

Sample conditioning equipment

4



4/2	Filters
4/2	Room air filter
4/2	Front mounting filter
4/3	Coalescence filter
4/4	Universal filter and moisture sensor
4/6	Stainless steel filter housing
4/7	Condensation removal
4/7	Condensation tank
4/7	Preliminary condensation trap
4/8	Hose pump for condensation removal
4/9	Gas coolers
4/9	Compressor gas coolers
4/11	Valves
4/11	Needle valve
4/12	Low-pressure overflow valve
4/12	Check valves
4/13	Shut-off ball valve for low temperatures
4/13	Shut-off ball valve for high temperatures
4/14	Multiway ball valves made of stainless steel
4/15	Control assemblies for shut-off ball valves
4/15	Shut-off and multiway ball valves made of PVDF
4/16	Solenoid valves
4/16	2/2-way solenoid valve made of PVDF
4/16	2/2-way solenoid valve, explosion-proof, made of PVDF
4/17	2/2-way solenoid valve made of stainless steel
4/17	2/2-way solenoid valve, explosion-proof, made of stainless steel
4/18	3/2-way solenoid valve as mixing valve made of PVDF
4/18	3/2-way solenoid valve, explosion-proof, as mixing valve made of PTFE
4/19	3/2-way solenoid valve as mixing valve made of stainless steel, for highly corrosive, dry gases
4/19	3/2-way solenoid valve, explosion-proof, as mixing or distribution valve made of stainless steel
4/20	Appliance socket DIN 43 650 form A, with LED and varistor

4/21	Flowmeters
4/21	All-metal flowmeter
4/22	Glass flowmeter
4/22	PVDF flowmeter for highly corrosive gases
4/23	Isolating switching amplifier
4/24	Pressure reducers
4/24	Single-stage pressure reducer for reference gas of OXYMAT gas analyzers
4/24	Single-stage pressure reducer for installation in pipes
4/25	Two-stage pressure reducer for calibration gas cylinders
4/26	Gases
4/26	Calibration gases
4/27	Pure gases
4/28	Reference gas monitoring for OXYMAT gas analyzers
4/29	NO2-NO converter
4/31	Fittings
4/31	Fittings made of PVDF
4/32	Fittings made of stainless steel



Sample conditioning equipment

Filters

Room air filter

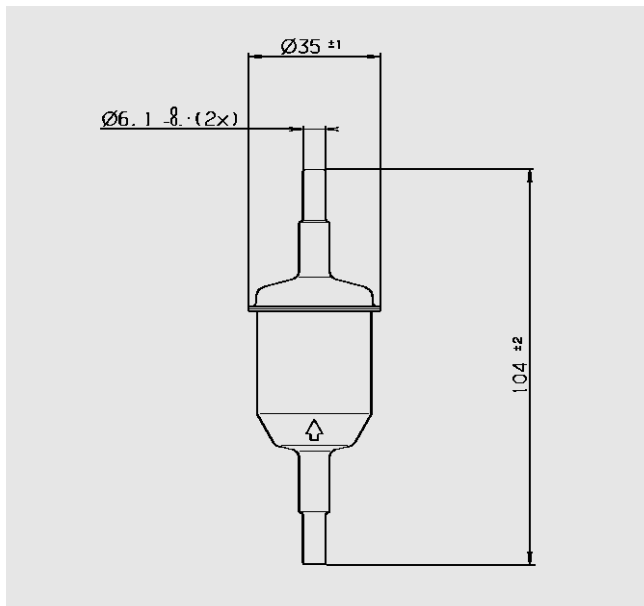


Fig. 4/1 Room air filter

Application

The room air filter filters the ambient air and removed particles contained in the ambient air down to a grain size of approx. 20 μm .

Technical data

Filter element	Paper, 20 μm (non-replaceable)
Material (housing)	Polyamide (natural colors)
Max. permissible operating temperature	100 °C
Connection	Pipe sockets, 6 mm diameter

Ordering data

Order No.

Room air filter

C79127-Z400-A1

Front mounting filter

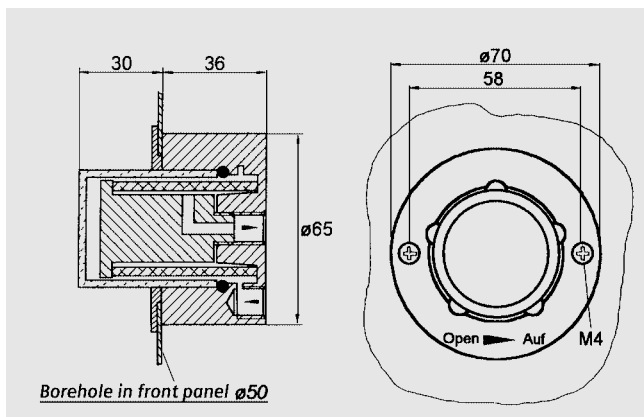


Fig. 4/2 Front mounting filter

Technical data

Filter mesh (pore size)	0.1 μm
Filter surface	50 cm^2
Operating pressure	Max. 4 bar
Max. permissible ambient temperature	80 °C
Max. permissible sample gas temperature	80 °C
Dead volume	30 ml
Sample gas connections	G $1/8$
Type of mounting	Front panel mounting
Material of parts in contact with sample gas	PVDF, glass, Viton
Weight	280 g

Application

For mounting in panels or cabinets.

Ordering data

Order No.

Front mounting filter
with glass-fiber filter element
0.1 μm

7MB1 943-2CA30

Consumables

Glass-fiber filter element 0.1 μm

7MB1 943-2CA32

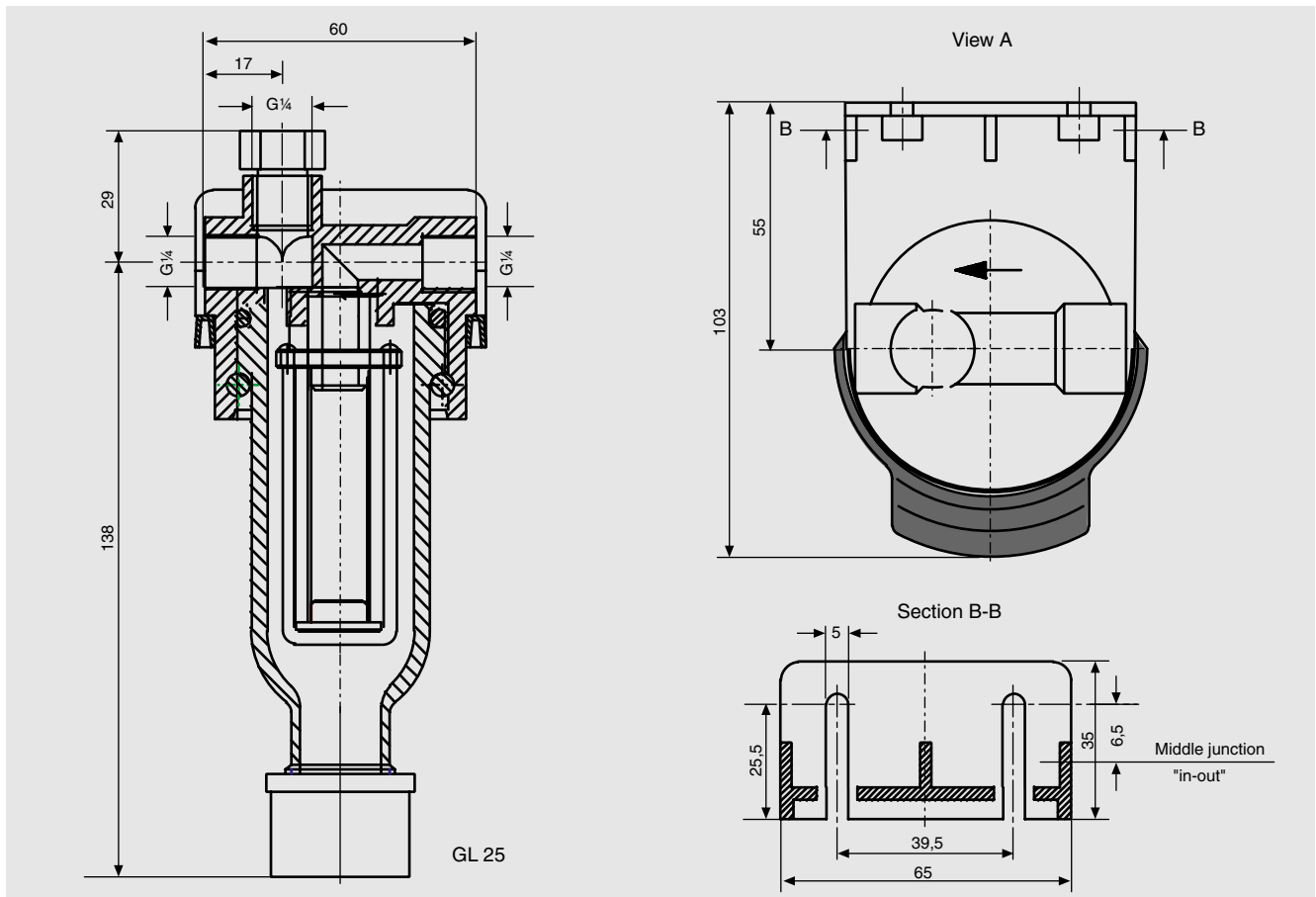


Fig. 4/3 Coalescence filter

Application

For mounting in sample conditioning systems.

