	10171713		10172713	
200	205	241	275	11.5	8	8	1.60	10201713		10202713	
224	225	265	295	11.5	8	8	1.76	10221713		10222713	
250	255	292	325	11.5	8	8	1.94	10251713		10252713	
280	283	332	363	11.5	8	8	2.51	10281713		10282713	
300	305	366	395	11.5	8	8	3.00	10301713		10302713	
315	318	366	398	11.5	8	8	3.10	10311713		10312713	
350	355	405	435	11.5	8	8	3.20	10351713		10352713	
400	404	448	484	11.5	12	8	3.44	10401713		10402713	

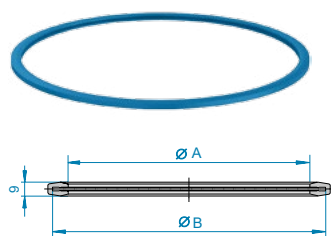
stainless steel

DN	$\varnothing d$	$\varnothing A$	$\varnothing B$	$\varnothing C$	E	S	kg	Stainless steel	
								Item no.	€
80	82	118	142	9.5	4	8	0.40	10083713	
100	105	139	165	9.5	4	8	0.46	10103713	
120	125	165	185	9.5	4	8	0.57	10123713	
140	142	182	212	11.5	8	8	0.73	10143713	
150	155	200	225	11.5	8	8	1.25	10153713	
175	180	219	250	11.5	8	8	1.50	10173713	
200	205	241	275	11.5	8	8	1.60	10203713	
224	225	265	295	11.5	8	8	1.76	10223713	
250	255	292	325	11.5	8	8	1.94	10253713	
280	283	332	363	11.5	8	8	2.51	10283713	
300	305	366	395	11.5	8	8	3.00	10303713	
315	318	366	398	11.5	8	8	3.10	10313713	
350	355	405	435	11.5	8	8	3.20	10353713	
400	404	448	484	11.5	12	8	3.44	10403713	



THE FLANGE RANGE

Flanges, seals and installation kit



U-SHAPED SEALS FOR 10 MM LIP FLANGE

6210

- Please also read and take into account the technical information given at the beginning of this chapter
- Profile for loose flange pipework with a 10 mm lip
- Use for 1-3 mm pipework system
- A U-shaped seal (chapter 2) must be used for pipe components with a loose flange diameter of up to 350 mm and a 6 mm lip
- For connecting:
 - 2 pipe components with loose flange from DN 350 mm with 10 mm lip
 - A pipe component with a welded flange in conjunction with a pipe component with a loose flange

NBR and silicone

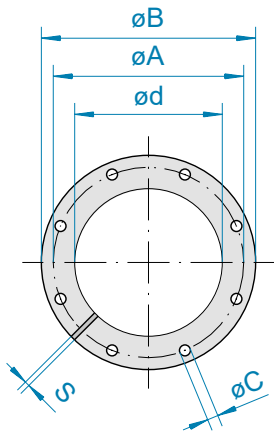
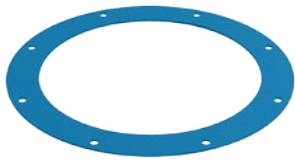
DN	ØA	ØB	kg	NBR grey white		Silicone beige	F	Silicone blue	F D
				Item no.	€	Item no.	€	Item no.	€
350	353	373	0.11	103567177		1035771709		10357717091	
400	403	423	0.13	104067177		1040771709		10407717091	
450	453	473	0.15	104567177		1045771709		10457717091	
500	503	523	0.17	105067177		1050771709		10507717091	
560	561	581	0.18	105667177		1056771709		10567717091	
630	631	651	0.21	106367177		1063771709		10637717091	
710	711	731	0.24	107167177		1071771709		10717717091	
800	801	821	0.26	108067177		1080771709		10807717091	

EPDM and Viton

DN	ØA	ØB	kg	EPDM black		Viton reddish brown	F
				Item no.	€	Item no.	€
350	353	373	0.11	1035871759		103597179	
400	403	423	0.13	1040871759		104097179	
450	453	473	0.15	1045871759		104597179	
500	503	523	0.17	1050871759		105097179	
560	561	581	0.18	1056871759		105697179	
630	631	651	0.21	1063871759		106397179	
710	711	731	0.24	1071871759		107197179	
800	801	821	0.26	1080871759		108097179	

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



E = No. of holes

FLAT SEALS FOR LOOSE FLANGES AND WELDED FLANGES

6220

- Similar to DIN 24154-2

- Please also read and take into account the technical information given at the beginning of this chapter

NBR and silicone

DN	Ø d	Ø A	Ø B	Ø C	E	S	kg	NBR grey white		Silicone beige F		Silicone blue F D	
								Item no.	€	Item no.	€	Item no.	€
350	355	405	435	11.5	8	3	0.20	10356718		10357718		1035771801	
400	400	448	484	11.5	12	3	0.24	10406718		10407718		1040771801	
450	450	497	534	11.5	12	3	0.26	10456718		10457718		1045771801	
500	500	551	584	11.5	12	3	0.28	10506718		10507718		1050771801	
560	560	629	664	14	16	3	0.38	10566718		10567718		1056771801	
630	630	698	734	14	16	3	0.42	10636718		10637718		1063771801	
710	710	775	814	14	16	3	0.52	10716718		10717718		1071771801	
800	800	861	904	14	24	3	0.56	10806718		10807718		1080771801	
900	897	958	1004	14	24	4	1.51	109967180090		109977180090		10997718009001	
1000	998	1067	1105	14	24	4	1.68	109967180100		109977180100		10997718010001	
1120	1118	1200	1245	18	32	4	2.79	109967180112		109977180112		10997718011201	
1250	1248	1337	1375	18	32	4	3.10	109967180125		109977180125		10997718012501	
1400	1398	1475	1525	18	32	4	3.47	109967180140		109977180140		10997718014001	
1600	1598	1675	1725	18	40	4	3.93	109967180160		109977180160		10997718016001	

EPDM

DN	Ø d	Ø A	Ø B	Ø C	E	S	kg	EPDM black	
								Item no.	€
350	355	405	435	11.5	8	3	0.20	10358718	
400	400	448	484	11.5	12	3	0.24	10408718	
450	450	497	534	11.5	12	3	0.26	10458718	
500	500	551	584	11.5	12	3	0.28	10508718	
560	560	629	664	14	16	3	0.38	10568718	
630	630	698	734	14	16	3	0.42	10638718	
710	710	775	814	14	16	3	0.52	10718718	
800	800	861	904	14	24	3	0.56	10808718	
900	897	958	1004	14	24	4	1.51	109987180090	
1000	998	1067	1105	14	24	4	1.68	109987180100	
1120	1118	1200	1245	18	32	4	2.79	109987180112	
1250	1248	1337	1375	18	32	4	3.10	109987180125	
1400	1398	1475	1525	18	32	4	3.47	109987180140	
1600	1598	1675	1725	18	40	4	3.93	109987180160	

F FOOD GRADE
EC 1935/2004 plus FDA compliant

D DETECTABLE DESIGN
Metal-detectable



JACOB FIXING COMPONENTS AND
ACCESSORIES – THE QUICK AND EASY WAY
TO INSTALL YOUR PIPEWORK SYSTEM



FIXING COMPONENTS AND ACCESSORIES

Technical information	234	
Flanging tools	236	
Spray paint and paint tin	236	
Earthing wires and earthing lugs	237	
Pipe clamps	238	
Assembly accessories	240	
Blank-off cover	241	



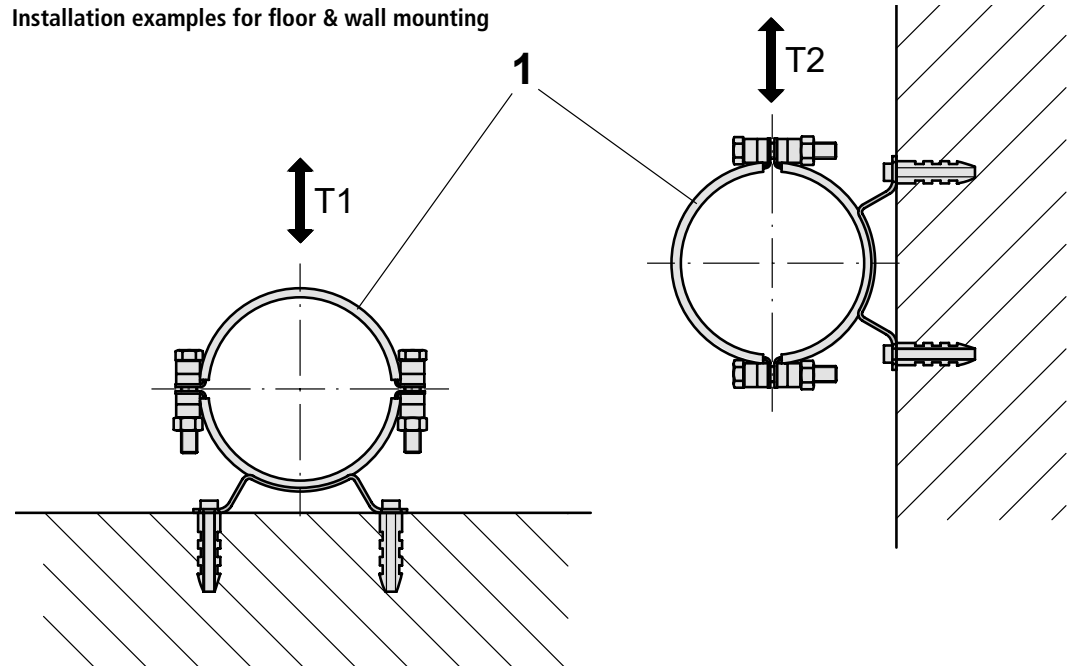
JACOB ACCESSORIES

Your pipework system entirely from one source and easily installed with our accessories, from the flanging tools for cutting exact lengths on site right up to pipe clamps.

INSTALLATION EXAMPLES OF PIPE CLAMPS FOR FLOOR AND WALL MOUNTING

Whether for floor or wall mounting – JACOB has the right pipe clamps in its range.

Installation examples for floor & wall mounting



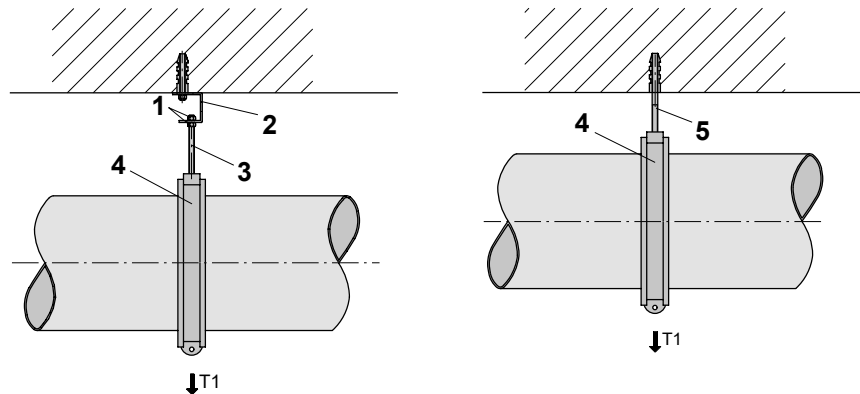
- 1 Pipe clamps for wall mounting with rubber insert
- T1 Load with a deformation of 5 mm
- T2 Load with a deformation of 10 mm

For details of loads, refer to the tables on pages 238 and 239



Installation examples for ceiling mounting

- 1 Hexagon nuts metric
- 2 Fixing clips
- 3 Threaded bolt metric
- 4 Pipe clamps for wall mounting with rubber insert
- 5 Hanger bolt metric
- T1 Load with a deformation of 5 mm



For details of loads, refer to the tables on pages 238 and 239



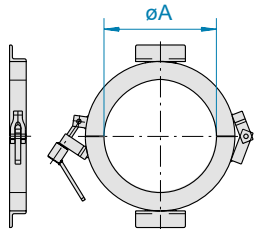
EARTHING WIRE

Creates electrostatic continuity through connecting two pipe components with an earthing lug using a JACOB earthing wire. Alternatively, the earthing bridge (see chapter 2) can be used to create electrostatic continuity.



FIXING COMPONENTS AND ACCESSORIES

Flanging tools / spray paint and paint tin



Operating instructions for flanging tools

FLANGING TOOLS

4020

- To create exact lengths on site
- Please also read and take into account our operating instructions
- From DN 80 to 175 mm only 1 angle piece welded
- From DN 200 to 400 mm 2 angle pieces welded

DN	ØA	kg	Powder-coated	
			Item no.	€
60	58	3.10	10061740	
80	80	3.30	10081740	
100	103	3.60	10101740	
120	123	4.70	10121740	
140	139	5.20	10141740	
150	153	5.60	10151740	
175	178	6.40	10171740	
200	203	6.80	10201740	
224	223	7.30	10221740	
250	253	8.75	10251740	
280	283	9.10	10281740	
300	303	9.35	10301740	
315	318	9.80	10311740	
350	353	10.30	10351740	
400	403	12.00	10401740	
450	453	14.50	10451740	
500	503	17.00	10501740	

SPRAY PAINT AND PAINT TIN

4040/4050



- Spray paint for re-touching powder-coated or galvanised pipework (RAL 7032)
- 1 kg paint and paintbrush for powder-coated pipework (RAL 7032)
- N.B.: Paint is a hazardous substance – separate packaging provided!
- Non-conductive

Paint and zinc spray

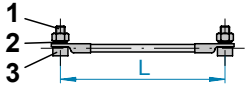
RAL 7032		Galvanised	
Item no.	€	Item no.	€
100019900		10002990	

1 kg paint and paintbrush

RAL 7032	
Item no.	€
100019910	



Earthing wires and earthing lugs



- 1 Hexagon nut metric M 6, A2
- 2 Toothed lock washer M 6.4, A2
- 3 Hexagon bolt metric M 6 x 16, A2

EARTHING WIRE 16 MM²

1420

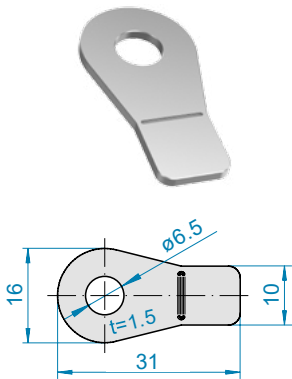
- To create electrostatic continuity
- For use in conjunction with pipework with earthing lugs
- Including hexagon nut M 6, A2, toothed lock washer 6.4, A2 and hexagon bolt M 6 x 16, A2

L = 120 mm		L = 230 mm		L = 330 mm		L = 430 mm	
Item no.	€/pack of ten	Item no.	€/pack of ten	Item no.	€/pack of five	Item no.	€/pack of five
1000079510		1000079610		1000079705		1000079805	

EARTHING LUGS

1415/1410

- To create electrostatic continuity in conjunction with the earthing wire
- Material 1.4301, material thickness 1.5 mm
- Available as a loose earthing lug for installation on site
- Including application through spot welding to pipework

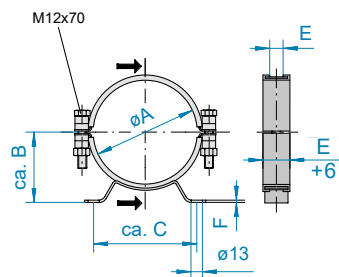
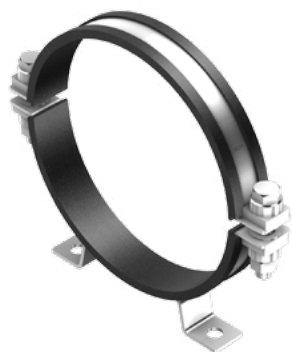


Earthing lug, loose		Earthing lug, spot-welded	
Item no.	€/pack of ten	Item no.	€
1100379020		11003791	



FIXING COMPONENTS AND ACCESSORIES

Pipe clamps



PIPE CLAMPS FOR WALL MOUNTING

3100

- With EPDM insert, -40°C to +120°C
- Silicone insert, -60°C to +170°C, on request
- Refer to the beginning of the chapter for installation examples of ceiling mounting

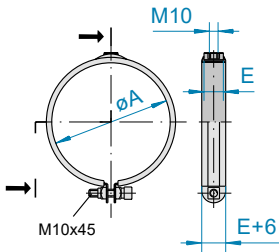
DN	ØA	B	C	E	F	Load (kN)		kg	Electro-galvanised		Stainless steel	
						T1	T2		Item no.	€	Item no.	€
60	60	50	100	20x1	2			0.20	10062780		10063780	
80	80	64	138	30x2.5	3	2.0	1.0	0.70	10082780		10083780	
100	102	75	138	30x2.5	3	2.5	1.0	0.80	10102780		10103780	
120	123	86	138	30x2.5	3	2.5	1.0	0.85	10122780		10123780	
140	139	94	138	30x2.5	3	2.5	1.0	0.85	10142780		10143780	
150	153	101	148	30x2.5	3	3.0	1.2	0.95	10152780		10153780	
175	178	113	148	30x2.5	3	3.0	1.2	1.00	10172780		10173780	
200	203	126	148	30x2.5	3	3.0	1.2	1.05	10202780		10203780	
224	223	136	148	30x2.5	3	3.0	1.2	1.10	10222780		10223780	
250	253	151	230	30x2.5	3	3.0	1.2	1.25	10252780		10253780	
280	280	166	230	30x2.5	3	3.0	1.2	1.40	10282780		10283780	
300	303	176	230	30x2.5	3	3.0	1.2	1.40	10302780		10303780	
315	315	182	230	30x2.5	3	3.0	1.2	1.40	10312780		10313780	
350	353	204	260	30x3	4	3.5	1.2	1.55	10352780		10353780	
400	402	228	260	30x3	4	3.5	1.2	2.10	10402780		10403780	
450	452	254	300	30x3	4	4.5	1.5	2.95	10452780		10453780	
500	502	279	300	30x3	4	4.5	1.5	3.05	10502780		10503780	
560	562	309	350	30x3	4	5.0	1.7	4.00	10562780		10563780	
630	632	344	350	30x3	4	5.0	1.7	5.00	10632780		10633780	
710	712	385	350	40x4	5			5.50	10712780		10713780	
800	800	450	350	40x4	5			6.50	10802780		10803780	



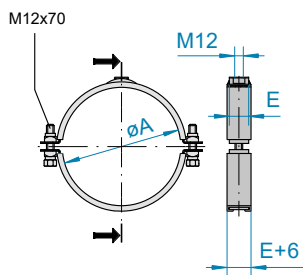
PIPE CLAMPS FOR CEILING MOUNTING

3090

- With EPDM insert, -40°C to +120°C
- Silicone insert, -60°C to +120°C, on request
- Refer to the beginning of the chapter for installation examples of ceiling mounting



DN 60 to 300 mm



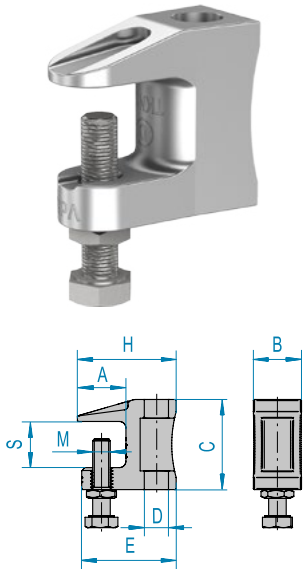
DN 315 to 800 mm

DN	ØA	E	Load (kN)	kg	Electro-galvanised		Stainless steel	
					Item no.	€	Item no.	€
60	60	20x1.0		0.11	10062770		10063770	
80	80	25x1.5	2.0	0.20	10082770		10083770	
100	102	25x1.5	2.0	0.24	10102770		10103770	
120	123	25x1.5	2.0	0.27	10122770		10123770	
140	139	25x1.5	2.0	0.29	10142770		10143770	
150	153	25x1.5	2.0	0.31	10152770		10153770	
175	178	25x1.5	2.0	0.34	10172770		10173770	
200	203	25x1.5	2.0	0.37	10202770		10203770	
224	223	25x1.5	2.0	0.41	10222770		10223770	
250	253	25x1.5	2.0	0.44	10252770		10253770	
280	280	25x1.5	2.0	0.51	10282770		10283770	
300	303	25x1.5	2.0	0.60	10302770		10303770	
315	315	30x2.5	2.0	1.25	10312770		10313770	
350	353	30x2.5	3.0	1.31	10352770		10353770	
400	402	30x2.5	3.0	1.42	10402770		10403770	
450	452	30x2.5	3.0	1.60	10452770		10453770	
500	502	30x2.5	3.0	1.66	10502770		10503770	
560	562	30x2.5	3.0	1.79	10562770		10563770	
630	632	30x2.5	3.0	1.80	10632770		10633770	
710	712	30x2.5		2.50	10712770		10713770	
800	802	30x2.5		3.50	10802770		10803770	



