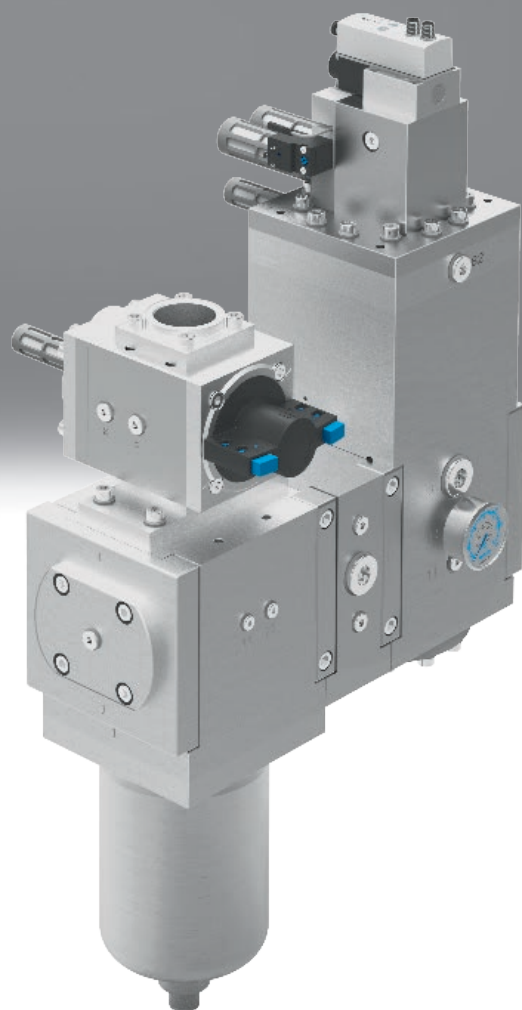
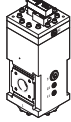
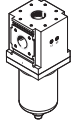





Pneumatic components for high-pressure applications

FESTO



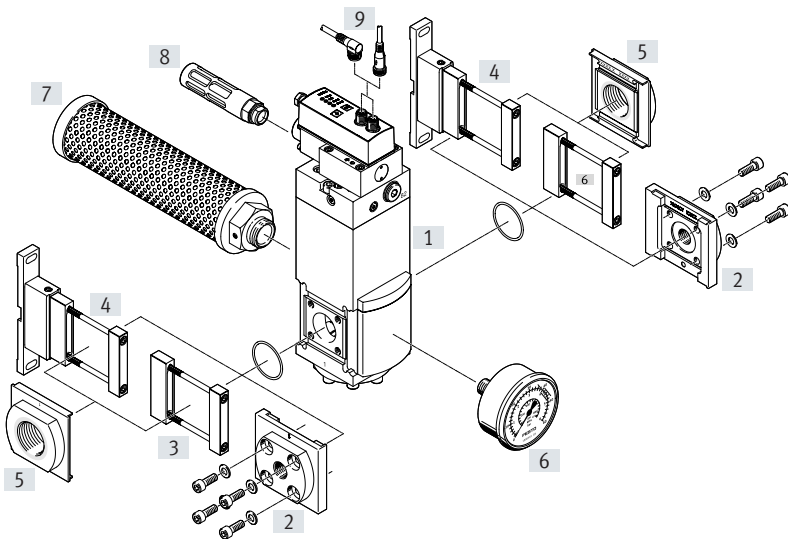
Product range overview

Function	Version	Type	Size	Pneumatic connection 1, 2		→ Page
				Direct	With connecting plate/flange	
Service unit components	Electric pressure regulator					
		PREL	90	–	G1/4, G1/2, G3/4, G1, G1 1/4	3
			186	–	G1/4, G1 1/4, G1 1/2, G2, G2 1/2	
	Micro filter					
		PFML	90	–	G1/4, G1/2, G3/4, G1, G1 1/4	19
			186	–	G1/4, G1 1/4, G1 1/2, G2, G2 1/2	
	On/off valve					
		PVEL	124	–	SAE flange	26
	Branching module					
		PMBL	90	–	G1/4, G1/2, G3/4, G1, G1 1/4	30
186			–	G1/4, G1 1/4, G1 1/2, G2, G2 1/2		
Valves	Proportional pressure regulator					
		VPPL	–	<ul style="list-style-type: none"> • Mounted on electric pressure regulator PREL • G1/4 	–	12

Peripherals overview

Accessories

Size 90



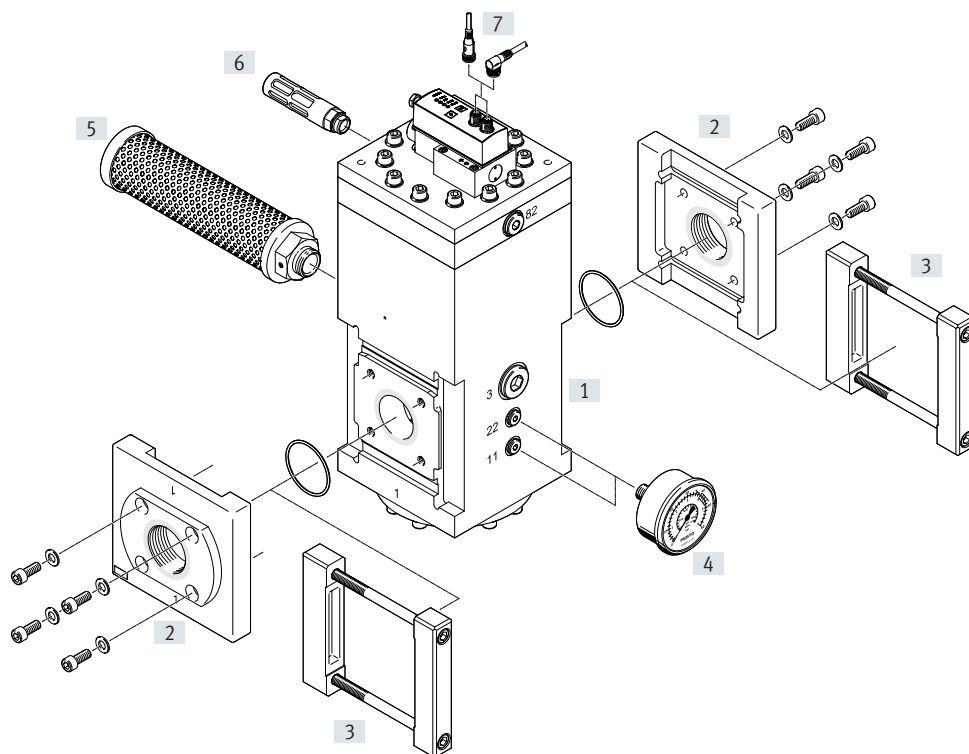
Mounting attachments and accessories

		→ Page/Internet
[1]	Electric pressure regulators PREL	7
[2]	Connecting plate PAML-CP	36
[3]	Module connector PAML-MK	39
[4]	Mounting bracket PAML-MB	41
[5]	Connecting plate PAML-CP...-G114	36
[6]	Pressure gauge PAGL	43
[7]	Silencer U-G1-HD-SA	On request
[8]	Silencer U-3/8-B	45
[9]	Connecting cable NEBA-M12	45

Peripherals overview

Accessories

Size 186



Mounting attachments and accessories

		→ Page/Internet
[1]	Electric pressure regulators PREL	7
[2]	Connecting plate PAML-CP	36
[3]	Module connector PAML-MK	39
[4]	Pressure gauge PAGL	43
[5]	Silencer U-G1-HD-SA	On request
[6]	Silencer U-1/2-B	45
[7]	Connecting cable NEBA-M12	45

Type codes

001	Series		007	Regulator type	
PREL	Electric pressure regulator		C	Piloted	
002	Size		008	Regulator exhausting	
90	90		F	Integrated return flow function with secondary exhaust	
003	Pressure application range		009	Control element	
HP3	Up to 50 bar		X	Proportional valve	
004	Setpoint input for individual valves		010	Overall accuracy	
V1	0 ... 10 V		S1	1%	
A4	4 ... 20 mA		S2	2%	
005	Electrical output 1		011	Variant	
V	0 ... 10 V		2	Variant 2	
A	4 ... 20 mA		3	Variant 3	
006	Pressure regulation range		4	Variant 4	
20	Up to 20 bar		5	Variant 5	
40	Up to 40 bar		8	Variant 8	

Type codes

001	Series
PREL	Electric pressure regulator

002	Size
186	186

003	Pressure application range
HP3	Up to 50 bar

004	Setpoint input for individual valves
V1	0 ... 10 V
A4	4 ... 20 mA

005	Electrical output 1
V	0 ... 10 V
A	4 ... 20 mA

006	Pressure regulation range
40	Up to 40 bar

007	Regulator type
C	Piloted

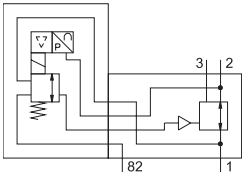
008	Regulator exhausting
F	Integrated return flow function with secondary exhaust



009	Control element
X	Proportional valve

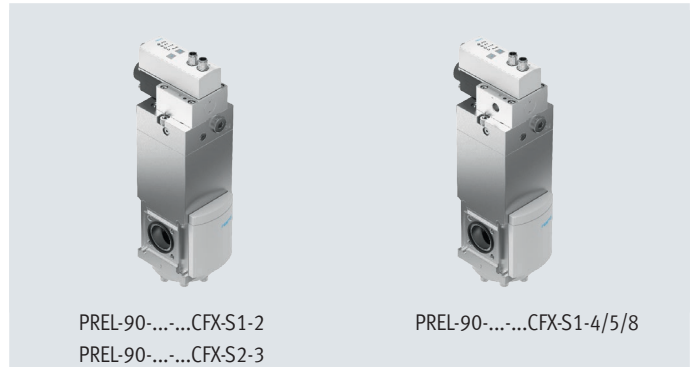
010	Variant
1	Variant 1

Datasheet

Function
PREL-90/186-...-...CFX, proportional valve




-  - Temperature range
+5 ... +50°C
-  - Operating pressure
0 ... 50 bar



The output pressure of the electric pressure regulator PREL is determined by the proportional pressure regulator VPPL via an integrated pressure sensor and compared internally to the setpoint value. In case of deviations, the VPPL controls the regulator of the PREL until the output

pressure reaches the setpoint value. In the initial position (no setpoint specification), the output pressure is reduced with the vent seat fully open.

- Slow pressure rise from 0.6 bar/s in the case of a setpoint value specification up to 8 bar, then 4.4 bar/s
- Connection options for pressure gauge on the front and the rear, one each for the operating and output pressure

 **Note**
The electric pressure regulator PREL can only be operated together with the proportional pressure regulator VPPL. The technical data for the proportional pressure regulator VPPL can be found from page 12 onwards.

General technical data		
Size	90	186
Nominal width DN	24	45
Pneumatic connection 3	G1	
Pneumatic connection 11, 22	G1/4	
Pneumatic connection 82	G3/8	G1/2
Actuation type	Electrical	
Design	Electrically adjustable pressure regulator	
Regulator function	Constant output pressure with primary pressure compensation and secondary venting	
Type of mounting	On service unit With accessories	
Mounting position	Vertical	
Pressure regulation range [bar]	0.5 ... 20 ¹⁾	–
	0.6 ... 40 ²⁾	0.4 ... 40
	2 ... 40 ²⁾	–
Max. pressure hysteresis [bar]	–	0.806

1) Due to the design, the output pressure is limited to 17.5 bar.
2) Due to the design, the output pressure is limited to 37.5 bar.

Datasheet

Electrical data		PREL...-V1-A	PREL...-V1-V	PREL...-A4-A
Type				
Electrical connection	IN	M12 plug, 5-pin, A-coded		
	OUT	M12 plug, 5-pin, A-coded		
Nominal operating voltage	[V DC]	24		
Analogue input signal range	[V]	0 ... 10	0 ... 10	–
	[mA]	–	–	4 ... 20
Analogue output signal range	[V]	–	0 ... 10	–
	[mA]	4 ... 20	–	4 ... 20
Setpoint/actual values	[V]	Voltage type 0 ... 10		–
	[mA]	–	–	Current type 4 ... 20

Operating and environmental conditions		
Operating pressure	[bar]	0 ... 50
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
		Inert gases
LABS (PWIS) conformity		VDMA24364 zone III
Ambient temperature	[°C]	+5 ... +50
Temperature of medium	[°C]	+5 ... +50
Storage temperature	[°C]	–10 ... +60
Corrosion resistance class CRC ¹⁾		2 - Moderate corrosion stress
CE marking (see declaration of conformity) ²⁾		To EU Pressure Equipment Directive
UKCA marking (see declaration of conformity) ²⁾		UK regulations for pressure equipment
Food-safe ²⁾		See supplementary material information
Certification		Special Equipment Type Test Certification

1) More information www.festo.com/x/topic/crc

2) Additional information: www.festo.com/catalogue/prel → Support/Downloads.