Design

To remove aerosols (liquid droplets) from the gas flow.

The collected condensation is removed in the case of pressurized systems via automatic drain valves, or via hose pumps in the case of systems at vacuum.

The coalescence filter comprises

- filter head (PVDF),
- filter bell (Duran glass) and
- sealing material (Viton).

Technical data

Gas connections	Inlet and outlet 2 x G $\frac{1}{4}$ on the side, female thread
Sample gas pressure	Max. 4 bar
Filter surface	28 cm 2
Dead volume	73 ml
Type of mounting	Wall mounting
Operating temperature	Max. 80 °C
Weight	Approx. 0.25 kg

Ordering data

Coalescence filter
with filter element made of borosilicate fiber

Accessories

Filter element
made of borosilicate fiber (1 unit)

Order No.

7MB1 943-2AC12

7MB1 943-2AC13

Sample conditioning equipment

Filters

Universal filter and moisture sensor

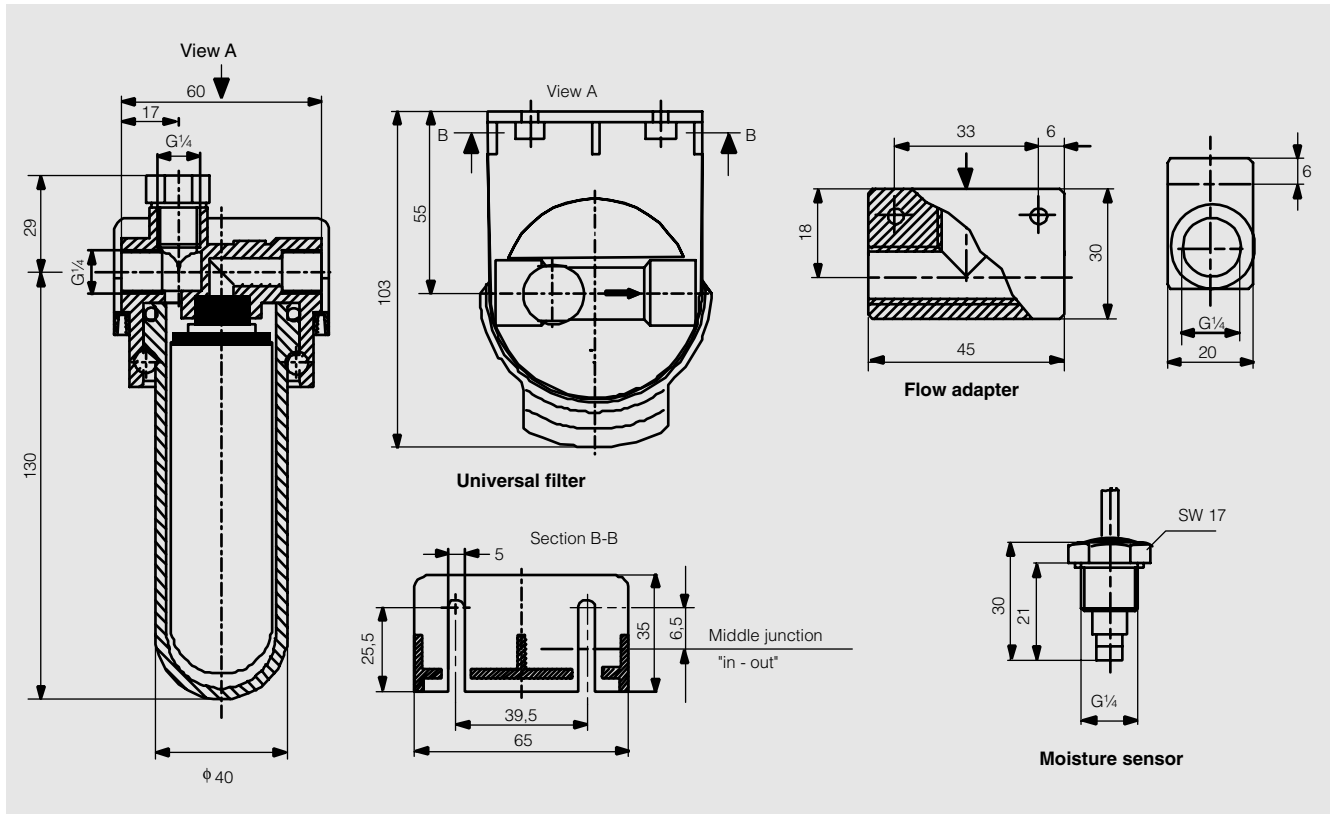


Fig. 4/4 Universal filter and moisture sensor

Application

For mounting in sample conditioning systems.

Design

The universal filter with quick-release fastener has a filter mesh of 2 μm . The quick-release fastener means that the PTFE or glass-fiber filter element can be easily changed. Dry dusts are filtered out reliably, and a moisture sensor can be installed on request. The filter element can be easily checked through the transparent housing.

Moist sample gas may damage the analyzer. The moisture sensor detects humidity and outputs a signal. The moisture sensor is a conductivity meter; moist gas with mist conducts electrical current better than dry gas.

The moisture sensor is connected to a wiring module which has 2 relay outputs. These relays can switch off the sample gas pump and trigger an alarm signal. Once the sample gas has passed the moisture sensor, it first flows through the filter housing before reaching the analyzer. This buffer provides additional safety if the sensor detects moisture.

Sample conditioning equipment

Filters

Universal filter and moisture sensor

Technical data		Ordering data	Order No.
Filter		Universal filter	
Gas connections	Inlet and outlet, 2 x G $\frac{1}{4}$ on the side, female thread	<ul style="list-style-type: none"> Filter element made of glass-fiber, pore size 2 μm Filter element made of Teflon, pore size 2 μm 	7MB1 943-2AC00 7MB1 943-2AC01
Sample gas pressure	Max. 4 bar	Moisture sensor	7MB1 943-2AC02
Filter surface		Cable length 4 m, connection G $\frac{1}{4}$	
- Glass-fiber	80 cm 2	Connection unit	
- Teflon	60 cm 2	For max. 2 moisture sensors, power supply 115/230 V AC, 50/60 Hz, switchable	
Dead volume	57 ml	<ul style="list-style-type: none"> Wall mounting DIN rail mounting 	7MB1 943-2AC04 7MB1 943-2AC05
Type of mounting	Wall mounting	Flow adapter	7MB1 943-2AC06
Operating temperature	Max. 100 °C	Made of PVDF for moisture sensor, for installation in sample gas line	
Materials		<u>Accessories and consumables</u>	
• Filter head	PVDF	Filter element (5 units)	
• Housing	Duran glass	<ul style="list-style-type: none"> Glass-fiber, pore size 2 μm, fits 7MB1 943-2AC00 Teflon, pore size 2 μm, fits 7MB1 943-2AC01 (filter elements cannot be combined) 	7MB1 943-2AC10 7MB1 943-2AC11
• Gasket	Viton		
Weight	Approx. 0.30 kg		
Moisture sensor			
Max. permissible operating temperature	80 °C		
Max. permissible operating pressure	4 bar		
Cable length (moisture sensor)	4 m		
Materials	PVDF, stainless steel, epoxy resin		
Weight	Approx. 0.1 kg		
Connection unit			
	Wall mounting	DIN rail mounting	
Degree of protection to EN 60 529			
• Unit	IP65	IP40	
• Terminal strip	IP20	IP20	
Operating temperature	-20 ... +60 °C	0 ... +60 °C	
Type of mounting	Wall mounting	35-mm DIN rail	
Dimensions (H x W x D) in mm	180 x 90 x 80	75 x 70 x 109	
Weight	Approx. 0.8 kg	Approx. 0.8 kg	