FIXING COMPONENTS AND ACCESSORIES

Assembly accessories

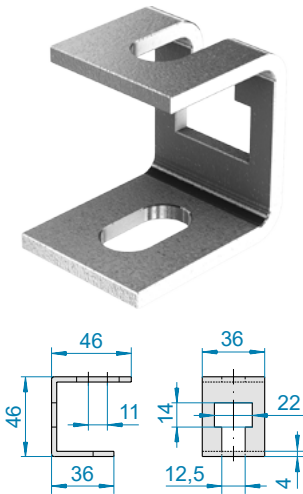


BEARING CLAMPS

3190

- For fixing pipes to steel girders (no welding or drilling required)
- Galvanised cast-iron bearing clamps (clamping width 0-20 mm)
- Bearing clamps, V2A (clamping width 0-16 mm)
- Fully equipped for the suspension of DN 60 to DN 300 pipes, size of through hole M10

S	A	B	C	D	E	H	M	Cast iron, galvanised		V2A	
								Item no.	€/pack of ten	Item no.	€
0-20	23	21	42	11	41	44	10	1008277610			
0-16	21.5	21	38	11	34	41.5	10			10083776	



FIXING CLIPS

3110

- Electro galvanised
- Load 3.0 kN with a deformation of 5 mm

Item no.	€/pack of ten
1008277110	



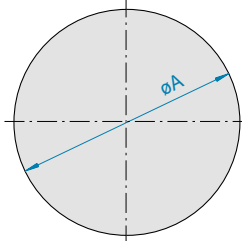
Hanger bolt metric

HANGER BOLTS METRIC

3120/3140/3150/3130

Article		Electro-galvanised		Stainless steel	
		Item no.	€	Item no.	€
Threaded bolts metric 1000 mm long	M 10	10082772		10083772	
	M 12	10102772		10103772	
Hexagon nuts metric DIN EN ISO 4032	M 10	10082774		10083774	
	M 12	10102774		10103774	
Twin nuts 30 mm long	M 10	10082775		10083775	
	M 12	10102775		10103775	
Hanger bolts metric M 10 x 100 mm	M 10	10082773		10083773	
	M 12	10102773		10103773	

Blank-off cover



BLANK-OFF COVER

1370

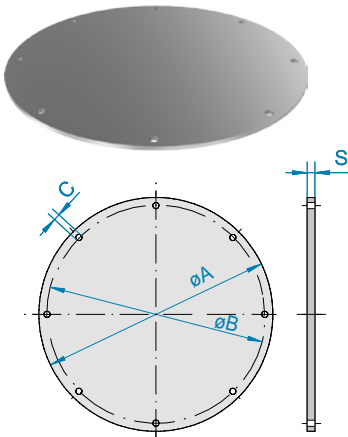
- For permanently closing off a pipe system
- For use in conjunction with U-shaped seal and pull-ring
- From DN 350 mm, also available for flange connections
- Pressure range restricted, particularly in the case of large diameters

Blank-off covers for pull ring connections

DN	ϕA	kg	1.5 mm stainless steel	F	2 mm stainless steel	F
			Item no.	€	Item no.	€
60	70	0.04	110637151			
80	92	0.05	110837151			
100	114	0.10	111037151			
120	134	0.10	111237151			
140	150	0.15	111437151			
150	164	0.15	111537151			
175	189	0.20	111737151			
200	214	0.30	112037151			
224	234	0.30	112237151			
250	264	0.45	112537151			
280	292	0.83	112837151			
300	314	0.55	113037151			
315	327	1.10	113137151			
350	364	1.60			123537151	
400	414	1.50			124037151	
450	464	1.50			124537151	
500	514	3.25			125037151	
560	574	4.05			125637151	
630	644	5.15			126337151	

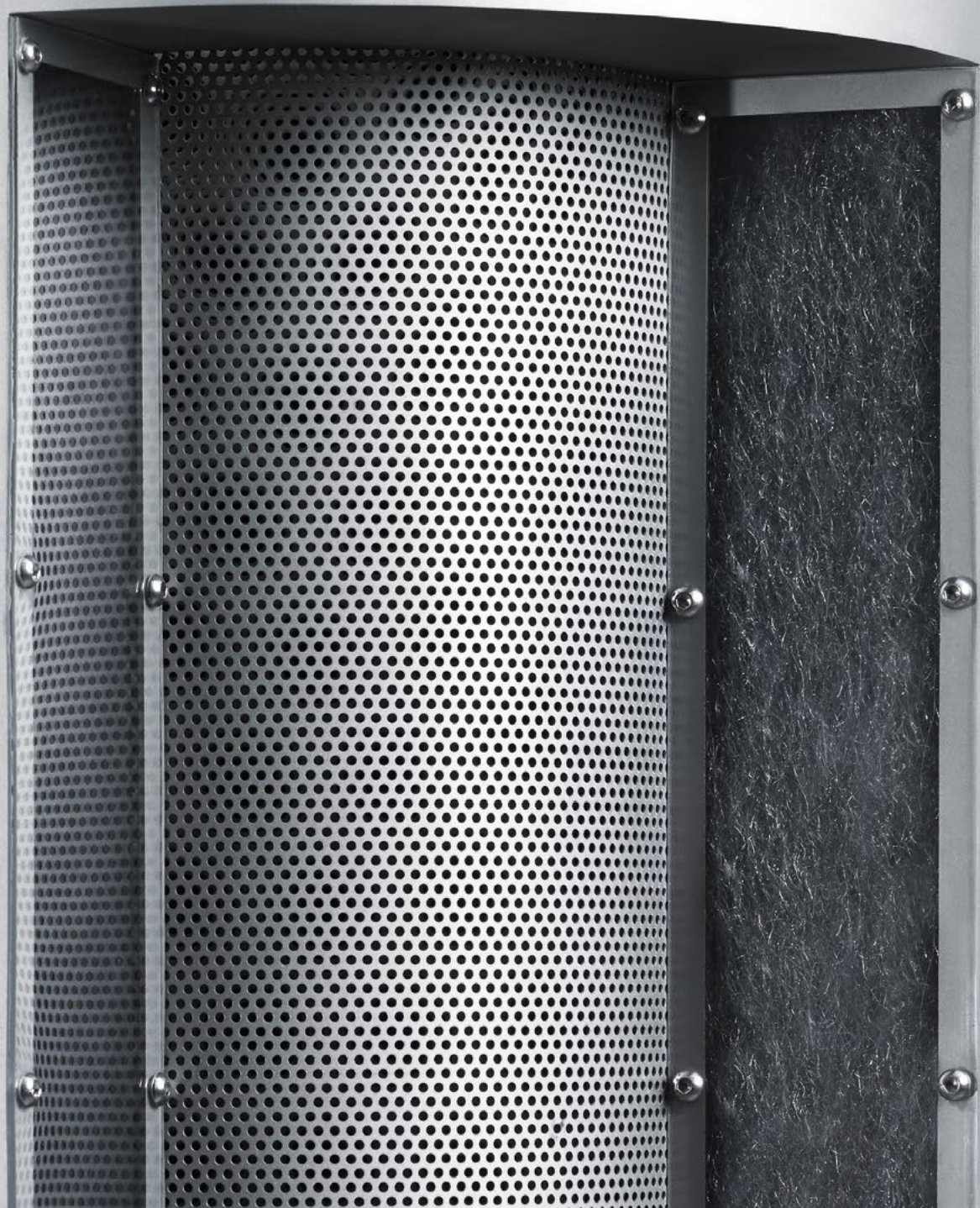
Blank-off cover for flange connections

DN	ϕA	ϕB	C	E	S	kg	Stainless steel	F
							Item no.	€
350	435	405	11.5	8	6	7.00	20353723	
400	484	448	11.5	12	6	8.70	20403723	
450	534	497	11.5	12	6	10.60	20453723	
500	584	551	11.5	12	6	12.70	20503723	
560	664	629	14.0	16	6	16.30	20563723	
630	734	698	14.0	16	6	20.00	20633723	
710	814	775	14.0	16	6	24.50	20713723	
800	904	861	14.0	24	6	30.30	20803723	
900	1004	958	14.0	24	6	37.30	209937230090	
1000	1105	1067	14.0	24	6	45.20	209937230100	
1120	1245	1200	18.0	32	6	57.30	209937230112	
1250	1375	1337	18.0	32	6	69.90	209937230125	
1400	1525	1475	18.0	32	6	86.00	209937230140	
1600	1725	1675	18.0	32	6	110.10	209937230160	



E = No. of holes

F FOOD GRADE
EC 1935/2004 plus FDA compliant



JACOB SILENCERS AND CYCLONES –
COMPLETE THE FUNCTIONALITY
OF THE JACOB MODULAR SYSTEM



SILENCERS AND CYCLONES

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SILENCERS AND CYCLONES

Technical information



SILENCERS

In pipework systems, noticeable noise cannot be avoided. To get your production systems to whisper, we offer silencers with JACOB-compatible elements in our standard range. Silencers are available in lengths of 500, 1000 and 1500 mm and in diameters of 80 to 630 mm. They are made in a variety of materials with a wall thickness of 2 mm. The ends are lipped and are alternately available with a loose flange connection from a diameter of 350 mm. The sound-absorbing material applied on the inside consists of non-inflammable mineral wool with a non-woven glass covering. As a component of the JACOB modular pipework system, the silencers are easy to disassemble and assemble for cleaning or to replace the mineral wool.

We are pleased to accommodate special customer requirements. If desired, we can also assist you in selecting the right design variant and the correct dimensions for your acoustic insulation.

The advantages for you:

- Easy to incorporate in the JACOB modular system
- Broad range of standard products with a variety of different diameters, materials and damping lengths
- Replaceable insulation through the use of our pull-ring system
- Accommodation of special customer requirements, such as special lengths
- Special colours



CYCLONES

Utilising centrifugal force, cyclones within a pipework system ensure that solid particles are separated out. Cyclones are often used in industry to recover raw materials from the production process or generally to remove solid particles before recirculating the air. The range of applications is therefore accordingly wide. Our cyclones are used in the timber, plastics and tobacco industries, for example. Our standard cyclones are available in diameters ranging from 250 to 1000 mm with lipped connections, and with diameters from 1120 to 2300 mm with welded-on flanges. For diameters up to 1250 mm, the material thickness can be 2 or 3 mm, and larger diameters are manufactured with a material thickness of 3 mm. Cyclones are available in powder-coated, galvanised or stainless steel versions. Please note that cyclones are passive components. The way they work depends on the volumetric flow, the pressure loss and the material load and particle size.

The nominal diameters refer to the diameter of the cyclone body. The size of the cyclone inlet can be dimensioned with a diameter of between 80 and 900 mm.

The volumetric flow indicated applies for a flow velocity of approx. 20-24 m/sec in the pipe system at the cyclone connection.

The separation rate and pressure loss were determined based on a material load of 1 kg/m³.

We custom-build cyclones according to your individual requirements and we also help you to select the right cyclone for the job. Further models and diameters are available on request. Please call us for further information.

The advantages for you:

- Easy to incorporate in the JACOB modular system
- Easy maintenance through modular design
- Also available in stainless steel for contact with food
- Accommodation of special customer requirements
- Special colours
- Leg supports on request



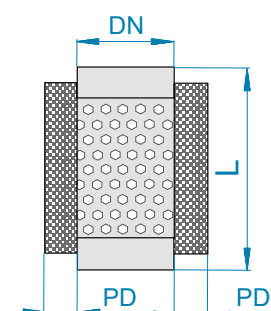
Explanatory video
about cyclones





SILENCERS, DAMPING LENGTH 400 MM

1470/6470



PD = insulation thickness

Technical data

DN	L	PD	Volumetric flow at v_{max} (m ³ /h)	Air speed v_{max} (m/s)	Damping at 250 Hz D_e (dB)	Acoustic power L_W (A)	Pressure loss (Pa)
80	486	100	250	15	18	32	17
100	486	100	400	15	15	34	14
120	486	100	600	15	13	35	11
140	486	100	800	15	12	36	10
150	486	100	900	15	11	37	9
175	486	100	1200	15	10	38	8
200	486	100	1700	15	9	40	7
224	486	100	2100	15	9	41	6
250	486	100	2600	15	7	42	5
300	486	100	3800	15	6	43	5
350	486	100	5100	15	5	44	4
400	486	100	6700	15	5	46	3

DN	2 mm, primed, with lipped end		2 mm, primed, with welded-on flange		2 mm, hot-dip galvanised, with lipped end		2 mm, hot-dip galvanised, with welded-on flange	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	4200805012500				4200805022500			
100	4201005012500				4201005022500			
120	4201205012500				4201205022500			
140	4201405012500				4201405022500			
150	4201505012500				4201505022500			
175	4201705012500				4201705022500			
200	4202005012500				4202005022500			
224	4202205012500				4202205022500			
250	4202505012500				4202505022500			
300	4203005012500				4203005022500			
350	4203505012500		4203505012503		4203505022500		4203505022503	
400	4204005012500		4204005012503		4204005022500		4204005022503	

DN	2 mm stainless steel, with lipped end		2 mm stainless steel, with loose flange	
	Item no.	€	Item no.	€
80	4200805032500			
100	4201005032500			
120	4201205032500			
140	4201405032500			
150	4201505032500			
175	4201705032500			
200	4202005032500			
224	4202205032500			
250	4202505032500			
300	4203005032500			
350	4203505032500		4203505032503	
400	4204005032500		4204005032503	



SILENCERS, DAMPING LENGTH 900 MM

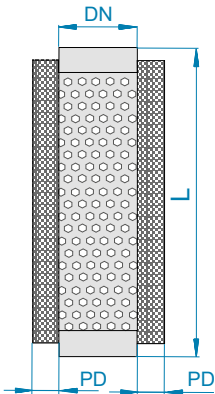
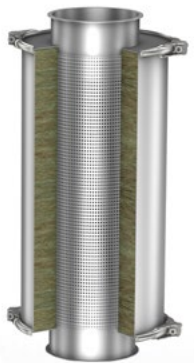
1470

Technical data

DN	L	PD	Volumetric flow at v_{\max} (m ³ /h)	Air speed v_{\max} (m/s)	Damping at 250 Hz D_e (dB)	Acoustic power L_W (A)	Pressure loss (Pa)
80	984	100	270	15	37	32	38
100	984	100	400	15	30	34	31
120	984	100	600	15	25	35	26
140	984	100	800	15	24	36	22
150	984	100	900	15	22	37	20
175	984	100	1200	15	21	38	18
200	984	100	1700	15	18	40	15
224	984	100	2100	15	17	41	14
250	984	100	2600	15	15	42	12
300	984	100	3800	15	13	43	10
350	984	100	5100	15	12	44	9
400	984	100	6700	15	11	46	8
450	984	100	8500	15	8	47	7

DN	2 mm, primed, with lipped end		2 mm, primed, with welded-on flange		2 mm, hot-dip galvanised, with lipped end		2 mm, hot-dip galvanised, with welded-on flange	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	4200810012500				4200810022500			
100	4201010012500				4201010022500			
120	4201210012500				4201210022500			
140	4201410012500				4201410022500			
150	4201510012500				4201510022500			
175	4201710012500				4201710022500			
200	4202010012500				4202010022500			
224	4202210012500				4202210022500			
250	4202510012500				4202510022500			
300	4203010012500				4203010022500			
350	4203510012500		4203510012503		4203510022500		4203510022503	
400	4204010012500		4204010012503		4204010022500		4204010022503	
450	4204510012500		4204510012503		4204510022500		4204510022503	

DN	2 mm stainless steel, with lipped end		2 mm stainless steel, with loose flange	
	Item no.	€	Item no.	€
80	4200810032500			
100	4201010032500			
120	4201210032500			
140	4201410032500			
150	4201510032500			
175	4201710032500			
200	4202010032500			
224	4202210032500			
250	4202510032500			
300	4203010032500			
350	4203510032500		4203510032503	
400	4204010032500		4204010032503	
450	4204510032500		4204510032503	

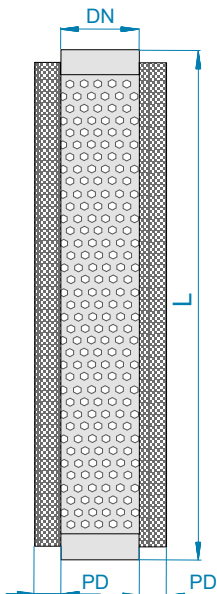


PD = insulation thickness



SILENCERS, DAMPING LENGTH 1400 MM

1470



PD = insulation thickness

Technical data

DN	L	PD	Volumetric flow at v_{max} (m ³ /h)	Air speed v_{max} (m/s)	Damping at 250 Hz D_e (dB)	Acoustic power L_w (A)	Pressure loss (Pa)
150	1484	100	900	15	34	37	32
175	1484	100	1200	15	32	38	27
200	1484	100	1700	15	27	40	24
224	1484	100	2100	15	26	41	21
250	1484	100	2600	15	23	42	19
300	1484	100	3800	15	30	43	16
350	1484	100	5100	15	18	44	14
400	1484	100	6700	15	16	46	12
450	1484	100	8500	15	13	47	11
500	1484	100	10600	15	12	48	10
560	1484	100	13300	15	12	49	9
630	1484	100	15800	15	11	50	8

DN	2 mm, primed, with lipped end		2 mm, primed, with welded-on flange		2 mm, hot-dip galvanised, with lipped end		2 mm, hot-dip galvanised, with welded-on flange	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	4201515012500				4201515022500			
175	4201715012500				4201715022500			
200	4202015012500				4202015022500			
224	4202215012500				4202215022500			
250	4202515012500				4202515022500			
300	4203015012500				4203015022500			
350	4203515012500		4203515012503		4203515022500		4203515022503	
400	4204015012500		4204015012503		4204015022500		4204015022503	
450	4204515012500		4204515012503		4204515022500		4204515022503	
500	4205015012500		4205015012503		4205015022500		4205015022503	
560	4205615012500		4205615012503		4205615022500		4205615022503	
630	4206315012500		4206315012503		4206315022500		4206315022503	

DN	2 mm stainless steel, with lipped end		2 mm stainless steel, with loose flange	
	Item no.	€	Item no.	€
150	4201515032500			
175	4201715032500			
200	4202015032500			
224	4202215032500			
250	4202515032500			
300	4203015032500			
350	4203515032500		4203515032503	
400	4204015032500		4204015032503	
450	4204515032500		4204515032503	
500	4205015032500		4205015032503	
560	4205615032500		4205615032503	
630	4206315032500		4206315032503	



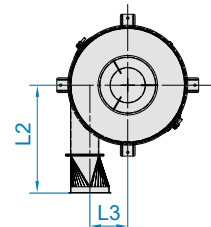
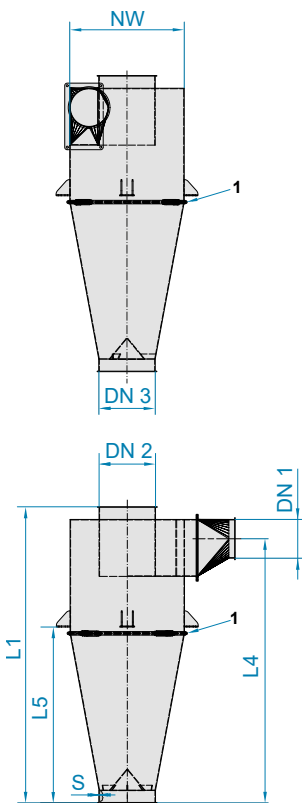
CYCLONES

1480

- Please also read and take into account the technical information given at the beginning of this chapter
- Up to NW 1800 mm powder-coated
- NW 2000 and 2300 mm spray-primed

