

# JUMO PINOS L02

## Calorimetric flow sensor

### Brief description

The JUMO PINOS L02 flow sensor measures and monitors flow velocities of liquid media. The measurement method is based on the calorimetric measuring principle and does not include any moving parts which can influence the flow profile negatively. The measuring principle is based on the cooling of a heating element. Due to the flow behavior of the liquid, heat is taken from the temperature probe. The higher the flow velocity, the higher the heat emission of the heating element. The resulting measured value can be output via an analog output of 4 to 20 mA or open or close a switching output. A device version with analog and switching output is also available. Both output variants can be configured for the output of the flow velocity or the medium temperature. The status of the device is displayed using 3 LEDs.

The JUMO PINOS L02 can be used for a nominal pressure up to 75 bar and in an admissible flow range of 0 to 300 cm/s.

To allow for simple startup of the flow sensor, it is equipped with a micro USB interface while a setup program is also available as an accessory. A switching point can be set on-site using a push-button on the user interface. The push-button can also be used for flow calibration if the process requirements (for example, medium, flow velocity) do not correspond to the default settings. Due to its robust design with protection type IP65/67, the flow sensor can also be used in difficult environmental conditions.

The main areas of use are the monitoring of cooling water circuits, pumps, heat exchangers, lubrication circuits, leakage monitoring for process lines, and dry-run protection for pumps.



Type 406041

### Customer benefits

- Configuration interface**

Simple connection to the JUMO PC setup via the micro USB interface.

- Flexibility**

By turning the sensor 360°, the measuring device can be installed in any installation position, regardless of the flow direction.

- Process reliability**

Different fittings and versions ensure a simple and reliable connection.

- Applications**

Can be used for different liquids in various nominal tube widths.

### Special features

- Analog and/or switching output
- No moving parts
- Variable installation position of the sensor (can be rotated 360°)
- Switching point is adjustable on-site
- With temperature output

## Technical data

### Output

Analogue output – flow sensor	Default setting	Setting range
Output signal	Flow velocity	Flow velocity Medium temperature
Attenuation	0 s	0 to 99 s
Scale start	0 % $\leq$ 0 cm/s (water)	0 to 100 %
Scale end	100 % $\leq$ 150 cm/s (water)	0 to 100 %
Behavior on error	3.4 mA	0, 3.4, or 22 mA
Output signal	4 to 20 mA	0 to 20, 4 to 20, 20 to 0, 20 to 4 mA

Switching output – flow switch		
Output signal	Flow velocity	Flow velocity Medium temperature
Output behavior	N/O contact	N/O contact, N/C contact, window opening function, window closing function
Switching point (Sp)	50 % $\leq$ 75 cm/s (water)	0 to 100 %
Release point (Rsp)	40 % $\leq$ 60 cm/s (water)	0 to 100 %
Switch-on delay	0 s	0 to 99 s
Behavior on error	Switch off	Switch on, switch off

Analog and switching output		
Analog output	Medium temperature	Flow velocity Medium temperature
Switching output	Flow velocity	Flow velocity Medium temperature

Flow velocity	Measuring range 0 to 300 cm/s
Repeatability	$\pm 2$ % from measuring range end value
Measuring accuracy	$\pm 8$ % from measuring range end value (applies for reference conditions and default setting)
Temperature drift	$\pm 0.2$ %/K from measuring range end value
Response time to flow change	4 to 10 s

Reference conditions	
Medium	Water
Flow velocity	$\leq$ 150 cm/s
Medium temperature	20 °C $\pm 5$ °C
Ambient temperature	20 °C $\pm 5$ °C
Installation position	JUMO installation device Vertical riser pipe Rotation $\pm 20$ % away from preferred direction (Inlet and outlet section according to operating manual)

## Electrical data

Voltage supply Requirement	DC 24 V $\pm 10\%$ , SELV The device must be equipped with an electrical circuit that meets the requirements of EN 61010-1 with regard to "Limited-energy circuits".
Electromagnetic compatibility Interference emission Interference immunity	Acc. to DIN EN 61326-1 Class A – only for industrial use Industrial requirement
Current consumption	Analog output - flow sensor: $\leq 200$ mA Switching output - flow switch: $\leq 400$ mA