Sample conditioning equipment

Filters

Stainless steel filter housing

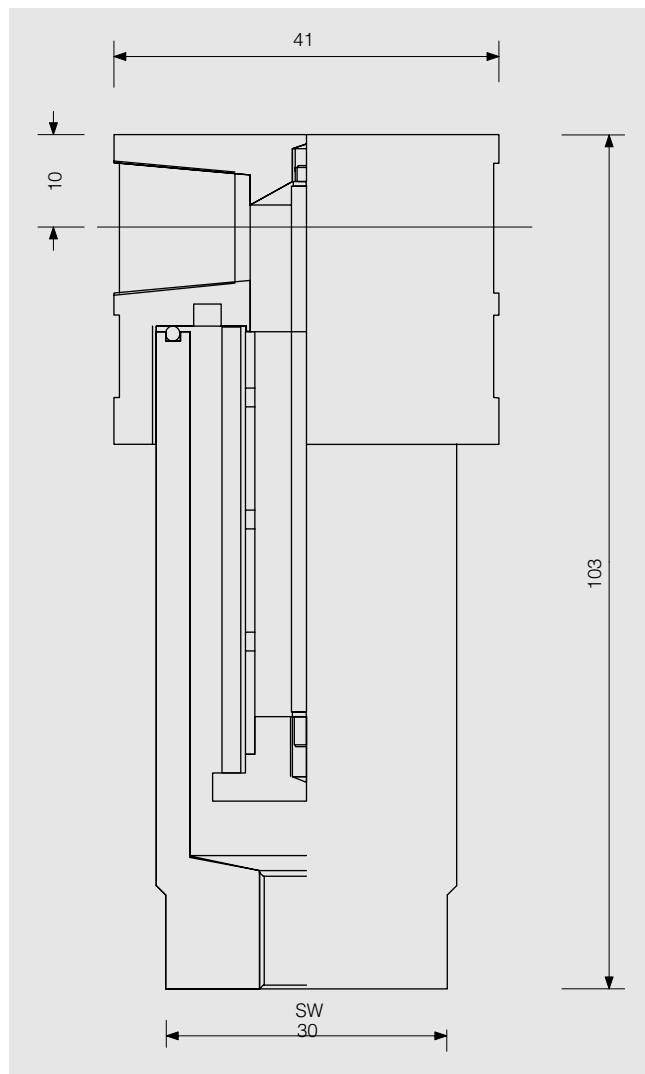


Fig. 4/5 Stainless steel filter housing

Application

For filtering gases under process conditions.

Technical data

Stainless steel filter housing

Max. permissible operating pressure	350 bar (at max. 200 °C operating temperature)
Max. permissible operating temperature	200 °C (when using PTFE gasket)
Housing volume	20 ml
Connection thread (inlet, outlet, drain)	¼ NPT female thread
Materials	
- Body	Steel SS 316 L, mat. No. 1.4404
- Gasket	PTFE
Weight	Approx. 0.4 kg

Filter element for gaseous samples

Material	Borosilicate glass-fiber
Max. permissible temperature	200 °C
Degree of filtration (pore size)	0.1 µm
Separation efficiency	> 99.9%

Filter element for liquid samples

Material	Stainless steel 1.4401
Max. permissible temperature	-250 ... +260 °C
Filter mesh (pore size)	1 µm

Ordering data

Order No.

Stainless steel housing

7MB1 943-2AC21

Filter element (10 units),
for gaseous samples

7MB1 943-2AC24

Filter element (1 unit),
for liquid samples

7MB1 943-2AC26

Sample conditioning equipment

Condensation removal

Condensation tank

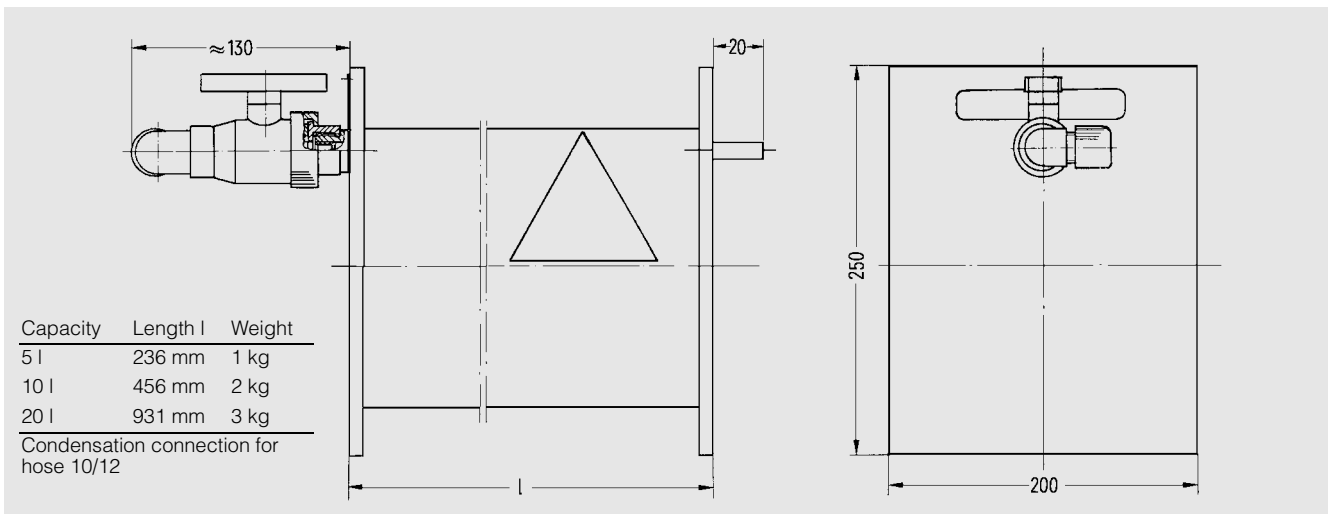


Fig. 4/6 Condensation tank without liquid level indicator

Ordering data

Order No.

Condensation tank

Made of polypropylene

Capacity 5 l

10 l

20 l

Liquid level indicator (BERO),
24 V DC power supply

7MB1 943-2AA60

7MB1 943-2AA62

7MB1 943-2AA64

7MB1 943-2AA66

Preliminary condensation trap

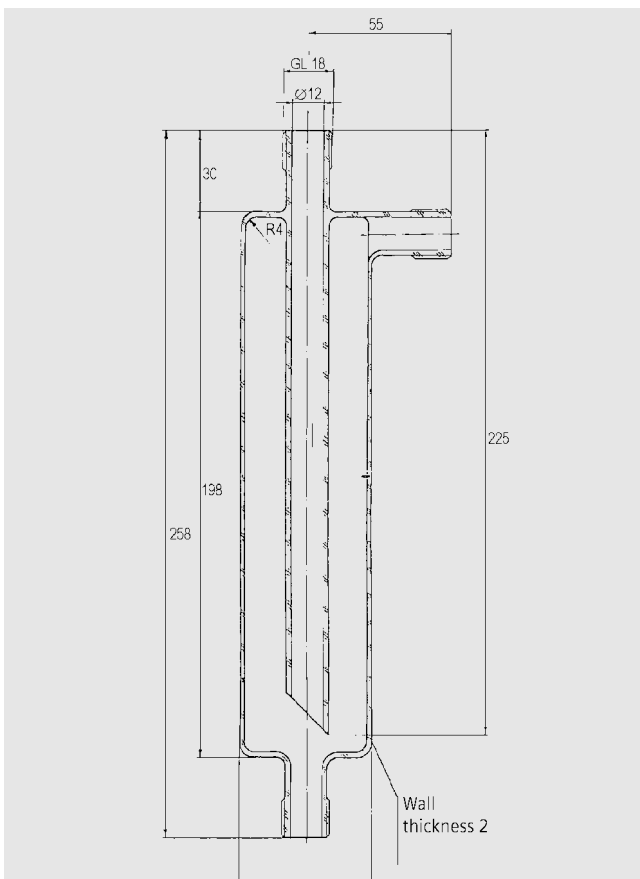


Fig. 4/7 Preliminary condensation trap

Application

For use where condensation is very high. Fitted upstream of the gas cooler.

