GF Piping Systems

Technical Information & Product Range 2017

COOL-FIT ABS Plus
COOL-FIT PE Plus

List of abbreviations

ANSI	American National Standard
ASTM	American Society for Testing and Materials
BS	British Standard
DIN	Deutsche Industrie-Normen
ISO	International Standardization Organisation
ABS	Acrylnitril Butadien Styrene
PVC-U	Polyvinyl Chloride
PVC-C	Polyvinyl Chloride chlorinated
PP	Polypropylene, heat stabilised
PP-N	Polypropylene, Random copolymer unpigmented
PE	Polyethylene
PVDF	Polyvinylidene fluoride
EPDM	Ethylene Propylene Rubber
FPM	Fluorine Rubber, e.g. Viton®
NBR	Nitrile Rubber
IIR	Butyl Rubber
CSM	Chlore Sulphonyl Polythene, e.g. Hypalon®
CR	Chloroprene Rubber, e.g. Neoprene®
PROGEF	GF of PP
PTFE	Polytetrafluorethylene, e.g. Teflon®
UP-GF	Unsaturated polyester resin glassfibre reinforced
St	Steel
Ms	Brass
Tg	Malleable Iron
d	Pipe outside diameter
FM	Fusion Method
DN	Nominal bore
PN	Nominal pressure at 20°C, water
kg	Weight in kilograms
g	Weight in grams
SP	Standard pack. The figure given indicates the quantity of fittings contained in a standard pack
GP	Gross pack. The figure given indicates the quantityof fittings contained in a gross pack
G	Pipe thread, not pressure tight in the thread to ISO 228/1
NPT	Taper male thread pressure tight in the thread to ANSI B 1.20.1
R	Taper male thread, pressure tight in the thread to ISO 7/DIN 2999/1
Rc	Taper female thread, pressure tight in the thread to ISO 7/1
Rp	Parallel female thread, pressure tight in the thread to ISO 7/DIN 999/1
Tr	Trapezoid thread
SC	Size of hexagon bolts
s	A/F
e	Wall thickness
AL	Number of bolt holes
®	Registered trade-mark

The best choice for you

Corrosion and chemical resistant system solutions

Georg Fischer

Georg Fischer focuses on three core businesses: GF Piping Systems, GF Automotive and GF Machining Solutions. The industrial corporation, founded in 1802, headquarters in Switzerland and operates approximately 120 companies with more than 14 500 employees in 32 countries. GF Piping Systems is a leading supplier of plastic and metal piping systems with global market presence. We offer corresponding pipes, fittings, valves, automation products and jointing technology for the treatment of water and chemicals, as well as for the safe distribution of liquids and gases.

Our market segments

Being a strong implementation partner, GF Piping Systems supports its customers in every phase of the project. No matter which processes and applications are planned in the following market segments:

- Automation
- Building Technology
- Chemical Process Industry
- Energy
- Food & Beverage / Cooling
- Microelectronics
- Marine
- Water & Gas Utilities
- Water Treatment

Global presence

Our global presence ensures customer proximity worldwide. Sales companies in 26 countries and representatives in another 80 countries provide customer service around the clock. With 32 production sites in Europe, Asia and the USA we are close to our customers and comply with local standards. A modern logistics concept with local distribution centers ensures highest product availability and short delivery times. GF Piping Systems' specialists are always close by.

Complete solutions provider

Our extensive product range represents a unique form of product and competence bundling. With over 70 000 products, allied with a broad range of services, we offer individual and comprehensive system solutions for a variety of industrial applications. Having the profitability of the projects of our customers in focus, we optimize processes and applications that are integrated into the whole system. Continually setting standards in the market, we directly provide our customers with technological advantages. Due to our worldwide network customers benefit directly from our 50 years+ experience in plastics.

From start to finish, we support our customers as a competent, reliable and experienced partner.

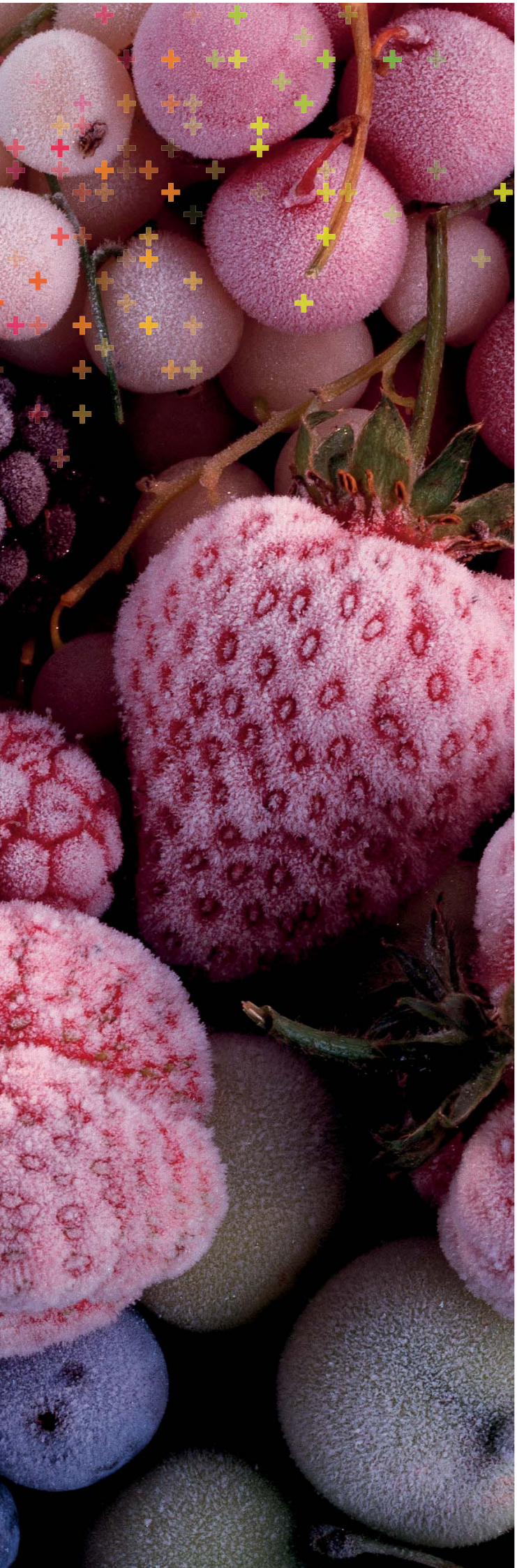
Introduction

GF Piping Systems and your Refrigeration / Cooling application

The origin of the artificial refrigeration process occurred not uncoincidentally at the same time as initial research into physics and thermodynamics. Linde, Carrier, Carre, Cullen and Harrison are prominent names in the history of refrigeration.

GF Piping Systems has been producing piping components since 1802, initially in malleable iron, nowadays with engineered system solutions for specific applications. One example is the highpurity, top-grade plastic piping systems developed by GF Piping Systems for the manufacture of semi-conductors.

Refrigeration systems place high demands on the piping system, which has a direct impact on the reliability, efficiency and life span of the plant.



Your benefits

- no corrosion
- zero maintenance
- energy efficient
- reduced plant running costs
- simple, reliable installation
- dedicated system solutions
- sustainable

GF Piping Systems in Cooling and Refrigeration Plants

It is the expressed intention of GF Piping Systems to be part of this world-wide initiative to optimise refrigeration and cooling plants in terms of energy use and environmental impact.

How efficiently an entire refrigeration plant operates is defined by the machinery's COP (Coefficient of Performance), the efficiency of the secondary piping system and the heat-transfer rate at the air cooler.

Thus, the secondary piping system plays a vital role in the efficiency of the plant as a whole.

COOL-FIT ABS Plus is a pre-insulated complete plastic piping system, designed specifically to optimise the efficiency, installation costs and life span of the secondary piping system.

Secondary Refrigeration

One of the consequences of national and international regulation to reduce and eliminate freons is an increase in the use of so-called secondary refrigeration systems. Such systems reduce the amount of environmentally unfriendly primary charge (freon gas) in a plant by about 80 %.

Leaks in standard refrigeration systems can be as high as 35 % of the original charge per year. This is not only immensely damaging to the environment, but also costs a great deal to refill the systems.

Commonly used in larger industrial refrigeration installations where large charges of refrigerant gases can be a health and safety issue, secondary refrigeration plants have several advantages:

- higher safety
- lower refill costs
- higher temperature stability and control
- lower maintenance costs
- environmentally friendly

Secondary systems also allow removal of refrigerant gases from the working or retail area into a separate machine room. This means that natural refrigerant gases such as ammonia or propane can be used to replace man-made freons with no danger to the personnel or public. The result is a 100 % sustainable plant with zero impact on the environment and with an improved efficiency.

The Environment

The “Montreal Protocol” in 1987 set the first internationally agreed timetable for the elimination of CFC gases. The Kyoto Protocol followed in 1997 with the intention of further accelerating the reduction of green-house gas emissions, including F-gases (fluorinated refrigerant). The latest regulation in Europe is the EC Regulation No. 842 / 2006. The aim of which is to contain, prevent and thereby reduce emissions of fluorinated greenhouse gases, as outlined in the Kyoto Protocol.

+ Ecological benefits

- less energy in production
- lower ozone depleting potential (ODP)
- reduced energy consumption
- far lower greenhouse gas emissions (TEWI)
- lower global warming potential (GWP)

Efficiency is the key

The cold chain and environmental climate control are integral parts of modernday life. We simply expect fresh food twelve months of the year and of course the fresher the better. Climate control whether in hospitals or for medicines are determining factors in the quality of our lives. The generation of cold for a whole range of applications is part of day-to-day life.

Refrigeration plants are major users of energy and play a key role in environmental protection. In a supermarket, for example, 70 % of the daily energy costs are attributed to the cooling and refrigeration plant. Cold stores and food production facilities with cooling performance energy requirements of many megawatts are common. Any technology improvements which improve the efficiency of refrigeration and cooling plants have real ecological as well as economical benefits.

COOL-FIT

Simplicity and efficiency were the driving forces behind one of the most significant innovations introduced by +GF+ in recent years: COOL-FIT, a plastic piping system for cooling and refrigeration systems with a secondary cooling circuit.

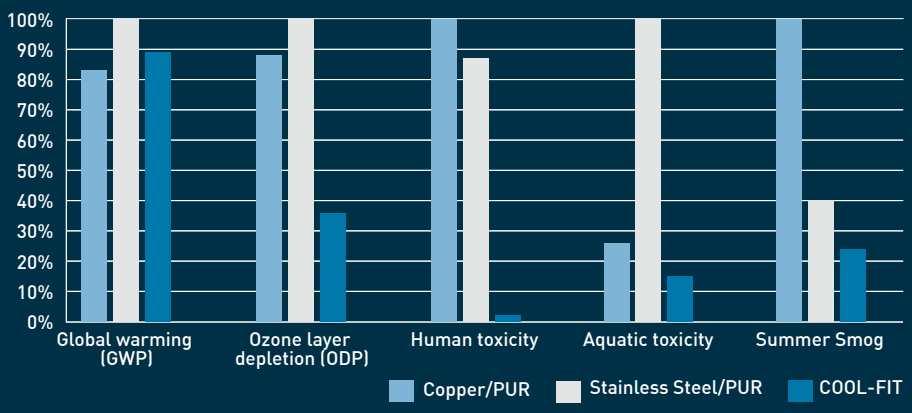
The system's advantages in terms of energy consumption and resource conservation as compared with traditional metal piping extend to all aspects of its life cycle – from the selection of materials and production to daily use in the plant. For example, the elaborate melting and processing involved in the production of copper releases significantly more CO2 into the atmosphere than the production process for ABS plastic. And we are talking about considerable magnitudes. Take, for example, this sample calculation for a 500-metre- long piping system required for a Wal-Mart supermarket in the USA. The use of copper would have resulted in the release of 4 600 kilograms of CO2 at the material production stage alone.

By using ABS, CO2 emissions are reduced to just 2 200 kilograms. And what's more, the latter process produces fewer toxic emissions than metal production.

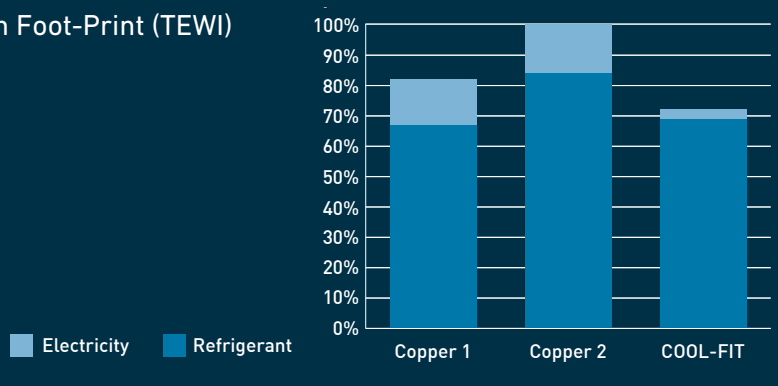
COOL-FIT is used exclusively in "secondary refrigeration systems".

This type of installation allows the required volume of refrigerant to be reduced by 80 to 90 % compared to that used by conventional systems. COOL-FIT therefore undercuts existing systems in terms of its TEWI (Total Equivalent Warming Impact) value, which is based on energy and coolant requirements, by over 50 % – with welcome effects not just for the environment, but also for reduced overall costs for the operator.

Environmental impacts



Carbon Foot-Print (TEWI)



TEWI: Total Equivalent Warming Impact
ODP: Ozone Depleting Potential
GWP: Global Warming Potential

Value added services

From planning support to implementation – our specialists are always close by

As a leading provider of piping systems in plastic and metal, we offer our customers not only reliable products, but also a large package of services. Our support ranges from a comprehensive technical manual or the extensive CAD library to an international team of experts, who work closely together with local sales companies. And when it comes to implementing a project, our customers additionally benefit from a wide range of training courses, either on site or in our modern training centres worldwide.

Generating a genuinely individual added value for our customers is our ultimate goal when implementing our tailor-made solutions. With our application knowledge and product expertise, we support our customers during the planning process, the sustainable realization of the projects and the provision of services. Our expertise in developing and producing piping systems, combined with our profound industry and market knowledge, based on longstanding experience, makes us a qualified and professional partner for our customers.

1 Chemical resistance

Our specialist teams have decades of experience in the area of chemical resistance. They can offer individual support and advice in selecting the right material for the corresponding system solution. On request, a team will examine and select the appropriate material for special applications.

2 CAD library

The extensive CAD library is the most frequently used planning tool at GF Piping Systems. The database comprises over 30 000 drawings and technical data regarding pipes, fittings, measurement and control technology as well as manual and actuated valves. The big advantage of the CAD library is that the data can be integrated directly in CAD models.

3 Technical support

Technical support and material selection are key factors for a successful installation. A team of specialists headquartered in Switzerland is available to support the GF Piping Systems sales companies around the world. For technical advice or for general information, our customers are supported individually by the specialist team in the corresponding sales company.

4 Online and mobile calculation tools

Our numerous, multilingual online calculation tools are very useful for configuring and calculating. By means of pressure / temperature diagrams, the pressure of liquid media recommended for pipes and fittings at various temperatures can be easily defined. FlowCalc App, the mobile application of GF Piping Systems, is an on-site planning tool for pipe diameter and flow velocity calculation to select the right dimension of piping systems when no expert is near by.

5 On-site training

Our experts are available to support our customers locally and conduct training in diverse fusion and jointing techniques on location. The duration and structure of the training depends on the project and the system being installed.

6 Customizing

The customizing teams at GF Piping Systems work closely together around the globe. The focus of these teams is to manufacture custom parts for special systems. In addition, a variety of special solutions can be produced in small series. Standardized processes warrant the highest level of quality for the individual solutions of our customers.

7

Technical manual

For our customers, we have documented the extensive know-how of GF Piping Systems in planning and installing plastic piping systems in our technical manual. This detailed documentation is available in both printed and digital version. The established reference book is helpful in planning large and small projects.

8

Training courses

GF Piping Systems offers a wide range of training courses that allow participants to gain confidence in working with our products and proven jointing technologies. The practical training is clearly defined, structured and adapted to the various levels of participants' experience.

Table of contents

System COOL-FIT Plus

1 General information

COOL-FIT Plus systems are completely pre-insulated plastic piping systems for secondary cooling circuits that are operated with water, sole, glycol solutions or slurry ice. Typical areas of application are industrial refrigeration systems with medium temperatures far below 0 °C and air-conditioning systems for media above 0 °C.

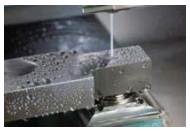
The COOL-FIT ABS Plus system is based on proven and cold-shock resistant ABS pipes and fittings for the media line, which is insulated by a high-quality PUR insulation, as well as a robust and UV-resistant outer jacket. The COOL-FIT PE Plus system consists of a tested PE media pipe and, similar to COOL-FIT ABS Plus, high-quality PUR insulation, as well as a robust and UV-resistant outer jacket. The smooth inner surface of the media piping system ensures very low pressure losses, the low thermal conductivity of the plastic and the insulation are a guarantee for low energy and operating costs during the service life of the pipe. Thanks to the 3-in-1 design, the installation times are very short.

The COOL-FIT Plus systems are used for the following applications, among other things:

Breweries,
press houses

Fruit and vegetable processing, bakeries, fish and meat processing

Cold stores



Process cooling water

System overview

ABS	COOL-FIT ABS Plus	ecoFIT	COOL-FIT PE Plus
			
Piping system made of ABS plastic without additional external insulation	Piping system made of ABS plastic with rigid foam insulation and UV-resistant jacket	Piping system made of PE plastic without additional external insulation	Piping system made of PE plastic with rigid foam insulation and UV-resistant jacket
d20 – d315 mm	d25 – d315 mm	d16 – d1000 mm	d250 – d415 mm
-50 °C to +60 °C	-50 °C to +40 °C	-50 °C to +60 °C	-35 °C to +55 °C
Thermal conductivity λ = 0.17 W/mK	Thermal conductivity λ = ≤ 0.026	Thermal conductivity λ = 0.38 W/mK	Thermal conductivity ≤ 0.026 W/mK
For detailed information, see Planning Fundamentals, chapter 3, "System overview"	For detailed information, see the following chapters	For detailed information, see Planning Fundamentals, chapter 3, "System overview"	For detailed information, see the following chapters

Supplementary systems

iFIT	JRG Sanipex	INSTAFLEX	iKLIMA
			
Multi-layer composite pipes with snap-fit mechanical compression joints	Multi-layer composite pipes with mechanical, dead space-free compression joints	Piping system made of polybutene with electrofusion fittings	Floor heating and cooling system

2 System specification

2.1 COOL-FIT ABS Plus

Specification

Material[1)]	Media pipe	ABS (acrylonitrile-butadiene-styrene)	
	Insulation	PUR (polyurethane), closed-cell	
		Foamed with CO_2 or cyclopentane	
	Outer jacket	Pipe	PE100 (polyethylene)
		Fitting	PUR (polyurethane) or PE100
Dimension	d25 – d315 mm (metric)		
Jointing technology	Solvent cementing, patented inside nipple		
Nominal pressure[2)]	d25 – d225 mm	10 bar, SDR 17.6	
	d250 – d315 mm	6 bar, SDR 26	
Insulation	$\lambda_{20\ °C}$	≤ 0.026 W/mK	
	Density	≥ 55 kg/m³	
	Foam cell size	Max. 0.5 mm	
Thermal expansion coefficient α[3)]	Interior application	0.06 mm/mK	
	Exterior application	0.09 mm/mK	
Temperature	Medium	-50 °C to +40 °C	
Mechanical tensile strength	Axial shear strength[2)]	≥ 0.12 N/mm²	
	Tensile strength	≥ 0.2 N/mm²	
	Compressive strength	≥ 0.3 N/mm²	
Color	Outer jacket	RAL 9004 (black)	
Weight	See chapter 3 "Technical details of COOL-FIT ABS Plus", page 7.		
Oxygen diffusion	< 0.1 g/m³ day		
Environment	Resistance	• Weather-resistant • UV-resistant • Water- and vapor-tight	
	Global warming potential GWP	≤ 0.01	
	Ozone depletion potential ODP	0	

Specification

Standards and guidelines	EN ISO 15493	Plastics piping systems for industrial applications – ABS, UPVC and CPVC – Metric series for specifications for components and the piping system
	ISO 727	Fittings made from UPVC, CPVC or ABS with plain sockets for pipes under pressure
	ISO 7	Pipe threads
	EN ISO 16135 EN ISO 16136 EN ISO 16137 EN ISO 16138	Industrial valves – Ball valves of thermoplastics materials Industrial valves – Butterfly valves of thermoplastics materials Industrial valves – Check valves of thermoplastics materials Industrial valves – Diaphragm valves of thermoplastics materials
	EN ISO 16871	Plastics piping and ducting systems – Plastic pipes and fittings – Method for exposure to direct (natural) weathering

1) All three materials are firmly connected with each other
2) At 20 °C, medium: water
3) The values listed are guide values. The expansion coefficient depends on the temperature change of the medium and the environment and must be calculated based on the application.

2.2 COOL-FIT PE Plus

Specification

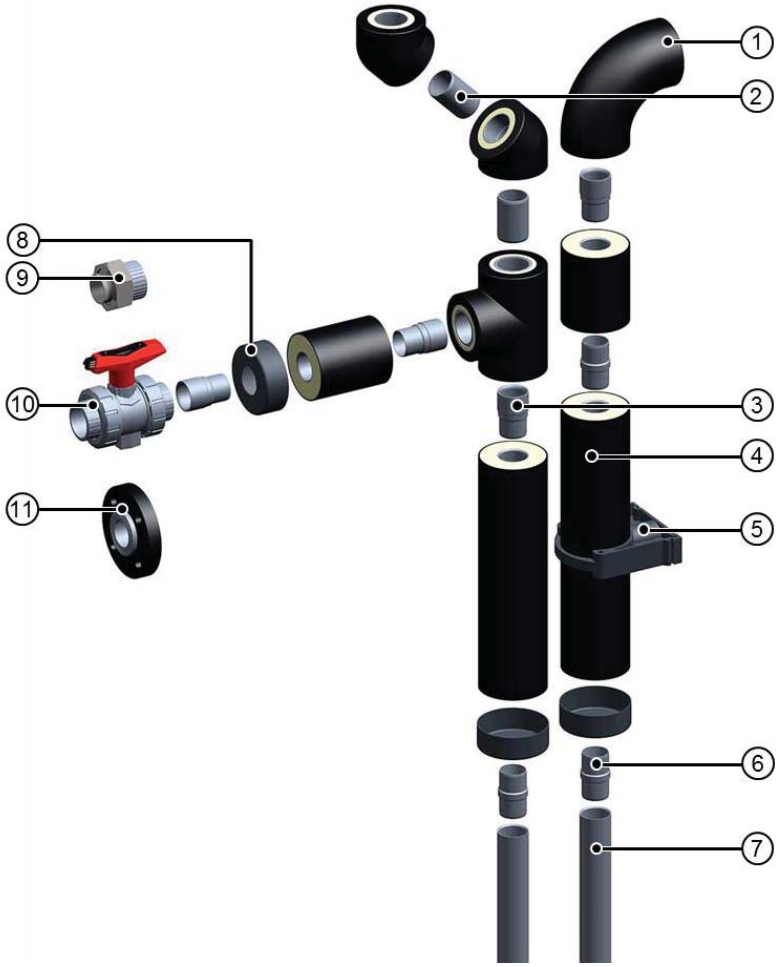
Material[1]	Media pipe	PE-HD100 (polyethylene)
	Insulation	PUR (polyurethane), closed-cell
		Foamed CO_2 or cyclopentane
	Outer jacket	PE-HD 100 (polyethylene) (pipe and fitting)
Dimension	d250 – d415 (metric)	
Jointing technology	Electrofusion (GF ELGEF)	
Nominal pressure[2]	10 bar, SDR 17.6	
Insulation	$\lambda_{20\ °C}$	≤ 0.026 W/mK
	Density	≥ 55 kg/m³
	Foam cell size	Max. 0.5 mm
Temperature	Medium	-35 °C to +55 °C
Thermal expansion coefficient α[3]	Interior application	0.14 mm/mK
	Exterior application	0.18 mm/mK
Mechanical tensile strength	Axial shear strength[2]	≥ 0.12 N/mm²
	Tensile strength	≥ 0.2 N/mm²
	Compressive strength	≥ 0.3 N/mm²
Color	Outer jacket	RAL 9004 (black)

Specification

Weight	See chapter 4 "Technical details of COOL-FIT PE Plus", page 14.	
Oxygen diffusion	< 0.1 g/m^3 day	
Environment	Resistance	• Weather-resistant • UV-resistant • Water- and vapor-tight
	Global warming potential GWP	</= 0.01
	Ozone depletion potential ODP	0
Standards	EN ISO 15494	Plastics piping systems for industrial applications – PB, PE and PP – Metric series for specifications for components and the piping system
	ISO 727	Fittings made from UPVC, CPVC or ABS with plain sockets for pipes under pressure
	EN ISO 16136 EN ISO 16137	Industrial valves – Butterfly valves of thermoplastics materials Industrial valves – Check valves of thermoplastics materials
	EN ISO 16871	Plastics piping and ducting systems – Plastic pipes and fittings – Method for exposure to direct (natural) weathering

1) All three materials are firmly connected with each other.
2) At 20 °C, medium: water
3) The values listed are guide values. The expansion coefficient depends on the temperature change of the medium and the environment and must be calculated based on the application.

3 Technical details of COOL-FIT ABS Plus



No.	Name
1	COOL-FIT ABS Plus fitting pre-insulated
2	COOL-FIT ABS Plus double nipple d-d +10
3	COOL-FIT ABS Plus adaptor nipple d-d_i
4	COOL-FIT ABS Plus pipe pre-insulated
5	Pipe clamp
6	COOL-FIT ABS Plus double nipple d_i-d_i
7	COOL-FIT ABS pipe
8	PE end cap
9	Adapter union
10	COOL-FIT ABS valve
11	Flange connection

No.	Name
1	Shrink tape

3.1 COOL-FIT ABS Plus pipes

COOL-FIT ABS Plus pipes are made of ABS raw material. The insulation made of PUR foam provides excellent insulation properties, protected by a UV and weather-resistant PE outer jacket.

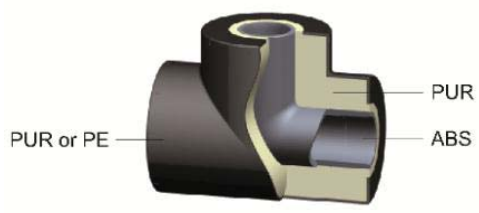
All three materials are firmly connected with each other to ensure good insulation properties and a uniform coefficient of thermal expansion for the system.

Media pipe ABS d x e (mm)	Media pipe ABS d_i (mm)	Outer jacket PE D x e1 (mm)	Open pipe ends (mm)	Weight (ABS, PUR, PE) (kg/m)	Volume (l/m)	Length (m)	Thermal conductivity coefficient (U) (W/m K)
25 x 2.3	20.4	90 x 3.0	-	1.3	0.36	5	0.13
32 x 1.9	28.2	90 x 3.0	-	1.5	0.61	5	0.16
40 x 2.4	35.2	110 x 3.0	-	1.9	0.95	5	0.17
50 x 3.0	44.0	110 x 3.0	-	2.1	1.49	5	0.21
63 x 3.8	55.4	125 x 3.0	-	2.7	2.34	5	0.25
75 x 4.5	66.0	140 x 3.0	-	3.5	3.36	5	0.27
90 x 5.4	79.2	160 x 3.0	-	4.4	4.80	5	0.29
110 x 6.6	96.8	180 x 3.0	-	5.5	7.21	5	0.34
140 x 8.3	123.4	225 x 3.4	-	8.5	11.69	5	0.35
160 x 9.5	141.0	250 x 3.6	-	10.5	15.22	5	0.37
200 x 12.3	175.4	280 x 3.9	-	13.5	24.50	5	0.50
225 x 13.9	197.2	315 x 4.1	-	18.5	30.05	5	0.50
250 x 9.6	230.8	355 x 5.6	150[1)]	14.9	41.84	5	0.49
280 x 10.7	258.6	400 x 4.8	165[1)]	18.7	52.50	5	0.48
315 x 12.1	290.8	450 x 5.2	185[1)]	23.7	66.42	5	0.48

d Nominal outside diameter ABS media pipe
d_i Nominal inner diameter media pipe
D Nominal outside diameter PE outer jacket
e, e1 Nominal wall thickness

[1)] The dimensions d250 – d315 are designed as socket-spigot (with one open end) or as spigot-spigot version (with two open ends):

3.2 COOL-FIT ABS Plus fittings



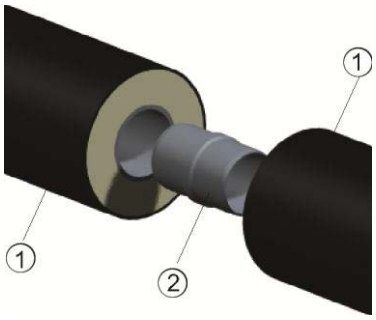
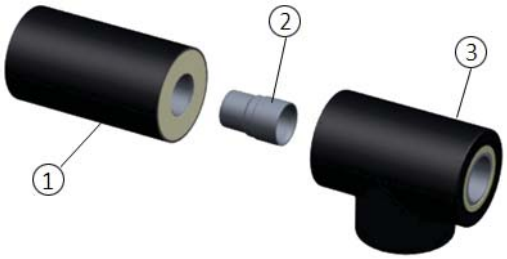
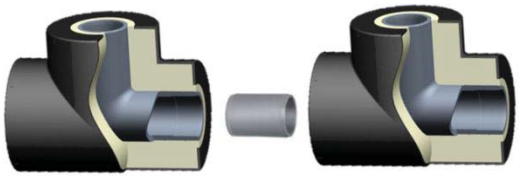
The ABS fittings used in COOL-FIT ABS Plus are made of the same raw material as the pipes. The insulation made of PUR foam is protected by a PUR or PE outer jacket. This makes the fittings fully compatible with COOL-FIT ABS Plus pipes.

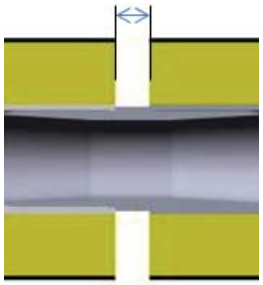
3.3 COOL-FIT ABS Plus connecting elements

3.3.1 COOL-FIT ABS Plus nipple

COOL-FIT ABS Plus components are connected with COOL-FIT ABS Plus nipples.

The following connecting nipples are available:

Connecting nipple		
d_i-d_i		
	• For pipe-to-pipe connections • For pipe-to-installation fitting connections • For some pipe-T90° reduced connections	1 COOL-FIT ABS Plus pipe 2 COOL-FIT ABS Plus double nipple d_i-d_i
d-d_i		
	• For standard pipe-to-fitting connections	1 COOL-FIT ABS Plus pipe 2 COOL-FIT ABS Plus adaptor nipple d-d_i 3 COOL-FIT ABS Plus fitting
d-d		
	• For fitting-to-fitting connections	1 COOL-FIT ABS Plus fitting 2 COOL-FIT ABS Plus nipple d-d



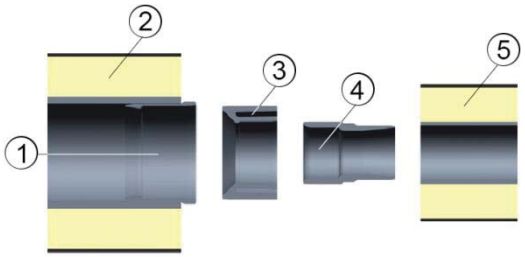
Each of these COOL-FIT ABS Plus connections creates a gap of 10 mm. The gap is used for visual inspection during the pressure test and is closed after a successful pressure test.

Connecting nipple

$d_i - d_{red}$

For reducing the diameter of the media pipe.

Using d_i-d_{red} in combination with di-d_i results in an inspection gap with a width of 20 mm. The combination requires twice as much insulating profile.

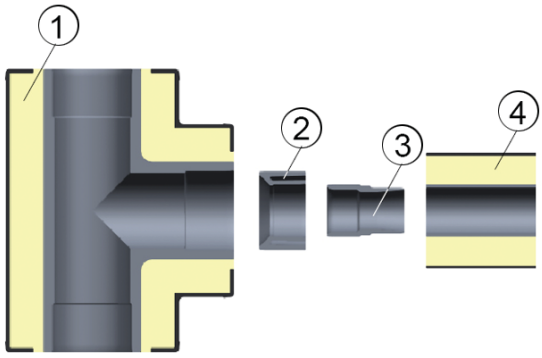


1	COOL-FIT ABS Plus nipple d_i-d_{red}
2	COOL-FIT ABS Plus pipe
3	ABS short reduction
4	COOL-FIT ABS Plus nipple d-d_i
5	COOL-FIT ABS Plus pipe

The connecting material and the method are identical for every version of the connection. The same cement and the same tools are used for application.

3.3.2 Reducing a COOL-FIT ABS Plus fitting to a COOL-FIT ABS Plus pipe

The d-type fittings feature standard ABS-d cement jointing. For this reason, the ABS short reduction can also be used for a reduction in diameter. For the next connection, the COOL-FIT ABS Plus nipple d-d_i for COOL-FIT ABS Plus pipes can be used.



No.	Name
1	COOL-FIT ABS Plus T 90° equal, d75
2	ABS short reduction d75 – d50
3	COOL-FIT ABS Plus nipple d-d_i, d50 – d_i50
4	COOL FIT ABS Plus pipe DN110/d50

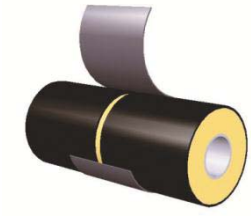
3.4 COOL-FIT ABS Plus accessories

COOL-FIT Plus insulating profile
Insulating profile with a width of 13 mm and a thermal conductivity of 0.04 W/mK is used for insulating the inspection gap. The use of this insulation guarantees almost identical insulating properties for the gap as for the pipe.

COOL-FIT Plus sealing tape
A roll of 40 mm wide butylene rubber-based sealing tape. For water- and vapor-tight sealing of inspection gaps in combination with shrink sleeves or shrink sockets. The sealing tape is affixed to the circumference of the pipe or fitting.

COOL-FIT Plus shrink sleeve, short
Used to water and vapor seal the inspection gap in the outer jacket between pipe and pipe, pipe and fitting, and fitting and fitting connections. The standard design is 100 mm wide and is used to seal components with equal outside diameter. To ensure proper functionality of the system, the shrink sleeve must be used in conjunction with the insulating profile and the butylene-rubber sealing tape. The shrink sleeve is shrunk with an open soft flame or alternatively with a powerful hot-air gun. For a long-lasting high-quality seal, GF Piping Systems recommends the use of shrink sleeves.

COOL-FIT Plus shrink socket
Used to water and vapor seal the inspection gap in the outer jacket. The design is 100 mm wide and can only seal components with equal outside diameter. To ensure proper functionality of the system, the shrink socket must be used in conjunction with the insulating profile and the butylene-rubber sealing tape. This version provides additional mechanical strength with regard to bending forces. It shrinks uniformly, resulting in a good visual appearance. This socket can be shrunk with an open, soft flame. For a long-lasting high-quality seal combined with high mechanical strength and good appearance, GF Piping Systems recommends the use of shrink sockets.



COOL-FIT Plus cold shrink tape
Used to water and vapor seal the inspection gap in the outer jacket. Cold shrink tape is suitable only for interior applications. The cold shrink tape is applied without using heat. It is applied manually with slight pull and approx. 10 cm overlap. The design is 100 mm wide and can only seal components with equal outside diameter. To ensure proper functionality of the system cold shrink tape must be used in conjunction with the insulating profile.

COOL-FIT Plus shrink tape for underground applications
This tape is specifically designed for underground applications. The integrated full-surface butylene rubber guarantees a water- and vapor-tight seal of the outer jacket at the inspection gaps.

COOL-FIT Plus shrink sleeve, long

This sleeve is 200 mm long and can be used only to seal PE and PUR outer jackets at connections with different diameters. It may not be applied to non-insulated ABS pipes. The shrink sleeve is positioned in the center. Functionality is ensured only in combination with the insulating profile and the sealing tape. The sealing tape must be applied to both outer PE jackets. The delivery program shows the differences in dimensions that can be sealed.

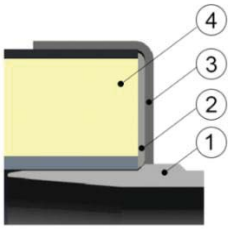
COOL-FIT Plus shrink cap

The shrink cap is to be used only to seal PE and PUR outer jackets at connections with different diameters. It may not be applied to non-insulated ABS pipes. The flame used to shrink the sleeve may damage the non-insulated ABS pipe. Ideal for use with T90° reducers. No separate sealing tape is required, the sealant is integrated into the cap. If the length of the cap is longer than the surface to be sealed, then the cap can be cut back up to the edge of the sealant. The delivery program shows the differences in dimensions that can be sealed.

End cap

End caps are used to cap the pre-insulated system. They seal the PUR insulation and prevent moisture from entering.

Sealing PUR is achieved by using a suitable sealant.



No.	Name
1	COOL-FIT ABS Plus nipple
2	Sealant
3	PE end cap
4	COOL-FIT ABS Plus pipe

Sealant

The silicone-free sealant is used at the end of the pre-insulated system to seal the PUR insulation. It is used to cement the end caps.

Ball valve insulation

GF Piping System offers customized insulation sets for ball valves type 546. The sets consist of UV-resistant PE foam with a shrink tape jacket and are available from d25 up to d110.

3.5 COOL-FIT ABS Plus tools

COOL-FIT ABS PLUS calibration tool

It is necessary to calibrate the inside diameters of pipes with dimension d200 and d225. This tool calibrates the inside diameter of the pipe to an exact dimension to allow nipple cementing at the inside diameter. For further details, see chapter 7.1 "Connection of COOL-FIT ABS Plus d25 to d225", page 30.

Rotary peeler

For COOL-FIT ABS Plus dimensions d250 to d315, a peeling tool must be used to completely remove residual insulation. For further details, see chapter 7.2 "Connection of COOL-FIT ABS Plus d250 to d315", page 36.

Tool for cemented joints

The cementing material for cementing is identical with the tool for standard socket cementing.

For further details about the tool for cemented joints, see chapter 7.1.2 "Required tools and equipment", page 30.

4 Technical details of COOL-FIT PE Plus

4.1 COOL-FIT PE Plus pipes

COOL-FIT PE Plus pipes are made of PE raw material. The insulation made of PUR foam provides excellent insulation properties, protecting pipes with a UV and weather-resistant PE outer jacket.

All three materials are firmly connected with each other to ensure good insulation properties and a uniform coefficient of thermal expansion for the system.

Media pipe PE d x e (mm)	Media pipe d_i (mm)	Outer jacket PE D x e1 (mm)	Open pipe ends (mm)	Weight PE/PUR/PE (kg/m)	Volume (l/m)	Standard length (m)	Thermal conductivity coefficient (u) (W/mK)
250 x 14.8	220.4	355 x 5.1	123	18.18	38.13	5.9	0.49
280 x 16.6	246.8	400 x 6.3	126	22.63	47.81	5.9	0.48
315 x 18.7	277.6	450 x 6.4	133	28.41	60.49	5.9	0.48
355 x 21.1	312.8	500 x 7.4	145	35.36	76.81	5.9	0.49
400 x 23.7	352.6	560 x 8.4	147	44.06	97.60	5.9	0.50
450 x 26.7	396.6	630 x 7.6	163	55.50	123.47	5.9	0.50

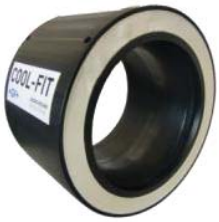
d Nominal outside diameter PE media pipe
d_i Nominal inner diameter media pipe
D Nominal outside diameter PE outer jacket
e, e1 Nominal wall thickness

4.2 COOL-FIT PE Plus fittings

COOL-FIT PE Plus fittings are fully compatible with COOL-FIT PE Plus pipes. This applies to insulation properties and open spigots, as well as to jointing technology.

4.3 COOL-FIT PE Plus connecting elements

COOL-FIT PE Plus pipes and fittings are delivered with a non-insulated spigot at each end. These open ends are used for connecting the individual products with a COOL-FIT PE Plus electrofusion socket.



COOL-FIT PE Plus electrofusion socket

COOL-FIT PE Plus electrofusion sockets connect the pre-insulated products with each other. The electrofusion sockets are equipped with internal resistance wires to which electric current is applied during the fusion process. This process heats the inside of the fitting and the outside of the pipe to fusion temperature and melts it.

4.4 COOL-FIT PE Plus accessories

COOL-FIT Plus sealing tape

A roll of 40 mm wide butylene rubber-based sealing tape. For a water- and vapor-tight connection of inspection gaps with shrink sockets. The sealing tape is affixed to the circumference of the pipe or fitting.

COOL-FIT Plus shrink socket

The shrink socket is used to water and vapor seal the inspection gap on the outer jacket and can seal only components with the same outside diameter. Functionality is ensured only in combination with the butylene-rubber sealing tape. This version provides additional mechanical strength with regard to bending forces. The socket shrinks uniformly, resulting in a good visual appearance. It can be shrunk with an open, soft flame.

COOL-FIT Plus shrink cap

The shrink cap is to be used only to seal PE outer jackets at connections with different diameters. It may not be applied to non-insulated PE pipes. Ideal for use with T90° reducers. No separate sealing tape is required, the sealant is integrated into the cap. If the length of the cap is longer than the surface to be sealed, the cap can be cut back up to the edge of the sealant. The delivery program shows the differences in dimensions that can be sealed.

End cap

End caps are used to cap the pre-insulated system. They seal the PUR insulation and prevent moisture from entering. Sealing PUR is achieved by using a suitable sealant.

Sealant

The silicone-free sealant is used at the end of the pre-insulated system to seal the PUR insulation. It is used to cement the end caps.

4.5 COOL-FIT PE Plus tools

Electrofusion machines

Electrofusion machines are required for connecting the COOL-FIT PE Plus components. The assortment includes monovalent and polyvalent fusion machines that are reliable and easy to operate.

Fusion adaptor

Fusion adaptors serve as an extension of the fusion plugs of electrofusion machines. Compared to standard adaptors, the longer adaptor length matches the insulation of the COOL-FIT PE Plus electrofusion sockets.

Rotary peelers

Rotary peelers are used to prepare the COOL-FIT PE Plus pipes for electrofusion. The chip-removing process in the fusion zone removes the existing oxide layer.

Peeler	Dimension	Code No.
RTC 315	d250 – d315 mm	799.150.423
RTC 710	d355 – d450 mm	799.300.757

5 COOL-FIT online calculation tool

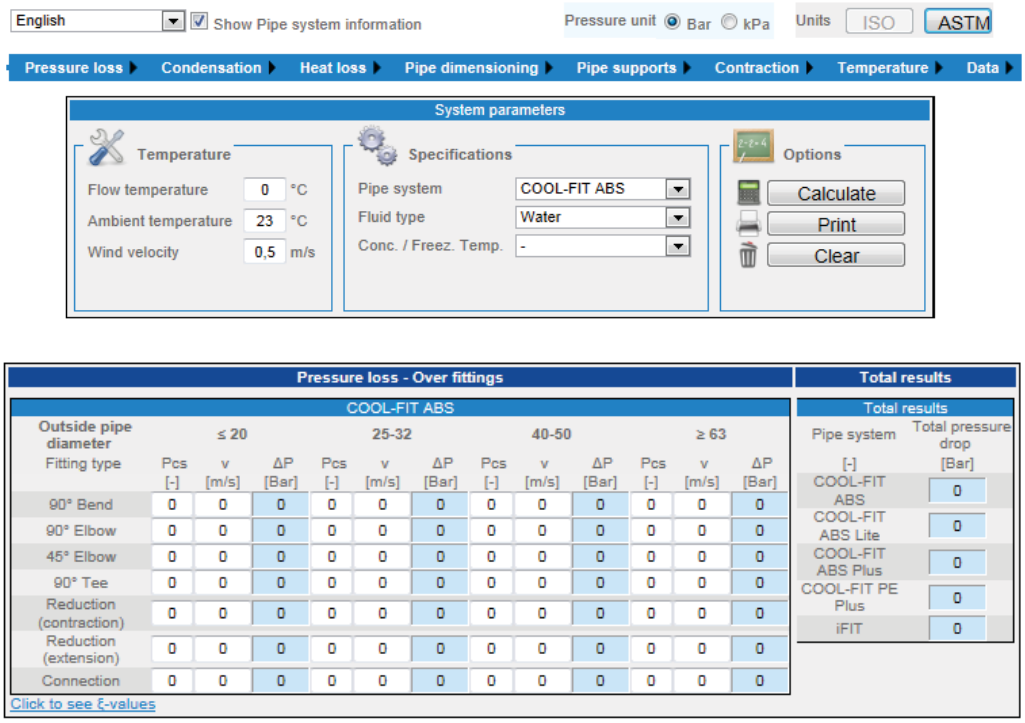
The cooling calculation tool by GF Piping Systems provides support for the dimensioning and sizing of cooling systems.

The online tool includes the following calculation functions:

- Expansion, contraction
- Flexible section design
- Energy savings
- Pipe exterior temperature
- Pipe dimensioning
- Pressure loss
- Condensation point/insulation thickness
- Pipe bracket spacing

The most common coolants are already stored in the calculation tool. It calculates all system components, such as pipes, fittings and valves. Its menu-based navigation is available in nine languages and allows for efficient and optimized dimensioning of a system.

The "Comparison" function allows for comparing a COOL-FIT system to a steel, stainless steel or copper system.



The online calculation tool for the support of dimensioning and calculation is available at www.gfps.com/tools

6 Dimensioning, hydraulic calculation and installation

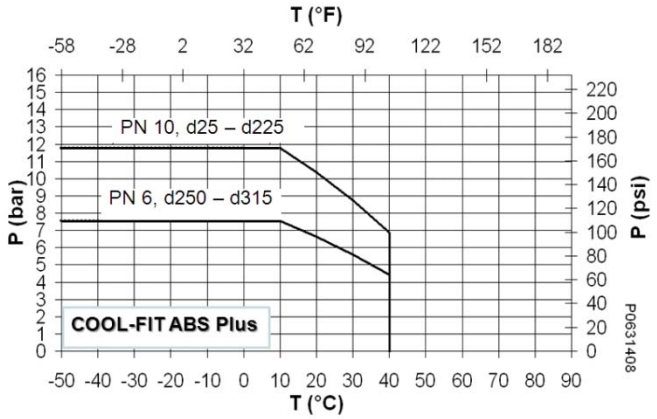
The following section describes only the COOL-FIT-specific planning fundamentals. For generally applicable information and details, see Planning Fundamentals, chapter 9, "Design of metric piping systems".

6.1 COOL-FIT ABS Plus pressure-temperature diagram

Pressure ratings for thermoplastic pipes are always quoted for water at +20 °C. Ensure that the working pressure is reduced at higher temperatures. The diagram shows the maximum permissible pressures at various temperatures up to the maximum allowable working temperature of +40 °C for COOL-FIT ABS Plus pipes and fittings. A safety factor of 1.8 has been included in all calculations with a minimum service life of 25 years.

6.1.1 Pressure/temperature limits for COOL-FIT ABS Plus pipes and fittings

Medium: Water



P Permissible pressure (bar, psi)
T Temperature (°C, °F)

6.1.2 Chemical resistance

COOL-FIT ABS Plus is resistant to most diluted inorganic acids, bases and salts, and to most animal oils and fats. It is not resistant to organic solvents, pure alcohol, gasoline, acetic acid and vegetable oils. In addition, COOL-FIT ABS Plus is not suitable for primary refrigerants, such as ammonia, propane, R407 or R22.

For working temperatures below 0 °C, antifreeze has to be added to the water to prevent it from freezing. For some refrigerants, a reduction factor is required depending on the type and mixing ratio. By contrast to the pressure-temperature curve that applies only when the medium is water, the permissible operating pressure must be lowered.

Reduction factors

Inorganic salt solutions	F = 1
Organic salt solutions	F = 1.25
Glycol solutions (max. 50 %)	F = 1.7

The following formula is used for the calculation:

$$P_{DF} = \frac{P_W}{DF}$$

P_{DF} Permissible pressure with reduction factor
P_W Permissible pressure for water as medium
DF Reduction factor

6.1.3 Ice slurry

Ice slurry is a mixture of ice particles, water and an antifreeze agent – usually alcohol, salt or glycol. GF Piping Systems has extensively tested ice slurry with COOL-FIT and can provide recommendations for pipeline layout and loss of pressure.

6.1.4 Glycol solutions

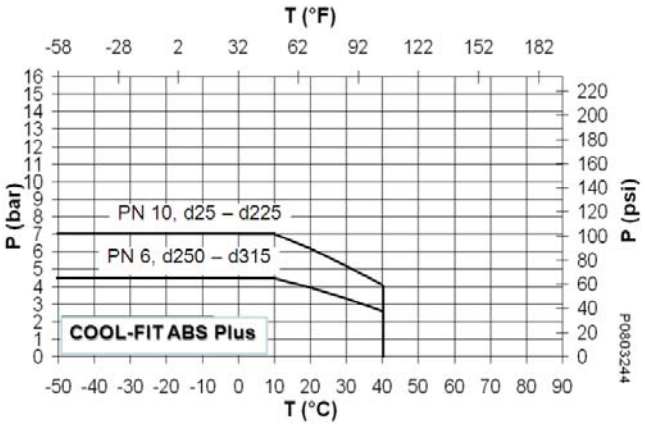
COOL-FIT ABS Plus can be used with glycol solutions up to a maximum concentration of 50 %. The following antifreeze agents can be used with the COOL-FIT ABS Plus system in terms of chemical resistance: ANTIFROGEN L, N, TYFOCOR, DOWFROST.

Example – Glycol dissolved in water
If the medium is a water-diluted glycol ≤ 50 %, the reduction factor for the pressure-temperature diagram = 1.7. Hence, at -10 °C and a minimum service life of 25 years, the permissible operating pressure is reduced as follows:

$$P_{DF} = \frac{11.8\ \text{bar}}{1.7} = 6.94\ \text{bar}$$

6.1.5 Pressure/temperature limits for COOL-FIT ABS Plus pipes and fittings

Medium: Water-glycol mixture, 50 %



P Permissible pressure (bar, psi)
T Temperature (°C, °F)

6.1.6 Organic salt solutions

These media are usually potassium formate or potassium acetate: water-based solutions with low viscosities at low temperatures. Trade name examples: HYCOOL, TEMPER, TYFOXIT, ANTIFROGEN KF, FREEZIUM, ZITREC. ABS can be used with these types of media. The manufacturer's instructions for the medium must be followed.

For more detailed information about resistance and reduction factors, see Planning Fundamentals, chapter 8, "Material selection – Chemical resistance".

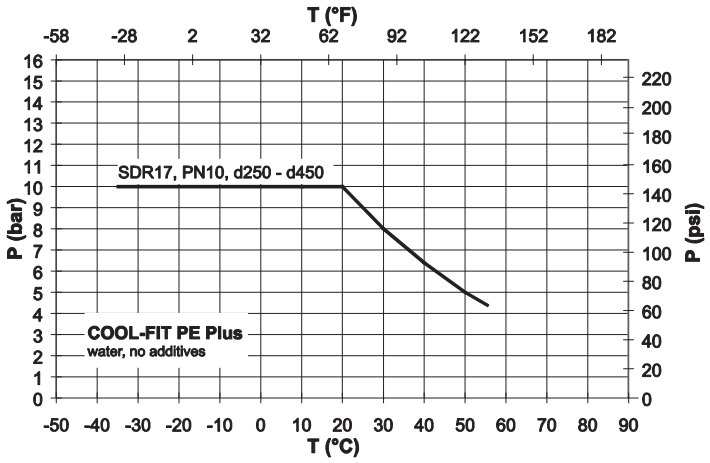
6.2 COOL-FIT PE Plus pressure-temperature diagram

Pressure ratings for thermoplastic pipes are always quoted for water at +20 °C. Ensure that the working pressure is reduced at higher temperatures.