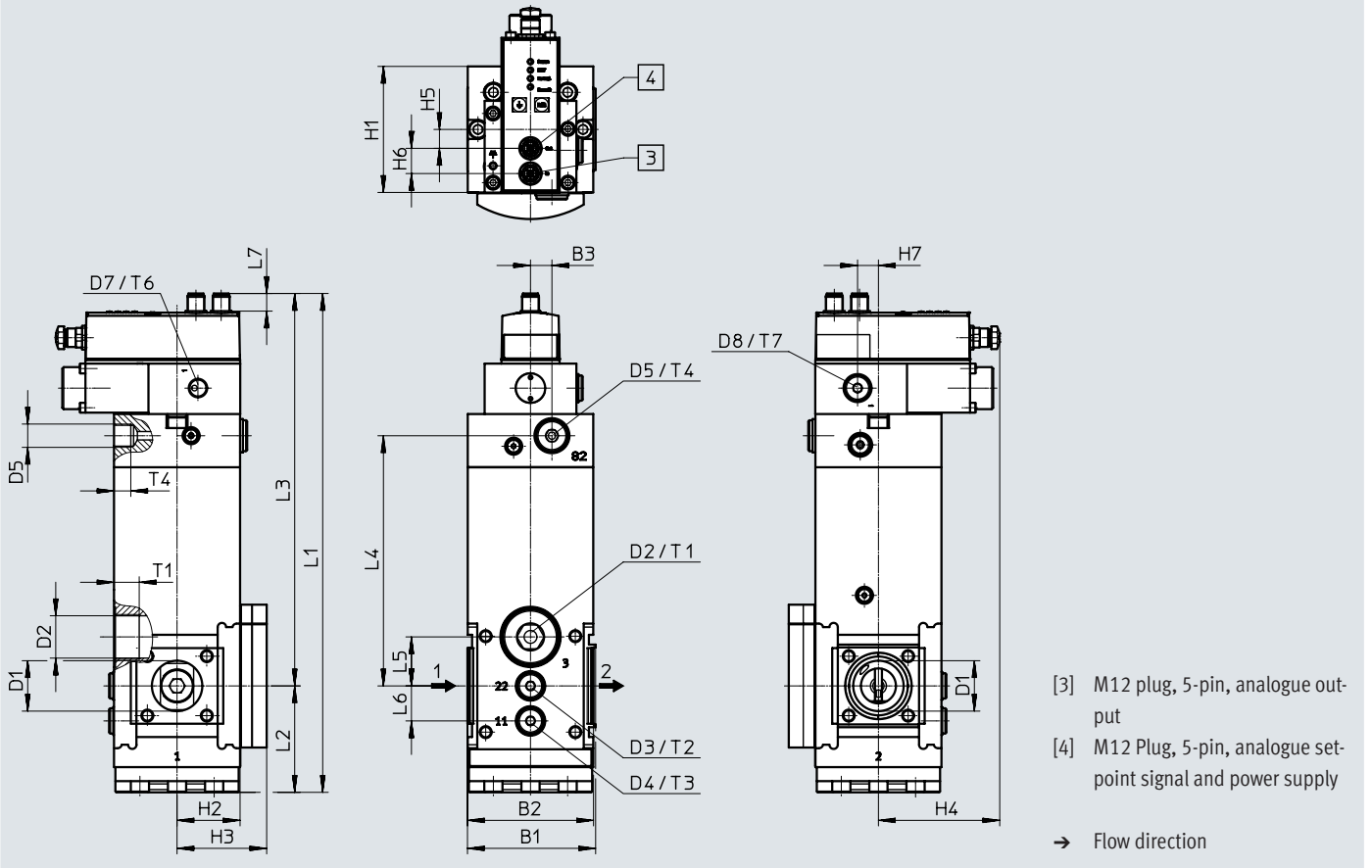
Weight [g]		
Size		90 186
Electric pressure regulator		6100 37100

Materials		
Housing		Anodised aluminium
Spring		Spring steel
Bottom cover		Anodised aluminium
Seals		NBR
Note on materials		RoHS-compliant

Datasheet

Dimensions – Size 90

Download CAD data → www.festo.com



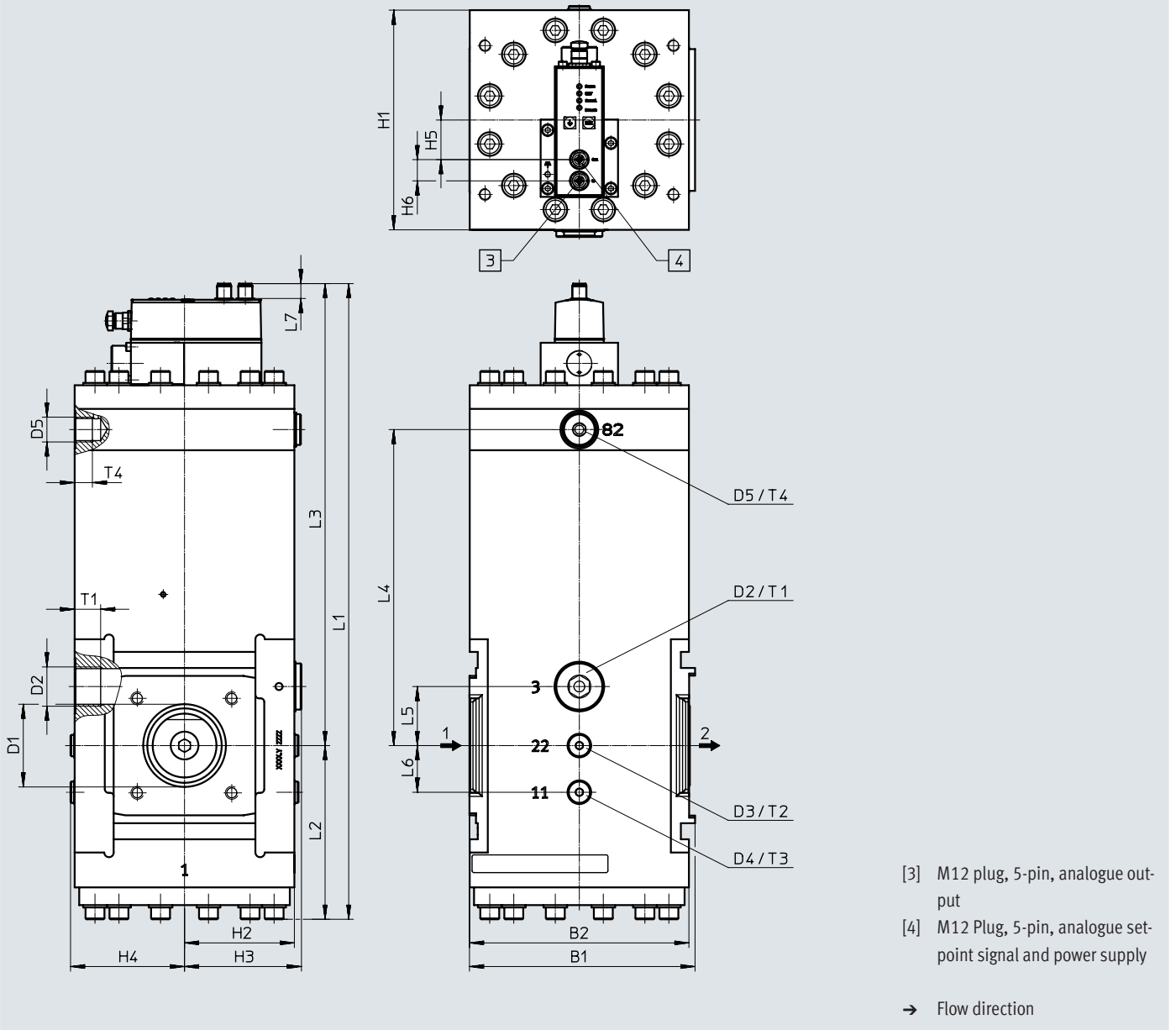
Type	B1	B2	B3	D1 ∅	D2	D3	D4	D5	D7	D8	H1	H2	H3	H4	H5	H6	H7
PREL-90-...CFX-...-2/3	91.5	90	~15.3	36	G1	G1/4	G1/4	G3/8	-	-	90	~45	~64	~87	13.5	18	~14.9
PREL-90-...CFX-...-4/5/8									G1/4	G1/4							

Type	L1	L2	L3	L4	L5	L6	L7	T1	T2	T3	T4	T6	T7
PREL-90-...CFX-...-2/3	~356	76	~280	~179	~35	~25	~12.6	18	12	12	12	-	-
PREL-90-...CFX-...-4/5/8												12	12

Datasheet

Dimensions – Size 186

Download CAD data → www.festo.com



Type	B1	B2	D1 ∅	D2	D3	D4	D5	H1	H2	H3	H4	H5	H6
PREL-186-...-40CFX-1	191	186	70	G1	G1/4	G1/4	G1/2	186	93	99	96.5	33.5	18

Type	L1	L2	L3	L4	L5	L6	L7	T1	T2	T3	T4
PREL-186-...-40CFX-1	~537	~147	~390	267.5	50	39.5	~12.6	18	12	12	14

Datasheet

Ordering data – Size 90				
With proportional pressure regulator VPPL				
Pressure regulation range [bar]	Setpoint input (input)	Actual value (output)	Part no.	Type
Without external auxiliary pilot air				
0.5 ... 20 ¹⁾	0 ... 10 V	4 ... 20 mA	1709128	PREL-90-HP3-V1-A-20CFX-S1-2
		0 ... 10 V	1709129	PREL-90-HP3-V1-V-20CFX-S1-2
	4 ... 20 mA	4 ... 20 mA	1709130	PREL-90-HP3-A4-A-20CFX-S1-2
0.6 ... 40 ²⁾	0 ... 10 V	4 ... 20 mA	1709131	PREL-90-HP3-V1-A-40CFX-S2-3
		0 ... 10 V	1709132	PREL-90-HP3-V1-V-40CFX-S2-3
	4 ... 20 mA	4 ... 20 mA	1709133	PREL-90-HP3-A4-A-40CFX-S2-3
With external auxiliary pilot air				
0.5 ... 20 ¹⁾	0 ... 10 V	4 ... 20 mA	1709134	PREL-90-HP3-V1-A-20CFX-S1-4
		0 ... 10 V	1709135	PREL-90-HP3-V1-V-20CFX-S1-4
	4 ... 20 mA	4 ... 20 mA	1709136	PREL-90-HP3-A4-A-20CFX-S1-4
With external auxiliary pilot air, with 2 bar offset in setpoint input				
2 ... 40 ²⁾	0 ... 10 V	4 ... 20 mA	1709137	PREL-90-HP3-V1-A-40CFX-S1-5

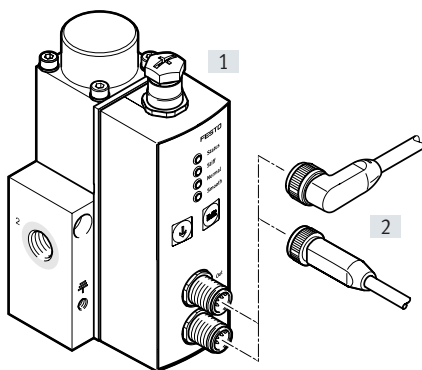
1) Due to the design, the output pressure is limited to 17.5 bar.

2) Due to the design, the output pressure is limited to 37.5 bar.

Ordering data – Size 186				
With proportional pressure regulator VPPL				
Pressure regulation range [bar]	Setpoint input (input)	Actual value (output)	Part no.	Type
Without external auxiliary pilot air				
0.4 ... 40	0 ... 10 V	4 ... 20 mA	1709211	PREL-186-HP3-V1-A-40CFX-1
		0 ... 10 V	1709212	PREL-186-HP3-V1-V-40CFX-1
	4 ... 20 mA	4 ... 20 mA	1709213	PREL-186-HP3-A4-A-40CFX-1

Peripherals overview and type codes

Accessories



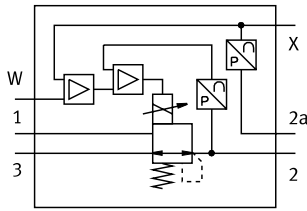
		→ Page/Internet
[1]	Proportional pressure regulators VPPL	13
[2]	Connecting cable NEBA-M12	45



Type codes

001	Series	
VPPL	Proportional pressure regulator	
002	Nominal width [mm]	
3	3	
003	Mounting method	
	Standard	
Q	Flange	
004	Directional control valve type	
	None	
L	In-line valve	
005	Valve function	
3	3/3-way valve, normally closed	
006	Pneumatic connection	
	Flange	
G14	G1/4	
Z	Flange/thread combination for connection 1 (external pilot air)	
007	Lower pressure value of control range	
0L	0 bar	
2L	2 bar	

008	Upper pressure value of control range	
20H	20 bar	
40H	40 bar	
009	Setpoint input for individual valves	
A4	4 ... 20 mA	
V1	0 ... 10 V	
010	Electrical output 1	
A	4 ... 20 mA	
V	0 ... 10 V	
011	Overall accuracy	
S1	1 %	
012	Variant	
1	Variant 1	
2	Variant 2	
3	Variant 3	
4	Variant 4	
5	Variant 5	
6	Variant 6	
7	Variant 7	
8	Variant 8	

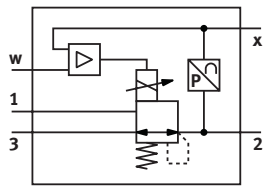
Datasheet

 Function
 Flanged valve


-  - Temperature range
+5 ... +50°C
-  - Operating pressure
0 ... 50 bar



In-line valve




The output pressure of the electric pressure regulator PREL is determined by the proportional pressure regulator VPPL via an integrated pressure sensor and compared internally to the setpoint value. In case of deviations, the VPPL controls the regulator of the PREL until the output pressure reaches the setpoint value.

In the initial position (no setpoint specification), the output pressure is reduced with the vent seat fully open. The proportional pressure regulator VPPL is available in three versions:

- Flanged valve VPPL-3Q-3
- Flanged valve with external pilot air supply VPPL-3Q-3-Z
- In-line valve VPPL-3L-3

 **Note**

The flanged valve with and without external pilot air supply can only be operated together with the electric pressure regulator PREL.

 **Safety instructions**

Safety position for VPPL: if the power supply cable is interrupted, the outlet pressure drops to 0 bar.

General technical data

Design	Flanged valve VPPL-3Q-3		Flanged valve with external pilot air supply VPPL-3Q-3-Z			In-line valve VPPL-3L-3		
	Type	-0L20H	-0L40H	-0L20H	-0L40H	-2L40H	-G14-0L20H	-G14-0L40H
Nominal size pressurisation/ exhaust	[mm]	3.0						
Pneumatic connection 1		Flange	Flange	Flange, G1/4	Flange, G1/4	Flange, G1/4	G1/4	G1/4
Pneumatic connection 2, 3		Flange	Flange	Flange	Flange	Flange	G1/4	G1/4
Actuation type		Electrical						
Design		Directly actuated piston regulator						
Type of mounting		With through-hole						
Mounting position		Any, preferably upright						
Pressure regulation range	[bar]	0.2 ... 20	0.4 ... 40	0.2 ... 20	0.4 ... 40	2 ... 40	0.2 ... 20	0.4 ... 40
Max. pressure hysteresis	[MPa]	0.01	0.04	0.01	0.04	0.04	0.01	0.04
	[bar]	0.1	0.4	0.1	0.4	0.4	0.1	0.4
	[psi]	1.45	5.8	1.45	5.8	5.8	1.45	5.8
Valve function		3-way proportional pressure regulator, closed						
Exhaust air function		Cannot be throttled						
Reset method		Mechanical spring						
Type of control		Direct						
Sealing principle		Soft						

Characteristic flow rate values
Standard nominal flow rate $q_{N^{1}}$ [l/min]

In main flow direction 1 → 2	245
in flow direction 2 → 3	282

C value [l/s*bar]

In main flow direction 1 → 2	0.8
------------------------------	-----

b value

In main flow direction 1 → 2	0.25
------------------------------	------

 1) Measured at $p_1 = 6$ bar and $p_2 = 5$ bar, $\Delta p = 1$ bar

Datasheet

Electrical data		VPPL-...-V1-A	VPPL-...-V1-V	VPPL-...-A4-A
Electrical connection	IN	M12 plug, 5-pin, A-coded		
	OUT	M12 plug, 5-pin, A-coded		
Electrical connection, diagnostic interface ¹⁾		Socket, M12, 5-pin, A-coded		
Operating voltage range	[V DC]	21.6 ... 27.6		
Analogue input signal range	[V]	0 ... 10	0 ... 10	–
	[mA]	–	–	4 ... 20
Analogue output signal range	[V]	–	0 ... 10	–
	[mA]	4 ... 20	–	4 ... 20
Setpoint/actual values	[V]	Voltage type 0 ... 10		–
	[mA]	–	–	Current type 4 ... 20
Degree of protection		IP65		
Duty cycle	[%]	100		
Switching time off	[ms]	654		
Switching time on	[ms]	428		
Reverse polarity protection		For all electrical connections		
Short circuit current rating		No		
Max. cable length	[m]	30		
Display type		LED indicator		
Max. electrical power consumption	[W]	26.7		
Residual ripple	[%]	10		

1) Diagnostics interface covered with a protective cap, for use only by Festo service staff.