Technical data

NW	DN 1	DN 2	DN 3	L1	L2	L3	L4	L5	Volumetric flow (m³/h)	Pressure loss (Pa)	Separation rate 95% with particle size (µm):
250	80	120	120	650	262	87	560	375	407	1020	>10
300	100	150	150	800	302	102	699	475	636	1012	>10
350	120	175	175	925	347	117	814	550	865	924	>12
400	140	200	200	1050	386	131	931	625	1130	980	>12
450	150	224	224	1170	426	151	1044	695	1418	984	>13
500	175	250	250	1300	471	164	1161	775	1766	980	>13
560	200	280	280	1450	516	181	1299	865	2216	980	>14
630	224	300	300	1550	576	204	1389	895	2543	975	>15
710	250	350	350	1800	647	232	1474	1040	3462	978	>16
800	280	400	400	2050	717	262	1710	1200	4522	980	>18
900	300	450	450	2300	802	302	1949	1350	5723	980	>18
1000	350	500	500	2550	887	327	2174	1500	7065	980	>19



1 Connection between top and bottom section of cyclone:

- Pull-ring connection
NW 250-630 mm
- Welded flanges
NW 710-2300 mm
- From DN 710 mm
with a domed cover

Inlets and outlets with 6 mm lip, powder-coated in RAL 7032 and galvanised

NW	2 mm powder-coated		3 mm powder-coated		2 mm galvanised		3 mm galvanised	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
250	4202002512255		4203002512255		4202002522255		4203002522255	
300	4202003012255		4203003012255		4202003022255		4203003022255	
350	4202003512255		4203003512255		4202003522255		4203003522255	
400	4202004012255		4203004012255		4202004022255		4203004022255	
450	4202004512255		4203004512255		4202004522255		4203004522255	
500	4202005012255		4203005012255		4202005022255		4203005022255	
560	4202005612255		4203005612255		4202005622255		4203005622255	
630	4202006312255		4203006312255		4202006322255		4203006322255	
710	4202007112255		4203007112255		4202007122255		4203007122255	
800	4202008012255		4203008012255		4202008022255		4203008022255	
900	4202009012255		4203009012255		4202009022255		4203009022255	
1000	4202010012255		4203010012255		4202010022255		4203010022255	

Inlets and outlets with 6 mm lip, stainless steel, shotblasted or pickled and passivated

NW	2 mm 1.4301 (304) shotblasted		2 mm 1.4571 (316Ti) pickled and passivated	
	Item no.	€	Item no.	€
250	4202002532255		4202002542255	
300	4202003032255		4202003042255	
350	4202003532255		4202003542255	
400	4202004032255		4202004042255	
450	4202004532255		4202004542255	
500	4202005032255		4202005042255	
560	4202005632255		4202005642255	
630	4202006332255		4202006342255	
710	4202007132255		4202007142255	
800	4202008032255		4202008042255	
900	4202009032255		4202009042255	
1000	4202010032255		4202010042255	



SILENCERS AND CYCLONES

Cyclones



Product similar to picture

Technical data

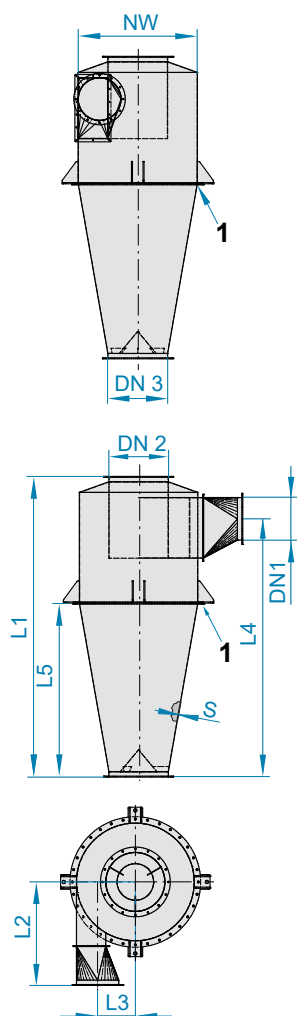
NW	DN1	DN2	DN3	L1	L2	L3	L4	L5	Volumetric flow (m³/h)	Pressure loss (Pa)	Separation rate 95% with particle size (µm):
1120	400	560	560	2900	987	362	2449	1650	8862	1003	>19
1250	450	630	630	3250	1097	402	2774	1900	11216	998	>21
1400	500	710	710	3650	1217	452	3149	2130	14246	980	>22
1600	560	800	800	4100	1387	522	3569	2400	18086	980	>24
1800	630	900	900	4600	1552	587	4034	2700	22891	980	>25
2000	710	1000	1000	5100	1717	647	4493	3000	28260	980	>28
2300	800	1120	1120	5850	1967	752	5198	3450	37374	980	>29

Inlets and outlets with welded-on flanges, powder-coated in RAL 7032 and galvanised

NW	2 mm powder-coated		3 mm powder-coated		2 mm galvanised		3 mm galvanised	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
1120	4202011212255		4203011212255		4202011222255		4203011222255	
1250	4202012512255		4203012512255		4202012522255		4203012522255	
1400			4203014012255				4203014022255	
1600			4203016012255				4203016022255	
1800			4203018012255				4203018022255	
2000			4203020012255				4203020022255	
2300			4203023012255				4203023022255	

Inlets and outlets with welded-on flanges, stainless steel, shotblasted or pickled and passivated

NW	2 mm 1.4301 (304) pickled and passivated		3 mm 1.4301 (304) pickled and passivated		2 mm 1.4571 (316Ti) pickled and passivated		3 mm 1.4571 (316Ti) pickled and passivated	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
1120	4202011232255		4203011232255		4202011242255		4203011242255	
1250	4202012532255		4203012532255		4202012542255		4203012542255	
1400			4203014032255				4203014042255	
1600			4203016032255				4203016042255	
1800			4203018032255				4203018042255	
2000			4203020032255				4203020042255	
2300			4203023032255				4203023042255	

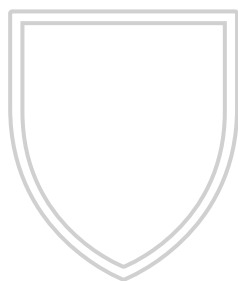


- 1 Connection between top and bottom section with JACOB flanges
- DN 1, 2 and 3 with welded flanges; flanges welded off-radius
 - Dimensions of JACOB flanges see chapter 12
 - From a nominal diameter of 2000 mm: three-part cyclone





GREATER EFFICIENCY WITH THE
JACOB WEAR PROTECTION RANGE



WEAR PROTECTION LINING

Technical information	254	
Inlet pieces	256	
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Segments	258	
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Special range hot-dip galvanised 3 mm	264	



WEAR PROTECTION LINING

Technical information



JACOB WEAR PROTECTION RANGE

Industrial systems that work more and more efficiently lead to an increase in the weight conveyed by the JACOB pipework system. In view of this, we have developed the new wear protection range.

You have the choice between several branded products. These consist basically of polyurethane, but vary due to their different material properties. The products are combined with our modular pipework system. We offer you diameters 150 to 350 mm as standard. The advantage of polyurethane is its elastic yet wear-resistant structure. As a result, the impact energy due to deflections is absorbed in particular and thereby extends the lifetime.

Thanks to the modular JACOB system, you can simply replace worn pipe components with lined pipes. You can still use pull-rings and seals from the standard range. To prevent the wear protection lining from being undermined, we have a transition component in our range with a chamfered lining which is fixed particularly securely in place. It is recommended that this piece is fitted at every place where lined pipework begins.

We also continue to supply ceramic linings, a non-stick coating such as PTFE or a lining of your choice, such as PU in glued form, upon request.

As an alternative to lined pipework, JACOB offers cast iron pipe components (see page 262) or hot-dip galvanised pipe components with 3 mm wall thickness (see page 264).

Our team would be pleased to assist you with selecting the right wear protection.

The advantages for you

- Wear protection in a modular system
- Perfect for combining with JACOB pull-ring system
- Flexibly replaceable
- Easy to assemble
- Longer lasting when conveying abrasive materials
- Choice between several materials in the standard range
- Other linings available on request



JACOB WEAR PROTECTION RANGE

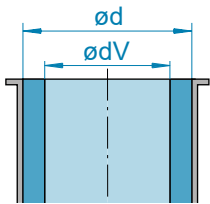
For the wear protection range, JACOB uses pipe components from the modular system which are lined with different materials:

- 2 mm wall thickness
- Galvanised or powder-coated
- DN 150 to 350 mm
- Straight pipes: 200, 500 and 1000 mm long
- Inlet piece: 50 mm long, with bevelled lining
- Segments: 5°, 15°, 30°, 45°
- Forks
- Cone pieces (partly 1.5 mm wall thickness)
- Two-way valves with inlet collar (powder-coated only)

See chapter 1 for dimensions and materials of JACOB pipework.

JACOB pipework galvanised or powder-coated

Lined with Blue Ox	Lined with Kryptane green	Lined with Rhino Hyde orange	Lined with Rhino Hyde blue
Polyurethane with expanded metal	Polyurethane with expanded metal	Polyurethane with expanded metal	Polyurethane with expanded metal
Material thickness approx. 6.5 mm	Material thickness approx. 6 mm	Material thickness approx. 8 mm	Material thickness approx. 8 mm
	FDA and EC 1935/2004 for handling bulk dry feed	FDA	FDA
		conductive	conductive
up to 80°C	up to 80°C	up to 60°C	up to 80°C
blue	green	orange	blue
Shore hardness A 85°	Shore hardness A 83°	Shore hardness A 85°	Shore hardness A 85°
bolted	bolted	bolted	bolted
Lining recommended solely for the grain and concentrated feed industry, for light to medium wear	Recommended use for linings for conveying non-sharp-edged bulk materials up to a conveying speed of 20 m/sec – Agricultural industry, e.g. to convey grains, soya, maize, etc. – Industry: e.g. to convey cement, lime, sand, gravel, concrete		



Internal diameter 1.5 mm pipework with wear protection lining

DN	Ø d	Ø dVS		
		Kryptane Material thickness approx. 6 mm	Blue Ox Material thickness approx. 6.5 mm	Rhino Hyde orange and blue Material thickness approx. 8 mm
150	150	138	137	134
200	200	188	187	184
250	250	238	237	234
300	300	288	287	284
350	350	338	337	334

Internal diameter 2 mm pipework with wear protection lining

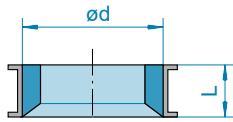
DN	Ø d	Ø dVS		
		Kryptane Material thickness approx. 6 mm	Blue Ox Material thickness approx. 6.5 mm	Rhino Hyde orange and blue Material thickness approx. 8 mm
150	149	137	136	133
200	199	187	186	183
250	249	237	236	233
300	299	287	286	283
350	349	337	336	333

All internal diameters (dVS) are approximate dimensions



WEAR PROTECTION LINING

Inlet pieces / Pipes



L = 50 mm

INLET PIECE WEAR PROTECTION LINING

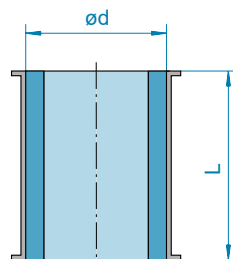
1490

50 mm long, 2 mm powder-coated

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121514000952		121514000951		121514000953		121514000950	
200	122014000952		122014000951		122014000953		122014000950	
250	122514000952		122514000951		122514000953		122514000950	
300	123014000952		123014000951		123014000953		123014000950	
350	123514000952		123514000951		123514000953		123514000950	

50 mm long, 2 mm galvanised

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121524000952		121524000951		121524000953		121524000950	
200	122024000952		122024000951		122024000953		122024000950	
250	122524000952		122524000951		122524000953		122524000950	
300	123024000952		123024000951		123024000953		123024000950	
350	123524000952		123524000951		123524000953		123524000950	



200 mm long: L = 200 mm
 500 mm long: L = 486 mm
 1000 mm long: L = 984 mm

PIPES – WEAR PROTECTION

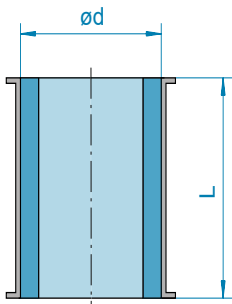
1492

200 mm long, 2 mm powder-coated

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121510400952		121510400951		121510400953		121510400950	
200	122010400952		122010400951		122010400953		122010400950	
250	122510400952		122510400951		122510400953		122510400950	
300	123010400952		123010400951		123010400953		123010400950	
350	123510400952		123510400951		123510400953		123510400950	

200 mm long, 2 mm galvanised

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121520400952		121520400951		121520400953		121520400950	
200	122020400952		122020400951		122020400953		122020400950	
250	122520400952		122520400951		122520400953		122520400950	
300	123020400952		123020400951		123020400953		123020400950	
350	123520400952		123520400951		123520400953		123520400950	



200 mm long: L = 200 mm
 500 mm long: L = 486 mm
 1000 mm long: L = 984 mm

500 mm long, 2 mm powder-coated

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121510300952		121510300951		121510300953		121510300950	
200	122010300952		122010300951		122010300953		122010300950	
250	122510300952		122510300951		122510300953		122510300950	
300	123010300952		123010300951		123010300953		123010300950	
350	123510300952		123510300951		123510300953		123510300950	

500 mm long, 2 mm galvanised

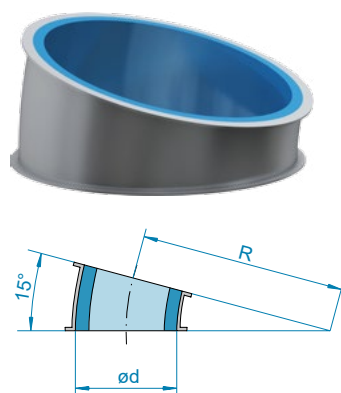
DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121520300952		121520300951		121520300953		121520300950	
200	122020300952		122020300951		122020300953		122020300950	
250	122520300952		122520300951		122520300953		122520300950	
300	123020300952		123020300951		123020300953		123020300950	
350	123520300952		123520300951		123520300953		123520300950	

1000 mm long, 2 mm powder-coated

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121510200952		121510200951		121510200953		121510200950	
200	122010200952		122010200951		122010200953		122010200950	
250	122510200952		122510200951		122510200953		122510200950	
300	123010200952		123010200951		123010200953		123010200950	
350	123510200952		123510200951		123510200953		123510200950	

1000 mm long, 2 mm galvanised

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121520200952		121520200951		121520200953		121520200950	
200	122020200952		122020200951		122020200953		122020200950	
250	122520200952		122520200951		122520200953		122520200950	
300	123020200952		123020200951		123020200953		123020200950	
350	123520200952		123520200951		123520200953		123520200950	



SEGMENTS – WEAR PROTECTION

1494/1496/1498/1500

5°, 2 mm powder-coated

DN	R	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	500	121513000952		121513000951		121513000953		121513000950	
200	690	122013000952		122013000951		122013000953		122013000950	
250	635	122513000952		122513000951		122513000953		122513000950	
300	625	123013000952		123013000951		123013000953		123013000950	
350	350	123513000952		123513000951		123513000953		123513000950	

5°, 2 mm galvanised

DN	R	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	500	121523000952		121523000951		121523000953		121523000950	
200	690	122023000952		122023000951		122023000953		122023000950	
250	635	122523000952		122523000951		122523000953		122523000950	
300	625	123023000952		123023000951		123023000953		123023000950	
350	350	123523000952		123523000951		123523000953		123523000950	

15°, 2 mm powder-coated

DN	R	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	250	121513100952		121513100951		121513100953		121513100950	
200	270	122013100952		122013100951		122013100953		122013100950	
250	310	122513100952		122513100951		122513100953		122513100950	
300	310	123013100952		123013100951		123013100953		123013100950	
350	350	123513100952		123513100951		123513100953		123513100950	

15°, 2 mm galvanised

DN	R	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	250	121523100952		121523100951		121523100953		121523100950	
200	270	122023100952		122023100951		122023100953		122023100950	
250	310	122523100952		122523100951		122523100953		122523100950	
300	310	123023100952		123023100951		123023100953		123023100950	
350	350	123523100952		123523100951		123523100953		123523100950	



30°, 2 mm powder-coated

DN	R	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	175	121513200952		121513200951		121513200953		121513200950	
200	180	122013200952		122013200951		122013200953		122013200950	
250	230	122513200952		122513200951		122513200953		122513200950	
300	230	123013200952		123013200951		123013200953		123013200950	
350	350	123513200952		123513200951		123513200953		123513200950	

30°, 2 mm galvanised

DN	R	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	175	121523200952		121523200951		121523200953		121523200950	
200	180	122023200952		122023200951		122023200953		122023200950	
250	230	122523200952		122523200951		122523200953		122523200950	
300	230	123023200952		123023200951		123023200953		123023200950	
350	350	123523200952		123523200951		123523200953		123523200950	

45°, 2 mm powder-coated

DN	R	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	150	121513300952		121513300951		121513300953		121513300950	
200	195	122013300952		122013300951		122013300953		122013300950	
250	195	122513300952		122513300951		122513300953		122513300950	
300	205	123013300952		123013300951		123013300953		123013300950	
350	350	123513300952		123513300951		123513300953		123513300950	

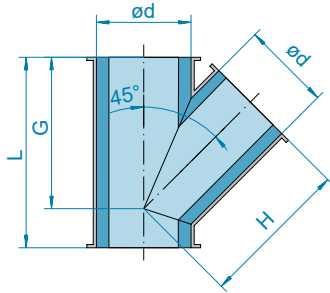
45°, 2 mm galvanised

DN	R	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	150	121523300952		121523300951		121523300953		121523300950	
200	195	122023300952		122023300951		122023300953		122023300950	
250	195	122523300952		122523300951		122523300953		122523300950	
300	205	123023300952		123023300951		123023300953		123023300950	
350	350	123523300952		123523300951		123523300953		123523300950	



WEAR PROTECTION LINING

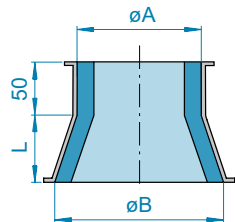
Forks/Cone pieces



See chapter 5 for fork dimensions



Product similar to picture



FORKS – WEAR PROTECTION

1502

45°, 2 mm powder-coated

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121512200952		121512200951		121512200953		121512200950	
200	122012200952		122012200951		122012200953		122012200950	
250	122512200952		122512200951		122512200953		122512200950	
300	123012200952		123012200951		123012200953		123012200950	
350	123512200952		123512200951		123512200953		123512200950	

45°, 2 mm galvanised

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121522200952		121522200951		121522200953		121522200950	
200	122022200952		122022200951		122022200953		122022200950	
250	122522200952		122522200951		122522200953		122522200950	
300	123022200952		123022200951		123022200953		123022200950	
350	123522200952		123522200951		123522200953		123522200950	

CONE PIECES – WEAR PROTECTION

1504

2 mm powder-coated

DN	L	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150-200	100	110014610952*		110014610951*		110014610953*		110014610950*	
150-250	150	110014620952*		110014620951*		110014620953*		110014620950*	
150-300	200	110014630952*		110014630951*		110014630953*		110014630950*	
200-250	120	120014700952		120014700951		120014700953		120014700950	
200-300	150	120014710952		120014710951		120014710953		120014710950	
250-300	150	120014750952		120014750951		120014750953		120014750950	
250-350	200	120014840952		120014840951		120014840953		120014840950	
300-350	200	120014800952		120014800951		120014800953		120014800950	

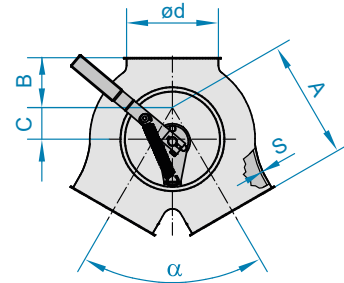
*1.5 mm

2 mm galvanised

DN	L	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
		Item no.	€	Item no.	€	Item no.	€	Item no.	€
150-200	100	110024610952*		110024610951*		110024610953*		110024610950*	
150-250	150	110024620952*		110024620951*		110024620953*		110024620950*	
150-300	200	110024630952*		110024630951*		110024630953*		110024630950*	
200-250	120	120024700952		120024700951		120024700953		120024700950	
200-300	150	120024710952		120024710951		120024710953		120024710950	
250-300	150	120024750952		120024750951		120024750953		120024750950	
250-350	200	120024840952		120024840951		120024840953		120024840950	
300-350	200	120024800952		120024800951		120024800953		120024800950	