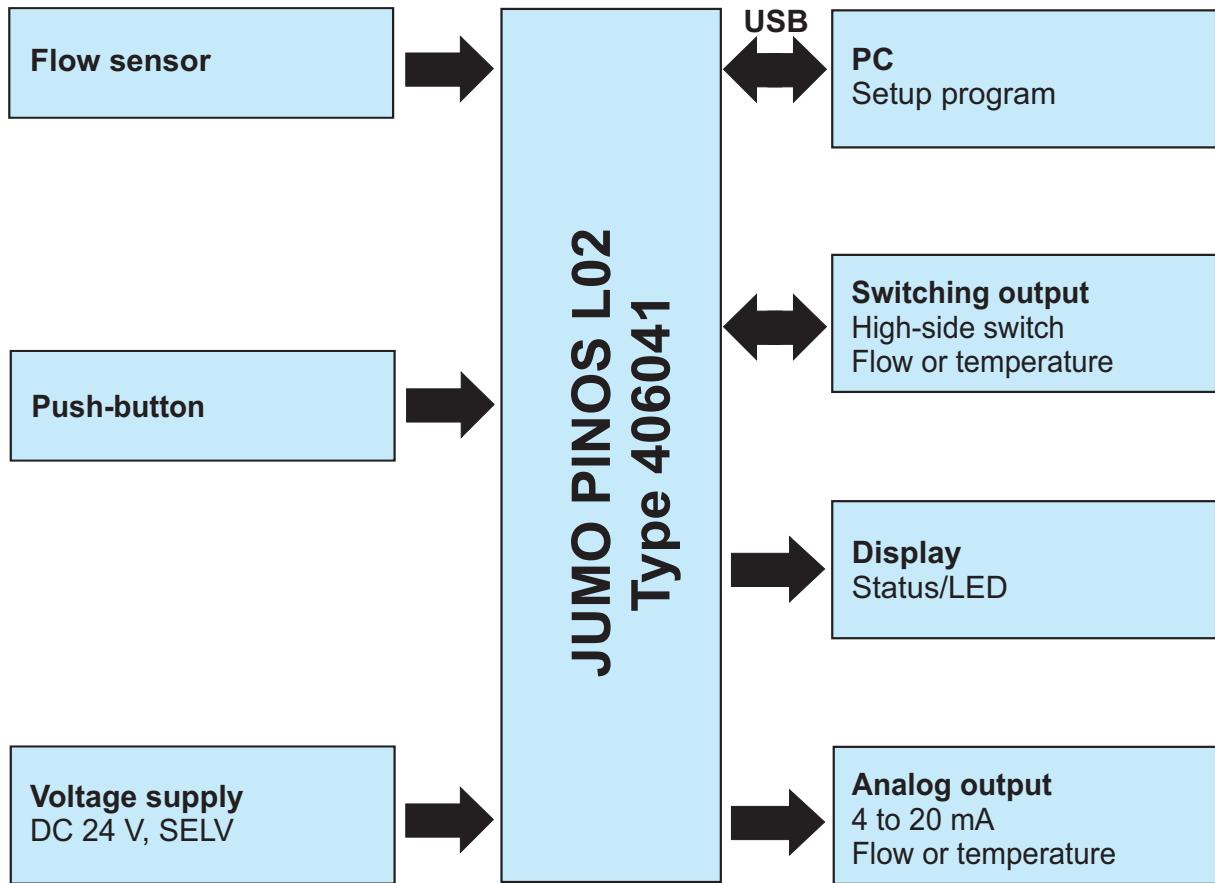
## Housing and environmental conditions

Housing	PA66-GF30
Parts in contact with the medium	Stainless steel 316L, 316Ti (1.4404, 1.4571), sealing material FPM Viton
Nominal pressure (input)	PN 75
Burst pressure (input)	200 bar
Weight	Approx. 100 g (depending on the probe length)
Ambient temperature range on the housing	-25 to +70 °C
Medium temperature range	-25 to +90 °C (liquids, no abrasive media)
Storage temperature range	-25 to +80 °C
Resistance to climatic conditions:	
Operation	100 % relative humidity including condensation of the housing
Storage	90 % relative humidity without condensation
Mounting position	Horizontal or vertical, housing can be rotated

## Operation

On-site calibration	Analog and/or switching output: Push-button on the device for setting the switching point (only for version with switching output); calibration for low and high flow velocity.
Setup interface	Micro USB socket

## Block diagram



## Setup program

### Function

The setup program serves the configuration of the flow sensor using a PC. The configuration data can be archived on data carriers and printed.