Ordering data

Order No.

Preliminary condensation trap

complete,
made of glass, with mounting
clamp, cap for couplings and
gaskets for hose 4/6

7MB1 943-2AA50

Consumables and accessories

Mounting clamp

Holder for preliminary condensa-
tion trap

7MB1 943-2AA48

Condensation trap, glass

7MB1 943-2AA41

Cap for couplings (3 x required)

7MB1 943-2AA44

Gasket ¹⁾

- For hose 4/6
- For hose 6/8
- For hose 8/10

7MB1 943-2AA45

7MB1 943-2AA46

7MB1 943-2AA47

1) The number of gaskets required for the gas inlet/outlet and the condensation outlet depends on the hose diameter.

Sample conditioning equipment

Condensation removal

Hose pump for condensation removal

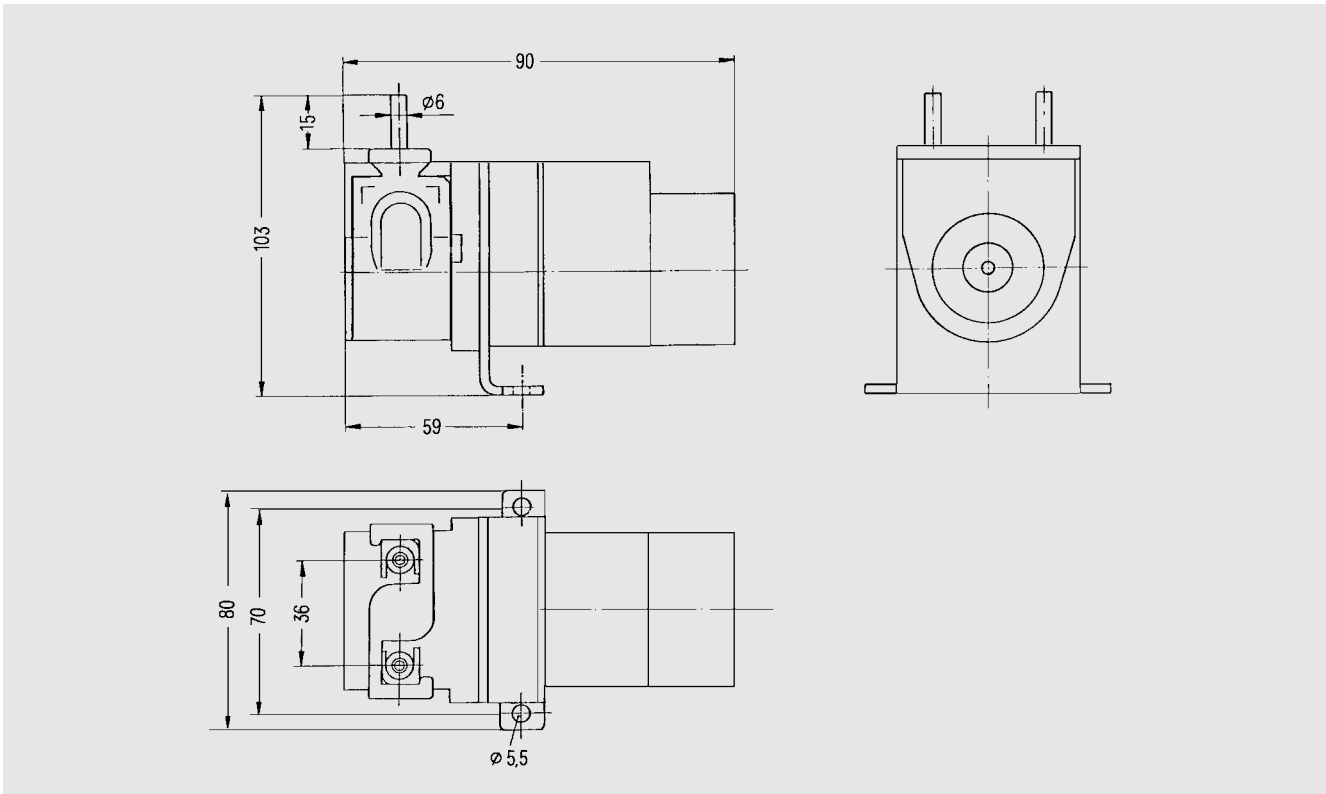


Fig. 4/8 Hose pump

Application

For the continuous removal of condensation.

Technical data

	7MB1 943-3AA20
Pump capacity	Approx. 0.3 l/h
Materials	
• Hose	Novopren
• Hose couplings	PVDF
Electrical connections	Terminals
Max. permissible ambient temperature	40 °C
Discharge pressure	0.8 bar
Explosion protection	–
Power supply	115/230 V AC, 50/60 Hz, switchable
Weight	Approx. 0.5 kg

Ordering data

Order No.

Hose pump

7MB1 943-3AA20

Consumables and accessories

Hose

7MB1 943-3AA22

Elbow coupling

for Teflon hose 4 x 1 mm

See page 4/31

Sample conditioning equipment

Gas coolers

Compressor gas coolers



Fig. 4/9 Compressor gas coolers

Application

To reduce the dew point of moist sample gases in order to bring the sample gas to a stable, low dew point.

The gas cooler prevents condensation of the sample gas in the analyzer. As a result of the constant, low dew point, the use of gas coolers also largely reduces water vapor cross-sensitivity and volume errors.

Compressor gas coolers are available with 1, 2, 3 or 4 cooling circuits (for 1 to 4 sample gas streams).

The condensation must be disposed of externally.

Technical data

Gas ducts	Quantity	1	2	2	3	4
Heat exchanger	Quantity	1	1	2	3	2
Gas flow ¹⁾	l/h	100	2 x 70 or 1 x 150	250		4 x 70 or 2 x 150
Gas inlet temperature	°C			Max. 140		
Gas inlet dew point	°C			Max. 80		
Gas outlet temperature	°C	3 ± 0.5			3 ± 0.3	
Gas outlet dew point	°C	3 ± 0.5			3 ± 0.3	
Gas pressure	bar			0.5 to 2.5		
Material of parts in contact with gas ²⁾				PVDF		
Permissible ambient temperature	°C			5 - 45		
Dead volume per gas duct	cm ³	137	37	137		37
Gas connection	mm			6 x 1		
Condensation connection	mm			12 x 1		
Temperature monitoring				Isolated signal, max. limit		
Housing color				RAL 7035		
Degree of protection			IP22		IP42	
Dimensions (H x W x D)	mm	247 x 298 x 272		290 x 360 x 335	290 x 440 x 360	290 x 360 x 335
Weight	kg	13	15	21	25	21

1) At a gas inlet temperature of 140 °C, inlet dew point 65 °C, ambient temperature 5 ... 40 °C

2) Gas ducts made of stainless steel (1.4571) or glass on request

Sample conditioning equipment

Gas coolers

Compressor gas coolers

Ordering data	Order No.	Ordering data	Order No.
Compressor gas cooler with 1 gas duct (MAK 6-Mini) without condensation removal - Power supply 230 V AC, 50 Hz; 160 VA; 0.7 A - Power supply 115 V AC, 50/60 Hz; 115 VA; 1.2 A	7MB1 943-3BB00 7MB1 943-3BB02	Compressor gas cooler with 3 gas ducts (MAK 6-3) without condensation removal - Power supply 230 V AC, 50 Hz; 350 VA; 2.4 A - Power supply 115 V AC, 50/60 Hz; 300 VA; 2.8 A	7MB1 943-3BB20 7MB1 943-3BB22
Compressor gas cooler with 2 gas ducts (MAK 6-2) without condensation removal, gas flow 250 l - Power supply 230 V AC, 50 Hz; 300 VA; 2.0 A - Power supply 115 V AC, 50/60 Hz; 250 VA; 2.4 A	7MB1 943-3BB10 7MB1 943-3BB12	Compressor gas cooler with 4 gas ducts (MAK 6-4) without condensation removal, gas flow 2 x 150 l in series or 4 x 70 l in parallel - Power supply 230 V AC, 50 Hz; 300 VA; 2.0 A - Power supply 115 V AC, 50/60 Hz; 250 VA; 2.4 A	7MB1 943-3BB24 7MB1 943-3BB26
Compressor gas cooler with 2 gas ducts (MAK 8-2) without condensation removal, gas flow 150 l in series or 2 x 70 l in parallel - Power supply 230 V AC, 50 Hz; 180 VA; 0.8 A - Power supply 115 V AC, 50/60 Hz; 130 VA; 1.3 A	7MB1 943-3BB14 7MB1 943-3BB16	<u>Accessories</u> Connector 4/6-10/14 for hose pump Hose pump (see page 4/8)	7MB1 943-2DA00 7MB1 943-3AA20