Accuracy		VPPL-...-0L20H	VPPL-...-0L40H/2L40H
Linearity error	[% FS]	±0.5	±1
Total accuracy	[% FS]	0,5	1,25
Temperature coefficient	[%/K]	0.04	
Repetition accuracy	[% FS]	±0.5	±1

Operating and environmental conditions	
Operating pressure	[bar] 0 ... 50
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]
	Inert gases
Note on the operating/pilot medium Lubricated operation not possible	
Ambient temperature	[°C] +5 ... +50
Temperature of medium	[°C] +5 ... +50
Storage temperature	[°C] –10 ... +60
Corrosion resistance class CRC ¹⁾ 2 - Moderate corrosion stress	
CE marking, (see declaration of conformity) ²⁾ To EU EMC Directive	
UKCA marking (see declaration of conformity) ²⁾ To UK EMC regulations	

1) More information www.festo.com/x/topic/crc

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/vppl → Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Weight [g]	
Proportional pressure regulator	1100

Datasheet

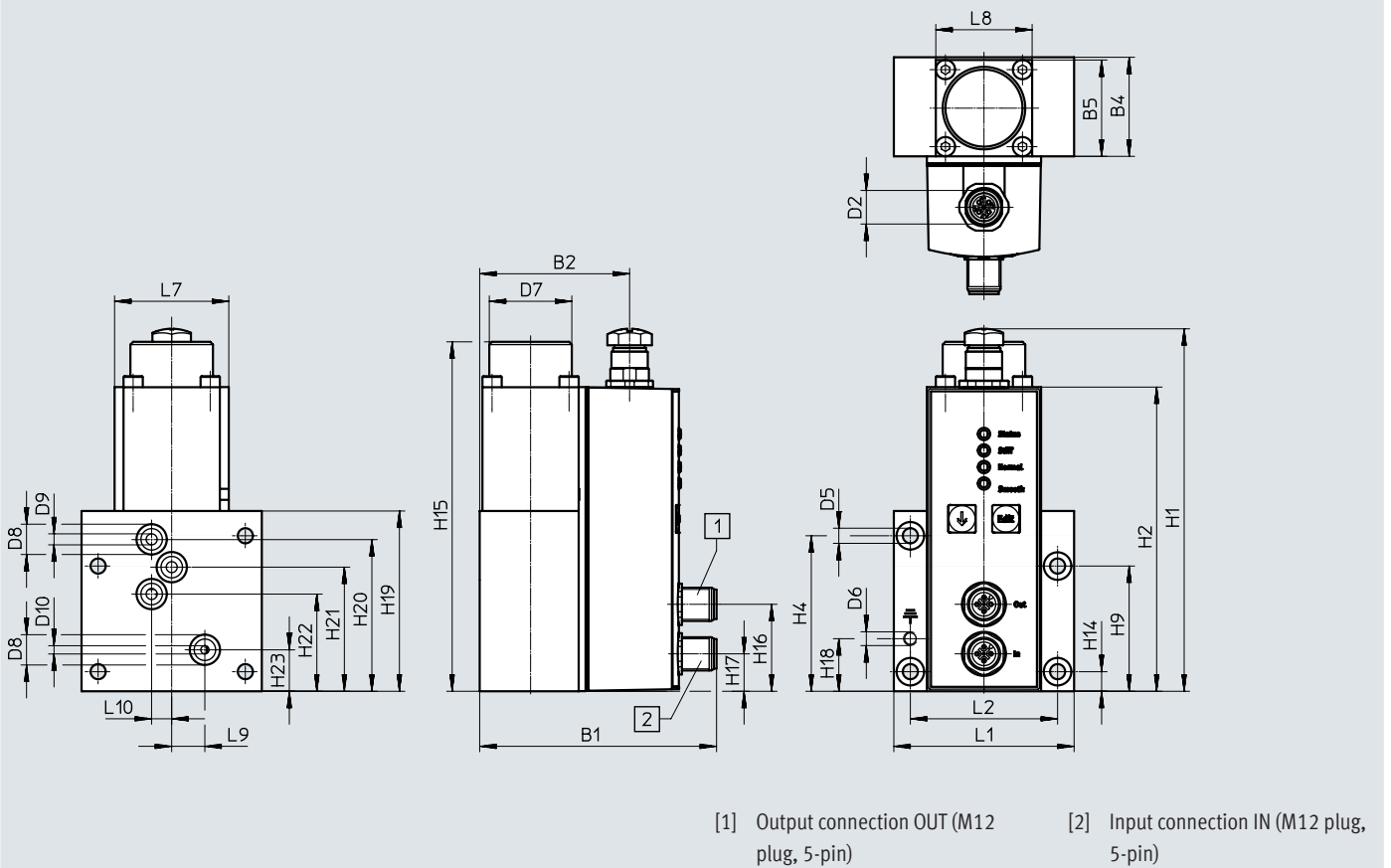
Materials	
Housing	Anodised wrought aluminium alloy
Note on materials	RoHS-compliant

Pin allocation			
M12 plug, 5-pin, A-coded	Pin	Output connection OUT Actual value	Input connection IN Setpoint value/power supply
	1	Not assigned	24 V DC
	2	Analogue OUT+ (actual value)	Analogue IN+ (setpoint value)
	3	Not assigned	0 V
	4	Analogue OUT- (actual value)	Analogue IN- (setpoint value)
	5	Functional earth	Functional earth

Dimensions – Flanged valve

Download CAD data → www.festo.com

VPPL-3Q-3



Type	B1	B2	B4	B5	D2	D5 ∅	D6	D7 ∅	D8 ∅	D9 ∅	D10 ∅
VPPL-3Q-3	86.1	54.5	36	35	M12	5.5	M5	30	11	4	3

Type	H1	H2	H4	H9	H14	H15	H16	H17	H18	H19
VPPL-3Q-3	132	110.5	56.5	45.5	7.1	127	31.5	13.5	19.1	65.5

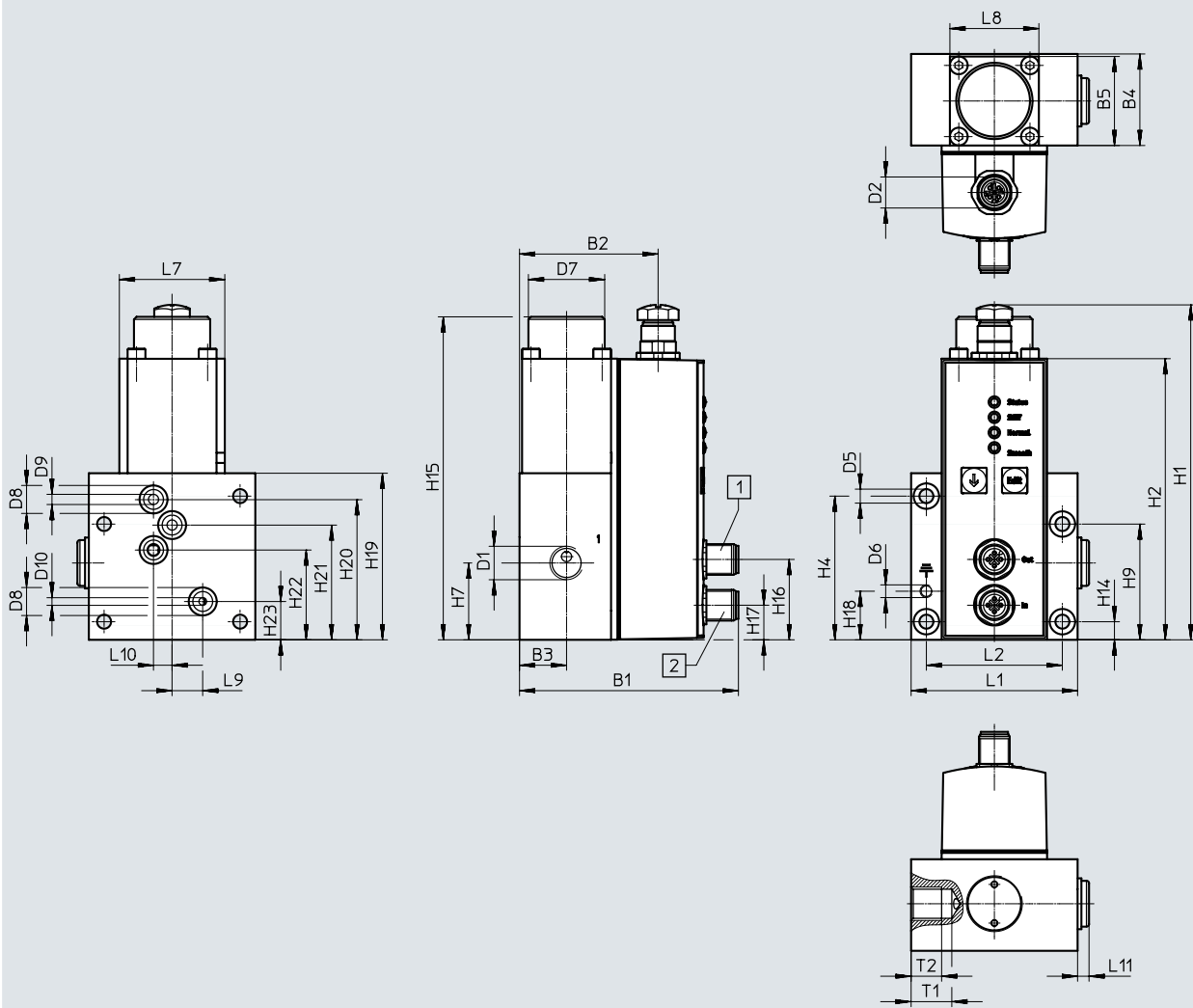
Type	H20	H21	H22	H23	L1	L2	L7	L8	L9	L10
VPPL-3Q-3	55.2	45.1	35.3	15.05	65.5	53.5	41.5	35	12.05	7.3

Datasheet

Dimensions – Flanged valve with external pilot air

Download CAD data → www.festo.com

VPPL-3Q-3-Z



[1] Output connection OUT (M12 plug, 5-pin) [2] Input connection IN (M12 plug, 5-pin)

Type	B1	B2	B3	B4	B5	D1	D2	D5 ∅	D6	D7 ∅	D8 ∅	D9 ∅	D10 ∅
VPPL-3Q-3-Z	86.1	54.5	18.5	36	35	G1/4	M12	5.5	M5	30	11	4	3

Type	H1	H2	H4	H7	H9	H14	H15	H16	H17	H18	H19	H20
VPPL-3Q-3-Z	132	110.5	56.5	30.2	45.5	7.1	127	31.5	13.5	19.1	65.5	55.2

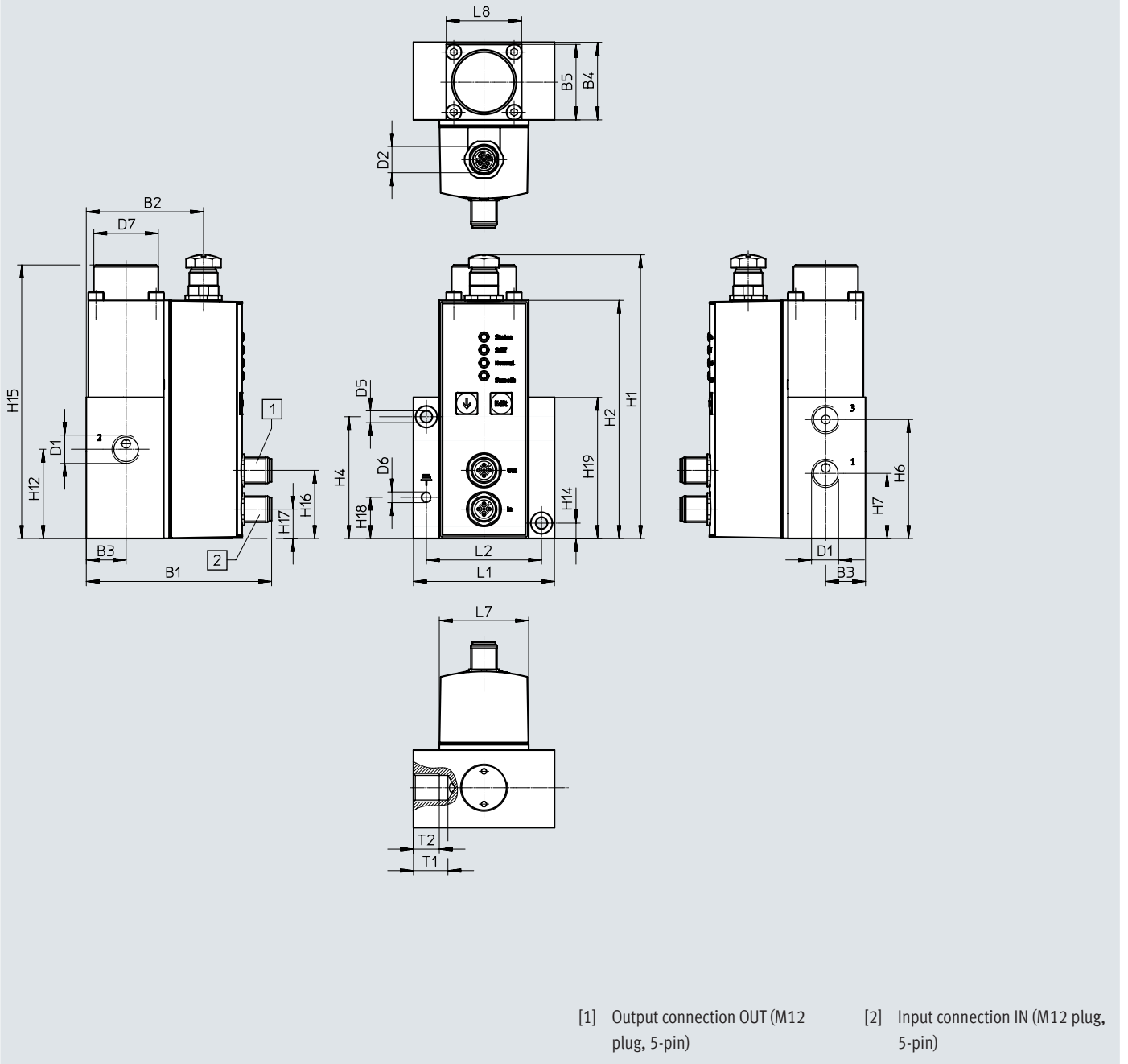
Type	H21	H22	H23	L1	L2	L7	L8	L9	L10	L11	T1	T2
VPPL-3Q-3-Z	45.1	35.3	15.05	65.5	53.5	41.5	35	12.05	7.3	4.5	16	12