The setup program can be used to overwrite changed parameters with the default settings at any time. The connection between flow sensor and PC is established via a micro USB interface.

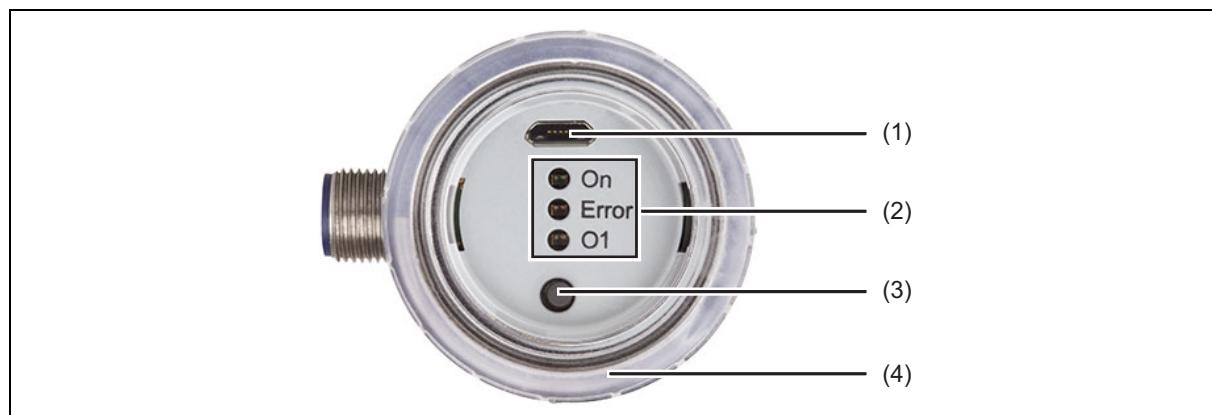
- Set the behavior of the outputs when the measuring range is exceeded
- Set the analog output function (optional)
- Set the switching output function (optional)

### NOTE!

It is possible to configure the flow sensor **without** auxiliary energy using the micro USB interface.



## Display and control elements



(1) Micro USB interface

(2) LEDs

On: green LED

Error: red LED

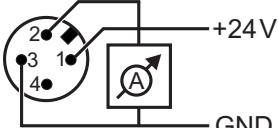
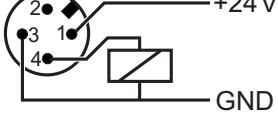
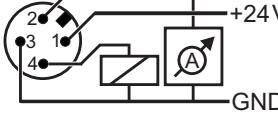
O1: yellow LED

(3) Button

(4) Protective lid with viewing window (IP67)