The diagram shows the maximum permissible pressures at various temperatures up to the maximum allowable working temperature of +55 °C for COOL-FIT PE Plus pipes and fittings. The table is based on an ambient temperature of 20 °C. A safety factor of 1.4 has been included in all calculations with a minimum service life of 25 years.

6.2.1 Pressure-temperature limits for COOL-FIT PE Plus pipes and fittings

Medium: Water



P Permissible pressure (bar, psi)
T Temperature (°C, °F)

6.2.2 Chemical resistance with refrigerants

For working temperatures below 0 °C, antifreeze has to be added to the water to prevent it from freezing.

For some refrigerants, a reduction factor is required depending on the type and mixing ratio. By contrast to the pressure-temperature curve that applies only when the medium is water, the permissible operating pressure must be lowered.

Reduction factors

Inorganic salt solutions	F = 1
Organic salt solutions	F = 1
Glycol solutions (max. 50 %)	F = 1.1

The following formula is used for the calculation:

$$P_{DF} = \frac{P_W}{DF}$$

P_{DF} Permissible pressure with reduction factor
P_W Permissible pressure for water as medium
DF Reduction factor

6.2.3 Ice slurry

Ice slurry is a mixture of ice particles, water and an antifreeze agent – usually alcohol, salt or glycol.

6.2.4 Glycol solutions

COOL-FIT PE Plus can be used with glycol solutions up to a maximum concentration of 50 %. The following antifreeze agents can be used with the COOL-FIT PE Plus system in terms of chemical resistance: ANTIFROGEN L, N, TYFOCOR, DOWFROST.

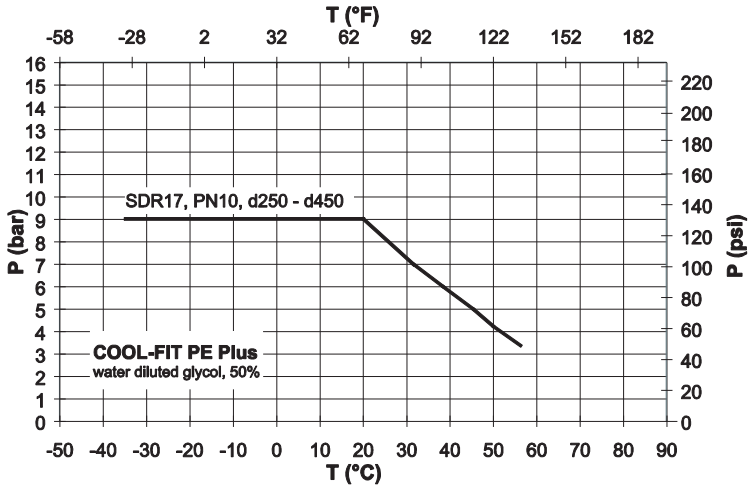
Example – Glycol dissolved in water

If the medium is a water-diluted glycol ≤ 50 %, the reduction factor for the pressure-temperature diagram = 1.1. Hence, at -10 °C and a minimum service life of 25 years, the permissible operating pressure is reduced as follows:

$$P_{DF} = \frac{10\ \text{bar}}{1.1} = 9\ \text{bar}$$

6.2.5 Pressure-temperature limits for COOL-FIT PE Plus pipes and fittings

Medium: water-glycol mixture, 50 %



P Permissible pressure (bar, psi)
T Temperature (°C, °F)

6.2.6 Organic salt solutions

These media are usually potassium formate or potassium acetate: water-based solutions with low viscosities at low temperatures. Trade name examples: HYCOOL, TEMPER, TYFOXIT, ANTIFROGEN KF, FREEZIUM, ZITREC. ABS can be used with these types of media. The manufacturer's instructions for the medium must be followed.

For more detailed information about resistance and reduction factors, see Planning Fundamentals, chapter 8, "Material selection – Chemical resistance".

6.3 UV resistance and fire behavior

6.3.1 UV resistance

The PE used by GF Piping Systems for the outer jacket of COOL-FIT ABS Plus and COOL-FIT PE Plus is UV resistant and, for this reason, safe for exterior installations.

6.3.2 ABS fire behavior

According to UL94, ABS has an HB (Horizontal Burning) flammability coefficient for building material class B2 (normally inflammable, non-dripping) according to DIN 4102-1. When ABS burns, carbon dioxide, carbon monoxide and water are primarily formed. Tests have shown that the relative toxicity of the products to be burned is similar or even lower than that of natural products, such as wood, wool and cotton. ABS combustion gases are not corrosive. Soot and smoke develop during burning. Suitable firefighting agents are water, foam and carbon dioxide.

6.3.3 PE fire behavior

Polyethylene is a flammable plastic. The oxygen index is 17 %. PE drips and continues to burn without soot after the flame is removed. When PE burns, carbon dioxide, carbon monoxide and water are primarily formed.

The following classifications are used according to different combustion standards: According to UL-94, PE is classified as HB (Horizontal Burning) and according to DIN 53438-1 as K2. According to DIN 4102-1 and EN 13501-1, PE is listed as B2 (normally flammable). In the French classification of building materials, polyethylene corresponds to M3 (of average flammability). The self-ignition temperature is 350 °C. Water, foam and carbon dioxide or powder are suitable fire-fighting agents.

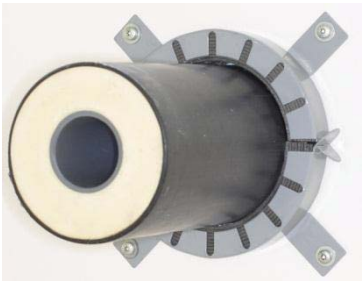
6.3.4 PUR fire behavior

Rigid polyurethane-based foams are effective insulation materials commonly used in the construction industry. Polyurethane foam will burn if exposed to flames. The combustibility characteristics vary with its chemical composition. Unlike expanded polystyrene (eps), polyurethane does not melt. It ignites between 800 °C and 850 °C, and chars. The charring may help protect adjacent foam.

6.3.5 Fire load

Dimension (mm)	Weight of support pipe (kg/m)	Fire load of support pipe (kWh/m)	Weight of PUR foam (kg/m)	Fire load of PUR foam (kWh/m)	Weight of outer pipe (kg/m)	Fire load of outer pipe (kWh/m)	Fire load COOL-FIT PE Plus (kWh/m)
250/355	11.1	135.42	2.47	16.55	4.61	56.19	208.16
280/400	13.9	169.58	3.20	21.41	5.54	67.58	258.57
315/450	17.6	214.72	4.06	27.20	6.75	82.40	324.32
355/500	22.4	273.28	4.87	32.66	8.08	98.64	404.58
400/560	28.3	345.26	6.06	40.59	9.71	118.42	504.27
450/630	35.8	436.76	7.68	51.47	12.01	146.58	634.82

6.3.6 Fire-resistant sealing



To seal a combustible pipe penetrating a fire wall, it is necessary to use locally approved sealing systems to preserve the integrity of the fire wall. There are various international and local companies offering solutions for combustible pipes (e.g. plastic pipes). The fire protection system ROKU® R – pipe sealing type AWM II has the European technical approval ETA-11/2008. Test data is available from Rolf Kuhn GmbH; that data can be used and evaluated by local testing authorities to show fitness for use.

For more product information, see www.kuhnbrandschutz.com
KUHN Brandschutz System Solutions for Building Technology.

6.4 Determining the change in length of COOL-FIT ABS Plus

The change in length caused by temperature can be calculated using the following formula:

$$\Delta L = L \bullet \alpha \bullet \Delta T$$

ΔL Temperature-related change in length (mm)
L Length of the pipe section (m)
α Linear coefficient of thermal expansion (mm/mK)
ΔT Difference in temperature (K)

The following temperatures must be known to calculate the change in length ΔL of the COOL-FIT ABS Plus pipe:

- Installation temperature
- Minimum medium temperature
- Maximum medium temperature
- Minimum ambient temperature
- Maximum ambient temperature

For general information about changes in length and flexible sections, see Planning Fundamentals, chapter 11, "Installation".

The following tables contain guide values. The online tool at www.cool-fit.georgfischer.com can be used to determine the exact change in length.

Change in length ΔL for exterior applications

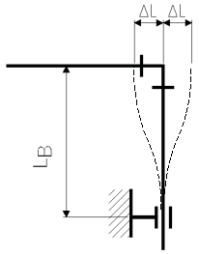
α = 0.09 mm/mK	L = 25 m	L = 50 m	L = 100 m	L = 150 m	L = 200 m
ΔT (K)	**ΔL (mm)**	**ΔL (mm)**	**ΔL (mm)**	**ΔL (mm)**	**ΔL (mm)**
5	11	23	45	68	90
10	23	45	90	135	180
15	34	68	135	203	270
20	45	90	180	270	360
25	56	113	225	338	450
30	68	135	270	405	540
35	79	158	315	473	630
40	90	180	360	540	720
45	101	203	405	608	810
50	113	225	450	675	900

ΔL Change in length for interior applications

α = 0.06 mm/mK	L = 25 m	L = 50 m	L = 100 m	L = 150 m	L = 200 m
ΔT (K)	ΔL (mm)	ΔL (mm)	ΔL (mm)	ΔL (mm)	ΔL (mm)
5	8	15	30	45	60
10	15	30	60	90	120
15	23	45	90	135	180
20	30	60	120	180	240
25	38	75	150	225	300
30	45	90	180	270	360
35	53	105	210	315	420
40	60	120	240	360	480
45	68	135	270	405	540
50	75	150	300	450	600

6.5 Flexible sections for COOL-FIT ABS Plus

The values for L_F (mm) for a given ΔL (mm) and the corresponding pipe dimension are available in the following table:



Flexible sections L_B

Dimension (mm)	ΔL 10 mm	ΔL 20 mm	ΔL 30 mm	ΔL 40 mm	ΔL 50 mm
	L_F (mm)	L_F (mm)	L_F (mm)	L_F (mm)	L_F (mm)
d25/D90	800	1,100	1,350	1,550	1,750
d32/D90	800	1,100	1,350	1,550	1,750
d40/D110	850	1,200	1,500	1,700	1,950
d50/D110	850	1,200	1,500	1,700	1,950
d63/D125	900	1,300	1,600	1,850	2,050
d75/D140	850	1,400	1,700	1,950	2,200
d90/D160	1,050	1,450	1,800	2,100	2,350
d110/D180	1,100	1,550	1,900	2,200	2,450
d140/D225	1,250	1,750	2,150	2,450	2,750
d160/D250	1,300	1,850	2,250	2,600	2,900
d200/D280	1,450	2,050	2,550	2,900	3,250
d222/D315	1,550	2,200	2,700	3,100	3,450
d250/D355	1,650	2,300	2,850	3,250	3,650
d280/D400	1,750	2,450	3,000	3,450	3,850
d315/D450	1,850	2,600	3,200	3,650	4,100

Dimension (mm)	ΔL 60 mm	ΔL 70 mm	ΔL 80 mm	ΔL 90 mm
	L_F (mm)	L_F (mm)	L_F (mm)	L_F (mm)
d25/D90	1,900	2,050	2,200	2,340
d32/D90	1,900	2,050	2,050	2,340
d40/D110	2,100	2,300	2,300	2,450
d50/D110	2,100	2,300	2,300	2,450
d63/D125	2,250	2,450	2,450	2,600
d75/D140	2,400	2,500	2,500	2,752
d90/D160	2,550	2,750	2,750	2,950
d110D/180	2,700	2,900	2,900	3,100
d140/D225	3,000	3,250	3,250	3,500
d160/D250	3,200	3,450	3,450	3,700
d200/D280	3,600	3,850	3,850	4,150
d222/D315	3,800	4,100	4,100	4,400
d250/D355	4,000	4,300	4,300	4,600
d280/D400	4,250	4,600	4,600	4,900
d315/D450	4,500	4,850	4,850	5,200

Dimension (mm)	ΔL 100 mm	ΔL 150 mm	ΔL 200 mm	ΔL 300 mm
	L_B (mm)	L_B (mm)	L_B (mm)	L_B (mm)
d25/D90	2,450	3,000	3,500	4,250
d32/D90	2,450	3,000	3,500	4,250
d40/D110	2,750	3,350	3,850	4,700
d50/D110	2,750	3,350	3,850	4,700
d63/D125	2,900	3,550	4,100	5,050
d75/D140	3,100	3,750	4,350	5,350
d90/D160	3,300	4,050	4,650	5,700
d110D180	3,500	4,250	4,950	6,050
d140/D225	3,900	4,800	5,500	6,750
d160/D250	4,150	5,050	5,850	7,150
d200/D280	4,600	5,650	6,550	8,000
d222/D315	4,900	6,000	6,950	8,500
d250/D355	5,150	6,350	7,300	8,950
d280/D400	5,450	670	7,750	9,500
d315/D450	5,800	7,100	8,200	10,050

6.6 Determining the change in length of COOL-FIT PE Plus

The change in length caused by temperature can be calculated using the following formula:

$$\Delta L = L \bullet \alpha \bullet \Delta T$$

ΔL Temperature-related change in length (mm)
L Length of the pipe section (m)
α Linear coefficient of thermal expansion (mm/mK)
ΔT Difference in temperature (K)

The following temperatures must be known to calculate the change in length ΔL (mm) of the COOL-FIT PE Plus pipe:

- Installation temperature
- Minimum medium temperature
- Maximum medium temperature
- Minimum ambient temperature
- Maximum ambient temperature

For general information about changes in length and flexible sections, see Planning Fundamentals, chapter 11, "Installation".

The following tables contain guide values. The online tool at www.cool-fit.georgfischer.com can be used to determine the exact change in length.

Information for exterior applications

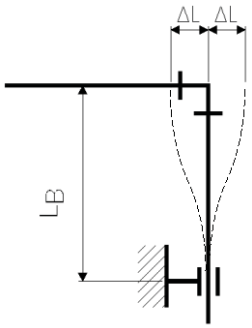
α = 0.18 mm/mK	L = 25 m	L = 50 m	L = 100 m	L = 150 m	L = 200 m
ΔT (K)	**ΔL (mm)**	**ΔL (mm)**	**ΔL (mm)**	**ΔL (mm)**	**ΔL (mm)**
5	25	45	90	135	180
10	45	90	180	270	360
15	70	135	270	405	540
20	90	180	360	540	720
25	115	225	450	675	900
30	135	270	540	810	1,080
35	160	315	630	945	1,260
40	180	360	720	1,080	1,440
45	205	405	810	1,215	1,620
50	225	450	900	1,350	1,800

Information for interior applications

α = 0.14 mm/mK	L = 25 m	L = 50 m	L = 100 m	L = 150 m	L = 200 m
ΔT (K)	ΔL (mm)	ΔL (mm)	ΔL (mm)	ΔL (mm)	ΔL (mm)
5	18	35	70	105	140
10	35	70	140	210	280
15	55	105	210	315	420
20	70	140	280	420	560
25	90	175	350	525	700
30	105	210	420	630	840
35	125	245	490	735	980
40	140	280	560	840	1,120
45	160	315	630	945	1,260
50	175	350	700	1,050	1,400

6.7 Flexible sections for COOL-FIT PE Plus

The values for L_F (mm) for a given ΔL (mm) and the corresponding pipe dimension are available in the following table:



Flexible sections L_B

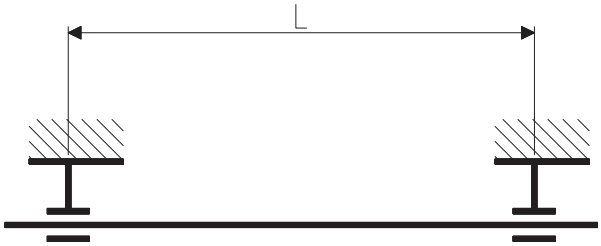
Dimension (mm)	ΔL 10 mm	ΔL 20 mm	ΔL 30 mm	ΔL 40 mm	ΔL 50 mm
	L_B (mm)	L_B (mm)	L_B (mm)	L_B (mm)	L_B (mm)
d250/D355	1,550	2,200	2,700	3,100	3,450
d280/D400	1,650	2,350	2,850	3,300	3,600
d315/D450	1,750	2,450	3,000	3,500	3,900
d355/D500	1,850	2,600	3,150	3,650	4,000
d400/D560	1,950	2,750	3,400	3,900	4,350
d450/D630	2,050	2,900	3,550	4,150	4,600

6.8 Pipe bracket spacing and support of pipelines

6.8.1 Overview

Install COOL-FIT Plus pipelines using suitable pipe supports. In the process, the pipes must not be under too much stress. The pipe bracket spacing of COOL-FIT Plus pipes is always consistent independent of pressure and temperature.

For general information about pipe bracket spacing, see Planning Fundamentals, chapter 11, "Installation".



The pipe bracket spacing of COOL-FIT ABS Plus and COOL-FIT PE Plus is available in the following table for each dimension:

Pipe bracket spacing L for COOL-FIT ABS Plus

d (mm)/ D (mm)	25/ 90	32/ 90	40/ 110	50/ 110	63/ 125	75/ 140	90/ 160	110/ 180	140/ 225	160/ 250	200/ 280	225/ 315	250/ 355	280/ 400	315/ 450
L (mm)	1,550	1,500	1,650	1,650	1,750	1,900	2,050	2,200	2,550	2,750	3,050	3,300	3,300	3,600	3,800

Pipe bracket spacing L for COOL-FIT PE Plus

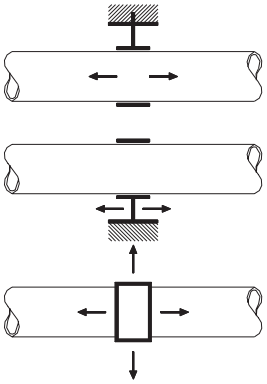
d (mm)/ D (mm)	250/ 355	280/ 400	315/ 450	355/ 500	400/ 560	450/ 630
L (mm)	3,300	3,500	3,700	3,900	4,100	4,300

Thanks to the excellent insulation properties of the COOL-FIT Plus pipes and the hard outer jacket, it is possible to use standard pipe brackets. Special insulation pipe brackets or refrigeration clamps are not required.

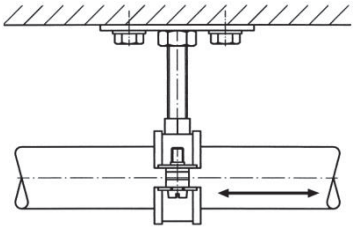
6.8.2 Arranging Loose Brackets

What is a loose bracket?

A loose bracket is a pipe bracket that allows axial movement of the pipe. This permits stress-free compensation of changes in length due to temperature changes or other changes in operating conditions.



When installed, the inner diameter of the bracket must be larger than the pipe outer diameter to allow for a change in pipe length at specified locations. The inner edges of the brackets must be constructed in such a way that the pipe surface cannot be damaged.



Another method is to use brackets with spacers in the screws which also avoids clamping the bracket on the pipe. The axial movement of the piping may not be hindered by fittings arranged next to the pipe bracket or other diameter changes. Sliding brackets and hanging brackets permit the pipe to move in several directions. Attaching a sliding block to the base of the pipe bracket permits free movement of the pipe along a flat supporting surface. Sliding or hanging brackets are needed in situations where the pipeline changes direction and free movement of the pipe must be allowed.

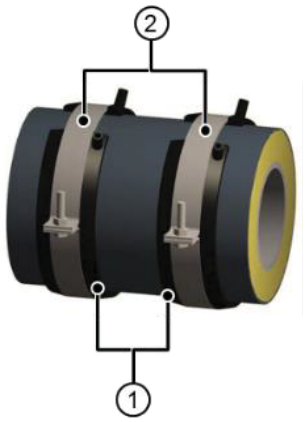
6.9 COOL-FIT Plus fixed point

Fixed points for COOL-FIT ABS Plus and COOL-FIT PE Plus are established with the special COOL-FIT Plus fixed points. The product consists of fusion bands and pipe brackets. Electrofusion bands as permanent joints transmit the forces that occur in the pipe to the fixed point. The supplied pipe brackets serve to build up the fusion pressure during installation of the fusion bands and provide stability during operation. For fusion, use an MSA 2.x, MSA 4.x or commercially available 220-V electrofusion unit. If you use an MSA electrofusion unit by GF Piping Systems, use the adaptor with code No. 799.350.339. Please take note of the maximum allowed forces in the table below.

Outside diameter (mm)	D90	D110	D125	D140	D160	D180	D225	D250	D280	D315	D355
Maximum force F (kN)	1.5	2.0	3.5	5.5	9.0	10.0	10.0	10.0	10.0	10.0	10.0

COOL-FIT Plus fixed points must be calculated based on the application. Fixed point brackets and cross braces are not included in the scope of delivery.

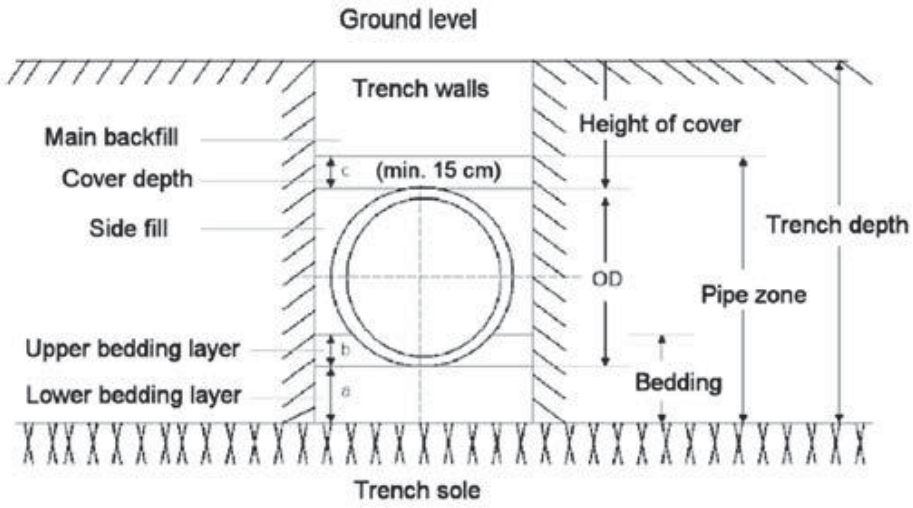
Scope of delivery



No.	Name
1	Electrofusion band
2	Pipe brackets for building up the fusion pressure

6.10 COOL-FIT Plus underground installation

COOL-FIT Plus can be used underground. The corresponding national installation guidelines apply to building the pipe trenches and installing the pipes. In general, trenches should not be less than 1 meter deep, deeper if there is a risk of frost. The sand bed must be built in such a way that the pipe is evenly supported. The pipes must be laid in a sand bed and protected against sharp stones and debris. The sand must be well compacted.



The pipe zone has to be designed according to planning fundamentals and static calculations. The area between trench sole and side fill is referred to as bedding. A load-carrying bedding must be created by using soil replacement. For regular soil conditions, EN 1610 specifies a minimum thickness of a = 150 mm for the lower bedding. In addition to the minimum thickness, corresponding requirements are also imposed on the building materials that must be used for the bedding.

No building materials with components exceeding the following ranges may be used:

- 22 mm for DN ≤ 200
- 40 mm for DN > 200

The upper bedding layer b is derived from static calculations. It is also important to ensure that no cavities are created below the pipe. The bedding dissipates all loads from the pipe securely and evenly into the ground. For this reason, the COOL-FIT Plus pipe has to rest solidly on the bedding across its entire length. The upper end of the pipe zone is defined according to EN 1610 as 150 mm above the pipe apex or 100 mm above the pipe connection. Ensure that the pipe is not damaged when the cover and main backfill are filled and compacted.

Closing the inspection gap requires the use of underground shrink tapes with integrated butylene rubber (738011 108). COOL-FIT Plus pipes have a higher degree of stiffness and a higher weight than non-insulated pipes. For this reason, the pipes should always be connected in the trench. Unnecessary stress on the COOL-FIT ABS Plus connecting elements is thus avoided. Under normal circumstances, it is not necessary to install expansion loops in the system.

A movement of the pipe before filling the pipe trench should be avoided. Please contact GF Piping Systems concerning recommendations for underground installations.

7 Connection

General notes for performing ABS-Tangit cementing, see Planning Fundamentals, chapter 12, "Jointing technology".

7.1 Connection of COOL-FIT ABS Plus d25 to d225

7.1.1 Overview

The following instructions provide only an overview of permforming solvent cementing of COOL-FIT ABS Plus. For additional information about the detailed installation, see www.gfps.com

7.1.2 Required tools and equipment

No.	Description		Dimensions
1	Hand saw		Commercially available
2	Deburring device		Commercially available
3	Can lid		–
4	Tangit cement	ABS	0.65 kg can
5	Screwdriver or wooden spatula		Commercially available
6	Round brush ø 4 mm Round brush ø 8 mm Flat brush 1″, 25 x 3 mm Flat brush 2″, 50 x 5 mm Flat brush 3″, 75 x 6 mm		Fitting 6 – 10 mm Fitting 12 – 32 mm Fitting 40 – 63 mm Fitting 75 – 225 mm Fitting 250 – 400 mm
7	Tangit UPVC, CPVC, ABS cleaner		1 liter can
8	Marking pen		–
9	White, absorbent, lint-free paper		Commercially available

No.	Description	Dimensions
10	Folding rule	Commercially available
11	Solvent-resistant safety gloves	Commercially available
12	Protective glasses	Commercially available
	Propane gas and burner	Commercially available

7.1.3 Cementing

The jointing technique for COOL-FIT ABS Plus internal jointing follows the same tried and tested technique as that for standard COOL-FIT ABS using exactly the same tools and Tangit ABS cement.

Below is a detailed description of the special characteristics of COOL-FIT ABS solvent cement jointing. Please refer to the standard ABS solvent cementing jointing instructions for exact curing times, instructions for handling and procedure, and health and safety advice.

Push the required shrink sleeve onto the pipe before jointing. After closing the joints, this may no longer be possible.

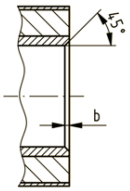
Cementing COOL-FIT ABS Plus below d200 mm

1. Cutting the pipe to length

Cut the pipe at a right angle with a saw.

2. Chamfering the pipe

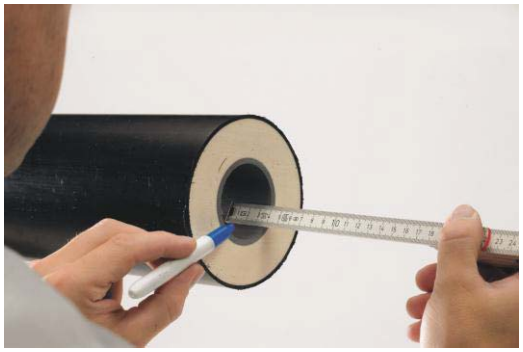
Chamfer the inside diameter of the pipe to ≈ 45° using a width according to the following table:



Pipe diameter d (mm)	Chamfer width d (mm)
25 – 50	1
63 – 90	2
≥ 110	3

3. Cleaning pipe and nipple

Clean the external surface of the nipple and the inside surface of the pipe with Tangit UPVC/CPVC/ABS cleaner and lint-free paper.



4. Marking the insertion depth

In the inner diameter of the pipe, mark the cementing length by using a folding rule and marking pen.

Calculating the insertion depth:

$$t = \frac{d}{2} + 6$$

t Insertion depth (mm)
d Pipe diameter (mm)

5. Applying the cement to pipe and fitting

Apply a closed layer of ABS cement in axial direction onto the inside of the pipe.

Apply the cement using firm brush pressure so that it is worked into the pipe.

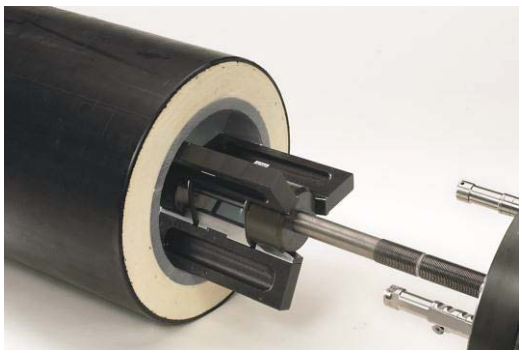
Apply ABS cement of approx. 1 mm thick onto the cementing surface of the nipple.

Insert the nipple into the pipe in axial direction and ensure that the pieces are not twisted or misaligned.

Cementing COOL-FIT ABS Plus above d200 mm

1. Chamfering the pipe

Chamfer the inside edge of the pipe according to the table in the section
"Cementing COOL-FIT ABS Plus below d200 mm", step 2. anfasen.

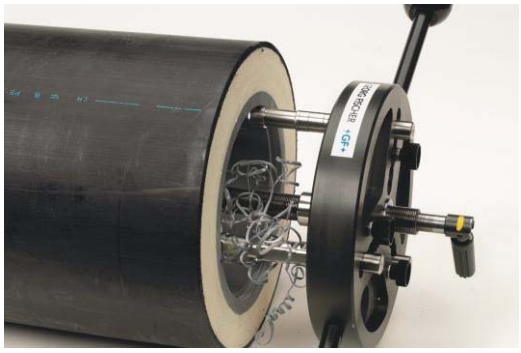


2. Calibrating the pipe

For diameters d200 and d225, the inside diameter of the pipe needs to be calibrated using the COOLFIT ABS Plus calibration tool.

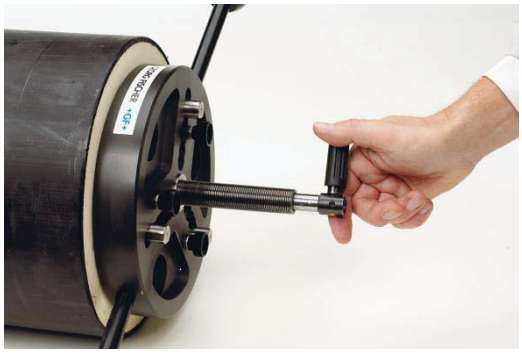
Insert the tool into the pipe to the depth indicated on the thread. For short lengths of pipe, see instructions packed with the tool.

Fix the tool in the pipe with the clamping elements.



Screw in the cutting head, check the cutting knife and the two guide heads for correct seating.

Note that the tool calibrates the inner pipe diameter and therefore may remove different amounts of material as it cuts.



- Screw in the cutting head until the ring rests on the end of the pipe.
- Loosen the clamping elements and carefully remove the tool without damaging the pipe.

3. Checking the pipe diameter

Check the diameters of the calibrated pipe. The required inner diameters are listed in the COOL-FIT catalog and in the tool instructions.

4. Chamfering the pipe

Chamfer the pipe again according to the table "Cementing COOL-FIT ABS Plus below d200 mm", step 2.

For further procedure, see section "Cementing COOL-FIT ABS Plus below d200 mm", step 3.

7.1.4 Waiting time and pressure test

Following the recommended waiting time is important to avoid damage due to stress. Hence, it is absolutely necessary that the waiting times be followed.

The pressure test must be performed before insulating the cementing gap; otherwise, it is not possible to locate a potential leak. The pressure test is performed according to the same procedure as the one used with regular piping.

7.1.5 Insulating the gap

Push the required shrink sleeve onto the pipe before jointing.

1. Preparing the insulation

If it is not possible to use the shrink sleeve or if the sleeve is damaged, cold or heat shrinking tapes can be used. It is also possible to use other insulating tapes instead of the shrink sleeve.

For information about service life and sealing properties of these tapes, contact the corresponding manufacturer.

2. Wrapping the gap insulator tape

Wrap Armaflex gap insulator tape into the gap. The gap must be evenly filled.

3. Affixing the sealing tape

Affix the sealing tape centered and without gaps over the filled gap. Do not remove the protective film.

4. Positioning the shrink sleeve

Position the shrink sleeve over the center of the gap. Fittings feature a positioning guide that facilitates aligning the shrink sleeve. Remove the protective film from the sealing tape and distribute the shrink sleeve (3-point location).

5. Shrinking the shrink sleeve

Using a heat gun apply heat to the sleeve, taking care to keep the flame moving to keep the sleeve from melting. To avoid that the sleeve is distorted apply the heat to the center of the sleeve, not from the side.

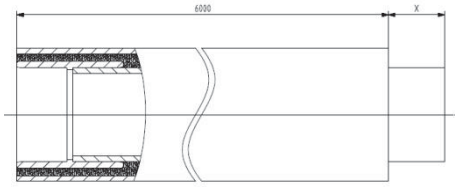
A hot air blower can be used instead of a heat gun to shrink the sleeve. Due to the large amount of energy required to activate shrinking, GF Piping Systems recommends using a heat gun.

7.2 Connection of COOL-FIT ABS Plus d250 to d315

The cementing process is identical to that of ABS in the dimensions d250 to d315, see Planning Fundamentals, chapter 12, section 2, "Tangit solvent cement jointing“. COOL-FIT ABS Plus pipes with dimensions d250 to d315 are delivered in lengths of 5 m as socket-spigot versions (with one open end) or as spigot-spigot versions (with two open ends).

If short pipe pieces are required for installation, the pipes must be shortened with a right-angle cut. To be able to cement the pipes, the insulation must first be removed professionally.

1. Marking the peeling length (X)



The peeling length depends on the ABS pipe diameter. The following formula is used for the calculation:

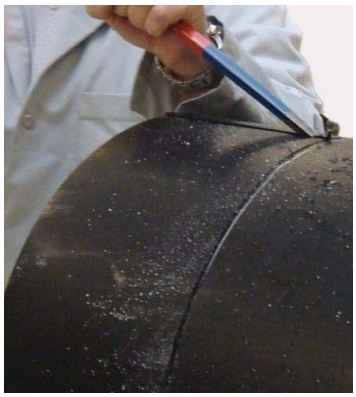
$$\textbf{Peeling lenght} = \frac{\mathbf{d}}{\mathbf{2}} + \mathbf{6\ mm}$$

At least 20 mm are added for the inspection gap, as well as the tolerances for marking and peeling. GF Piping Systems recommends that the entire circumference be marked to allow for a precise cut.

d (mm)	X_{min} (mm)
250	151
280	166
315	186

2. Separating the PE protective sheath

During the entire cutting and peeling process the ABS pipe inside the sheath cannot be mechanically damaged under any circumstances!



Step 1
Cut into the protective sheath along the marking across the entire circumference using a hand saw. Then make a longitudinal cut (axial) up to the marking.

Step 2
Remove the protective sheath from the PUR insulation.

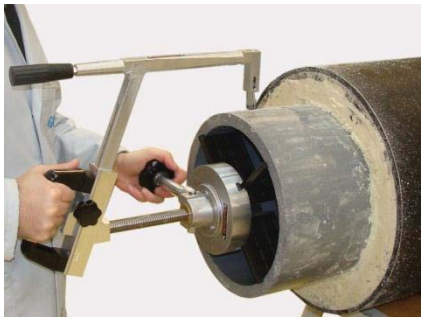
3. Peeling off the PUR insulation

Step 1
Cut axially into the PE protective sheath with the saw at a sufficient distance to the ABS inner pipe.

Step 2
Remove the PE spacer in the peeling area. It is fixed with a metal wire and can easily be cut and removed.

Step 3
Remove remaining PUR with a blunt tool. Small residues may remain on the ABS surface.

4. Peeling the ABS pipe



Step 1
Clamp the peeler (RTC 315, code no. 799.150.423) onto the inner diameter and adjust the pre-tension of the cutting knife according to the supplied operating instructions. Peel the ABS pipe from the PUR insulation in the direction of the pipe end, removing an ABS peel of approx. 0.1 to 0.2 mm thickness.

After peeling, the surface is free of PUR.

Step 2
Chamfer the ABS pipe at an angle of 15° and a length of at least 6 to 8 mm. A chamfer device or a file can be used for this purpose.

The ABS pipe may be peeled only once!

Cementing the pipes and fittings is performed according to the cementing instructions for ABS systems, see Planning Fundamentals, chapter 12, "Jointing technology", section 2 "Tangit solvent cement jointing".

7.3 Connection of COOL-FIT PE Plus

For general notes and information about electrofusion, see Planning Fundamentals, chapter 12, "Jointing technology", section 11 "Electrofusion jointing".

7.3.1 Processing notes

The quality of the fusion is importantly determined by the careful execution of the preparatory work. The fusion area must be protected against harmful atmospheric influences, such as rain, snow or wind. Permissible temperature range for the processing is -10 °C to +45 °C. National guidelines must be observed. In case of direct exposure to the sun, shielding the fusion area can achieve a balanced temperature profile across the entire pipe circumference. Particular attention should be paid to positioning the automatic electrofusion control unit and the fusion area under the same climate conditions.

7.3.2 Performing the electrofusion

Protecting the fusion area

The fusion areas on the pipe and the fitting must be carefully protected against dirt, all greases, oils and lubricants. Only cleaning agents suitable for PE may be used.

No grease (e.g. hand creme, oily rags, silicone, etc.) may enter the fusion zone!

1. Preparing for fusion

Step 1
Perform a preliminary cleaning of the media pipe, deburr at a right angle using the pipe cutter, if necessary.

Step 2
Check the pipe outer diameter before and after peeling with a circumferential measuring tape.

Step 3
Check the open spigot length.

Overview of pipe outer diameter and open spigot length

Dimension (mm)	Minimum permissible pipe outer diameter after peeling (mm)	Factory-set spigot length (mm)
d250	249.3	113 – 123
d280	279.3	116 – 126
d315	314.3	123 – 133
d355	354.3	135 – 145
d400	399.3	137 – 147
d450	449.3	153 – 163

2. Cleaning

Step 1
Peel the media pipe with the rotary peeler. Observe min. peel removal of 0.2 mm.

Step 2
Clean peeled pipe section with PE cleaner and lint-free cloth and allow to air out.

Step 3
Clean fusion area of the electrofusion socket with PE cleaner and lint-free cloth and allow to air out.

3. Fusion process

Step 1
Slide on the electrofusion socket up to the insulation without touching the fusion area. Slide on the shrink sockets and fix the components stress-free[1)].

Step 2
Connect the fusion device with fusion adaptors and fuse according to the operating instructions of the fusion device. Check and monitor the fusion process[1)].

Step 3
After the fusion process, the socket is labeled with the following information.

- Date
- Fusion number
- Cooling time

4. Sealing

Step 1
Affix the sealing tape centered over the gap and overlap it at the end. Press it on well and smooth out folds.

Step 2
Position the shrink socket centered.

Step 3
The flame or hot-air stream must strike the shrink socket as vertically as possible. Avoid applying unnecessary heat to the fittings.

[1)] The use of suitable fixing devices is recommended.

Removing the insulation for COOL-FIT PE Plus pipes d250 to d450

COOL-FIT PE Plus pipes with large dimensions (d250 to d450) are delivered as spigot-spigot versions. If short pipe pieces are required for installation, the pipes must be shortened with a right-angle cut. To be able to fuse the pipes with COOL-FIT PE Plus electrofusion sockets, the insulation must first be removed professionally.

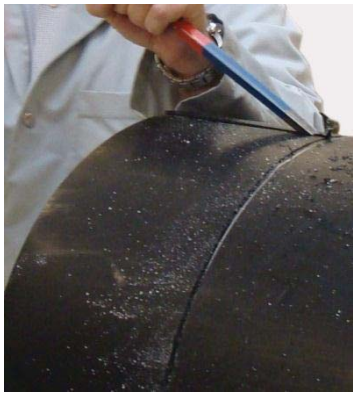
Marking the peeling length

The peeling length depends on the COOL-FIT PE Plus pipe diameter (see table). GF Piping Systems recommends that the entire circumference be marked to allow for a precise cut.

Dimension (mm)	d250/D355	d280/D400	d315/D450	d355/D500	d400/D560	d450/D630
Spigot length (mm)	126	123	133	145	147	163

5. Separating the PE protective sheath

The PE pipe on the inside must not be mechanically damaged in any way during the entire cutting and peeling process!



Step 1
Cut into the protective sheath along the marking across the entire circumference using a hand saw. Then make a longitudinal cut (axial) up to the marking.

Step 2
Remove the protective sheath from the PUR insulation.

6. Peeling off the PUR insulation

Step 1
Cut axially into the PE protective sheath with the saw at a sufficient distance to the ABS inner pipe.

Step 2
Remove the PE spacer in the peeling area. It is fixed with a metal wire and can easily be cut and removed.

Step 3
Remove the remaining PUR with a blunt tool. Small residues may remain on the PE surface.

7. Peeling the PE pipe

Step 1
Clamp the peeler (RTC 710, code no. 799.330.757) onto the inner diameter and adjust the pre-tension of the cutting knife according to the supplied operating instructions. Peel the ABS pipe from the PUR insulation in the direction of the pipe end.

After peeling, the surface is free of PUR.

The PE pipe may be peeled only once!

7.3.3 Additional installation notes

Foaming ABS with PUR at the construction site

There are various types of PUR on the market using different types of activators to start the foaming process. All create an exothermic reaction, i.e. generate heat, usually reaching temperatures of about 120 °C, which can destroy thermoplastics. ABS has a softening point of +98 °C. This means that any temperatures above this have an adverse effect on ABS. Usually the on-site foaming takes place in an enclosed space which then causes external pressure on the components.

For these reasons, GF Piping Systems recommends that ABS fittings, pipes and valves are not insulated using PUR foaming on-site.

COOL-FIT Plus is foamed under controlled conditions to ensure that the quality of the ABS is not affected by the PUR foaming process.

Post-insulating ABS

ABS is not chemically resistant to solvents. Solvents are used in the jointing process to soften and swell the material. This use of solvents takes place under controlled conditions while the pipe is inserted into the fitting. Any other contact of solvents with ABS should be avoided. Some insulation materials on the market use solvent-based cements to position the insulation.

According to the manufacturer's' instructions, only the insulation itself should be cemented together. In the area of the cementing for sealing, apply self-adhesive tape first. Then perform the sealing on the adhesive tape.

Any surplus of cement that may come into direct contact with ABS, should be removed with a cloth. If the insulation was cemented directly onto the pipe, possible effects on the piping system must be clarified. Contact your authorized GF Piping Systems representative for additional information about this topic.

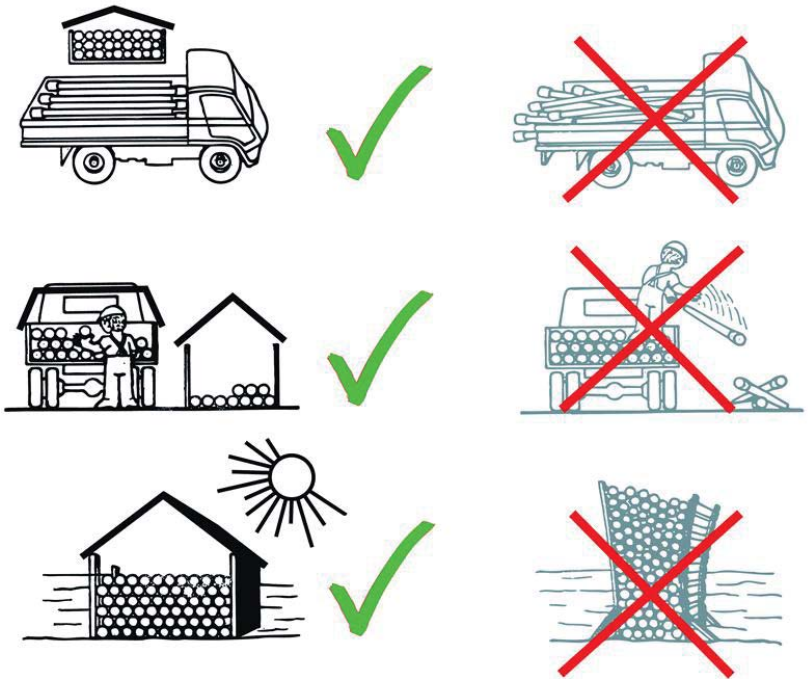
8 Internal pressure test

For the internal pressure test and putting into operation, the same requirements apply to the COOL-FIT ABS Plus and COOL-FIT PE Plus systems as those for the non-insulated ABS and ecoFIT systems. For further details, see Planning Fundamentals, chapter 11 "Installation" in section 7 "Internal pressure and leak tightness test".

9 Storage and handling

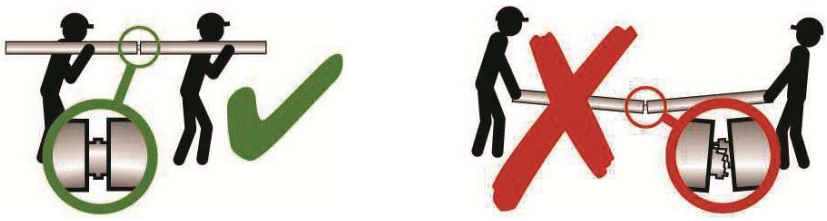
9.1 Storage

All plastic pipes, including pre-insulated plastic pipes, i.e. COOL-FIT ABS Plus, must be stacked on a flat surface free from sharp edges. During handling, care must be taken to avoid damage to the outside surface of the pipe, for instance no dragging along the ground. Avoid pipe overhangs during storage since this could cause the pipes to bend.



9.2 Handling of COOL-FIT ABS Plus nipple connections

COOL-FIT ABS Plus pipes with nipple connection must always be kept straight during transport. Incorrect handling can cause the connection to break.



Correct handling

Incorrect handling

9.3 Environment

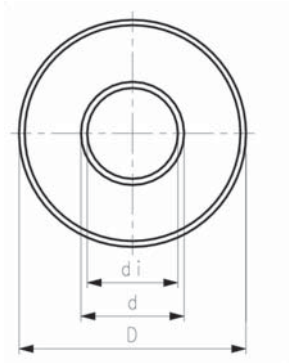
COOL-FIT Plus products are halogen-free. The materials used for COOL-FIT Plus (ABS, PE and PUR) are recyclable materials. GF Piping Systems aims to meet customer requirements regarding the environment. TEWI, ODP and GWP values and test reports are available for COOL-FIT ABS Plus pipes.