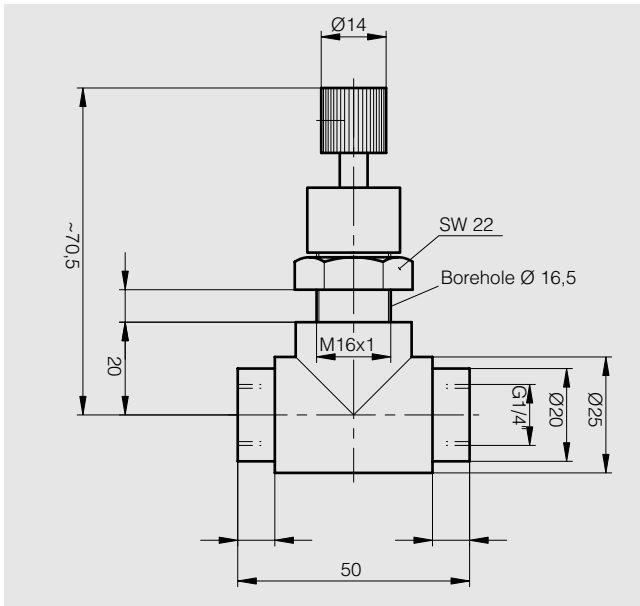


Fig. 4/10 Needle valve made of PVDF

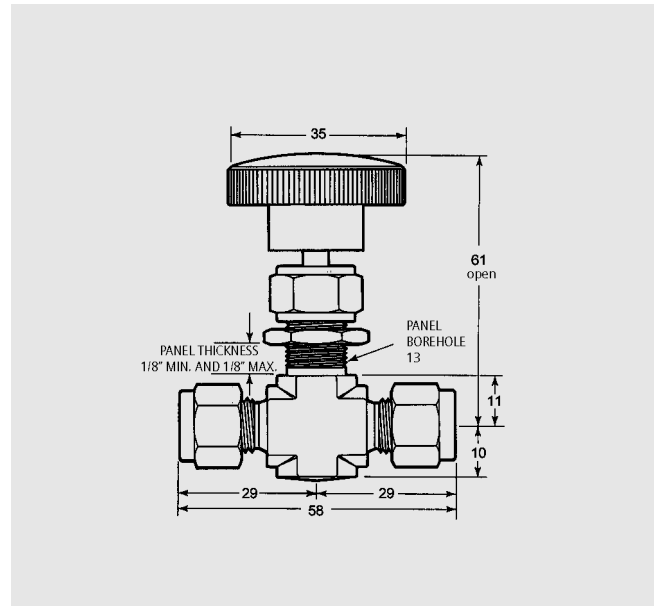


Fig. 4/11 Needle valve made of stainless steel

Application

Needle valves are used to set the gas flow to the required value. They should not be used as shut-off valves.

Technical data

	Needle valve made of VA stainless steel	Needle valve made of PVDF
Nominal diameter	4 mm	4 mm
Permissible operating overpressure	345 bar at 40 °C	10 bar at 20 °C 4 bar at 80 °C
Permissible sample temperature	Max. 230 °C	Max. 120 °C
Permissible ambient temperature	Max. 100 °C	Max. 120 °C
Material	Stainless steel	PVDF
Gas connection	Threaded joint for pipe 4/6	Threaded joint for hose 4/6
Weight	Approx. 0.3 kg	Approx. 0.1 kg

Ordering data

Order No.

Needle valve
made of PVDF

7MB1 943-2BA13

Needle valve
made of stainless steel

7MB1 940-1FA00

Sample conditioning equipment

Valves

Low-pressure overflow valve

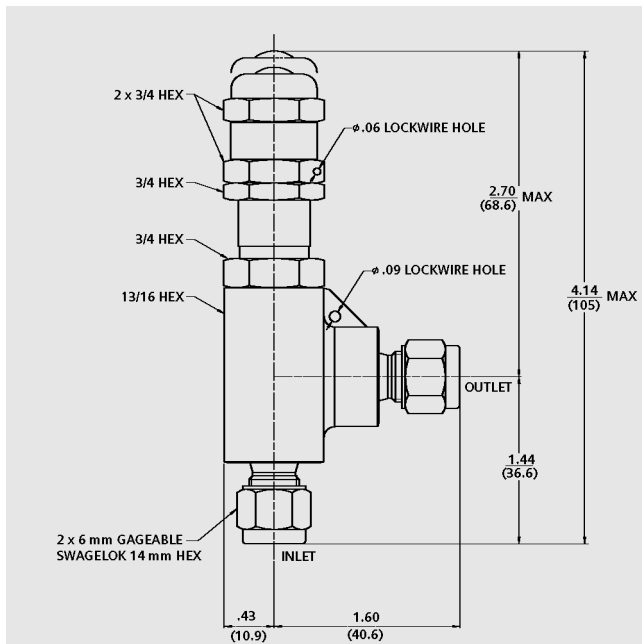


Fig. 4/12 Low-pressure overflow valve

Application

To protect against overpressure during gas preparation.

Technical data

Connection	For pipe with 6 mm outer diameter
Max. permissible pressure	20 bar at 21 °C
Permissible temperature range	-23 ... +204 °C
Adjustment range of opening pressure	0.69 ... 15 bar
Materials	Steel SS316 (mat. No. 1.4401), Viton, PTFE

Ordering data

Order No.

Adjustable overflow valve

- Adjustment range of opening pressure 0.69 ... 15 bar

7MB1 943-2EC06

Check valves

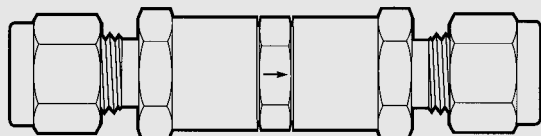


Fig. 4/13 Adjustable check valve

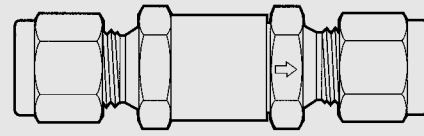


Fig. 4/14 Non-adjustable check valve

Application

The adjustable check valve is used to protect against overpressure in the sample gas line of the analyzer.

The non-adjustable check valve is used to protect against reverse flows of the sample into the analyzer. It prevents analyzer systems from receiving a reverse flow of exhaust should pressure variations occur in the exhaust line.

Technical data

Connection	For pipe with 6 mm outer diameter
Max. permissible pressure	205 bar at 21 °C
Permissible temperature range	-25 ... +190 °C
Materials	Steel SS316 (mat. No. 1.4401), Viton, PTFE

Ordering data

Order No.

Adjustable check valve

- Adjustment range of opening pressure 0.2 ... 3.5 bar
- Adjustment range of opening pressure 3.5 ... 10 bar

7MB1 943-2EC00

7MB1 943-2EC02

Non-adjustable check valve

- Adjustment range of opening pressure 0.02 bar differential pressure

7MB1 943-2EC04

Shut-off ball valve for low temperatures

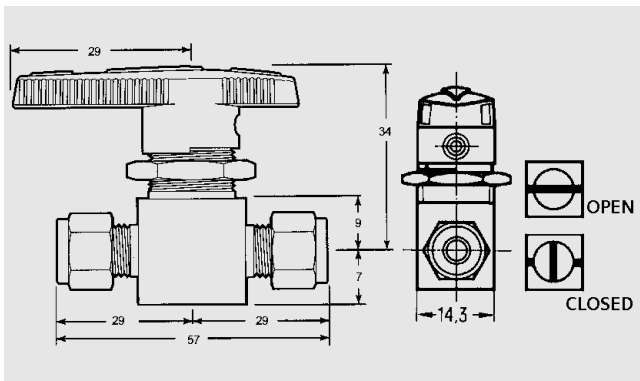


Fig. 4/15 Shut-off ball valve, dimensions and valve positions

Technical data

Material	
- Body, ball system	X 10 CrNiMoTi 18 10, mat. No. 1.4401
- Handle	Nylon, black
- Gasket	Teflon
Permissible ambient and sample gas temperature	10 ... 65 °C
Permissible operating pressure at 21 °C	Max. 175 bar
Connection	For pipe with 6 mm outer diameter
Weight	Approx. 0.3 kg

Note:

On delivery, the shut-off ball valves are set for a pressure of 70 bar. At higher pressures, it may be necessary to tighten the packing further (1/8 version is sufficient).