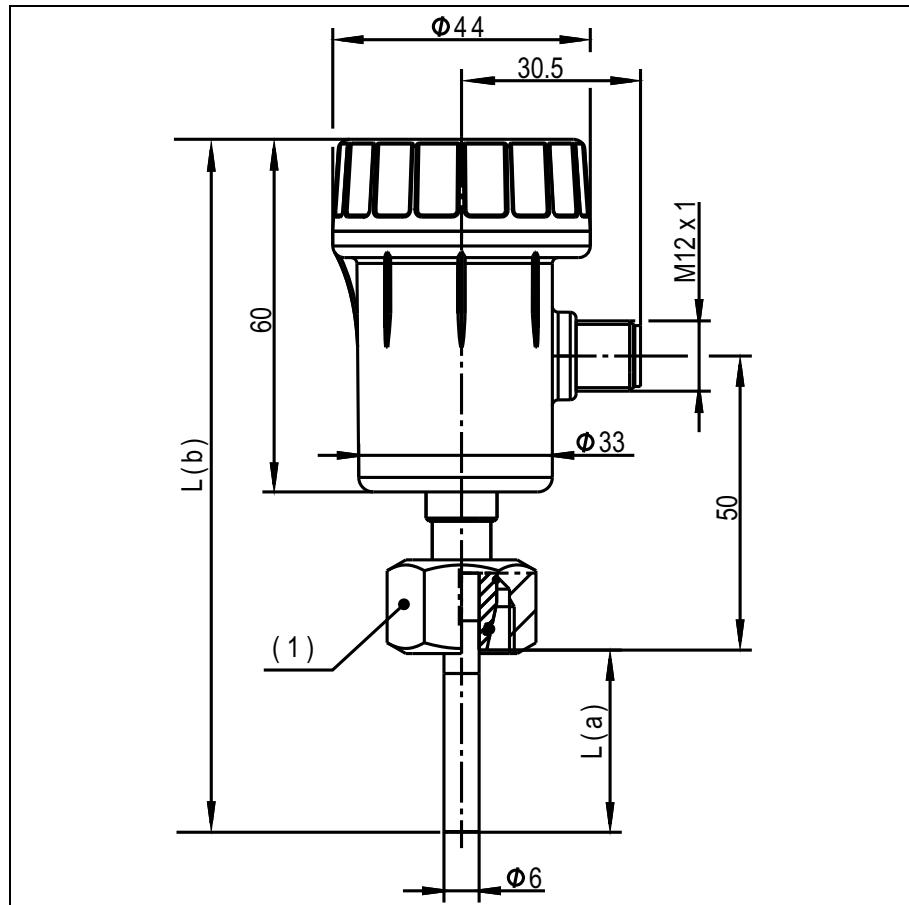
## Connection diagram

The connection diagram in the data sheet provides preliminary information about the connection options. For the electrical connection, only use the installation instructions or the operating manual. The knowledge and the correct technical compliance with the safety information and warnings contained in these documents are mandatory for mounting, electrical connection, and startup as well as for safety during operation.

Connection for	Type	PIN	Description	Terminal assignment
Analog output		1 2 3 4	+24 V Analog output GND Not used	
Switching output		1 2 3 4	+24 V Not used GND Switching output	
Analog and switching output		1 2 3 4	+24 V Analog output GND Switching output	
PC	Micro USB interface <sup>a</sup> (Type B)			

<sup>a</sup> The micro USB interface is designed only for configuring the flow sensor. Continuous operation is not admissible.

## Dimensions



(1) Union nut L12, M18 x 1.5; DIN EN ISO 8434-1,  wrench size 22

	Nominal pipe width	Internal pipe diameter [mm]
NTS 0020	DN 20	20 to 23.7
NTS 0025	DN 25	26 to 29.7
NTS 0032	DN 32	32 to 38.4
NTS 0040	DN 40	38 to 44.3
NTS 0050	DN 50	50 to 56.3
NTS 6530	Additional nominal widths	