For additional information, visit www.coolfit.georgfischer.com

COOL-FIT ABS Plus

Pipes

PF 2 33 372 001



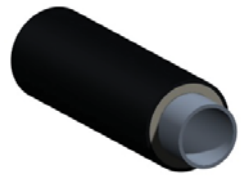
COOL-FIT ABS Plus pipe PN10

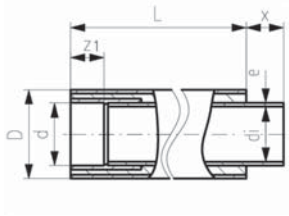
Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant. Color: black
- Insulated length: 5m

d (mm)	D (mm)	PN (bar)	Code	Weight (kg/m)	di (mm)	closest inch (inch)	Refrigeration Size (inch)
25	90	10	**169 017 682**	1.300	20.4	¾	⅞
32	90	10	**169 017 683**	1.500	28.2	1	1 ⅛
40	110	10	**169 017 684**	1.900	35.2	1 ¼	1 ⅜
50	110	10	**169 017 685**	2.100	44.0	1 ½	1 ⅝
63	125	10	**169 017 686**	2.700	55.4	2	2 ⅛
75	140	10	**169 017 687**	3.500	66.0	2 ½	2 ⅝
90	160	10	**169 017 688**	4.400	79.2	3	3 ⅛
110	180	10	**169 017 689**	5.500	96.8	4	4 ⅛
140	225	10	**169 017 691**	8.500	123.4	5	
160	250	10	**169 017 692**	10.500	141.0	6	6
200	280	10	**169 017 693**	13.500	175.4	8	
225	315	10	**169 017 694**	18.500	197.2	8	

PF 2 33 372 001





COOL-FIT ABS Plus pipe PN6 - one socket end, one free end

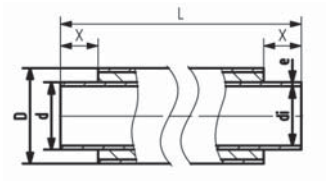
Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant. Color: black
- Insulated length: 5m (as an option available in 10m)
- Ready for connection with free pipe end and integrated socket

d (mm)	D (mm)	PN (bar)	Code	Weight (kg/m)	x (mm)	L (mm)	e (mm)	di (mm)	Z1 (mm)	closest inch (inch)
250	355	6	**169 017 695**	14.900	150	5000	9.6	230.8	130	10
280	400	6	**169 017 696**	18.700	165	5000	10.7	258.6	145	10
315	450	6	**169 017 697**	23.700	185	5000	12.1	290.8	165	12

PF 2 33 372 001

COOL-FIT ABS Plus pipe PN6 - two free ends



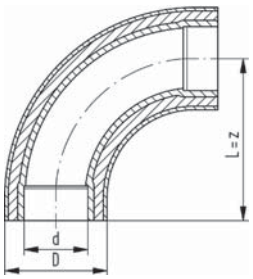
Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant. Color: black
- Insulated length: 5m (as an option available in 10m)
- Ready for connection with two free pipe ends

d (mm)	D (mm)	PN (bar)	Code	Weight (kg/m)	x (mm)	L (mm)	e (mm)	di (mm)	closest inch (inch)
250	355	6	**169 017 698**	14.900	150	5000	9.6	230.8	10
280	400	6	**169 017 699**	18.700	165	5000	10.7	258.6	10
315	450	6	**169 017 700**	23.700	185	5000	12.1	290.8	12

Fittings

PF 2 33 372 020



COOL-FIT ABS Plus Bend 90° PN10

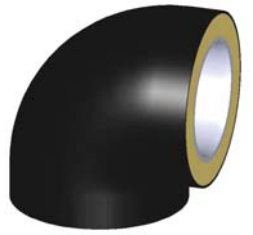
Model:

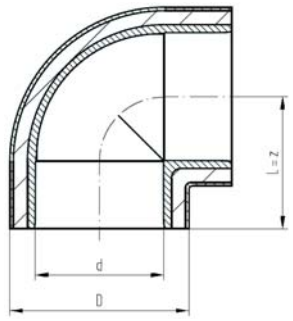
- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant. Color: black

Connecting dimensions = Pipe outer diameter

d (mm)	D (mm)	PN (bar)	Code	Weight (kg)	L (mm)	z (mm)	required Nipple	closest inch (inch)
25	90	10	**738 001 107**	0.183	69	69	738901607	¾
32	90	10	**738 001 108**	0.220	86	86	738901608	1
40	110	10	**738 001 109**	0.363	109	109	738901609	1 ¼
50	110	10	**738 001 110**	0.498	131	131	738901610	1 ½
63	125	10	**738 001 111**	0.759	164	164	738901611	2
75	140	10	**738 001 112**	1.159	194	194	738901612	2 ½
90	160	10	**738 001 113**	1.885	231	231	738901613	3
110	180	10	**738 001 114**	3.235	281	281	738901614	4
140	225	10	**738 001 116**	6.909	356	356	738901616	5
225	315	10	**738 001 120**	8.176	287	287	738901620	8

PF 2 33 372 020





COOL-FIT ABS Plus Elbow 90° PN10

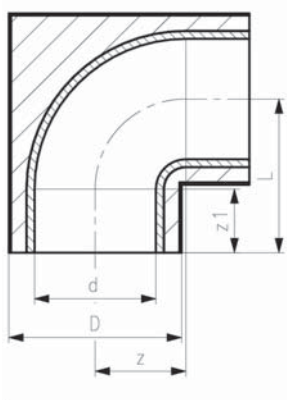
Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant.Color: black
- Compact design

Connecting dimensions = Pipe outer diameter

d (mm)	D (mm)	PN (bar)	Code	Weight (kg)	L (mm)	z (mm)	required Nipple	closest inch (inch)
160	250	10	**738 101 117**	2.600	166	166	738901617	6
200	280	10	**738 101 119**	5.003	207	207	738901619	8

PF 2 33 372 020



COOL-FIT ABS Plus Bend 90° PN6

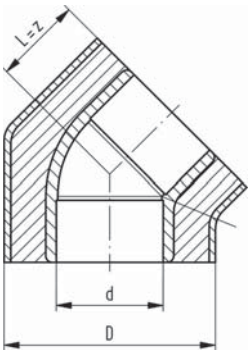
Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant. Color: black
- Compact design

Connecting dimensions = Pipe outer diameter

d (mm)	D (mm)	PN (bar)	Code	Weight (kg)	L (mm)	z1 (mm)	z (mm)	closest inch (inch)
250	355	6	**738 101 121**	10.000	263	130	131	10
280	400	6	**738 001 122**	18.000	357	145	210	10
315	450	6	**738 001 123**	24.000	401	165	237	12

PF 2 33 372 020



COOL-FIT ABS Plus Elbow 45° PN10

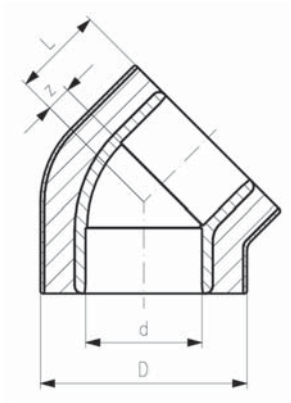
Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant.Color: black

Connecting dimensions = Pipe outer diameter

d (mm)	D (mm)	PN (bar)	Code	Weight (kg)	L (mm)	z (mm)	required Nipple	closest inch (inch)
25	90	10	**738 151 107**	0.080	25	25	738901607	¾
32	90	10	**738 151 108**	0.103	30	30	738901608	1
40	110	10	**738 151 109**	0.166	36	36	738901609	1 ¼
50	110	10	**738 151 110**	0.193	43	43	738901610	1 ½
63	125	10	**738 151 111**	0.300	52	52	738901611	2
75	140	10	**738 151 112**	0.443	61	61	738901612	2 ½
90	160	10	**738 151 113**	0.692	71	71	738901613	3
110	180	10	**738 151 114**	0.967	89	89	738901614	4
140	225	10	**738 151 116**	1.967	108	108	738901616	5
160	250	10	**738 151 117**	2.904	122	122	738901617	6
200	280	10	**738 151 119**	3.687	149	149	738901619	8
225	315	10	**738 151 120**	4.620	168	168	738901620	8

PF 2 33 372 020



COOL-FIT ABS Plus Elbow 45° PN6

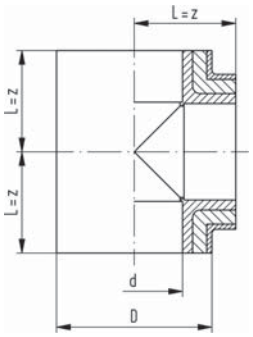
Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant. Color: black
- Compact design

Connecting dimensions = Pipe outer diameter

d (mm)	D (mm)	PN (bar)	Code	Weight (kg)	L (mm)	z (mm)	closest inch (inch)
250	355	6	**738 151 121**	9.000	192	60	10
280	400	6	**738 151 122**	13.000	213	66	10
315	450	6	**738 151 123**	17.000	239	74	12

PF 2 33 372 020



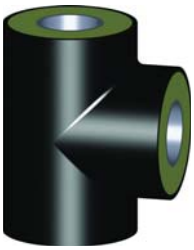
COOL-FIT ABS Plus Tee 90° PN10

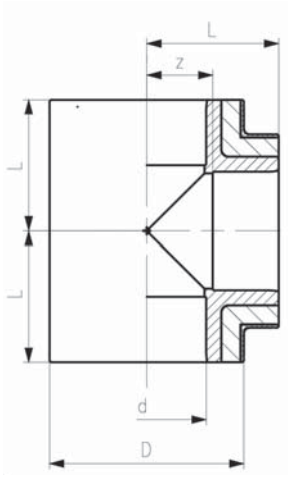
Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant.Color: black

d (mm)	D (mm)	PN (bar)	Code	Weight (kg)	L (mm)	z (mm)	required Nipple	closest inch (inch)
25	90	10	**738 201 007**	0.287	80	80	738901607	¾
32	90	10	**738 201 008**	0.292	80	80	738901608	1
40	110	10	**738 201 009**	0.470	90	90	738901609	1 ¼
50	110	10	**738 201 010**	0.517	90	90	738901610	1 ½
63	125	10	**738 201 011**	0.768	100	100	738901611	2
75	140	10	**738 201 012**	1.270	125	125	738901612	2 ½
90	160	10	**738 201 013**	1.600	140	140	738901613	3
110	180	10	**738 201 114**	2.309	122	122	738901614	4
140	225	10	**738 201 116**	3.639	147	147	738901616	5
160	250	10	**738 201 117**	5.106	167	167	738901617	6
200	280	10	**738 201 119**	6.800	207	207	738901619	8
225	315	10	**738 201 120**	10.200	233	233	738901620	8

PF 2 33 372 020





COOL-FIT ABS Plus Tee 90° PN6

Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant. Color: black
- Compact design

Connecting dimensions = Pipe outer diameter

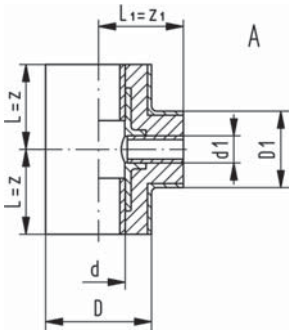
d (mm)	D (mm)	PN (bar)	Code	Weight (kg)	L (mm)	z (mm)	closest inch (inch)
250	355	6	**738 201 121**	14.654	263	132	10
280	400	6	**738 201 122**	21.000	298	152	10
315	450	6	**738 201 123**	27.000	332	160	12

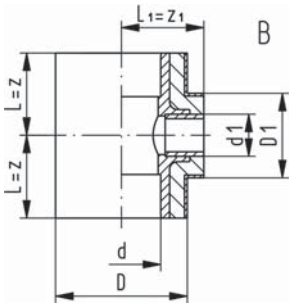
PF 2 33 372 020

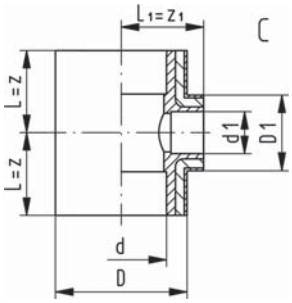
COOL-FIT ABS Plus Tee 90° reduced PN10

Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant.Color: black



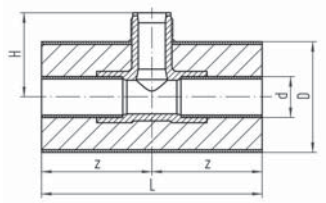


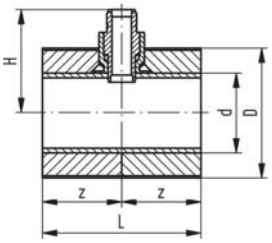


d (mm)	d1 (mm)	D (mm)	D1 (mm)	Type	PN (bar)	Code	Weight (kg)
32	25	90	90	C	10	**738 201 038**	0.282
40	25	110	90	C	10	**738 201 051**	0.433
40	32	110	90	C	10	**738 201 047**	0.460
50	25	110	90	C	10	**738 201 092**	0.475
50	32	110	90	C	10	**738 201 064**	0.489
63	25	125	90	C	10	**738 201 093**	0.668
63	32	125	90	C	10	**738 201 078**	0.668
63	50	125	110	C	10	**738 201 070**	0.802
75	40	140	110	A	10	**738 201 182**	1.091
90	32	160	90	C	10	**738 201 043**	1.495
90	63	160	125	C	10	**738 201 046**	1.597
110	32	180	90	B	10	**738 201 144**	1.783
110	50	180	110	B	10	**738 201 136**	1.841
140	50	225	110	B	10	**738 201 148**	3.229
140	75	225	140	B	10	**738 201 149**	3.342
160	110	250	180	B	10	**738 201 152**	4.885
200	110	280	180	C	10	**738 201 153**	7.799
225	110	315	180	C	10	**738 201 156**	9.237
225	160	315	250	C	10	**738 201 157**	9.968

d (mm)	d1 (mm)	z (mm)	z1 (mm)	required Nipple	Closest inch (inch)
32	25	80	80	1x738901607; 2x738901608	1 - ¾
40	25	90	90	1x738901607; 2x738901609	1 ¼ - ¾
40	32	90	90	1x738901608; 2x738901609	1 ¼ - 1
50	25	90	90	1x738901607; 2x738901610	1 ½ - ¾
50	32	90	90	1x738901608; 2x738901610	1 ½ - 1
63	25	100	100	1x738901607; 2x738901611	2 - ¾
63	32	100	100	1x738901608; 2x738901611	2 - 1
63	50	100	100	1x738901610; 2x738901611	2 - 1 ¼
75	40	115	110	1x738901109; 2x738901112	2 ½ - 1 ¼
90	32	140	140	1x738901608; 2x738901613	3 - 1
90	63	140	140	1x738901611; 2x738901613	3 - 2
110	32	117	130	1x738901108; 2x738901614	4 - 1
110	50	117	130	1x738901110; 2x738901614	4 - 1 ½
140	50	147	153	1x738901110; 2x738901616	5 - 1 ½
140	75	147	153	1x738901112; 2x738901616	5 - 2 ½
160	110	167	165	1x738901114; 2x738901617	6 - 4
200	110	213	193	1x738901614; 2x738901619	8 - 4
225	110	239	206	1x738901614; 2x738901620	8 - 4
225	160	239	206	1x738901617; 2x738901620	8 - 6

PF 2 98 930 002





COOL-FIT ABS Plus Installation fitting type 310 PN10

Model:

- Pre-insulated ABS metric
- Threaded outlet 1 ¼" NPSM
- Insulation made from PUR
- Outer jacket impact resistant.Color: black

Range of use:

- Compatible Signet flow sensors: type 2551, 2537, 515, 8510, 2536, 8512
- Compatible Signet pH/ORP sensors: type 2724, 2725, 2726, 2734, 2736, 2735

Attention:

- sensor length depends on installation fitting

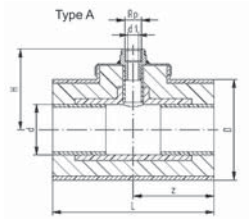
Connecting dimensions = Pipe inner diameter

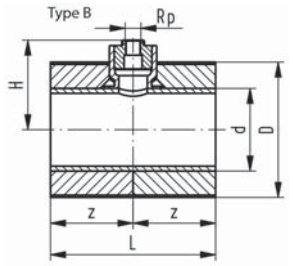
d (mm)	D (mm)	PN (bar)	Code	Weight (kg)
25	90	10	**738 310 107**	0.377
32	90	10	**738 310 108**	0.380
40	110	10	**738 310 109**	0.494
50	110	10	**738 310 110**	0.550
63	125	10	**738 310 111**	0.702
75	140	10	**738 310 112**	0.839
90	160	10	**738 310 113**	0.964
110	180	10	**738 310 114**	1.256
140	225	10	**738 310 116**	1.801
160	250	10	**738 310 117**	2.385
200	280	10	**738 310 119**	3.277
225	315	10	**738 310 120**	5.154

d (mm)	D (mm)	H (mm)	L (mm)	z (mm)	Sensor Type	required Nipple	closest inch (inch)	Type
25	90	78	220	110	flow X0, pH XX	738901107	¾	A
32	90	81	220	110	flow X0, pH XX	738901108	1	A
40	110	85	220	110	flow X0, pH XX	738901109	1	A
50	110	89	220	110	flow X0, pH XX	738901110	1 ½	A
63	125	95	220	110	flow X0, pH XX	738901111	2	A
75	140	161	220	110	flow X1	738901112	2 ½	B
90	160	171	220	110	flow X1	738901113	3	B
110	180	181	220	110	flow X1	738901114	4	B
140	225	193	220	110	flow X1	738901116	5	B
160	250	202	220	110	flow X1	738901117	6	B
200	280	211	250	125	flow X1	738901119	8	B
225	315	225	280	140	flow X1	738901120	8	B

Type A

Type B





COOL-FIT ABS Plus Installation fitting type 313 PN10

Model:

- Pre-insulated ABS metric
- Insulation made from PUR
- Outer jacket impact resistant.Color: black
- With 1/2 " Rp threaded branch for sensors (i.e. pressure)

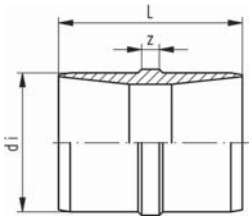
Range of use:

- compatible signet pressure sensors: type 2450-1 /-2 /-5

d (mm)	D (mm)	PN (bar)	Code	PF	Weight (kg)
25	90	10	**738 313 007**	2 33 372 020	0.330
32	90	10	**738 313 008**	2 33 372 020	0.400
40	110	10	**738 313 009**	2 33 372 020	0.500
50	110	10	**738 313 010**	2 33 372 020	0.570
63	125	10	**738 313 011**	2 33 372 020	0.890
75	140	10	**738 313 012**	2 33 372 020	0.767
90	160	10	**738 313 013**	2 33 372 020	0.961
110	180	10	**738 313 114**	2 98 930 002	1.178
140	225	10	**738 313 116**	2 98 930 002	1.731
160	250	10	**738 313 117**	2 98 930 002	2.228
200	280	10	**738 313 119**	2 98 930 002	3.609
225	315	10	**738 313 120**	2 98 930 002	4.645

d (mm)	D (mm)	Rp (inch)	H (mm)	L (mm)	z (mm)	required Nipple	closest inch (inch)	Type
25	90	½	112	160	80	2x738901607	¾	A
32	90	½	112	180	90	2x738901608	1	A
40	110	½	112	180	90	2x738901609	1 ¼	A
50	110	½	112	180	90	2x738901610	1 ½	A
63	125	½	100	200	100	2x738901611	2	A
75	140	½	147	250	125	2x738901612	2 ½	A
90	160	½	162	280	140	2x738901613	3	A
110	180	½	119	220	110	2x738901114	4	B
140	225	½	134	220	110	2x738901116	5	B
160	250	½	145	220	110	2x738901117	6	B
200	280	½	165	250	125	2x738901119	8	B
225	315	½	178	280	140	2x738901120	8	B

PF 2 33 372 020



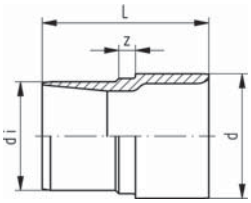
COOL-FIT ABS Plus Barrel nipple di-di PN10

Model:

- Material: ABS metric
- To connect pipe inner diameters di

d (mm)	PN (bar)	Code	Weight (kg)	di (mm)	L (mm)	z (mm)	closest inch (inch)
25	10	**738 901 107**	0.009	20	52	10	¾
32	10	**738 901 108**	0.014	28	58	10	1
40	10	**738 901 109**	0.021	35	66	10	1 ¼
50	10	**738 901 110**	0.035	44	76	10	1 ½
63	10	**738 901 111**	0.059	55	90	10	2
75	10	**738 901 112**	0.087	65	102	10	2 ½
90	10	**738 901 113**	0.127	79	104	10	3
110	10	**738 901 114**	0.204	96	122	10	4
140	10	**738 901 116**	0.416	123	150	10	5
160	10	**738 901 117**	0.582	141	166	10	6
200	10	**738 901 119**	1.019	176	202	10	8
225	10	**738 901 120**	1.392	198	224	10	8

PF 2 33 372 020



COOL-FIT ABS Plus Adaptor nipple d-di PN10

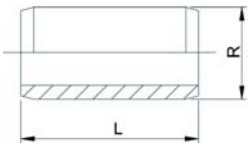
Model:

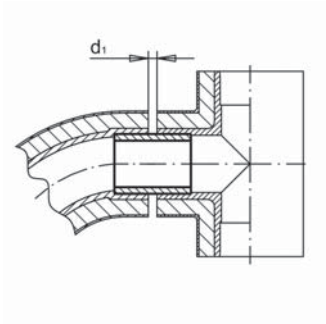
- Material: ABS metric
- To connect d to pipe inner diameter di

* Can also be used as a reducer di 160 to di 140

	d (mm)	PN (bar)	Code	Weight (kg)	di (mm)	L (mm)	z (mm)	closest inch (inch)
	25	10	**738 901 607**	0.008	20	50	10	¾
	32	10	**738 901 608**	0.017	28	56	10	1
	40	10	**738 901 609**	0.026	35	64	10	1 ¼
	50	10	**738 901 610**	0.044	44	74	10	1 ½
	63	10	**738 901 611**	0.082	55	88	10	2
	75	10	**738 901 612**	0.127	65	100	10	2 ½
	90	10	**738 901 613**	0.179	79	108	10	3
	110	10	**738 901 614**	0.319	96	127	10	4
*	140	10	**738 901 616**	0.505	123	156	10	5
	160	10	**738 901 617**	0.765	141	174	10	6
	200	10	**738 901 619**	1.855	176	212	10	8
	225	10	**738 901 620**	1.921	198	236	10	8

PF 2 33 372 020





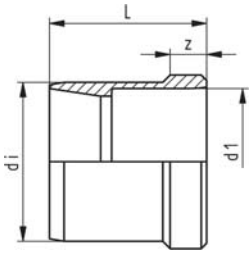
COOL-FIT ABS Plus Barrel nipple d-d PN10

Model:

- Material: ABS metric
- For a quick jointing of COOL-FIT fittings for d - connecting dimensions
- For the shortest possible distance between COOL-FIT fittings
- Overall length L = 2 x socket length + 10 mm inspection gap

d (mm)	PN (bar)	Code	Weight (kg)	d1 (mm)	L (mm)	closest inch (inch)
25	16	**738 901 907**	0.010	10	48	¾
32	10	**738 901 908**	0.011	10	54	1
40	10	**738 901 909**	0.021	10	62	1 ¼
50	10	**738 901 910**	0.036	10	72	1 ½
63	10	**738 901 911**	0.072	10	86	2
75	10	**738 901 912**	0.115	10	98	2 ½
90	10	**738 901 913**	0.190	10	112	3
110	10	**738 901 914**	0.310	10	132	4
140	10	**738 901 916**	0.727	10	162	5
160	10	**738 901 917**	0.946	10	182	6
200	10	**738 901 919**	1.790	10	222	8
225	10	**738 901 920**	2.525	10	248	8
250	6	**738 901 921**	2.525	10	272	10
280	6	**738 901 922**	2.525	10	302	10
315	6	**738 901 923**	2.525	10	332	12

PF 2 33 372 020



COOL-FIT ABS Plus Reducing nipple di-dred PN10

Model:

- Material: ABS metric
- To connect pipe inner diameter di to reduced dred

d (mm)	d1 (mm)	PN (bar)	Code	Weight (kg)	di (mm)	L (mm)	z (mm)	closest inch (inch)
32	25	10	**738 911 341**	0.006	28	34	10	1
40	32	10	**738 911 346**	0.009	35	38	10	1 ¼
50	40	10	**738 911 352**	0.014	44	43	10	1 ½
63	50	10	**738 911 358**	0.024	55	50	10	2
75	63	10	**738 911 364**	0.022	65	56	10	2 ½
90	75	10	**738 911 370**	0.032	79	57	10	3
110	90	10	**738 911 376**	0.068	96	66	10	4
140	110	10	**738 911 385**	0.218	123	80	10	5
200	160	10	**738 911 392**	0.424	176	106	10	8

Accessories

PF 2 33 372 999

Insulation set

Model:

- To insulate inspection gaps of 10mm width with the same outer diameter
- For inspection gaps of 20 mm width two insulation sets are required
- Scope of delivery: - Gap filler: 13 x 13 mm- Sealing tape: 40 mm width, butylene rubber-based

D (mm)	d (mm)	Code	Weight (kg)
90	25 - 32	**738 011 313**	0.032
110	40 - 50	**738 011 314**	0.045
125	63	**738 011 315**	0.047
140	75	**738 011 316**	0.053
160	90	**738 011 317**	0.064
180	110	**738 011 318**	0.067
225	140	**738 011 320**	0.085
250	160	**738 011 321**	0.082
280	200	**738 011 322**	0.098
315	225	**738 011 323**	0.128

PF 2 33 372 030

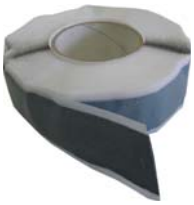
Gap filler

- 13 x 13mm, 2.5 m on a roll
- To insulate inspection gap at joints

Price listed per 2,5m roll

D (mm)	d-d (mm)	Code	Weight (kg)
90 - 450	25 - 315	**738 011 150**	0.020

PF 2 33 372 999



Sealing tape

Model:

- For a water- and steam-tight sealing of inspection gaps in combination with shrink sleeves/ -sockets
- Sealing tape: 40mm width, buthylene rubber-based
- 30 m on a roll

D (mm)	d-d (mm)	Code	Weight (kg)	Closest inch (inch)
90 - 450	25 - 315	**738 011 152**	2.134	¾ - 12

PF 2 33 372 999

Shrink sleeve short PE

Model:

- For a water- and steam-tight sealing in combination with buthylene rubber-based sealing tape
- For connections of the same pipe outer diameter
- Length: 100 mm

- For a water- and steam-tight sealing in combination with buthylene rubber-based sealing tape
- Length = 100 mm
- For connections of the same pipe outer diameter

D (mm)	d (mm)	Code	Weight (kg)
90	25 - 32	**738 011 113**	0.035
110	40 - 50	**738 011 114**	0.052
125	63	**738 011 115**	0.076
140	75	**738 011 116**	0.073
160	90	**738 011 117**	0.088
180	110	**738 011 118**	0.087
225	140	**738 011 120**	0.121
250	160	**738 011 121**	0.130
280	200	**738 011 122**	0.134
315	225	**738 011 123**	0.130

Shrink socket PE

Model:

- For a water- and steam-tight sealing in combination with buthylene rubber-based sealing tape
- Length: 100 mm
- "Heavy duty" version for high end applications
- For connections of the same pipe outer diameter

D (mm)	d (mm)	Code	PF	Weight (kg)	L (mm)
90	25 - 32	**738 011 013**	2 33 372 999	0.100	100
110	40 - 50	**738 011 014**	2 33 372 999	0.113	100
125	63	**738 011 015**	2 33 372 999	0.133	100
140	75	**738 011 016**	2 33 372 999	0.146	100
160	90	**738 011 017**	2 33 372 999	0.165	100
180	110	**738 011 018**	2 33 372 999	0.222	100
225	140	**738 011 020**	2 33 372 999	0.280	100
250	160	**738 011 021**	2 33 372 999	0.352	100
280	200	**738 011 022**	2 33 372 999	0.371	100
315	225	**738 011 023**	2 33 372 999	0.444	100
355	250	**738 011 024**	2 33 372 999	0.900	100
400	280	**738 011 025**	2 33 372 999	1.100	100
450	315	**738 011 026**	2 33 372 999	1.900	100
500	355	**738 011 027**	2 B3 A60 001	1.000	100
560	400	**738 011 028**	2 B3 A60 001	1.000	100
630	450	**738 011 029**	2 B3 A60 001	1.000	100

PF 2 33 372 999

Shrink sleeve long PE black

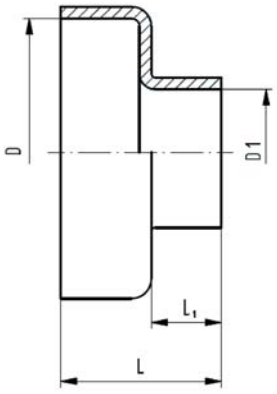
Model:

- To provide a water tight seal in combination with sealing tape
- For straight connections only
- D-D1 connections can be realized with the sleeves listed in the table below
- Length: 200 mm

D (mm)	Code	Weight (kg)	L (mm)	Closest inch (inch)
110 - 160	**738 011 167**	0.288	200	4 - 6
180 - 225	**738 011 170**	0.098	200	7 - 8
250 - 315	**738 011 173**	0.680	200	10 - 12

	D 110	D 125	D 140	D 160	D 180	D 225	D 250	D 280	D 315
D1 90	738 011 167	738 011 167	738 011 167	738 011 167					
D1 110		738 011 167	738 011 167	738 011 167					
D1 125			738 011 167	738 011 167					
D1 140				738 011 167	738 011 170	738 011 170			
D1 160					738 011 170	738 011 170			
D1 180						738 011 170	738 011 173	738 011 173	
D1 225							738 011 173	738 011 173	738 011 173
D1 250								738 011 173	738 011 173
D1 280									738 011 173

PF 2 33 372 030



Shrink cap PE black

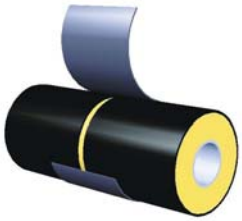
Model:

- To seal dimension reductions on PE
- Can also be used for T 90° reducers
- No sealing tape required (In cap included)
- Attention: Do not shrink onto ABS

D (mm)	D1 (mm)	Code	Weight (kg)	L (mm)	L1 (mm)	Closest inch (inch)
225 - 160	140 - 90	**733 960 135**	0.177	137	61	8 - 6
315 - 225	250 - 125	**733 960 140**	0.315	143	43	12 - 8

PF 2 33 372 999

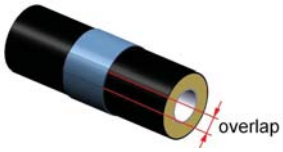
Cold shrink tape PE black



Model:

- For indoor use only
- Width (L) available in 100mm
- 15 m on a roll
- Shrinks without heat application

D (mm)	d-d (mm)	Code	Weight (kg)	Closest inch (inch)
90 - 450	25 - 315	**738 011 107**	1.723	¾ - 8



PF 2 33 372 030

Hot shrink tape PE black

Model:

- For watertight sealing of outer pipe in underground installations
- Mastic backed
- 30 m on a roll
- Shrink with a burner or hot air gun
- Order sealing patches separately (738 011 109)

D (mm)	d-d (mm)	Code	Weight (kg)	L (mm)	Closest inch (inch)
90 - 630	25 - 450	**738 011 108**	3.000	150	¾ - 18

Aussenrohr/ casing pipe	Länge Schrumpfband length shrink tape
90	370
110	440
125	480
140	530
160	600
180	660
225	800
250	880
280	970
315	1080
355	1210
400	1350
450	1500
500	1660
560	1850
630	2070

PF 2 33 372 030

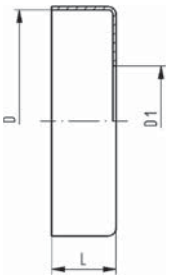
Sealing patch

Model:

- For sealing of hot-shrink-tape in underground installations
- Mastic backed
- 1 patch needed per seal

D (mm)	d-d (mm)	Code	Weight (kg)	L (mm)	Closest inch (inch)
90 - 630	25 - 450	**738 011 109**	0.100	150	¾ - 18

PF 2 33 372 030



COOL-FIT ABS Plus Cap PE black

Model:

- To seal the end of a COOL-FIT Plus pipe

d (mm)	D (mm)	D1 (mm)	Code	Weight (kg)	L (mm)	closest inch (inch)
25	90	24	**733 960 171**	0.026	35	¾
32	90	32	**733 960 172**	0.014	35	1
40	110	39	**733 960 173**	0.036	35	1 ¼
50	110	48	**733 960 174**	0.024	35	1 ½
63	125	59	**733 960 175**	0.045	35	2
75	140	70	**733 960 176**	0.029	35	2 ½
90	160	83	**733 960 177**	0.031	35	3
110	180	100	**733 960 178**	0.055	35	4
140	225	127	**733 960 180**	0.081	35	5
160	250	144	**733 960 181**	0.066	35	6
200	280	187	**733 960 183**	0.146	35	8
225	315	210	**733 960 184**	0.125	35	8
250	355	265	**733 960 185**	0.155	35	10
280	400	300	**733 960 186**	0.185	35	10
315	450	335	**733 960 187**	0.225	35	12

PF 2 33 372 999

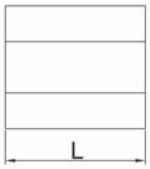
Sealant

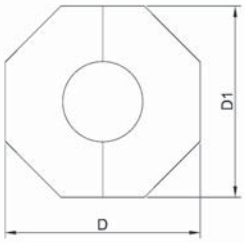
Model:

- For sealing and glueing caps
- Cartridge à 290 ml

	Code	Weight (kg)
290 ml	**738 011 103**	0.473

PF 2 33 372 999





Valve insulation

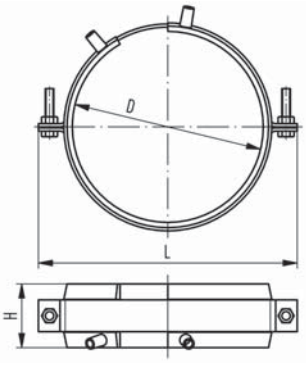
Model:

- Insulation made from PE
- Outer jacket UV resistant
- For ball valve type 546

* handle extension for ball valve recommended, d75/90 161.490.920, d110 161.490.921

	d (mm)	DN (mm)	Code	Weight (kg)	D (mm)	D1 (mm)	L (mm)	closest inch (inch)
	25	20	**738 990 138**	0.100	89	87	108	¾
	32	25	**738 990 139**	0.100	96	94	121	1
	40	32	**738 990 140**	0.100	110	110	143	1 ¼
	50	40	**738 990 141**	0.100	122	120	156	1 ½
	63	50	**738 990 142**	0.100	150	147	181	2
*	75	65	**738 990 143**	0.100	190	185	235	2 ½
*	90	80	**738 990 144**	0.100	226	221	255	3
*	110	100	**738 990 145**	1.100	268	262	300	4

PF 2 33 372 040



COOL-FIT ABS Plus fixed point

Model:

- The product consists of two components namely a welding band an a pipe bracket.
- Electro-fusion welded band as permanent connection to transmit the forces that occur in the pipe to the fixed point.
- The delivered pipe brackets are needed to deliver welding pressure during installtion and give stability during operation.
- For welding, use an MSA2.x, MSA4.x, MSA 250, 300, 350, 400 or commercially available 220 V fusion machines.
- If you use an MSA fusion machine from GF Piping Systems, use the 799 350 339 adapter or the 790 156 032 y-cable set.
- Please take note of the maximum allowed forces for this version in the table below.
- **Fixed point brackets and cross braces have to be calculated and obtained by the installer. They are not included in the fixed point set from GF.**

D (mm)	d (mm)	Code	Weight (kg)	L (mm)	H (mm)	max. Force (kN)	Closest inch (inch)
90	25 - 32	**738 912 013**	0.895	150	60	1.5	¾ - 1
110	40 - 50	**738 912 014**	0.904	170	60	2.0	1 ¼ - 1 ½
125	63	**738 912 015**	1.103	180	60	3.5	2
140	75	**738 912 016**	1.188	215	60	5.5	2 ½
160	90	**738 912 017**	1.177	220	60	9.0	3
180	110	**738 912 018**	1.530	255	60	10.0	4
225	140	**738 912 020**	1.813	310	60	10.0	5
250	160	**738 912 021**	1.957	335	60	10.0	6
280	200	**738 912 022**	2.001	365	60	10.0	8
315	225	**738 912 023**	2.388	400	60	10.0	8
355	250	**738 912 024**	2.388	420	60	10.0	10

PF 2 33 372 999

Adaptor

- MSA electrofusion adaptor for COOL-Fit Fixed point

Code	Weight (kg)
799 350 339	0.021

PF 3 10 588 900

COOL-FIT Y cables kit

- The COOL-fit Y cables are used to speed up the installation of the Fixed Points Electro-Fusion Tapes. The Y cables allow the welding in parallel of 2 E-Tapes, halving the total duration of the fusion process.
- Compatible with all MSA Units

Type	Code	Weight (kg)
4 leads cable with 2mm plugs in output	**790 156 032**	0.385

PF 2 33 372 050

COOL-FIT ABS Plus pipe calibration tool

Model:

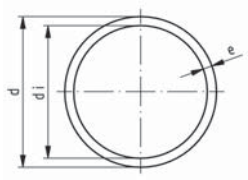
- To calibrate pipe inner diameters of COOL-FIT pipes d200/D280, d225/D315
- including transportation case

d-d (mm)	Code	Weight (kg)	Closest inch (inch)
200 - 225	**790 205 001**	18.905	5 - 8

ABS metric - pipes, transition fittings, valves

Pipes & transition fittings

PF 2 33 472 001



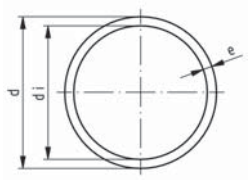
Pipe ABS metric
Nominal pressure PN16 (at 20°C)

Model:

- Colour: RAL 7001, gravel grey
- Pipe length: 5m, with plain ends
- Minimum order quantity: 1 length

d (mm)	PN (bar)	Code	Weight (kg/m)	e (mm)	di (mm)	Copper size (inch)	closest inch (inch)
16	16	**169 017 080**	0.095	1.8	12.4	½	⅜
20	16	**169 017 081**	0.148	2.3	15.4	⅝	½
25	16	**169 017 082**	0.191	2.3	20.4	⅞	¾

PF 2 33 472 001



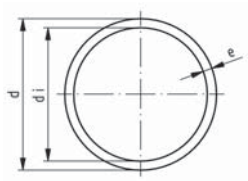
Pipe ABS metric
Nominal pressure PN10 (at 20°C)

Model:

- Colour: RAL 7001, gravel grey
- Pipe length: 5m, with plain ends
- Minimum order quantity: 1 length

d (mm)	PN (bar)	d (inch)	Code	Weight (kg/m)	e (mm)	di (mm)	closest inch (inch)	Copper size (inch)
32	10		**169 017 083**	0.213	1.9	28.2	1	1 ⅛
40	10		**169 017 084**	0.336	2.4	35.2	1 ¼	1 ⅜
50	10		**169 017 085**	0.516	3.0	44.0	1 ½	1 ⅝
63	10		**169 017 086**	0.819	3.8	55.4	2	2 ⅛
75	10	2 ½	**169 017 087**	1.154	4.5	66.0	2 ½	2 ⅝
90	10		**169 017 088**	1.905	5.4	79.2	3	3 ⅛
110	10		**169 017 089**	2.745	6.6	96.8	4	4 ⅛
140	10	5	**169 017 091**	4.083	8.3	123.4	5	
160	10		**169 017 092**	5.200	9.5	141.0	6	6
200	10		**169 017 093**	8.307	12.3	175.4	8	
225	10		**169 017 094**	10.522	13.9	197.2	9	

PF 2 33 472 001

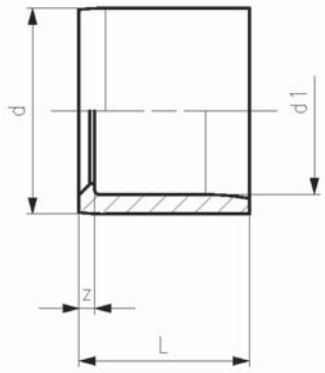


Pipe ABS metric
Nominal pressure PN6 (at 20°C)

Model:

- Colour: RAL 7001, gravel grey
- Pipe length: 5m, with plain ends
- Minimum order quantity: 1 length

d (mm)	PN (bar)	Code	Weight (kg/m)	di (mm)	e (mm)	closest inch (inch)
250	6	**169 017 095**	8.299	230.8	9.6	10
280	6	**169 017 096**	10.346	258.6	10.7	11
315	6	**169 017 097**	13.173	290.8	12.1	12



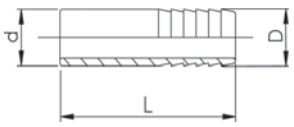
Reducing bush ABS metric

Model:

- With solvent cement spigot and socket metric

	d (mm)	d1 (mm)	PN (bar)	Code	PF	Weight (kg)	z (mm)	L (mm)
*	25	20	16	**729 900 337**	2 33 197 006	0.005	3	19
*	32	20	10	**729 900 342**	2 33 197 006	0.011	6	22
*	32	25	10	**729 900 341**	2 33 197 006	0.008	4	22
	40	20	10	**729 900 348**	2 33 197 006	0.016	10	26
	40	25	10	**729 900 347**	2 33 197 006	0.016	7	26
*	40	32	10	**729 900 346**	2 33 197 006	0.012	4	26
	50	20	10	**729 900 355**	2 33 197 006	0.026	15	31
	50	25	10	**729 900 354**	2 33 197 006	0.011	12	31
	50	32	10	**729 900 353**	2 33 197 006	0.035	9	31
*	50	40	10	**729 900 352**	2 33 197 006	0.022	5	31
	63	32	10	**729 900 360**	2 33 197 006	0.060	16	38
	63	40	10	**729 900 359**	2 33 197 006	0.051	12	38
*	63	50	10	**729 900 358**	2 33 197 006	0.043	7	36
	75	50	10	**729 900 365**	2 33 197 006	0.082	13	44
*	75	63	10	**729 900 364**	2 33 197 006	0.061	7	44
	90	50	10	**729 900 372**	2 33 197 006	0.143	20	51
	90	63	10	**729 900 371**	2 33 197 006	0.129	14	51
*	90	75	10	**729 900 370**	2 33 197 006	0.100	7	51
	110	63	10	**729 900 378**	2 33 197 006	0.231	24	61
*	110	90	10	**729 900 376**	2 33 197 006	0.196	10	61
*	125	110	10	**700 244 660**	2 33 197 006	0.356	8	69
*	140	110	10	**729 900 385**	2 33 197 007	0.459	15	76
	160	110	10	**729 900 390**	2 33 197 006	0.662	25	86
*	160	140	10	**729 900 388**	2 33 197 007	0.410	10	86
	200	160	10	**729 900 392**	2 33 197 006	0.820	20	106
	225	160	10	**729 900 396**	2 33 197 006	1.651	33	119
*	225	200	10	**729 900 181**	2 33 197 006	1.018	13	119
*	250	225	6	**729 900 303**	2 33 197 006	1.294	12	131
*	280	250	6	**729 900 306**	2 33 197 006	2.500	15	146
	315	280	6	**729 900 312**	2 33 197 006	2.852	17	164

PF 2 33 197 012



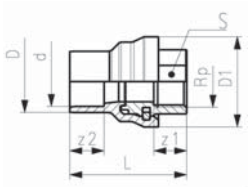
Hose connector ABS metric

Model:

- With solvent cement spigot metric and parallel hose connection

d (mm)	PN (bar)	Code	Weight (kg)	closest inch (inch)	D (mm)	L (mm)
20	10	**729 960 406**	0.012	½	20	73
25	10	**729 960 407**	0.015	¾	25	79
32	10	**729 960 408**	0.027	1	30	89
40	10	**729 960 409**	0.026	1 ¼	40	100
32	10	**729 960 508**	0.027	1	32	89

PF 2 33 198 001



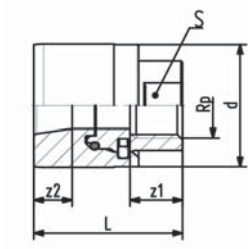
Adaptor fitting ABS/brass Rp

Model:

- Adaptor fitting equally suitable as socket and spigot
- Brass with parallel female thread Rp
- Gasket: O-ring EPDM

d (mm)	D (mm)	Rp (inch)	PN (bar)	Code	Weight (kg)	D1 (mm)	L (mm)	z1 (mm)	z2 (mm)	S (mm)
20	25	½	10	**729 950 106**	0.098	40	55	17	17	25
25	32	¾	10	**729 950 107**	0.166	50	65	19	19	30
32	40	1	10	**729 950 108**	0.257	59	77	22	23	36

PF 2 33 198 001



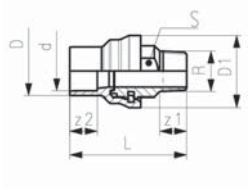
Adaptor fitting ABS/brass Rp

Model:

- Brass with parallel female thread Rp
- Gasket: O-ring EPDM

d (mm)	Rp (inch)	PN (bar)	Code	Weight (kg)	L (mm)	z1 (mm)	z2 (mm)	S (mm)
40	½	10	**729 950 131**	0.263	48.2	17.0	12.4	25
50	½	10	**729 950 132**	0.348	54.2	17.0	12.5	25
50	¾	10	**729 950 133**	0.356	54.9	18.5	13.0	30
63	½	10	**729 950 134**	0.432	66.2	17.0	7.1	25
63	¾	10	**729 950 135**	0.449	66.9	18.5	13.0	30
63	1	10	**729 950 136**	0.462	70.7	21.5	18.9	36

PF 2 33 198 001



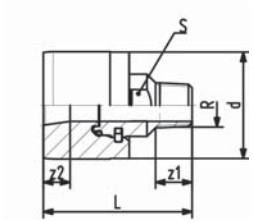
Adaptor fitting ABS/brass R

Model:

- Adaptor fitting equally suitable as socket and spigot
- Brass with taper male thread R
- Gasket: O-ring EPDM

d (mm)	D (mm)	R (inch)	PN (bar)	Code	Weight (kg)	L (mm)	z1 (mm)	z2 (mm)	S (mm)	D1 (mm)
20	25	½	10	**729 950 606**	0.124	70	17	17	25	40
25	32	¾	10	**729 950 607**	0.221	83	19	19	30	50
32	40	1	10	**729 950 608**	0.336	96	22	23	36	59

PF 2 33 198 001



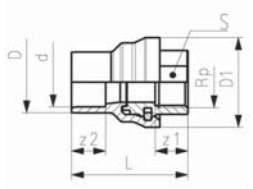
Adaptor fitting ABS/brass R

Model:

- Brass with taper male thread R
- Gasket: O-ring EPDM

d (mm)	R (inch)	PN (bar)	Code	Weight (kg)	L (mm)	z1 (mm)	z2 (mm)	S (mm)
40	½	10	**729 950 631**	0.336	63.2	17.0	12.4	25
50	½	10	**729 950 632**	0.404	69.2	17.0	12.5	25
50	¾	10	**729 950 633**	0.416	72.9	19.0	13.0	30
63	½	10	**729 950 634**	0.492	81.2	17.0	7.1	25
63	¾	10	**729 950 635**	0.501	84.9	19.0	13.0	30
63	1	10	**729 950 636**	0.513	89.7	22.0	18.9	36

PF 2 33 198 001



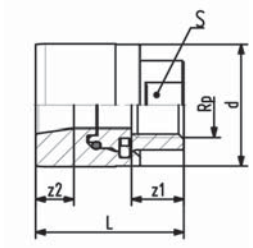
Adaptor fitting ABS/stainless steel Rp

Model:

- Adaptor fitting equally suitable as socket and spigot
- Stainless steel WN 1.4404 (316L) with parallel female thread Rp
- Gasket: O-ring EPDM

d (mm)	D (mm)	Rp (inch)	PN (bar)	Code	Weight (kg)	D1 (mm)	L (mm)	z1 (mm)	z2 (mm)	S (mm)
20	25	½	10	**729 940 106**	0.094	40	55	17	17	25
25	32	¾	10	**729 940 107**	0.164	50	65	19	19	30
32	40	1	10	**729 940 108**	0.251	59	77	22	23	36

PF 2 33 198 001



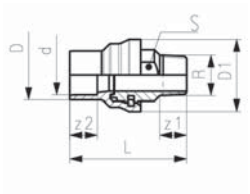
Adaptor fitting ABS/stainless steel Rp

Model:

- Stainless steel WN 1.4404 (316L) with parallel female thread Rp
- Gasket: O-ring EPDM

d (mm)	Rp (inch)	PN (bar)	Code	Weight (kg)	L (mm)	z1 (mm)	z2 (mm)	S (mm)
40	½	10	**729 940 131**	0.356	48.2	17.0	12.4	25
50	½	10	**729 940 132**	0.443	54.2	17.0	12.5	25
50	¾	10	**729 940 133**	0.458	54.9	18.5	13.0	30
63	½	10	**729 940 134**	0.721	66.2	17.0	7.1	25
63	¾	10	**729 940 135**	0.732	66.9	18.5	13.0	30
63	1	10	**729 940 136**	0.746	70.7	21.5	18.9	36

PF 2 33 198 001



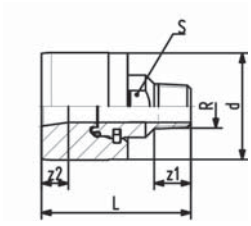
Adaptor fitting ABS/stainless steel R

Model:

- Adaptor fitting equally suitable as socket and spigot
- Stainless steel with taper male thread R
- Gasket: O-ring EPDM

d (mm)	D (mm)	R (inch)	PN (bar)	Code	Weight (kg)	D1 (mm)	L (mm)	z1 (mm)	z2 (mm)	S (mm)
20	25	½	10	**729 940 606**	0.119	40	70	17	17	25
25	32	¾	10	**729 940 607**	0.209	50	83	19	19	30
32	40	1	10	**729 940 608**	0.319	59	96	22	23	36

PF 2 33 198 001



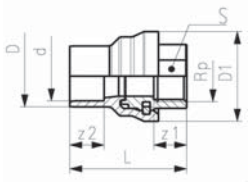
Adaptor fitting ABS/stainless steel R

Model:

- Stainless steel WN 1.4404 (316L) with taper male thread R
- Gasket: O-ring EPDM

d (mm)	R (inch)	PN (bar)	Code	Weight (kg)	L (mm)	z1 (mm)	z2 (mm)	S (mm)
40	½	10	**729 940 631**	0.476	63.2	17.0	12.4	25
50	½	10	**729 940 632**	0.535	69.2	17.0	12.5	25
50	¾	10	**729 940 633**	0.539	72.9	19.0	13.0	30
63	½	10	**729 940 634**	0.861	81.2	17.0	7.1	25
63	¾	10	**729 940 635**	0.869	84.9	19.0	13.0	30
63	1	10	**729 940 636**	0.878	89.7	22.0	18.9	36

PF 2 33 198 001

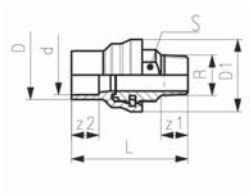


Adaptor fitting ABS/stainless steel F NPT

- With solvent cement spigot/socket metric and female thread NPT
- Gasket: O-ring EPDM
- For transition from ABS to stainless steel

d (mm)	D (mm)	NPT (inch)	PSI (bar)	Code	Weight (lb)	lbs	z1 (inch)	z2 (inch)	L (inch)	S (mm)
20	25	½	150	**729 942 106**	0.207	0	1	1	2	25
25	32	¾	150	**729 942 107**	0.362	0	1	1	3	30
32	40	1	150	**729 942 108**	0.553	1	1	1	3	36

PF 2 33 198 001

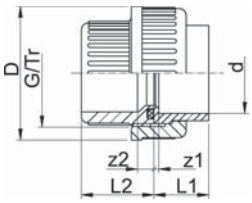


Adaptor fitting ABS/stainless steel M NPT

- With solvent cement spigot/socket metric and male thread NPT
- Gasket: O-ring EPDM
- For transition from ABS to stainless steel

d (mm)	D (mm)	NPT (inch)	PSI (bar)	Code	Weight (lb)	z2 (inch)	lbs	z1 (inch)	L (inch)	S (mm)
20	25	½	150	**729 942 606**	0.262	1	0	1	3	25
25	32	¾	150	**729 942 607**	0.461	1	1	1	3	30
32	40	1	150	**729 942 608**	0.703	1	1	1	4	36

PF 2 33 198 008



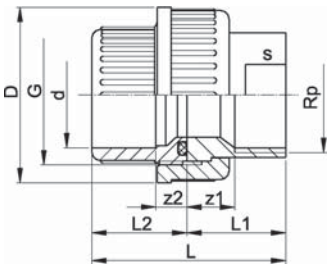
Union ABS metric

Model:

- Union End: Solvent cement socket metric
- Union bush: Solvent cement socket metric
- Gasket: O-ring EPDM code no. 748 410 006-016

d (mm)	d (inch)	PN (bar)	Code	Weight (kg)	L1 (mm)	D (mm)	L2 (mm)	z1 (mm)	z2 (mm)	closest inch (inch)	G/Tr (inch)
20		10	**729 510 106**	0.035	21	43	26	4	10	½	1
25		10	**729 510 107**	0.044	24	53	29	5	10	¾	1 1/4
32		10	**729 510 108**	0.064	27	60	33	5	10	1	1 1/2
40		10	**729 510 109**	0.130	31	74	39	3	12	1 ¼	2
50		10	**729 510 110**	0.154	33	83	46	3	14	1 ½	2 1/4
63		10	**729 510 111**	0.258	40	103	58	3	18	2	2 3/4
75	2 ½	10	**729 510 112**	0.469	47	135	62	3	18	2 ½	Tr 108x5
90		10	**729 510 313**	0.701	56	158	69	5	18	3	Tr 128x5
110		10	**729 510 114**	1.069	66	158	72	5	11	4	Tr 154x5

PF 2 33 198 021



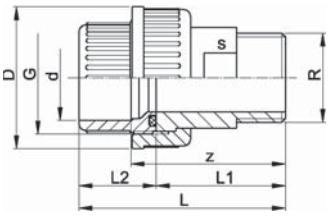
Adaptor union ABS/stainless steel metric Rp

Model:

- Union Nut: ABS
- Union Bush: Solvent cement socket ABS metric
- Union End: Stainless Steel WN 1.4404 (316L), parallel female thread Rp
- Gasket: O-ring EPDM code no. 748 410 006-011

d (mm)	Rp (inch)	PN (bar)	EPDM Code	Weight (kg)	z1 (mm)	z2 (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	G (inch)	s (mm)
20	½	10	**729 540 206**	0.096	11	10	43	50	24	26	1	24
25	¾	10	**729 540 207**	0.154	11	10	51	55	26	29	1 1/4	29
32	1	10	**729 540 208**	0.212	12	10	58	61	29	33	1 1/2	36
40	1 ¼	10	**729 540 209**	0.356	14	12	74	71	33	39	2	45
50	1 ½	10	**729 540 210**	0.443	15	14	83	79	34	46	2 1/4	54
63	2	10	**729 540 211**	0.721	15	18	100	95	39	58	2 3/4	63

PF 2 33 198 021



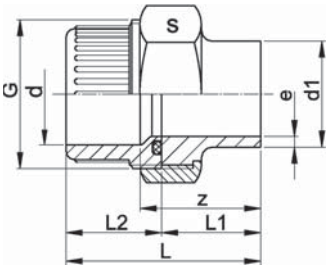
Adaptor union ABS/stainless steel metric R

Model:

- Union Nut: ABS
- Union Bush: Solvent cement socket ABS metric
- Union End: Stainless Steel WN 1.4404 (316L), taper male thread R
- Gasket: O-ring EPDM code no. 748 410 006-011

d (mm)	R (inch)	PN (bar)	EPDM Code	Weight (kg)	z (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	G (inch)	s (mm)
20	½	10	**729 540 706**	0.106	44	43	60	34	26	1	24
25	¾	10	**729 540 707**	0.174	46	51	65	36	29	11/4	32
32	1	10	**729 540 708**	0.262	50	58	72	40	33	11/2	37
40	1 ¼	10	**729 540 709**	0.476	58	74	84	46	39	2	48
50	1 ½	10	**729 540 710**	0.535	62	83	93	48	46	21/4	54
63	2	10	**729 540 711**	0.861	73	100	111	55	58	23/4	69

PF 2 33 198 021



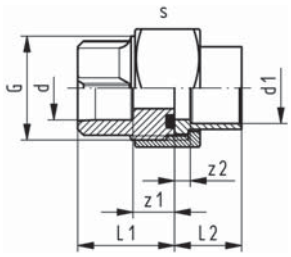
Adaptor union ABS/stainless steel metric Welding end

Model:

- Union End: Stainless Steel WN 1.4404 (316L) with welding end
- Union Bush: Solvent cement socket ABS metric
- Union Nut: Stainless Steel WN 1.4404 (316L)
- Gasket: O-ring EPDM code no. 748 410 006-011

d1 (mm)	d (mm)	PN (bar)	EPDM Code	Weight (kg)	z (mm)	L (mm)	L1 (mm)	L2 (mm)	e (mm)	G (inch)	s (mm)
21	20	10	**729 545 506**	0.176	32	48	22	26	2.0	1	41
27	25	10	**729 545 507**	0.204	33	52	23	29	2.0	1 1/4	46
34	32	10	**729 545 508**	0.313	36	58	26	33	2.0	1 1/2	55
42	40	10	**729 545 509**	0.493	38	64	26	39	2.0	2	68
48	50	10	**729 545 510**	0.566	42	73	28	46	2.0	2 1/4	74
60	63	10	**729 545 511**	0.902	50	88	32	58	2.6	2 3/4	88