Datasheet

Dimensions – In-line valve

Download CAD data → www.festo.com

VPPL-3L-3-G14



Type	B1	B2	B3	B4	B5	D1	D2	D5 ∅	D6	D7 ∅
VPPL-3L-3-G14	86.1	54.5	18.5	36	35	G1/4	M12	5.5	M5	30

Type	H1	H2	H4	H6	H7	H12	H14	H15	H16
VPPL-3L-3-G14	132	110.5	56.5	55.2	30.2	41.4	7.1	127	31.5

Type	H17	H18	H19	L1	L2	L7	L8	T1	T2
VPPL-3L-3-G14	13.5	19.1	65.5	65.5	53.5	41.5	35	16	12

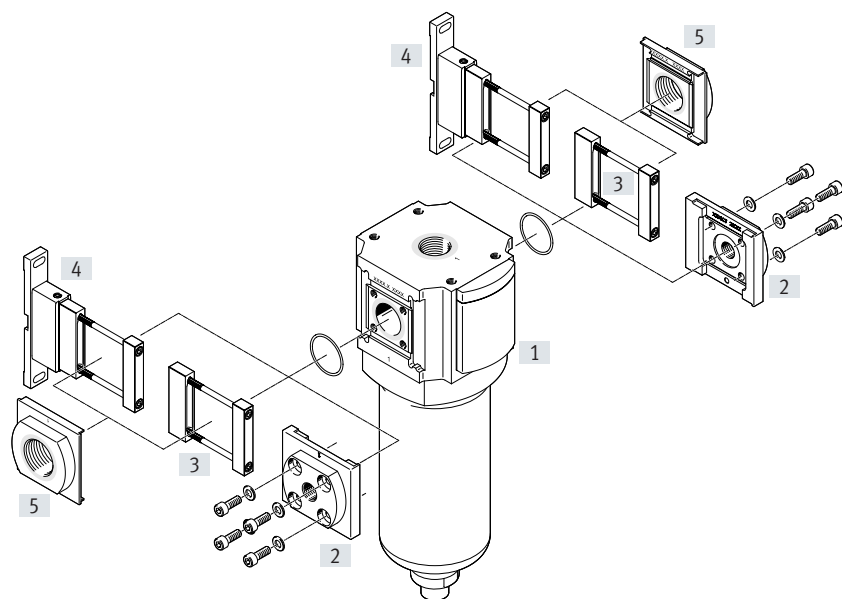
Datasheet

Ordering data						
Pneumatic connection	For electric pressure regulator	Pressure regulation range [bar]	Setpoint value (input)	Actual value (output)	Part no.	Type
1						
Flanged valve						
Flange	PREL-90-...-20CFX-S1-2	0.2 ... 20	0 ... 10 V	4 ... 20 mA	1635984	VPPL-3Q-3-0L20H-V1-A-S1-2
			0 ... 10 V	0 ... 10 V	1635987	VPPL-3Q-3-0L20H-V1-V-S1-2
			4 ... 20 mA	4 ... 20 mA	1635990	VPPL-3Q-3-0L20H-A4-A-S1-2
	PREL-186-...-40CFX-1	0.4 ... 40	0 ... 10 V	4 ... 20 mA	1635973	VPPL-3Q-3-0L40H-V1-A-S1-1
			0 ... 10 V	0 ... 10 V	1635978	VPPL-3Q-3-0L40H-V1-V-S1-1
			4 ... 20 mA	4 ... 20 mA	1635981	VPPL-3Q-3-0L40H-A4-A-S1-1
	PREL-90-...-40CFX-S2-3	0.4 ... 40	0 ... 10 V	4 ... 20 mA	1635985	VPPL-3Q-3-0L40H-V1-A-S1-3
			0 ... 10 V	0 ... 10 V	1635979	VPPL-3Q-3-0L40H-V1-V-S1-3
			4 ... 20 mA	4 ... 20 mA	1691730	VPPL-3Q-3-0L40H-A4-A-S1-3
Flanged valve with external pilot air						
Flange, G1/4	PREL-90-...-20CFX-S1-4	0.2 ... 20	0 ... 10 V	4 ... 20 mA	1635975	VPPL-3Q-3-Z-0L20H-V1-A-S1-4
			0 ... 10 V	0 ... 10 V	1635988	VPPL-3Q-3-Z-0L20H-V1-V-S1-4
			4 ... 20 mA	4 ... 20 mA	1635991	VPPL-3Q-3-Z-0L20H-A4-A-S1-4
	PREL-90-...-40CFX-S1-8	0.4 ... 40	0 ... 10 V	4 ... 20 mA	1910709	VPPL-3Q-3-Z-0L40H-V1-A-S1-8
	PREL-90-...-40CFX-S1-5	2 ... 40	0 ... 10 V	4 ... 20 mA	1635982	VPPL-3Q-3-Z-2L40H-V1-A-S1-5
In-line valve						
G1/4	0.2 ... 20	0.2 ... 20	0 ... 10 V	4 ... 20 mA	1635986	VPPL-3L-3-G14-0L20H-V1-A-S1-6
			0 ... 10 V	0 ... 10 V	1635989	VPPL-3L-3-G14-0L20H-V1-V-S1-6
			4 ... 20 mA	4 ... 20 mA	1635992	VPPL-3L-3-G14-0L20H-A4-A-S1-6
	0.4 ... 40	0.4 ... 40	0 ... 10 V	4 ... 20 mA	1635977	VPPL-3L-3-G14-0L40H-V1-A-S1-7
			0 ... 10 V	0 ... 10 V	1635980	VPPL-3L-3-G14-0L40H-V1-V-S1-7
			4 ... 20 mA	4 ... 20 mA	1635983	VPPL-3L-3-G14-0L40H-A4-A-S1-7

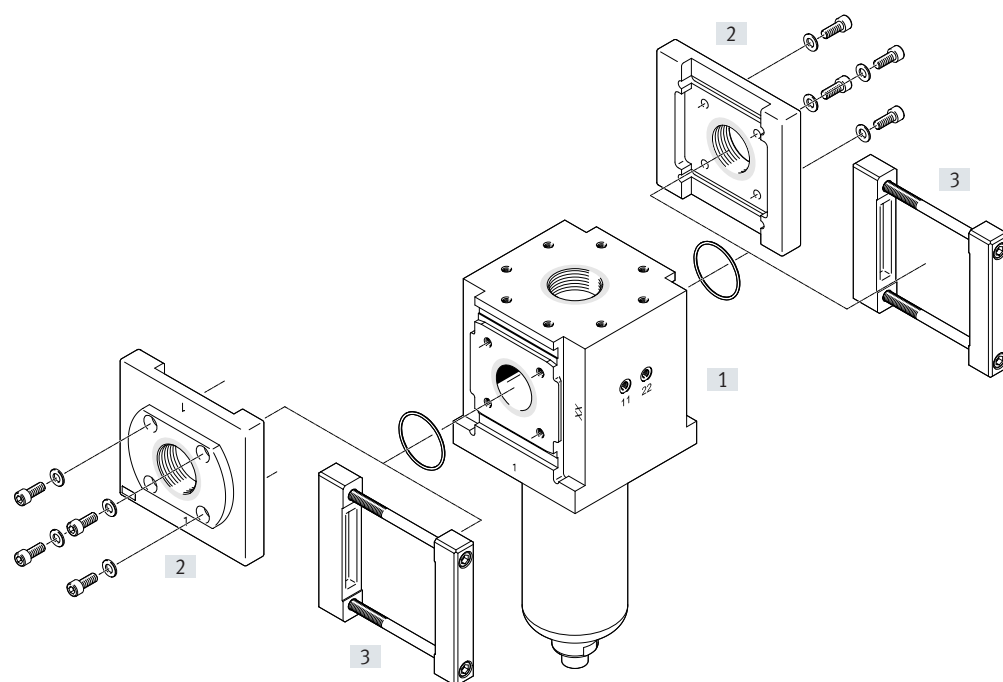
Peripherals overview

Accessories

Size 90



Size 186



Mounting attachments and accessories

		→ Page/Internet
[1]	Micro filter PFML	21
[2]	Connecting plate PAML-CP	36
[3]	Module connector PAML-MK	39
[4]	Mounting bracket PAML-MB	41
[5]	Connecting plate PAML-CP-...-G114	36

Type codes

001	Series	
PFML	Micro filter	

002	Size	
90	90 mm	
186	186 mm	

003	Pressure application range	
HP3	Up to 50 bar	

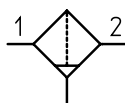
004	Flow rate	
	Standard	
H	High flow rate	




005	Grade of filtration	
A	0.01 µm	

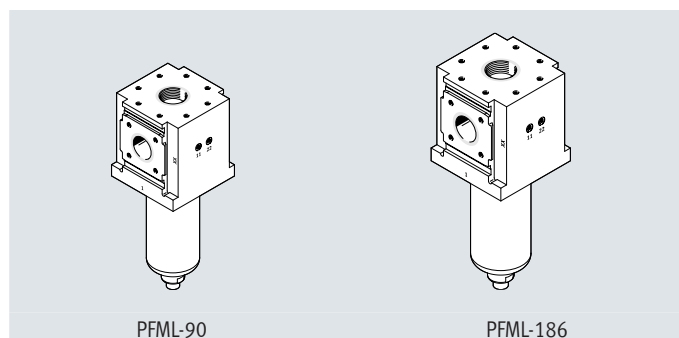
006	Bowl type	
ST	Steel	

Datasheet

Function
Manual condensate drain



-  - Flow rate
3406 ... 138233 l/min
-  - Temperature range
+5 ... +60°C
-  - Operating pressure
0 ... 50 bar



PFML-90

PFML-186

Micro filter with filter cartridges made from thermally fused microfibre borosilicate and stable polyester fibres. Direction of flow through the filter cartridges is from the inside to the outside.

Condensate drain via connecting thread G1/2 underneath the filter bowl, differential pressure sensing via two connecting threads G1/8 each on the front and the rear.

Alternative pneumatic connection 1 at the top of the housing via an internal thread.

On/off valves PVEL can be connected to the alternative connection 1 at the top of the micro filter via double nipples or directly using special connecting plates.

General technical data			
Size	90	186	
Type	PFML-90-HP3-AST	PFML-186-HP3-AST	PFML-186-HP3-H-AST
Design	Fibre filter		
Type of mounting	In-line installation		
Mounting position	Vertical ±5°		
Grade of filtration [µm]	0.01		
Filter efficiency [%]	99.99998		
Air purity class at the output	Compressed air to ISO 8573-1:2010 [1:4:2]		
Condensate drain	Manual		
Max. condensate volume [cm ³]	200		400
Volume	3		6.7

Operating and environmental conditions			
Size	90	186	
Type	PFML-90-HP3-AST	PFML-186-HP3-AST	PFML-186-HP3-H-AST
Operating pressure [bar]	0 ... 50		
Operating medium	Compressed air to ISO 8573-1:2010 [2:4:4] Inert gases		
Note on the operating/pilot medium	Lubricated operation not possible		
LABS (PWIS) conformity	VDMA24364 zone III		
Ambient temperature [°C]	+5 ... +60		
Temperature of medium [°C]	+5 ... +60		
Storage temperature [°C]	-10 ... +60		
Corrosion resistance class CRC ¹⁾	2 - Moderate corrosion stress		
CE marking (see declaration of conformity) ²⁾	To EU Pressure Equipment Directive		
UKCA marking (see declaration of conformity) ²⁾	UK regulations for pressure equipment		
Food-safe ²⁾	See supplementary material information		

1) More information www.festo.com/x/topic/crc

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/pfml → Support/Downloads.

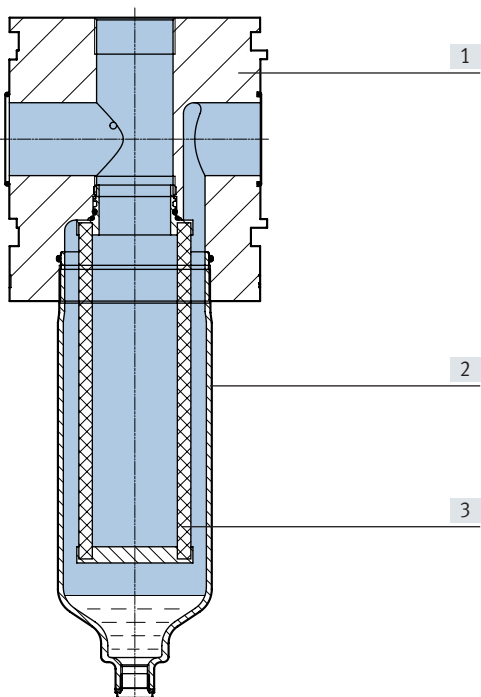
Datasheet

Standard flow rate q_n [l/min]		90		186	
Size		PFML-90-HP3-AST	PFML-186-HP3-AST	PFML-186-HP3-H-AST	
Max. standard flow rate $q_{n\ max}$ for air quality class	At $p_1 = 6$ bar	10220	10220	18980	
	At $p_1 = 20$ bar	30683	30683	56983	
	At $p_1 = 25$ bar	37916	37916	70416	
	At $p_1 = 30$ bar	45266	45266	84066	
	At $p_1 = 35$ bar	52500	52500	97500	
	At $p_1 = 40$ bar	59850	59850	111150	
	At $p_1 = 45$ bar	67083	67083	124583	
	At $p_1 = 50$ bar	74433	74433	138233	
Min. standard flow rate $q_{n\ min}$ for air quality class	At $p_1 = 6$ bar	3406	3406	6326	
	At $p_1 = 20$ bar	10227	10227	18994	
	At $p_1 = 25$ bar	12638	12638	23472	
	At $p_1 = 30$ bar	15088	15088	28022	
	At $p_1 = 35$ bar	17500	17500	32500	
	At $p_1 = 40$ bar	19950	19950	37050	
	At $p_1 = 45$ bar	22361	22361	41527	
	At $p_1 = 50$ bar	24811	24811	46077	

Weight [g]		90		186	
Size		PFML-90-HP3-AST	PFML-186-HP3-AST	PFML-186-HP3-H-AST	
Micro filter		7700	17900	21000	