*1.5 mm

Two-way valves with inlet collar



Inlet and inner flap lined

Refer to chapter 9 for dimensions of two-way valve with inlet collar

TWO-WAY VALVES WITH INLET COLLAR WEAR PROTECTION LINING

1506

- For gravity-flow pipe systems for coarse bulk goods

Asymmetrical 60°, hand-operated, 2 mm powder-coated

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121515120952		121515120951		121515120953		121515120950	
200	122015170952		122015170951		122015170953		122015170950	
250	122515170952		122515170951		122515170953		122515170950	
300	123015120952		123015120951		123015120953		123015120950	
350	123515150952		123515150951		123515150953		123515150950	

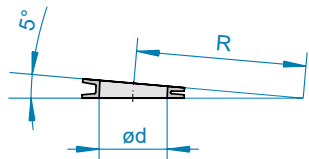
Symmetrical 60°, hand-operated, 2 mm powder-coated

DN	Lined with Blue Ox		Lined with Kryptane green		Lined with Rhino Hyde orange		Lined with Rhino Hyde blue	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
150	121515020952		121515020951		121515020953		121515020950	
200	122015050952		122015050951		122015050953		122015050950	
250	122515050952		122515050951		122515050953		122515050950	
300	123015020952		123015020951		123015020953		123015020950	
350	123515050952		123515050951		123515050953		123515050950	

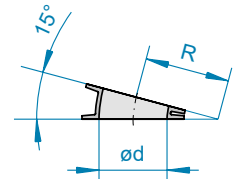


WEAR PROTECTION LINING

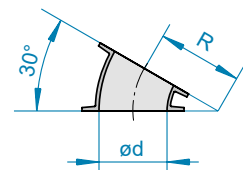
Cast-iron pipework



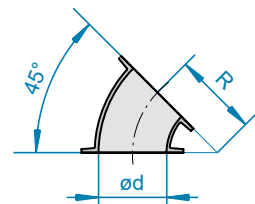
Cast-iron segment 5°



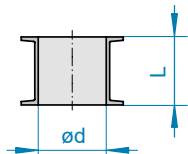
Cast-iron segment 15°



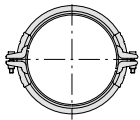
Cast-iron segment 30°



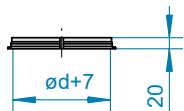
Cast-iron segment 45°



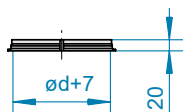
Cast-iron pipes



Pull-rings for cast-iron pipework



Angle flanges



Angle flanges, 1 cut

CAST-IRON PIPEWORK

1160/1170/1180/1190/1150/1200/7000/1210

- Cast-iron pipework made from modular spheroidal graphite cast iron
- 7.5 mm wall thickness
- Powder-coated (RAL 7032)

- Internal diameters correspond to 3 mm thick pipework
- Connection using pull-rings for cast-iron pipes
- Combination with JACOB pipework with lip using angle flanges

Cast-iron segments 5° and 15°

DN	Ø d	R	Cast-iron segments 5°		R	Cast-iron segments 15°	
			Item no.	€		Item no.	€
120	118				155	17121310	
150	148	600	17151300		250	17151310	
200	198	690	17201300		270	17201310	
250	248	635	17251300		310	17251310	
300	298	625	17301300		310	17301310	

Cast-iron segments 30° and 45°

DN	Ø d	R	Cast-iron segments 30°		R	Cast-iron segments 45°	
			Item no.	€		Item no.	€
120	118	110	17121320				
150	148	175	17151320		150	17151330	
200	198	180	17201320		195	17201330	
250	248	230	17251320		195	17251330	
300	298	230	17301320		205	17301330	

Cast-iron pipes and pull-rings

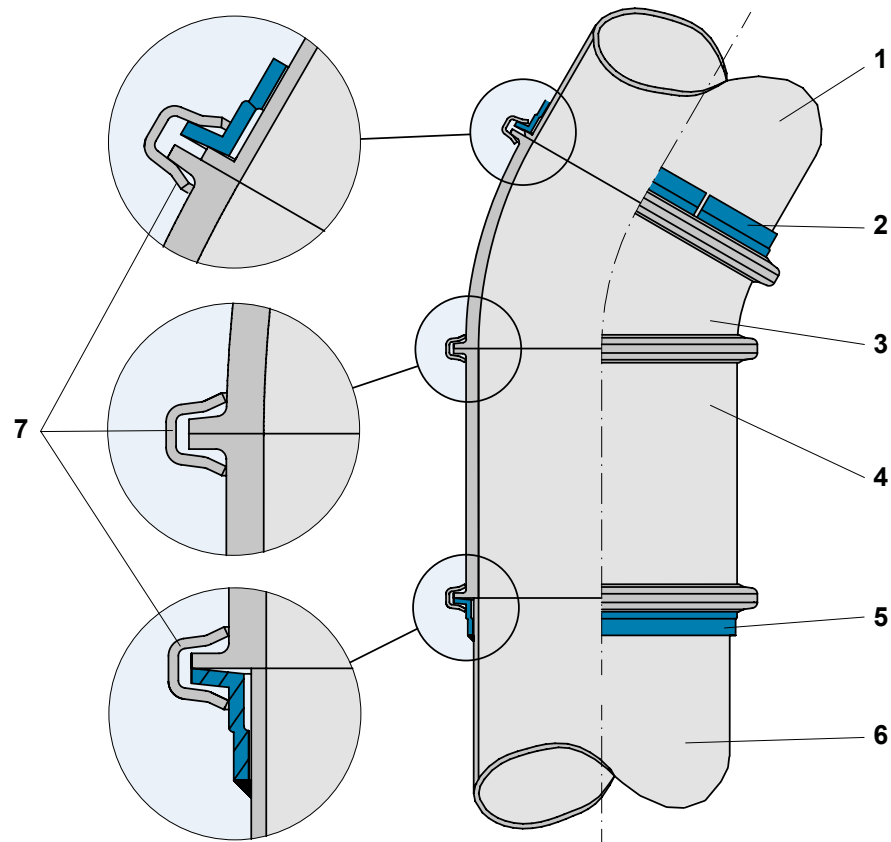
DN	Ø d	L	Cast-iron pipes		Pull-rings for cast-iron pipework, galvanised, with mastic sealant	
			Item no.	€	Item no.	€
120	118	150	17121040		17122382	
150	148	150	17151040		17152382	
200	198	200	17201040		17202382	
250	248	250	17251040		17252382	
300	298	300	17301040		17302382	

Angle flanges

DN	Ø d	Angle flanges for welding-on on site		Angle flanges, 1 cut	
		Item no.	€	Item no.	€
120	118	33121705		17121705	
150	148	33151705		17151705	
200	198	33201705		17201705	
250	248	33251705		17251705	
300	298	33301705		17301705	



INCORPORATING CAST-IRON PIPE COMPONENTS INTO THE MODULAR PIPEWORK SYSTEM



- 1 Steel pipe with lip
- 2 Angle flange (1 cut)
- 3 Cast-iron segment
- 4 Cast-iron pipe
- 5 Angle flange welded-on
- 6 Steel pipe
- 7 Pull-rings for cast-iron pipework

- Angle flange, 1 cut, is rotated on behind the lipped end of the existing JACOB pipe component and connected to the cast-iron pipe with the pull-ring for cast-iron pipes.
- Alternatively: Use of an angle flange for welding-on on site. One pipe end without a lip is necessary to enable the angle flange to be fitted. This can be created when connecting pipes are shortened, for example.



WEAR PROTECTION LINING

Special range hot-dip galvanised 3 mm



PIPEWORK SYSTEM HOT-DIP GALVANISED 3 MM

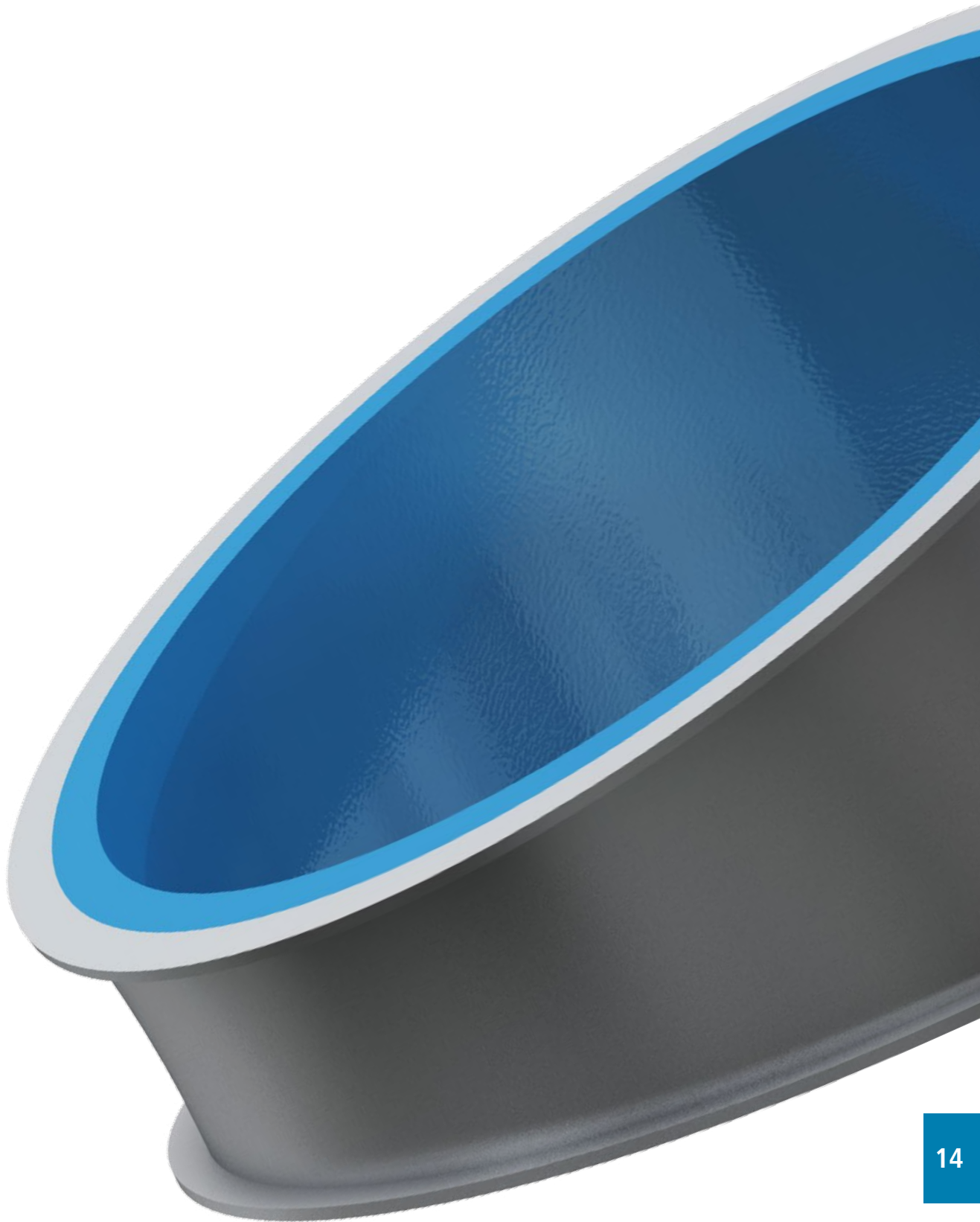
7200/7210/7220/7230/7240/7250/7260/7270/7280/7290/7300/7310/7320

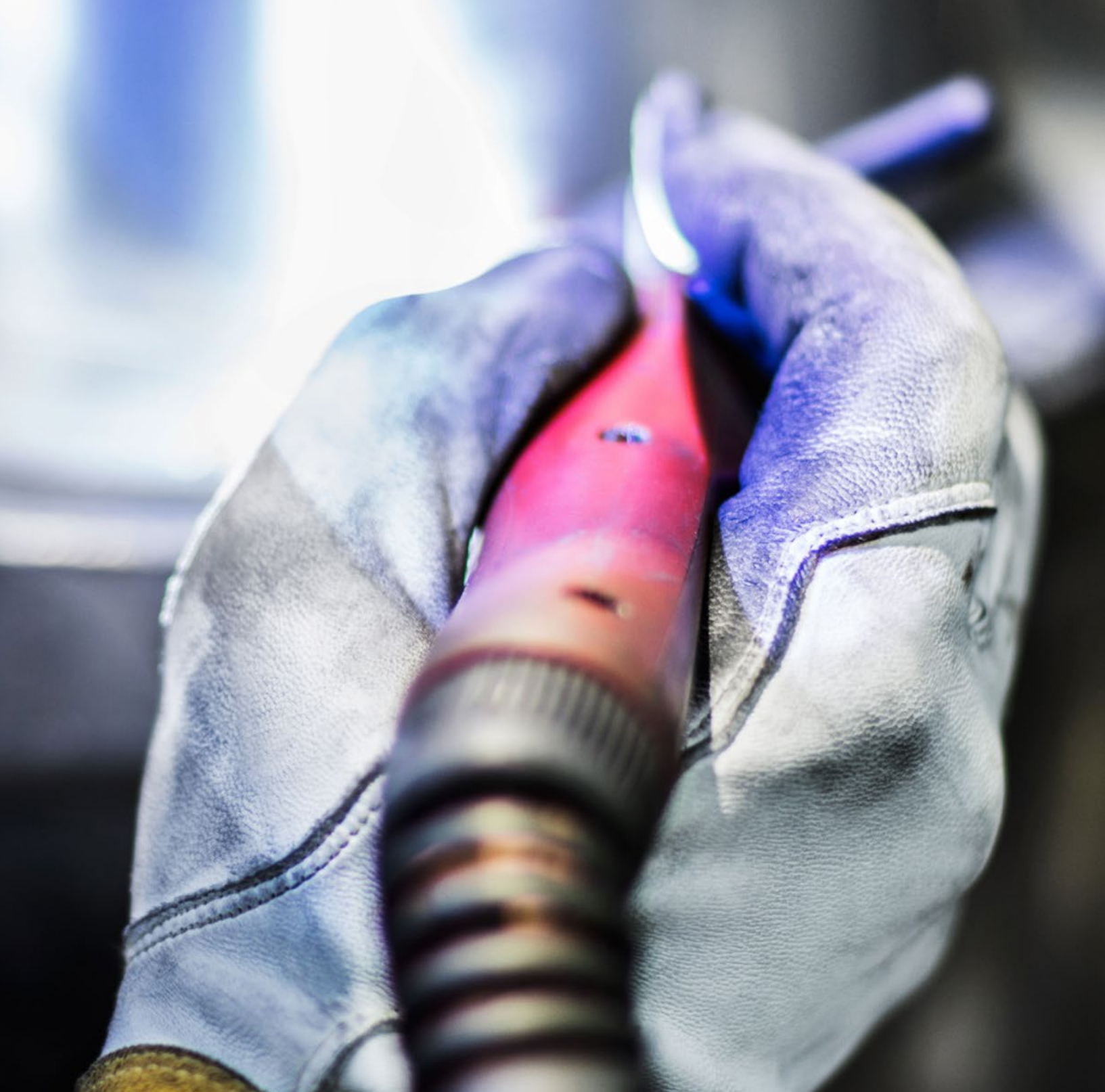
The hot-dip galvanised pipework system that JACOB delivers from stock is specially designed for conveying bulk goods in outdoor areas. It is particularly suitable for conveying goods with abrasive characteristics.

The components can be mounted fast and provide a tight seal due to the use of our proven pull-ring system. The hot-dip galvanised pipe components and pressed components are available in the popular diameters DN 200, 250 and 300 mm. With a wall thickness of 3 mm, the system remains installation-friendly yet is still suitable for abrasive bulk goods, such as coarse-grained products like grains or pellets.

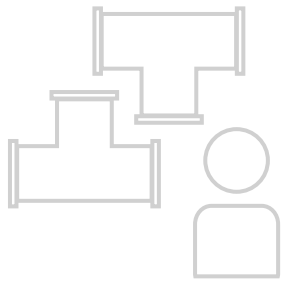
Please refer to chapter 2 for technical information and instructions for assembling the JACOB pull-ring system.

Hot-dip galvanised range All pipework with 6 mm lip for pull-ring system	DN 200 mm		DN 250 mm		DN 300 mm	
	Item no.	€	Item no.	€	Item no.	€
Welded pipes 2000 mm long	13202010		13252010		13302010	
Welded pipes 1000 mm long	13202020		13252020		13302020	
Welded pipes 500 mm long	13202030		13252030		13302030	
Segments 5°	13202300		13252300		13302300	
Segments 15°	13202310		13252310		13302310	
Segments 30°	13202320		13252320		13302320	
Segments 45°	13202330		13252330		13302330	
Cone pieces 200-250	13002470					
Cone pieces 200-300	13002471					
Cone pieces 250-300			13002475			
Forks 45°	13202220		13252220		13302220	
Connecting flanges with loose flange drilled according to DIN 24154-2	13202432		13252432		13302432	
Spouts without a gradient from square to round	13202400		13252400		13302400	
Spouts with a 45° gradient from square to round	13202420		13252420		13302420	
Inspection T-pieces without a rubber cover	13202200		13252200		13302200	
Two-way valves with inlet collar, symmetrical, hand-operated	13202505		13252505		13302502	
Two-way valves with inlet collar, asymmetrical, hand-operated	13202517		13252517		13302512	



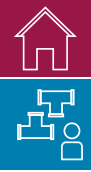


JACOB MANUFACTURING TECHNOLOGY:
TOP QUALITY CUSTOMISED PRODUCT SOLUTIONS



SPECIAL MANUFACTURE

Technical information	268	
Special parts	270	
Special range shock explosion proof to 10 bar	274	



SPECIAL PART MANUFACTURE

JACOB manufacturing technology stands not only for top quality mass-produced standard parts but also for top quality special part manufacture. From manufacturing product variants and small-lot production right up to made-to-order production to customers' drawings: You can depend on the comprehensive expertise and many years of experience of our technicians, design engineers and production staff. We also invest in production equipment on an ongoing basis to guarantee the highest possible quality using modern technology.

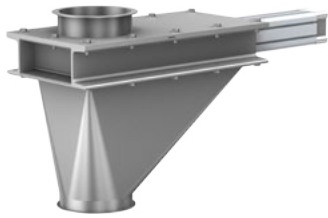
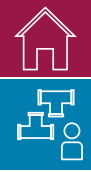
Take advantage of our professional expertise, providing you with advice and solutions that are tailored to your specific product requirements. We guarantee integration and compatibility with our modular system. For you, this means: mass-produced standard products and special manufacture from a single source, which is the No. 1 for modular pipework systems.

This chapter merely shows a small selection of our manufacturing capabilities for special parts and customised solutions. We would be pleased to fulfil your specific requests on an individual basis.

Individual product solutions: Variant manufacture, small-lot manufacture, made-to-order manufacture to customers' drawings

DISTRIBUTORS/THROTTLE VALVES	Dust-tight slide gate Louvre valve Square two-way valve
MEASUREMENT TECHNOLOGY AND ACTUATORS	Preparation and integration for measurement technology Actuators and limit switches Venturi tube
WEAR PROTECTION AND NON-STICK PROTECTION	Wear protection linings Baffle boxes/pipes Non-stick protection
ADAPTERS / SYSTEMS	Adapters for connection to the JACOB system Connector system with guide rings
EXHAUST AIR	Air outlets for roofs Air inlet / outlet hoods Air quality / air conditioning and ventilation
MATERIALS AND SPECIAL FINISHES	Innovative powder coating Special colours Grinding or electrolytic polishing
PIPE LENGTHS OF UP TO 12 M	





DISTRIBUTORS / THROTTLE VALVES

Dust-tight slide gate

The range of products in the valve and gate catalogue (see chapter 8) has been extended with the addition of the sealed slide gate. This slide valve is sealed to prevent dust from leaking out. It is used for floury or granular goods in gravity-flow pipe systems.



Louvre valve

The louvre valve is mostly used in pipes that carry hot air. The valve is available with either one or several louvre flaps. Louvre flaps with larger dimensions of 1000 mm or more are used in industrial halls, for example. The size of the valve required depends on the hot air flow capacity. The valve can withstand temperatures of up to 320°C.