PF 2 33 198 005



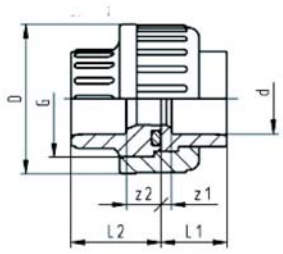
Adaptor union ABS/copper for soldering metric

Model:

- Union End: Copper
- Union Bush: Solvent cement socket ABS metric
- Union Nut: brass
- Gasket: O-ring EPDM code no. 748 410 006-011

PN (bar)	d1 (mm)	d (mm)	Code	Weight (kg)	L1 (mm)	L2 (mm)	z1 (mm)	z2 (mm)	G (inch)	s (mm)
10	22	20	**720 510 106**	0.140	26	19	9	3	1	40
10	28	25	**720 510 107**	0.269	29	28	9	6	1 1/4	50
10	35	32	**720 510 108**	0.198	33	27	10	5	1 1/2	52
10	42	40	**720 510 109**	0.350	39	35	12	6	2	66
10	54	50	**720 510 110**	0.438	46	46	14	3	2 1/4	72

PF 2 33 198 015



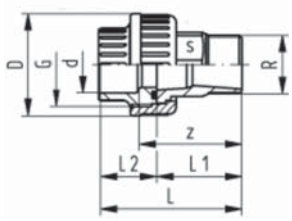
Adaptor union ABS/brass metric Rp

Model:

- Union Nut: ABS
- Union Bush: Solvent cement socket ABS metric
- Union End: Brass with parallel female thread Rp
- Gasket: O-ring EPDM code no. 748 410 006-011

PN (bar)	Rp (inch)	d (mm)	Code	Weight (kg)	z1 (mm)	s (mm)	L2 (mm)	L (mm)	G (inch)	z2 (mm)	D (mm)	L1 (mm)
10	½	20	**729 550 506**	0.084	7	25	26	48	1	10	43	22
10	¾	25	**729 550 507**	0.134	9	30	29	54	1 1/4	11	51	25
10	1	32	**729 550 508**	0.179	8	36	33	60	1 1/2	11	58	27
10	1 ¼	40	**729 550 509**	0.327	10	48	39	70	2	13	72	31
10	1 ½	50	**729 550 510**	0.452	14	55	46	81	2 1/4	21	83	35
10	2	63	**729 550 511**	0.674	14	65	58	98	2 3/4	21	100	40

PF 2 33 198 016



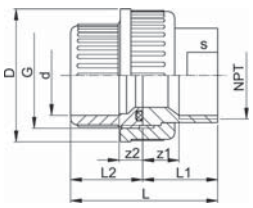
Adaptor union ABS/brass metric R

Model:

- Union Nut: ABS
- Union Bush: Solvent cement socket ABS metric
- Union End: Brass with taper male thread R
- Gasket: O-ring EPDM code no. 748 410 006-011

d (mm)	R (inch)	PN (bar)	Code	Weight (kg)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	z (mm)	G (inch)	s (mm)
20	½	10	**729 550 906**	0.123	43	63	37	26	47	1	25
25	½	10	**729 550 957**	0.185	51	66	37	29	48	1 1/4	30
25	¾	10	**729 550 907**	0.175	51	71	42	29	52	1 1/4	30
25	1	10	**729 550 967**	0.293	51	75	46	29	57	1 1/4	30
32	½	10	**729 550 958**	0.283	58	70	37	33	48	1 1/2	36
32	¾	10	**729 550 968**	0.283	58	75	42	33	53	1 1/2	36
32	1	10	**729 550 908**	0.374	58	79	46	33	57	1 1/2	36
40	1 ¼	10	**729 550 909**	0.503	72	91	52	39	65	2	46
50	1 ½	10	**729 550 910**	0.640	83	102	56	46	71	2 1/4	55
63	2	10	**729 550 911**	1.019	100	125	67	58	87	2 3/4	65

PF 2 33 172 002

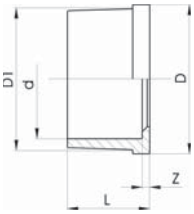


Adapter Union, Stainless Steel FNPT thread, ABS

- Union End: stainless steel (304L) female NPT tread
- Union Bush: solvent cement socket ABS metric
- Union Nut: ABS
- Gasket: O-ring EPDM

NPT (inch)	PSI (bar)	d (mm)	Code	Weight (lb)	z2 (inch)	s (inch)	L (inch)	L1 (inch)	D (inch)	z1 (inch)	G (inch)	L2 (inch)
¾	150	25	**729 541 007**	0.340	0	1 ¼	2	1	2	0	1 ¼	1
1	150	32	**729 541 008**	0.397	0	1 ½	2	1	2	0	1 ½	1
1 ¼	150	40	**150 541 009**	0.287								
1 ½	150	50	**150 541 010**	0.002								
2	150	63	**150 541 011**	1.521								

PF 2 33 198 999



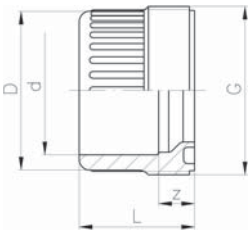
Union end ABS metric

Model:

- Solvent cement socket metric
- For union 729 510 106-114, 729 510 156-164

PN (bar)	d (mm)	Code	Weight (kg)	closest inch (inch)	z (mm)	L (mm)	D (mm)	D1 (mm)
10	20	**729 800 106**	0.007	½	4	21	30	28
10	25	**729 800 107**	0.012	¾	5	24	39	36
10	32	**729 800 108**	0.016	1	5	27	44	41
10	40	**729 800 109**	0.042	1 ¼	3	31	57	53
10	50	**729 800 110**	0.045	1 ½	3	34	63	59
10	63	**729 800 111**	0.084	2	3	41	78	74
10	75	**729 800 162**	0.109	2 ½	3	47	101	91
10	90	**729 800 163**	0.178	3	5	56	121	108
10	110	**729 800 164**	0.295	4	5	66	146	131

PF 2 33 198 999

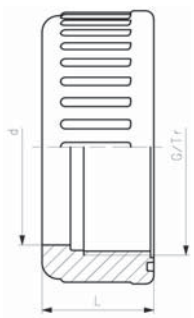


Union bush ABS metric

Model:

- Solvent cement socket metric
- For union 729 510 106-114
- Jointing face: with O-ring groove

d (mm)	PN (bar)	Code	Weight (kg)	closest inch (inch)	z (mm)	D (mm)	L (mm)	G/Tr (inch)
20	10	**729 840 106**	0.011	½	10	28	26	1
25	10	**729 840 107**	0.016	¾	10	33	29	1 1/4
32	10	**729 840 108**	0.027	1	10	41	33	1 1/2
40	10	**729 840 109**	0.046	1 ¼	12	50	39	2
50	10	**729 840 110**	0.058	1 ½	14	62	46	2 1/4
63	10	**729 840 111**	0.110	2	18	77	58	2 3/4
75	10	**729 840 112**	0.160	2 ½	18	93	62	Tr108x5
90	10	**729 840 123**	0.274	3	18	110	69	Tr128x5
110	10	**729 840 114**	0.330	4	11	133	72	Tr154x6



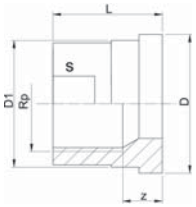
Union nut ABS

Model:

- For union 723 510 105-114

d (mm)	PN (bar)	Code	PF	Weight (kg)	L (mm)	G/Tr (inch)	D (mm)	closest inch (inch)
16	10	**729 890 405**	2 33 172 999	0.009	21	3/4		⅜
20	10	**729 890 406**	2 33 172 999	0.048	23	1	28	½
25	10	**729 890 407**	2 33 172 999	0.046	25	1 1/4	36	¾
32	10	**729 890 408**	2 33 172 999	0.025	27	1 1/2	42	1
40	10	**729 890 409**	2 33 172 999	0.060	30	2	53	1 ¼
50	10	**729 890 410**	2 33 172 999	0.100	34	2 1/4	59	1 ½
63	10	**729 890 411**	2 33 172 999	0.147	38	2 3/4	74	2
75	10	**729 690 012**	2 33 198 999	0.192	40	Tr108x5	92	2 ½
90	10	**729 690 013**	2 33 198 999	0.269	43	Tr128x5	110	3
110	10	**729 690 014**	2 33 198 999	0.416	48	Tr154x6	133	4

PF 2 30 153 999



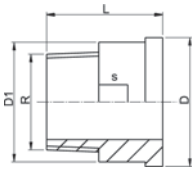
Union end stainless steel Rp

Model:

- Material: stainless steel 1.4404 (316L)
- Parallel female thread Rp

Rp (inch)	PN (bar)	Code	Weight (kg)	z (mm)	D (mm)	D1 (mm)	L (mm)	s (mm)
⅜	16	**724 600 655**	0.030	9	24	22	19	19
½	16	**724 600 656**	0.060	11	30	28	24	24
¾	16	**724 600 657**	0.092	11	39	36	26	29
1	16	**724 600 658**	0.137	12	45	42	29	36
1 ¼	16	**724 600 659**	0.226	14	57	53	33	45
1 ½	16	**724 600 660**	0.314	15	63	59	34	54
2	16	**724 600 661**	0.438	15	78	74	39	63

PF 2 30 153 999



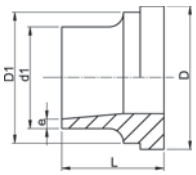
Union end stainless steel R

Model:

- Material: stainless steel 1.4404 (316L)
- Taper male thread R

R (inch)	PN (bar)	Code	Weight (kg)	D (mm)	D1 (mm)	L (mm)	s (mm)
⅜	16	**724 600 705**	0.052	24	22	30	19
½	16	**724 600 706**	0.083	30	28	34	24
¾	16	**724 600 707**	0.125	39	36	36	32
1	16	**724 600 708**	0.189	45	42	40	37
1 ¼	16	**724 600 709**	0.356	57	53	46	48
1 ½	16	**724 600 710**	0.407	63	59	48	54
2	16	**724 600 711**	0.668	78	74	55	69

PF 2 30 153 999



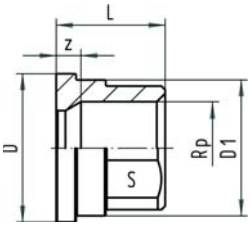
Union end stainless steel Welding end

Model:

- Material: stainless steel 1.4404 (316L)

d1 (mm)	d (mm)	PN (bar)	Code	Weight (kg)	D (mm)	D1 (mm)	L (mm)	e (mm)
17	16	16	**724 605 505**	0.029	24	22	18	1.6
21	20	16	**724 605 506**	0.046	30	28	22	2.0
26	25	16	**724 605 507**	0.080	39	36	23	2.0
33	32	16	**724 605 508**	0.112	45	42	26	2.0
42	40	16	**724 605 509**	0.188	57	53	26	2.0
48	50	16	**724 605 510**	0.222	63	59	28	2.0
60	63	16	**724 605 511**	0.361	78	74	32	2.6

PF 2 30 153 999



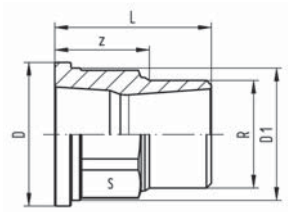
Union end brass Rp

Model:

- Union End: Brass with parallel female thread Rp

Rp (inch)	d (mm)	Code	Weight (kg)	L (mm)	s (mm)	D (mm)	D1 (mm)	z (mm)
½	20	**720 600 236**	0.059	22	25	30	28	5
¾	25	**720 600 237**	0.100	25	30	39	36	6
1	32	**720 600 238**	0.128	27	36	45	42	6
1 ¼	40	**720 600 239**	0.211	31	46	56	53	7
1 ½	50	**720 600 240**	0.324	35	55	62	59	7
2	63	**720 600 241**	0.510	40	65	78	74	8
2 ½	75	**720 600 242**	0.893	47	85	100	92	10
3	90	**720 600 243**	1.395	52	95	121	110	11

PF 2 30 153 999

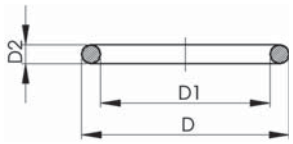


Union end brass R

Model:

- Union End: Brass with taper male thread R

d (mm)	R (inch)	Code	Weight (kg)	z (mm)	D1 (mm)	D (mm)	s (mm)	L (mm)
20	½	**720 600 246**	0.092	22	28	30	25	37
25	¾	**720 600 247**	0.151	25	36	39	30	42
25	½	**720 600 257**	0.142	27	36	39	30	42
32	1	**720 600 248**	0.216	28	42	45	36	46
32	½	**720 600 258**	0.113	31	42	45	36	46
32	¾	**720 600 268**	0.206	30	42	45	36	46
40	1 ¼	**720 600 249**	0.408	32	53	56	46	52
50	1 ½	**720 600 250**	0.538	36	59	62	55	56
63	2	**720 600 251**	0.859	42	74	78	65	67
75	2 ½	**720 600 252**	1.446	49	92	100	85	77
90	3	**720 600 253**	2.063	54	110	121	95	86



O-Ring gasket

Model:

- For unions and adaptor unions
- Hardness approx. 65° Shore
- EPDM minimum temperature -40°C
- FPM minimum temperature -15°C
- * for unions PVC-U, PVC-C and ABS: 21 51 01, 21 51 11, 21 53 03, 21 53 08, 21 55 04, 21 55 13, 21 55 18, 23 51 01 and 29 51 01 only

	d (mm)	DN (mm)	EPDM Code	PF	Weight (kg)	FPM Code	PF	Weight (kg)
	10 - 12	8	**748 410 004**	2 30 162 006	0.002	**749 410 004**	2 30 162 008	0.020
	16	10	**748 410 005**	2 30 162 006	0.004	**749 410 005**	2 30 162 008	0.002
	20	15	**748 410 006**	2 30 162 006	0.002	**749 410 006**	2 30 162 008	0.002
	25	20	**748 410 007**	2 30 162 006	0.002	**749 410 007**	2 30 162 008	0.002
	32	25	**748 410 008**	2 30 162 006	0.003	**749 410 008**	2 30 162 008	0.002

	d (mm)	DN (mm)	D (mm)	D1 (mm)	D2 (mm)	closest inch (inch)
	10 - 12	8	18	12	2.62	¼
	16	10	21	16	2.62	⅜
	20	15	27	20	3.53	½
	25	20	35	28	3.53	¾
	32	25	40	33	3.53	1

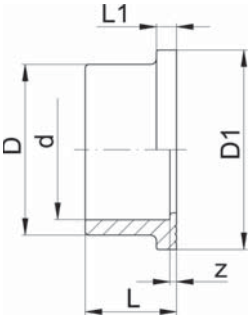
PF 2 34 539 999

Adapter ring for ball valve type 546

d (mm)	DN (mm)	Code	Weight (kg)
20	15	**167 481 182**	0.003
25	20	**167 481 183**	0.003
32	25	**167 481 184**	0.004
40	32	**167 481 185**	0.008
50	40	**167 481 186**	0.014
63	50	**167 481 187**	0.026

PF 2 33 198 019

Flange adaptor ABS metric



Model:

- Counter part: same flange adaptor
- Gasket: profile flange gasket EPDM code no. 748 440 706-723, FPM code no. 749 440 706-723
- Gasket: flat gasket EPDM code no. 748 400 306-323
- Joining faces flat/serrated
- >d225 - maximum operating temperature: +40°C

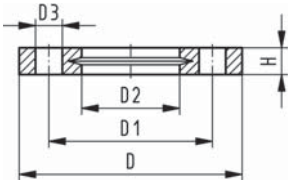
Note:

* bevel on pipe may be needed if used with butterfly valve type 037/038/039

	d (mm)	d (inch)	DN (mm)	PN (bar)	Code	Weight (kg)	D (mm)	D1 (mm)	L (mm)	L1 (mm)	z (mm)	closest inch (inch)
	20		15	10	**729 790 106**	0.007	27	34	21	6	3	½
	25		20	10	**729 790 107**	0.015	33	41	24	7	3	¾
	32		25	10	**729 790 108**	0.020	41	50	27	7	3	1
	40		32	10	**729 790 109**	0.028	50	61	30	8	3	1 ¼
	50		40	10	**729 790 110**	0.038	61	73	34	8	3	1 ½
	63		50	10	**729 790 111**	0.068	76	90	41	9	3	2
	75	2 ½	65	10	**729 790 112**	0.116	91	106	47	10	3	2 ½
	90		80	10	**729 790 113**	0.185	108	125	56	11	5	3
	110		100	10	**729 790 114**	0.305	131	150	66	12	5	4
	140	5	125	10	**729 790 116**	0.535	165	188	81	14	5	5
*	160		150	10	**729 790 117**	0.821	188	213	91	16	5	6
*	200		200	10	**729 790 119**	1.123	224	250	112	24	6	8
	225		200	10	**729 790 120**	1.330	248	274	125	25	6	8
	250		250	6	**729 790 121**	1.699	274	303	140	23	9	9
	280		250	6	**729 790 122**	2.183	307	329	151	23	5	10
	315		300	6	**729 790 123**	3.321	346	379	172	27	8	12

PF 2 34 238 030

Backing flange PP-V metric
For socket systems metric and BS



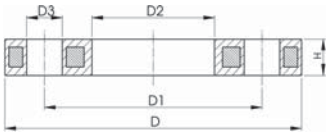
Model:

- Connecting dimension: ISO 7005, EN 1092, BS 4504, DIN 2501
- **Bolt circle PN 10**
- Full-plastic flange PP-GF (30 % glass-fibre reinforced)

[1]) Suitable for socket- and butt fusion systems
[2]) Not for BS
[3]) Combined version, metric - ANSI
AL: number of holes

	d (mm)	DN (mm)	PN (bar)	Code	Weight (kg)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	H (mm)	AL	SC
1	20	15	16	**727 700 406**	0.093	95	65	28	14	16	4	M12
1	25	20	16	**727 700 407**	0.120	105	75	34	14	17	4	M12
1	32	25	16	**727 700 408**	0.151	115	85	42	14	18	4	M12
1	40	32	16	**727 700 409**	0.244	140	100	51	18	20	4	M16
1	50	40	16	**727 700 410**	0.297	150	110	62	18	22	4	M16
1	63	50	16	**727 700 411**	0.362	165	125	78	18	24	4	M16
1	75	65	16	**727 700 412**	0.487	185	145	92	18	26	4	M16
	90	80	16	**727 700 413**	0.550	200	160	110	18	27	8	M16
2	110	100	16	**727 700 414**	0.640	220	180	133	18	28	8	M16
	140	125	16	**727 700 416**	0.781	250	210	167	18	30	8	M16
2	160	150	16	**727 700 417**	1.050	285	240	190	22	32	8	M20
3	200	200	16	**727 700 419**	1.629	340	295	226	22	34	8	M20
3	225	200	16	**727 700 420**	1.400	340	295	250	22	34	8	M20
	250	250	16	**727 700 421**	2.229	395	350	277	22	38	12	M20
	280	250	16	**727 700 422**	1.651	395	350	310	22	38	12	M20
	315	300	16	**727 700 423**	2.461	445	400	348	22	42	12	M20

PF 2 34 238 020



Backing flange PP-Steel metric
For socket systems metric and BS

Model:

- **Bolt circle PN 10**
- PP-GF (30% glass-fibre reinforced) with steel ring
- UV-resistant. Applicable for outside applications
- Connecting dimension: ISO 7005, EN 1092, BS 4504, DIN 2501

AL: number of holes

[1]) Suitable for socket -and butt fusion systems

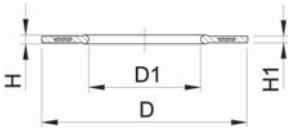
[2]) Not for BS

[3]) Connecting dimension: ISO 2536. bolt circle acc. DN125. suitable for flange adaptor d125/ DN100

[4]) Connecting dimension: ISO 2536. bolt circle acc. DN225. suitable for flange adaptor d250/ DN250

[5]) Combined version, bolt circle metric - ANSI

	d (mm)	DN (mm)	PN (bar)	Code	Weight (kg)	D1 (mm)	D3 (mm)	D2 (mm)	D (mm)	H (mm)	AL	SC
1	20	15	16	**727 700 206**	0.216	65	14	28	95	12	4	M12
1	25	20	16	**727 700 207**	0.279	75	14	34	105	12	4	M12
1	32	25	16	**727 700 208**	0.429	85	14	42	115	16	4	M12
1	40	32	16	**727 700 209**	0.621	100	18	51	140	16	4	M16
1	50	40	16	**727 700 210**	0.722	110	18	62	150	20	4	M16
1	63	50	16	**727 700 211**	1.084	125	18	78	165	20	4	M16
1	75	65	16	**727 700 212**	1.349	145	18	92	185	20	4	M16
	90	80	16	**727 700 213**	1.369	160	18	110	200	20	8	M16
2	110	100	16	**727 700 214**	1.522	180	18	133	220	20	8	M16
3	125	125	16	**727 700 815**	2.475	210	18	150	250	26	8	M16
	140	125	16	**727 700 816**	2.033	210	18	167	250	26	8	M16
2/5	160	150	16	**727 700 817**	3.167	241	22	190	285	26	8	M20
5	200	200	16	**727 700 819**	6.143	297	22	226	340	29	8	M20
5	225	200	16	**727 700 820**	4.448	297	22	250	340	29	8	M20
	250	250	16	**727 700 821**	7.179	350	22	277	395	32	12	M20
4	250	225	16	**727 700 031**	8.340	325	22	277	395	32	8	M20
	280	250	16	**727 700 822**	5.547	350	22	310	395	32	12	M20
	315	300	16	**727 700 823**	6.980	400	22	348	445	36	12	M20



Profile Flange Gasket, metric
EPDM / FPM

Model:

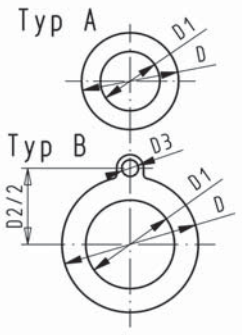
- For all metric GF Flange Adaptors
- Hardness: 70° Shore EPDM, 75° Shore FPM
- EPDM: approved acc. to DVGW W 270, KTW recommendation
- Centering on the inner diameter of the screw crown
- material steel insert: carbon steel
- Rubber-steel body combined with rubber profile cord ring

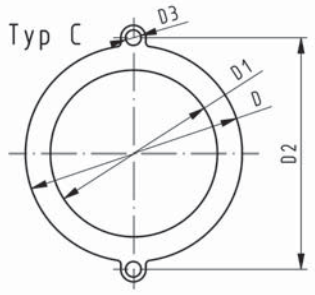
di FA are the suitable inner diameters of flanges adaptors

d (mm)	PN (bar)	DN (mm)	EPDM Code	PF	FPM Code	PF	Weight (kg)
20	16	15	**748 440 706**	2 30 162 037	**749 440 706**	2 30 162 038	0.013
25	16	20	**748 440 707**	2 30 162 037	**749 440 707**	2 30 162 038	0.014
32	16	25	**748 440 708**	2 30 162 037	**749 440 708**	2 30 162 038	0.019
40	16	32	**748 440 709**	2 30 162 037	**749 440 709**	2 30 162 038	0.026
50	16	40	**748 440 710**	2 30 162 037	**749 440 710**	2 30 162 038	0.039
63	16	50	**748 440 711**	2 30 162 037	**749 440 711**	2 30 162 038	0.050
75	16	65	**748 440 712**	2 30 162 037	**749 440 712**	2 30 162 038	0.082
90	16	80	**748 440 713**	2 30 162 037	**749 440 713**	2 30 162 038	0.083
110	16	100	**748 440 714**	2 30 162 037	**749 440 714**	2 30 162 038	0.127
125	16	100	**748 440 715**	2 30 162 037	**749 440 715**	2 30 162 038	0.105
140	16	125	**748 440 716**	2 30 162 037	**749 440 716**	2 30 162 038	0.173
160 - 180	16	150	**748 440 717**	2 30 162 037	**749 440 717**	2 30 162 038	0.207
200	16	200	**748 440 719**	2 30 162 037	**749 440 719**	2 30 162 038	0.263
225	16	200	**748 440 720**	2 30 162 037	**749 440 720**	2 30 162 038	0.255
250	16	250	**748 440 721**	2 30 162 037	**749 440 721**	2 30 162 038	0.462
280	16	250	**748 440 722**	2 30 162 037	**749 440 722**	2 30 162 038	0.323
315	16	300	**748 440 723**	2 30 162 037	**749 440 723**	2 30 162 038	0.549

d (mm)	PN (bar)	D (mm)	D1 (mm)	di FA (mm)	H (mm)	H1 (mm)
20	16	51	20	10 - 20	4	3
25	16	61	22	12 - 22	4	3
32	16	71	28	18 - 28	4	3
40	16	82	40	30 - 40	4	3
50	16	92	46	36 - 46	4	3
63	16	107	58	48 - 58	5	4
75	16	127	69	59 - 69	5	4
90	16	142	84	73 - 84	5	4
110	16	162	104	94 - 104	6	5
125	16	162	123	113 - 123	6	5
140	16	192	137	127 - 137	6	5
160 - 180	16	218	160	150 - 160	8	6
200	16	273	203	192 - 203	8	6
225	16	273	220	207 - 220	8	6
250	16	328	252	238 - 252	8	6
280	16	328	274	264 - 274	8	6
315	16	378	306	296 - 306	8	6

PF 2 30 162 003





Flat gasket
EPDM

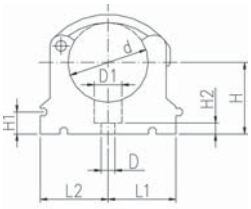
Model:

- For all metric GF Flange Adaptors
- Hardness approx. 65° Shore
- Integrated fixation aids from d110
- Centering on the inner diameter of the screw crown

di FA are the suitable inner diameters of flanges adaptors

d (mm)	DN (mm)	PN (bar)	Type	EPDM Code	Weight (kg)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	H (mm)	di FA (mm)
20	15	10	A	**748 400 306**	0.012	51	20			2	10 - 30
25	20	10	A	**748 400 307**	0.004	61	25			2	15 - 35
32	25	10	A	**748 400 308**	0.008	71	32			2	22 - 42
40	32	10	A	**748 400 309**	0.013	82	40			3	30 - 50
50	40	10	A	**748 400 310**	0.016	92	50			3	40 - 60
63	50	10	A	**748 400 311**	0.018	107	63			3	53 - 73
75	65	10	A	**748 400 312**	0.029	127	71			3	61 - 81
90	80	10	A	**748 400 313**	0.035	142	84			3	74 - 94
110	100	10	B	**748 400 314**	0.051	162	104	180	18	4	94 - 114
125	100	10	B	**748 400 315**	0.044	162	119	180	18	4	109 - 129
140	125	10	B	**748 400 316**	0.068	192	134	210	18	4	124 - 144
160 - 180	150	10	B	**748 400 317**	0.090	218	155	241	22	4	145 - 165
200	200	6	C	**748 400 319**	0.210	273	195	295	22	5	185 - 205
225	200	6	C	**748 400 320**	0.140	273	216	295	22	5	206 - 226
250	250	6	C	**748 400 321**	0.210	328	250	350	22	5	240 - 260
280	250	6	C	**748 400 322**	0.151	328	273	350	22	5	263 - 283
315	300	6	C	**748 400 323**	0.237	378	305	400	22	5	295 - 315

PF 2 30 162 023



KLIP-IT pipe clip type 061 PP metric

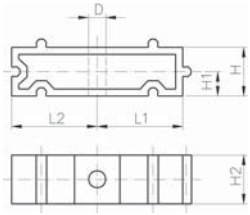
Model:

- Material: clip and safety clip PP black, UV resistant
- d16 - d63: height designed for ball valve type 546 and 543
- **Minimum order quantity: standard packagings SP**

	d (mm)	d (inch)	Code	Weight (kg)
*	10		**167 061 003**	0.003
*	12		**167 061 004**	0.003
*	16		**167 061 035**	0.007
*	20		**167 061 036**	0.007
*	25		**167 061 037**	0.009
*	32		**167 061 038**	0.012
	40		**167 061 039**	0.027
	50		**167 061 040**	0.031
	63		**167 061 041**	0.052
	75	2 ½	**167 061 012**	0.057
	90	3	**167 061 013**	0.092
	110	4	**167 061 014**	0.117
	125		**167 061 015**	0.180
	140	5	**167 061 016**	0.224
	160		**167 061 017**	0.242

	d (mm)	D (mm)	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L1 (mm)	L2 (mm)	SC	closest inch (inch)
*	10	5	8	20	10	6	12	11	14	M4	⅛
*	12	5	8	21	10	6	12	11	14	M5	¼
*	16	6	11	27	10	6	16	14	17	M5	⅜
*	20	6	11	27	10	6	16	17	19	M5	½
*	25	6	11	30	10	6	16	19	22	M5	¾
*	32	6	11	36	10	6	16	24	27	M5	1
	40	7	14	44	10	7	22	34	34	M6	1 ¼
	50	7	14	51	10	7	22	37	37	M6	1 ½
	63	9	17	64	10	10	25	45	45	M8	2
	75	9	17	58	10	10	25	52	52	M8	2 ½
	90	9	17	65	10	10	28	65	65	M8	3
	110	9	17	75	10	10	28	79	79	M8	4
	125	9	17	90	10	10	32	88	88	M8	
	140	9	17	110	10	10	32	98	98	M8	5
	160	9	17	108	10	10	32	109	109	M8	6

PF 2 30 162 023



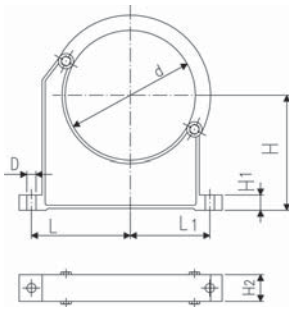
KLIP-IT spacer type 061 PP

Model:

- For pipe clips type 061/061H, PP black, UV resistant
- **Minimum order quantity: standard packaging SP**

d (mm)	Inch (inch)	Code	Weight (kg)	D (mm)	L1 (mm)	L2 (mm)	H (mm)	H1 (mm)	H2 (mm)	SC
10 - 12	⅛ - ¼	**167 061 153**	0.003	5	11	14	20	10	12	M4
16	⅜	**167 061 155**	0.005	6	14	17	20	10	16	M5
20	½	**167 061 156**	0.005	6	17	19	20	10	16	M5
25	¾	**167 061 157**	0.007	6	19	22	20	10	16	M5
32	1	**167 061 158**	0.006	6	24	27	20	10	16	M5
40	1 ¼	**167 061 159**	0.015	7	34	34	20	10	22	M6
50	1 ½	**167 061 160**	0.017	7	37	37	20	10	22	M6
63	2	**167 061 161**	0.020	9	45	45	20	10	25	M8
75	2 ½	**167 061 162**	0.027	9	52	52	20	10	25	M8
90	3	**167 061 163**	0.039	9	65	65	20	10	28	M8
110	4	**167 061 164**	0.048	9	79	79	20	10	28	M8
125	4 ½	**167 061 165**	0.059	9	88	88	20	10	32	M8
140	5	**167 061 166**	0.065	9	98	98	20	10	32	M8
160	6	**167 061 167**	0.071	9	109	109	20	10	32	M8

PF 2 30 162 023



Pipe clip type 060 PP metric

Model:

- Material: clip and safety clip PP black, UV resistant
- **Minimum order quantity: standard packaging SP or gross packaging GP**
- Accidental opening of the safety clip is not possible
- Clip and safety clip are not assembled in the packaging.
- Pipes with flanges can be installed directly

d (mm)	Code	Weight (kg)	D (mm)	L (mm)	L1 (mm)	H (mm)	H1 (mm)	H2 (mm)	SC	closest inch (inch)
90	**167 060 038**	0.144	9	89	71	105	15	33	M 8	3
110	**167 060 039**	0.158	9	94	80	115	15	33	M 8	4
125	**167 060 040**	0.249	11	116	91	130	20	35	M10	
140	**167 060 041**	0.260	11	121	98	130	20	35	M10	5
160	**167 060 042**	0.296	11	131	107	148	20	35	M10	6
180	**167 060 043**	0.327	11	143	115	163	20	35	M10	7
200	**167 060 019**	0.539	13	152	120	175	25	39	M12	8
225	**167 060 020**	0.178	13	165	132	175	25	39	M12	8
250	**167 060 021**	0.657	13	183	143	200	25	39	M12	9
280	**167 060 022**	0.212	13	198	156	200	25	39	M12	10
315	**167 060 023**	0.805	13	219	172	225	25	39	M12	12
355	**167 060 024**	1.251	17	275	209	258	30	50	M16	14
400	**167 060 025**	1.031	17	300	228	288	30	50	M16	16

Solvent cements & tools

PF 2 28 473 005

Tangit ABS solvent cement

Description	Code	Weight (kg)
Tin: 0.65 kg (net)	**799 298 022**	0.750

PF 2 28 473 002

Tangit PVC-U/PVC-C/ABS cleaner

Model:

- For PVC-U, PVC-C, ABS
- 1 litre tin

Code	Weight (kg)
799 298 010	0.900

PF 2 28 473 009

Cap for cement

- Cap prevents the evaporation of the solvent whilst using the Tangit cement

Code	Weight (kg)
799 298 028	0.030

PF 2 30 217 004

Round brush

d-d (mm)		Code	Weight (kg)	Closest inch (inch)
6 - 10	4 mm (for Fittings 6-10mm)	**799 299 001**	0.004	⅛
12 - 32	8 mm (for Fittings 12-32mm)	**799 299 002**	0.006	¼ - 1

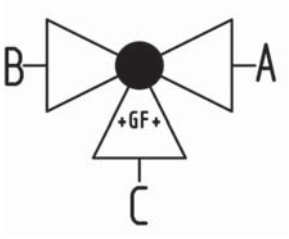
PF 2 30 217 005

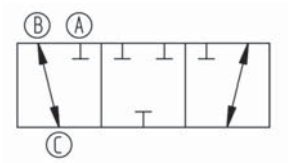
Flat brush

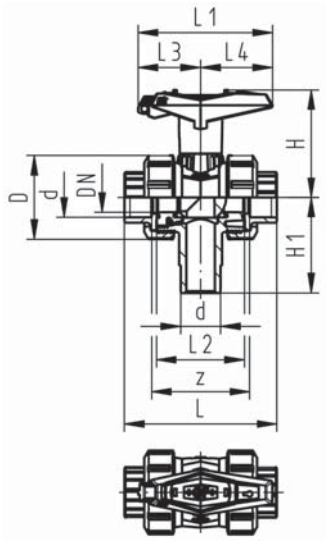
d-d (mm)		Code	Weight (kg)	Closest inch (inch)
40 - 63	25x3 mm (for Fittings 40-63mm)	**799 299 003**	0.015	1 ¼ - 2
75 - 225	50x5 mm (for Fittings 75-225mm)	**799 299 004**	0.035	2 ½ - 8
250 - 400	75x6 mm (for Fittings 250-400mm)	**799 299 005**	0.053	9 - 16

Ball valves type 543

PF 2 33 728 901







3-Way ball valve type 543 ABS
Vertical/L-port
With lockable handle
With solvent cement sockets metric

Model:

- Vertical inlet solvent cement spigot metric
- Easy installation and removal using union on third outlet
- Ball seals PTFE
- Electric actuator available separately
- Angle of operation 360° without turn limiter
- Multifunctional lever red with ratched setting 45°, lockable
- Delivery status B-C opened, see flow scheme

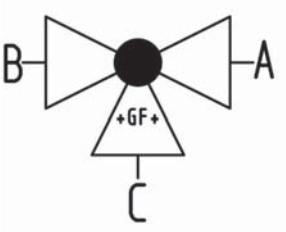
Mode of action:

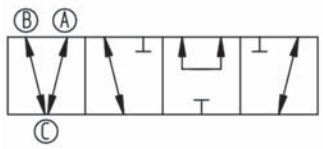
- For interconnection of two inputs

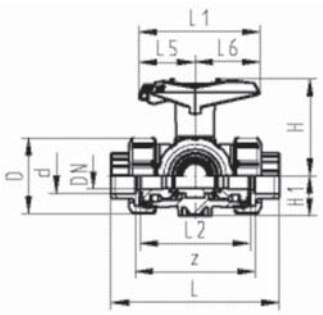
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	49	**169 543 821**	0.198
20	15	10	77	**169 543 822**	0.202
25	20	10	146	**169 543 823**	0.289
32	25	10	260	**169 543 824**	0.433
40	32	10	437	**169 543 825**	0.734
50	40	10	667	**169 543 826**	1.079
63	50	10	1293	**169 543 827**	2.088

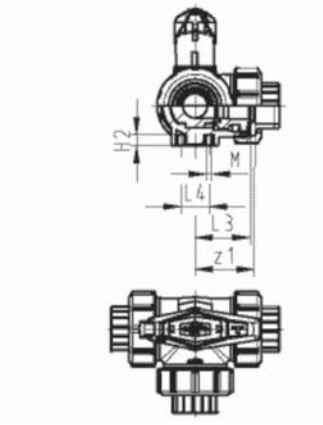
d (mm)	D (mm)	H (mm)	H1 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	z (mm)	closest inch (inch)
16	50	79	62	92	87	56	42	45	64	⅜
20	50	79	62	95	87	56	42	45	64	½
25	58	88	72	111	108	66	50	58	74	¾
32	68	94	77	123	108	71	50	58	79	1
40	84	113	87	146	140	85	66	74	95	1 ¼
50	97	119	97	157	140	89	66	74	95	1 ½
63	124	141	112	183	165	101	78	87	107	2

PF 2 33 728 801









3-Way ball valve type 543 ABS
Horizontal/T-port
With lockable handle
With solvent cement sockets metric

Model:

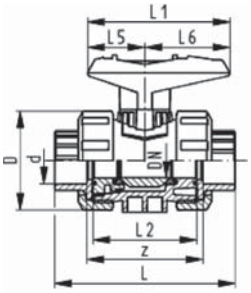
- For easy installation and removal (valve end and union nut are compatible with type 546)
- Ball seals PTFE
- Pneumatic or electric actuator available separately
- Angle of operation 360° without turn limiter
- Turn limiter 90° enclosed, in different positions usable as a clip-on ring
- Integrated stainless steel mounting inserts
- Multifunctional lever red with ratched setting 45°, lockable
- Delivery status A-B-C opened, see flow scheme

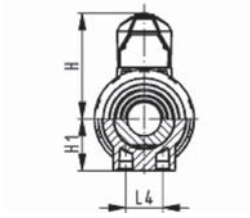
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	140	**169 543 811**	0.197
20	15	10	200	**169 543 812**	0.202
25	20	10	470	**169 543 813**	0.281
32	25	10	793	**169 543 814**	0.428
40	32	10	1290	**169 543 815**	0.725
50	40	10	1910	**169 543 816**	1.063
63	50	10	3100	**169 543 817**	2.054

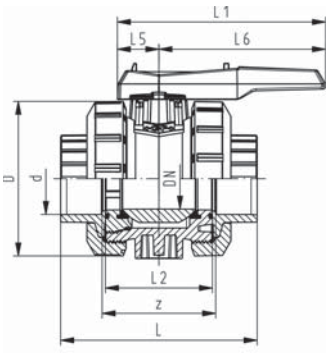
d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	M	z (mm)	z1 (mm)	closest inch (inch)
16	50	79	28	8	109	87	73	36	25	42	45	6	81	40	⅜
20	50	79	28	8	112	87	73	36	25	42	45	6	81	40	½
25	58	88	32	8	131	108	86	43	25	50	58	6	94	47	¾
32	68	94	36	8	151	108	99	50	25	50	58	6	107	54	1
40	84	113	45	9	181	141	120	60	45	66	75	8	130	65	1 ¼
50	97	119	51	9	205	141	137	69	45	66	75	8	143	72	1 ½
63	124	141	65	9	261	165	179	89	45	78	87	8	185	92	2

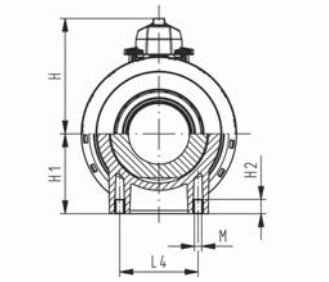
Ball valves type 546

DN10/15 - 50









Ball valve type 546 ABS
With solvent cement sockets metric

Model:

- For easy installation and removal
- Ball seals PTFE
- Without mounting inserts
- z-dimension, valve end and union nut are **not compatible** with type 346 (DN10/15-50) resp. type 370 (DN65-100)

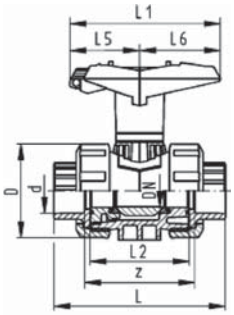
Option:

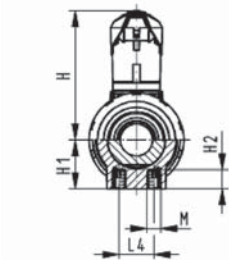
- Individual configuration of the valve (see diagram)
- Multifunctional module with integrated limit switches
- Pneumatic or electric actuators from +GF+

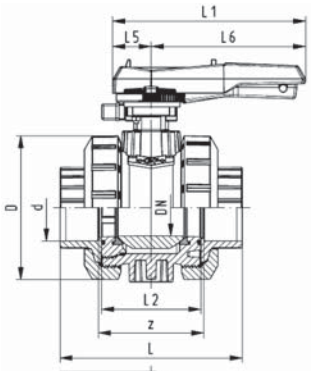
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
16	10	10	71	**169 546 001**	2 33 542 801	0.112
20	15	10	185	**169 546 002**	2 33 542 801	0.119
25	20	10	350	**169 546 003**	2 33 542 801	0.184
32	25	10	700	**169 546 004**	2 33 542 801	0.265
40	32	10	1000	**169 546 005**	2 33 542 801	0.470
50	40	10	1600	**169 546 006**	2 33 542 801	0.647
63	50	10	3100	**169 546 007**	2 33 542 801	1.190
75	65	10	5000	**169 546 008**	2 33 542 604	2.936
90	80	10	7000	**169 546 009**	2 33 542 601	4.973
110	100	10	11000	**169 546 010**	2 33 542 601	6.930

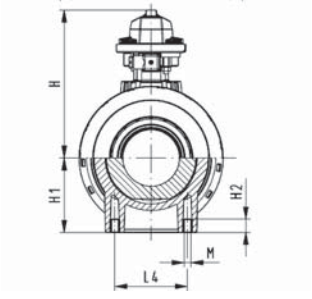
d (mm)	D (mm)	H (mm)	H1 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	z (mm)	closest inch (inch)
16	50	57	27	92	77	56	25	32	45	64	⅜
20	50	57	27	95	77	56	25	32	45	64	½
25	58	67	30	110	97	65	25	39	58	72	¾
32	68	73	36	123	97	71	25	39	58	79	1
40	84	90	44	146	128	85	45	54	74	94	1 ¼
50	97	97	51	157	128	89	45	54	74	95	1 ½
63	124	116	64	183	152	101	45	66	87	107	2
75	166	149	85	233	270	136	70	64	206	144	2 ½
90	200	161	105	254	270	141	70	64	206	151	3
110	238	178	123	301	320	164	120	64	256	174	4

DN10/15 - 50









Ball valve type 546 ABS
With lockable handle
With solvent cement sockets metric

Model:

- For easy installation and removal
- Ball seals PTFE
- Integrated stainless steel mounting inserts
- z-dimension, valve end and union nut are **not compatible** with type 346 (DN10/15-50) resp. type 370 (DN65-100)
- Lockable hand lever with ratchet settings

Option:

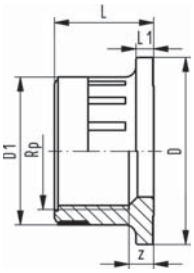
- Individual configuration of the valve (see diagram)
- Multifunctional module with integrated limit switches
- Pneumatic or electric actuators from +GF+

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
16	10	10	71	**169 546 081**	2 33 542 801	0.121
20	15	10	185	**169 546 082**	2 33 542 801	0.123
25	20	10	350	**169 546 083**	2 33 542 801	0.193
32	25	10	700	**169 546 084**	2 33 542 801	0.273
40	32	10	1000	**169 546 085**	2 33 542 801	0.480
50	40	10	1600	**169 546 086**	2 33 542 801	0.665
63	50	10	3100	**169 546 087**	2 33 542 801	1.205
75	65	10	5000	**169 546 088**	2 33 542 604	4.200
90	80	10	7000	**169 546 089**	2 33 542 601	6.100
110	100	10	11000	**169 546 090**	2 33 542 601	9.400

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	M	z (mm)	closest inch (inch)
16	50	79	27	12	92	87	56	25	42	45	M6	64	⅜
20	50	79	27	12	95	87	56	25	42	45	M6	64	½
25	58	88	30	12	110	108	65	25	50	58	M6	72	¾
32	68	94	36	12	123	108	71	25	50	58	M6	79	1
40	84	113	44	15	146	140	85	45	66	75	M8	94	1 ¼
50	97	119	51	15	157	140	89	45	66	75	M8	95	1 ½
63	124	141	64	15	183	165	101	45	78	87	M8	107	2
75	166	224	85	15	233	270	136	70	64	206	M8	144	2 ½
90	200	235	105	15	254	270	141	70	64	206	M8	151	3
110	238	245	123	22	301	320	164	120	64	256	M12	174	4

Valve ends for ball valves type 543 and 546

PF 2 33 542 999



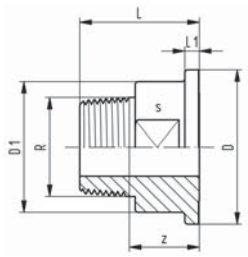
Valve end 546 and 543 ABS (G23)
With threaded socket Rp reinforced

Model:

- Connection to plastic or metal threads
- Reinforcing ring stainless (A2)
- Do not use thread sealing pastes that are harmful to ABS

Rp (inch)	PN (bar)	Code	Weight (kg)	D (mm)	D1 (mm)	L (mm)	L1 (mm)	z (mm)
⅜	16	**169 480 925**	0.008	38	24	20	4	7
½	16	**169 480 926**	0.010	38	28	22	4	6
¾	16	**169 480 927**	0.014	44	34	25	5	7
1	16	**169 480 928**	0.023	53	42	28	5	7
1 ¼	16	**169 480 929**	0.035	65	52	30	5	7
1 ½	16	**169 480 930**	0.077	77	63	32	6	9
2	16	**169 480 931**	0.130	99	78	38	7	10

PF 2 33 542 999



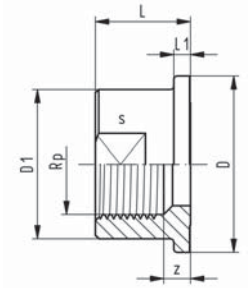
Valve end 546 and 543 brass
With threaded spigot R

Model:

- Connection to metal threads

Size (inch)	Code	Weight (kg)	D (mm)	D1 (mm)	D2 (mm)	L1 (mm)	L (mm)	z (mm)	s (mm)
½	**161 486 640**	0.144	38	32	13	4	36	23	30
¾	**161 486 641**	0.201	44	38	16	5	36	22	36
1	**161 486 642**	0.326	53	45	20	5	41	24	41

PF 2 33 542 999



Valve end 546 and 543 brass
With threaded socket Rp

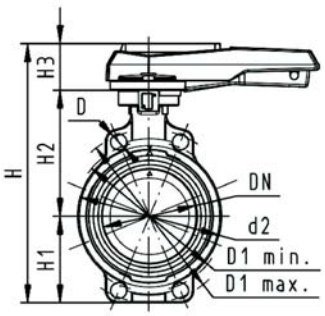
Model:

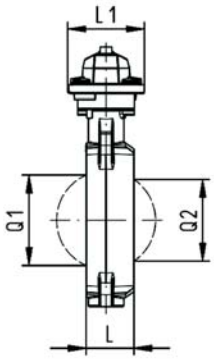
- Connection to metal threads

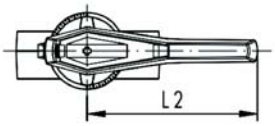
Size (inch)	Code	Weight (kg)	D (mm)	D1 (mm)	D2 (mm)	L (mm)	L1 (mm)	s (mm)	z (mm)
½	**161 486 651**	0.091	38	32	15	20	4	30	5
¾	**161 486 652**	0.149	44	38	20	25	5	36	8
1	**161 486 653**	0.224	53	45	25	29	5	41	10

Butterfly valves type 567

PF 2 33 564 001







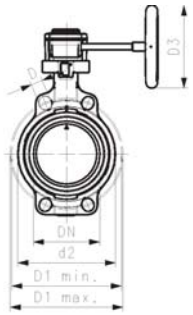
Butterfly valve type 567 ABS
Hand lever with ratchet settings

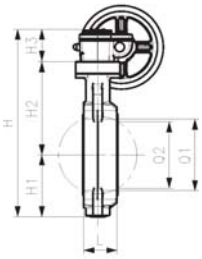
Model:

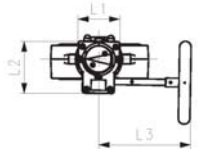
- Overall length according to EN 558, ISO 5752
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
63	50	10	1470	**169 567 002**	1.187
75	65	10	2200	**169 567 003**	1.282
90	80	10	3000	**169 567 004**	1.420
110	100	10	6500	**169 567 005**	2.020
140	125	10	11500	**169 567 006**	2.536
160	150	10	16600	**169 567 007**	3.337
225	200	10	39600	**169 567 008**	5.808
280	250	10	55200	**169 567 009**	14.328
315	300	10	80000	**169 567 010**	18.899

d (mm)	d2 (mm)	D (mm)	D1 min. (mm)	D1 max. (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L1 (mm)	L2 (mm)	Q1 (mm)	Q2 (mm)	closest inch (inch)
63	104	19	120.0	125.0	265	77	134	54	45	106	205	40		2
75	115	19	139.7	145.0	277	83	140	54	46	106	205	54	35	2 ½
90	131	19	150.0	160.0	289	89	146	54	49	106	205	67	50	3
110	161	19	175.0	190.5	326	104	167	55	56	106	255	88	74	4
140	187	23	210.0	215.9	353	117	181	55	64	106	255	113	97	5
160	215	24	241.3	241.3	374	130	189	55	72	106	255	139	123	6
225	267	23	290.0	295.0	435	158	210	67	73	140	408	178	169	8
280	329	25	353.0	362.0	554	205	264	85	113	149	408	210	207	10
315	379	25	400.0	432.0	598	228	285	85	113	149	408	256	253	12







Butterfly valve type 567 ABS
Reduction gear with handwheel

Model:

- Overall length according to EN 558, ISO 5752
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
63	50	10	1470	**169 567 022**	2 33 564 003	3.078
75	65	10	2200	**169 567 023**	2 33 564 003	3.201
90	80	10	3000	**169 567 024**	2 33 564 003	3.259
110	100	10	6500	**169 567 025**	2 33 564 003	3.493
140	125	10	11500	**169 567 026**	2 33 564 003	4.526
160	150	10	16600	**169 567 027**	2 33 564 003	5.118
225	200	10	39600	**169 567 028**	2 33 564 003	6.389
280	250	10	51000	**169 567 029**	2 33 564 001	12.998
315	300	10	73000	**169 567 030**	2 33 564 001	19.139

d (mm)	d2 (mm)	D (mm)	D1 min. (mm)	D1 max. (mm)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	Q1 (mm)
63	104	19	120	125	160	273	77	134	62	45	78	112	179	40
75	115	19	140	145	150	285	83	140	62	46	78	112	179	54
90	131	19	150	160	150	297	89	146	62	49	78	112	179	67
110	160	19	175	191	150	333	104	167	62	56	78	112	179	88
140	187	23	210	216	150	360	117	181	62	64	78	112	179	113
160	215	24	241	241	160	381	130	189	62	72	78	112	179	139
225	267	23	290	295	160	430	158	210	62	73	78	112	179	178
280	329	25	353	362	200	538	205	264	69	113	97	130	198	210
315	379	25	400	432	200	582	228	285	69	113	97	130	198	256

d (mm)	Q2 (mm)	closest inch (inch)
63		2
75	35	2 ½
90	50	3
110	74	4
140	97	5
160	123	6
225	169	8
280	207	10
315	253	12