Materials

Sectional view

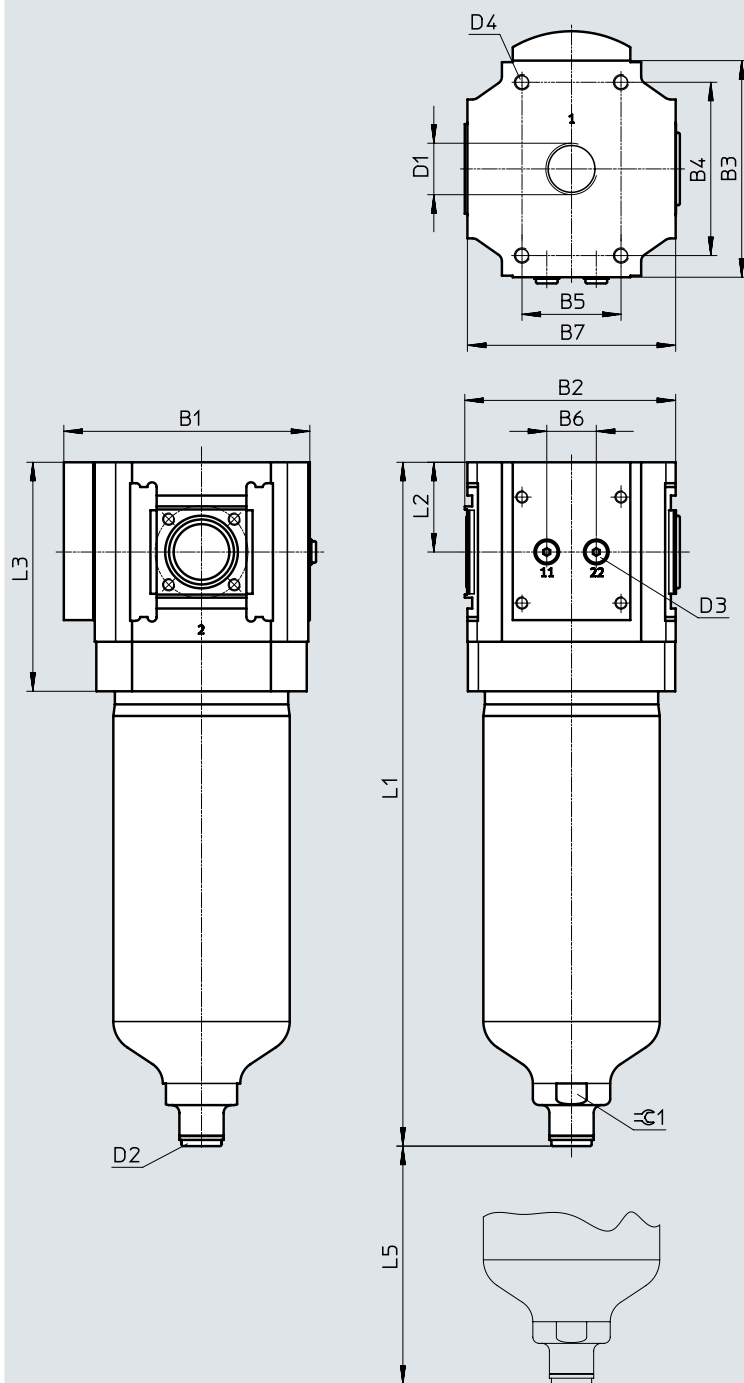


Micro filter		
[1]	Housing	Wrought aluminium alloy
[2]	Bowl	High-alloy stainless steel
[3]	Filter	Borosilicate fibre
-	Seals	NBR
Note on materials		RoHS-compliant

Datasheet

Dimensions – Size 90

Download CAD data → www.festo.com

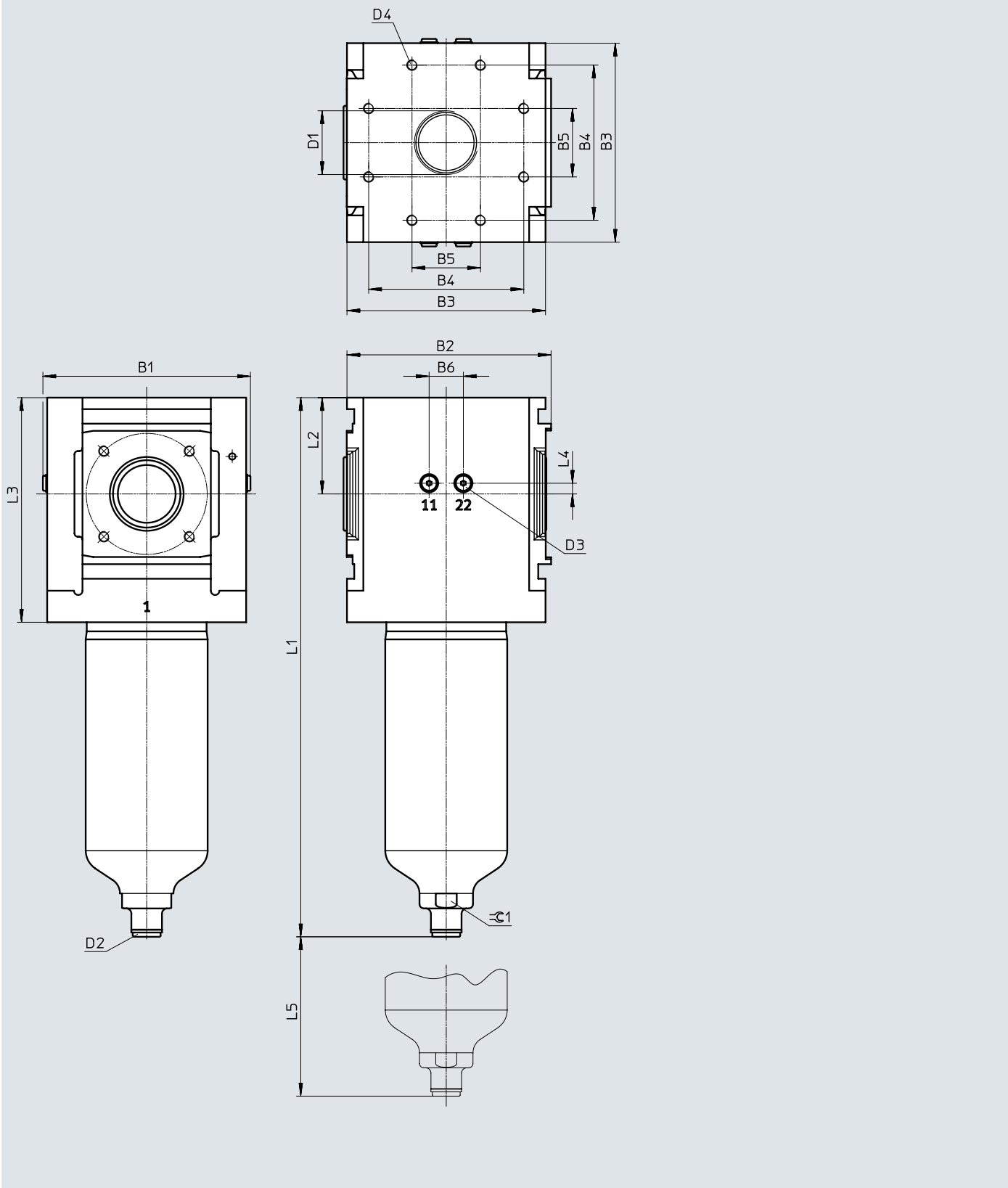


Type	B1	B2	B3	B4	B5	B6	B7	D1	D2	D3	D4	L1	L2	L3	L5 min.	≙ 1
PFML-90-HP3-AST	159	137	140	112	64	32	135	G1	G1/2	G1/8	M10	442	58	148	210	46

Datasheet

Dimensions – Size 186

Download CAD data → www.festo.com



Type	B1	B2	B3	B4	B5	B6	D1	D2	D3	D4	L1	L2	L3	L4	L5	±0.1
PFML-186-HP3-AST	194	191	186	145	64	32	G2	G1/2	G1/8	M10	504	90	210	10	210	46
PFML-186-HP3-H-AST											522		236		200	

Datasheet

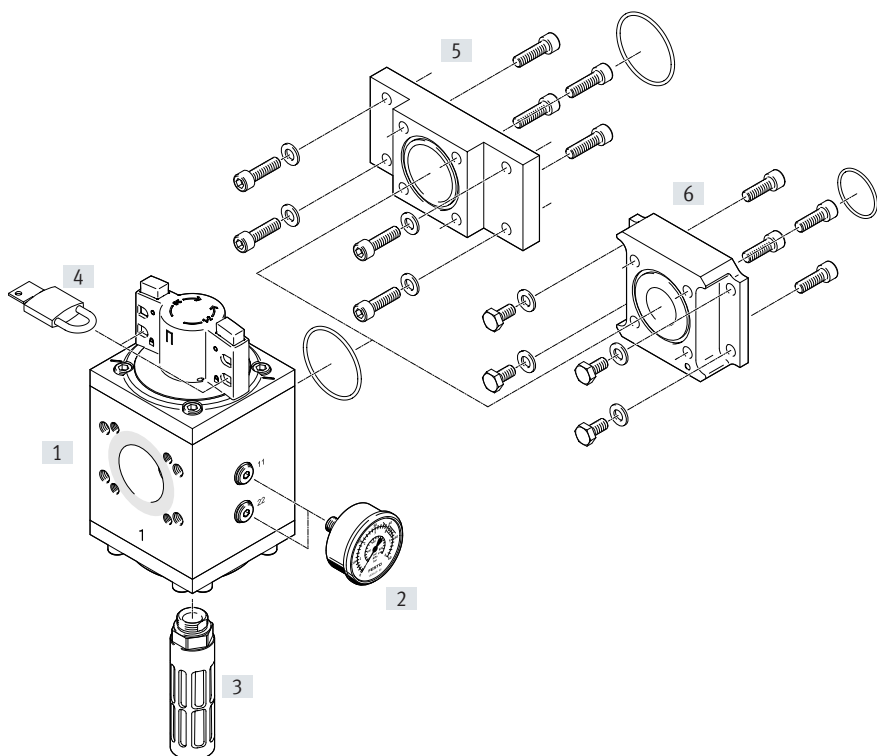
Ordering data				
Flow rate	Size 90		Size 186	
	Part no.	Type	Part no.	Type
Standard	1612487	PFML-90-HP3-AST	1364705	PFML-186-HP3-AST
High flow rate	-	-	1624062	PFML-186-HP3-H-AST

Ordering data – Accessories		
Flow rate	Part no.	Type
Filter cartridges		
Standard	1334716	PFEL-G2-A
High flow rate	1471578	PFEL-G212-H-A

Peripherals overview and type codes

Accessories

Size 124



Mounting attachments and accessories

		→ Page/Internet
[1]	On/off valve PVEL	27
[2]	Pressure gauge PAGL	43
[3]	Silencer U-1/2-B	45
[4]	Padlock (only for PVEL-H-124-HP3) LRVS-D	45
[5]	Connecting plate kit (for alternative connection at the top of the micro filter PFML-186) PAML-CP-186-HP3-E1	On request
[6]	Connecting plate module (for alternative connection at the top of the micro filter PFML-90) PAML-CP-90-HP3-E1	On request

Type codes

001	Series
PVEL	On/off valve, L series

002	Type of actuation
H	Manually actuated
P	Pneumatically actuated

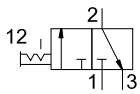
003	Size [mm]
124	124

004	Pressure application range
HP3	Up to 50 bar
HP7	Up to 42 bar

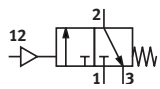
Datasheet

Function



PVEL-H, manually actuated



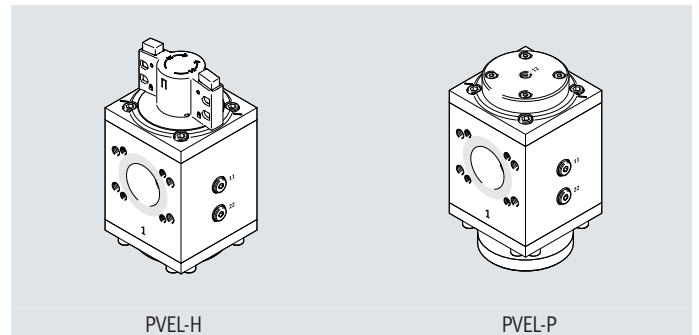
PVEL-P, pneumatically actuated



The PVEL-H has a detenting intermediate position which enables slow pressurisation (slow start) of the system. A mark on the top cover indicates the position of the rotary knob for the slow

-  - Temperature range
-10 ... +60°C
-  - Operating pressure
0 ... 50 bar

start. In the closed state, the PVEL-H can be locked using up to 4 padlocks. The PVEL-P is switched by an external pneumatic signal. The on/off valve PVEL-P does not have an internal slow-start function. A slow switch-on can be



PVEL-H

PVEL-P

achieved by throttling the pilot air build-up.

- Connection options for pressure gauge on the front and the rear, one each for the operating and output pressure
- Interface for SAE flange 2 1/2"

General technical data		
Type	PVEL-H	PVEL-P
Nominal width DN	54	
Pneumatic connection 3	G1/2	
Pilot air port 12	–	G1/4
Actuation type	Manual	Pneumatic
Design	Piston spool	
Type of mounting	In-line installation	
Mounting position	Any	
Actuator lock	Rotary knob with detent, can be locked using accessories	–
Valve function	3/2-way valve, bistable	3/2-way valve, closed, monostable
Exhaust air function	Cannot be throttled	
Reset method	Force-pilot operated	Mechanical spring
Type of control	Direct	
Pilot air supply	–	External
Sealing principle	Soft	

Operating and environmental conditions		
Type	PVEL-H	PVEL-P
Operating pressure	[MPa]	0 ... 5
	[bar]	0 ... 50
Pilot pressure	[bar]	9 ... 42
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]	
	Inert gases	
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)	
LABS (PWIS) conformity	VDMA24364 zone III	
Ambient temperature	[°C]	+5 ... +50
	[°F]	+41 ... +122
Temperature of medium	[°C]	+5 ... +50
Storage temperature	[°C]	–10 ... +60
Corrosion resistance class CRC ¹⁾	2 - Moderate corrosion stress	
CE marking (see declaration of conformity) ²⁾	To EU Pressure Equipment Directive	
UKCA marking (see declaration of conformity) ²⁾	UK regulations for pressure equipment	
Food-safe ²⁾	See supplementary material information	

1) More information www.festo.com/x/topic/crc

2) Additional information: www.festo.com/catalogue/pvel → Support/Downloads.

Note

Additional variants, e.g. for safety-oriented applications or with low pilot pressure, available on request.