Square two-way valves

The square two-way valve is an extension of the design-optimised two-way distributor unit (see chapter 9). It is used in many industries, including for processing granular materials and distributing bulk goods.



MEASUREMENT TECHNOLOGY AND ACTUATORS

Preparation and integration of measurement technology

Our modular pipework system makes it possible to integrate various types of measurement technology. At the customer's request, we can prepare our modular pipework system for the integration of measurement systems, to measure pressure, temperature or flow rate, for example. We install adapters, transition pieces or other special connection systems in order to facilitate the installation of measurement devices on site. To enable our customers to integrate measurement technology in a modular system as standard, in chapter 3 we offer pipes in 200 mm lengths in a variety of materials and with various spigots.



Actuators and limit switches

With regard to automatic control technology, we offer a wide selection of tried-and-tested drives for two-way distributors and valves (see chapter 9) and for throttle valves (see chapter 8). Whether electrically or pneumatically driven: Our pipework system components can be fitted with many different brands of drive thanks to the DIN EN ISO attachment system. The same applies to a wide range of different mechanical or inductive limit switches.



Venturi tube

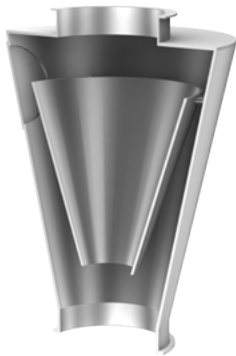
Pressure changes through alteration of the speed in a constricted section allow the volumetric flow to be determined. One example of use is in waste management, where other measurement methods are unsuitable due to the presence of aggressive gases.

WEAR PROTECTION AND NON-STICK PROTECTION



Wear protection linings

Besides the JACOB wear protection range (chapter 14), we have numerous materials available in a range of thicknesses for lining our products (from DN 100 mm). Examples of these materials are PUR, Linatex, ceramic, Correx and Philan. With many materials, you have the choice between layer thicknesses of 2, 4, 6 and 8 mm. Thicker layers are possible on request. We are also happy to fulfil special requirements, such as for food grade quality, electrostatic conductivity or higher temperature resistance.



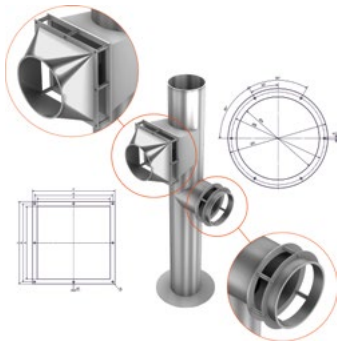
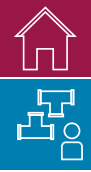
Baffle boxes/pipes

Baffle boxes can be installed to reduce the speed of abrasive or sensitive bulk goods as they fall, and so lessen their abrasive effect. This increases the lifetime of the pipework and reduces wear on the product. Typically, baffle boxes are installed just upstream of direction changes in gravity-flow downpipes.



Non-stick protection coating

The addition of a non-stick coating improves the flow properties of dry products that do not tend to flow freely. Examples of these are coffee powder varieties with a high oil content, or products used in the manufacture and recycling of car tyres. This type of coating is typically used in the food industry, mechanical engineering applications, polymer processing and the printing and paper industry. Other lining materials are available on request.



ADAPTERS / SYSTEMS

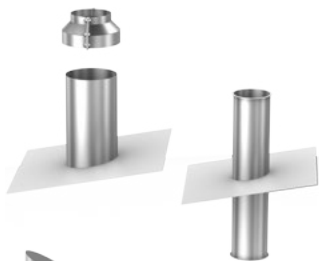
Adapters for connection to the JACOB system

Do you require special transitions or adapter connections for the JACOB pipework system? We have a wide range of adapters and transitions available as standard components. Special customer-specific solutions can also be produced if required. Please refer to chapter 6 of this catalogue for details of standardised adapters and transitions. These include connecting flanges, together with loose flanges, used as spouts for connecting square sections to round pipes, or used as single round or square flanges for connecting to machine inlets or outlets.



Connector system with internal guide rings

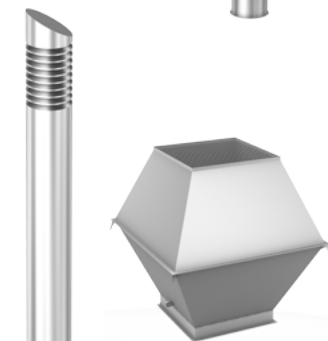
Our connector system with internal guide rings allows you to make virtually step-free transitions to the various pipe components. This is a big advantage if your product is susceptible to problematic turbulent flow at pipe transitions. It is suitable as a rule for ensuring that the product is conveyed particularly carefully and gently. The system is used in applications such as extraction pipelines in the tobacco industry or pulp industry. We would be pleased to advise you as to whether this system would be suitable as a specific solution for your particular application.



EXHAUST AIR

Air outlets for roofs

The roof air outlet is used as a connection element for on-roof exhaust components. It consists of a pipe with a circular roof sealing plate. The roof outlets are available in stainless steel and can also be surface-coated if required.



Air inlet/outlet hoods

Deflector hoods and rain hoods for industrial applications can be found in chapter 6 of this catalogue. In addition to these, however, we offer a wide spectrum of stylish and attractive design variants for heat exchange and air exchange applications. Whether you would like a striking tower and hood construction or a discreet weather protection grille for wall or on-roof installation, a square or round form, or perhaps a design-optimised outlet head – there is a wide range of options to choose from. The air inlet towers can be installed on roofs as well as at ground level.



Air quality/air conditioning and ventilation

Our source air outlets are design-oriented customised solutions for use in air-conditioning systems. In areas where the system is visible, the source air is introduced through a system of pipes. The picture shows our customised solution created for the entrance area of a hospital.



MATERIALS AND SPECIAL FINISHES

Innovative powder coating

JACOB uses an ultra-modern, automated powder-coating system in order to ensure superior and uniform product quality. The advantages of our standard powder coating (similar to RAL 7032) are:

- Electrostatically conductive
- Its constituents comply with the requirements of the Food and Drug Administration (FDA)
- Coating thickness on the outside: average layer thickness 55 µm
- Coating thickness on the inside: optically covered as temporary corrosion protection
- Optimum surface quality and long service life due to three-stage pretreatment
- Temperature resistance: from -60°C to +120°C

3,000 special colours

JACOB can provide powder coatings on request in any colour from the wide RAL spectrum. In this case, the products are first coated with our standard RAL 7032 powder coating and then powder coated again in the colour of your choice. This creates a layer thickness of at least 80 µm. We also offer further special features on request. These include high-gloss effects. Also, liquid paint coatings can be provided as an alternative to powder coating, if required.

Grinding or electrolytic polishing

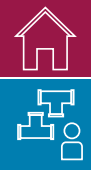
At our customers' request, we also offer electrolytic polishing or grinding of our stainless steel pipework. Surface roughness of 0.8 µm or less is possible.

PIPE LENGTHS

Pipe lengths of up to 12 m

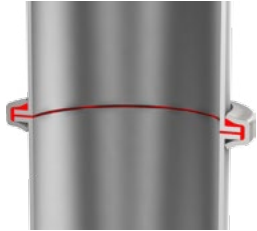
We produce special pipes up to 12 m in length in diameters of DN 60-300 mm and in different materials with a wall thickness of 1-3 mm. We normally supply pipes in lengths of 6-12 m with untreated and unlipped ends. Pipes of up to 6 m in length can optionally be supplied with lipped ends for quick assembly with JACOB pull-rings. For pipes of up to 12 m in length, we also offer special connections on request.





SPECIAL MANUFACTURE

Special range shock explosion proof to 10 bar



SHOCK EXPLOSION PROOF PIPEWORK SYSTEM 10 BAR

Particularly exacting demands for up to 10 bar shock explosion resistance are met by the special range certified by DEKRA EXAM GmbH and/or the Forschungsgesellschaft für angewandte Systemsicherheit und Arbeitsmedizin (FSA) (Research Society for Applied System Security and Occupational Medicine).

We have dimension sheets available to aid your planning and design work. Test reports are available on request.

DN 100 to 200 mm

Pipework with lip, shock explosion proof to 10 bar:

- Pipes, bends and forks tested by DEKRA EXAM in conjunction with a reinforced two-part pull-ring and a U-shaped seal
- DN 100, 120, 150, 175 and 200 mm
- Refer to chapters 3 and 4 for pipes, bends with 2 mm wall thickness, DN 100 and 120 mm with a lip (except: forks and inspection T-pieces with 2 mm wall thickness; these are tested with angle flange only)
- Refer to chapters 3 and 4 for pipes, bends with 3 mm wall thickness with a lip, DN 150, 175 and 200 mm, forks available on request
- Connection with two-part pull-ring (reinforced version) and U-shaped seals for 2 mm pipework
- The pull-ring bolts must be tightened to a torque of 25 Nm to meet 10 bar certified shock explosion resistance

Pull-rings, reinforced version

DN	Two-part pull-ring (reinforced version)			
	2 mm wall thickness		3 mm wall thickness	
	Item no.	€	Item no.	€
100	32102383	9.50		
120	32122383	10.20		
150			32152926	10.90
175			32172926	11.30
200			32202926	11.70



DN 80 to 300 mm

Pipework with angle flange, shock explosion proof to 10 bar:

- Pipe components DN 80, 100, 120, 150, 175, 200, 250 and 300 mm with angle flange
- Depending on the diameter, available with 2 and/or 3 mm wall thickness
- Straight pipes up to 2000 mm in length, inspection T-pieces with end cover in reinforced version, forks 30° and 45° and bends $R = 2 D$, 30° to 90°
- Pipe components connected with special pull-ring for angle flange
- The seal is incorporated in the pipework
- Mastic sealant approved for food use in accordance with NSF, commodities directive 2002/72/EC, temperature resistance -40°C to +90°C
- The pull-ring bolts must be tightened to a torque of 25 Nm to meet 10 bar certified shock explosion resistance
- Earthing lugs are spot-welded to all angle flange pipework

DN 350 to 630 mm:

DN 350 to 630 mm with welded-on special flanges for 10 bar shock explosion resistance available on request



PULL-RINGS FOR ANGLE FLANGE PIPEWORK

7010

- 10 bar shock explosion proof
- Electro galvanised
- The pull-ring bolts must be tightened to a torque of 25 Nm to meet 10 bar certified shock explosion resistance

Pull-rings for angle flange

DN	Pull-ring for angle flange			
	2 mm wall thickness		3 mm wall thickness	
	Item no.	€	Item no.	€
80	32082382	10.80		
100	32102382	11.00		
120	32122382	11.80		
150			32152382	12.40
175			32172382	13.00
200			32202382	13.40
250			32252382	17.10
300			32302382	19.10



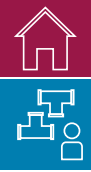
WELDED PIPES

7020

- With angle flange
- Powder-coated

DN	1996 mm long				996 mm long			
	2 mm wall thickness		3 mm wall thickness		2 mm wall thickness		3 mm wall thickness	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	32081010	67.00			32081020	43.20		
100	32101010	70.20			32101020	45.80		
120	32121010	77.60			32121020	52.40		
150	32151010	86.60	33151010	117.50	32151020	60.50	33151020	79.30
175	32171010	97.10	33171010	132.50	32171020	66.40	33171020	86.80
200	32201010	105.50	33201010	143.50	32201020	81.30	33201020	107.00
250	32251010	127.00	33251010	170.50	32251020	82.20	33251020	112.00
300	32301010	147.00	33301010	197.50	32301020	92.10	33301020	124.50

DN	498 mm long				212 mm long			
	2 mm wall thickness		3 mm wall thickness		2 mm wall thickness		3 mm wall thickness	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	32081030	32.60			32081040	27.60		
100	32101030	34.50			32101040	29.10		
120	32121030	40.40			32121040	33.90		
150	32151030	44.70	33151030	56.50	32151040	39.40	33151040	47.30
175	32171030	50.30	33171030	63.10	32171040	41.60	33171040	50.10
200	32201030	52.90	33201030	66.80	32201040	43.00	33201040	52.00
250	32251030	61.80	33251030	77.20	32251040	49.80	33251040	60.10
300	32301030	67.80	33301030	84.60	32301040	55.20	33301040	66.30



SPECIAL MANUFACTURE

Special range shock explosion proof to 10 bar



WELDING ENDS

7030

- With angle flange
- Powder-coated

DN	60 mm long			
	2 mm wall thickness		3 mm wall thickness	
	Item no.	€	Item no.	€
80	32081060	16.40		
100	32101060	17.30		
120	32121060	19.50		
150	32151060	21.30	33151060	25.60
175	32171060	22.40	33171060	26.90
200	32201060	23.30	33201060	28.10
250	32251060	26.40	33251060	31.70
300	32301060	29.30	33301060	35.30



INSPECTION T-PIECES

7040

- With angle flange pull-ring and end cover
- Powder-coated

DN	2 mm wall thickness		3 mm wall thickness	
	Item no.	€	Item no.	€
80	32081200	107.00		
100	32101200	120.50		
120	32121200	134.00		
150	32151200	147.50	33151200	161.00
175	32171200	156.50	33171200	172.00
200	32201200	172.50	33201200	189.50
250	32251200	198.00	33251200	218.00
300	32301200	214.00	33301200	235.00





FORKS

7050/7052

- With angle flange
- Powder-coated

DN	30° powder-coated				45° powder-coated			
	2 mm wall thickness		3 mm wall thickness		2 mm wall thickness		3 mm wall thickness	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	32081230	83.60			32081220	82.00		
100	32101230	88.00			32101220	82.90		
120	32121230	98.50			32121220	95.60		
150	32151230	123.50	33151230	148.50	32151220	114.00	33151220	134.00
175	32171230	149.00	33171230	176.00	32171220	137.50	33171220	159.50
200	32201230	174.50	33201230	209.50	32201220	158.00	33201220	185.50
250	32251230	224.00	33251230	267.00	32251220	202.50	33251220	232.50
300	32301230	289.50	33301230	317.50	32301220	239.00	33301220	280.50



BENDS R = 2 D

7060/7062/7064/7066/7068

- With angle flange
- Powder-coated

DN	30° powder-coated				45° powder-coated			
	2 mm wall thickness		3 mm wall thickness		2 mm wall thickness		3 mm wall thickness	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	32081343	36.60			32081344	44.60		
100	32101343	39.50			32101344	47.50		
120	32121343	49.80			32121344	52.70		
150	32151343	59.40	33151343	74.30	32151344	66.80	33151344	83.60
175	32171343	65.10	33171343	82.00	32171344	73.70	33171344	92.10
200	32201343	74.60	33201343	93.50	32201344	79.50	33201344	99.40
250	32251343	86.10	33251343	108.00	32251344	104.00	33251344	131.00
300	32301343	119.00	33301343	149.00	32301344	151.50	33301344	189.50

DN	60° powder-coated				90° powder-coated			
	2 mm wall thickness		3 mm wall thickness		2 mm wall thickness		3 mm wall thickness	
	Item no.	€	Item no.	€	Item no.	€	Item no.	€
80	32081346	48.00			32081349	55.90		
100	32101346	50.60			32101349	59.00		
120	32121346	65.10			32121349	70.50		
150	32151346	74.30	33151346	93.20	32151349	89.90	33151349	112.50
175	32171346	82.70	33171346	103.50	32171349	99.40	33171349	124.50
200	32201346	97.60	33201346	122.50	32201349	116.00	33201349	144.50
250	32251346	155.00	33251346	194.00	32251349	193.00	33251349	241.00
300	32301346	196.50	33301346	244.50	32301349	289.00	33301349	360.50



1. General Information

- (1) Our deliveries, services and offers are made exclusively on the basis of these General Terms and Conditions of Delivery and Payment (in the following "T&C"); we do not recognise any terms and conditions of the Purchaser which contradict or deviate from our T&C unless we have expressly agreed to their validity in writing. Our T&C also apply if we deliver to the Purchaser without any reservations although we are aware of Purchaser's terms and conditions which contradict or deviate from our T&C.
- (2) Our T&C apply to entrepreneurs (§ 14 German Civil Code – BGB), legal entities under public law and special funds under public law ("öffentlich-rechtliches Sondervermögen") only.

2. Conclusion of the Contract; Contract Documents

- (1) Our offers are subject to confirmation and non-binding unless they are explicitly specified as binding. The Purchaser's order of goods is viewed as a binding offer to contract. Unless otherwise stated in the order, we are entitled to accept this offer to contract within one week of receipt. During this period the Purchaser is bound to his order. The contract is deemed to be concluded upon our confirmation (order confirmation). In case of immediate delivery, our delivery replaces the order confirmation.
- (2) The Purchaser must check our order confirmation without undue delay to ensure that it is correct and complete and must inform us of any discrepancies between the order and the order confirmation without undue delay. In the event of discrepancies from his order, the discrepancies are deemed to be approved by the Purchaser if the Purchaser accepts our delivery without reservation.
- (3) Performance characteristics specified in catalogues and orders such as figures, drawings etc. are to be considered an approximation only. In particular, such information represents no guarantees or assurances („Zusicherungen“) and do not relieve the Purchaser from its duty to execute own tests or examinations.
- (4) Our salespersons are not authorised to make further agreements or give assurances which exceed the content of the written contract or these T&C.
- (5) The Purchaser is liable for the correctness, accuracy and completeness of his order data and all of his order documents, especially those relating to drawings as well as for technical data and samples. Verbal specifications, including those relating to amendments and modifications of the documentation and data provided, require written confirmation.

3. Prices; Terms of Payment

- (1) Our prices are EURO prices. Unless stated otherwise in the order confirmation, our prices are FCA (pursuant to Incoterms 2010 or in their respective version valid in time) ex our works in Porta Westfalica plus packaging costs and the then applicable value-added tax.
- (2) Our prices do not include installation, commissioning and assembly costs nor packaging, freight, postage and insurance costs.
- (3) We reserve the right to adjust our prices adequately in case cost increases or decreases occur which are not attributable to us, especially due to materials costs, the increase in raw or auxiliary materials prices, wages and salaries, freight or public charges, if there is an interval of more than three months between the date of conclusion of the contract and delivery or the last partial delivery. In this case, costs decreases and increases will be netted. We will produce evidence of these cost changes upon the Purchaser's request.
- (4) Deliveries and services in excess of the order will be – after consultation with the Purchaser – invoiced separately.
- (5) Payments are to be conducted cashless and free of charge without any deductions. Unless indicated otherwise in the order confirmation, our invoices are due and payable within 14 days after the invoice date and receipt of the invoice. In case prepayment has been agreed upon, the deadline for delivery begins to start only after receipt of the full invoice amount.
- (6) Despite dissenting provisions by the Purchaser, we are entitled to offset the Purchaser's payments first with older claims due against the Purchaser; we will inform the Purchaser of any type of offsetting. In case any costs and interests have already occurred, we are entitled to offset the payment first with the costs, then the interests and the main service at last.
- (7) Payments are only considered settled if we can dispose of the amount.

- (8) In case of the Purchaser's default in payment, the statutory provisions are fully applicable.
- (9) The Purchaser is not entitled to retain payments based on counter-claims arising out of other contractual relationships or to offset any such counter-claims unless these counter-claims have been recognised by us, are undisputed or have been determined as final by a court.

4. Serial Deliveries, Long-term and Call-off Contracts

- (1) Unlimited contracts are subject to ordinary termination giving three months' notice prior to the end of a calendar month, unless provided otherwise.
- (2) In case of call-off contracts, unless provided otherwise, binding quantities are to be notified at least 3 months prior to the delivery date by call-offs. Additional costs arising as a result of delayed call-offs or subsequent amendments to a call-off regarding time or quantity by the Purchaser will be borne by the latter.