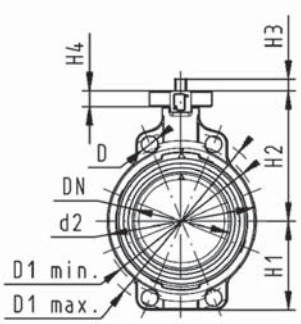
PF 2 33 564 998

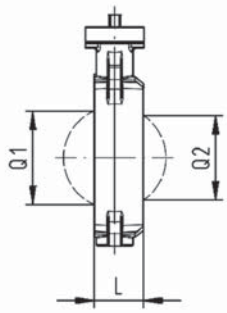
Butterfly valve type 567 ABS
Bare shaft

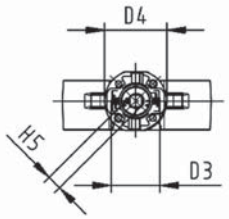
Model:

- Overall length according to EN 558, ISO 5752
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220
- Interface F07 according to DIN/ISO 5211

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
63	50	10	1470	**169 567 802**	0.763
75	65	10	2200	**169 567 803**	0.859
90	80	10	3000	**169 567 804**	0.999
110	100	10	6500	**169 567 805**	1.535
140	125	10	11500	**169 567 806**	2.018
160	150	10	16600	**169 567 807**	2.858
225	200	10	39600	**169 567 808**	4.129
280	250	10	51000	**169 567 809**	11.600
315	300	10	73000	**169 567 810**	16.000





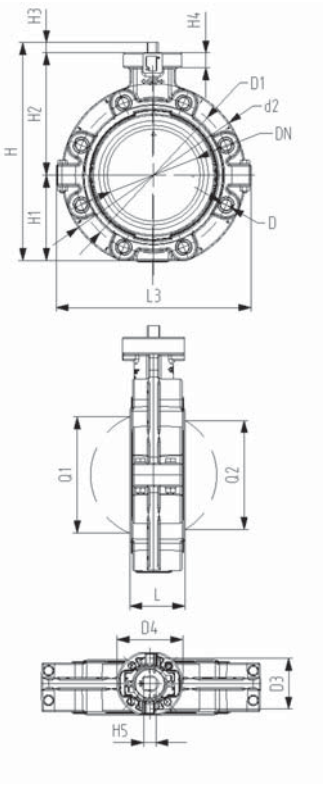


d (mm)	d2 (mm)	D (mm)	D1 min. (mm)	D1 max. (mm)	D3 (mm)	D4 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	Q1 (mm)
63	104	19	120	125	70	90	238	77	134	27	23	11	45	40
75	115	19	140	145	70	90	250	83	140	27	23	11	46	54
90	131	19	150	160	70	90	262	89	146	27	23	11	49	67
110	161	19	175	191	70	90	287	104	167	16	23	14	56	88
140	187	23	210	216	70	90	314	117	181	16	23	14	64	113
160	215	24	241	241	70	90	338	130	189	19	23	17	72	139
225	267	23	290	295	70	90	387	158	210	19	23	17	73	178
280	329	25	353	362	102	125	509	205	264	40	23	22	113	210
315	379	25	400	432	102	125	553	228	285	40	23	22	113	256

d (mm)	Q2 (mm)	closest inch (inch)
63		2
75	35	2 ½
90	50	3
110	74	4
140	97	5
160	123	6
225	169	8
280	207	10
315	253	12

Butterfly valves type 578

PF 2 33 A82 001



Lugstyle butterfly valve type 578 ABS
Bare shaft

Model:

- Housing material: PP-GF30 with SS316 lug-inserts
- Overall length according to EN 558, ISO 5752 (DN50 - 200 line 25, DN250 - 300 line 10)
- Connecting dimension: ISO 7005 PN10, EN 1092 PN10, DIN 2501 PN10
- Interface F07 according to DIN/ISO 5211

Option:

- Optional accessory: Valve-Integrated position feedback with limit switches (limit switches have to be ordered separately)

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
63	50	10	1470	**169 578 802**	1.299
75	65	10	2200	**169 578 803**	1.456
90	80	10	3000	**169 578 804**	1.701
110	100	10	6500	**169 578 805**	2.606
140	125	10	11500	**169 578 806**	4.120
160	150	10	16600	**169 578 807**	5.881
225	200	10	39600	**169 578 808**	7.125
280	250	10	55200	**169 578 809**	17.880
315	300	10	80000	**169 578 810**	24.416

d (mm)	d2 (mm)	D	D1 (mm)	D3 (mm)	D4 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L3 (mm)	Q1 (mm)	Q2 (mm)
63	160	M16	125	70	90	238	77	134	27	23	11	45	165	40	
75	180	M16	145	70	90	250	83	140	27	23	11	46	182	54	35
90	195	M16	160	70	90	262	89	146	27	23	11	49	210	67	50
110	226	M16	180	70	90	289	106	167	16	23	14	56	240	88	74
140	258	M16	210	70	90	318	121	181	16	23	14	64	272	113	97
160	284	M20	240	70	90	341	133	189	19	23	17	72	300	139	123
225	341	M20	295	70	90	388	159	210	19	23	17	73	360	178	169
280	412	M20	350	200	125	555	205	264	86	23	22	113	440	210	207
315	482	M20	400	200	125	605	234	285	86	23	22	113	510	256	253

d (mm)	closest inch (inch)
63	2
75	2 ½
90	3
110	4
140	5
160	6
225	8
280	10
315	12

PF 2 33 A82 001

Lugstyle butterfly valve type 578 ABS
Hand lever with ratchet settings

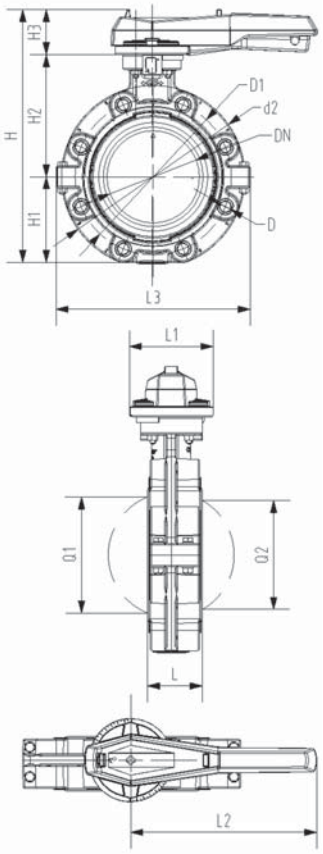
Model:

- Housing material: PP-GF30 with SS316 lug-inserts
- Overall length according to EN 558, ISO 5752 (DN50 - 200 line 25, DN250 - 300 line 10)
- Connecting dimension: ISO 7005 PN10, EN 1092 PN10, DIN 2501 PN10

Option:

- Optional accessory: Valve-Integrated position feedback with limit switches (limit switches have to be ordered separately)

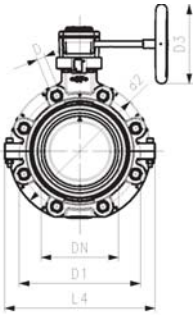
d (mm)	DN (mm)	closest inch (inch)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
63	50	2	10	1470	**169 578 002**	1.800
75	65	2 ½	10	2200	**169 578 003**	1.895
90	80	3	10	3000	**169 578 004**	2.251
110	100	4	10	6500	**169 578 005**	3.146
140	125	5	10	11500	**169 578 006**	4.660
160	150	6	10	16600	**169 578 007**	6.430
225	200	8	10	39600	**169 578 008**	8.625
280	250	10	10	55200	**169 578 009**	19.528
315	300	12	10	80000	**169 578 010**	26.106

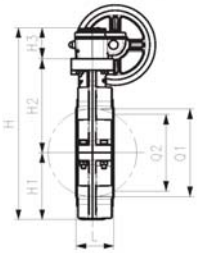


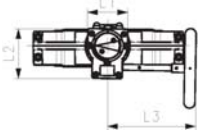
d (mm)	d2 (mm)	D	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	Q1 (mm)	Q2 (mm)
63	160	M16	125	265	77	134	54	45	106	205	165	40	
75	180	M16	145	277	83	140	54	46	106	205	182	54	35
90	195	M16	160	289	89	146	54	49	106	205	210	67	50
110	226	M16	180	328	106	167	55	56	106	255	240	88	74
140	258	M16	210	357	121	181	55	64	106	255	272	113	97
160	284	M20	240	377	133	189	55	72	106	255	300	139	123
225	341	M20	295	436	159	210	67	73	140	408	360	178	169
280	412	M20	350	538	205	264	69	113	97	130	198	210	207
315	482	M20	400	588	234	285	69	113	97	130	198	256	253

PF 2 33 A82 001

Lugstyle butterfly valve type 578 ABS
Reduction gear with handwheel







Model:

- Housing material: PP-GF30 with SS316 lug-inserts
- Overall length according to EN 558, ISO 5752 (DN50 - 200 line 25, DN250 - 300 line 10)
- Connecting dimension: ISO 7005 PN10, EN 1092 PN10, DIN 2501 PN10

Option:

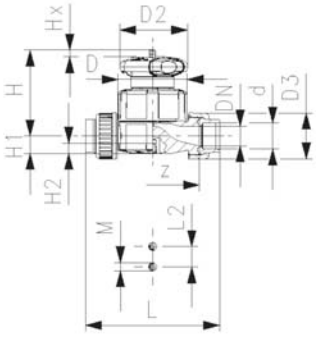
- Optional accessory: Valve-Integrated position feedback with limit switches (limit switches have to be ordered separately)

d (mm)	DN (mm)	closest inch (inch)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
63	50	2	10	1470	**169 578 022**	3.467
75	65	2 ½	10	2200	**169 578 023**	3.610
90	80	3	10	3000	**169 578 024**	3.929
110	100	4	10	6500	**169 578 025**	4.834
140	125	5	10	11500	**169 578 026**	6.348
160	150	6	10	16600	**169 578 027**	8.109
225	200	8	10	39600	**169 578 028**	9.353
280	250	10	10	55200	**169 578 029**	19.528
315	300	12	10	80000	**169 578 030**	26.106

d (mm)	d2 (mm)	D	D1 (mm)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	Q1 (mm)	Q2 (mm)
63	160	M16	125	160	273	77	134	62	45	78	112	179	155	165	
75	180	M16	145	150	285	83	140	62	46	78	112	179	155	182	35
90	195	M16	160	150	297	89	146	62	49	78	112	179	155	210	50
110	226	M16	180	150	335	106	167	62	56	78	112	179	155	240	74
140	258	M16	210	150	364	121	181	62	64	78	112	179	155	272	97
160	284	M20	240	160	384	133	189	62	72	78	112	179	155	300	123
225	341	M20	295	150	419	159	210	50	73	110	120	360	155	178	169
280	412	M20	350	200	536	205	264	67	113	100	131	440	170	210	207
315	482	M20	400	200	586	234	285	67	113	100	131	510	170	256	253

Diaphragm valves

PF 2 33 778 020



Diaphragm valve type 514 ABS
With solvent cement sockets metric

Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Handwheel with built-in locking mechanism
- For easy installation and removal
- Short overall length

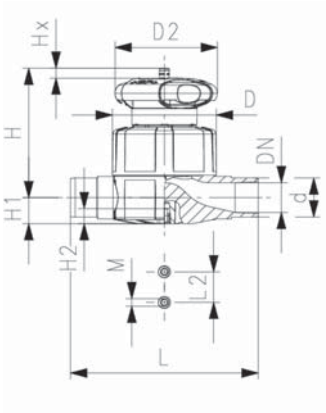
Option:

- Individual configuration of the valve (see diagram)
- Self adjusting multifunctional module with integrated limit switches

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)	PTFE/EPDM Code	Weight (kg)
20	15	10	125	**169 514 012**	0.355	**169 514 032**	0.365
25	20	10	271	**169 514 013**	0.365	**169 514 033**	0.479
32	25	10	481	**169 514 014**	1.061	**169 514 034**	1.081
40	32	10	759	**169 514 015**	1.338	**169 514 035**	1.357
50	40	10	1263	**169 514 016**	1.408	**169 514 036**	2.374
63	50	10	1728	**169 514 017**	3.083	**169 514 037**	3.111

d (mm)	D (mm)	D2 (mm)	D3 (mm)	H (mm)	H1 (mm)	H2 (mm)	L (mm)	L2 (mm)	M	z (mm)	Lift = Hx (mm)	closest inch (inch)
20	65	65	43	73	14	12	128	25	M6	96	7	½
25	80	65	51	81	18	12	152	25	M6	114	10	¾
32	88	87	58	107	22	12	166	25	M6	122	13	1
40	101	87	72	115	26	15	192	45	M8	140	15	1 ¼
50	117	135	83	148	32	15	222	45	M8	160	19	1 ½
63	144	135	100	166	39	15	266	45	M8	190	25	2

PF 2 33 778 010



Diaphragm valve type 515 ABS
With solvent cement spigots metric

Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Handwheel with built-in locking mechanism
- Overall length EN 558

Option:

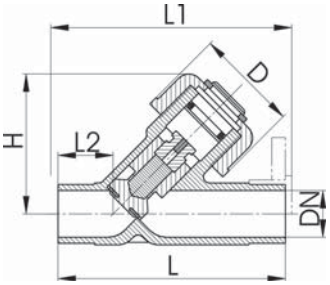
- Individual configuration of the valve (see diagram)
- Self adjusting multifunctional module with integrated limit switches

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)	PTFE/EPDM Code	Weight (kg)
20	15	10	125	**169 515 012**	0.308	**169 515 032**	0.318
25	20	10	271	**169 515 013**	0.400	**169 515 033**	0.412
32	25	10	481	**169 515 014**	0.509	**169 515 034**	0.992
40	32	10	759	**169 515 015**	1.143	**169 515 035**	1.164
50	40	10	1263	**169 515 016**	2.112	**169 515 036**	2.141
63	50	10	1728	**169 515 017**	1.805	**169 515 037**	2.726

d (mm)	D (mm)	D2 (mm)	H (mm)	H1 (mm)	H2 (mm)	L (mm)	L2 (mm)	M	Lift = Hx (mm)	closest inch (inch)
20	65	65	73	14	12	124	25	M6	7	½
25	80	65	81	18	12	144	25	M6	10	¾
32	88	87	107	22	12	154	25	M6	13	1
40	101	87	115	26	15	174	45	M8	15	1 ¼
50	117	135	148	32	15	194	45	M8	19	1 ½
63	144	135	166	39	15	224	45	M8	25	2

Angle seat check valves

PF 2 33 199 005



Angle seat check valve type 303 ABS
With solvent cement spigots metric

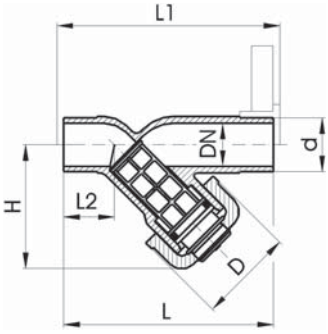
Model:

- For horizontal or vertical installation
- Leakproof from: EPDM 2m, FPM 3m water column
- Specific gravity of piston approx. 2 kg/dm^3
- Overall length EN 558

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	closest inch (inch)
20	15	10	95	**169 303 006**	0.092	43	65	124	130	28	½
25	20	10	180	**169 303 007**	0.133	47	75	144	150	37	¾
32	25	10	327	**169 303 008**	0.219	56	90	154	160	37	1
40	32	10	484	**169 303 009**	0.348	64	102	174	180	44	1 ¼
50	40	10	725	**169 303 010**	0.615	82	123	194	200	48	1 ½
63	50	10	1130	**169 303 011**	1.059	95	144	224	230	60	2

Strainers

PF 2 33 199 005



Line strainer type 305 ABS
With solvent cement spigots metric

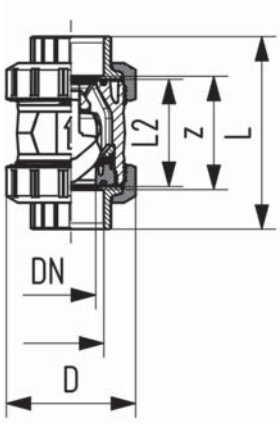
Model:

- Protects valves, pumps, etc. from becoming soiled
- Easy dismantling for cleaning the screens
- Overall length EN 558
- Cylindrical screen must be ordered separately
- Screen in stainless steel operable temperature range up -40°C to +60°C
- Screen in PVC-U operable temperature range up 0°C to +60°C

d (mm)	DN (mm)	PN (bar)	EPDM Code	Weight (kg)	D (mm)	H (mm)	L (mm)	L1 (mm)	L2 (mm)	closest inch (inch)
20	15	10	**169 305 302**	0.081	48	65	124	130	28	½
25	20	10	**169 305 303**	0.120	54	76	144	150	37	¾
32	25	10	**169 305 304**	0.180	62	90	154	160	37	1
40	32	10	**169 305 305**	0.284	71	104	174	180	44	1 ¼
50	40	10	**169 305 306**	0.484	88	124	194	200	48	1 ½
63	50	10	**169 305 307**	0.780	103	148	224	230	60	2

Cone check valves

PF 2 33 988 211



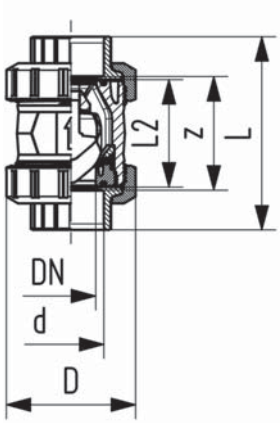
Check valve type 561 ABS
With threaded sockets Rp

Model:

- Sealing at a minimum water column of 2 m
- Designed for easy installation and removal
- Vibration free even at high flow velocity
- Flow-optimized return cone, double guided
- For vertical installation
- Compact installation length, same as ball valve type 546
- Z-length, end connectors and union nuts **not** compatible with type 360

Rp (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)	D (mm)	L (mm)	L2 (mm)	z (mm)
⅜	10	10	190	**169 561 021**	0.090	50	95	56	69
½	15	10	180	**169 561 022**	0.100	50	100	56	67
¾	20	10	380	**169 561 023**	0.200	58	114	65	78
1	25	10	460	**169 561 024**	0.220	68	127	71	85
1 ¼	32	10	850	**169 561 025**	0.380	84	146	85	100
1 ½	40	10	1080	**169 561 026**	0.580	97	152	89	106
2	50	10	1670	**169 561 027**	1.040	124	177	101	121

PF 2 33 988 211



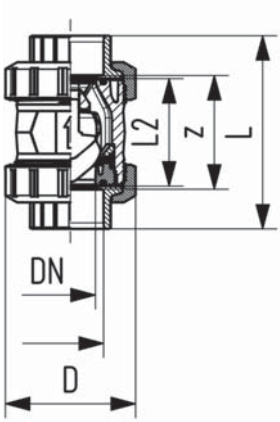
Check valve type 561 ABS
With solvent cement sockets metric

Model:

- Sealing at a minimum water column of 2 m
- Designed for easy installation and removal
- Vibration free even at high flow velocity
- Flow-optimized return cone, double guided
- For vertical installation
- Compact installation length, same as ball valve type 546
- Z-length, end connectors and union nuts **not** compatible with type 360
- New DN65-DN100

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)	D (mm)	L (mm)	L2 (mm)	z (mm)	closest inch (inch)
16	10	10	190	**169 561 001**	0.090	50	92	56	64	⅜
20	15	10	180	**169 561 002**	0.090	50	95	56	64	½
25	20	10	380	**169 561 003**	0.190	58	110	65	72	¾
32	25	10	460	**169 561 004**	0.220	68	123	71	79	1
40	32	10	850	**169 561 005**	0.380	84	146	85	94	1 ¼
50	40	10	1080	**169 561 006**	0.560	97	157	89	95	1 ½
63	50	10	1670	**169 561 007**	0.990	124	183	101	107	2
75	65	10	2950	**169 561 008**	2.420	166	233	136	144	2 ½
90	80	10	3600	**169 561 009**	3.870	200	254	141	151	3
110	100	10	4150	**169 561 010**	6.240	238	301	164	174	4

PF 2 33 988 111



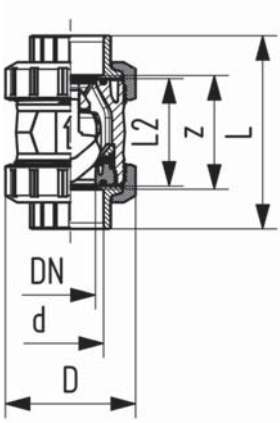
Check valve type 562 ABS
With threaded sockets Rp

Model:

- For horizontal or vertical installation
- Sealing at a minimum water column of 1 m
- Spring loaded, spring made of stainless steel (1.4310)
- Spring available in other materials, see spare parts
- Designed for easy installation and removal
- Vibration free even at high flow velocity
- Flow-optimized return cone, double guided
- Compact installation length, same as ball valve type 546
- Z-length, end connectors and union nuts **not** compatible with type 360

Rp (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)	D (mm)	L (mm)	L2 (mm)	z (mm)
⅜	10	10	190	**169 562 021**	0.090	50	95	56	69
½	15	10	180	**169 562 022**	0.100	50	100	56	67
¾	20	10	380	**169 562 023**	0.200	58	114	65	78
1	25	10	460	**169 562 024**	0.220	68	127	71	85
1 ¼	32	10	850	**169 562 025**	0.380	84	146	85	100
1 ½	40	10	1080	**169 562 026**	0.580	97	152	89	106
2	50	10	1670	**169 562 027**	1.040	124	177	101	121

PF 2 33 988 111



Check valve type 562 ABS
With solvent cement sockets metric

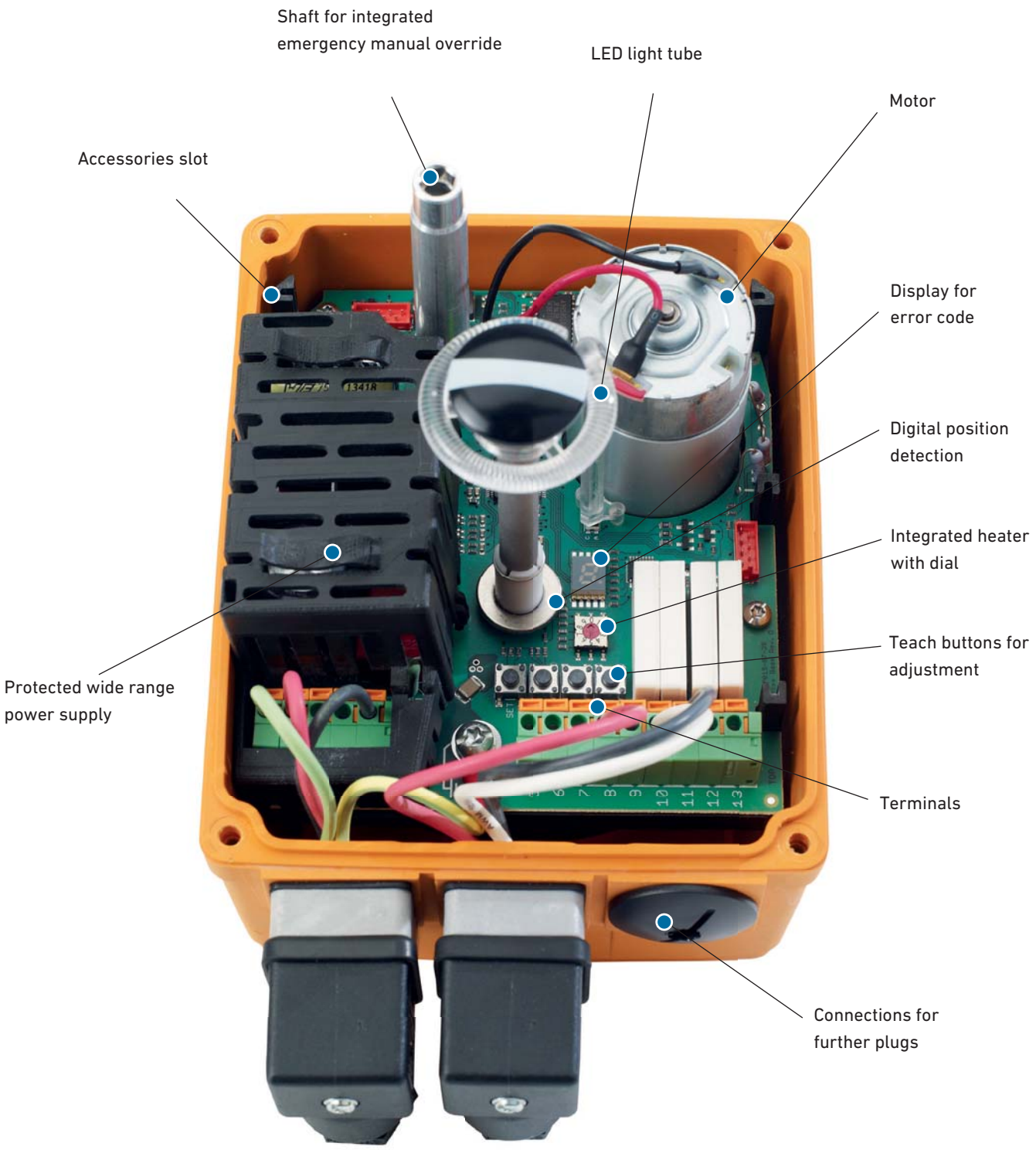
Model:

- For horizontal or vertical installation
- Sealing at a minimum water column of 1 m
- Spring loaded, spring made of stainless steel (1.4310)
- Spring available in other materials, see spare parts
- Designed for easy installation and removal
- Vibration free even at high flow velocity
- Flow-optimized return cone, double guided
- Compact installation length, same as ball valve type 546
- Z-length, end connectors and union nuts **not** compatible with type 360
- New DN65-DN100

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)	D (mm)	L (mm)	L2 (mm)	z (mm)	closest inch (inch)
16	10	10	190	**169 562 001**	0.090	50	92	56	64	⅜
20	15	10	180	**169 562 002**	0.090	50	95	56	64	½
25	20	10	380	**169 562 003**	0.190	58	110	65	72	¾
32	25	10	460	**169 562 004**	0.220	68	123	71	79	1
40	32	10	850	**169 562 005**	0.380	84	146	85	94	1 ¼
50	40	10	1080	**169 562 006**	0.560	97	157	89	95	1 ½
63	50	10	1670	**169 562 007**	0.990	124	183	101	107	2
75	65	10	2950	**169 562 008**	2.420	166	233	136	144	2 ½
90	80	10	3600	**169 562 009**	3.870	200	254	141	151	3
110	100	10	4150	**169 562 010**	6.240	238	301	164	174	4

Small & Light

Electric actuators type EA15-250



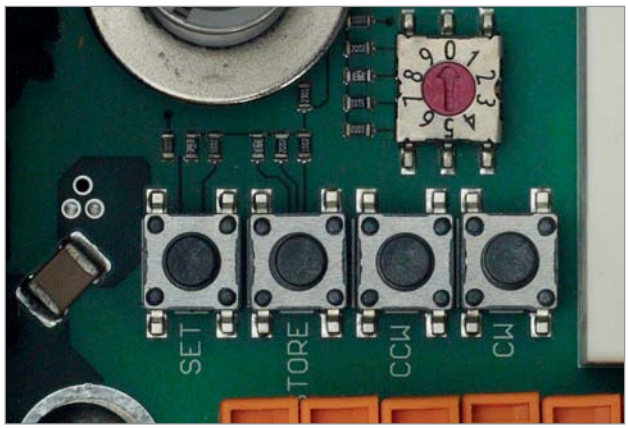
Smart functions for easy operation

The new series of electric actuators from GF Piping Systems provides the highest reliability and ease of use. With smart additional functions, these actuators are ahead of their time.

+ Features & benefits

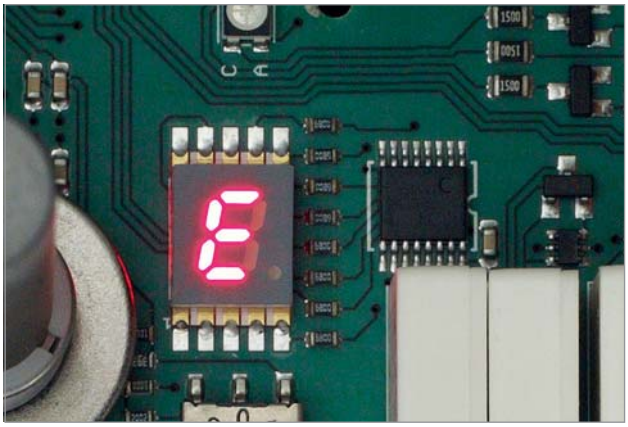
Clear display

In addition to the standard display, there is colour LED feedback. This enables easy and fast detection of the operating status at a glance – whether in low light conditions or from a distance. The different colours show the respective position of the actuator. The integrated relays allow feedback from up to three different actuating positions.



Easy set-up

Digital 360° position detection is used to clearly identify the actuating position. Ex factory, the actuator is adjusted to 0° and 90°. Readjustment by the user is possible at any time on site via four buttons. The buttons are easy to operate without any additional tools.



Intelligent feedback

The 7-segment error display ensures the highest level of security in case of a problem. Through various error codes, the cause of a problem can be clearly identified. A time and labour-intensive search is no longer necessary. Whether it's undervoltage, a position error or use of the emergency manual override – the display facilitates the identification of disruptions. The 'ready-to-operate' signal gives feedback on the process control system. The signal will drop in case of failure.

Technical details

EA15, EA25, EA45, EA120, EA250

Nominal voltage	AC: 100 – 230 V, 50/60 Hz
	AC/DC: 24 V, 50/60 Hz
Nominal voltage tolerance	± 15%
Protection class	IP 65 according to EN 60529
Pollution degree	2 according to EN 61010-1
Overload protection	Current/time dependent, resetting
Overvoltage category	II
Ambient temperature	-10 ° to +50 °C
Allowable humidity	Max. 90 % relative humidity, non condensing
Housing material	PP-GF for very good chemical resistance

	EA15	EA25	EA45	EA120	EA250
Nominal power	AC: 30 VA at 100–230 V	AC: 35 VA at 100–230 V	AC: 55 VA at 100–230 V	AC: 50 VA at 100–230 V	AC: 60 VA at 100–230 V
	AC/DC: 35 VA at 24 V	AC/DC: 40 VA at 24 V	AC/DC: 60 VA at 24 V	AC/DC: 55 VA at 24 V	AC/DC: 65 VA at 24 V
Nominal power	0.3A at 100V	0.35A at 100V	0.55A at 100V	0.5A at 100V	0.55A at 100V
	0.13A at 230V	0.15A at 230V	0.24A at 230V	0.22A at 230V	0.26A at 230V
	1.5A at 24V	1.7A at 24V	2.5A at 24V	2.3A at 24V	2.7A at 24V
Nominal torque Mdn (peak)	10 (20) Nm	10 (25) Nm	20 (45) Nm	60 (120) Nm	100 (250) Nm
Duty cycle	40% @ 25°C/15min	100%	50%	50%	35%
Cycle time s/90° at Mdn.	5 s	5 s	6 s	15 s	20 s
Flange fitting	F05	F05	F05	F07	F07
Tested cycles (at 20 °C and Mdn)	150 000	250 000	100 000	100 000	75 000
Weight	1.85 kg	2,1 kg	2,2 kg	3,6 kg	5,0 kg
Actuating angle	Max. 355°, set to 90°				

Ball valves electric type 127

PF 3 39 695 033

Ball valve type 127 ABS 100-230V
With manual emergency override
With solvent cement sockets metric

Model:

- Built on with electric actuator EA15
- Voltage 100-230V, 50-60Hz
- Factory set control range 90°<)
- Heating element, position feedback (Open/Close)
- Integrated stainless steel mounting inserts

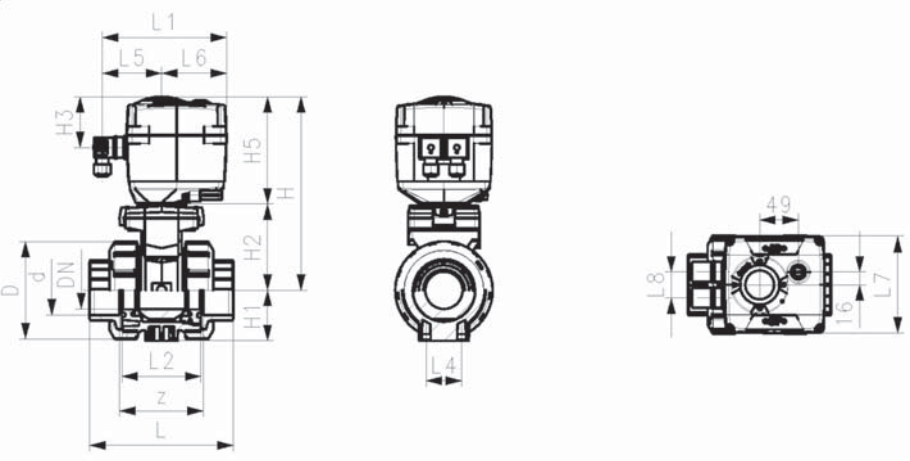
Option:

- Other valve and actuator configurations available
- Optional accessories: Fail-safe return unit

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	70	**199 127 082**	2.072
20	15	10	185	**199 127 083**	2.072
25	20	10	350	**199 127 084**	2.189
32	25	10	700	**199 127 085**	2.261
40	32	10	1000	**199 127 086**	2.465
50	40	10	1600	**199 127 087**	2.648
63	50	10	3100	**199 127 088**	3.222

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	z (mm)
16	50	200	27	64	64	137	92	161	56	25	77	83	122	33	64
20	50	200	27	64	64	137	95	161	56	25	77	83	122	33	64
25	58	209	30	73	64	137	110	161	65	25	77	83	122	33	72
32	68	209	36	73	64	137	123	161	71	25	77	83	122	33	79
40	84	220	44	84	64	137	146	161	85	45	77	83	122	33	94
50	97	220	51	84	64	137	157	161	89	45	77	83	122	33	95
63	124	243	64	106	64	137	183	161	101	45	77	83	122	33	107

d (mm)	closest inch (inch)
16	⅜
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2



PF 3 39 695 033

Ball valve type 127 ABS 24V
With manual emergency override
With solvent cement sockets metric

Model:

- Built on with electric actuator EA15
- Voltage 24V AC/DC
- Factory set control range 90°<)
- Heating element, position feedback (Open/Close)
- Integrated stainless steel mounting inserts

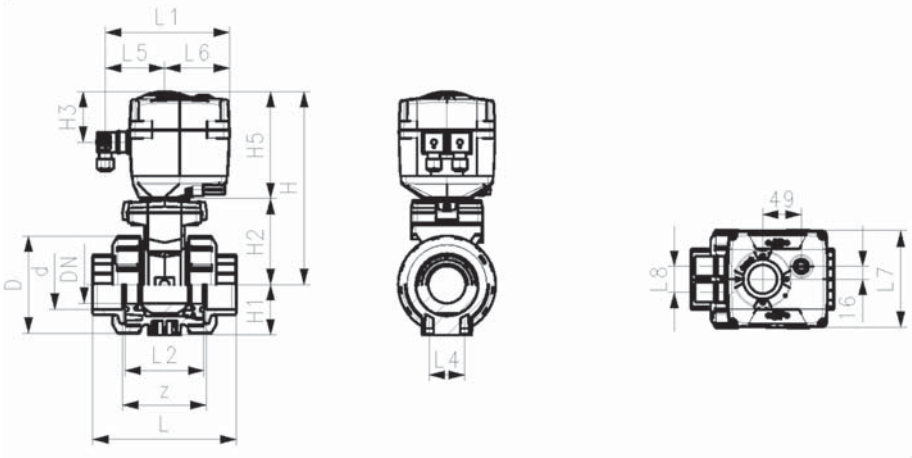
Option:

- Other valve and actuator configurations available
- Optional accessories: Fail-safe return unit

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	70	**199 127 092**	2.072
20	15	10	185	**199 127 093**	2.097
25	20	10	350	**199 127 094**	2.189
32	25	10	700	**199 127 095**	2.253
40	32	10	1000	**199 127 096**	2.592
50	40	10	1600	**199 127 097**	2.914
63	50	10	3100	**199 127 098**	3.209

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	z (mm)
16	50	200	27	64	64	137	92	161	56	25	77	83	122	33	64
20	50	200	27	64	64	137	95	161	56	25	77	83	122	33	64
25	58	209	30	73	64	137	110	161	65	25	77	83	122	33	72
32	68	209	36	73	64	137	123	161	71	25	77	83	122	33	79
40	84	220	44	84	64	137	146	161	85	45	77	83	122	33	94
50	97	220	51	84	64	137	157	161	89	45	77	83	122	33	95
63	124	243	64	106	64	137	183	161	101	45	77	83	122	33	107

d (mm)	closest inch (inch)
16	⅜
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2



PF 3 39 695 033

Ball valve type 127 ABS 24V
With manual emergency override
With threaded sockets Rp

Model:

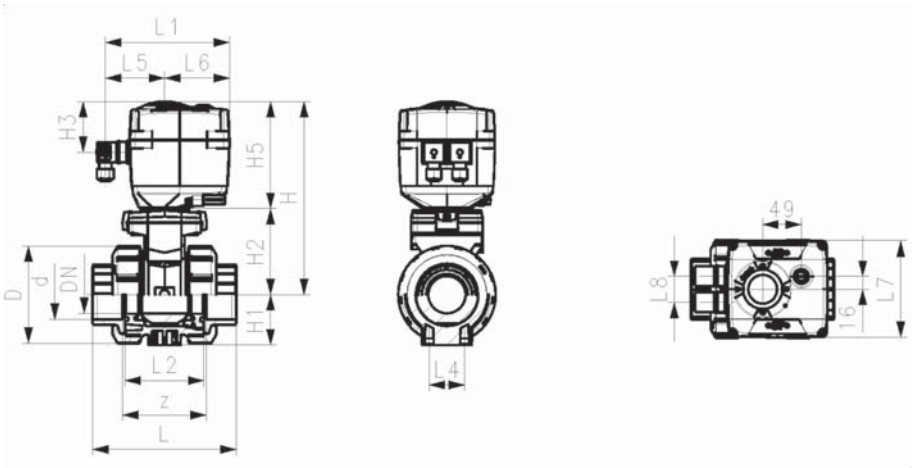
- Built on with electric actuator EA15
- Voltage 24V AC/DC
- Factory set control range 90°<)
- Heating element, position feedback (Open/Close)
- Integrated stainless steel mounting inserts

Option:

- Other valve and actuator configurations available
- Optional accessories: Fail-safe return unit

Rp (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
⅜	10	10	70	**199 127 692**	2.100
½	15	10	185	**199 127 693**	2.100
¾	20	10	350	**199 127 694**	2.200
1	25	10	700	**199 127 695**	2.300
1 ¼	32	10	1000	**199 127 696**	2.600
1 ½	40	10	1600	**199 127 697**	3.000
2	50	10	3100	**199 127 698**	3.800

Rp (inch)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	z (mm)
⅜	50	200	27	64	64	137	92	161	56	25	77	83	122	33	64
½	50	200	27	64	64	137	95	161	56	25	77	83	122	33	64
¾	58	209	30	73	64	137	110	161	65	25	77	83	122	33	72
1	68	209	36	73	64	137	123	161	71	25	77	83	122	33	79
1 ¼	84	220	44	84	64	137	146	161	85	45	77	83	122	33	94
1 ½	97	220	51	84	64	137	157	161	89	45	77	83	122	33	95
2	124	243	64	106	64	137	183	161	101	45	77	83	122	33	107



Ball valves electric type 167

PF 3 39 980 033

3-Way ball valve type 167 ABS
Horizontal/L-port 100-230V
With manual emergency override
With solvent cement sockets metric

Model:

- Voltage 100-230V, 50-60Hz
- Factory set control range 90°<)
- Basic position A-C opened, activated position B-C opened, see flow scheme
- Other positions possible by adjusting the limit switches
- Heating element, position feedback (Open/Close/ Middle)
- Integrated stainless steel mounting inserts

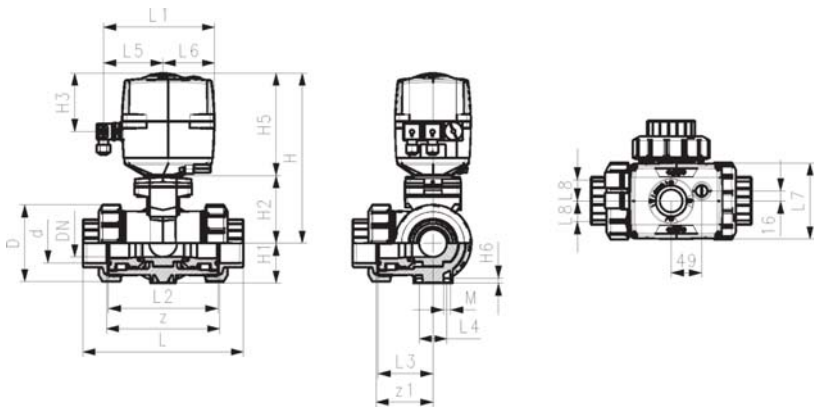
Option:

- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board

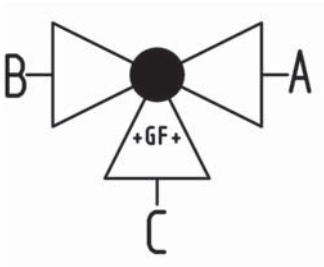
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EA	EPDM Code	Weight (kg)
16	10	10	50	EA25	**199 167 162**	2.065
20	15	10	75	EA25	**199 167 163**	2.069
25	20	10	150	EA25	**199 167 164**	2.171
32	25	10	280	EA25	**199 167 165**	2.316
40	32	10	480	EA25	**199 167 166**	2.649
50	40	10	620	EA25	**199 167 167**	3.384
63	50	10	1230	EA25	**199 167 168**	5.324

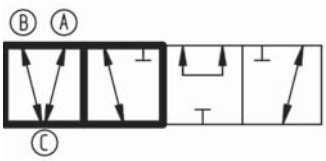
d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	H6 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)
16	50	231	28	64	94	167	8	109	180	73	36	25	97	83	122
20	50	231	28	64	94	167	8	112	180	73	36	25	97	83	122
25	58	240	32	73	94	167	8	131	180	86	43	25	97	83	122
32	68	240	36	73	94	167	8	151	180	99	50	25	97	83	122
40	84	251	45	84	94	167	9	181	180	120	60	45	97	83	122
50	97	251	51	84	94	167	9	205	180	137	69	45	97	83	122
63	124	273	65	106	94	167	9	261	180	179	89	45	97	83	122

d (mm)	L8 (mm)	M	z (mm)	z1 (mm)	closest inch (inch)
16	33	6	81	40	⅜
20	33	6	81	40	½
25	33	6	94	47	¾
32	33	6	107	54	1
40	33	8	130	65	1 ¼
50	33	8	143	72	1 ½
63	33	8	185	92	2



PF 3 39 980 033





3-Way ball valve type 167 ABS
Horizontal/T-port 100-230V
With manual emergency override
With solvent cement sockets metric

Model:

- Voltage 100-230V, 50-60Hz
- Factory set control range 90°<)
- Basic position A-B-C opened, activated position B-C opened, see flow scheme
- Other positions possible by adjusting the limit switches
- Heating element, position feedback (Open/Close/ Middle)
- Integrated stainless steel mounting inserts

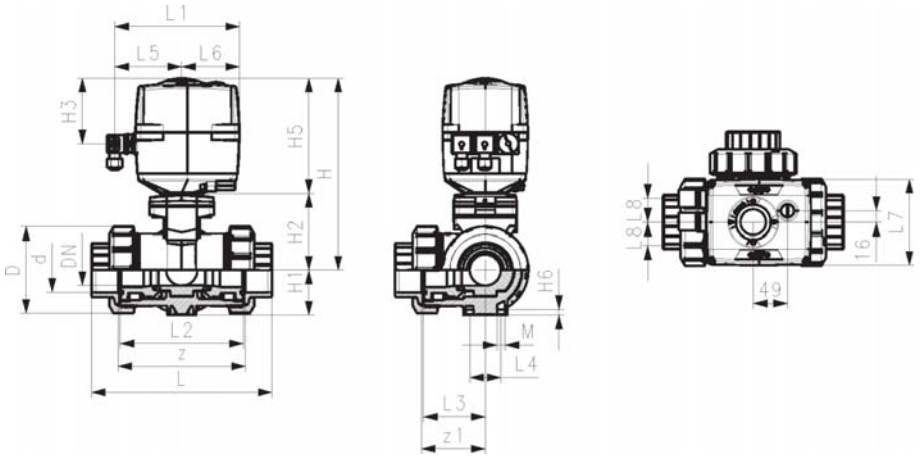
Option:

- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EA	EPDM Code	Weight (kg)
16	10	10	140	EA25	**199 167 172**	2.064
20	15	10	200	EA25	**199 167 173**	2.068
25	20	10	470	EA25	**199 167 174**	2.169
32	25	10	793	EA25	**199 167 175**	2.732
40	32	10	1290	EA25	**199 167 176**	2.640
50	40	10	1910	EA25	**199 167 177**	3.377
63	50	10	3100	EA25	**199 167 178**	5.135

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	H6 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)
16	50	231	28	64	94	167	8	109	180	73	36	25	97	83	122
20	50	231	28	64	94	167	8	112	180	73	36	25	97	83	122
25	58	240	32	73	94	167	8	131	180	86	43	25	97	83	122
32	68	240	36	73	94	167	8	151	180	99	50	25	97	83	122
40	84	251	45	84	94	167	9	181	180	120	60	45	97	83	122
50	97	251	51	84	94	167	9	205	180	137	69	45	97	83	122
63	124	273	65	106	94	167	9	261	180	179	89	45	97	83	122

d (mm)	L8 (mm)	M	z (mm)	z1 (mm)	closest inch (inch)
16	33	6	81	40	⅜
20	33	6	81	40	½
25	33	6	94	47	¾
32	33	6	107	54	1
40	33	8	130	65	1 ¼
50	33	8	143	72	1 ½
63	33	8	185	92	2



PF 3 39 980 033

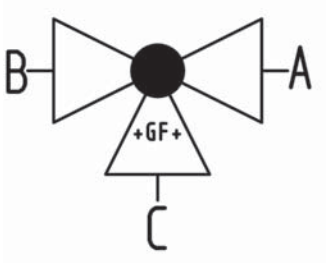
3-Way ball valve type 167 ABS
Horizontal/L-port 24V
With manual emergency override
With solvent cement sockets metric

Model:

- Voltage 24V AC/DC
- Factory set control range 90°<)
- Basic position A-C opened, activated position B-C opened, see flow scheme
- Other positions possible by adjusting the limit switches
- Heating element, position feedback (Open/Close/ Middle)
- Integrated stainless steel mounting inserts

Option:

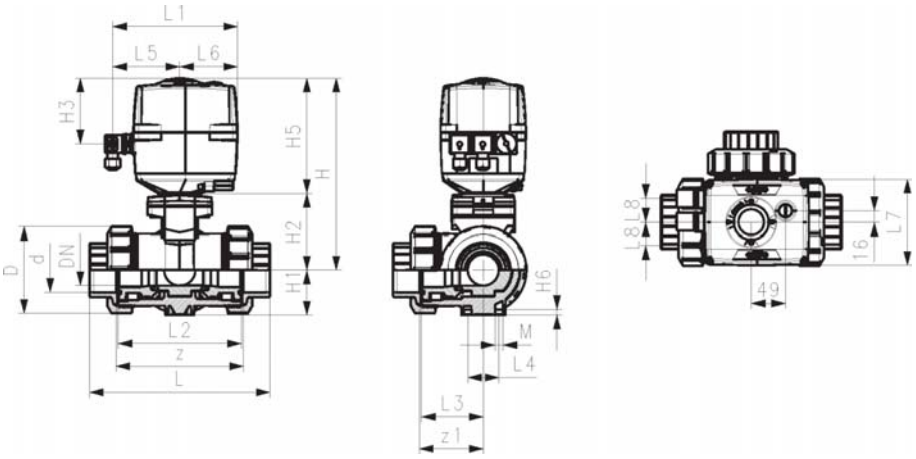
- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board



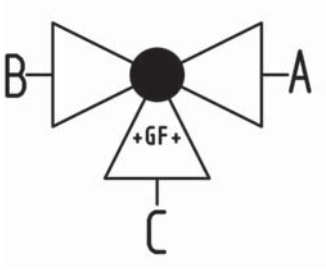
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EA	EPDM Code	Weight (kg)
16	10	10	50	EA25	**199 167 342**	2.065
20	15	10	75	EA25	**199 167 343**	2.069
25	20	10	150	EA25	**199 167 344**	2.171
32	25	10	280	EA25	**199 167 345**	2.704
40	32	10	480	EA25	**199 167 346**	3.681
50	40	10	620	EA25	**199 167 347**	3.370
63	50	10	1230	EA25	**199 167 348**	4.042

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	H6 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)
16	50	231	28	64	94	167	8	109	180	73	36	25	97	83	122
20	50	231	28	64	94	167	8	112	180	73	36	25	97	83	122
25	58	240	32	73	94	167	8	131	180	86	43	25	97	83	122
32	68	240	36	73	94	167	8	151	180	99	50	25	97	83	122
40	84	251	45	84	94	167	9	181	180	120	60	45	97	83	122
50	97	251	51	84	94	167	9	205	180	137	69	45	97	83	122
63	124	273	65	106	94	167	9	261	180	179	89	45	97	83	122

d (mm)	L8 (mm)	M	z (mm)	z1 (mm)	closest inch (inch)
16	33	6	81	40	⅜
20	33	6	81	40	½
25	33	6	94	47	¾
32	33	6	107	54	1
40	33	8	130	65	1 ¼
50	33	8	143	72	1 ½
63	33	8	185	92	2



PF 3 39 980 033



3-Way ball valve type 167 ABS
Horizontal/T-port 24V
With manual emergency override
With solvent cement sockets metric

Model:

- Voltage 24V AC/DC
- Factory set control range 90°<)
- Basic position A-C opened, activated position B-C opened, see flow scheme
- Other positions possible by adjusting the limit switches
- Heating element, position feedback (Open/Close/ Middle)
- Integrated stainless steel mounting inserts

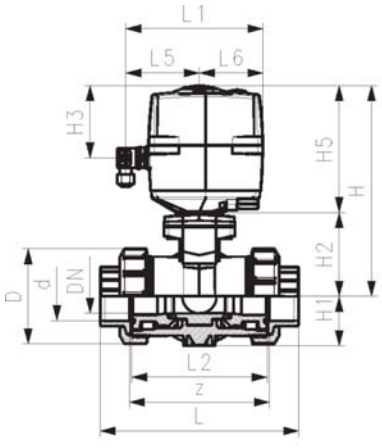
Option:

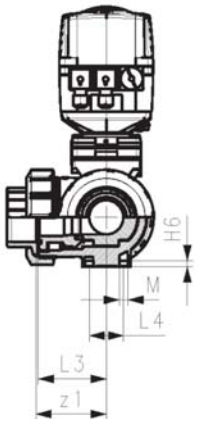
- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board