Sensor version	L(a) mm	L(b) mm
NTS 37	37	124
NTS 51	51	138
NTS 65	65	152

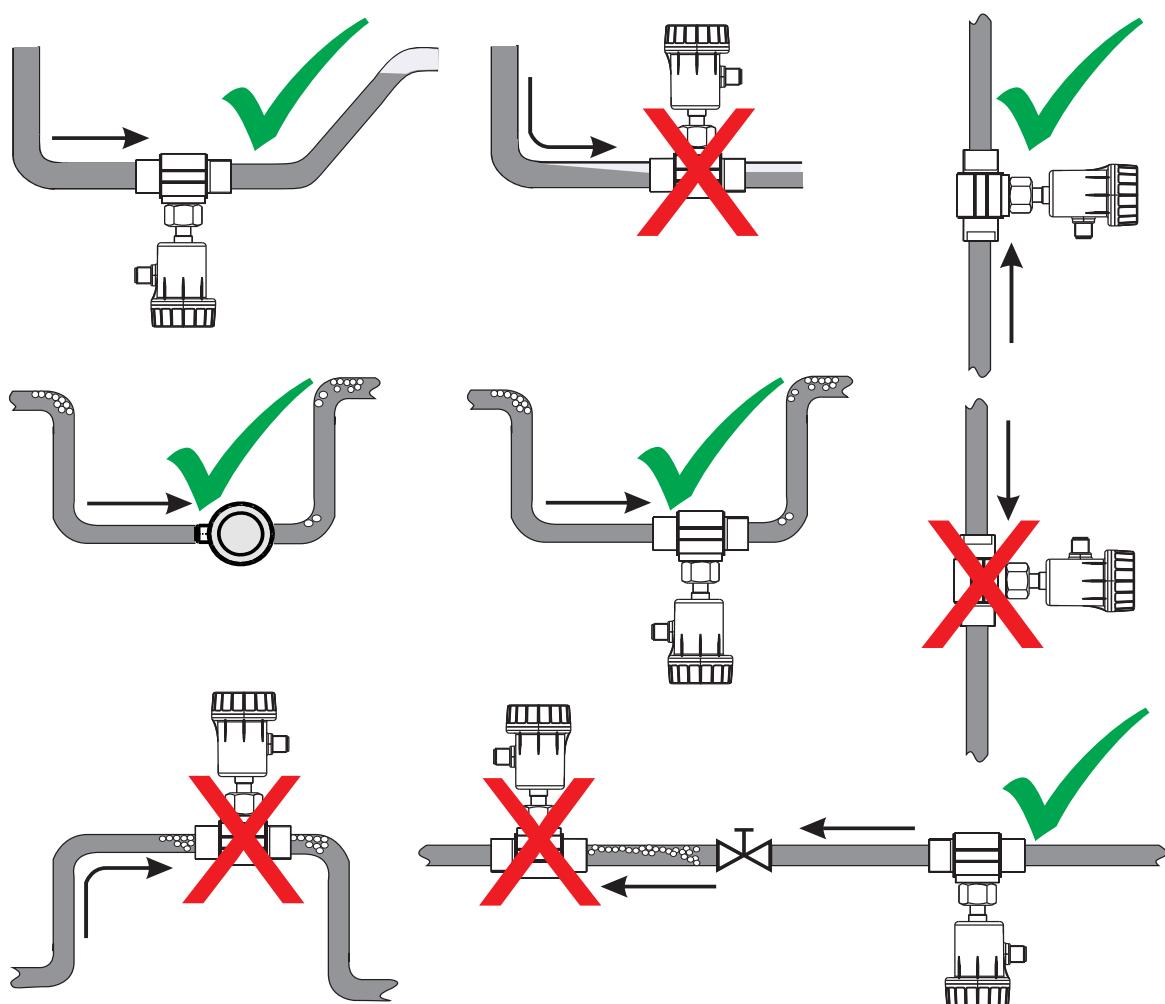
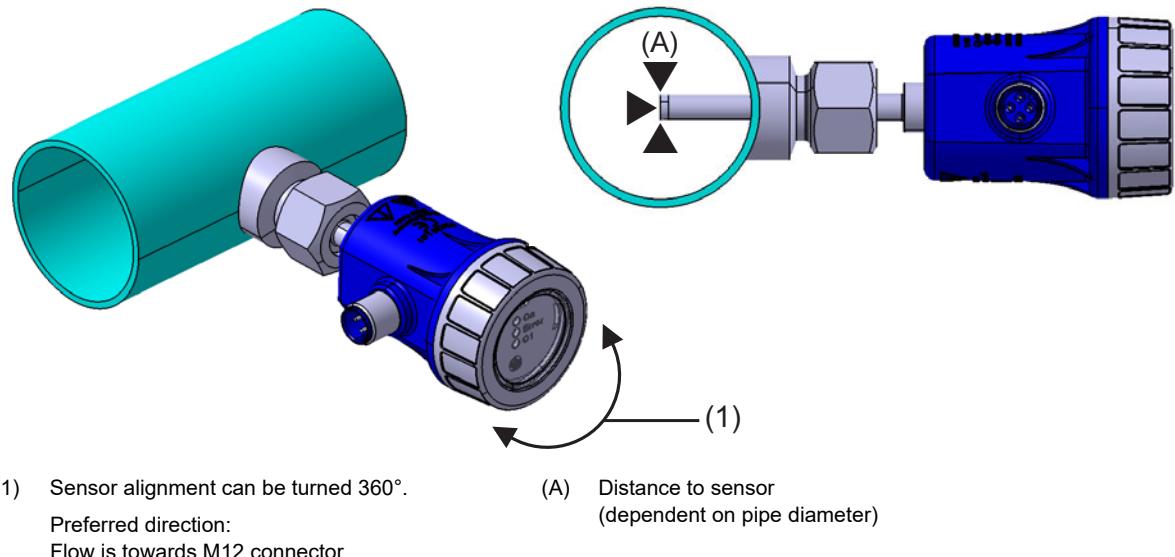
(NTS = numerical type code)