5. Time of Delivery

- (1) Unless explicitly provided otherwise, any indicated delivery times are approximate only. Any delivery deadline only starts to run if all details of execution have been clarified and both parties have mutually agreed on the conditions of the order. Any agreed delivery date will be postponed accordingly. Any change made to the scope of services will result in a corresponding extension of the delivery period once the order has been accepted.
- (2) Fulfilment of our delivery obligations further requires timely and proper fulfilment of the Purchaser's obligations. The defence of non-performance remains reserved. In addition, we are entitled to postpone delivery as long as the Purchaser has failed to fulfil due payment obligations arising out of previous deliveries without justification.
- (3) In case we are prevented from adhering to agreed delivery dates as a result of force majeure, labour disputes, governmental action, energy or raw material shortages, transport bottlenecks or hindrances, operational hindrances, for example due to fire, water and/or machine defects, for which we are not responsible, or other disruptions in the flow of operations either at our premises or those of suppliers or subcontractors for which we are not responsible and which can be proven to have a significant impact, we are obliged to inform the other party without undue delay ("unverzöglich"). In such cases we are entitled to extend the delivery period by the period of the event of force majeure or the disruption if we have informed the Purchaser pursuant to the above information obligation. If delivery becomes impossible as a result thereof, our obligation to supply will become null and void and claims for damages be excluded. If the Purchaser proves that subsequent performance of the contract is of no interest to him as a result of the delay, he may withdraw from the contract, any further claims being excluded. If the event of force majeure or the disruption lasts longer than three months, we may withdraw from the contract in view of any part of the contract which has not yet been performed, provided that we have informed the Purchaser pursuant to the above information obligation and have not assumed the risk of procurement ("Beschaffungsrisiko") or a delivery guarantee.
- (4) Article 5 (3) applies mutatis mutandis if and to the extent that we have, prior to conclusion of the contract with the Purchaser, entered into a covering transaction which – if properly executed – would have enabled us to fulfil our contractual obligations in our relationship with the Purchaser and have not been supplied by our suppliers in conformity with the contract and/or due time with no fault on our part.
- (5) In case we are in default, the Purchaser may specify an additional period for performance in writing and, if said period elapsed to no avail, withdraw from the contract. An additional period for performance is not required if we seriously and finally refuse to perform the contract or if the underlying contract is a fixed-date transaction ("Fixgeschäft") according to Section 323 para. 2 No. 2 of the German Civil Code (BGB) or Section 376 of the German Commercial Code (HGB) or if special circumstances exist which, taking into account the interests of both parties, justify immediate withdrawal from the contract.
- (6) We are liable for damages in accordance with Article 10 of these T&C only. The Purchaser's right to withdraw from the contract is governed by statutory provisions.
- (7) If an acceptance inspection of the delivered goods has been agreed, the acceptance inspection has to be performed at our factory immediately after we

have informed the Purchaser that the goods are ready for acceptance, unless otherwise agreed. The Purchaser will bear the costs of the acceptance inspection.

- (8) If the Purchaser is in default of acceptance or if the delivery is delayed for reasons which are attributable to the Purchaser, we will be entitled to claim compensation of any damage incurred as a result thereof, including additional expenses, if any. In these cases, we will store the goods at the Purchaser's risk and invoice the Purchaser for such storage. We are entitled to charge for the storage a flat fee of 0.1 % of the net price agreed in the contract for each completed working day ("Werktag") but not more than 5 % in total of the net price agreed in the contract. We reserve the right to assert further claims. The Purchaser reserves the right to prove that we incurred no damage or a substantially smaller damage than the foregoing flat fee.
- (9) We reserve the right to make partial deliveries if and to the extent that they are reasonably acceptable for the Purchaser, also considering the Purchaser's interests.

6. Delivery and transfer of risk

- (1) Unless stated otherwise in the order confirmation, deliveries are made FCA (pursuant to Incoterms 2010 or in their respective version valid in time) ex our works in Porta Westfalica. This also applies if we have exceptionally assumed the transport costs or paid them in advance on behalf of the Purchaser.
- (2) In case shipment has been agreed, the risk of incidental loss or incidental deterioration of the goods passes to the Purchaser at the time the goods have been handed over to the carrier, freight forwarder or any other third party entrusted with the execution of shipment. This also applies if shipment is performed by our own vehicles, if we have assumed the transport costs or if we have advanced the costs on behalf of the Purchaser. If delivery is delayed for reasons attributable to the Purchaser, the risk will pass to the Purchaser at the time the goods are ready for dispatch and we have notified the Purchaser thereof.
- (3) Unless provided otherwise, the type of packaging will be left to our reasonable discretion. Packaging costs shall be borne by the Purchaser. The transport boxes we use as standard packaging are not designed to be stacked. Special packaging (for instance with strengthened supports to allow the transport boxes to be stacked, but no more than two high) is subject to special agreement and/or the Purchaser's request (with the submission of the order, at the latest).
- (4) Provided that the Purchaser does not announce in due time how the goods shall be delivered, we will conclude a transport contract with a carrier at the Purchaser's expense. In this case the choice of the transportation route and the shipping method is at our discretion, unless provided otherwise. The Purchaser shall point out to us if transport insurance is desired; if so, transport insurance will be concluded at our reasonable discretion in favour of the Purchaser. Any costs incurred in this respect shall be borne by the Purchaser, even if we have exceptionally assumed the remaining transport costs.
- (5) Transport packaging is taken back at our place of business during regular business hours.

7. Retention of Title

- (1) We reserve title to the goods delivered until receipt of all payments deriving from the business relation with the Purchaser.
- (2) Prior to complete payment of the secured claims, goods subject to reservation of title must neither be pledged to third parties nor assigned by way of security by the Purchaser without our explicit written consent. In the case of pledges or other third party intervention, the Purchaser must notify us immediately in writing. If we bring an action against the third party and to the extent that the action was successful and the third party is unable to reimburse us for the judicial and extra-judicial costs incurred by us, the Purchaser will be liable for such costs.
- (3) If the Purchaser acts contrary to the contract – in particular delayed payment – we are entitled to rescind the contract in accordance with the statutory regulation and to reclaim the reserved goods.
- (4) The Purchaser is obliged to notify us at all times of the location of the goods subject to retention of title until the reserved goods have been paid for in full.
- (5) The Purchaser is entitled to resell the goods delivered within the ordinary course of business. He herewith assigns to us, however, all claims amounting to the final invoice amount (including value-added tax) of our claims which accrue from the resale vis-à-vis its customers or third parties, irrespective of whether the goods purchased have been sold again with or without further processing. After such

assignment the Purchaser also remains entitled to collect this claim. Our right to collect this claim ourselves remains unaffected thereby. However, we undertake not to collect the claim provided that no bill or cheque protests are raised, the Purchaser fulfils his payment obligations out of the proceeds received, the Purchaser is not in default of payment and, in particular, no application to initiate insolvency proceedings with regard to the Purchaser's assets has been filed. If this is the case, however, we may demand that the Purchaser notifies us of the claims assigned and their debtors, provides all details necessary for their collection, delivers the relevant documents and informs the debtors (third parties) of said assignment.

- (6) The processing or conversion by the Purchaser of the goods supplied subject to reservation of title is always deemed to be performed for us and on our behalf. If the goods supplied subject to reservation of title are processed with other items/materials not belonging to us, we acquire co-ownership of the new article in a ratio of the value of the goods subject to reservation of title to the other processed items/materials at the time of processing. In all other respects, the provisions applicable to the goods supplied subject to reservation of title also apply mutatis mutandis to the articles resulting from such processing.
- (7) If the goods supplied subject to reservation of title are mixed or joined inseparably with other items/materials not belonging to us in such a way that they become major components of a uniform article, we acquire co-ownership of the new article in a ratio of the value of the goods subject to reservation of title to the other mixed or joined items/materials at the time of the joining or mixing. If the goods and other items/materials are joined or mixed in such a way that the Purchaser's article is to be regarded as the main item, it is already agreed here and now that the Purchaser transfers pro-rata co-ownership to us. The Purchaser will keep the jointly held property thus produced in safe custody for us. Furthermore, the same will apply to the article resulting from such joining or mixing as to the goods supplied subject to reservation of title.
- (8) The Purchaser is obliged to treat the goods subject to reservation of title carefully. He is obliged to adequately insure such at his own expense, in particular against fire, water damage and theft at replacement value. The Purchaser is obliged to perform any necessary service and inspection work in good time and at its own expense.
- (9) In the event of loss or damage to the goods subject to reservation of title, the Purchaser hereby assigns to us any claims to insurance payments existing in this connection in the amount of the final invoice (including value-added tax) of our claims with respect to the object of delivery by way of additional security in advance.
- (10) In case of deliveries abroad, if certain measures and/or declarations by either party are necessary to ensure the effectiveness of the above mentioned reservation of title and/or certain other rights referred to in the paragraphs above, the Purchaser is obliged to inform us accordingly in writing or in text form and to take all necessary measures and/or make all necessary declarations without undue delay at its own expense. If the law of the country of import does not permit to retain the reservation of title to the delivered goods, the Purchaser is obliged to provide another appropriate security to the goods delivered or provide any other equivalent collateral based on equitable discretion (Section 315 German Civil Code (BGB) at its own expense.
- (11) We undertake to release, at Purchaser's request, the securities due to us if the realizable value of our securities exceeds the claims to be secured by more than 10%; we reserve the right to select of the securities to be released.

8. Acquisition of Ownership Through Machining, Processing or Repair of Items Provided to us

- (1) If the Purchaser delivers to us an item for machining or processing or repair and if the Purchaser remains sole owner of the machined, processed or repaired item also after machining, processing or repair, it is already agreed here and now that the Purchaser assigns to us pro-rata co-ownership in a ratio of the value of our machining, processing or repair work (final invoice amount including value-added tax) to the value of the item made available at the time of processing.
- (2) If the item is mixed or joined during machining, processing or repair with items/materials belonging to us in such a way that they become essential components of a uniform article, we will acquire co-ownership of the new article in a ratio of the value of our items/materials to the value of the Purchaser's item made available at the time of joining or mixing.



- (3) If joining or mixing takes place in such a way that the Purchaser's article is to be regarded as the main item, it is already agreed here and now that the Purchaser transfers pro-rata co-ownership to us in a ratio of the value of our machining, processing or repair work (final invoice amount including value-added tax) to the value of the item made available at the time of joining or mixing.
- (4) The provisions of Article 7 of these T&C apply mutatis mutandis to items of the Purchaser in which we have acquired co-ownership in accordance with the above provisions. For clarification: we will transfer the co-ownership we have acquired pursuant to the above terms and conditions to the Purchaser on delivery of the item in accordance with the provisions set forth in Article 7 of these T&C.

9. Warranty – Liability for Infringement of Obligations

- (1) The statutory provisions apply to the rights of the Purchaser with respect to material or legal defects (including incorrect delivery and short delivery) unless nothing to the contrary is determined in the following. In any case, the special statutory provisions on final delivery of the goods to a consumer (Sections 478, 479 of the German Civil Code (BGB)) remain unaffected.
- (2) In case we have to perform a contract in accordance with drawings, specifications, specimens, figures and/or other documents supplied by the Purchaser, the latter has to bear the risk of the suitability for the intended use.
- (3) If parts of the Purchaser are processed on behalf of the Purchaser, the Purchaser is obliged to examine whether the parts are suitable for the requested processing. If processing of parts sent by the Purchaser is not successful due to reasons beyond our control and responsibility, we will accept no responsibility for any damages caused. The Purchaser will still be required to pay for the costs already incurred for the processing. We will invoice the Purchaser for any necessary reworking costs.
- (4) The Purchaser's right to warranty claims under this contract requires the Purchaser to duly discharge his obligations of inspection and notification of defects in accordance with Section 377 of the German Commercial Code (HGB). If the contractual relationship between us and the Purchaser constitutes a contract for work and services ("Werkvertrag"), Section 377 of the German Commercial Code (HGB) shall apply mutatis mutandis. Notices of defects have to be addressed to our Customer Service Department in writing.
- (5) If an acceptance inspection or an initial specimen inspection has been agreed with the Purchaser, a complaint about defects which the Purchaser could have detected during a careful acceptance or initial specimen inspection is excluded.
- (6) We must be given the opportunity to examine on site any defect complained about.
- (7) If our operating and maintenance instructions are not followed, unauthorised modifications are carried out in the products and/or parts are exchanged, warranty claims for the consequences so caused are excluded. The foregoing applies also to incorrect installation or removal, poor maintenance, incorrect handling or storage, improper repairs not carried out by us, alterations as well as chemical, electrochemical or electrical influences for which we are not responsible as well as weather-induced or other natural causes.
- (8) If the delivered goods or the work created is defective, the Purchaser is entitled to the statutory rights as follows:
 - a) We are first entitled to either remedy the defect or to supply the Purchaser with goods free of defect as we so choose or, in case a contract for work and services has been agreed upon, to produce a new work (subsequent performance ("Nacherfüllung")). The Purchaser must allow the time necessary for and give the opportunity to subsequent performance. We are obliged to bear all expenses necessary for subsequent performance, in particular transport, labour and material costs. If the Purchaser's request for defect remedy proves to be unjustified, we are entitled to claim from the Purchaser compensation of the costs incurred by us as a result of the request. Where we were under no obligation to install/assemble the product originally, subsequent performance does not comprise the de-installation/disassembly of the defective product nor its reinstallation/reassembly. In the event of replacement delivery or, in case a contract for works and services has been agreed upon, new production, the Purchaser must return the defective goods to us on request. We are entitled to make the subsequent performance contingent on the Purchaser paying the price agreed for the goods delivered. The Purchaser is entitled, however, to retain an appropriate part of the price.
 - b) If the subsequent performance fails, the Purchaser is entitled to withdraw from

the contract or to request a reduction in the agreed purchase price as he so chooses. However, there is no right of withdrawal in case of minor defects.

- c) Claims of the Purchaser for compensation of damages or replacement of expenses only apply in accordance with the provisions of Article 10 of these T&C.

- (9) The limitation periods are governed by Article 11 of these T&C.

10. Exclusions and Limitations of Liability

- (1) Subject to the provisions of Article 10 (2), we are only liable for damages – in the case of contractual, non-contractual or other claims for damages, irrespective of the legal reason, in particular due to defects, default and impossibility, culpa in contrahendo and tort – in case of wilful intent and/or gross negligence, including wilful intent and/or gross negligence on the part of our representatives or vicarious agents. In addition, we are also liable in case of mild negligence, including mild negligence of our representatives and vicarious agents, for damages arising from the infringement of an essential contractual duty, i.e. a duty, the satisfaction of which makes the due implementation of the contract possible in the first place and which the Purchaser can therefore usually expect to be satisfied by us (cardinal duty). If and to the extent that we are not liable for wilfully infringing a duty, the liability for damages will, however, be restricted to the foreseeable, typical damage.
- (2) Claims for damages arising from injury of life, limb and health as well as claims of the Purchaser pursuant to the German Product Liability Act and the special statutory provisions on final delivery of the goods to a consumer (Section 478, 479 of the German Civil Code (BGB)) as well as other mandatory statutory liability regulations remain unaffected by the exclusions and limitations of liability set out in Article 10 (1). The above exclusions and limitations do neither apply insofar as we have fraudulently concealed a defect or insofar as we are liable because of the assumption of a guarantee or of the risk of procurement ("Beschaffungsrisiko").
- (3) Articles 10 (1) and 10 (2) also apply if the Purchaser demands replacement of useless applications instead of a claim to compensation of damages.
- (4) Insofar as our liability of damages is excluded or limited, this also applies with regard to personal liability for damages of our employees, representatives and vicarious agents which is based on the same legal reason.

11. Statute of Limitations

- (1) Claims of the Purchaser arising from material and legal defects become statute-barred within 12 months.
- (2) Mandatory provisions on the statute of limitations remain unaffected. Therefore, Article 11 (1) shall not apply to claims for injury of life, limb or health, to claims based on wilful intent and gross negligence and to claims based on the assumption of a warranty or the risk of procurement ("Beschaffungsrisiko"). The longer limitation periods pursuant to Section 438 (1) No. 1 of the German Civil Code (BGB) – third party rights in rem; Sections 438 (1) Nr. 2, 634a (1) No. 2 of the German Civil Code (BGB) – constructions (Bauwerke), construction materials and construction components as well as planning services for a construction, Sections 438 (3), 634a (3) of the German Civil Code (BGB) – fraudulent concealment and Section 479 of the German Civil Code (BGB) – supplier regress, remain unaffected.
- (3) The limitation periods resulting from Articles 11 (1) and 11 (2) for claims due to material and legal defects apply mutatis mutandis to competing contractual or non-contractual claims for damages of the Purchaser which are based on a defect to the contractual goods. If, however, in an individual case the application of the statutory limitation rules lead to an earlier statutory limitation of the competing claims, the statutory period of limitation applies to the competing claims. In any case, the statutory periods of limitation pursuant to the German Product Liability Act remain unaffected.
- (4) Insofar as the limitation period for claims against us is shortened pursuant to Articles 11 (1) to 11 (3), this applies mutatis mutandis to any claims of the Purchaser against our statutory representatives, employees, authorised representatives and vicarious agents which are based on the same legal reason.

12. Right of Withdrawal – Right of Termination

- (1) The Purchaser is only entitled to withdraw from the contract for a breach of duty on our part other than a defect if we can be made responsible for such breach of duty.

- (2) In case a contract for works and services under which we are obliged to bring about a particular result ("Werkvertrag") or a contract for work and services under which we are obliged to supply the Purchaser with movable things to be produced or manufactured ("Werklieferungsvertrag") has been agreed upon, the Purchaser's right to freely terminate the contract according to Sections 651, 649 of the German Civil Code (BGB) is excluded.

13. Industrial property rights and Copyrights

- (1) Unless provided otherwise, we are required to perform delivery free of third party industrial property rights and/or copyrights (hereinafter referred to as industrial property rights) only in the country in which the place of original delivery is located.
- (2) If a third party raises legitimate claims against the Purchaser for breach of industrial property rights by goods delivered by us and used in accordance with the contract, we are liable vis-à-vis the Purchaser as follows:
We will, at our option and cost, either secure a right of use of the deliveries concerned, or modify them so as to ensure that they will not infringe upon such property rights or exchange such deliveries. In case neither option can be reasonably demanded from us, the Purchaser may cancel the contract or reduce the remuneration pursuant to the statutory provisions and Article 8 of these T&C. Our obligation to pay damages is determined by Article 10 of these T&C, the statute of limitations by Article 11 of these T&C. The above obligations apply to us only provided that the Purchaser has notified us of the claims asserted by third parties immediately in writing.
- (3) Claims by the Purchaser are excluded to the extent he himself is responsible for the infringement of the industrial property right. Claims by the Purchaser are excluded in particular if the infringement of the industrial property right is caused by the Purchaser's special requirements or is caused by a use which we could not foresee or because the delivery is changed by the Purchaser or is used together with products that we did not deliver and if we are not responsible for the infringement.

14. Non-Disclosure

We reserve property rights and copyrights in figures, drawings, calculations and other documents. This also applies to written documents which are marked as "confidential". The Purchaser requires our explicit written consent before passing on such to third parties. Upon request, the Purchaser has to return these documents to us completely, including any copies which may have been made, if they are no longer needed during the ordinary course of business or if negotiations do not lead to the conclusion of a contract.

15. Communication with the Purchaser

- (1) Any data transmitted to us within the course of an order will be used in accordance with the applicable provision of data protection law only. We will use personal data only with the Purchaser's consent or if use is allowed by statutory provisions. Personal data may be used for goods and services comparable to those ordered and for non-periodic information about our product ordering system or comparable information (e.g. changes to our shop system), which we may also send by e-mail, but only for our own promotional purposes.
- (2) Any person concerned may object to this use for promotional purposes and may revoke any consent they have given at any time without incurring any costs other than transmission costs according to the basic rates.
- (3) The purchaser may register separately for our newsletter and receive periodical information about our goods. Our newsletter is subject to separate provisions which will be announced before registration.
- (4) Any data transmitted will not be passed on to third parties. For the purpose of sending out information, we cooperate with external service providers who operate on our behalf as contract data processors who are bound by data protection law and who particularly must not divulge data to third parties.

16. Final Provisions

- (1) A transfer of the contractual rights and obligations to third parties by the Purchaser is only admissible with our written approval. This does not apply if the contractual rights and obligations are transferred to an affiliated company within the meaning of Section 15 German Stock Corporation Act (AktG).
- (2) Unless otherwise stated in the order confirmation, place of performance for

payments and delivery is Porta Westfalica.