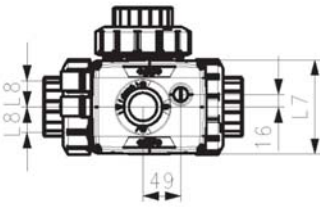
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EA	EPDM Code	Weight (kg)
16	10	10	50	EA25	**199 167 352**	2.064
20	15	10	75	EA25	**199 167 353**	2.068
25	20	10	150	EA25	**199 167 354**	2.169
32	25	10	280	EA25	**199 167 355**	2.311
40	32	10	480	EA25	**199 167 356**	2.640
50	40	10	620	EA25	**199 167 357**	2.977
63	50	10	1230	EA25	**199 167 358**	4.008

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	H6 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)
16	50	231	28	64	94	167	8	109	180	73	36	25	97	83	122
20	50	231	28	64	94	167	8	112	180	73	36	25	97	83	122
25	58	240	32	73	94	167	8	131	180	86	43	25	97	83	122
32	68	240	36	73	94	167	8	151	180	99	50	25	97	83	122
40	84	251	45	84	94	167	9	181	180	120	60	45	97	83	122
50	97	251	51	84	94	167	9	205	180	137	69	45	97	83	122
63	124	273	65	106	94	167	9	261	180	179	89	45	97	83	122

d (mm)	L8 (mm)	M	z (mm)	z1 (mm)	closest inch (inch)
16	33	6	81	40	⅜
20	33	6	81	40	½
25	33	6	94	47	¾
32	33	6	107	54	1
40	33	8	130	65	1 ¼
50	33	8	143	72	1 ½
63	33	8	185	92	2







Ball valves electric type 179

Ball valve type 179 ABS 100-230V
With manual emergency override
With solvent cement sockets metric

Model:

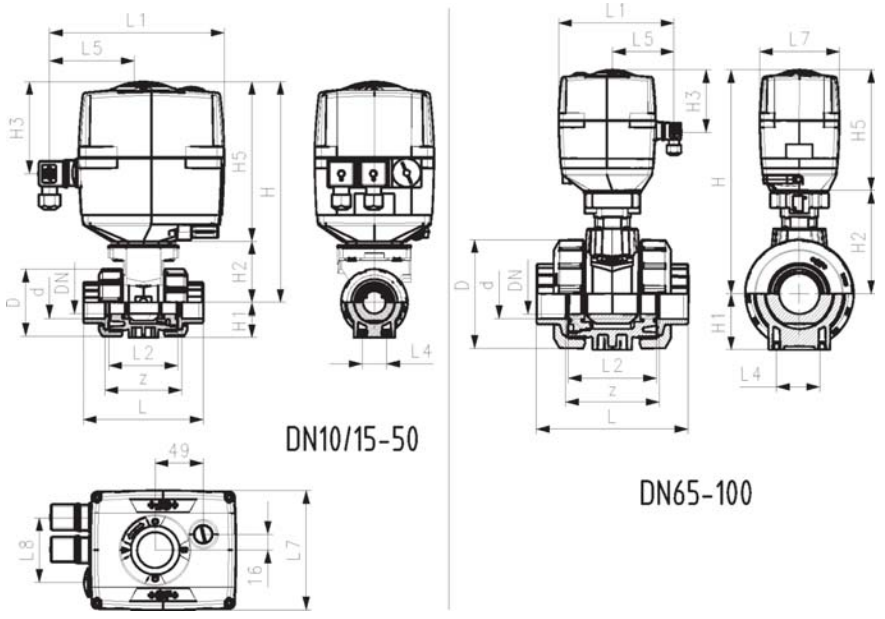
- Voltage 100-230V, 50-60Hz
- Factory set control range 90°<)
- Heating element, position feedback (Open/Close/ Middle)
- Integrated stainless steel mounting inserts

Option:

- Other valve and actuator configurations available
- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EA	EPDM Code	PF	Weight (kg)
16	10	10	70	EA25	**199 179 702**	3 39 696 033	2.100
20	15	10	185	EA25	**199 179 703**	3 39 696 033	2.100
25	20	10	350	EA25	**199 179 704**	3 39 696 033	2.200
32	25	10	700	EA25	**199 179 705**	3 39 696 033	2.300
40	32	10	1000	EA25	**199 179 706**	3 39 696 033	2.600
50	40	10	1600	EA25	**199 179 707**	3 39 696 033	3.000
63	50	10	3100	EA25	**199 179 708**	3 39 696 033	3.555
75	65	10	5000	EA45	**199 179 709**	3 39 695 633	6.300
90	80	10	7000	EA120	**199 179 710**	3 39 695 633	8.200
110	100	10	11000	EA120	**199 179 711**	3 39 695 633	11.500

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L7 (mm)	z (mm)	closest inch (inch)
16	50	231	27	64	94	167	92	180	56	25	97	122	64	⅜
20	50	231	27	64	94	167	95	180	56	25	97	122	64	½
25	58	240	30	73	94	167	110	180	65	25	97	122	72	¾
32	68	240	36	73	94	167	123	180	71	25	97	122	79	1
40	84	251	44	84	94	167	146	180	85	45	97	122	94	1 ¼
50	97	251	51	84	94	167	157	180	89	45	97	122	95	1 ½
63	124	273	64	106	94	167	183	180	101	45	97	122	107	2
75	166	346	85	156	94	190	233	180	136	70	98	122	144	2 ½
90	200	358	105	168	94	190	254	180	141	70	98	122	151	3
110	238	365	123	175	94	190	301	180	164	120	98	122	174	4



Ball valve type 179 ABS 24V
With manual emergency override
With solvent cement sockets metric

Model:

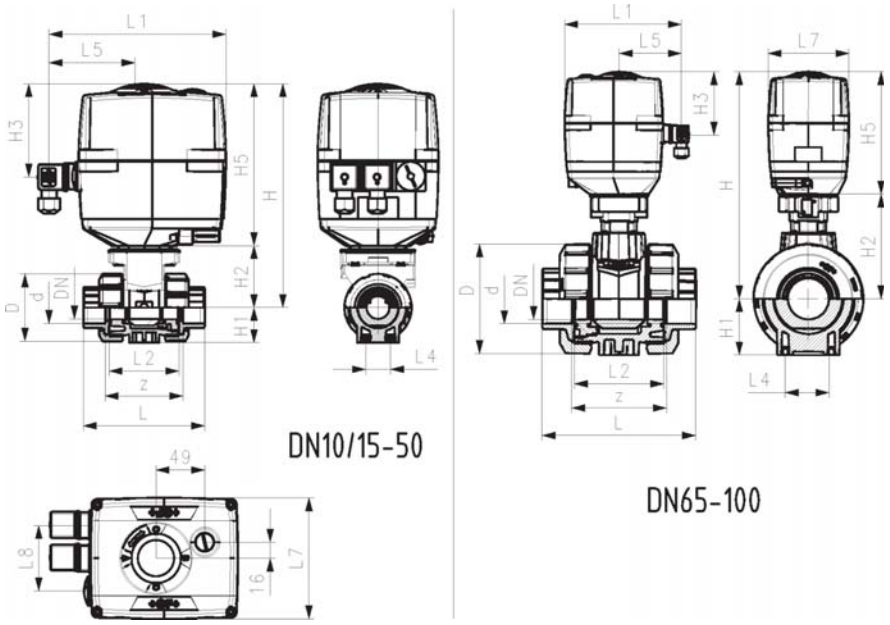
- Voltage 24V AC/DC
- Factory set control range 90°<)
- Heating element, position feedback (Open/Close/ Middle)
- Integrated stainless steel mounting inserts

Option:

- Other valve and actuator configurations available
- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EA	EPDM Code	PF	Weight (kg)
16	10	10	70	EA25	**199 179 742**	3 39 696 033	2.100
20	15	10	185	EA25	**199 179 743**	3 39 696 033	2.100
25	20	10	350	EA25	**199 179 744**	3 39 696 033	2.200
32	25	10	700	EA25	**199 179 745**	3 39 696 033	2.300
40	32	10	1000	EA25	**199 179 746**	3 39 696 033	2.600
50	40	10	1600	EA25	**199 179 747**	3 39 696 033	3.000
63	50	10	3100	EA25	**199 179 748**	3 39 696 033	3.535
75	65	10	5000	EA45	**199 179 749**	3 39 695 633	6.300
90	80	10	7000	EA120	**199 179 750**	3 39 695 633	8.200
110	100	10	11000	EA120	**199 179 751**	3 39 695 633	11.500

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L7 (mm)	z (mm)	closest inch (inch)
16	50	231	27	64	94	167	92	180	56	25	97	122	64	⅜
20	50	231	27	64	94	167	95	180	56	25	97	122	64	½
25	58	240	30	73	94	167	110	180	65	25	97	122	72	¾
32	68	240	36	73	94	167	123	180	71	25	97	122	79	1
40	84	251	44	84	94	167	146	180	85	45	97	122	94	1 ¼
50	97	251	51	84	94	167	157	180	89	45	97	122	95	1 ½
63	124	273	64	106	94	167	183	180	101	45	97	122	107	2
75	166	346	85	156	94	190	233	180	136	70	98	122	144	2 ½
90	200	358	105	168	94	190	254	180	141	70	98	122	151	3
110	238	365	123	175	94	190	301	180	164	120	98	122	174	4



Ball valves pneumatic type 230

PF 3 39 696 033

DN10/15 - 50

Ball valve type 230 ABS FC (Fail safe to close)
With manual override
With solvent cement sockets metric

Model:

- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Control time 90°<) 1-2s
- For easy installation and removal
- Integrated stainless steel mounting inserts

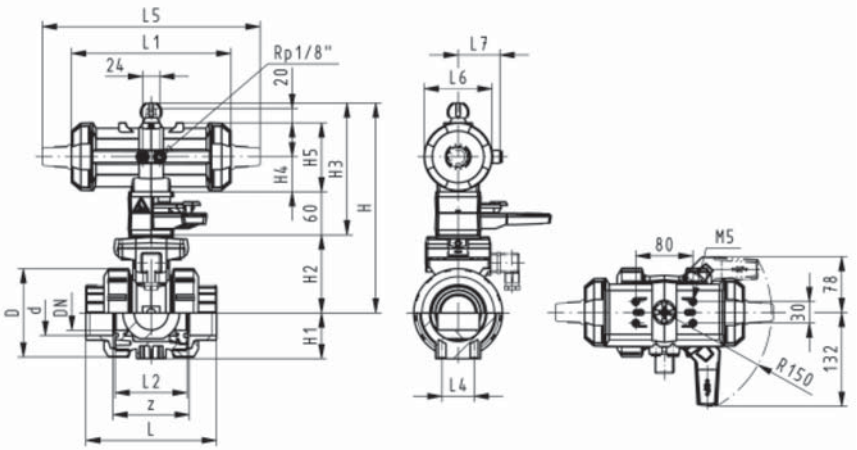
Option:

- Individual configuration of the valve (see diagram)

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	70	**199 230 702**	1.459
20	15	10	185	**199 230 703**	1.459
25	20	10	350	**199 230 704**	1.576
32	25	10	700	**199 230 705**	1.394
40	32	10	1000	**199 230 706**	2.751
50	40	10	1600	**199 230 707**	3.073
63	50	10	3100	**199 230 708**	3.054

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)
16	50	230	27	62	168	40	77	92	194	56	25	261	76	48	64
20	50	230	27	62	168	40	77	95	194	56	25	261	76	48	64
25	58	239	30	71	168	40	77	110	194	65	25	261	76	48	72
32	68	239	36	71	168	40	77	123	194	71	25	261	76	48	79
40	84	271	44	84	187	51	99	146	224	85	45	305	95	59	94
50	97	271	51	84	187	51	99	157	224	89	45	305	95	59	95
63	124	293	64	106	187	51	99	183	224	101	45	305	95	59	107

d (mm)	closest inch (inch)
16	⅜
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2



PF 3 39 696 033

DN10/15 - 50

Ball valve type 230 ABS FC (Fail safe to close)
With manual override
With threaded sockets Rp

Model:

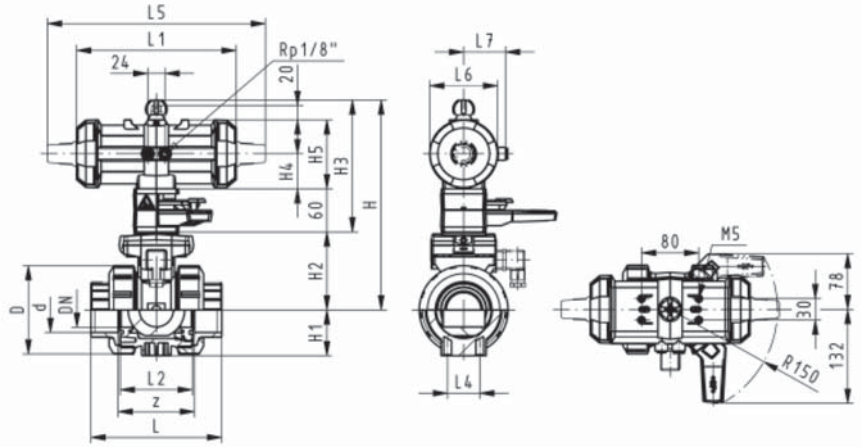
- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Control time 90°<) 1-2s
- For easy installation and removal
- Integrated stainless steel mounting inserts

Option:

- Individual configuration of the valve (see diagram)

Rp (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
⅜	10	10	70	**199 230 722**	1.459
½	15	10	185	**199 230 723**	1.459
¾	20	10	350	**199 230 724**	1.576
1	25	10	700	**199 230 725**	1.700
1 ¼	32	10	1000	**199 230 726**	2.751
1 ½	40	10	1600	**199 230 727**	3.073
2	50	10	3100	**199 230 728**	3.931

Rp (inch)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)
⅜	50	159	27	62	168	40	77	92	194	56	25	261	76	48	64
½	50	159	27	62	168	40	77	95	194	56	25	261	76	48	64
¾	58	168	30	71	168	40	77	110	194	65	25	261	76	48	72
1	68	168	36	71	168	40	77	123	194	71	25	261	76	48	79
1 ¼	84	202	44	84	187	51	99	146	224	85	45	305	95	59	94
1 ½	97	202	51	84	187	51	99	157	224	89	45	305	95	59	95
2	124	225	64	106	187	51	99	183	224	101	45	305	95	59	107



PF 3 39 696 033

DN10/15 - 50

Ball valve type 230 ABS FO (Fail safe to open)
With manual override
With solvent cement sockets metric

Model:

- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Control time 90°<) 1-2s
- For easy installation and removal
- Integrated stainless steel mounting inserts

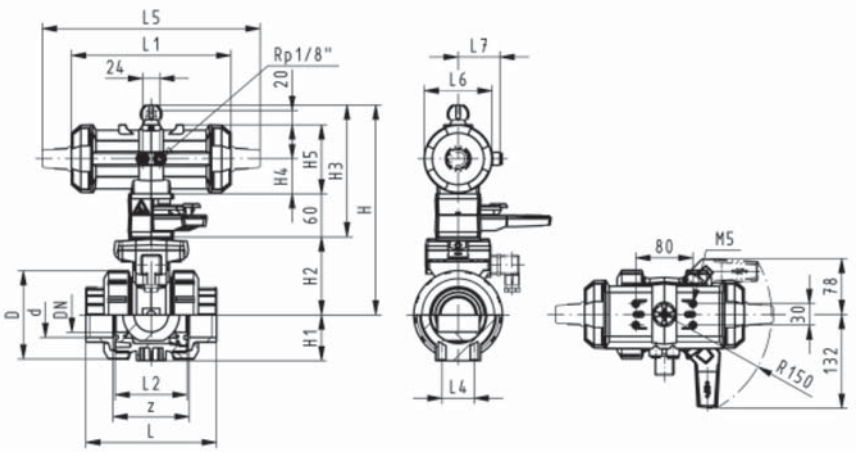
Option:

- Individual configuration of the valve (see diagram)

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	70	**199 230 742**	1.459
20	15	10	185	**199 230 743**	1.459
25	20	10	350	**199 230 744**	1.576
32	25	10	700	**199 230 745**	1.700
40	32	10	1000	**199 230 746**	2.751
50	40	10	1600	**199 230 747**	3.073
63	50	10	3100	**199 230 748**	3.931

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)
16	50	230	27	62	168	40	77	92	194	56	25	261	76	48	64
20	50	230	27	62	168	40	77	95	194	56	25	261	76	48	64
25	58	239	30	71	168	40	77	110	194	65	25	261	76	48	72
32	68	239	36	71	168	40	77	123	194	71	25	261	76	48	79
40	84	271	44	84	187	51	99	146	224	85	45	305	95	59	94
50	97	271	51	84	187	51	99	157	224	89	45	305	95	59	95
63	124	293	64	106	187	51	99	183	224	101	45	305	95	59	107

d (mm)	closest inch (inch)
16	⅜
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2



PF 3 39 696 033

DN10/15 - 50

Ball valve type 230 ABS FO (Fail safe to open)
With manual override
With threaded sockets Rp

Model:

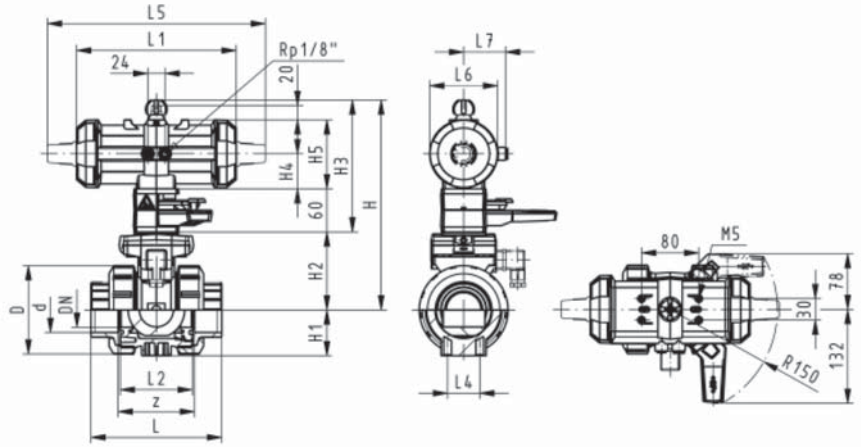
- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Control time 90°<) 1-2s
- For easy installation and removal
- Integrated stainless steel mounting inserts

Option:

- Individual configuration of the valve (see diagram)

Rp (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
⅜	10	10	70	**199 230 762**	1.459
½	15	10	185	**199 230 763**	1.459
¾	20	10	350	**199 230 764**	1.576
1	25	10	700	**199 230 765**	1.700
1 ¼	32	10	1000	**199 230 766**	2.751
1 ½	40	10	1600	**199 230 767**	3.073
2	50	10	3100	**199 230 768**	3.931

Rp (inch)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)
⅜	50	159	27	62	168	40	77	92	194	56	25	261	76	48	64
½	50	159	27	62	168	40	77	95	194	56	25	261	76	48	64
¾	58	168	30	71	168	40	77	110	194	65	25	261	76	48	72
1	68	168	36	71	168	40	77	123	194	71	25	261	76	48	79
1 ¼	84	202	44	84	187	51	99	146	224	85	45	305	95	59	94
1 ½	97	202	51	84	187	51	99	157	224	89	45	305	95	59	95
2	124	225	64	106	187	51	99	183	224	101	45	305	95	59	107



PF 3 39 696 033

DN10/15 - 50

Ball valve type 230 ABS DA (Double acting)
With manual override
With solvent cement sockets metric

Model:

- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- For easy installation and removal
- Integrated stainless steel mounting inserts
- Control time 90°<) 1-2s

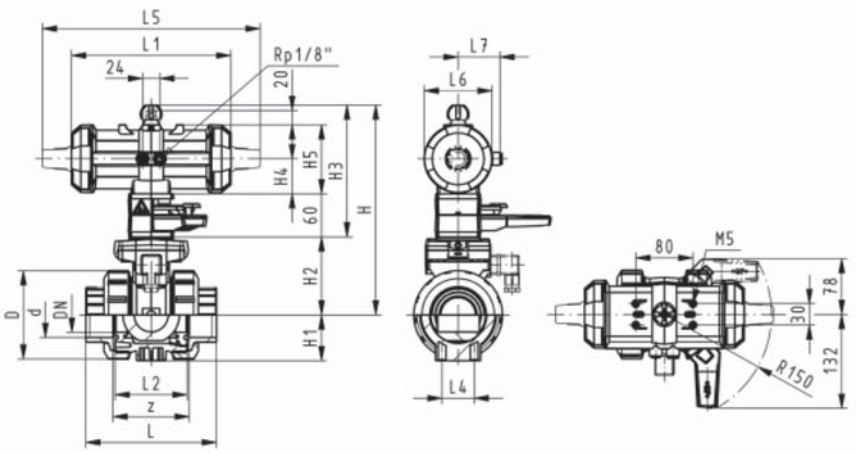
Option:

- Individual configuration of the valve (see diagram)

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	70	**199 230 782**	1.459
20	15	10	185	**199 230 783**	1.459
25	20	10	350	**199 230 784**	1.576
32	25	10	700	**199 230 785**	1.700
40	32	10	1000	**199 230 786**	2.751
50	40	10	1600	**199 230 787**	3.073
63	50	10	3100	**199 230 788**	3.931

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)
16	50	230	27	62	168	40	77	92	194	56	25	261	76	48	64
20	50	230	27	62	168	40	77	95	194	56	25	261	76	48	64
25	58	239	30	71	168	40	77	110	194	65	25	261	76	48	72
32	68	239	36	71	168	40	77	123	194	71	25	261	76	48	79
40	84	271	44	84	187	51	99	146	224	85	45	305	95	59	94
50	97	271	51	84	187	51	99	157	224	89	45	305	95	59	95
63	124	293	64	106	187	51	99	183	224	101	45	305	95	59	107

d (mm)	closest inch (inch)
16	⅜
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2



PF 3 39 696 033

DN10/15 - 50

Ball valve type 230 ABS DA (Double acting)
With manual override
With threaded sockets Rp

Model:

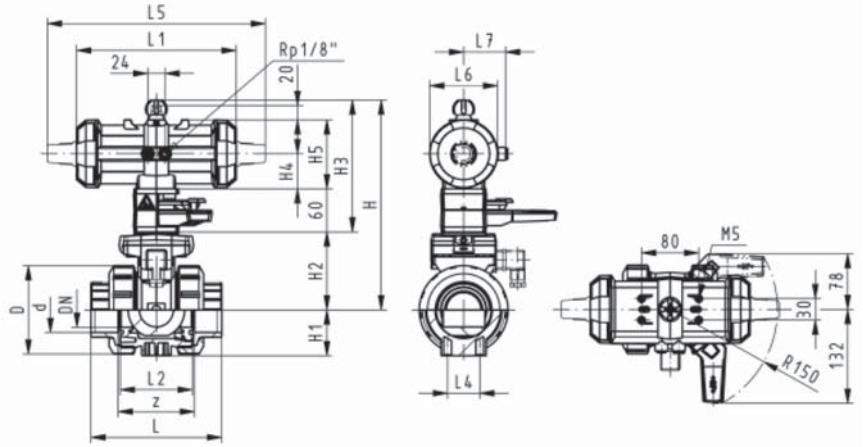
- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Control time 90°<) 1-2s
- For easy installation and removal
- Integrated stainless steel mounting inserts

Option:

- Individual configuration of the valve (see diagram)

Rp (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
⅜	10	10	70	**199 230 802**	1.459
½	15	10	185	**199 230 803**	1.459
¾	20	10	350	**199 230 804**	1.576
1	25	10	700	**199 230 805**	1.700
1 ¼	32	10	1000	**199 230 806**	2.751
1 ½	40	10	1600	**199 230 807**	3.073
2	50	10	3100	**199 230 808**	3.931

Rp (inch)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)
⅜	50	159	27	62	168	40	77	92	194	56	25	261	76	48	64
½	50	159	27	62	168	40	77	95	194	56	25	261	76	48	64
¾	58	168	30	71	168	40	77	110	194	65	25	261	76	48	72
1	68	168	36	71	168	40	77	123	194	71	25	261	76	48	79
1 ¼	84	202	44	84	187	51	99	146	224	85	45	305	95	59	94
1 ½	97	202	51	84	187	51	99	157	224	89	45	305	95	59	95
2	124	225	64	106	187	51	99	183	224	101	45	305	95	59	107



DN10/15 - 50

Ball valve type 230 ABS FC (Fail safe to close)
Without manual override
With solvent cement sockets metric

Model:

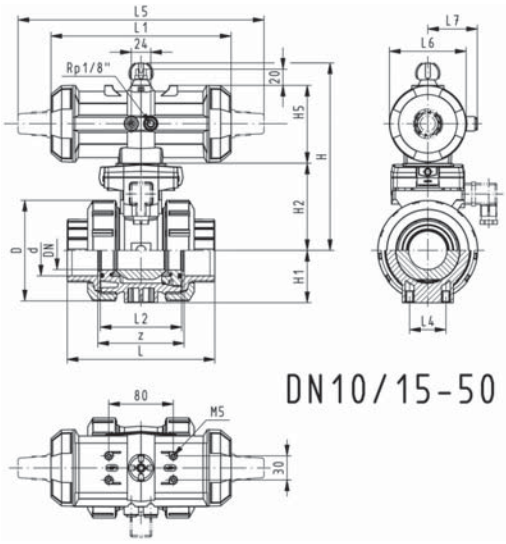
- Control time 90°<) 1-2s
- Assignment of actuators: PA11 (DN10/15-25), PA21 (DN32-50), PA30 (DN65), PA40 (DN80), PA40 (DN100)
- For easy installation and removal
- Integrated stainless steel mounting inserts

Option:

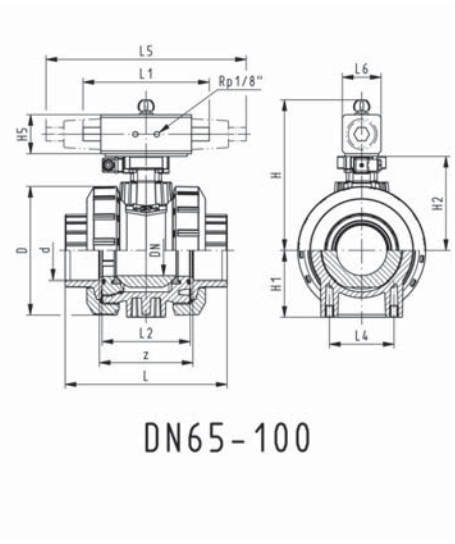
- Individual configuration of the valve (see diagram)

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
16	10	10	70	**199 230 822**	3 39 696 033	1.459
20	15	10	185	**199 230 823**	3 39 696 033	1.459
25	20	10	350	**199 230 824**	3 39 696 033	1.576
32	25	10	700	**199 230 825**	3 39 696 033	1.700
40	32	10	1000	**199 230 826**	3 39 696 033	2.751
50	40	10	1600	**199 230 827**	3 39 696 033	3.073
63	50	10	3100	**199 230 828**	3 39 696 033	3.931
75	65	10	5000	**199 230 829**	3 39 696 633	6.700
90	80	10	7000	**199 230 830**	3 39 696 633	8.600
110	100	10	11000	**199 230 831**	3 39 696 633	12.900

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)	closest inch (inch)
16	50	159	27	62	77	92	194	56	25	261	76	48	64	⅜
20	50	159	27	62	77	95	194	56	25	261	76	48	64	½
25	58	168	30	71	77	110	194	65	25	261	76	48	72	¾
32	68	168	36	71	77	123	194	71	25	261	76	48	79	1
40	84	202	44	84	99	146	224	85	45	305	95	59	94	1 ¼
50	97	202	51	84	99	157	224	89	45	305	95	59	95	1 ½
63	124	225	64	106	99	183	224	101	45	305	95	59	107	2
75	166	262	85	156	70	233		136	70	276	65		144	2 ½
90	200	281	105	168	78	254		141	70	341	72		151	3
110	238	292	123	175	86	301		164	120	369	80		174	4



DN10/15-50



DN65-100

PF 3 39 696 033

DN10/15 - 50

Ball valve type 230 ABS FC (Fail safe to close)
Without manual override
With threaded sockets Rp

Model:

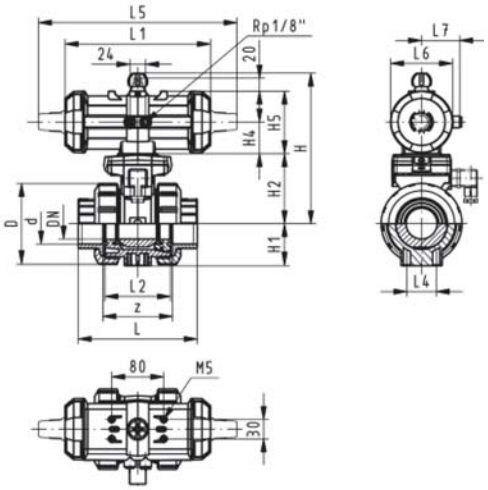
- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Control time 90°<) 1-2s
- For easy installation and removal
- Integrated stainless steel mounting inserts

Option:

- Individual configuration of the valve (see diagram)

Rp (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
⅜	10	10	70	**199 230 842**	1.200
½	15	10	185	**199 230 843**	1.200
¾	20	10	350	**199 230 844**	1.300
1	25	10	700	**199 230 845**	1.400
1 ¼	32	10	1000	**199 230 846**	2.500
1 ½	40	10	1600	**199 230 847**	2.800
2	50	10	3100	**199 230 848**	3.700

Rp (inch)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)
⅜	50	159	27	62	40	77	92	194	56	25	261	76	48	64
½	50	159	27	62	40	77	95	194	56	25	261	76	48	64
¾	58	168	30	71	40	77	110	194	65	25	261	76	48	72
1	68	168	36	71	40	77	123	194	71	25	261	76	48	79
1 ¼	84	202	44	84	51	99	146	224	85	45	305	95	59	94
1 ½	97	202	51	84	51	99	157	224	89	45	305	95	59	95
2	124	225	64	106	51	99	183	224	101	45	305	95	59	107



DN10/15 - 50

Ball valve type 230 ABS FO (Fail safe to open)
Without manual override
With solvent cement sockets metric

Model:

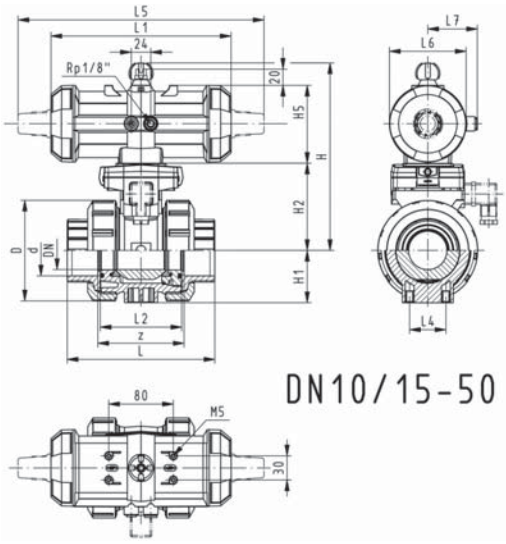
- Control time 90°<) 1-2s
- Assignment of actuators: PA11 (DN10/15-25), PA21 (DN32-50), PA30 (DN65), PA40 (DN80), PA40 (DN100)
- For easy installation and removal
- Integrated stainless steel mounting inserts

Option:

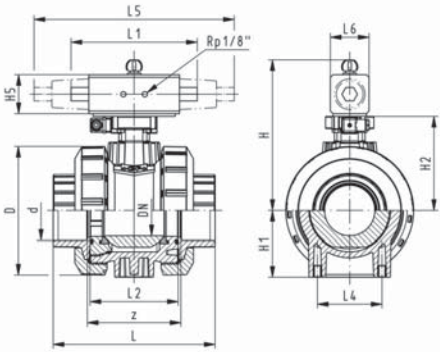
- Individual configuration of the valve (see diagram)

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
16	10	10	70	**199 230 862**	3 39 696 033	1.459
20	15	10	185	**199 230 863**	3 39 696 033	1.459
25	20	10	350	**199 230 864**	3 39 696 033	1.576
32	25	10	700	**199 230 865**	3 39 696 033	1.700
40	32	10	1000	**199 230 866**	3 39 696 033	2.751
50	40	10	1600	**199 230 867**	3 39 696 033	3.073
63	50	10	3100	**199 230 868**	3 39 696 033	3.931
75	65	10	5000	**199 230 869**	3 39 696 633	6.700
90	80	10	7000	**199 230 870**	3 39 696 633	8.600
110	100	10	11000	**199 230 871**	3 39 696 633	12.900

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)	closest inch (inch)
16	50	159	27	62	77	92	194	56	25	261	76	48	64	⅜
20	50	159	27	62	77	95	194	56	25	261	76	48	64	½
25	58	168	30	71	77	110	194	65	25	261	76	48	72	¾
32	68	168	36	71	77	123	194	71	25	261	76	48	79	1
40	84	202	44	84	99	146	224	85	45	305	95	59	94	1 ¼
50	97	202	51	84	99	157	224	89	45	305	95	59	95	1 ½
63	124	225	64	106	99	183	224	101	45	305	95	59	107	2
75	166	262	85	156	70	233		136	70	276	65		144	2 ½
90	200	281	105	168	78	254		141	70	341	72		151	3
110	238	292	123	175	86	301		164	120	369	80		174	4



DN10/15-50



DN65-100

PF 3 39 696 033

DN10/15 - 50

Ball valve type 230 ABS FO (Fail safe to open)
Without manual override
With threaded sockets Rp

Model:

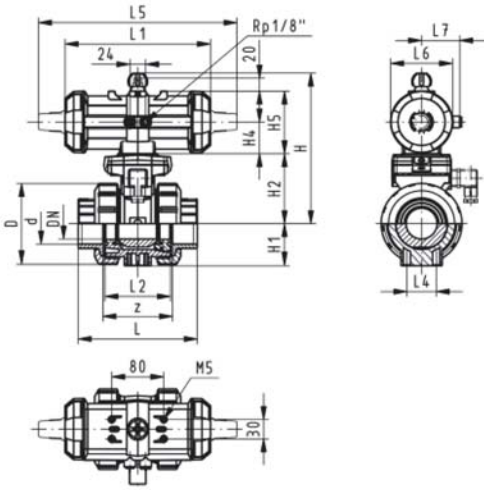
- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Control time 90°<) 1-2s
- For easy installation and removal
- Integrated stainless steel mounting inserts

Option:

- Individual configuration of the valve (see diagram)

Rp (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
⅜	10	10	70	**199 230 882**	1.200
½	15	10	185	**199 230 883**	1.200
¾	20	10	350	**199 230 884**	1.300
1	25	10	700	**199 230 885**	1.400
1 ¼	32	10	1000	**199 230 886**	2.500
1 ½	40	10	1600	**199 230 887**	2.800
2	50	10	3100	**199 230 888**	3.700

Rp (inch)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)
⅜	50	159	27	62	40	77	92	194	56	25	261	76	48	64
½	50	159	27	62	40	77	95	194	56	25	261	76	48	64
¾	58	168	30	71	40	77	110	194	65	25	261	76	48	72
1	68	168	36	71	40	77	123	194	71	25	261	76	48	79
1 ¼	84	202	44	84	51	99	146	224	85	45	305	95	59	94
1 ½	97	202	51	84	51	99	157	224	89	45	305	95	59	95
2	124	225	64	106	51	99	183	224	101	45	305	95	59	107



DN10/15 - 50

Ball valve type 230 ABS DA (Double acting)
Without manual override
With solvent cement sockets metric

Model:

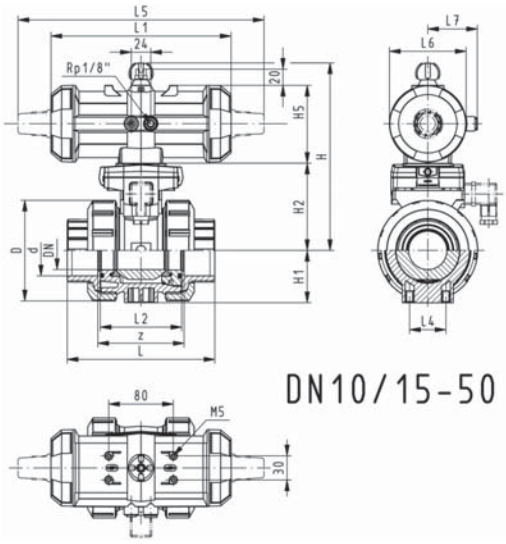
- Control time 90°<) 1-2s
- Assignment of actuators: PA11 (DN10/15-25), PA21 (DN32-50), PA35 (DN65), PA40 (DN80), PA45 (DN100)
- For easy installation and removal
- Integrated stainless steel mounting inserts

Option:

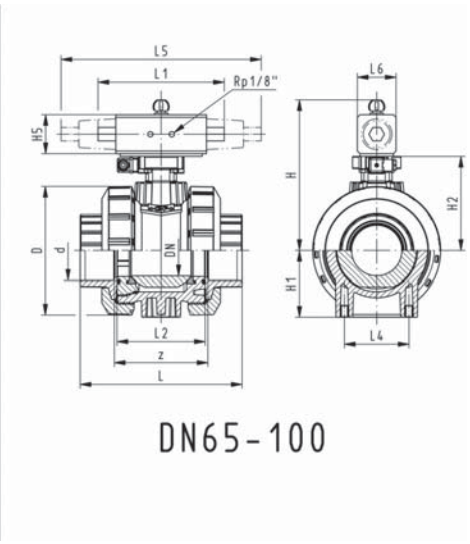
- Individual configuration of the valve (see diagram)

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
16	10	10	70	**199 230 902**	3 39 696 033	1.459
20	15	10	185	**199 230 903**	3 39 696 033	1.459
25	20	10	350	**199 230 904**	3 39 696 033	1.576
32	25	10	700	**199 230 905**	3 39 696 033	1.700
40	32	10	1000	**199 230 906**	3 39 696 033	2.751
50	40	10	1600	**199 230 907**	3 39 696 033	3.073
63	50	10	3100	**199 230 908**	3 39 696 033	3.931
75	65	10	5000	**199 230 909**	3 39 696 633	5.600
90	80	10	7000	**199 230 910**	3 39 696 633	7.900
110	100	10	11000	**199 230 911**	3 39 696 633	11.200

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)	closest inch (inch)
16	50	159	27	62	77	92	194	56	25	261	76	48	64	⅜
20	50	159	27	62	77	95	194	56	25	261	76	48	64	½
25	58	168	30	71	77	110	194	65	25	261	76	48	72	¾
32	68	168	36	71	77	123	194	71	25	261	76	48	79	1
40	84	202	44	84	99	146	224	85	45	305	95	59	94	1 ¼
50	97	202	51	84	99	157	224	89	45	305	95	59	95	1 ½
63	124	225	64	106	99	183	224	101	45	305	95	59	107	2
75	166	257	85	156	66	233	144	136	70		60		144	2 ½
90	200	274	105	168	70	254	152	141	70		65		151	3
110	238	273	123	175	78	301	169	164	120		72		174	4



DN10/15-50



DN65-100

PF 3 39 696 033

DN10/15 - 50

Ball valve type 230 ABS DA (Double acting)
Without manual override
With threaded sockets Rp

Model:

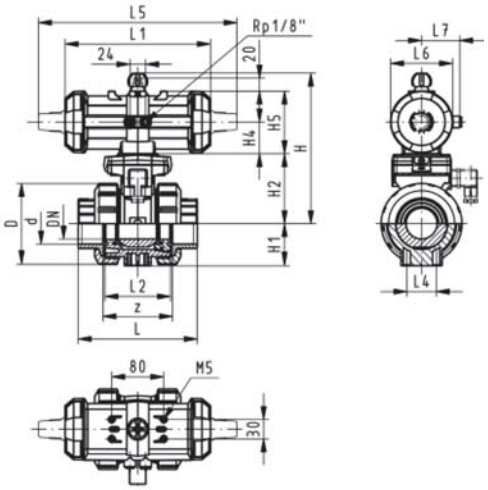
- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Control time 90°<) 1-2s
- For easy installation and removal
- Integrated stainless steel mounting inserts

Option:

- Individual configuration of the valve (see diagram)

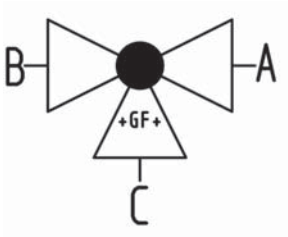
Rp (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
⅜	10	10	70	**199 230 922**	1.200
½	15	10	185	**199 230 923**	1.200
¾	20	10	350	**199 230 924**	1.300
1	25	10	700	**199 230 925**	1.400
1 ¼	32	10	1000	**199 230 926**	2.500
1 ½	40	10	1600	**199 230 927**	2.800
2	50	10	3100	**199 230 928**	3.700

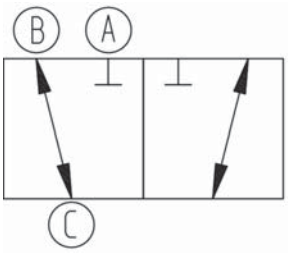
Rp (inch)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	z (mm)
⅜	50	159	27	62	40	77	92	194	56	25	261	76	48	64
½	50	159	27	62	40	77	95	194	56	25	261	76	48	64
¾	58	168	30	71	40	77	110	194	65	25	261	76	48	72
1	68	168	36	71	40	77	123	194	71	25	261	76	48	79
1 ¼	84	202	44	84	51	99	146	224	85	45	305	95	59	94
1 ½	97	202	51	84	51	99	157	224	89	45	305	95	59	95
2	124	225	64	106	51	99	183	224	101	45	305	95	59	107



Ball valves pneumatic type 285

PF 3 39 981 033





3-Way ball valve type 285 ABS
Horizontal/L-port
Without manual override
With solvent cement sockets metric

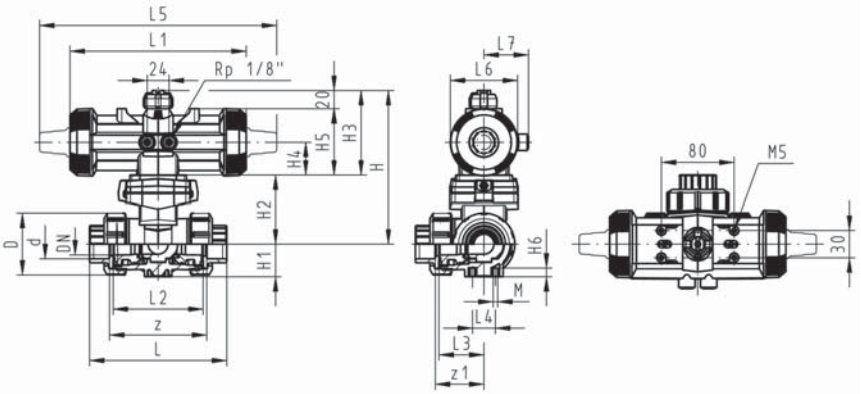
Model:

- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Actuator fails safe to the closed position FC
- Basic position B-C opened, activated position A-C opened, see flow scheme
- Control time 90°<) 1-3 s
- For easy installation and removal
- Integrated stainless steel mounting inserts

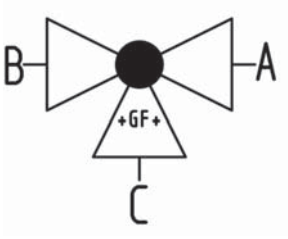
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	50	**199 285 162**	1.058
20	15	10	75	**199 285 163**	1.062
25	20	10	150	**199 285 164**	1.164
32	25	10	280	**199 285 165**	1.309
40	32	10	480	**199 285 166**	2.318
50	40	10	620	**199 285 167**	2.662
63	50	10	1230	**199 285 168**	3.689

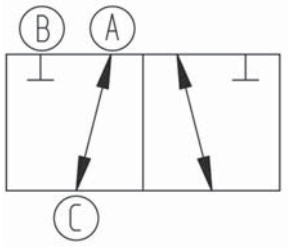
d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)
16	50	159	28	62	97	40	77	8	109	194	73	36	25	261	76
20	50	159	28	62	97	40	77	8	112	194	73	36	25	261	76
25	58	168	32	71	97	40	77	8	131	194	86	43	25	261	76
32	68	168	36	71	97	40	77	8	151	194	99	50	25	261	76
40	84	203	45	84	119	51	99	9	181	224	120	60	45	305	95
50	97	203	51	84	119	51	99	9	205	224	137	69	45	305	95
63	124	225	65	106	119	51	99	9	261	224	179	89	45	305	95

d (mm)	L7 (mm)	M	z (mm)	z1 (mm)	closest inch (inch)
16	48	6	81	40	⅜
20	48	6	81	40	½
25	48	6	94	47	¾
32	48	6	107	54	1
40	59	8	130	65	1 ¼
50	59	8	143	72	1 ½
63	59	8	185	92	2



PF 3 39 981 033





3-Way ball valve type 285 ABS
Horizontal/L-port DA (Double acting)
Without manual override
With solvent cement sockets metric

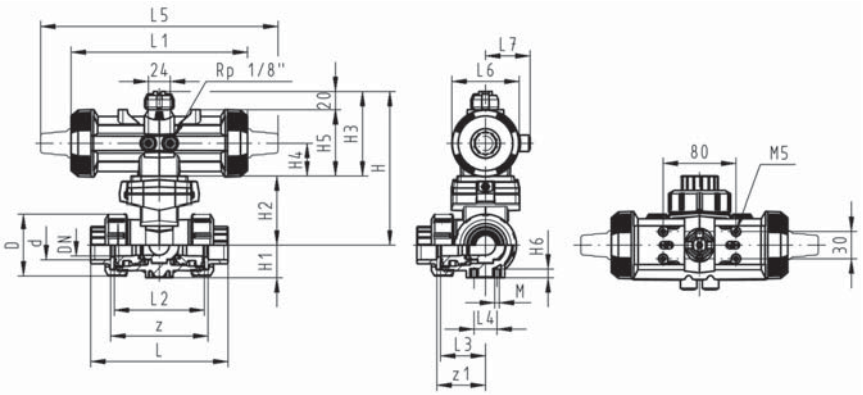
Model:

- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Basic position A-C opened, activated position B-C opened, see flow scheme
- Control time 90°<) 1-3 s
- For easy installation and removal
- Integrated stainless steel mounting inserts

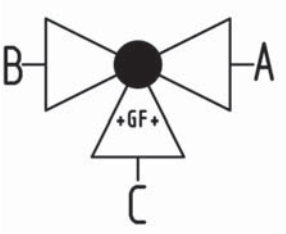
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	50	**199 285 342**	0.867
20	15	10	75	**199 285 343**	0.872
25	20	10	150	**199 285 344**	0.974
32	25	10	280	**199 285 345**	1.119
40	32	10	480	**199 285 346**	1.894
50	40	10	620	**199 285 347**	2.238
63	50	10	1230	**199 285 348**	3.287

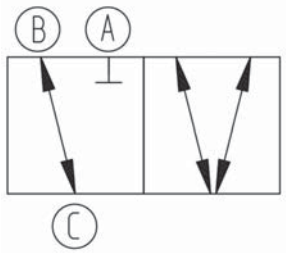
d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)
16	50	159	28	62	97	40	77	8	109	194	73	36	25	261	76
20	50	159	28	62	97	40	77	8	112	194	73	36	25	261	76
25	58	168	32	71	97	40	77	8	131	194	86	43	25	261	76
32	68	168	36	71	97	40	77	8	151	194	99	50	25	261	76
40	84	203	45	84	119	51	99	9	181	224	120	60	45	305	95
50	97	203	51	84	119	51	99	9	205	224	137	69	45	305	95
63	124	225	65	106	119	51	99	9	261	224	179	89	45	305	95

d (mm)	L7 (mm)	M	z (mm)	z1 (mm)	closest inch (inch)
16	48	6	81	40	⅜
20	48	6	81	40	½
25	48	6	94	47	¾
32	48	6	107	54	1
40	59	8	130	65	1 ¼
50	59	8	143	72	1 ½
63	59	8	185	92	2



PF 3 39 981 033





3-Way ball valve type 285 ABS
Horizontal/T-port
Without manual override
With solvent cement sockets metric

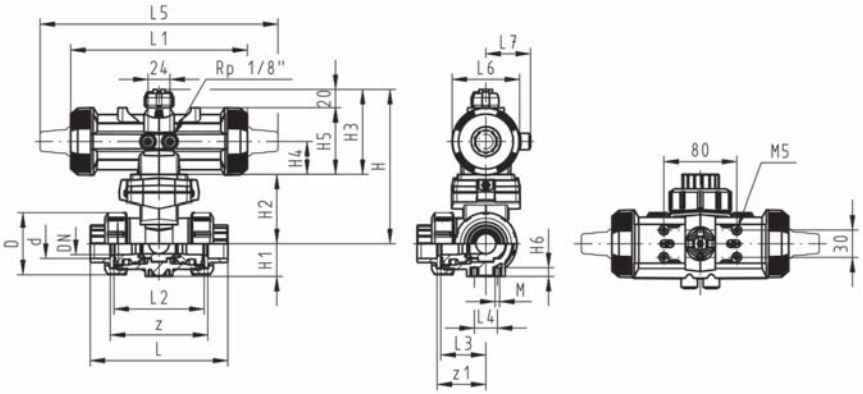
Model:

- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Actuator fails safe to the closed position FC
- Basic position B-C opened, activated position A-B-C opened, see flow scheme
- Control time 90°<) 1-3 s
- For easy installation and removal
- Integrated stainless steel mounting inserts

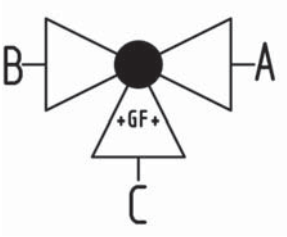
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	140	**199 285 172**	1.057
20	15	10	200	**199 285 173**	1.061
25	20	10	470	**199 285 174**	1.162
32	25	10	793	**199 285 175**	1.304
40	32	10	1290	**199 285 176**	2.309
50	40	10	1910	**199 285 177**	2.646
63	50	10	3100	**199 285 178**	3.677

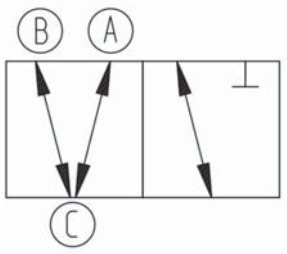
d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)
16	50	159	28	62	97	40	77	8	109	194	73	36	25	261	76
20	50	159	28	62	97	40	77	8	112	194	73	36	25	261	76
25	58	168	32	71	97	40	77	8	131	194	86	43	25	261	76
32	68	168	36	71	97	40	77	8	151	194	99	50	25	261	76
40	84	203	45	84	119	51	99	9	181	224	120	60	45	305	95
50	97	203	51	84	119	51	99	9	205	224	137	69	45	305	95
63	124	225	65	106	119	51	99	9	261	224	179	89	45	305	95

d (mm)	L7 (mm)	M	z (mm)	z1 (mm)	closest inch (inch)
16	48	6	81	40	⅜
20	48	6	81	40	½
25	48	6	94	47	¾
32	48	6	107	54	1
40	59	8	130	65	1 ¼
50	59	8	143	72	1 ½
63	59	8	185	92	2



PF 3 39 981 033





3-Way ball valve type 285 ABS
Horizontal/T-port DA (Double acting)
Without manual override
With solvent cement sockets metric

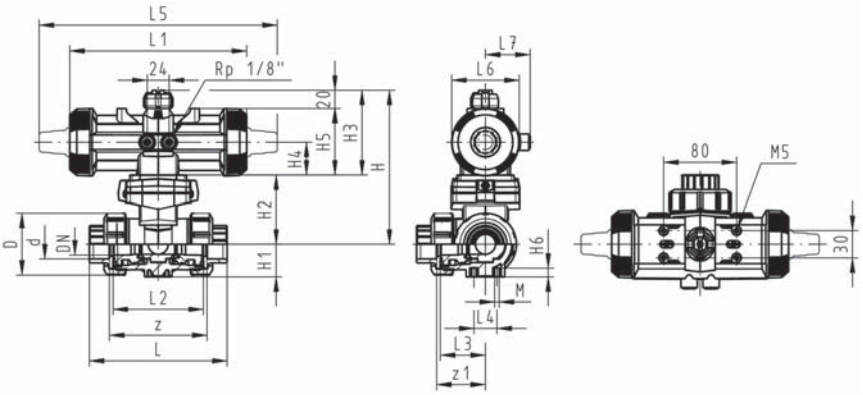
Model:

- Built on with pneumatic actuator PA11 (DN10/15-25), PA21 (DN32-50)
- Basic position A-B-C opened, activated position B-C opened, see flow scheme
- Control time 90°<) 1-3 s
- For easy installation and removal
- Integrated stainless steel mounting inserts

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
16	10	10	140	**199 285 352**	0.866
20	15	10	200	**199 285 353**	0.871
25	20	10	470	**199 285 354**	0.972
32	25	10	793	**199 285 355**	1.060
40	32	10	1290	**199 285 356**	1.783
50	40	10	1910	**199 285 357**	2.222
63	50	10	3100	**199 285 358**	3.253

d (mm)	D (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H6 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)
16	50	159	28	62	97	40	77	8	109	194	73	36	25	261	76
20	50	159	28	62	97	40	77	8	112	194	73	36	25	261	76
25	58	168	32	71	97	40	77	8	131	194	86	43	25	261	76
32	68	168	36	71	97	40	77	8	151	194	99	50	25	261	76
40	84	203	45	84	119	51	99	9	181	224	120	60	45	305	95
50	97	203	51	84	119	51	99	9	205	224	137	69	45	305	95
63	124	225	65	106	119	51	99	9	261	224	179	89	45	305	95

d (mm)	L7 (mm)	M	z (mm)	z1 (mm)	closest inch (inch)
16	48	6	81	40	⅜
20	48	6	81	40	½
25	48	6	94	47	¾
32	48	6	107	54	1
40	59	8	130	65	1 ¼
50	59	8	143	72	1 ½
63	59	8	185	92	2



Butterfly valves electric type 145

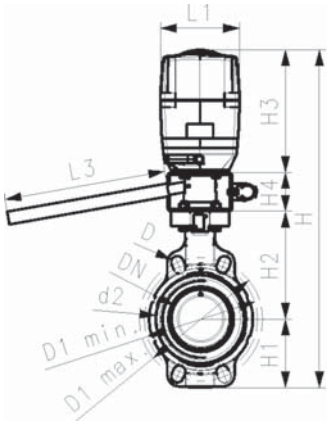
Butterfly valve type 145 ABS 100-230V
With manual override

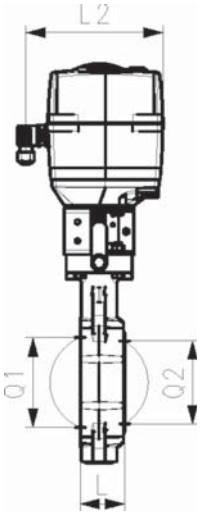
Model:

- Voltage 100-230V, 50-60Hz
- Factory set control range 90°<)
- Heating element, position feedback (Open/Close/ Middle)
- Overall length according to EN 558, ISO 5752 (DN50-200 line 25, DN250-300 line 16)
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220

Option:

- Other valve and actuator configurations available
- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board





d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
63	50	10	1470	**199 145 482**	3 39 643 135	5.678
75	65	10	2200	**199 145 483**	3 39 643 135	5.781
90	80	10	3000	**199 145 484**	3 39 643 135	5.859
110	100	10	6500	**199 145 485**	3 39 643 135	6.395
140	125	10	11500	**199 145 486**	3 39 643 135	5.389
160	150	10	16600	**199 145 487**	3 39 643 135	7.718
225	200	10	39600	**199 145 488**	3 39 643 135	13.529
280	250	6	55200	**199 145 489**	3 39 643 131	14.334
315	300	4	80000	**199 145 490**	3 39 643 131	19.546

d (mm)	Actuator unit type	d2 (mm)	D (mm)	D1 min. (mm)	D1 max. (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)
63	EA-45	104	19	120	125	475	77	134	188	75	45	122	180	250
75	EA-45	115	19	140	145	488	83	140	188	75	46	122	180	250
90	EA-120	131	19	150	160	488	89	146	188	60	49	122	180	250
110	EA-120	161	19	175	191	520	104	167	188	60	56	122	180	250
140	EA-120	187	23	210	216	547	117	181	188	60	64	122	180	250
160	EA-120	215	24	241	241	568	130	189	188	60	72	122	180	250
225	EA-250	267	23	290	295	635	158	210	208	60	73	122	180	250
280	EA-250	329	25	353	362	677	205	264	208	0	113	122	180	440
315	EA-250	379	25	400	432	721	228	285	208	0	113	122	180	510

d (mm)	Q1 (mm)	Q2 (mm)	closest inch (inch)
63	40		2
75	54	35	2 ½
90	67	50	3
110	88	74	4
140	113	97	5
160	139	123	6
225	178	169	8
280	210	207	10
315	256	253	12

PF 3 39 643 135

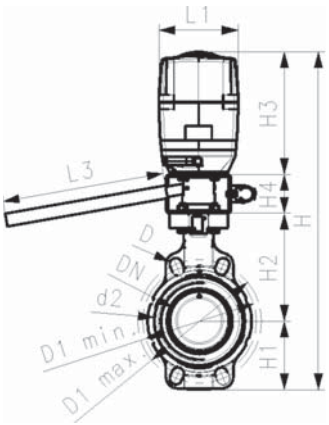
Butterfly valve type 145 ABS 24V
With manual override

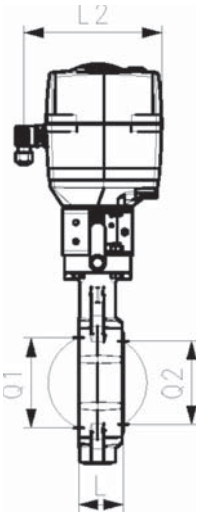
Model:

- Voltage 24V AC/DC
- Factory set control range 90°<)
- Heating element, position feedback (Open/Close/ Middle)
- Overall length according to EN 558, ISO 5752 (DN50-200 line 25, DN250-300 line 16)
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220

Option:

- Other valve and actuator configurations available
- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board



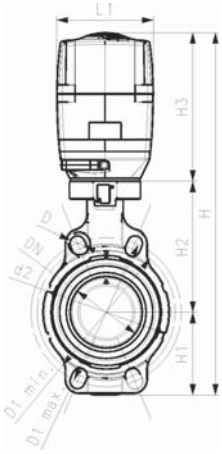


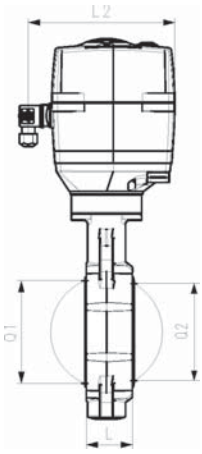
d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
63	50	10	1470	**199 145 522**	4.161
75	65	10	2200	**199 145 523**	4.257
90	80	10	3000	**199 145 524**	5.859
110	100	10	6500	**199 145 525**	6.395
140	125	10	11500	**199 145 526**	5.389
160	150	10	16600	**199 145 527**	9.910
225	200	10	39600	**199 145 528**	13.529

d (mm)	Actuator unit type	d2 (mm)	D (mm)	D1 min. (mm)	D1 max. (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)
63	EA-45	104	19	120	125	475	77	134	188	75	45	122	180	250
75	EA-45	115	19	140	145	488	83	140	188	75	46	122	180	250
90	EA-120	131	19	150	160	488	89	146	188	60	49	122	180	250
110	EA-120	161	19	175	191	520	104	167	188	60	56	122	180	250
140	EA-120	187	23	210	216	547	117	181	188	60	64	122	180	250
160	EA-120	215	24	241	241	568	130	189	188	60	72	122	180	250
225	EA-250	267	23	290	295	635	158	210	208	60	73	122	180	250

d (mm)	Q1 (mm)	Q2 (mm)	closest inch (inch)
63	40		2
75	54	35	2 ½
90	67	50	3
110	88	74	4
140	113	97	5
160	139	123	6
225	178	169	8

PF 3 39 643 135





Butterfly valve type 145 ABS 24V
Without manual override

Model:

- Voltage 24V AC/DC
- Factory set control range 90°<)
- Heating element, position feedback (Open/Close/ Middle)
- Overall length according to EN 558, ISO 5752 (DN50-200 line 25, DN250-300 line 16)
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220

Option:

- Other valve and actuator configurations available
- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
63	50	10	1470	**199 145 542**	4.178
75	65	10	2200	**199 145 543**	3.217
90	80	10	3000	**199 145 544**	4.359
110	100	10	6500	**199 145 545**	4.895
140	125	10	11500	**199 145 546**	4.376
160	150	10	16600	**199 145 547**	6.218
225	200	10	39600	**199 145 548**	12.029
280	250	6	55200	**199 145 549**	14.334
315	300	6	55200	**199 145 550**	19.546

d (mm)	Actuator unit type	d2 (mm)	D (mm)	D1 min. (mm)	D1 max. (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L1 (mm)	L2 (mm)	Q1 (mm)	Q2 (mm)
63	EA-45	104	19	120	125	415	77	134	188	45	122	180	40	
75	EA-45	115	19	140	145	428	83	140	188	46	122	180	54	35
90	EA-120	131	19	150	160	428	89	146	188	49	122	180	67	50
110	EA-120	161	19	175	191	460	104	167	188	56	122	180	88	74
140	EA-120	187	23	210	216	487	117	181	188	64	122	180	113	97
160	EA-120	215	24	241	241	508	130	189	188	72	122	180	139	123
225	EA-250	267	23	290	295	575	158	210	208	73	122	180	178	169
280	EA-250	329	25	353	362	677	205	264	208	113	122	180	210	207
315	EA-250	329	25	353	362	677	205	264	208	113	122	180	210	207

d (mm)	closest inch (inch)
63	2
75	2 ½
90	3
110	4
140	5
160	6
225	8
280	10
315	12

Butterfly valves electric type 146

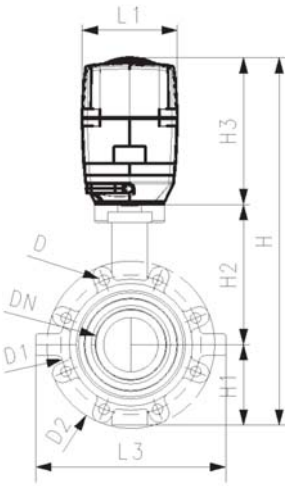
Lugstyle butterfly valve type 146 ABS 100-230V
Without manual override

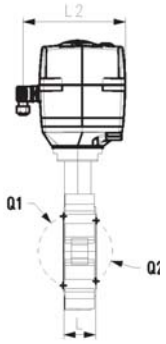
Model:

- Voltage 100-230V, 50-60Hz
- Factory set control range 90°<)
- Heating element, position feedback (Open/Close/ Middle)
- Overall length according to EN 558, ISO 5752 (DN50-200 line 25, DN250-300 line 16)
- Connecting dimension: ISO 7005 PN10, EN 1092 PN10, DIN 2501 PN10

Option:

- Other valve and actuator configurations available
- Optional accessories: Fail-safe return unit, Monitoring board, Position controller, Profibus DP board

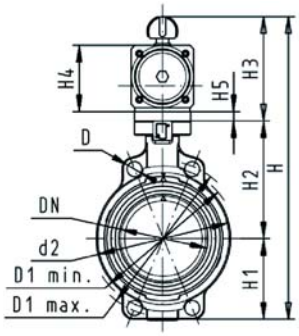


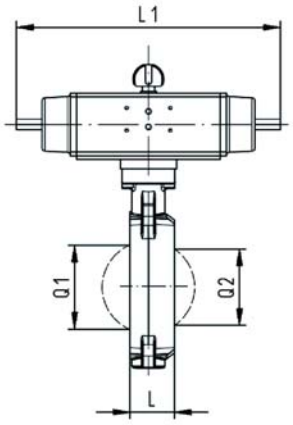


d (mm)	DN (mm)	closest inch (inch)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
63	50	2	10	1470	**199 146 502**	3 39 A85 121	4.299
75	65	2 ½	10	2200	**199 146 503**	3 39 A85 121	4.456
90	80	3	10	3000	**199 146 504**	3 39 A85 121	4.701
110	100	4	10	6500	**199 146 505**	3 39 A85 121	5.606
140	125	5	10	11500	**199 146 506**	3 39 A85 121	7.120
160	150	6	10	16600	**199 146 507**	3 39 A85 121	8.881
225	200	8	10	39600	**199 146 508**	3 39 A85 121	13.625
280	250	10	6	55200	**199 146 509**	3 39 A85 101	24.385
315	300	12	4	80000	**199 146 510**	3 39 A85 101	30.916

d (mm)	Actuator unit type	d2 (mm)	D	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	Q1 (mm)	Q2 (mm)
63	EA-45	160	M16	125	399	77	134	188	45	122	180	165	40	
75	EA-45	180	M16	145	411	83	140	188	46	122	180	182	54	35
90	EA-120	195	M16	160	423	89	146	188	49	122	180	210	67	50
110	EA-120	226	M16	180	461	106	167	188	56	122	180	240	88	74
140	EA-120	258	M16	210	490	121	181	188	64	122	180	272	113	97
160	EA-120	284	M20	240	510	133	189	188	72	122	180	300	139	123
225	EA-250	341	M20	295	577	159	210	208	73	122	180	360	178	169
280	EA-250	412	M20	350	677	205	264	208	113	122	180	440	210	207
315	EA-250	482	M20	400	727	234	285	208	113	122	180	510	256	253

Butterfly valves pneumatic type 240





Butterfly valve type 240 ABS
FC (Fail safe to close)
Without manual override

Model:

- Control range 90°<)
- Overall length according to EN 558, ISO 5752
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
63	50	10	1470	**199 240 402**	3 39 644 035	3.371
75	65	10	2200	**199 240 403**	3 39 644 035	3.100
90	80	10	3000	**199 240 404**	3 39 644 035	3.399
110	100	10	6500	**199 240 405**	3 39 644 035	5.133
140	125	10	11500	**199 240 406**	3 39 644 035	6.826
160	150	10	16600	**199 240 407**	3 39 644 035	9.779
225	200	10	39600	**199 240 408**	3 39 644 035	13.529
280	250	10	55200	**199 240 409**	3 39 644 031	28.200
315	300	10	80000	**199 240 410**	3 39 644 031	36.200

d (mm)	Actuator unit type	d2 (mm)	D (mm)	D1 min. (mm)	D1 max. (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)
63	PA-30 FC	104	19	120	125	327	77	134	117	70	15	45	276
75	PA-30 FC	115	19	140	145	340	83	140	117	70	15	46	276
90	PA-35 FC	131	19	150	160	361	89	146	126	78	15	49	326
110	PA-40 FC	161	19	175	191	400	104	167	129	86	0	56	370
140	PA-45 FC	187	23	210	216	436	117	181	139	96	0	64	411
160	PA-50 FC	215	24	241	241	468	130	189	149	106	0	72	423
225	PA-55 FC	267	23	290	295	529	158	210	161	118	0	73	452
280	PA-65 FC	329	25	353	362	808	205	264	191	148	0	113	648
315	PA-70 FC	379	25	400	432	866	228	285	196	157	0	113	663

d (mm)	L2 (mm)	Q1 (mm)	Q2 (mm)	closest inch (inch)
63	65	40		2
75	65	54	35	2 ½
90	72	67	50	3
110	80	88	74	4
140	90	113	97	5
160	100	139	123	6
225	112	178	169	8
280	137	210	207	10
315	145	256	253	12

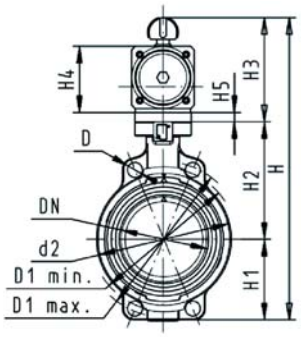
PF 3 39 644 035

Butterfly valve type 240 ABS
FO (Fail safe to open)
Without manual override

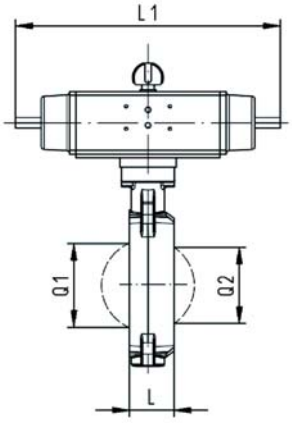
Model:

- Control range 90°<)
- Overall length according to EN 558, ISO 5752
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
63	50	10	1470	**199 240 422**	3.371
75	65	10	2200	**199 240 423**	3.467
90	80	10	3000	**199 240 424**	3.399
110	100	10	6500	**199 240 425**	5.133
140	125	10	11500	**199 240 426**	6.826
160	150	10	16600	**199 240 427**	9.779
225	200	10	39600	**199 240 428**	13.529



d (mm)	Actuator unit type	d2 (mm)	D (mm)	D1 min. (mm)	D1 max. (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)
63	PA-30 FO	104	19	120	125	327	77	134	117	70	15	45	276
75	PA-30 FO	115	19	140	145	340	83	140	117	70	15	46	276
90	PA-35 FO	131	19	150	160	361	89	146	126	78	15	49	326
110	PA-40 FO	161	19	175	191	400	104	167	129	86		56	370
140	PA-45 FO	187	23	210	216	436	117	181	139	96		64	411
160	PA-50 FO	215	24	241	241	468	130	189	149	106		72	423
225	PA-55 FO	267	23	290	295	529	158	210	161	118		73	452



d (mm)	L2 (mm)	Q1 (mm)	Q2 (mm)	closest inch (inch)
63	65	40		2
75	65	54	35	2 ½
90	72	67	50	3
110	80	88	74	4
140	90	113	97	5
160	100	139	123	6
225	112	178	169	8

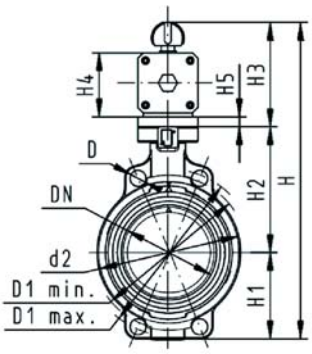
PF 3 39 644 035

Butterfly valve type 240 ABS
DA (Double acting)
Without manual override

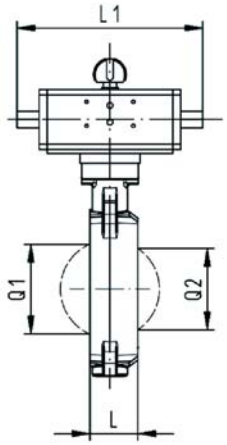
Model:

- Control range 90°<)
- Overall length according to EN 558, ISO 5752
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, ANSI/ASME B 16.5 Class 150, BS 1560: 1989, BS 4504, JIS B 2220

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
63	50	10	1470	**199 240 442**	2.221
75	65	10	2200	**199 240 443**	2.317
90	80	10	3000	**199 240 444**	2.730
110	100	10	6500	**199 240 445**	3.385
140	125	10	11500	**199 240 446**	4.076
160	150	10	16600	**199 240 447**	6.258
225	200	10	39600	**199 240 448**	7.529



d (mm)	Actuator unit type	d2 (mm)	D (mm)	D1 min. (mm)	D1 max. (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)
63	PA-35 DA	104	19	120	125	317	77	134	107	60	15	45	177
75	PA-35 DA	115	19	140	145	330	83	140	107	60	15	46	177
90	PA-40 DA	131	19	150	160	348	89	146	113	66	15	49	190
110	PA-45 DA	161	19	175	191	372	104	167	102	71		56	235
140	PA-45 DA	187	23	210	216	408	117	181	111	78		64	235
160	PA-55 DA	215	24	241	241	448	130	189	129	86		72	279
225	PA-55 DA	267	23	290	295	507	158	210	139	96		73	279



d (mm)	L2 (mm)	Q1 (mm)	Q2 (mm)	closest inch (inch)
63	55	40		2
75	55	54	35	2 ½
90	60	67	50	3
110	65	88	74	4
140	72	113	97	5
160	80	139	123	6
225	90	178	169	8

Butterfly valves pneumatic type 243

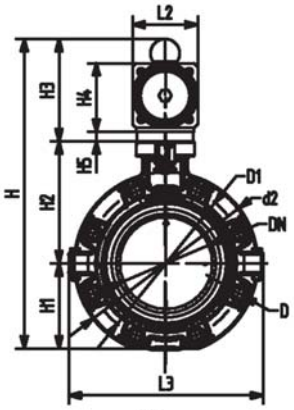
Lugstyle butterfly valve type 243 ABS
FC (Fail safe to close)
Without manual override

Model:

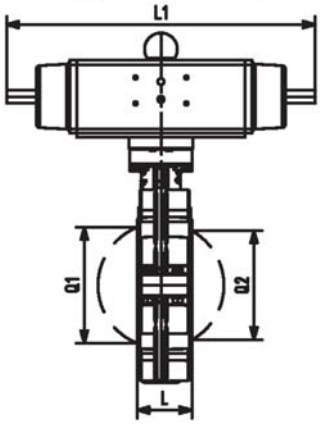
- Housing material: PP-GF30 with SS316 lug-inserts
- Control range 90°<)
- Overall length according to EN 558, ISO 5752 (DN50 - 200 line 25, DN250 - 300 line 10)
- Connecting dimension: ISO 7005 PN10, EN 1092 PN10, DIN 2501 PN10

Option:

- Optional accessory: Valve-Integrated position feedback with limit switches (limit switches have to be ordered separately)



d (mm)	DN (mm)	closest inch (inch)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
63	50	2	10	1470	**199 243 402**	3 39 A86 021	3.499
75	65	2 ½	10	2200	**199 243 403**	3 39 A86 021	3.656
90	80	3	10	3000	**199 243 404**	3 39 A86 021	4.692
110	100	4	10	6500	**199 243 405**	3 39 A86 021	6.406
140	125	5	10	11500	**199 243 406**	3 39 A86 021	9.222
160	150	6	10	16600	**199 243 407**	3 39 A86 021	12.902
225	200	8	10	39600	**199 243 408**	3 39 A86 021	16.691
280	250	10	10	55200	**199 243 409**	3 39 A86 001	33.880
315	300	12	10	80000	**199 243 410**	3 39 A86 001	43.985



d (mm)	Actuator unit type	d2 (mm)	D	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)
63	PA-30 FC	160	M16	125	328	77	134	117	70	15	45	276	65	165
75	PA-30 FC	180	M16	145	340	83	140	117	70	15	46	276	65	182
90	PA-35 FC	195	M16	160	361	89	146	126	78	15	49	326	72	210
110	PA-40 FC	226	M16	180	402	106	167	129	86	0	56	370	80	240
140	PA-45 FC	258	M16	210	441	121	181	139	96	0	64	411	90	272
160	PA-50 FC	284	M20	240	471	133	189	149	106	0	72	423	100	300
225	PA-55 FC	341	M20	295	530	159	210	161	118	0	73	452	112	360
280	PA-65 FC	412	M20	350	660	205	164	191	148	0	113	648	137	440
315	PA-70 FC	482	M20	400	715	234	285	196	157	0	113	663	145	510

d (mm)	Q1 (mm)	Q2 (mm)
63	40	
75	54	35
90	67	50
110	88	74
140	113	97
160	139	123
225	178	169
280	210	207
315	256	253

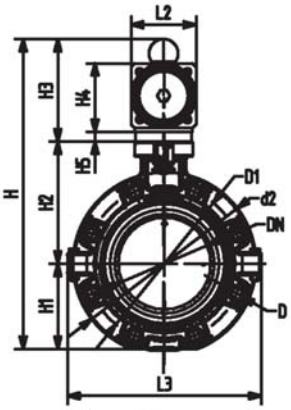
Lugstyle butterfly valve type 243 ABS
FO (Fail safe to open)
Without manual override

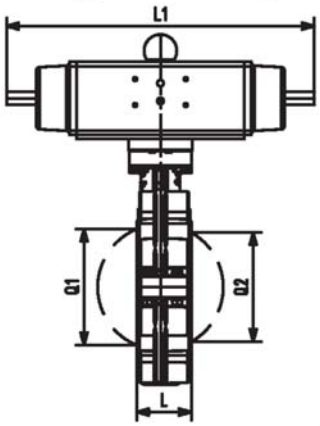
Model:

- Housing material: PP-GF30 with SS316 lug-inserts
- Control range 90°<)
- Overall length according to EN 558, ISO 5752 (DN50 - 200 line 25, DN250 - 300 line 10)
- Connecting dimension: ISO 7005 PN10, EN 1092 PN10, DIN 2501 PN10

Option:

- Optional accessory: Valve-Integrated position feedback with limit switches (limit switches have to be ordered separately)





d (mm)	DN (mm)	closest inch (inch)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
63	50	2	10	1470	**199 243 422**	3 39 A86 021	3.499
75	65	2 ½	10	2200	**199 243 423**	3 39 A86 021	3.656
90	80	3	10	3000	**199 243 424**	3 39 A86 021	4.692
110	100	4	10	6500	**199 243 425**	3 39 A86 021	6.406
140	125	5	10	11500	**199 243 426**	3 39 A86 021	9.222
160	150	6	10	16600	**199 243 427**	3 39 A86 021	12.902
225	200	8	10	39600	**199 243 428**	3 39 A86 021	16.691
280	250	10	10	55200	**199 243 429**	3 39 A86 001	33.880
315	300	12	10	80000	**199 243 430**	3 39 A86 001	43.985

d (mm)	Actuator unit type	d2 (mm)	D	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)
63	PA-30 FO	160	M16	125	328	77	134	117	70	15	45	276	65	165
75	PA-30 FO	180	M16	145	340	83	140	117	70	15	46	276	65	182
90	PA-35 FO	195	M16	160	361	89	146	126	78	15	49	326	72	210
110	PA-40 FO	226	M16	180	402	106	167	129	86	0	56	370	80	240
140	PA-45 FO	258	M16	210	441	121	181	139	96	0	64	411	90	272
160	PA-50 FO	284	M20	240	471	133	189	149	106	0	72	423	100	300
225	PA-55 FO	341	M20	295	530	159	210	161	118	0	73	452	112	360
280	PA-70 FO	412	M20	350	660	205	264	191	148	0	113	648	137	440
315	PA-70 FO	482	M20	400	715	234	285	196	157	0	113	663	145	510

d (mm)	Q1 (mm)	Q2 (mm)
63	40	
75	54	35
90	67	50
110	88	74
140	113	97
160	139	123
225	178	169
280	210	207
315	256	253

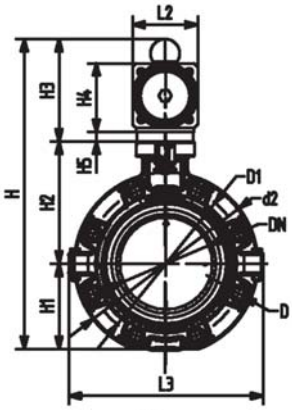
Lugstyle butterfly valve type 243 ABS
DA (Double acting)
Without manual override

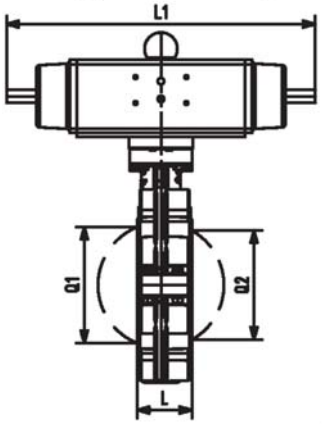
Model:

- Housing material: PP-GF30 with SS316 lug-inserts
- Control range 90°<)
- Overall length according to EN 558, ISO 5752 (DN50 - 200 line 25, DN250 - 300 line 10)
- Connecting dimension: ISO 7005 PN10, EN 1092 PN10, DIN 2501 PN10

Option:

- Optional accessory: Valve-Integrated position feedback with limit switches (limit switches have to be ordered separately)





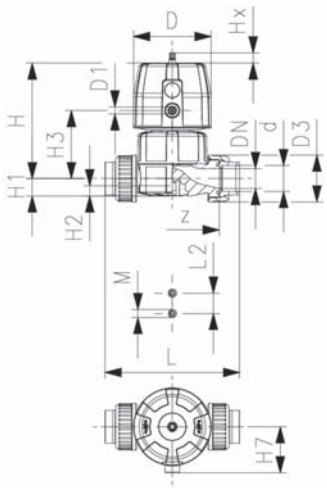
d (mm)	DN (mm)	closest inch (inch)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	PF	Weight (kg)
63	50	2	10	1470	**199 243 442**	3 39 A86 021	3.499
75	65	2 ½	10	2200	**199 243 443**	3 39 A86 021	3.656
90	80	3	10	3000	**199 243 444**	3 39 A86 021	4.692
110	100	4	10	6500	**199 243 445**	3 39 A86 021	6.406
140	125	5	10	11500	**199 243 446**	3 39 A86 021	9.222
160	150	6	10	16600	**199 243 447**	3 39 A86 021	12.902
225	200	8	10	39600	**199 243 448**	3 39 A86 021	16.691
280	250	10	10	55200	**199 243 449**	3 39 A86 001	33.880
315	300	12	10	80000	**199 243 450**	3 39 A86 001	43.985

d (mm)	Actuator unit type	d2 (mm)	D	D1 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)
63	PA-35 DA	160	M16	125	318	77	134	107	60	15	45	177	55	165
75	PA-35 DA	180	M16	145	330	83	140	107	60	15	46	177	55	182
90	PA-40 DA	195	M16	160	348	89	146	113	66	15	49	190	60	210
110	PA-45 DA	226	M16	180	375	106	167	102	71	0	56	235	65	240
140	PA-45 DA	258	M16	210	413	121	181	111	78	0	64	235	72	272
160	PA-55 DA	284	M20	240	451	133	189	129	86	0	72	279	80	300
225	PA-55 DA	341	M20	295	508	159	210	139	96	0	73	279	90	360
280	PA-65 DA	412	M20	350	630	205	264	161	118	0	113	350	112	440
315	PA-70 DA	482	M20	400	692	234	285	173	130	0	113	381	124	510

d (mm)	Q1 (mm)	Q2 (mm)
63	40	
75	54	35
90	67	50
110	88	74
140	113	97
160	139	123
225	178	169
280	210	207
315	256	253

Diaphragm valves pneumatic

PF 3 39 772 220



Diaphragm valve DIASTAR Six ABS
FC (Fail safe to close)
Unions with solvent cement sockets metric

Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- For easy installation and removal
- Short overall length

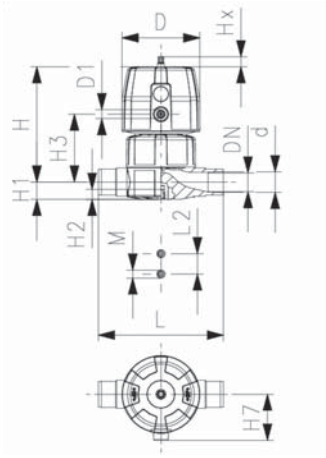
Option:

- Individual configuration of the valve (see diagram)

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	6	125	**169 614 012**	0.523
25	20	6	271	**169 614 013**	0.986
32	25	6	481	**169 614 014**	1.175
40	32	6	759	**169 614 015**	1.977
50	40	6	960	**169 614 016**	2.495
63	50	6	1181	**169 614 017**	3.460

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	z (mm)	Lift = Hx (mm)	closest inch (inch)
20	68	⅛	101	14	12	60	43	128	25	M6	96	7	½
25	96	⅛	132	18	12	73	57	152	25	M6	114	10	¾
32	96	⅛	143	22	12	84	57	166	25	M6	122	13	1
40	120	⅛	173	26	15	99	69	192	45	M8	140	14	1 ¼
50	120	⅛	193	32	15	119	69	222	45	M8	160	16	1 ½
63	120	⅛	205	39	15	132	69	266	45	M8	190	16	2

PF 3 39 772 210



Diaphragm valve DIASTAR Six ABS
FC (Fail safe to close)
With solvent cement spigots metric

Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Overall length EN 558

Option:

- Individual configuration of the valve (see diagram)

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	6	125	**169 615 012**	0.477
25	20	6	271	**169 615 013**	0.920
32	25	6	481	**169 615 014**	1.086
40	32	6	759	**169 615 015**	1.782
50	40	6	960	**169 615 016**	2.262
63	50	6	1181	**169 615 017**	3.075

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	Lift = Hx (mm)	closest inch (inch)
20	68	⅛	101	14	12	60	43	124	25	M6	7	½
25	96	⅛	132	18	12	73	57	144	25	M6	10	¾
32	96	⅛	143	22	12	84	57	154	25	M6	13	1
40	120	⅛	173	26	15	99	69	174	45	M8	14	1 ¼
50	120	⅛	193	32	15	119	69	194	45	M8	16	1 ½
63	120	⅛	205	39	15	132	69	224	45	M8	16	2

PF 3 39 772 230

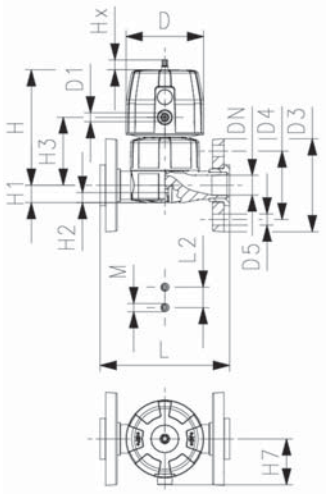
Diaphragm valve DIASTAR Six ABS
FC (Fail safe to close)
With backing flanges PP-V metric/BS

Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Flat sealing faces
- Overall length EN 558
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, BS 4504 PN 10

Option:

- Individual configuration of the valve (see diagram)

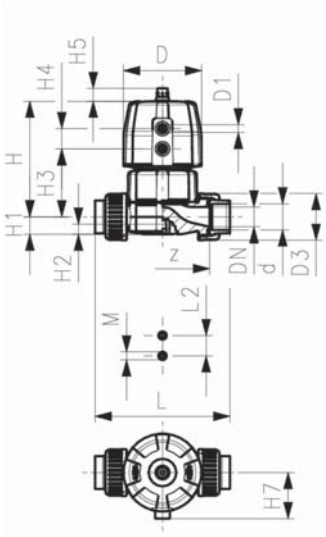


d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	6	125	**169 617 112**	0.652
25	20	6	271	**169 617 113**	1.144
32	25	6	481	**169 617 114**	1.406
40	32	6	759	**169 617 115**	2.280
50	40	6	960	**169 617 116**	2.798
63	50	6	1181	**169 617 117**	3.983

d (mm)	D (mm)	D1_G (inch)	D3 (mm)	D4 (mm)	D5 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	Lift = Hx (mm)
20	68	⅛	95	65	14	101	14	12	60	43	130	25	M6	7
25	96	⅛	105	75	14	132	18	12	73	57	150	25	M6	10
32	96	⅛	115	85	14	143	22	12	84	57	160	25	M6	13
40	120	⅛	140	100	18	173	26	15	99	69	180	45	M8	14
50	120	⅛	150	110	18	193	32	15	119	69	200	45	M8	16
63	120	⅛	165	125	18	205	39	15	132	69	230	45	M8	16

d (mm)	closest inch (inch)
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2

PF 3 39 772 220



Diaphragm valve DIASTAR Ten ABS
FC (Fail safe to close)
Unions with solvent cement sockets metric

Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- For easy installation and removal
- Short overall length

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

Working Pressure: **one side**

d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10	125	**169 624 012**	0.549
25	20	10	271	**169 624 013**	1.061
32	25	10	481	**169 624 014**	1.247
40	32	10	759	**169 624 015**	2.127
50	40	10	1263	**169 624 016**	3.633
63	50	10	1728	**169 624 017**	4.381

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	z (mm)	Lift = Hx (mm)
20	68	⅛	101	14	12	60	24	16	43	128	25	M6	96	7
25	96	⅛	132	18	12	73	25	16	57	152	25	M6	114	10
32	96	⅛	143	22	12	84	25	16	57	166	25	M6	122	13
40	120	⅛	173	26	15	99	26	26	69	192	45	M8	140	15
50	150	¼	214	32	15	119	36	26	88	222	45	M8	160	19
63	150	¼	226	39	15	132	36	26	88	266	45	M8	190	23

d (mm)	closest inch (inch)
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2

PF 3 39 772 210

Diaphragm valve DIASTAR Ten ABS FC (Fail safe to close) With solvent cement spigots metric

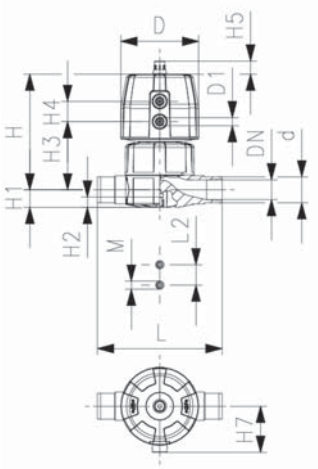
Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Overall length EN 558

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

Working Pressure: **one side**



d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10	125	**169 625 012**	0.503
25	20	10	271	**169 625 013**	0.995
32	25	10	481	**169 625 014**	1.158
40	32	10	759	**169 625 015**	1.932
50	40	10	1263	**169 625 016**	3.520
63	50	10	1728	**169 625 017**	3.996

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	Lift = Hx (mm)	closest inch (inch)
20	68	⅛	101	14	12	60	24	16	43	124	25	M6	7	½
25	96	⅛	132	18	12	73	25	16	57	144	25	M6	10	¾
32	96	⅛	143	22	12	84	25	16	57	154	25	M6	13	1
40	120	⅛	173	26	15	99	26	26	69	174	45	M8	15	1 ¼
50	150	¼	214	32	15	119	36	26	88	194	45	M8	19	1 ½
63	150	¼	226	39	15	132	36	26	88	224	45	M8	23	2

PF 3 39 772 230

Diaphragm valve DIASTAR Ten ABS
FC (Fail safe to close)
With backing flanges PP-V metric/BS

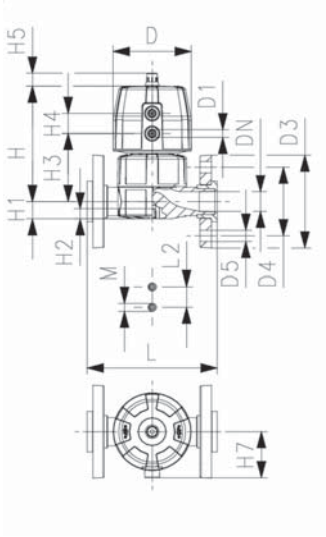
Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Flat sealing faces
- Overall length EN 558
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, BS 4504 PN 10

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

Working Pressure: **one side**



d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10	125	**169 627 112**	0.678
25	20	10	271	**169 627 113**	1.219
32	25	10	481	**169 627 114**	1.478
40	32	10	759	**169 627 115**	2.430
50	40	10	1263	**169 627 116**	3.936
63	50	10	1728	**169 627 117**	4.904

d (mm)	D (mm)	D1_G (inch)	D3 (mm)	D4 (mm)	D5 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M
20	68	⅛	95	65	14	101	14	12	60	24	16	43	130	25	M6
25	96	⅛	105	75	14	132	18	12	73	25	16	57	150	25	M6
32	96	⅛	115	85	14	143	22	12	84	25	16	57	160	25	M6
40	120	⅛	140	100	18	173	26	15	99	26	26	69	180	45	M8
50	150	¼	150	110	18	193	32	15	119	36	26	88	200	45	M8
63	150	¼	165	125	18	205	39	15	132	36	26	88	230	45	M8

d (mm)	Lift = Hx (mm)	closest inch (inch)
20	7	½
25	10	¾
32	13	1
40	15	1 ¼
50	19	1 ½
63	23	2

PF 3 39 772 220

Diaphragm valve DIASTAR Ten ABS
FO (Fail safe to open)
Unions with solvent cement sockets metric

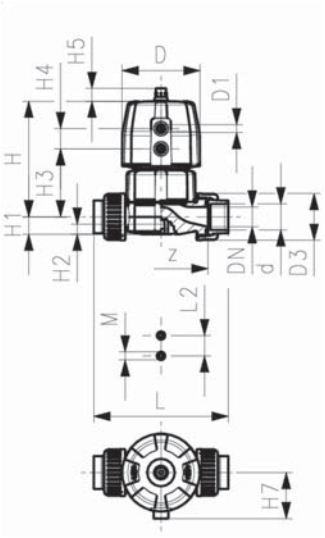
Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- For easy installation and removal
- Short overall length

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

* PN: PTFE
Working Pressure: **one side**

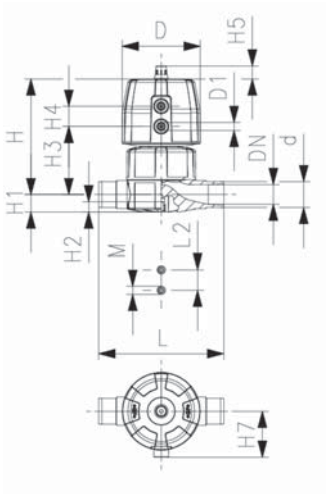


d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10/10*	125	**169 644 012**	0.499
25	20	10/10*	271	**169 644 013**	0.887
32	25	10/10*	481	**169 644 014**	1.067
40	32	10/10*	759	**169 644 015**	1.767
50	40	10/10*	1263	**169 644 016**	3.543
63	50	10/10*	1728	**169 644 017**	4.291

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	z (mm)	Lift = Hx (mm)
20	68	⅛	101	14	12	60	24	16	43	128	25	M6	96	7
25	96	⅛	132	18	12	73	25	16	57	152	25	M6	114	10
32	96	⅛	143	22	12	84	25	16	57	166	25	M6	122	13
40	120	⅛	173	26	15	99	26	26	69	192	45	M8	140	15
50	150	¼	214	32	15	119	36	26	88	222	45	M8	160	19
63	150	¼	226	39	15	132	36	26	88	266	45	M8	190	23

d (mm)	closest inch (inch)
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2

PF 3 39 772 210



Diaphragm valve DIASTAR Ten ABS
FO (Fail safe to open)
With solvent cement spigots metric

Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Overall length EN 558

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

* PN: PTFE

Working Pressure: **one side**

d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10/10*	125	**169 645 012**	0.453
25	20	10/10*	271	**169 645 013**	0.821
32	25	10/10*	481	**169 645 014**	0.978
40	32	10/10*	759	**169 645 015**	1.572
50	40	10/10*	1263	**169 645 016**	3.310
63	50	10/10*	1728	**169 645 017**	3.906

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	Lift = Hx (mm)	closest inch (inch)
20	68	⅛	101	14	12	60	24	16	43	124	25	M6	7	½
25	96	⅛	132	18	12	73	25	16	57	144	25	M6	10	¾
32	96	⅛	143	22	12	84	25	16	57	154	25	M6	13	1
40	120	⅛	173	26	15	99	26	26	69	174	45	M8	15	1 ¼
50	150	¼	214	32	15	119	36	26	88	194	45	M8	19	1 ½
63	150	¼	226	39	15	132	36	26	88	224	45	M8	23	2

PF 3 39 772 230

Diaphragm valve DIASTAR Ten ABS
FO (Fail safe to open)
With backing flanges PP-V metric/BS

Model:

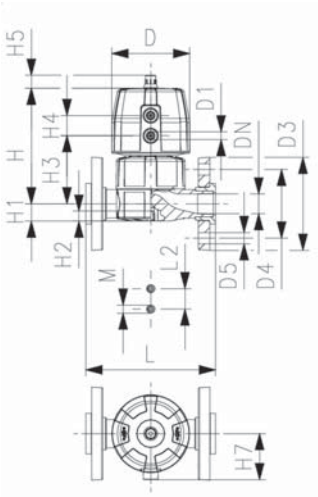
- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Flat sealing faces
- Overall length EN 558
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, BS 4504 PN 10

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

* PN: PTFE

Working Pressure: **one side**



d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10/10*	125	**169 647 112**	0.628
25	20	10/10*	271	**169 647 113**	1.045
32	25	10/10*	481	**169 647 114**	1.298
40	32	10/10*	759	**169 647 115**	2.070
50	40	10/10*	1263	**169 647 116**	3.846
63	50	10/10*	1728	**169 647 117**	4.814

d (mm)	D (mm)	D1_G (inch)	D3 (mm)	D4 (mm)	D5 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M
20	68	⅛	95	65	14	101	14	12	60	24	16	43	130	25	M6
25	96	⅛	105	75	14	132	18	12	73	25	16	57	150	25	M6
32	96	⅛	115	85	14	143	22	12	84	25	16	57	160	25	M6
40	120	⅛	140	100	18	173	26	15	99	26	26	69	180	45	M8
50	150	¼	150	110	18	214	32	15	119	36	26	88	200	45	M8
63	150	¼	165	125	18	226	39	15	132	36	26	88	230	45	M8

d (mm)	Lift = Hx (mm)	closest inch (inch)
20	7	½
25	10	¾
32	13	1
40	15	1 ¼
50	19	1 ½
63	23	2

PF 3 39 772 220

Diaphragm valve DIASTAR Ten ABS
DA (Double acting)
Unions with solvent cement sockets metric

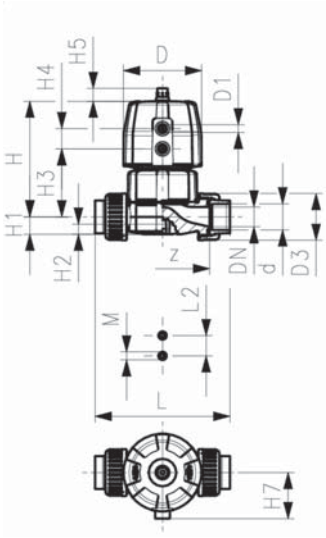
Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- For easy installation and removal
- Short overall length

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

* PN: PTFE
Working Pressure: **one side**

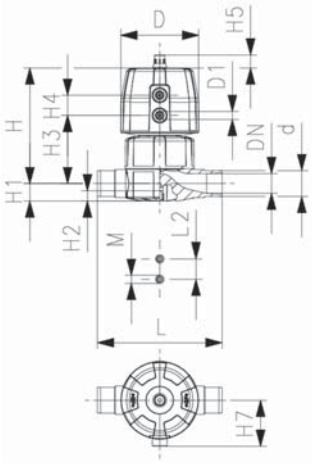


d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10/10*	125	**169 654 012**	0.483
25	20	10/10*	271	**169 654 013**	0.851
32	25	10/10*	481	**169 654 014**	1.037
40	32	10/10*	759	**169 654 015**	1.707
50	40	10/10*	1263	**169 654 016**	2.793
63	50	10/10*	1728	**169 654 017**	3.541

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	z (mm)	Lift = Hx (mm)
20	68	⅛	101	14	12	60	24	16	43	128	25	M6	96	7
25	96	⅛	132	18	12	73	25	16	57	152	25	M6	114	10
32	96	⅛	143	22	12	84	25	16	57	166	25	M6	122	13
40	120	⅛	173	26	15	99	26	26	69	192	45	M8	140	15
50	150	¼	214	32	15	119	36	26	88	222	45	M8	160	19
63	150	¼	226	39	15	132	36	26	88	266	45	M8	190	23

d (mm)	closest inch (inch)
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2

PF 3 39 772 210



Diaphragm valve DIASTAR Ten ABS
DA (Double acting)
With solvent cement spigots metric

Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Overall length EN 558

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

* PN: PTFE

Working Pressure: **one side**

d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10/10*	125	**169 655 012**	0.437
25	20	10/10*	271	**169 655 013**	0.785
32	25	10/10*	481	**169 655 014**	0.948
40	32	10/10*	759	**169 655 015**	1.512
50	40	10/10*	1263	**169 655 016**	2.560
63	50	10/10*	1728	**169 655 017**	3.156

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	Lift = Hx (mm)	closest inch (inch)
20	68	⅛	101	14	12	60	24	16	43	124	25	M6	7	½
25	96	⅛	132	18	12	73	25	16	57	144	25	M6	10	¾
32	96	⅛	143	22	12	84	25	16	57	154	25	M6	13	1
40	120	⅛	173	26	15	99	26	26	69	174	45	M8	15	1 ¼
50	150	¼	214	32	15	119	36	26	88	194	45	M8	19	1 ½
63	150	¼	226	39	15	132	36	26	88	224	45	M8	23	2

PF 3 39 772 230

Diaphragm valve DIASTAR Ten ABS
DA (Double acting)
With backing flanges PP-V metric/BS

Model:

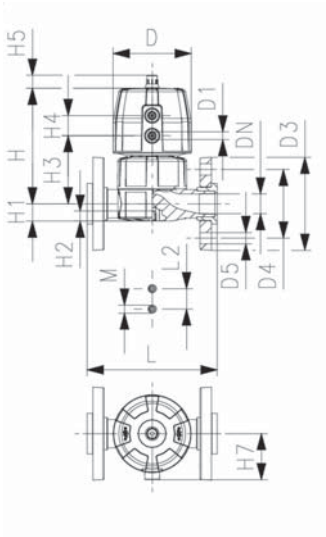
- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Flat sealing faces
- Overall length EN 558
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, BS 4504 PN 10

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

* PN: PTFE

Working Pressure: **one side**



d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10/10*	125	**169 657 112**	0.612
25	20	10/10*	271	**169 657 113**	1.009
32	25	10/10*	481	**169 657 114**	1.268
40	32	10/10*	759	**169 657 115**	2.010
50	40	10/10*	1263	**169 657 116**	3.096
63	50	10/10*	1728	**169 657 117**	4.064

d (mm)	D (mm)	D1_G (inch)	D3 (mm)	D4 (mm)	D5 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M
20	68	⅛	95	65	14	101	14	12	60	24	16	43	130	25	M6
25	96	⅛	105	75	14	132	18	12	73	25	16	57	150	25	M6
32	96	⅛	115	85	14	143	22	12	84	25	16	57	160	25	M6
40	120	⅛	140	100	18	173	26	15	99	26	26	69	180	45	M8
50	150	¼	150	110	18	214	32	15	119	36	26	88	200	45	M8
63	150	¼	165	125	18	226	39	15	132	36	26	88	230	45	M8

d (mm)	Lift = Hx (mm)	closest inch (inch)
20	7	½
25	10	¾
32	13	1
40	15	1 ¼
50	19	1 ½
63	23	2

PF 3 39 772 220

Diaphragm valve DIASTAR TenPlus ABS
FC (Fail safe to close)
Unions with solvent cement sockets metric

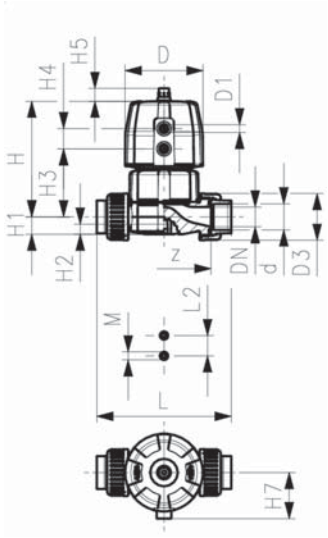
Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- For easy installation and removal
- Short overall length

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

* PN: PTFE
Working Pressure: **both sides**

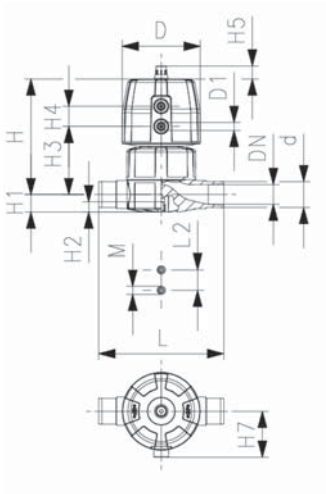


d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10/10*	125	**169 684 012**	0.949
25	20	10/10*	271	**169 684 013**	1.061
32	25	10/10*	481	**169 684 014**	1.841
40	32	10/10*	759	**169 684 015**	3.197
50	40	10/10*	1263	**169 684 016**	5.041
63	50	10/10*	1728	**169 684 017**	5.788