## Conical plug

JUMO PINOS L02	Threaded bore on process side

## Installation

### Mounting example



## Order details

<b>(1) Basic type</b>	
406041	JUMO PINOS L02
<b>(2) Basic type extension</b>	
000	None
999	Special version
<b>(3) Output</b>	
406	4 to 20 mA, three-wire
470	1 x PNP switching output
475	1 x PNP switching output, and 1 x analog output, 4 to 20 mA, three-wire
<b>(4) Nominal width</b>	
0020	DN 20 (3/4 in.)
0025	DN 25 (1 in.)
0032	DN 32 (1-1/4 in.)
0040	DN 40 (1-1/2 in.)
0050	DN 50 (2 in.)
6530	Additional nominal widths*
* only available for sensor version 99 (on-site calibration)	
<b>(5) Process connection</b>	
182	Union nut M18 x 1.5
<b>(6) Sensor length</b>	
37	Sensor length L(a) 37 mm
51	Sensor length L(a) 51 mm
65	Sensor length L(a) 65 mm
<b>(7) Sensor version</b>	
88	Factory calibration
99	On-site calibration
<b>(8) Extra code</b>	
100	Customer-specific configuration (specifications in plain text)

Order code      (1)      (2)      (3)      (4)      (5)      (6)      (7)      (8)  
 Order example      406041 / 000 - 406 - 0050 - 182 - 51 - 88 / 100

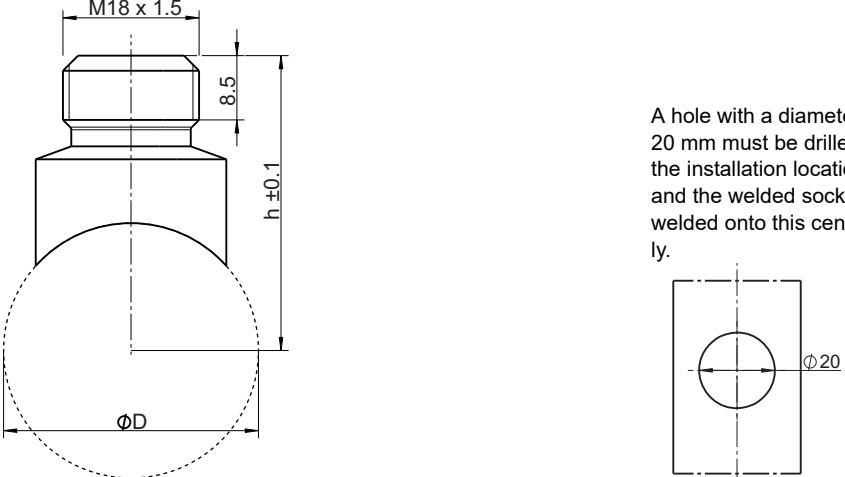
## Installation recommendation

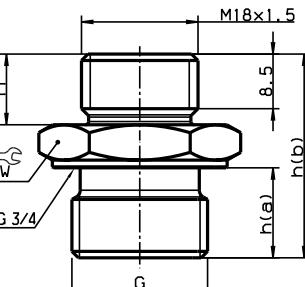
Nominal width	Installation situation					
	Stainless steel/ welded socket	PVC glue fitting/ PVC T-piece	Screw-in adapter	Other		
DN 20	L(a) = 37 (NTS 37)	L(a) = 37 (NTS 37)	L(a) = 51 (NTS 51) or L(a) = 65 (NTS 65)	Upon request		
DN 25		L(a) = 51 (NTS 51)				
DN 32						
DN 40		--				
DN 50						
Additional nominal widths	L(a) = 51 (NTS 51)	--	--	--		