- (3) The law of the Federal Republic of Germany shall apply to the contractual relationship. The application of the UN sales law (CISG – United Nations Convention on Contracts for the International Sale of Goods) is excluded.
- (4) If the Purchaser is a merchant, legal entity under public law or a special fund under public law ("öffentlich-rechtliches Sondervermögen") as defined by German law, the place of jurisdiction for all disputes arising out of the contractual relationship including legal proceedings relating to cheques, bills of exchange and deeds shall be the venue competent at our registered office, Porta Westfalica. We are, however, also entitled to bring legal action against the Purchaser before the court having jurisdiction at its place of residence.
- (5) In case of discrepancies between the German and a translated version of these T&C, the German version always prevails.
- (6) Should any individual provision of these T&C or any individual provision of any other agreement be or become void or illegal, the validity of the remaining provisions or agreements is in no way affected.

We deliver in accordance with our 'General Terms and Conditions of Delivery and Payment'.

(Please visit also www.jacob-pipesystems.com or also request a copy from us.)



1. Allgemeines – Geltungsbereich

- (1) Unsere Lieferungen, Leistungen und Angebote erfolgen ausschließlich aufgrund dieser Allgemeinen Lieferungs- und Zahlungsbedingungen (nachfolgend „AGB“); entgegenstehende oder von unseren Lieferungs- und Zahlungsbedingungen abweichende Bedingungen des Bestellers erkennen wir nicht an, es sei denn, wir hätten ausdrücklich schriftlich ihrer Geltung zugestimmt. Unsere AGB gelten auch dann, wenn wir in Kenntnis entgegenstehender oder von unseren AGB abweichender Bedingungen des Bestellers die Lieferung an den Besteller vorbehaltlos ausführen.
- (2) Unsere AGB gelten nur gegenüber Unternehmern (§ 14 BGB), juristischen Personen des öffentlichen Rechts und öffentlich-rechtlichen Sondervermögen.

2. Vertragsabschluss; Vertragsunterlagen

- (1) Unsere Angebote sind freibleibend und unverbindlich, sofern sie nicht ausdrücklich als verbindlich gekennzeichnet sind. Die Bestellung der Ware durch den Besteller gilt als verbindliches Vertragsangebot. Sofern sich aus der Bestellung nichts anderes ergibt, sind wir berechtigt, dieses Vertragsangebot innerhalb einer Woche nach seinem Zugang bei uns anzunehmen. Während dieser Frist ist der Besteller an seine Bestellung gebunden. Der Vertrag gilt als geschlossen, wenn wir diesen bestätigt haben (Auftragsbestätigung). Sofortige Lieferung ersetzt die Auftragsbestätigung.
- (2) Der Besteller hat die Richtigkeit und Vollständigkeit unserer Auftragsbestätigung unverzüglich zu überprüfen und uns Abweichungen von seiner Bestellung unverzüglich mitzuteilen. Nimmt der Besteller unsere Lieferung bei Abweichungen gegenüber seiner Bestellung vorbehaltlos an, gelten die Abweichungen als durch den Besteller genehmigt.
- (3) Die in unseren Katalogen und Angeboten angegebenen Leistungsmerkmale, wie Abbildungen, Zeichnungen etc. sind nur als annähernd zu betrachten. Diese Informationen stellen insbesondere keine Garantien oder Zusicherungen dar und befreien den Besteller nicht von eigenen Prüfungen und Versuchen. Es gelten die in unseren Katalogen und Angeboten angegebenen Toleranzen.
- (4) Auch bei nach Zeichnungen, Spezifikationen, Mustern, Vorgaben und/oder sonstigen Unterlagen des Bestellers gefertigten Bauteilen, gelten die in unseren Katalogen und Angeboten zu diesen Bauteilen angegebenen Toleranzen.
- (5) **Unsere Verkaufsangestellten sind nicht befugt, Nebenabreden zu treffen oder Zusicherungen zu geben, die über den Inhalt des schriftlichen Vertrags oder dieser AGB hinausgehen.**
- (6) Der Besteller haftet für die Richtigkeit, Genauigkeit und Vollständigkeit der von ihm gelieferten Bestellungsunterlagen und Bestellangaben, insbesondere in Zeichnungen sowie für technische Daten und Muster. Mündliche Angaben, auch über Änderungen sowie Ergänzungen der zur Verfügung gestellten Unterlagen und Daten bedürfen der schriftlichen Bestätigung.

3. Preise; Zahlungsbedingungen

- (1) Unsere Preise sind EURO-Preise. Sofern sich aus der Auftragsbestätigung nichts anderes ergibt, gelten unsere Preise FCA ab unserem Werk in Porta Westfalica (gemäß Incoterms 2010 bzw. der aktuellen Fassung) zuzüglich der Verpackungskosten und der jeweils geltenden Mehrwertsteuer.
- (2) Unsere Preise schließen Aufstellungs-, Inbetriebnahme- und Montagekosten sowie Verpackung, Fracht, Porto und Versicherungskosten nicht ein.
- (3) Wir behalten uns das Recht vor, unsere Preise angemessen zu ändern, wenn bei Verträgen, bei denen zwischen Abschluss des Vertrages und Lieferung oder der letzten Teillieferung mehr als drei Monate liegen, von uns nicht zu vertretende Kostenerhöhungen oder Kostensenkungen, insbesondere aufgrund von Materialkosten, der Erhöhung von Rohstoffpreisen, Hilfsstoffpreisen, Löhnen und Gehältern, Fracht oder öffentlichen Abgaben, eintreten. Dabei werden wir Kostensenkungen und Kostenerhöhungen gegeneinander saldieren. Die Änderung dieser Kosten werden wir dem Besteller auf Verlangen nachweisen.
- (4) Über die Bestellung hinausgehende Lieferungen und Leistungen werden, nach Abstimmung mit dem Besteller, gesondert berechnet.
- (5) Zahlungen sind unbar und ohne jeden Abzug spesenfrei zu leisten. Sofern sich aus der Auftragsbestätigung nichts anderes ergibt, sind unsere Rechnungen innerhalb von 30 Tagen ab Rechnungsdatum und Zugang der Rechnung zur Zahlung fällig. Soweit Vorkasse vereinbart ist, beginnt die Lieferfrist erst nach Eingang des vollständigen Rechnungsbetrages zu laufen.

- (6) Wir sind berechtigt, trotz anders lautender Bestimmungen des Bestellers, Zahlungen zunächst auf dessen ältere Schulden anzurechnen, und werden den Besteller über die Art der erfolgten Verrechnung informieren. Sind bereits Kosten und Zinsen entstanden, so sind wir berechtigt, die Zahlung zunächst auf die Kosten, dann auf die Zinsen und zuletzt auf die Hauptleistung anzurechnen.
- (7) Eine Zahlung gilt erst dann als erfolgt, wenn wir über den Betrag verfügen können.
- (8) Bei Zahlungsverzug des Bestellers gelten die gesetzlichen Regelungen in vollem Umfang.
- (9) Der Besteller ist nicht berechtigt, Zahlungen wegen Gegenansprüchen aus anderen Vertragsverhältnissen zurückzuhalten oder mit solchen Gegenansprüchen aufzurechnen, es sei denn, dass diese von uns anerkannt, unbestritten oder rechtskräftig festgestellt sind.

4. Serienlieferungen, Langfrist- und Abrufverträge

- (1) Unbefristete Verträge sind mit einer Frist von 3 Monaten zum Monatsende ordentlich kündbar, wenn nicht etwas anderes vereinbart ist.
- (2) Bei Lieferverträgen auf Abruf sind uns, wenn nichts anderes vereinbart ist, verbindliche Mengen mindestens 3 Monate vor dem Liefertermin durch Abruf mitzuteilen. Mehrkosten, die durch einen verspäteten Abruf oder nachträgliche Änderungen des Abrufs hinsichtlich der Zeit oder Menge durch den Besteller verursacht sind, gehen zu seinen Lasten.

5. Lieferfristen

- (1) Soweit nicht ausdrücklich etwas anderes vereinbart wird, sind Angaben zu Lieferzeiten nur annähernd. Eine Lieferfrist beginnt erst, wenn sämtliche Einzelheiten der Ausführung klargestellt und beide Teile über die Bedingungen des Auftrages einig sind. Vereinbarte Liefertermine werden entsprechend herausgeschoben. Jede Änderung der Leistung nach Bestellsannahme verlängert die Lieferfrist angemessen.
- (2) Die Einhaltung unserer Lieferverpflichtung setzt weiter die rechtzeitige und ordnungsgemäße Erfüllung der Verpflichtungen des Bestellers voraus. Die Einrede des nicht erfüllten Vertrages bleibt vorbehalten. Des Weiteren sind wir berechtigt, die Lieferung aufzuschieben, solange der Besteller fällige Zahlungsverpflichtungen aus vorangegangenen Lieferungen unberechtigterweise nicht erfüllt hat.
- (3) Werden wir an der rechtzeitigen Lieferung durch höhere Gewalt, von uns nicht zu vertretende Arbeitskämpfe, behördliche Maßnahmen, Energie- oder Rohstoffknappheit, Transportengpässe oder -hindernisse, Betriebsbehinderungen z. B. durch Feuer, Wasser und/oder Maschinenschaden oder andere von uns nicht zu vertretende Störungen im Betriebsablauf bei uns oder unseren Vorlieferanten/Subunternehmern, die nachweislich von erheblichem Einfluss sind, gehindert, sind wir verpflichtet, den Besteller unverzüglich zu informieren. In diesen Fällen sind wir berechtigt, die Lieferzeit um die Dauer des Ereignisses der höheren Gewalt oder der Störung hinauszuschieben, soweit wir unserer obenstehenden Informationsverpflichtung nachgekommen sind. Wird die Lieferung dadurch unmöglich, so entfällt unter Ausschluss von Schadenersatz unsere Lieferverpflichtung. Weist der Besteller nach, dass die nachträgliche Erfüllung infolge der Verzögerung für ihn ohne Interesse ist, kann er unter Ausschluss weitergehender Ansprüche vom Vertrag zurücktreten. Dauert das Ereignis höherer Gewalt oder der Störung länger als drei Monate an, so können wir hinsichtlich des noch nicht erfüllten Teils vom Vertrag zurücktreten, wenn wir unserer vorstehenden Informationsverpflichtung nachgekommen sind und soweit wir nicht das Beschaffungsrisiko oder eine Liefergarantie übernommen haben.
- (4) Ziffer 5(3) gilt entsprechend, soweit wir vor Abschluss des Vertrages mit dem Besteller ein kongruentes Deckungsgeschäft abgeschlossen haben, das uns bei ordnungsgemäßer Durchführung die Erfüllung unserer vertraglichen Lieferverpflichten gegenüber dem Besteller ermöglicht hätte, und wir von unserem Lieferanten nicht, nicht richtig und/oder nicht rechtzeitig beliefert werden und wir dies nicht zu vertreten haben.
- (5) Geraten wir in Verzug, so ist der Besteller berechtigt, schriftlich eine angemessene Nachfrist zu setzen, und nach deren ergebnislosen Ablauf vom Vertrag zurückzutreten. Der Nachfristsetzung bedarf es nicht, wenn wir die Leistung ernsthaft und endgültig verweigern oder es sich bei dem zugrunde liegenden Vertrag um ein Fixgeschäft im Sinne von § 323 Abs. 2 Nr. 2 BGB oder § 376 HGB handelt oder besondere Umstände vorliegen, die unter Abwägung der beiderseitigen Interessen den sofortigen Rücktritt rechtfertigen.

- (6) Auf Schadensersatz haften wir nur nach Maßgabe der Ziffer 10 dieser AGB. Für den Rücktritt gelten die gesetzlichen Bestimmungen.
- (7) Ist eine Abnahme vereinbart, hat die Abnahme bei uns unverzüglich nach gemeldeter Abnahmebereitschaft zu erfolgen, wenn nicht etwas anderes vereinbart ist. Die Kosten der Abnahme gehen zu Lasten des Bestellers.
- (8) Kommt der Besteller in Annahmeverzug oder wird die Lieferung aus Gründen, die der Besteller zu vertreten hat, verzögert, sind wir berechtigt, Ersatz des daraus entstehenden Schadens einschließlich Mehraufwendungen ersetzt zu verlangen. In diesen Fällen werden wir die Produkte auf Risiko des Bestellers lagern und dem Besteller die Lagerung in Rechnung stellen. Wir sind berechtigt, für die durch die Lagerung entstehenden Kosten pauschal 0,1 % des Nettovertragspreises pro beendetem Werktag, insgesamt aber nicht mehr als 5 % des Nettovertragspreises, zu berechnen. Weitergehende Ansprüche behalten wir uns vor. Dem Besteller bleibt das Recht vorbehalten, nachzuweisen, dass uns gar kein oder ein wesentlich geringerer Schaden entstanden ist.
- (9) Teillieferungen bleiben vorbehalten, soweit diese dem Besteller unter Berücksichtigung seiner Interessen zumutbar sind.

6. Lieferung und Gefahrübergang

- (1) Sofern sich aus der Auftragsbestätigung nichts anderes ergibt, erfolgt die Lieferung FCA ab unserem Werk in Porta Westfalica (gemäß Incoterms® 2010 oder der jeweils geltenden Fassung). Dies gilt auch dann, wenn wir ausnahmsweise die Transportkosten übernommen oder für den Besteller verauslagt haben.
- (2) Sofern Versendung vereinbart wurde, geht die Gefahr des zufälligen Untergangs und der zufälligen Verschlechterung der Sache auf den Besteller über, wenn wir die Sache an den Spediteur, Frachtführer oder sonst zur Ausführung der Versendung bestimmten Dritten übergeben haben. Dies gilt auch dann, wenn die Lieferung durch unsere eigenen Fahrzeuge erfolgt oder wir die Transportkosten übernommen oder für den Besteller verauslagt haben. Verzögert sich Lieferung aus Gründen, dessen Ursache beim Besteller liegt, geht die Gefahr von dem Tag an auf den Besteller über, an dem die Ware versandbereit ist und wir dies dem Besteller angezeigt haben.
- (3) Soweit nichts anderes vereinbart ist, steht die Verpackung in unserem pflichtgemäßen Ermessen. Die Kosten der Verpackung trägt der Besteller. Die Transportkisten unserer Standardverpackung sind nicht für eine Stapelverstaung ausgelegt. Eine besondere Verpackung (etwa eine zusätzliche Transportverstärkung, welche ein max. doppelstöckiges Stapeln der Transportkisten erlaubt) erfolgt nur nach besonderer Vereinbarung und/oder auf Wunsch des Bestellers (den dieser spätestens in seiner Bestellung anzugeben hat).
- (4) Soweit der Besteller nicht rechtzeitig erklärt, wie die Versendung der Ware erfolgen soll, werden wir einen Beförderungsvertrag mit einem Spediteur auf Kosten des Bestellers schließen. In diesem Fall steht die Wahl des Transportwegs und der Versandart in unserem Ermessen, es sei denn, es wurde etwas anderes vereinbart. Soweit der Besteller eine Transportversicherung wünscht, hat er uns darauf hinzuweisen; diese wird dann durch uns nach pflichtgemäßem Ermessen zu Gunsten des Bestellers abgeschlossen. Die insoweit anfallenden Kosten trägt der Besteller, auch wenn wir ansonsten ausnahmsweise die Transportkosten übernommen haben.
- (5) Transportverpackungen nehmen wir an unserem Geschäftssitz innerhalb der üblichen Geschäftszeiten zurück.

7. Eigentumsvorbehalt

- (1) Wir behalten uns das Eigentum an den gelieferten Waren bis zum Eingang aller Zahlungen aus der Geschäftsverbindung mit dem Besteller vor.
- (2) Die Vorbehaltsware darf vom Besteller ohne unsere ausdrückliche schriftliche Zustimmung vor vollständiger Bezahlung der gesicherten Forderungen weder an Dritte verpfändet noch zur Sicherheit übereignet werden. Bei Pfändungen oder sonstigen Eingriffen Dritter hat uns der Besteller unverzüglich schriftlich zu benachrichtigen. Soweit wir gegen den Dritten klagen, die Klage erfolgreich war und der Dritte nicht in der Lage ist, uns die gerichtlichen oder außergerichtlichen Kosten einer Klage zu erstatten, haftet der Besteller für die uns entstandenen Kosten.
- (3) Bei vertragswidrigem Verhalten des Bestellers – insbesondere Zahlungsverzug – sind wir berechtigt, nach den gesetzlichen Vorschriften vom Vertrag zurückzutreten und die Vorbehaltsware heraus zu verlangen.
- (4) Der Besteller ist bis zur vollständigen Bezahlung der Vorbehaltsware verpflichtet,

uns jederzeit über den Standort der Vorbehaltsware informiert zu halten.

- (5) Der Besteller ist berechtigt, die gelieferten Waren im ordentlichen Geschäftsgang weiter zu verkaufen; er tritt uns jedoch bereits jetzt alle Forderungen in Höhe des Faktura-Endbetrages (einschließlich MwSt.) unserer Forderungen ab, die ihm aus der Weiterveräußerung gegen seine Abnehmer oder Dritte erwachsen, und zwar unabhängig davon, ob die Kaufsache ohne oder nach Verarbeitung weiter verkauft worden ist. Zur Einziehung dieser Forderung bleibt der Besteller auch nach der Abtretung ermächtigt. Unsere Befugnis, die Forderung selbst einzuziehen, bleibt hiervon unberührt. Wir verpflichten uns jedoch, die Forderung nicht einzuziehen, solange keine Wechsel- und Scheckproteste vorkommen, der Besteller seinen Zahlungsverpflichtungen aus den vereinnahmten Erlösen nachkommt, nicht in Zahlungsverzug ist und kein Antrag auf Eröffnung des Insolvenzverfahrens über sein Vermögen gestellt ist. Ist dies aber der Fall, können wir verlangen, dass der Besteller uns die abgetretenen Forderungen und deren Schuldner bekannt gibt, alle zum Einzug erforderlichen Angaben macht, die dazugehörigen Unterlagen aushändigt und den Schuldner (Dritten) die Abtretung mitteilt.
- (6) Die Verarbeitung oder Umbildung der von uns gelieferten Vorbehaltsware durch den Besteller wird stets für uns vorgenommen. Wird die von uns gelieferte Vorbehaltsware mit anderen, uns nicht gehörenden Gegenständen/Stoffen verarbeitet, so erwerben wir das Miteigentum an der neuen Sache im Verhältnis des Wertes der Vorbehaltsware zu den anderen verarbeiteten Gegenständen/Stoffen zur Zeit der Verarbeitung. Für die durch Verarbeitung entstehende Sache gilt im Übrigen das Gleiche wie für die unter Vorbehalt gelieferte Ware.
- (7) Wird die von uns gelieferte Vorbehaltsware mit anderen, uns nicht gehörenden Gegenständen/Stoffen untrennbar vermischt oder dergestalt verbunden, dass sie wesentliche Bestandteile einer einheitlichen Sache werden, so erwerben wir das Miteigentum an der neuen Sache im Verhältnis des Wertes der Vorbehaltsware zu den anderen vermischten oder verbundenen Gegenständen/Stoffen zum Zeitpunkt der Verbindung oder Vermischung. Erfolgt die Verbindung oder Vermischung in der Weise, dass die Sache des Bestellers als Hauptsache anzusehen ist, so gilt bereits jetzt als vereinbart, dass der Besteller uns anteilmäßig Miteigentum überträgt. Der Besteller verwahrt das so entstandene Miteigentum für uns. Für die durch Verbindung oder Vermischung entstandene Sache gilt im Übrigen das Gleiche wie für die unter Vorbehalt gelieferte Ware.
- (8) Der Besteller ist verpflichtet, die Vorbehaltsware pfleglich zu behandeln. Er ist verpflichtet, diese auf eigene Kosten ausreichend zum Neuwert zu versichern, insbesondere gegen Feuer, Wasserschäden und Diebstahl. Sofern Wartungs- und Inspektionsarbeiten erforderlich sind, muss der Besteller diese auf eigene Kosten rechtzeitig durchführen.
- (9) Für den Fall des Untergangs oder der Beschädigung der Vorbehaltsware tritt der Besteller in diesem Zusammenhang bestehende etwaige Ansprüche auf Versicherungsleistungen in Höhe des Faktura-Endbetrages (einschließlich Mehrwertsteuer) unserer Forderungen in Ansehung des Liefergegenstandes als zusätzliche Sicherheit im Voraus an uns ab.
- (10) Sind bei Lieferungen in das Ausland im Einfuhrstaat zur Wirksamkeit des vorstehend geregelten Eigentumsvorbehalts oder der in den vorangegangenen Absätzen bezeichneten sonstigen Rechte unsererseits bestimmte Maßnahmen und/oder Erklärungen durch den Besteller erforderlich, so hat der Besteller uns hierauf schriftlich oder in Textform unverzüglich hinzuweisen und diese Maßnahmen und/oder Erklärungen auf seine eigenen Kosten unverzüglich durchzuführen bzw. abzugeben. Lässt das Recht des Einfuhrstaates einen Eigentumsvorbehalt nicht zu, ist der Besteller verpflichtet, uns auf seine Kosten unverzüglich andere geeignete Sicherheiten an der gelieferten Ware oder sonstige Sicherheiten nach billigem Ermessen (§ 315 BGB) zu verschaffen.
- (11) Wir verpflichten uns, die uns zustehenden Sicherheiten auf Verlangen des Bestellers insoweit freizugeben, als der realisierbare Wert unserer Sicherheiten die zu sichernden Forderungen um mehr als 10 % übersteigt; die Auswahl der freizugebenden Sicherheiten obliegt uns.