Application

The shut-off ball valve is used to shut off the flow of sample gas.

Design

Gas-tight at both high and low operating pressures, Teflon gasket fills out the hollow space and prevents accumulation of contamination.

Ordering data

Order No.

Shut-off ball valve

7MB1 943-2BA20

With 3.2 mm bore

A supporting sleeve is required for each gas duct when using a Teflon hose 4 x 6:

Supporting sleeve

See page 4/32

Shut-off ball valve for high temperatures

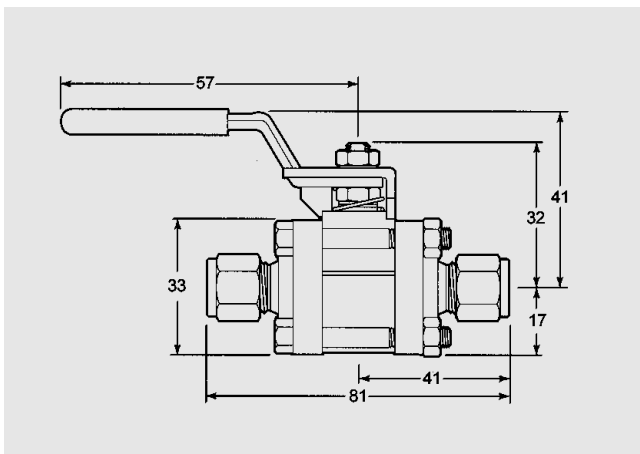


Fig. 4/16 Shut-off ball valve

Technical data

Materials	
- Ball	Stainless steel SS316 (mat. No. 1.4401)
- Packing ring	PEEK
- Packing	Reinforced PTFE
Max. temperature	235 °C
Max. pressure	
• At -29 to +38 °C	151 bar
• At 235 °C	7 bar
Connection	For pipe with 6 mm outer diameter

Ordering data

Order No.

Shut-off ball valve

7MB1 943-2EA02

Application

The shut-off ball valve is used to shut off the flow of sample gas.

Sample conditioning equipment

Valves

Multiway ball valves made of stainless steel

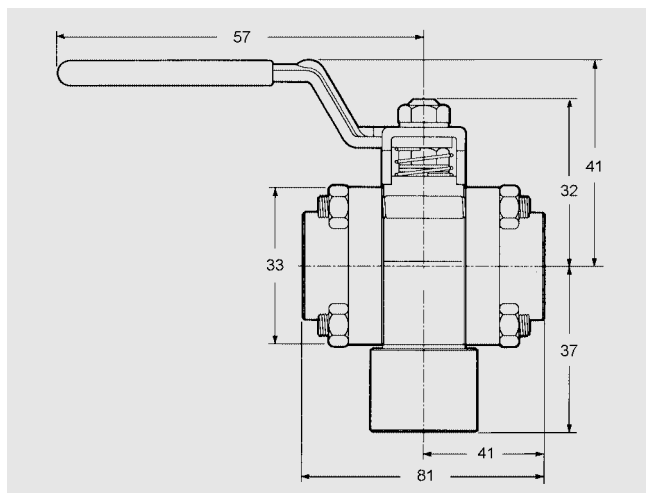


Fig. 4/17 3/2-way ball valve 7MB1 943-2EA08 for high temperatures

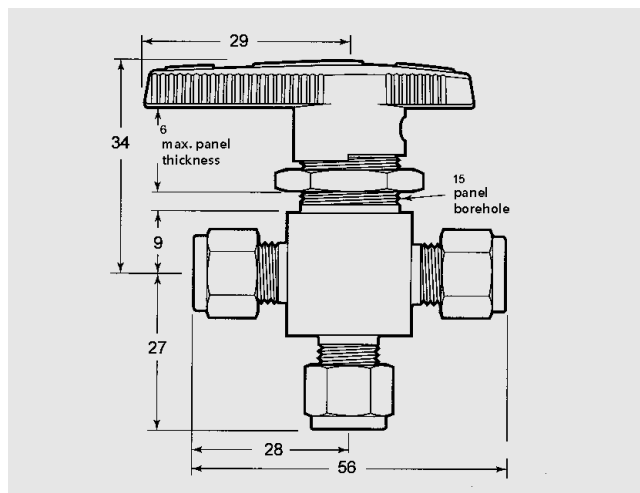


Fig. 4/18 3/2-way ball valve 7MB1 943-2BA22 for ambient temperatures

Application

For switching over gas flows.

Technical data

3/2-way ball valve	7MB1 943-2EA08	7MB1 943-2BA22
Max. pressure		175 bar
• At -30 ... +40 °C	70 bar	
• At -55 ... +150 °C		68 bar
• At 235 °C (max.)	7 bar	
Connections		
• Connection on side	For pipe with 6 mm outer diameter	
• Connection at bottom	¼ NPT, female thread	
Materials		
• Ball	Stainless steel body SS316 (mat. No. 1.4401)	
• Packing ring	PEEK	-
• Packing	Reinforced PTFE	PFA/D3307

5-way ball valve

Max. permissible operating pressure at 21 °C	68 bar
Max. permissible ambient and sample gas temperature	65 °C
Connection	For pipe with 6 mm outer diameter
Material	Twist knob: nylon, Body: stainless steel 316 Packing: TFE ID 1760
Weight	Approx. 0.3 kg

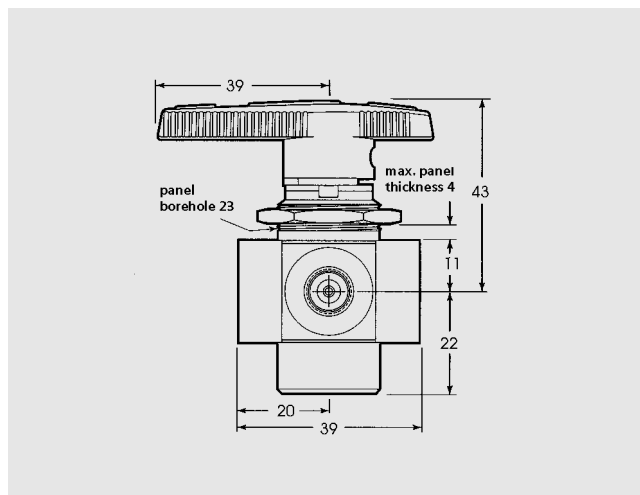


Fig. 4/19 5-way ball valve

Ordering data

Order No.

3/2-way ball valve made of stainless steel

- For max. pressure 70 bar
- For max. pressure 210 bar

7MB1 943-2EA08

7MB1 943-2BA22

5-way ball valve made of stainless steel

7MB1 943-2EA20

Control assemblies for shut-off ball valves

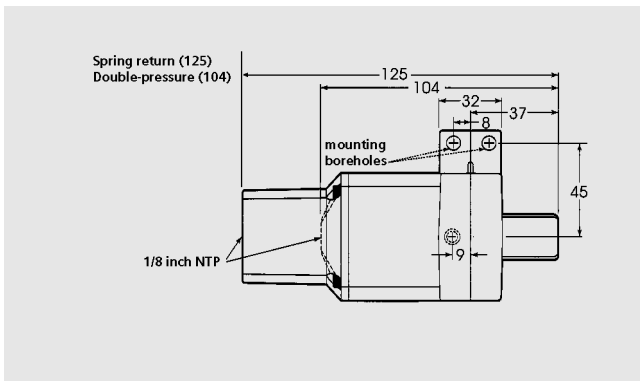


Fig. 4/20 Control assembly for shut-off ball valve

Application

The control assembly is required to pneumatically open and close the respective ball valve.

Control assembly 7MB1 943-2EA00

By applying a control medium with a specific inlet pressure, the ball valve is opened or closed depending on the mode of operation.

Spring reset in the unpressurized state.

Control assembly 7MB1 943-2EA10

By applying a control medium with a specific inlet pressure, the position of the ball valve is moved through 180°. Application: e.g. switching over from sample gas to calibration/zero gas. Spring reset in the unpressurized state.