(NTS = numerical type code)

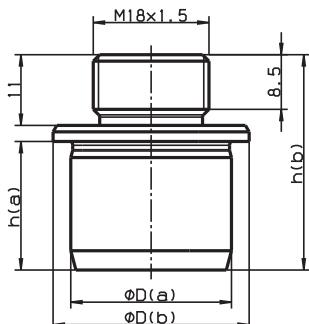
## Accessories

Item	Part no.
Setup program on CD-ROM, multilingual	00694887
Micro USB cable, type A USB connector on Micro-B USB connector, length 3 m	00616250
4-pole cable box (straight) M12 x 1 with 2 m PVC cable	00404585
4-pole angled socket M12 x 1 with 2 m PVC cable	00409334

<b>Welded socket</b> 									
DN	Material	Nominal pressure	Temperature operating range	h	øD	Part no.			
20	Stainless steel 316L	PN 75	-25 to +90°C	45	26.9	00667698			
25					33.7	00659696			
32					42.4	00659697			
40					48.3	00659699			
50				50	60.3	00659700			
- Other variants for alternative pipe diameters available upon request.									
- Pressure Equipment Directive (2014/68/EU): Article 4, Paragraph 3 - "Sound engineering practice".									

<b>Screw-in adapter</b> 												
Thread identifier	Material	Nominal pressure	Temperature operating range	Seal material	Wrench size	h(a)	h(b)	Part no.				
G 1/2	Stainless steel 316L	PN 25	-25 to +90 °C	FPM	27	14	31.7	00669206				
G 3/4					32	16	33.7	00669205				
1/2 NPT	Stainless steel 316L	PN 25	-25 to +90 °C	--	27	*	*	00699496				
3/4 NPT					32	*	*	00699495				
- Other variants for alternative pipe diameters available upon request.							* upon request					
- Pressure Equipment Directive (2014/68/EU): Article 4, Paragraph 3 - "Sound engineering practice".												

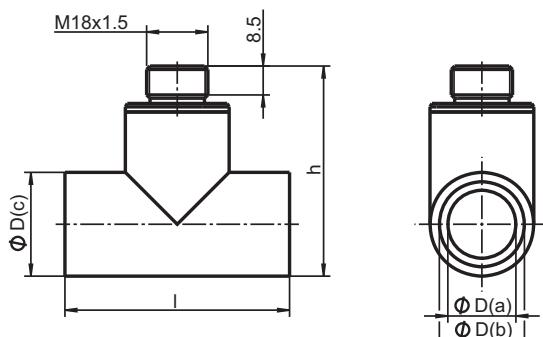
PVC spigot



DN	Material	Nominal pressure	Temperature operating range	h(a)	h(b)	øD(a)	øD(b)	Part no.
20 to 50	PVC-U	PN 16	0 to +60°C	20	33.5	25	30.5	00671018

- For gluing in PVC T-pieces with (reduced) outflow of a diameter of 25 mm.  
 - Other variants for alternative pipe diameters available upon request.  
 - Pressure Equipment Directive (2014/68/EU): Article 4, Paragraph 3 - "Sound engineering practice".

PVC T-piece



DN	Material	Nominal pressure	Temperature operating range	øD(a)	øD(b)	øD(c)	h	l	Part no.
20	PVC-U	PN 16	0 to +60°C	20	25.2	30.5	62.5	66	00670832
25				31	32.2	41	70.5	78	00670845
32				39	40.2	50	81	98	00670850
40				49	50.2	62	92	108	00670862
50				62	63.2	77	105	145	00670866

- Other variants for alternative pipe diameters available upon request.  
 - Pressure Equipment Directive (2014/68/EU): Article 4, Paragraph 3 - "Sound engineering practice".