8. Eigentumserwerb durch Be- oder Verarbeitung uns zur Verfügung gestellter Gegenstände

- (1) Übergibt uns der Besteller einen Gegenstand zur Be- oder Verarbeitung oder zur Reparatur und bleibt der Besteller auch nach der Be- oder Verarbeitung oder Reparatur Alleineigentümer des be- oder verarbeiteten bzw. reparierten Gegenstands, so gilt bereits jetzt als vereinbart, dass der Besteller uns anteilmäßig Miteigentum im Verhältnis des Wertes unserer Be- oder Verarbeitung oder Reparatur (Faktura-



Endbetrag, einschließlich MwSt.) zum Wert des zur Verfügung gestellten Gegenstandes überträgt.

- (2) Wird der Gegenstand bei der Be- oder Verarbeitung oder Reparatur mit uns gehörenden Gegenständen/Stoffen vermischt oder dergestalt verbunden, dass sie wesentliche Bestandteile einer einheitlichen Sache werden, so erwerben wir das Miteigentum an der neuen Sache im Verhältnis des Wertes unserer Gegenstände/Stoffe zu dem Wert des zur Verfügung gestellten Gegenstandes des Bestellers zum Zeitpunkt der Verbindung oder Vermischung.
- (3) Erfolgt die Verbindung oder Vermischung in der Weise, dass die Sache des Bestellers als Hauptsache anzusehen ist, so gilt bereits jetzt als vereinbart, dass der Besteller uns anteilmäßig Miteigentum im Verhältnis des Wertes unserer Be- oder Verarbeitung bzw. unserer Reparatur (Faktura-Endbetrag, einschließlich MwSt.) zum Wert des zur Verfügung gestellten Gegenstandes zum Zeitpunkt der Verbindung oder Vermischung überträgt.
- (4) Für Sachen des Bestellers, an denen wir nach den vorstehenden Bedingungen Miteigentum erworben haben, gelten insoweit die Bestimmungen der Ziffer 7 dieser AGB entsprechend. Zur Klarstellung: Wir übertragen das nach den vorstehenden Bedingungen erworbene Miteigentum an den Besteller mit Lieferung der Sache gemäß den Regelungen in Ziffer 7 dieser AGB.

9. Gewährleistung – Haftung für Pflichtverletzungen

- (1) Für die Rechte des Bestellers bei Sach- und Rechtsmängeln (einschließlich Falsch- und Minderlieferung) gelten die gesetzlichen Bestimmungen, wenn nachfolgend nichts anderes bestimmt ist. In allen Fällen unberührt bleiben die gesetzlichen Sondervorschriften bei Endlieferung der Ware an einen Verbraucher (§§ 478, 479 BGB).
- (2) Sofern wir nach Zeichnungen, Spezifikationen, Mustern, Vorgaben und/oder sonstigen Unterlagen des Bestellers leisten, trägt dieser das Risiko der Eignung für den vorgesehenen Verwendungszweck.
- (3) Bearbeiten wir Teile des Bestellers in dessen Auftrag, ist der Besteller verpflichtet, zu prüfen, ob sich die Teile für die gewünschte Bearbeitung eignen. Führt eine Bearbeitung von Teilen, die der Besteller an uns sendet, aus Gründen, die wir nicht zu vertreten haben, nicht zum Erfolg, übernehmen wir für etwaige Schäden des Bestellers keine Haftung. Darüber hinaus sind uns die für die Bearbeitung bereits angefallenen Kosten zu ersetzen. Gegebenenfalls erforderliche Nacharbeiten werden wir dem Besteller in Rechnung stellen.
- (4) Die Gewährleistungsrechte des Bestellers setzen voraus, dass dieser seinen nach § 377 HGB geschuldeten Untersuchungs- und Rügeobliegenheiten ordnungsgemäß nachgekommen ist. Handelt es sich bei dem Vertragsverhältnis zwischen uns und dem Besteller um einen Werkvertrag, findet § 377 HGB entsprechende Anwendung. Mängelrügen sind schriftlich an unsere Kundendienstleitung zu richten.
- (5) Wurde mit dem Besteller eine Abnahme oder eine Erstmusterprüfung vereinbart, ist die Rüge von Mängeln ausgeschlossen, die der Besteller bei sorgfältiger Abnahme oder Erstmusterprüfung hätte feststellen können.
- (6) Uns ist Gelegenheit zu geben, einen gerügten Mangel an Ort und Stelle zu überprüfen.
- (7) Werden unsere Betriebs- oder Wartungsanweisungen nicht befolgt, eigenmächtige Änderungen an den Produkten vorgenommen und/oder Teile ausgewechselt, so bestehen für die daraus entstehenden Folgen keine Gewährleistungsansprüche. Dies gilt auch bei fehlerhaftem Einbau oder Aufbau, schlechter Instandhaltung, fehlerhafter Behandlung oder Lagerung, für von uns nicht ausgeführte unsachgemäße Reparaturen, Änderungen sowie von uns nicht zu vertretende chemische, elektrochemische oder elektrische Einflüsse sowie Witterungs- oder anderen Naturinflüsse.
- (8) Ist die gelieferte Ware oder das hergestellte Werk mangelhaft, so stehen dem Besteller die gesetzlichen Rechte nach folgender Maßgabe zu:
 - a) Wir sind zunächst berechtigt, nach unserer Wahl entweder den Mangel zu beseitigen oder dem Besteller mangelfreie Ware zu liefern bzw. im Falle eines Werkvertrages ein neues Werk herzustellen (Nacherfüllung). Der Besteller hat uns hierfür die zur Nacherfüllung erforderliche Zeit und Gelegenheit zu geben. Wir sind verpflichtet, alle zum Zweck der Nacherfüllung erforderlichen Aufwendungen, insbesondere Transport-, Wege-, Arbeits- und Materialkosten zu tragen. Stellt sich das Mängelbeseitigungsverlangen des Bestellers als unberechtigt heraus, können wir die hieraus entstandenen Kosten vom Besteller ersetzt verlangen. Die Nacherfüllung beinhaltet weder den Ausbau der mangel-

haften Sache noch den erneuten Einbau, wenn wir ursprünglich nicht zum Einbau der Sache verpflichtet waren. Im Falle der Ersatzlieferung bzw. Neuherstellung bei Werkverträgen hat uns der Besteller die mangelhafte Ware auf unser Verlangen zurückzugeben. Wir sind berechtigt, die Nacherfüllung davon abhängig zu machen, dass der Besteller den für die gelieferte Ware vereinbarten Preis bezahlt. Der Besteller ist jedoch berechtigt, einen angemessenen Teil des Preises zurückzuhalten.

- b) Schlägt die Nacherfüllung fehl, so ist der Besteller nach seiner Wahl berechtigt, vom Vertrag zurückzutreten oder eine Minderung des vereinbarten Preises zu verlangen. Bei einem unerheblichen Mangel besteht jedoch kein Rücktrittsrecht.
 - c) Ansprüche des Bestellers auf Schadensersatz bzw. Ersatz vergeblicher Aufwendungen bestehen nur nach Maßgabe von Ziffer 10 dieser AGB.
- (9) Für die Verjährungsfristen gilt Ziffer 11 dieser AGB.

10. Haftungsausschlüsse und -begrenzungen

- (1) Vorbehaltlich der Regelung der Ziffer 10 (2) haften wir auf Schadensersatz – bei vertraglichen, außervertraglichen oder sonstigen Schadensersatzansprüchen, gleich aus welchem Rechtsgrund, insbesondere wegen Mängeln, Verzug und Unmöglichkeit, Verschulden bei Vertragsverhandlungen und Delikt – nur bei Vorsatz und/oder grober Fahrlässigkeit, einschließlich Vorsatz und/oder grober Fahrlässigkeit unserer Vertreter oder Erfüllungsgehilfen.

Darüber hinaus haften wir auch bei einfacher Fahrlässigkeit, einschließlich einfacher Fahrlässigkeit unserer Vertreter und Erfüllungsgehilfen, für Schäden aus der Verletzung einer wesentlichen Vertragspflicht, d.h. einer Pflicht, deren Erfüllung die ordnungsgemäße Durchführung des Vertrages erst ermöglicht und auf deren Erfüllung der Besteller daher regelmäßig vertrauen darf (Kardinalpflicht). Soweit uns keine vorsätzliche Pflichtverletzung angelastet wird, ist die Schadensersatzhaftung jedoch auf den vorhersehbaren, typischerweise eintretenden Schaden begrenzt.
- (2) Von den in Ziffer 10 (1) geregelten Haftungsausschlüssen und -beschränkungen unberührt bleiben Ansprüche für Schäden aus der Verletzung des Lebens, des Körpers und der Gesundheit sowie Ansprüche des Bestellers nach dem Produkthaftungsgesetz, den gesetzlichen Sondervorschriften bei Endlieferung der Ware an einen Verbraucher (§ 478, 479 BGB) und anderen zwingenden gesetzlichen Haftungsregelungen. Die vorstehenden Haftungsausschlüsse bzw. -beschränkungen gelten außerdem nicht, soweit wir einen Mangel arglistig verschwiegen haben oder soweit wir aus der Übernahme einer Garantie oder wegen der Übernahme des Beschaffungsrisikos haften.
- (3) Die Ziffern 10 (1) bis 10 (2) gelten auch, wenn der Besteller anstelle eines Anspruchs auf Ersatz des Schadens statt der Leistung Ersatz nutzloser Aufwendungen verlangt.
- (4) Soweit die Schadensersatzhaftung uns gegenüber ausgeschlossen oder eingeschränkt ist, gilt dies auch im Hinblick auf die persönliche Schadensersatzhaftung unserer Angestellten, Arbeitnehmer, Mitarbeiter, Vertreter und Erfüllungsgehilfen, die auf demselben Rechtsgrund beruhen.

11. Verjährung

- (1) Ansprüche des Bestellers aus Sach- und Rechtsmängeln verjähren innerhalb von 12 Monaten.
- (2) Zwingende Verjährungsvorschriften bleiben unberührt. Die in Ziffer 11 (1) genannte Verjährungserleichterung gilt nicht für Ansprüche wegen der Verletzung von Leben, Körper oder Gesundheit, für Ansprüche aufgrund von Vorsatz und/oder grober Fahrlässigkeit und für Ansprüche aufgrund der Übernahme einer Garantie oder der Übernahme des Beschaffungsrisikos. Unberührt bleiben auch die längeren Verjährungsfristen nach § 438 Abs. 1 Nr. 1 BGB (dingliche Rechte eines Dritten), § 438 Abs. 1 Nr. 2, 634a Abs. 1 Nr. 2 BGB (Bauwerke, Baustoffe und Bauteile sowie Planungsleistungen für ein Bauwerk), § 438 Abs. 3, 634a Abs. 3 BGB (Arglist) und § 479 BGB (Lieferantenregress).
- (3) Die sich nach den Ziffern 11 (1) und 11 (2) für Ansprüche wegen Sach- und Rechtsmängeln ergebenden Verjährungsfristen gelten entsprechend für konkurrierende vertragliche und außervertragliche Schadensersatzansprüche des Bestellers, die auf einem Mangel der Vertragsware beruhen. Wenn jedoch im Einzelfall die Anwendung der gesetzlichen Verjährungsregeln zu einer früheren Verjährung der konkurrierenden Ansprüche führen sollte, gilt für die konkurrierenden Ansprüche die gesetzliche Verjährungsfrist. Die gesetzlichen Verjährungsfristen nach dem Produkthaftungsgesetz bleiben in jedem Fall unberührt.

- (4) Soweit gemäß Ziffer 11 (1) bis 11 (3) die Verjährung von Ansprüchen uns gegenüber verkürzt wird, gilt diese Verkürzung entsprechend für etwaige Ansprüche des Bestellers gegen unsere gesetzlichen Vertreter, Angestellten, Mitarbeiter, Beauftragten sowie Verrichtungs- und Erfüllungsgehilfen, die auf demselben Rechtsgrund beruhen.

12. Rücktritts- /Kündigungsrechte

- (1) Wegen einer Pflichtverletzung unsererseits, die nicht in einem Mangel besteht, ist der Besteller nur dann berechtigt, vom Vertrag zurückzutreten, wenn wir die Pflichtverletzung zu vertreten haben.
- (2) Handelt es sich bei dem Vertrag um einen Werkvertrag oder einen Werklieferungsvertrag über bewegliche, nicht vertretbare Sachen, ist das freie Kündigungsrecht des Bestellers (§§ 651, 649 BGB) ausgeschlossen.

13. Schutz- und Urheberrechte

- (1) Sofern nichts anderes vereinbart ist, sind wir verpflichtet, die Lieferung lediglich im Land des Lieferortes frei von gewerblichen Schutzrechten und Urheberrechten Dritter – nachfolgend Schutzrechte genannt – zu erbringen.
- (2) Sofern ein Dritter wegen der Verletzung von Schutzrechten durch von uns erbrachte, vertragsgemäß genutzte Lieferungen gegen den Besteller berechnete Ansprüche erhebt, haften wir gegenüber dem Besteller wie folgt: Wir werden nach unserer Wahl und auf unsere Kosten für die betreffenden Lieferungen entweder ein Nutzungsrecht erwirken, sie so ändern, dass das Schutzrecht nicht verletzt wird oder austauschen. Ist uns dies nicht zu angemessenen Bedingungen möglich, stehen dem Besteller die gesetzlichen Rücktritts- oder Minderungsrechte nach Maßgabe von Ziffer 8 dieser AGB zu. Unsere Schadensersatzpflicht richtet sich nach Ziff. 10 dieser AGB, die Verjährung nach Ziffer 11 dieser AGB. Die vorstehend genannten Verpflichtungen bestehen für uns nur, soweit der Besteller uns über die vom Dritten geltend gemachten Ansprüche unverzüglich schriftlich verständigt.
- (3) Ansprüche des Bestellers bestehen nicht, soweit er selbst die Schutzrechtsverletzung zu vertreten hat. Ansprüche des Bestellers sind insbesondere ausgeschlossen, soweit die Schutzrechtsverletzung auf speziellen Vorgaben des Bestellers beruht, durch eine von uns nicht voraussehbare Anwendung oder dadurch verursacht wird, dass die Lieferung vom Besteller verändert oder zusammen mit nicht von uns gelieferten Produkten eingesetzt wird und wir die Schutzrechtsverletzung nicht zu vertreten haben.

14. Geheimhaltung

An unseren Abbildungen, Zeichnungen, Kalkulationen und sonstigen Unterlagen behalten wir uns Eigentums- und Urheberrechte vor. Dies gilt auch für solche schriftlichen Unterlagen, die als „vertraulich“ bezeichnet sind. Vor ihrer Weitergabe an Dritte bedarf der Besteller unserer ausdrücklichen schriftlichen Zustimmung. Er hat auf unser Verlangen diese Unterlagen vollständig an uns, einschließlich etwaiger Kopien, zurückzugeben, wenn sie von ihm im ordnungsgemäßen Geschäftsgang nicht mehr benötigt werden oder wenn Verhandlungen nicht zum Abschluss eines Vertrages führen.

15. Kommunikation mit dem Besteller

- (1) Die Verwendung der im Rahmen einer Bestellung an uns übermittelten Daten erfolgt ausschließlich in datenschutzrechtlich zulässiger Weise. Wir verwenden personenbezogene Daten nur, soweit der Besteller eingewilligt hat oder ein gesetzlicher Erlaubnistatbestand greift. Die Verwendung erfolgt für mit der Bestellung vergleichbare Waren und Dienstleistungen und für nicht periodische Informationen zu unserem Warenbestellsystem oder vergleichbare Informationen (z. B. Änderungen im Shopsystem), die wir auch per E-Mail versenden, jeweils aber nur für eigene werbliche Zwecke.
- (2) Die betroffenen Personen können dieser Verwendung Ihrer Daten für die werbliche Ansprache jederzeit widersprechen und eine gegebene Einwilligung jederzeit widerrufen, ohne dass dafür andere als Übermittlungskosten nach den Basistarifen entstehen.
- (3) Der Besteller kann sich gesondert für den periodischen Bezug von Wareninformationen im Rahmen unseres Newsletters anmelden. Dafür gelten besondere Bestimmungen, die vor der Anmeldung bekannt gegeben werden.
- (4) Die übermittelten Daten werden nicht an Dritte weitergegeben. Wir arbeiten zum Versand von Informationen mit externen Dienstleistern zusammen, die als Auf-

tragsdatenverarbeiter für uns tätig werden und dem Datenschutz verpflichtet sind und insbesondere die Daten nicht an Dritte weitergeben dürfen.

16. Schlussbestimmungen

- (1) Eine Übertragung der Vertragsrechte und -pflichten auf Dritte durch den Besteller ist nur mit unserem schriftlichem Einverständnis zulässig. Dies gilt nicht, soweit die Übertragung auf ein verbundenes Unternehmen im Sinne des § 15 Aktiengesetz erfolgt.
- (2) Sofern sich aus der Auftragsbestätigung nichts anderes ergibt, ist Erfüllungsort für Lieferungen und Zahlungen unser Geschäftssitz in Porta Westfalica.
- (3) Für das Vertragsverhältnis gilt das Recht der Bundesrepublik Deutschland. Die Anwendung des UN-Kaufrechts (CISG – Convention on Contracts for the International Sale of Goods) ist ausgeschlossen.
- (4) Sofern der Besteller Kaufmann, juristische Person des öffentlichen Rechts oder öffentlich-rechtliches Sondervermögen ist, ist der Gerichtsstand für alle sich aus dem Vertragsverhältnis ergebenden Streitigkeiten einschließlich Scheck-, Wechsel- und Urkundenprozessen der für unseren Firmensitz, Porta Westfalica, zuständige Gerichtsort. Wir sind jedoch berechtigt, den Käufer auch an seinem Wohnsitzgericht zu verklagen.
- (5) Bei Abweichungen zwischen der deutschen und einer übersetzten Fassung dieser AGB, hat stets die deutsche Fassung Vorrang.
- (6) Sollte eine Bestimmung in diesen AGB oder eine Bestimmung im Rahmen sonstiger Vereinbarungen unwirksam sein oder werden, so wird hiervon die Wirksamkeit aller sonstigen Bestimmungen oder Vereinbarungen nicht berührt.

Wir liefern unter Geltung unserer „Allgemeinen Lieferungs- und Zahlungsbedingungen“.
(Siehe auch unter www.jacob-rohre.de oder auch auf Anforderung.)

Alle Marken, Produktbezeichnungen und Logos gehören ausschließlich den jeweiligen Inhabern. Die Verwendung von Unternehmens- und Produktbezeichnungen sowie Marken in diesem Katalog erfolgt ausschließlich zur Identifizierung der jeweiligen Produkte bzw. Unternehmen.

– RHINO HYDE ist zugunsten der Tandem Products Inc. in den USA und/oder anderen Ländern als Marke eingetragen.

– KRYPTANE und BLUE OX sind zugunsten der Argonic Inc. in den USA und/oder anderen Ländern als Marke eingetragen.

– FESTO ist zugunsten der Festo AG & Co. KG in den USA und/oder anderen Ländern als Marke eingetragen.

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Die oben genannten Marken können auch als nicht registrierte Zeichen in den USA und/oder anderen Ländern geschützt sein. Alle anderen in diesem Katalog genannten Marken sind zugunsten der jeweiligen Inhaber geschützt.



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