Technical data

Min. control pressure	3.5 bar
Max. control pressure	13.5 bar
• 7MB1 943-2EA00	13.5 bar
• 7MB1 943-2EA10	13.5 bar
Permissible temperature	-30 °C ... +95 °C
Connection	1/4NPT, female thread

Ordering data

Order No.

Control assembly for shut-off ball valve

For max. control pressure of 13.5 bar

- Swivel range 90°
- Swivel range 180°

Accessories

Mounting set for ball valve

- For control assembly 7MB1 943-2EA00
 - Ball valve 7MB1 943-2EA02
 - Ball valve 7MB1 943-2BA20
- For control assembly 7MB1 943-2EA10
 - Ball valve 7MB1 943-2EA08
 - Ball valve 7MB1 943-2BA22

7MB1 943-2EA00
7MB1 943-2EA10

7MB1 943-2EA04
7MB1 943-2EA06

7MB1 943-2EA04
7MB1 943-2EA06

Shut-off and multiway ball valves made of PVDF

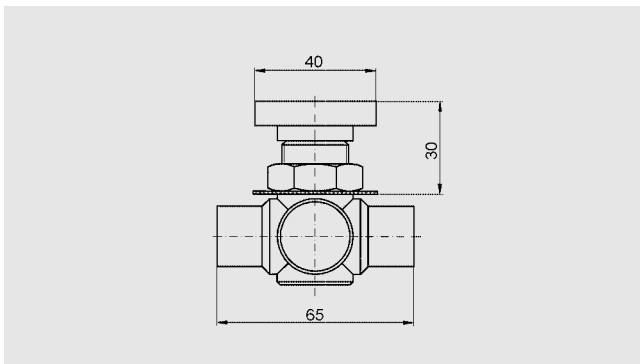


Fig. 4/21 Shut-off ball valve, dimensions

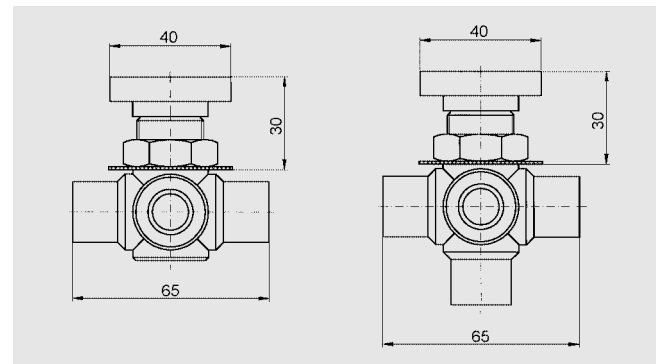


Fig. 4/22 3-way and 5-way ball valves, dimensions

Application

To shut off and switch over gases. Also suitable for highly corrosive gases.

Technical data

Gas connection	Male coupling G1/4
Nominal diameter	4 mm
Permissible operating overpressure	10 bar
Max. permissible sample temperature	140 °C
Max. permissible ambient temperature	90 °C ¹⁾
Material of parts in contact with sample gas	Polyvinylidene fluoride (PVDF) / Viton
Type of mounting	With mounting clamp

1) 140 °C on request

Ordering data

Order No.

Shut-off ball valve made of PVDF

With mounting clamps

3-way ball valve made of PVDF
With mounting clamps

5-way ball valve made of PVDF
With mounting clamp

Spacer for wall mounting
for 5-way ball valve

Male coupling G1/4 made of PVDF

For Teflon hose with 6 mm outer diameter

7MB1 943-2BA25

7MB1 943-2BA30

7MB1 943-2BA35

7MB1 943-2BA40

See page 4/31

Sample conditioning equipment

Solenoid valves

2/2-way solenoid valve made of PVDF

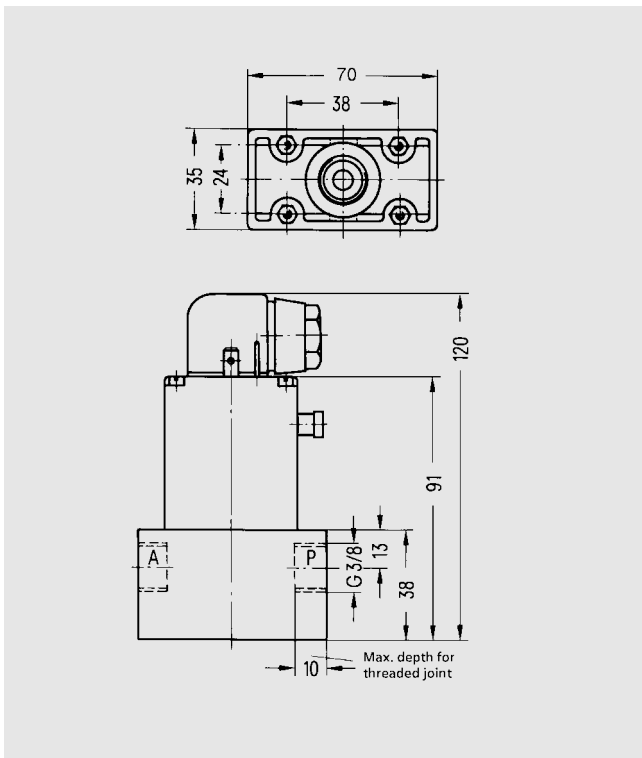


Fig. 4/23 2/2-way solenoid valve made of PVDF

Technical data

Permissible pressure range	0 ... 4 bar
• With power supply 230 V AC	0 ... 2 bar
• With power supply 24 V DC	
Nominal diameter	4.0 mm
Sealing material	Kalrez (perfluoroelastomer)
Gas connection	G $\frac{3}{8}$ female thread
Electrical connection	Appliance socket with LED and varistor
Degree of protection to EN 60 529	IP65
Mounting position	Any
Power supply	230 V AC, 50 Hz, 40 VA (pick-up), 18 VA (operation) or 24 V DC, 8.5 W (operation)
Function	Closed when de-energized
Weight	Approx. 0.32 kg

Ordering data

Order No.

2/2-way solenoid valve made of PVDF

- Power supply 230 V AC, 50 Hz
- Power supply 24 V DC

7MB1 943-2BA50
7MB1 943-2BA55

2 male couplings are also required:

Male coupling G $\frac{3}{8}$,
made of PVDF,
for Teflon hose 4 x 6 ¹⁾

See page 4/31

Appliance socket DIN 43 650 form A, with LED and varistor

See page 4/20

1) Note: seal with Teflon tape before screwing tight

4

2/2-way solenoid valve, explosion-proof, made of PVDF

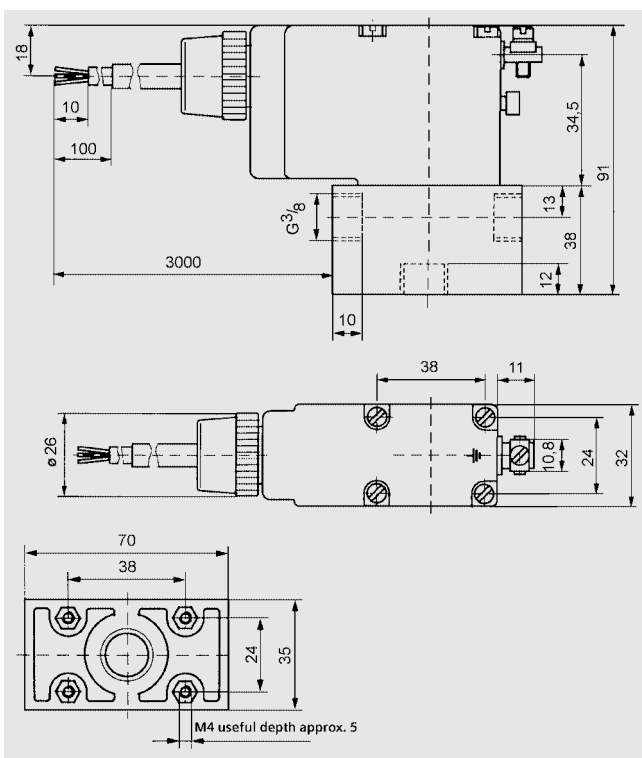


Fig. 4/24 2/2-way solenoid valve made of PVDF, explosion-proof

Technical data

Permissible pressure range	0 ... 4 bar
Nominal diameter	4.0 mm
Sealing material	Kalrez
Gas connection	G $\frac{3}{8}$ female thread
Electrical connection	Press-fit cable, 3 m
Degree of protection to EN 60 529	IP65
PTB No.	PTB 03 ATEX 1030X
Mounting position	Any
Power supply	24 V AC/DC, 40 VA (pick-up), 18 VA (operation)
Weight	Approx. 0.62 kg
Function	Closed when de-energized

Ordering data

Order No.