Datasheet

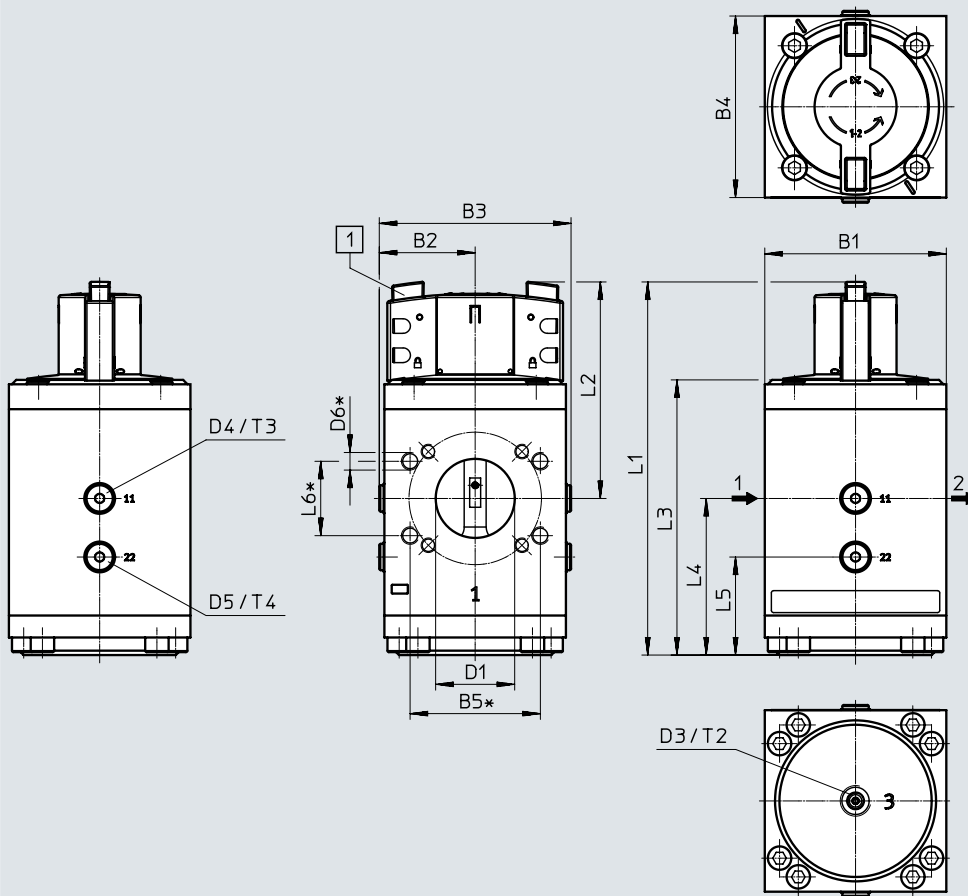
Weight [g]		
Type	PVEL-H	PVEL-P
On/off valve	5900	7250

Materials	
Housing	Wrought aluminium alloy
Piston spool	Wrought aluminium alloy
Rotary knob	POM
Seals	NBR
	PU
Note on materials	RoHS-compliant

Dimensions – Size 124

Download CAD data → www.festo.com

PVEL-H



[1] In switching position "Exhausting 3 → 2" up to 4 padlocks can be attached for the actuator lock 1. To do this, press the button(s) and attach the padlock(s).

* Interface for SAE flange 2 1/2"

→ Flow direction

Type	B1	B2	B3	B4	B5	D1 ∅	D3	D4	D5	D6
PVEL-H	124	65.5	131	124	88.9	54	G1/2	G1/4	G1/4	M12x18

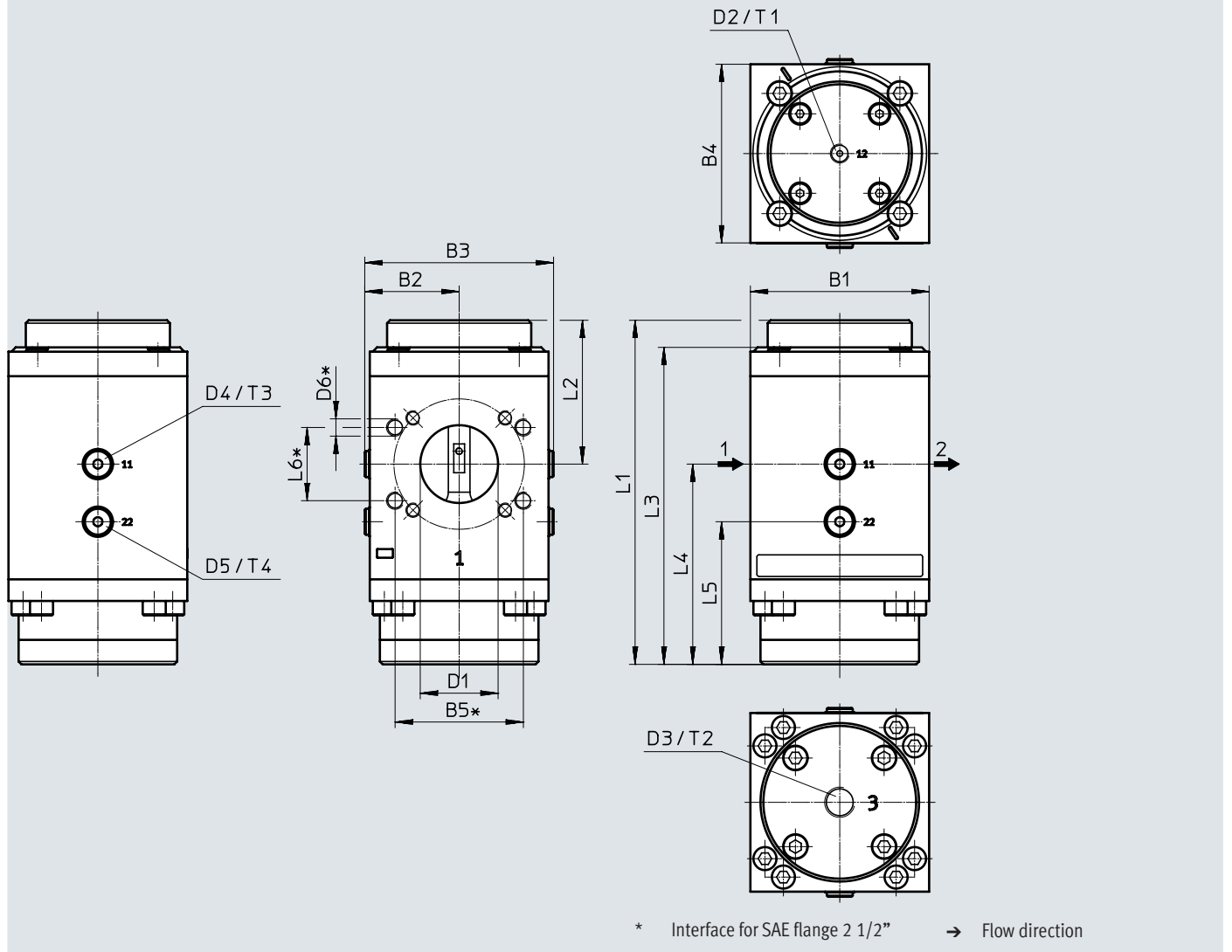
Type	L1	L2	L3	L4	L5	L6	T2	T3	T4
PVEL-H	~255	148	188	107	67	50.8	14	12	12

Datasheet

Dimensions – Size 124

Download CAD data → www.festo.com

PVEL-P



Type	B1	B2	B3	B4	B5*	D1 ∅	D2	D3	D4	D5	D6*
PVEL-P	124	65.5	131	124	88.9	54	G1/4	G1/2	G1/4	G1/4	M12x18

Type	L1	L2	L3	L4	L5	L6	T1	T2	T3	T4
PVEL-P	~250	100	231	150	110	50,8	12	17	12	12

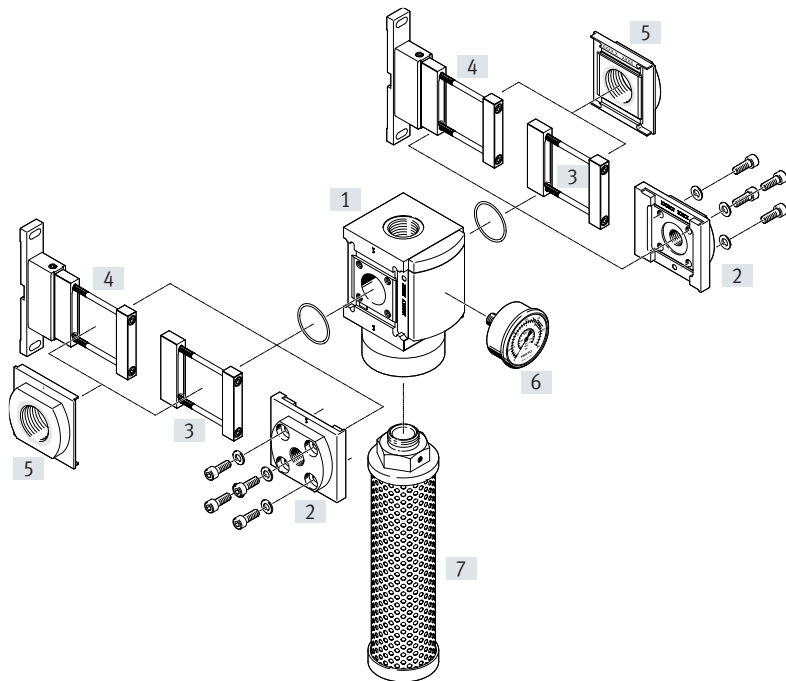
Ordering data

Actuation type	Part no.	Type
Manual	1629207	PVEL-H-124-HP3
Pneumatic	1629205	PVEL-P-124-HP7

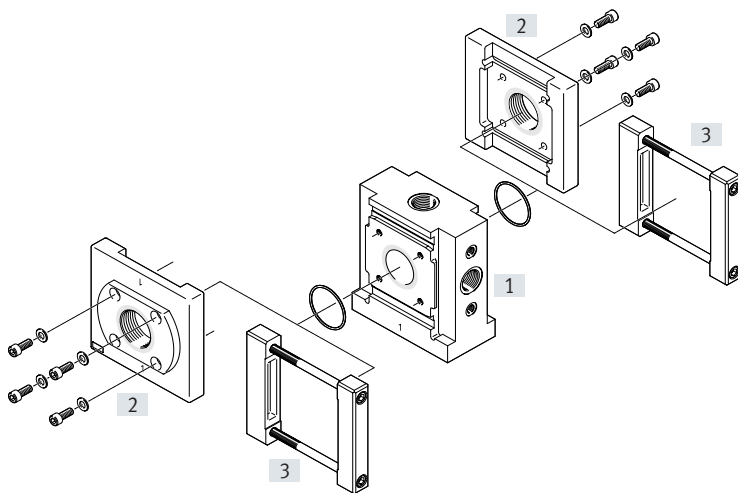
Peripherals overview

Accessories

Size 90



Size 186



Mounting attachments and accessories

		→ Page/Internet
[1]	Branching modules PMBL	32
[2]	Connecting plate PAML-CP	36
[3]	Module connector PAML-MK	39
[4]	Mounting bracket PAML-MB	41
[5]	Connecting plate PAML-CP-...-G114	36
[6]	Pressure gauge PAGL	43
[7]	Silencer (only for PMBL-90-HP3-E) U-G1-HD-SA	On request

Type codes

001	Series
PMBL	Branching module

002	Size
90	90 mm
186	186 mm

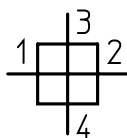
003	Pressure application range
HP3	Up to 50 bar

004	Additional function
	None
E	Pneumatically actuated exhaust

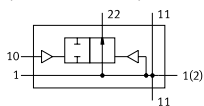
005	Width
	Standard
H	Half width



Datasheet

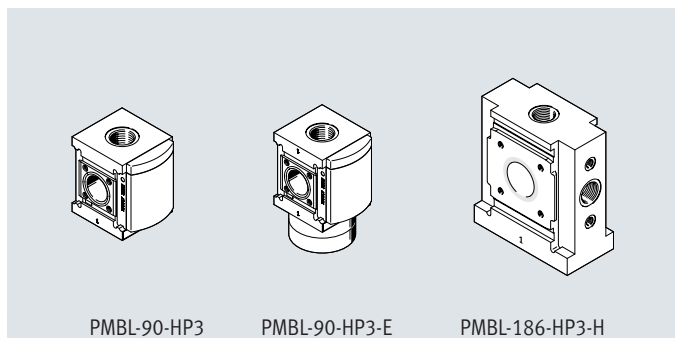
Function
Standard



With exhaust function
(PFML-90-HP3-E)



-  - Temperature range
+5 ... +60°C
-  - Operating pressure
0 ... 50 bar



PMBL-90-HP3

PMBL-90-HP3-E

PMBL-186-HP3-H

- Compressed air distributor with various connections
- Can be used as an intermediate distributor for varying compressed air qualities
- Support for auxiliary modules

Outlets PMBL-90-HP3

- Female thread G1 at top and bottom
- Female thread G1/4 at the rear and front (rear cover plate), sealed with blanking plug

Outlets PMBL-90-HP3-E

- Female thread G1 at top, rear and bottom (exhaust port)
- Female thread G1/4 at the front (rear cover plate), sealed with blanking plug

Outlets PMBL-186-HP3-H

- Female thread G1 at top, bottom and front
- Female thread G1/4 at front (2x) and rear

General technical data			
Size	90		186
Type	PMBL-90-HP3	PMBL-90-HP3-E	PMBL-186-HP3-H
Nominal width DN	36	36	54
Pneumatic connection 3, 4	G1	–	G1
Pneumatic connection 11	–	G1	–
Pilot air port, exhaust function 10	–	G1/4	–
Silencer connection, exhaust function 22	–	G1	–
Design	Branching module	Branching module with exhaust function via integrated 2/2-way valve.	Branching module
Type of mounting	In-line installation		
Mounting position	Any		

Operating and environmental conditions			
Size	90		186
Type	PMBL-90-HP3	PMBL-90-HP3-E	PMBL-186-HP3-H
Operating pressure [bar]	0 ... 50		
Pilot pressure [bar]	–	0 ... 50	–
Operating medium	Compressed air to ISO 8573-1:2010 [–:–:–]	Compressed air to ISO 8573-1:2010 [7:4:4]	Compressed air to ISO 8573-1:2010 [–:–:–]
Note on the operating/pilot medium	Lubricated operation not possible		
LABS (PWIS) conformity	VDMA24364 zone III		
Ambient temperature [°C]	+5 ... +60		
Temperature of medium [°C]	+5 ... +60		
Storage temperature [°C]	–10 ... +60		
Corrosion resistance class CRC ¹⁾	2 - Moderate corrosion stress		
CE marking (see declaration of conformity) ²⁾	To EU Pressure Equipment Directive		
UKCA marking (see declaration of conformity) ²⁾	UK regulations for pressure equipment		
Food-safe ²⁾	See supplementary material information		

1) More information www.festo.com/x/topic/crc

2) Additional information: www.festo.com/catalogue/pmbL → Support/Downloads.