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	z (mm)	Lift = Hx (mm)
20	96	⅛	127	14	12	68	25	16	57	128	25	M6	96	7
25	96	⅛	132	18	12	73	25	16	57	152	25	M6	114	10
32	120	⅛	167	22	12	93	26	26	69	166	25	M6	122	13
40	150	¼	196	26	15	101	36	26	88	192	45	M8	140	15
50	180	¼	239	32	15	124	37	26	103	222	45	M8	160	19
63	180	¼	251	39	15	137	37	26	103	266	45	M8	190	23

d (mm)	closest inch (inch)
20	½
25	¾
32	1
40	1 ¼
50	1 ½
63	2

PF 3 39 772 210



Diaphragm valve DIASTAR TenPlus ABS FC (Fail safe to close) With solvent cement spigots metric

Model:

- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Overall length EN 558

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

* PN: PTFE

Working Pressure: **both sides**

d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10/10*	125	**169 685 012**	0.902
25	20	10/10*	271	**169 685 013**	0.994
32	25	10/10*	481	**169 685 014**	1.752
40	32	10/10*	759	**169 685 015**	3.002
50	40	10/10*	1263	**169 685 016**	4.808
63	50	10/10*	1728	**169 685 017**	5.403

d (mm)	D (mm)	D1_G (inch)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M	Lift = Hx (mm)	closest inch (inch)
20	96	⅛	127	14	12	68	25	16	57	124	25	M6	7	½
25	96	⅛	132	18	12	73	25	16	57	144	25	M6	10	¾
32	120	⅛	167	22	12	93	26	26	69	154	25	M6	13	1
40	150	¼	196	26	15	101	36	26	88	174	45	M8	15	1 ¼
50	180	¼	239	32	15	124	37	26	103	194	45	M8	19	1 ½
63	180	¼	251	39	15	137	37	26	103	224	45	M8	23	2

PF 3 39 772 230

Diaphragm valve DIASTAR TenPlus ABS
FC (Fail safe to close)
With backing flanges PP-V metric/BS

Model:

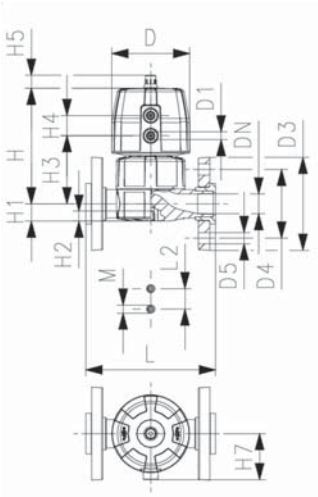
- Double flow rate compared to predecessor
- One housing nut replaces four screws
- Rotating air connection at 90° intervals
- Flat sealing faces
- Overall length EN 558
- Connecting dimension: ISO 7005 PN 10, EN 1092 PN 10, DIN 2501 PN 10, BS 4504 PN 10

Option:

- Individual configuration of the valve (see diagram)
- Comprehensive range of accessories available

* PN: PTFE

Working Pressure: **both sides**



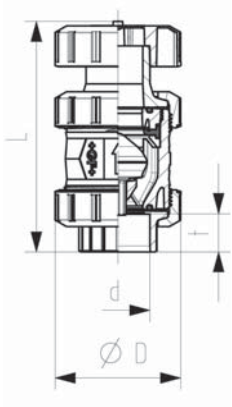
d (mm)	DN (mm)	PN* (bar)	kv-value (Δp=1 bar) (l/min)	EPDM Code	Weight (kg)
20	15	10/10*	125	**169 687 112**	1.079
25	20	10/10*	271	**169 687 113**	1.219
32	25	10/10*	481	**169 687 114**	2.072
40	32	10/10*	759	**169 687 115**	3.500
50	40	10/10*	1263	**169 687 116**	5.344
63	50	10/10*	1728	**169 687 117**	6.311

d (mm)	D (mm)	D1_G (inch)	D3 (mm)	D4 (mm)	D5 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	H5 (mm)	H7 (mm)	L (mm)	L2 (mm)	M
20	96	⅛	95	65	14	127	14	12	68	25	16	57	130	25	M6
25	96	⅛	105	75	14	132	18	12	73	25	16	57	150	25	M6
32	120	⅛	115	85	14	167	22	12	93	26	26	69	160	25	M6
40	150	¼	140	100	18	196	26	15	101	36	26	88	180	45	M8
50	180	¼	150	110	18	239	32	15	124	37	26	103	200	45	M8
63	180	¼	165	125	18	251	39	15	137	37	26	103	230	45	M8

d (mm)	Lift = Hx (mm)	closest inch (inch)
20	7	½
25	10	¾
32	13	1
40	15	1 ¼
50	19	1 ½
63	23	2

Process control valves

PF 2 33 988 311



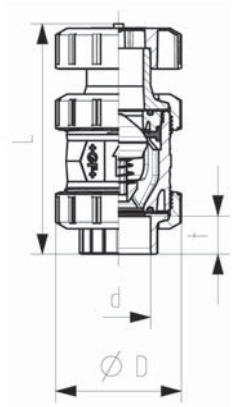
Ventilating and bleed valve
Type 591 ABS
With solvent cement sockets metric

Model:

- With protection cap up to DN50 made of PP-GF, DN65-100 made of POM
- Floater made of PP-H
- Designed for easy installation and removal
- Compact installation length

d (mm)	DN (mm)	PN (bar)	EPDM Code	D (mm)	L (mm)	t (mm)	closest inch (inch)
16	10	10	**169 591 001**	50	126	14	⅜
20	15	10	**169 591 002**	50	127	16	½
25	20	10	**169 591 003**	58	142	18	¾
32	25	10	**169 591 004**	68	155	22	1
40	32	10	**169 591 005**	84	177	26	1 ¼
50	40	10	**169 591 006**	97	195	31	1 ½
63	50	10	**169 591 007**	124	227	38	2
75	65	10	**169 591 008**	166	256	45	2 ½
90	80	10	**169 591 009**	200	275	52	3
110	100	10	**169 591 010**	238	318	64	4

PF 2 33 988 411



Ventilating valve type 595 ABS
With solvent cement sockets metric

Model:

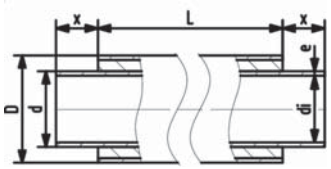
- With protection cap up to DN50 made of PP-GF, DN65-100 made of POM
- Spring HALAR coated
- Spring available in other materials, see spare parts
- Designed for easy installation and removal
- Compact installation length

d (mm)	DN (mm)	PN (bar)	EPDM Code	D (mm)	L (mm)	t (mm)	closest inch (inch)
16	10	10	**169 595 001**	50	126	14	⅜
20	15	10	**169 595 002**	50	127	16	½
25	20	10	**169 595 003**	58	142	18	¾
32	25	10	**169 595 004**	68	155	22	1
40	32	10	**169 595 005**	84	177	26	1 ¼
50	40	10	**169 595 006**	97	195	31	1 ½
63	50	10	**169 595 007**	124	227	38	2
75	65	10	**169 595 008**	166	256	45	2 ½
90	80	10	**169 595 009**	200	275	52	3
110	100	10	**169 595 010**	238	318	64	4

COOL-FIT PE Plus

Pipes

PF 2 B3 A58 001



COOL-FIT PE Plus pipe PN10

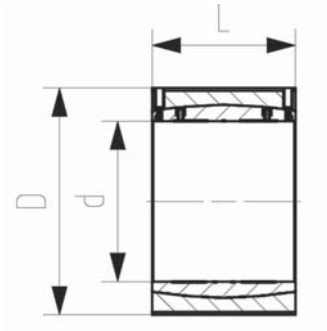
Model:

- Pre-insulated PE100 SDR 17 metric
- Outer jacket impact resistant. Color: black
- Insulation made from PUR
- Length: 5.9m (optional: 10m)

d (mm)	D (mm)	PN (bar)	Code	Weight (kg/m)	di (mm)	x (mm)	closest inch (inch)
250	355	10	**738 173 021**	18.180	221.6	123	10
280	400	10	**738 173 022**	22.640	248.2	126	10
315	450	10	**738 173 023**	28.510	279.2	133	12
355	500	10	**738 173 024**	35.350	314.8	145	14
400	560	10	**738 173 125**	44.070	354.6	147	16
450	630	10	**738 173 126**	55.490	400.0	163	18

Fittings

PF 2 B3 A59 001



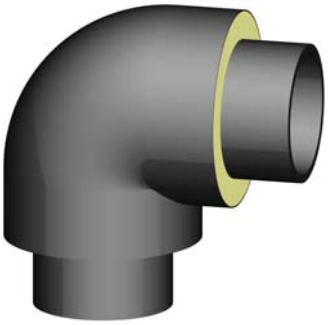
COOL-FIT PE Plus Coupler

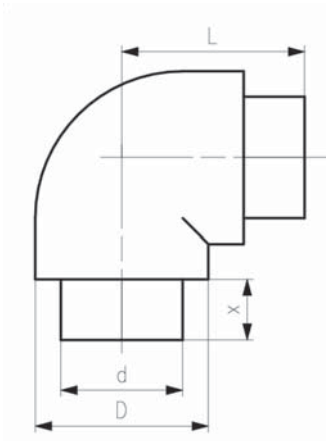
Model:

- Pre-insulated PE100 SDR 17 metric
- Outer jacket impact resistant. Color: black
- Insulation made from PUR

d (mm)	D (mm)	PN (bar)	Code	Weight (kg)	L (mm)	closest inch (inch)
250	355	10	**738 911 821**	4.616	247	10
280	400	10	**738 911 822**	1.000	252	10
315	450	10	**738 911 823**	13.800	267	12
355	500	10	**738 911 824**	1.000	290	14
400	560	10	**738 911 875**	1.000	294	16
450	630	10	**738 911 876**	1.000	326	18

PF 2 B3 A59 001





COOL-FIT PE Plus Bend 90° PN10

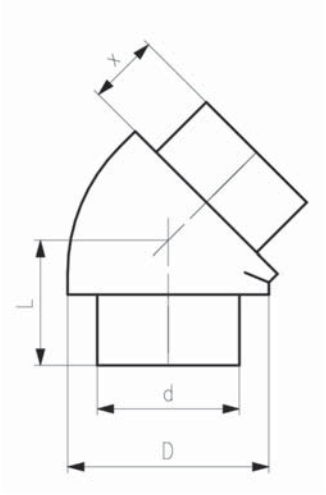
Model:

- Pre-insulated PE100 SDR 17 metric
- Outer jacket impact resistant. Color: black
- Insulation made from PUR

d (mm)	D (mm)	PN (bar)	Code	L (mm)	x (mm)	closest inch (inch)
250	355	10	**738 003 121**	375	123	10
280	400	10	**738 003 122**	430	126	10
315	450	10	**738 003 123**	470	133	12
355	500	10	**738 003 124**	900	145	14
400	560	10	**738 003 175**	980	147	16
450	630	10	**738 003 176**	1070	163	18

PF 2 B3 A59 001

COOL-FIT PE Plus Bend 45° PN10



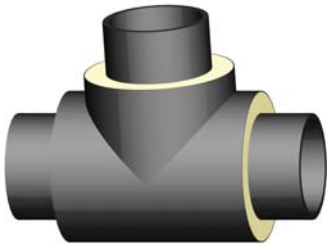
Model:

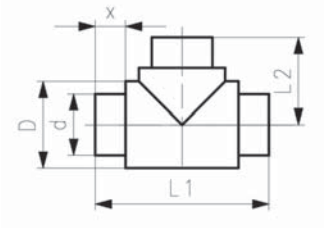
- Pre-insulated PE100 SDR 17 metric
- Outer jacket impact resistant. Color: black
- Insulation made from PUR

d (mm)	D (mm)	PN (bar)	Code	L (mm)	x (mm)	closest inch (inch)
250	355	10	**738 053 121**	440	123	10
280	400	10	**738 053 122**	460	126	10
315	450	10	**738 053 123**	535	133	12
355	500	10	**738 053 124**	620	145	14
400	560	10	**738 053 175**	650	147	16
450	630	10	**738 053 176**	680	163	18

PF 2 B3 A59 001

COOL-FIT PE Plus T 90° PN10





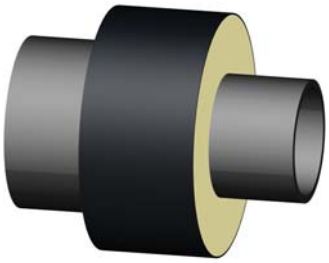
Model:

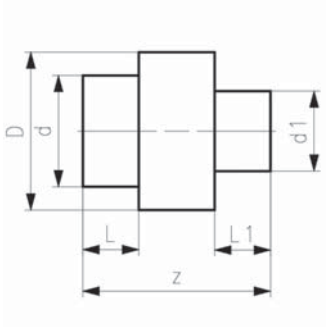
- Pre-insulated PE100 SDR 17 metric
- Outer jacket impact resistant. Color: black
- Insulation made from PUR

d (mm)	D (mm)	PN (bar)	Code	L1 (mm)	L2 (mm)	x (mm)	closest inch (inch)
250	355	10	**738 203 121**	1000	500	123	10
280	400	10	**738 203 122**	1000	500	126	10
315	450	10	**738 203 123**	1000	500	133	12
355	500	10	**738 203 124**	1300	700	145	14
400	560	10	**738 203 175**	1300	700	147	16
450	630	10	**738 203 176**	1400	750	163	18

PF 2 B3 A59 001

COOL-FIT PE Plus Reducer





Model:

- Pre-insulated PE100 SDR 17 metric
- Outer jacket impact resistant. Color: black
- Insulation made from PUR

d (mm)	d1 (mm)	D (mm)	PN	Code	Weight (kg)	L (mm)	L1 (mm)	z (mm)
250	225	355	PN 10	**738 903 802**	2.800	123	110	332
280	225	400	PN 10	**738 903 899**	4.700	126	110	335
315	225	450	PN 10	**738 903 807**	7.100	133	110	365
280	250	400	PN 10	**738 903 803**	5.100	126	123	340
315	250	450	PN 10	**738 903 805**	7.400	133	123	365
315	280	450	PN 10	**738 903 806**	6.800	133	126	365
355	250	500	PN 10	**738 903 808**	8.200	145	123	390
355	280	500	PN 10	**738 903 809**	7.700	145	126	390
355	315	500	PN 10	**738 903 810**	8.300	145	133	390
400	280	560	PN 10	**738 903 871**	9.100	147	126	415
400	315	560	PN 10	**738 903 872**	11.400	147	133	415
400	355	560	PN 10	**738 903 873**	11.000	147	145	420
450	280	630	PN 10	**738 903 874**	13.200	163	126	389
450	315	630	PN 10	**738 903 875**	13.600	163	133	390
450	355	630	PN 10	**738 903 876**	13.700	163	145	393
450	400	630	PN 10	**738 903 877**	14.800	163	147	395

Accessories

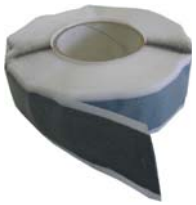
Shrink socket PE

Model:

- For a water- and steam-tight sealing in combination with buthylene rubber-based sealing tape
- Length: 100 mm
- "Heavy duty" version for high end applications
- For connections of the same pipe outer diameter

D (mm)	d (mm)	Code	PF	Weight (kg)	L (mm)
355	250	**738 011 024**	2 33 372 999	0.900	100
400	280	**738 011 025**	2 33 372 999	1.100	100
450	315	**738 011 026**	2 33 372 999	1.900	100
500	355	**738 011 027**	2 B3 A60 001	1.000	100
560	400	**738 011 028**	2 B3 A60 001	1.000	100
630	450	**738 011 029**	2 B3 A60 001	1.000	100

PF 2 33 372 999



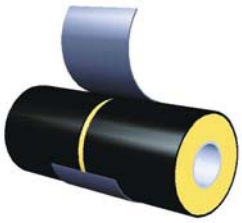
Sealing tape

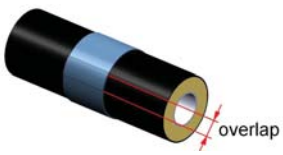
Model:

- For a water- and steam-tight sealing of inspection gaps in combination with shrink sleeves/ -sockets
- Sealing tape: 40mm width, buthylene rubber-based
- 30 m on a roll

D (mm)	d-d (mm)	Code	Weight (kg)	Closest inch (inch)
90 - 450	25 - 315	**738 011 152**	2.134	¾ - 12

PF 2 33 372 999





Cold shrink tape PE black

Model:

- For indoor use only
- Width (L) available in 100mm
- 15 m on a roll
- Shrinks without heat application

D (mm)	d-d (mm)	Code	Weight (kg)	Closest inch (inch)
90 - 450	25 - 315	**738 011 107**	1.723	¾ - 8

PF 2 33 372 030

Hot shrink tape PE black

Model:

- For watertight sealing of outer pipe in underground installations
- Mastic backed
- 30 m on a roll
- Shrink with a burner or hot air gun
- Order sealing patches separately (738 011 109)

D (mm)	d-d (mm)	Code	Weight (kg)	L (mm)	Closest inch (inch)
90 - 630	25 - 450	**738 011 108**	3.000	150	¾ - 18

Aussenrohr/ casing pipe	Länge Schrumpfband length shrink tape
90	370
110	440
125	480
140	530
160	600
180	660
225	800
250	880
280	970
315	1080
355	1210
400	1350
450	1500
500	1660
560	1850
630	2070

PF 2 33 372 030

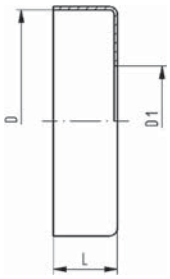
Sealing patch

Model:

- For sealing of hot-shrink-tape in underground installations
- Mastic backed
- 1 patch needed per seal

D (mm)	d-d (mm)	Code	Weight (kg)	L (mm)	Closest inch (inch)
90 - 630	25 - 450	**738 011 109**	0.100	150	¾ - 18

PF 2 33 372 030

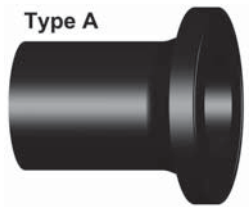


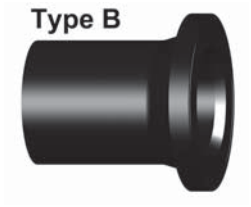
COOL-FIT ABS Plus Cap PE black

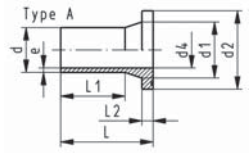
Model:

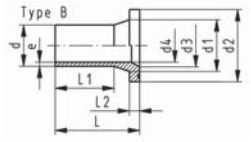
- To seal the end of a COOL-FIT Plus pipe

d (mm)	D (mm)	D1 (mm)	Code	Weight (kg)	L (mm)	closest inch (inch)
250	355	265	**733 960 185**	0.155	35	10
280	400	300	**733 960 186**	0.185	35	10
315	450	335	**733 960 187**	0.225	35	12
355	500	370	**733 963 188**	0.269	35	14
400	560	420	**733 963 189**	0.269	35	16
450	630	470	**733 963 190**	0.269	35	18









Flange adaptor PE100 SDR17/17.6
Combined jointing face: flat and serrated

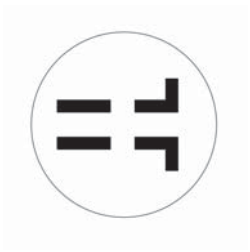
Model:

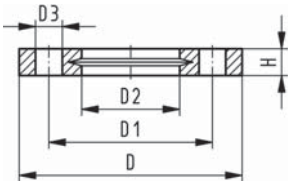
- Material: PE100
- Long spigot
- For IR, butt- and electro fusion
- Suitable for flange connections to metric (from d110 also to ANSI/ASME B16.5)
- Up to d280, suitable for butterfly valve type 037/038/039. Above use ecoFIT adaptor for butterfly valves SDR17.6 (d315-d1200)
- Up to d315, suitable for butterfly valve type 567/578. Above use ecoFIT adaptor for butterfly valves SDR17.6 (d355-d1200)
- Gasket d20-d630: Profile flange gasket NBR No. 45 44 07, EPDM No. 48 44 07
- Gasket d710-d1000: flat gasket EPDM No. 48 40 03
- 5 bar Gas / 10 bar Water
- Type A without chamfer, Type B with chamfer

* Not suitable for butterfly valves type 037/038/039
** Not suitable for butterfly valves

	d (mm)	DN (mm)	FM	Code	PF	Weight (kg)
	225	200	IR	**753 800 095**	2 51 301 001	2.456
	250	250		**753 800 096**	2 51 301 002	3.500
	280	250		**753 800 097**	2 51 301 002	3.714
*	315	300		**753 800 098**	2 51 301 002	5.470
	355	350		**753 800 299**	2 51 301 008	7.100
	400	400		**753 800 300**	2 51 301 008	9.600
	450	500		**753 800 301**	2 51 301 008	16.400

	d (mm)	d1 (mm)	d2 (mm)	d3 (mm)	d4 (mm)	L (mm)	L1 (mm)	L2 (mm)	e (mm)	Type
	225	235	268	210	198	200	138	32	13.4	B
	250	285	320	245	220	220	148	35	14.8	B
	280	291	320	265	246	230	154	35	16.6	B
*	315	335	370	300	277	242	166	36	18.7	B
	355	373	430	346	310	260	170	33	21.1	B
	400	427	482	395	350	282	185	36	23.7	B
	450	514	585	400	400	316	205	46	26.7	B





Backing flange PP-V metric
For butt fusion systems metric

Model:

- Full-plastic flange PP-GF (30 % glass-fibre reinforced)
- Connecting dimension: ISO 7005, EN 1092, BS 4504, DIN 2501
- **Bolt circle PN 10**

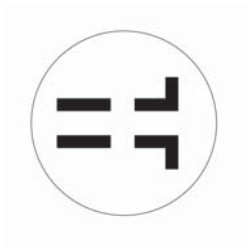
AL: number of holes

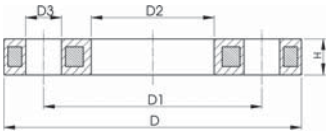
[1]) Suitable for socket- and butt fusion systems

[2]) Combined version, metric-ANSI

	d (mm)	DN (mm)	PN (bar)	Code		PF	Weight (kg)
	250	250	16	**727 700 521**	2 34 238 031		2.052
	280	250	16	**727 700 522**	2 34 238 031		1.700
	315	300	16	**727 700 523**	2 34 238 031		2.400
	355	350	10	**727 700 524**	2 34 238 031		4.440
	400	400	10	**727 700 525**	2 34 238 031		5.624

	d (mm)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	H (mm)	AL	SC
	250	395	350	288	22	38	12	M20
	280	395	350	294	22	38	12	M20
	315	445	400	338	22	42	12	M20
	355	515	460	376	22	46	16	M20
	400	574	515	430	26	50	16	M24





Backing flange PP-Steel metric
For butt fusion systems metric

Model:

- Material: PP (30% glass-fibre reinforced) with steel ring
- Connecting dimension: ISO 7005, EN 1092, BS 4504, DIN 2501
- **Bolt circle PN 10**

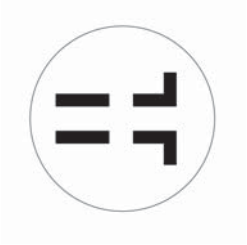
AL: number of holes

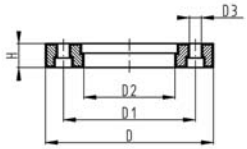
[1]) Suitable for socket -and butt fusion systems

[2]) Combined version, bolt circle metric - ANSI

	d (mm)	DN (mm)	PN (bar)	Code		PF	Weight (kg)
	250	250	16	**727 700 721**	2 34 238 022		6.632
	280	250	16	**727 700 722**	2 34 238 022		6.573
	315	300	16	**727 700 723**	2 34 238 022		7.903
	355	350	16	**727 700 724**	2 34 238 022		14.587
	400	400	16	**727 700 725**	2 34 238 022		20.034

	d (mm)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	H (mm)	AL	SC
	250	395	350	288	22	32	12	M20
	280	395	350	294	22	32	12	M20
	315	445	400	338	22	36	12	M20
	355	515	460	376	23	42	16	M20
	400	574	515	430	26	42	16	M24





Profiled backing flange PP-Steel metric
For butt fusion systems metric

Model:

- PP with glass-fibre reinforcement and GGG 50 insert
- Connecting dimensions: ISO 7005, EN 1092, DIN 2501
- **Bolt circle PN 10**

Note:

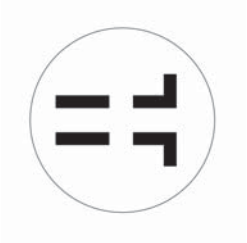
flat side = bolt side profiled side = flange adaptor side

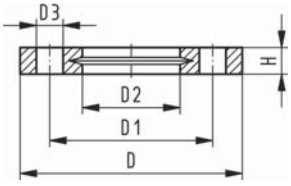
AL: number of holes

* Galvanized steel S235-JR, suitable for underground laying

	d (mm)	DN (mm)	PN (bar)	Code	PF	Weight (kg)
*	450	450	10	**724 705 026**	2 55 337 001	38.000
	450	500	10	**724 700 426**	2 55 337 003	25.600

	d (mm)	DN (mm)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	H (mm)	AL	SC
*	450	450	615	565	470	26	36	20	M24
	450	500	685	620	517	26	56	20	M24





Backing flange PP-V Inch ANSI
For butt fusion systems metric

Model:

- Full-plastic flange PP-GF (30 % glass-fibre reinforced)
- Connecting dimension: ANSI/ASME B 16.5 class 150, ASTM D 4024, BS 1560, BS EN 1759
- **Bolt circle class 150**
- Special flange adapter ANSI for d25 - d50 and d90 required

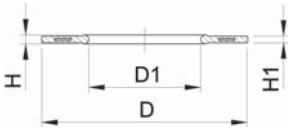
AL: number of holes

[1]) Suitable for socket- and butt fusion systems

[2]) Combined version, metric-ANSI

	Size (inch)	d (mm)	DN (mm)	PN (bar)	Code	PF	Weight (kg)
	10	250	250	16	**727 701 521**	2 34 238 033	2.241
	10	280	250	16	**727 701 522**	2 34 238 033	2.173
	12	315	300	16	**727 701 523**	2 34 238 033	3.627

	Size (inch)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	H (mm)	AL	SC
	10	406	362	288	26	38	12	M20
	10	406	362	294	26	38	12	M20
	12	483	432	338	26	42	12	M20



Profile Flange Gasket, metric
EPDM / FPM

Model:

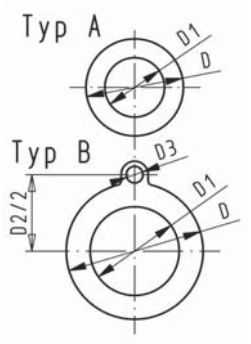
- For all metric GF Flange Adaptors
- Hardness: 70° Shore EPDM, 75° Shore FPM
- EPDM: approved acc. to DVGW W 270, KTW recommendation
- Centering on the inner diameter of the screw crown
- material steel insert: carbon steel
- Rubber-steel body combined with rubber profile cord ring

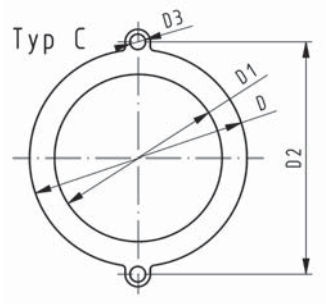
di FA are the suitable inner diameters of flanges adaptors

d (mm)	PN (bar)	DN (mm)	EPDM Code	PF	FPM Code	PF	Weight (kg)
250	16	250	**748 440 721**	2 30 162 037	**749 440 721**	2 30 162 038	0.462
280	16	250	**748 440 722**	2 30 162 037	**749 440 722**	2 30 162 038	0.323
315	16	300	**748 440 723**	2 30 162 037	**749 440 723**	2 30 162 038	0.549
355	16	350	**748 440 724**	2 30 162 037	**749 440 724**	2 30 162 038	0.870
400	16	400	**748 440 725**	2 30 162 037	**749 440 725**	2 30 162 038	1.088
450	16	500	**748 440 726**	2 30 162 037	**749 440 726**	2 30 162 038	0.718

d (mm)	PN (bar)	D (mm)	D1 (mm)	di FA (mm)	H (mm)	H1 (mm)
250	16	328	252	238 - 252	8	6
280	16	328	274	264 - 274	8	6
315	16	378	306	296 - 306	8	6
355	16	438	355	340 - 355	10	7
400	16	489	400	385 - 400	10	7
450	16	594	403	393 - 403	10	7

PF 2 30 162 003





Flat gasket
EPDM

Model:

- For all metric GF Flange Adaptors
- Hardness approx. 65° Shore
- Integrated fixation aids from d110
- Centering on the inner diameter of the screw crown

di FA are the suitable inner diameters of flanges adaptors

d (mm)	DN (mm)	PN (bar)	Type	EPDM Code	Weight (kg)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	H (mm)	di FA (mm)
250	250	6	C	**748 400 321**	0.210	328	250	350	22	5	240 - 260
280	250	6	C	**748 400 322**	0.151	328	273	350	22	5	263 - 283
315	300	6	C	**748 400 323**	0.237	378	305	400	22	5	295 - 315

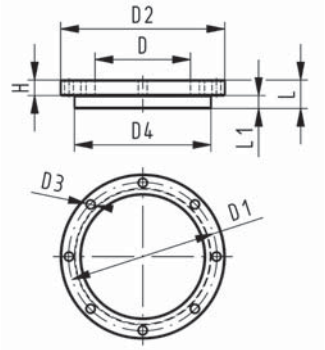
PF 2 34 238 038

Blanking flange set PE
Combined jointing face flat and serrated metric

Model:

- d63 - d315: backing flange PP-V with end blank PE
- d355 - d630: backing flange PP/Steel with end blank PE
- Connecting dimensions: ISO 7005, EN 1092, DIN 2501
- **Bolt circle PN 10**

AL: number of holes
L: length of the End Blank



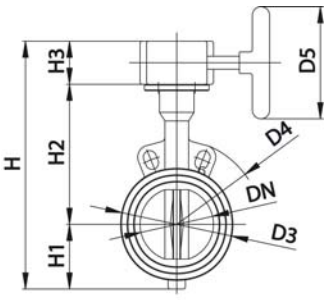
d (mm)	DN (mm)	PN (bar)	Code	Weight (kg)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	D4 (mm)	L (mm)	L1 (mm)	H (mm)	AL	SC
250	250	16	**753 700 621**	6.051	285	350	395	22	320	55	35	38	12	M20
280	250	16	**753 700 622**	6.305	291	350	395	22	320	60	35	38	12	M20
315	300	16	**753 700 623**	8.894	335	400	445	22	370	65	35	42	12	M20
355	350	16	**753 700 624**	23.198	373	460	515	22	430	70	40	40	16	M20
400	400	16	**753 700 625**	30.766	427	515	574	26	482	75	46	40	16	M24
450	500	10	**753 700 626**	44.271	510	620	684	26	585	80	60	49	20	M24

Metal - butterfly valve type 039G
Reduction gear with handwheel

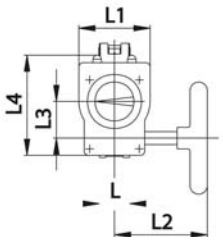
Model:

- Body GGG40 (A 395 M:88, EN-JS 1020 EN1563) Rilsan coating
- Seat material: EPDM, FPM and others on request
- Full bore shaft, square shape
- Installation length: EN 558 row 20
- Mounting between ISO, ANSI, BS or JIS Flanges
- Interface according to DIN/ISO 5211

d (mm)	Size (inch)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	Disc: ductile iron/Rilsan® coated EPDM Code	PF	Weight (kg)
280	10	250	16	78333	**199 039 033**	3 39 226 002	31.600
315	12	300	16	115000	**199 039 034**	3 39 226 002	40.000

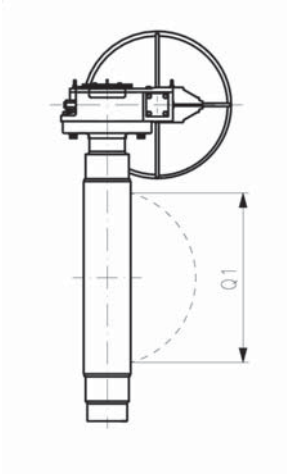


d (mm)	Disc: stainless steel EPDM Code	PF	Weight (kg)	Disc: Alu-bronze EPDM Code	PF	Weight (kg)
280	**199 039 233**	3 39 226 026	19.000	**199 039 433**	3 39 226 026	19.000
315	**199 039 234**	3 39 226 026	37.000	**199 039 434**	3 39 226 026	23.000



d (mm)	D3 (mm)	D4 (mm)	D5 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	Cv value (Δp=1 psi) (l/min)
280	331	333	250	542	200	275	67	106	184	52	142	20693
315	380	353	250	609	227	315	67	106	184	52	142	30380

PF 3 39 226 002



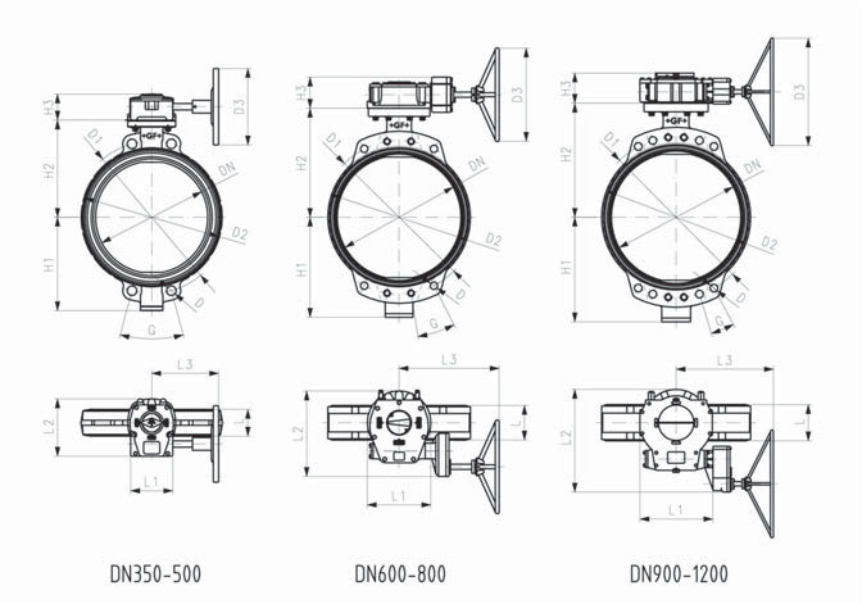
Metal - butterfly valve type 039G
Reduction gear with handwheel metric DN350-1200

Model:

- Housing: Ductile Iron ASTM A 395, Epoxy coated
- Seatliner available in EPDM, FPM on request
- Disc available in Aluminium Bronze on request
- Up to DN 500: Overall length according to EN558, line 20, ISO 5752
- Connecting dimension: EN 1092 PN10
- Also available: ANSI, electric-, pneumatic actuated

d (mm)	DN (mm)	PN (bar)	kv-value (Δp=1 bar) (l/min)	Disc: Ductile Iron: EPOXY coated EPDM Code	Disc: stainless steel EPDM Code	Disc: Ductile Iron: EPOXY coated FPM Code	Disc: stainless steel FPM Code	Weight (kg)
355	350	10	143360	**198 039 000**	**198 039 010**	**198 039 040**	**198 039 050**	53.700
400	400	10	186700	**198 039 001**	**198 039 011**	**198 039 041**	**198 039 051**	81.200
450	450	10	258390	**198 039 002**	**198 039 012**	**198 039 042**	**198 039 052**	110.500

d (mm)	D (mm)	D1 (mm)	D2 (mm)	D3 (mm)	H1 (mm)	H2 (mm)	H3 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	M (mm)	Q1 (mm)	N (mm)
355	21	460	442	125	291	307	55	78	75	180	282	20	332	16
400	25	515	193	140	325	342	65	102	88	226	270	24	382	16
450	25	565	544	140	357	387	65	113	88	258	326	24	432	20



PF 2 33 372 050

Peeling tool COOL-FIT RTC-315

The peeling tool COOL-FIT RTC-315 is suitable for peeling of pre-insulated ABS pipes of the COOL FIT system.
Scope of delivery: 1 Scraper arm, 1 Self-centering chuck base, 1 Aluminium transport case, 1 screwdriver, 1 deburing knife.

d-d (mm)	Code	Weight (kg)	Description
75 - 315	**799 150 423**	9.616	max. working-range 185 mm

PF 2 51 305 001

Peeling tool RTC-710

The peeling tool RTC-710 is suitable for preparing pipe ends in big dimensions (d 355-710 mm). The tool ensures a constant peeling quality on the complete peeling surface of max. 530 mm length and is suitable for PE 80 and PE 100 pipes.
Scope of delivery: 1 Scraper arm, 1 Self-centering chuck base, 2 Aluminium transport cases, 1 screwdriver, 1 spare blade, 1 deburing knife, 1 accessories bag.

d-d (mm)	Code	Weight (kg)	Description
355 - 710	**799 300 757**	31.400	max. working-range 530 mm

PF 3 10 588 500

Long adapters

- Adapters for Electrofusion units with 4 mm connectors.
- Longer version, suitable for all COOL-FIT PE dimensions.

Type	Code	Weight (kg)	Description
4,0 mm	**790 128 035**	0.058	Angle adapters pair, black

PF 3 10 588 200

MSA 2.1
Automatic Electrofusion Unit with protocols retrieval

The MSA 2.1 automatic electro fusion unit combines light weight and high efficiency, thanks to its inverter technology and furthermore provides fusion documentation in PDF. The unit is extremely fast and simple, with three basic operations required to operator: connect, scan, start the fusion. It is robust, safe and ergonomic.
All is meant to simplify the job: the barcode scanner, for long distance reading, the cooling system to joint in series, the icon system, to keep the interaction between user and machine intuitive. The entire welding process is controlled and regulated with energy output compensation depending on ambient temperature and the indication of cooling time.
The unit has 1000 protocols permanently stored in the internal memory. The user can copy the fusion reports in an USB stick to print them out in PDF format.
Scope of delivery includes: transport box, 1 pair of angle adapter clips 4.0 mm, 1 pair of angle adapter clips 4.7 mm, operating instructions, START/STOP badge and USB memory stick. The mini Welding Book is available as option.

Technical Data:

- Operating temperature: -20°C to +50°C
- Fusion data input mode: bar code, manual
- Mains voltage: 230V (190V - 265V)
- Mains frequency: 50-60 Hz
- Welding technique: Voltage controlled
- Fusion voltage: 8-42 V (48 V)
- Fusion current: 90 A (max)
- Suggested power generators: 3.5 kVA
- Internal memory capacity: 1000 protocols
- Fittings range: d20-1200 mm
- Protocols format: PDF and binary (compatible with mini Welding Book)
- USB Port: Type A
- Protection factor: Class 1 / IP 65
- Mains cable: 4 m
- Fusion cable: 4 m
- Weight: ca. 11.9 kg
- Display: Graphical LCD, adjustable contrast
- Languages support: all

Type	Code	Weight (kg)
Barcode scanner, transport case, mini Welding Book	**790 156 003**	13.000
Barcode scanner, transport case, mini Welding Book, Swiss plug	**790 156 006**	13.000
Barcode scanner, transport case, mini Welding Book, 8m welding cables	**790 156 010**	21.000

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Notes:

Notes:

General Condition of Supply of Georg Fischer Piping Systems Limited, Schaffhausen

1 General

1.1 These General Conditions shall apply to all Products supplied by Georg Fischer Piping Systems Limited («Georg Fischer») to the Purchaser.
They shall also apply to all future business even when no express reference is made to them.

1.2 Any deviating or supplementary conditions especially Purchaser's general conditions of purchase and verbal agreements shall only be applicable if accepted in writing by Georg Fischer.

1.3 The written form shall be deemed to be fulfilled by all forms of transmission, evidenced in the form of text, such as telefax, e-mail, etc.

2 Tenders

Tenders shall only be binding if they contain a specifically stated period for acceptance.

3 Scope of Delivery

3.1 Georg Fischer's product range is subject to change.

3.2 The confirmation of order shall govern the scope and execution of the contract.

4 Data and Documents

4.1 Technical documents such as drawings, descriptions, illustrations and data on dimensions, performance and weight as well as the reference to standards are for information purposes only. They are not warranted characteristics and are subject to change.

4.2 All technical documents shall remain the exclusive property of Georg Fischer and may only be used for the agreed purposes or as Georg Fischer may consent.

5 Confidentiality, Protection of Personal Data

5.1 Each party shall keep in strict confidence all commercial or technical information relating to the business of the other party, of which it has gained knowledge in the course of its dealing with the other party. Such information shall neither be disclosed to third parties nor used for other purposes than those for which the information has been supplied.

5.2 In the context of the contractual relation with the Purchaser personal data may be processed. The Purchaser agrees to the disclosure of said data to third parties such as foreign subcontractors and suppliers etc .

6 Local Laws and Regulations, Export Controls

6.1 The Purchaser shall bring to the attention of Georg Fischer all local laws and regulations at the place of destination which bear connection with the execution of the contract and the adherence to relevant safety regulations and approval procedures.

6.2 In case of re-exports, Purchaser shall be responsible for compliance with pertinent export control regulations.

7 Price

7.1 Unless agreed otherwise, the prices shall be deemed quoted net ex works (according to Incoterms 2010 of the ICC, or latest version) including standard packing. All supplementary costs such as the cost of carriage, insurance, export-, transit- and import- licences etc. shall be borne by the Purchaser. The Purchaser shall also bear the costs of all taxes, fees, duties etc. connected with the contract.

7.2 If the costs of packing, carriage, insurance, fees and other supplementary costs are included in the tender price or contract price or are referred to specifically in the tender or confirmation of order, Georg Fischer reserve the right to revise their prices accordingly should any change occur in the relevant tariffs.

8 Terms of Payment

8.1 The Purchaser shall make payment in the manner agreed by the parties without any deductions such as discounts, costs, taxes or dues.

8.2 The Purchaser may only withhold or off-set payments due against counter claims which are either expressly acknowledged by Georg Fischer or finally awarded to the Purchaser.
In particular, payment shall still be made when unessential items are still outstanding provided that the Products already delivered are not rendered unusable as a result.

9 Retention of Title

9.1 The Products shall remain the property of Georg Fischer until the Purchaser shall have settled all claims, present and future, which Georg Fischer may have against him.

9.2 Should the Purchaser resell Products to which title is reserved, in the ordinary course of business, he shall hereby be deemed to have tacitly assigned to Georg Fischer the proceeds deriving from their sale together with all collateral rights, securities and reservations of title until all claims held by Georg Fischer shall have been settled. Until revoked by Georg Fischer, this assignment shall not preclude Purchaser's right to collect the assigned receivables.

9.3 To the extent the value of the Products to which title is reserved together with collateral securities exceeds Georg Fischer's claims against the Purchaser by more than 20%, Georg Fischer shall re-assign the above proceeds to Purchaser at his request.

10 Delivery

10.1 The term of delivery shall commence as soon as the contract has been entered into, all official formalities such as import and payment permits have been obtained and all essential technical issues have been settled. The term of delivery shall be deemed duly observed when, upon its expiry, the Products are ready for despatch.

10.2 Delivery is subject to the following conditions, i.e. the term of delivery shall be reasonably extended:

a) if Georg Fischer are not supplied in time with the information necessary for the execution of the contract or if subsequent changes causing delays are made by the Purchaser.

b) if Georg Fischer are prevented from performing the contract by force majeure. Force majeure shall equally be deemed to be any unforeseeable event beyond Georg Fischer's control which renders Georg Fischer's performance commercially unpractical or impossible, such as delayed or defective supplies from sub contractors labour disputes, governmental orders or regulations, shortages in materials or energy, serious disturbances in Georg Fischer's works, such as the total or partial destruction of plant and equipment or the breakdown of essential facilities, serious disruptions in transport facilities, e.g. impassable roads.
Should the effect of force majeure exceed a period of six (6) months, either party may cancel the contract forthwith.
Georg Fischer shall not be liable for any damage or loss of any kind whatsoever resulting the refrom, any suspension or cancellation being without prejudice to Georg Fischer's right to recover all sums due in respect of consignments delivered and costs incurred to date.

c) if the Purchaser is in delay with the fulfilment of his obligations under the contract, in particular, if he does not adhere to the agreed conditions of payment or if he has failed to timely provide the agreed securities.

10.3 If for reasons attributable to Georg Fischer the agreed term of delivery or a reasonable extension thereof is exceeded, Georg Fischer shall not be deemed in default until the Purchaser has granted to Georg Fischer in writing a reasonable extension thereof of not less than one (1) month which equally is not met.
The Purchaser shall then be entitled to the remedies provided at law, it being however understood that, subject to limitations of Art. 16, damage claims shall be limited to max. 10% of the price of the delayed delivery.

10.4 Part shipments shall be allowed and Georg Fischer shall be entitled to invoice for such partial deliveries.

10.5 If the Purchaser fails to take delivery within a reasonable time of Products notified as ready for despatch, Georg Fischer shall be entitled to store the Products at the Purchaser's expense and risk and to invoice them as delivered. If Purchaser fails to effect payment, Georg Fischer shall be entitled to dispose of the Products.

10.6 Should Purchaser cancel an order without justification and should Georg Fischer not insist on the performance of the contract, Georg Fischer shall be entitled to a penalty amounting to 10% of the contract price, Georg Fischer's right to prove and claim higher damages remaining reserved. Purchaser shall be entitled to prove, that Georg Fischer has suffered no or a considerably lower damage than the penalty forfeited.

11 Packing

If the Products are provided with additional packing over and above the standard packing, such packing shall be charged additionally.

12 Passing of Risk

12.1 The risk in the Products shall pass to the Purchaser as soon as they have left Georg Fischer's works (EX WORKS, Incoterms 2010 ICC, or latest version), even if delivery is made carriage-paid, under similar clauses or including installation or when carriage is organized and managed by Georg Fischer.

12.2 If delivery is delayed for reasons beyond Georg Fischer's control, the risk shall pass to the Purchaser when he is notified that the Products are ready for despatch.

13 Carriage and Insurance

13.1 Unless agreed otherwise, the Purchaser shall bear the cost of carriage.

13.2 The Purchaser shall be responsible for transport insurance against damage of whatever kind. Even when such insurance is arranged by Georg Fischer it shall be deemed taken out by the order of and for the account of the Purchaser and at his risk.

13.3 Special requests regarding carriage and insurance shall be communicated to Georg Fischer in due time. Otherwise carriage shall be arranged by Georg Fischer at their discretion, but without responsibility, by the quickest and cheapest method possible.
In case of carriage-paid delivery transport arrangements shall be made by Georg Fischer. If the Purchaser specifies particular requirements, any extra costs involved shall be borne by him.

13.4 In the event of damage or loss of the Products during carriage the Purchaser shall mark the delivery documents accordingly and immediately have the damage ascertained by the carrier. Not readily ascertainable damages sustained during carriage shall be notified to the carrier within six (6) days after receipt of the Products.

14 Inspection, Notification of Defects and Damages

14.1 The Products will be subject to normal inspection by Georg Fischer during manufacture. Additional tests required by the Purchaser shall be agreed upon in writing and shall be charged to the Purchaser.

14.2 It shall be a condition of Georg Fischer's obligation under the warranties stated hereinafter that Georg Fischer be notified in writing by the Purchaser of any purported defect immediately upon discovery. Notice concerning weight, numbers or apparent defects is to be given latest within 30 days from receipt of the Products, notice of other defects immediately latest within seven (7) working days after discovery, in any event within the agreed warranty period.

14.3 Purchaser shall not dispose of allegedly defective Products until all warranty and/or damage claims are finally settled. At its request, defective Products are to be placed at Georg Fischer's disposal.

14.4 At its request, Georg Fischer shall be given the opportunity to inspect the defect and/or damage, prior to commencement of remedial work, either itself or by third party experts.

15 Warranty

15.1 At the written request of the Purchaser, Georg Fischer undertakes to repair or replace at its discretion, as quickly as possible and free of charge, all Products supplied which demonstrably suffer from faulty design, materials or workmanship, from faulty operating or installation instructions or which become defective or unusable due to faulty advice.
In order to protect employees from toxic or radioactive substances which may have been transported through defective parts returned to Georg Fischer's sales organisation, said parts must be accompanied by a Material Safety Disclosure Form. The form may be obtained from Georg Fischer's local sales company or via www.piping.georgfischer.com.
Replaced parts shall become property of Georg Fischer, unless Georg Fischer waives such claim.

15.2 For Products which are manufactured to specifications, drawings or patterns supplied by the Purchaser, Georg Fischer's warranty shall be restricted to proper materials and workmanship.

15.3 The Purchaser shall be entitled to rescind the contract or to demand a reduction of the contract price if
- the repair or replacement of the defective Product is impossible
- the defective Product is not repaired or replaced within a reasonable period
- Georg Fischer refuses the repair or replacement or if for reasons attributable to Georg Fischer the repair or replacement is delayed.

15.4 For Products or essential components manufactured by a third party and supplied by Georg Fischer under this contract, Georg Fischer's warranty is limited to the warranty provided by said third party.

15.5 This warranty shall not apply to damage resulting from normal wear and tear, improper storage and maintenance, failure to observe the operating instructions, overstressing or overloading, unsuitable operating media, unsuitable construction work or unsuitable building ground, improper repairs or alterations by the Purchaser or third parties, the use of other than original spare parts and other reasons beyond Georg Fischer's control.

15.6 No action or claim may be brought by the Purchaser on account of any alleged breach of warranty or any other obligation of Georg Fischer after the expiration of twelve (12) months from receipt of the Products by the end user or at the latest within eighteen (18) months of the Products being despatched by Georg Fischer.

15.7 In case of Products for use in domestic installations or in utilities
- Georg Fischer will assume the costs of dismantling the defective Product and restoring the damaged object up to CHF 1'000'000 per occurrence.
- warranty or damage claims - contrary to Section 15.6 – are time-barred five (5) years from the date of installation or seven (7) years from the production date, whichever is earlier.

16 Limitation of Liability

The rights and remedies of the customer shall be exclusively governed by these General Conditions of Supply and shall be in lieu of any remedies at law. All further claims for damages, reduction of the purchase price, termination of or rescission of the contract are excluded.
In no case whatsoever shall the customer be entitled to claim damages other than compensation for costs of remedying defects in the supplies. This in particular refers, but shall not be limited, to loss of production, loss of use, loss of orders, loss of profit, third party recovery claims and other direct or indirect or consequential damages.
This limitation of liability equally applies to the extent Georg Fischer is liable for acts or omissions of its employees or third parties engaged for the performance of its obligations. It does not apply in case unlawful intent or gross negligence on the part of Georg Fischer's management and in case of Georg Fischer's statutory liability, in particular under applicable product liability laws.

17 Severability

Should any term or clause of these General Conditions in whole or in part be found to be unenforceable or void, all other provisions shall remain in full force and effect and the unenforceable or void provision shall be replaced by a valid provision, which comes closest to the original intention of the unenforceable or invalid provision.

18 Place of Performance and Jurisdiction

18.1 Place of performance for the Products shall be the Georg Fischer works from which the Products are despatched.

18.2 The contract shall be governed by Swiss law without regard to conflict of law provisions that would require the application of another law.

18.3 Any civil action based upon any alleged breach of this contract shall be filed and prosecuted exclusively in the courts of Schaffhausen, Switzerland.
Georg Fischer however reserves the right to file actions in any court having jurisdiction over controversies arising out of or in connection with the present contract.

03/2011

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ensure local customer support in over 100 countries

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