Datasheet

Characteristic flow rate values			
Size	90		186
Type	PMBL-90-HP3	PMBL-90-HP3-E	PMBL-186-HP3-H
Standard nominal flow rate $q_{nN^{(1)}}$ [l/min]			
In main flow direction 1 → 2	49000	49000	117240
In exhaust direction 2 → 3	–	13000	–

 1) Measured at $p_1 = 6$ bar and $p_2 = 5$ bar, $\Delta p = 1$ bar

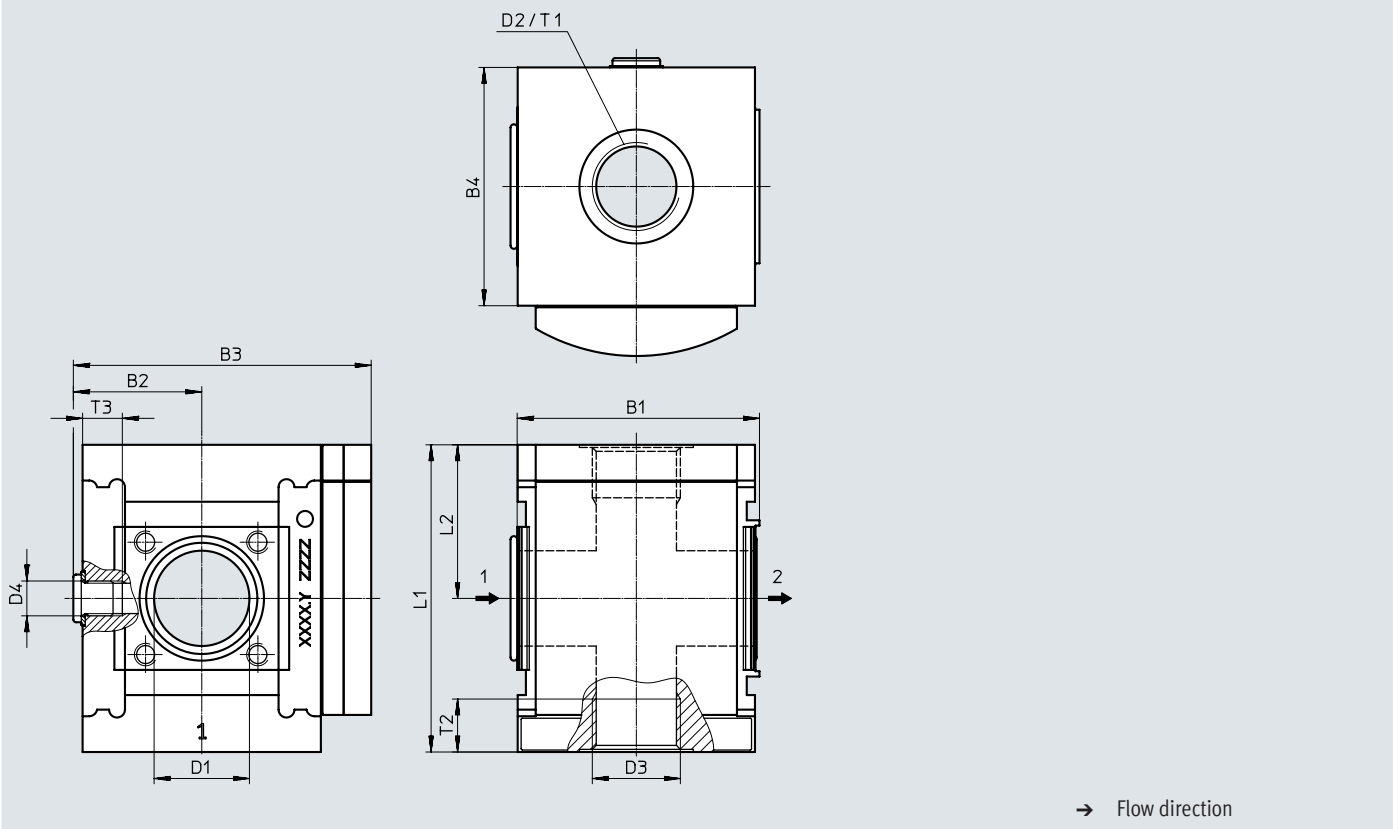
Weight [g]			
Size	90		186
Type	PMBL-90-HP3	PMBL-90-HP3-E	PMBL-186-HP3-H
Branching module	2000	2600	7500

Materials			
Size	90		186
Type	PMBL-90-HP3	PMBL-90-HP3-E	PMBL-186-HP3-H
Housing	Wrought aluminium alloy		
Seals	NBR		
	–	PU	–
Note on materials	RoHS-compliant		

Dimensions – Size 90

 Download CAD data → www.festo.com

PMBL-90-HP3



Type	B1	B2	B3	B4	D1 ∅	D2	D3	D4	L1	L2	T1	T2	T3
PMBL-90-HP3	~92	~49	~113	90	36	G1	G1	G1/4	116	58	20	20	15

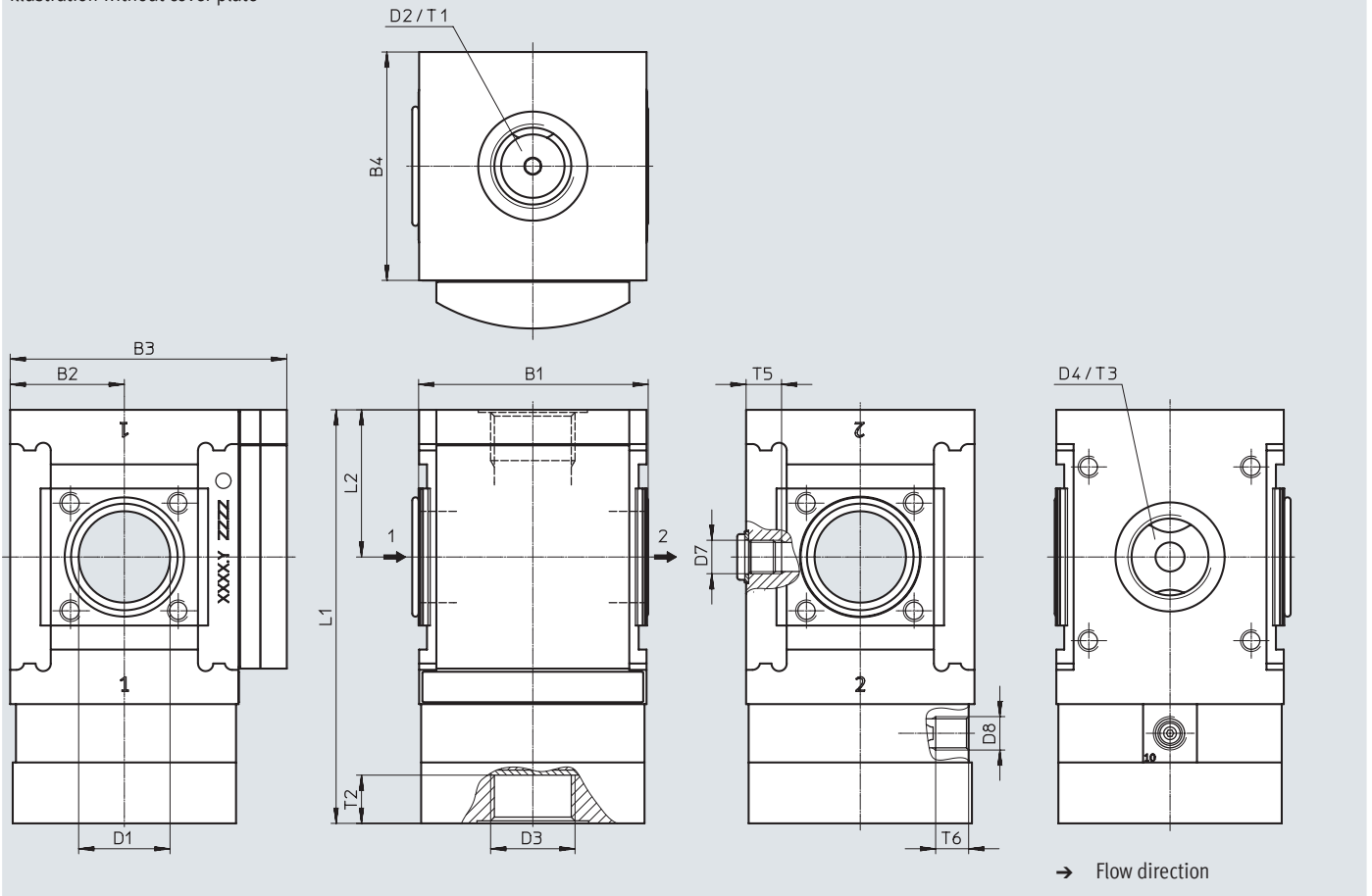
Datasheet

Dimensions – Size 90

Download CAD data → www.festo.com

PMBL-90-HP3-E

Illustration without cover plate



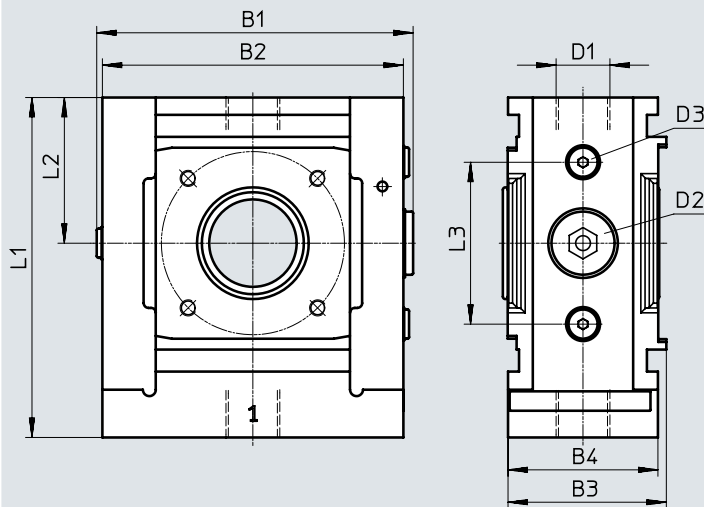
Type	B1	B2	B3	B4	D1	D2	D3	D4	D7	D8	L1	L2	T1	T2	T3	T5	T6
PMBL-90-HP3-E	90	45	109	90	36	G1	G1	G1	G1/4	G1/4	163	58	20	19	20	14	13

Datasheet

Dimensions – Size 186

Download CAD data → www.festo.com

PMBL-186-HP3-H



Type	B1	B2	B3	B4	D1	D2	D3	L1	L2	L3
PMBL-186-HP3-H	196	186	98	93	G1	G1	G1/4	210	90	100



Ordering data

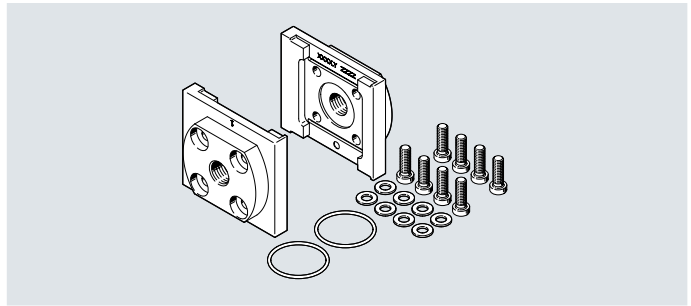
Function	Size 90		Size 186	
	Part no.	Type	Part no.	Type
Standard	1401366	PMBL-90-HP3	1609073	PMBL-186-HP3-H
With exhaust function	2663892	PMBL-90-HP3-E	-	-

Accessories

Connecting plate PAML-CP

With internal thread for connecting fittings/pipes

-  - Temperature range
+5 ... +60°C
-  - Operating pressure
0 ... 50 bar



General technical data

Size	90					186				
Nominal width DN	36					54				
Pneumatic connection 1, 2	G1/4	G1/2	G3/4	G1	G1 1/4	G1/4	G1 1/4	G1 1/2	G2	G2 1/2

Operating and environmental conditions

Operating pressure	[MPa]	0 ... 5
	[bar]	0 ... 50
	[psi]	0 ... 725
Operating medium	Compressed air to ISO 8573-1:2010 [---:--]	
LABS (PWIS) conformity	VDMA24364-B2-L	
Ambient temperature	[°C]	+5 ... +60
Temperature of medium	[°C]	+5 ... +60
Storage temperature	[°C]	-10 ... +60
Corrosion resistance class CRC ¹⁾	2 - Moderate corrosion stress	
Food-safe ²⁾	See supplementary material information	

1) More information www.festo.com/x/topic/crc

2) Additional information: www.festo.com/catalogue/paml → Support/Downloads.

Materials

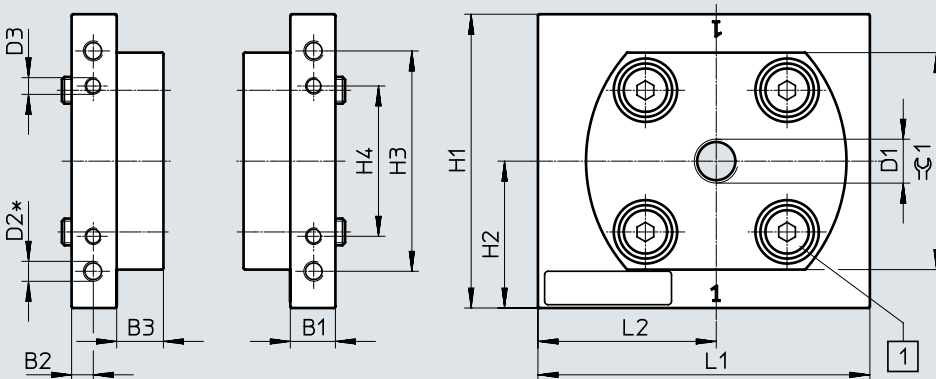
Connecting plate	Wrought aluminium alloy
Screws	Stainless steel
Seals	NBR
Note on materials	RoHS-compliant

Accessories

Dimensions – Size 90

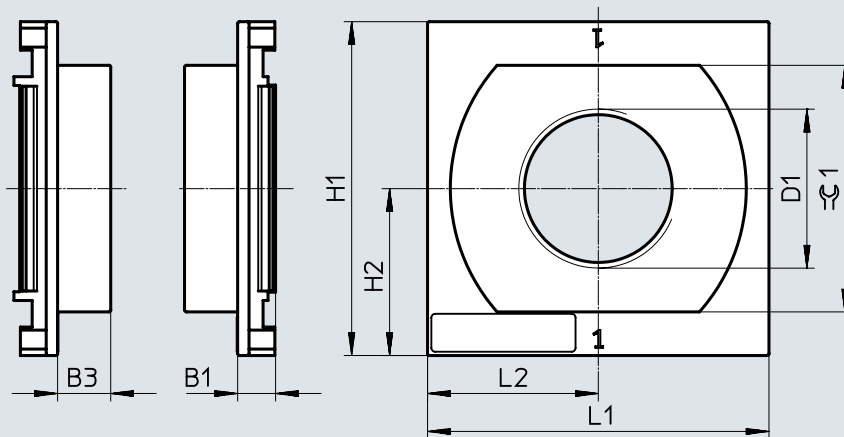
Download CAD data → www.festo.com


PAML-CP-90-HP3-G14/G12/G34/G1



[1] Socket head screw M8x25

PAML-CP-90-HP3-G114



 **Note**

A module connector PAML-MK-90-HP3 or a mounting bracket PAML-MB-90-HP3 is required for mounting.

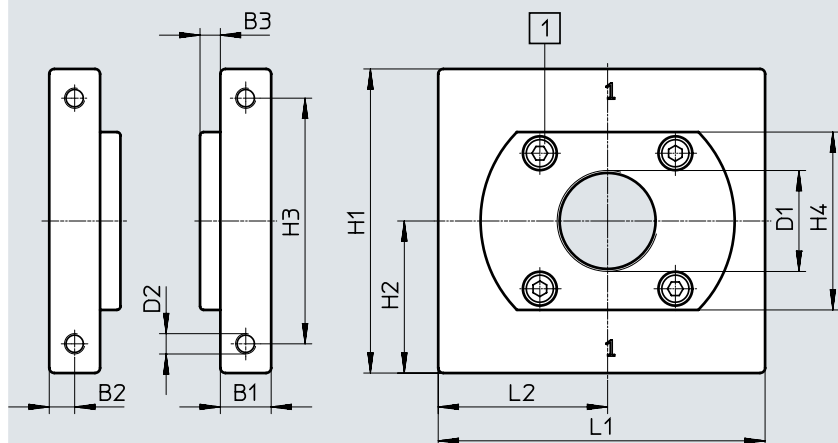
Type	B1	B2	B3	D1	D2 ¹⁾	D3	H1	H2	H3	H4	L1	L2	≈± 1
PAML-CP-90-HP3-G14	13.5	6.5	14	G1/4	M6x10	M5x9	88	44	66	45	-99	-53	65
PAML-CP-90-HP3-G12				G1/2									
PAML-CP-90-HP3-G34				G3/4									
PAML-CP-90-HP3-G1				G1									
PAML-CP-90-HP3-G114	10	-	-	G1 1/4	-	-	-	-	-	-	90	45	-

1) Thread for mounting the service unit on a wall without mounting bracket

Accessories

Dimensions – Size 186

Download CAD data → www.festo.com



[1] Socket head screw M10x30



Type	B1	B2	B3	D1	D2	H1	H2	H3	H4	L1	L2
PAML-CP-186-HP3-G14	30	15	12	G1/4	M12	180	90	145	105	193	100
PAML-CP-186-HP3-G114				G1 1/4							
PAML-CP-186-HP3-G112				G1 1/2							
PAML-CP-186-HP3-G2				G2							
PAML-CP-186-HP3-G212			25	G2 1/2							

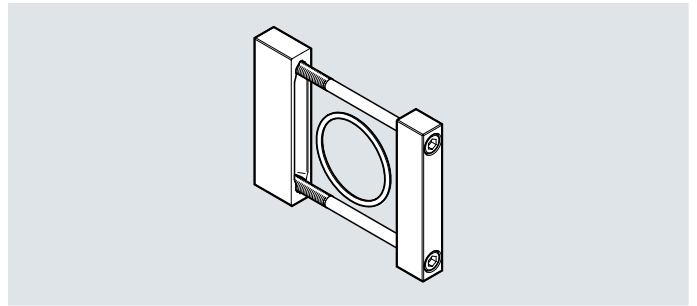
Ordering data				
Size	Pneumatic connection	Weight [g]	Part no.	Type
90	G1/4	800	1651540	PAML-CP-90-HP3-G14
	G1/2	770	1651541	PAML-CP-90-HP3-G12
	G3/4	750	1651542	PAML-CP-90-HP3-G34
	G1	730	1651543	PAML-CP-90-HP3-G1
	G1 1/4	500	1448978	PAML-CP-90-HP3-G114
186	G1/4	4700	1629300	PAML-CP-186-HP3-G14
	G1 1/4	4600	1629296	PAML-CP-186-HP3-G114
	G1 1/2	4500	1629297	PAML-CP-186-HP3-G112
	G2	4400	1629298	PAML-CP-186-HP3-G2
	G2 1/2	4900	1629299	PAML-CP-186-HP3-G212

Accessories

Module connector PAML-MK

For connecting individual service unit components to form service units

-  - Temperature range
+5 ... +60°C
-  - Operating pressure
0 ... 50 bar



General technical data		
Size	90	186
Nominal width DN	36	54

Operating and environmental conditions		
Operating pressure	[MPa]	0 ... 5
	[bar]	0 ... 50
	[psi]	0 ... 725
Operating medium	Compressed air to ISO 8573-1:2010 [---:--]	
LABS (PWIS) conformity	VDMA24364-B2-L	
Ambient temperature	[°C]	+5 ... +60
Temperature of medium	[°C]	+5 ... +60
Storage temperature	[°C]	-10 ... +60
Corrosion resistance class CRC ¹⁾	2 - Moderate corrosion stress	
Food-safe ²⁾	See supplementary material information	

1) More information www.festo.com/x/topic/crc

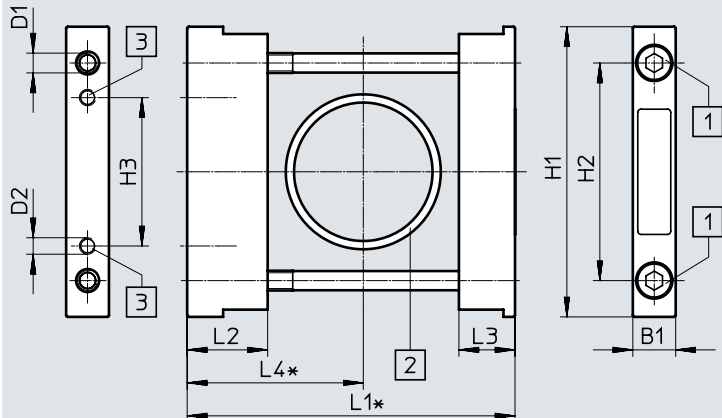
2) Additional information: www.festo.com/catalogue/paml → Support/Downloads.

Materials	
Module connector	Wrought aluminium alloy
Screws	Stainless steel
Seals	NBR
Note on materials	RoHS-compliant

Accessories

Dimensions – Size 90

Download CAD data → www.festo.com



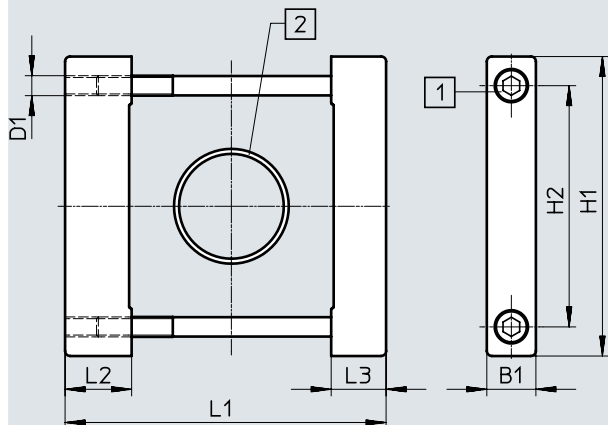
- [1] Socket head screw M6x85
- [2] O-ring 42x2.5
- [3] Thread for mounting the service unit component on a wall

Type	B1	D1	D2	H1	H2	H3	L1 ¹⁾	L2	L3	L4 ¹⁾
PAML-MK-90-HP3	13	M6	M5x9	88	66	45	99	24.4	17	~53

1) Dimension in mounted state

Dimensions – Size 186

Download CAD data → www.festo.com



- [1] Socket head screw M12x160
- [2] O-ring 63x3

Type	B1	D1	H1	H2	L1 ¹⁾	L2	L3
PAML-MK-186-HP3	29.5	M12	180	145	193	40	33

1) Dimension in mounted state

Ordering data



Size	Weight [g]	Part no.	Type
90	150	1367005	PAML-MK-90-HP3
186	1300	1629377	PAML-MK-186-HP3

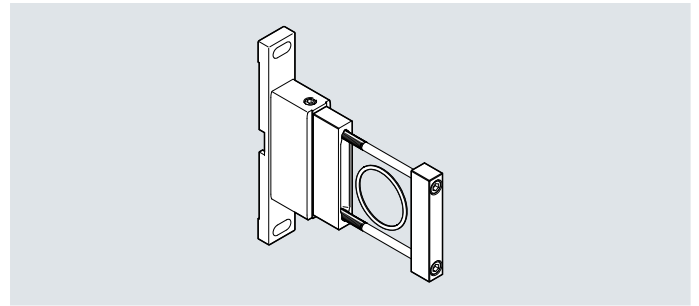
Accessories

Mounting bracket PAML-MB

For mounting service units on a wall and for connecting individual service unit components to form service units

- Fast hooking and unhooking

-  - Temperature range
+5 ... +60°C
-  - Operating pressure
0 ... 50 bar



General technical data	
Size	90
Nominal width DN	36

Operating and environmental conditions		
Operating pressure	[MPa]	0 ... 5
	[bar]	0 ... 50
	[psi]	0 ... 725
Operating medium	Compressed air to ISO 8573-1:2010 [---:--]	
LABS (PWIS) conformity	VDMA24364-B2-L	
Ambient temperature	[°C]	+5 ... +60
Temperature of medium	[°C]	+5 ... +60
Storage temperature	[°C]	-10 ... +60
Corrosion resistance class CRC ¹⁾	2 - Moderate corrosion stress	
Food-safe ²⁾	See supplementary material information	

1) More information www.festo.com/x/topic/crc

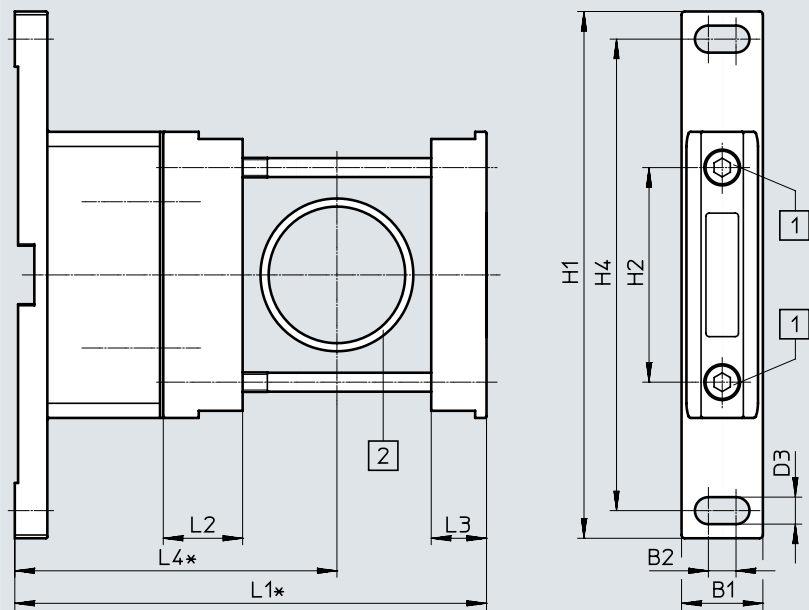
2) Additional information: www.festo.com/catalogue/paml → Support/Downloads.

Materials	
Bracket	Wrought aluminium alloy
Module connector	Wrought aluminium alloy
Screws	Stainless steel
Seals	NBR
Note on materials	RoHS-compliant

Accessories

Dimensions – Size 90

Download CAD data → www.festo.com



- [1] Socket head screw M5x18
- [2] O-ring 42x2.5

Type	B1	B2	D3	H1	H2	H4	L1 ¹⁾	L2	L3	L4 ¹⁾
PAML-MB-90-HP3	25	8.5	8.3	162	66	145	~145	24.4	17	~99

1) Dimension in mounted state



Ordering data

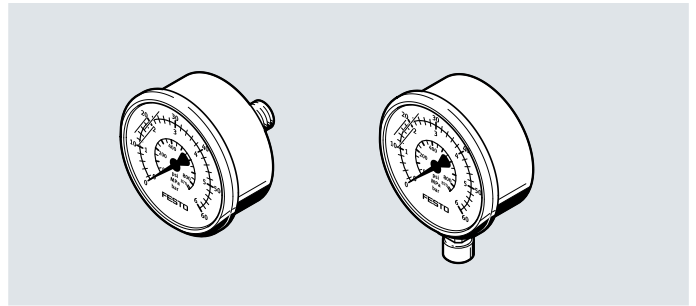
Size	Weight [g]	Part no.	Type
90	300	1367323	PAML-MB-90-HP3

Accessories

Pressure gauge PAGL



-  - Temperature range
0 ... +60°C
-  - Operating pressure
0 ... 60 bar



Technical data	
Nominal size	63
Pneumatic connection	G1/4
Operating medium	Inert gases Neutral fluids
Note on the operating/ pilot medium	No oxygen No acetylene
Design	Bourdon tube pressure gauge
Conforms to standard	EN 837-1
Type of mounting	In-line installation
Connection position	Centred, rear Radial, underneath
Ambient temperature [°C]	0 ... +60
Temperature of medium [°C]	0 ... +60
Storage temperature [°C]	-40 ... +70
Measurement accuracy class	1.6
Continuous load factor	0.75
Intermittent load factor	0.66
Degree of protection	IP65
Weight [g]	80

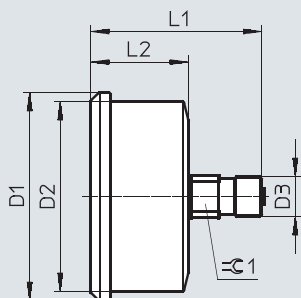
Materials	
Nominal size	63
Pneumatic connection	G1/4
Housing	Steel (colour: silver)
Inspection window	PS
Screwed trunnion/ materials in contact with the media	Brass
Note on materials	RoHS-compliant

Accessories

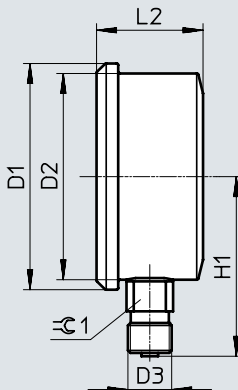
Dimensions

Download CAD data → www.festo.com

PAGL-HP3-63-60-G14



PAGL-HP3-63-60-G14-RC

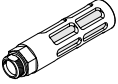


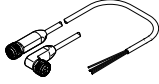
Type	D1	D2	D3	H1	L1	L2	⊖ 1
PAGL-HP3-63-60-G14	∅ 68	∅ 62	G1/4	±0.5	±0.5	±0.5	14
PAGL-HP3-63-60-G14-RC				54	-	32	

Ordering data

Nominal size	Pneumatic connection	Operating pressure	Display range		Connection position	Part no.	Type
			Outer scale	Inner scale			
63	G1/4	0 ... 60 bar	0 ... 60 bar and 0 ... 6 MPa	0 ... 870 psi	Centred, rear	1166938	PAGL-HP3-63-60-G14
					Radial, underneath	1908519	PAGL-HP3-63-60-G14-RC

Accessories

Ordering data – Silencer U			Datasheets → Internet: u	
	Description	Pneumatic connection	Part no.	Type
	For PREL-90	G3/8	6843	U-3/8-B
	For PREL-186	G1/2	6844	U-1/2-B
	For PVEL	G1	151990	U-1-B

Ordering data – Connecting cable NEBA-M12				Datasheets → Internet: neba	
	Electrical connection	Number of wires	Cable length [m]	Part no.	Type
	M12x1, straight socket	5	2.5	8078242	NEBA-M12G5-U-2.5-N-LE5
			5	8078243	NEBA-M12G5-U-5-N-LE5
			10	8078244	NEBA-M12G5-U-10-N-LE5
	M12x1, angled socket	5	2.5	8078251	NEBA-M12W5-U-2.5-N-LE5
			5	8078252	NEBA-M12W5-U-5-N-LE5

Ordering data – Padlock LRV5-D		Part no.	Type
	Weight [g]		
	120	193786	LRV5-D