2/2-way solenoid valve made of PVDF, explosion-proof to II 2G EEx ed IIC T4

Power supply 24 V AC/DC

7MB1 943-2BA57

Note: The magnet system must be protected by a series-connected fuse suitable for the rated current. The current is printed on the magnet system.
Fuse: 2 A

Sample conditioning equipment

Solenoid valves

2/2-way solenoid valve made of stainless steel

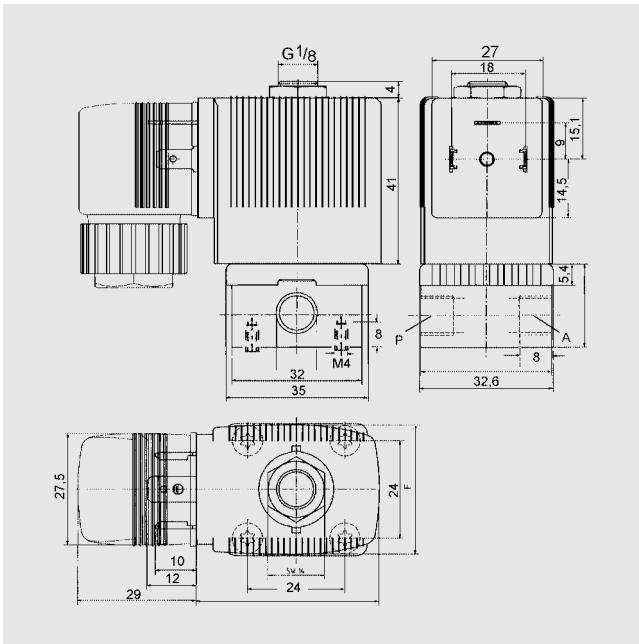


Fig. 4/25 2/2-way solenoid valve made of stainless steel

Technical data

Permissible pressure range	0 ... 10 bar
• With power supply 230 V AC	0 ... 6 bar
• With power supply 24 V DC	
Nominal diameter	3.0 mm
Sealing material	Viton
Gas connection	G 1/8 female thread
Electrical connection	Appliance socket with LED and varistor
Degree of protection to EN 60 529	IP65
Mounting position	Any
Power supply	230 V AC, 50 Hz, 24 VA (pick-up), 14 VA (operation) or 24 V DC, 8 W
Weight	Approx. 0.3 kg
Function	Closed when de-energized

Ordering data

Order No.

2/2-way solenoid valve made of stainless steel

- Power supply 230 V AC, 50 Hz
- Power supply 24 V DC

7MB1 943-2BA60
7MB1 940-1HA01

2 male couplings are also required:

Male coupling G 1/8,
made of stainless steel,

See page 4/32

Appliance socket DIN 43 650 form A, with LED and varistor

See page 4/20

2/2-way solenoid valve, explosion-proof, made of stainless steel

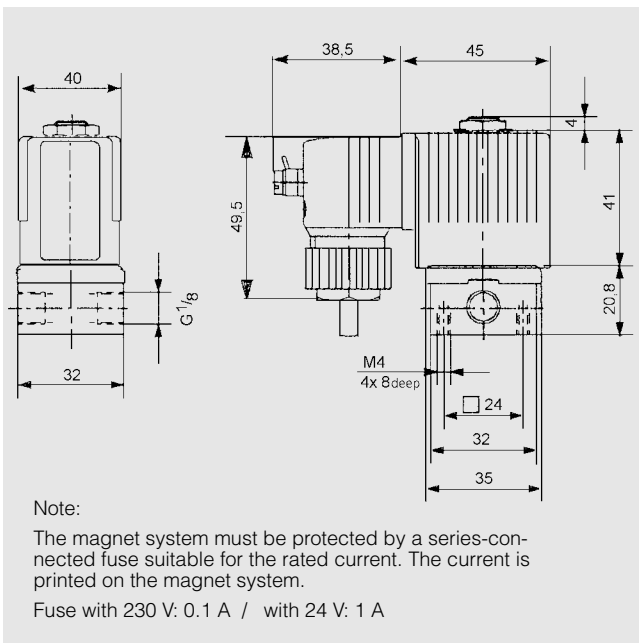


Fig. 4/26 2/2-way solenoid valve made of stainless steel, explosion-proof

Technical data

Permissible pressure range	0 ... 5 bar
Nominal diameter	3.0 mm
Sealing material	Viton
Gas connection	G 1/8 female thread
Electrical connection	Press-fit cable, 3 m
Degree of protection to EN 60 529	IP65
PTB No.	PTB 00 ATEX 2129 X
Mounting position	Any
Power supply	230 V AC/DC or 24 V AC/DC, 9 VA
Weight	Approx. 0.51 kg
Function	Closed when de-energized

Ordering data

Order No.

2/2-way solenoid valve made of stainless steel, explosion-proof to II 2G EEx m II T4

- Power supply 230 V AC/DC
- Power supply 24 V AC/DC

7MB1 943-2BA62
7MB1 943-2BA63

Sample conditioning equipment

Solenoid valves

3/2-way solenoid valve as mixing valve made of PVDF

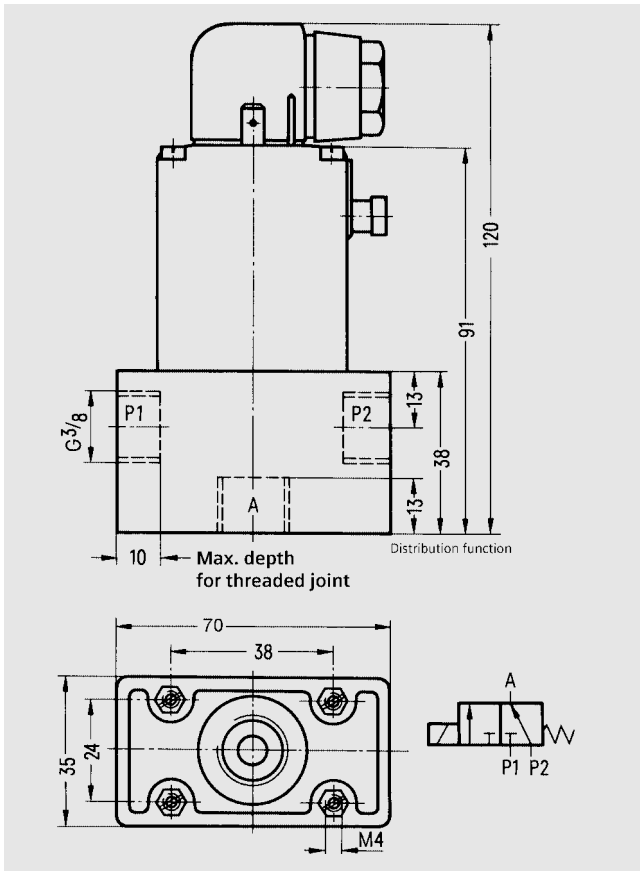


Fig. 4/27 3/2-way solenoid valve made of PVDF

Technical data

Permissible pressure range	0 ... 2 bar
• With power supply 230 V AC	0 ... 2 bar
• With power supply 24 V DC	0 ... 1 bar
Nominal diameter	4.0 mm
Sealing material	Kalrez (perfluoroelastomer)
Gas connection	G $\frac{3}{8}$ female thread
Electrical connection	Appliance socket with LED and varistor
Degree of protection to EN 60 529	IP65
Mounting position	Any
Power supply	230 V AC, 50 Hz, 40 VA (pick-up), 18 VA (operation) or 24 V DC, 8.5 W (operation)
Weight	Approx. 0.32 kg

Ordering data

Order No.

3/2-way solenoid valve made of PVDF

- Power supply 230 V AC, 50 Hz
- Power supply 24 V DC

7MB1 943-2BA65
7MB1 943-2BA67

3 male couplings are also required:

See page 4/31

Male coupling G $\frac{3}{8}$,

made of PVDF, for Teflon hose 4x6
Note: seal with Teflon tape before screwing tight

Appliance socket DIN 43 650 form A, with LED and varistor

See page 4/20

4

3/2-way solenoid valve, explosion-proof, as mixing valve made of PTFE

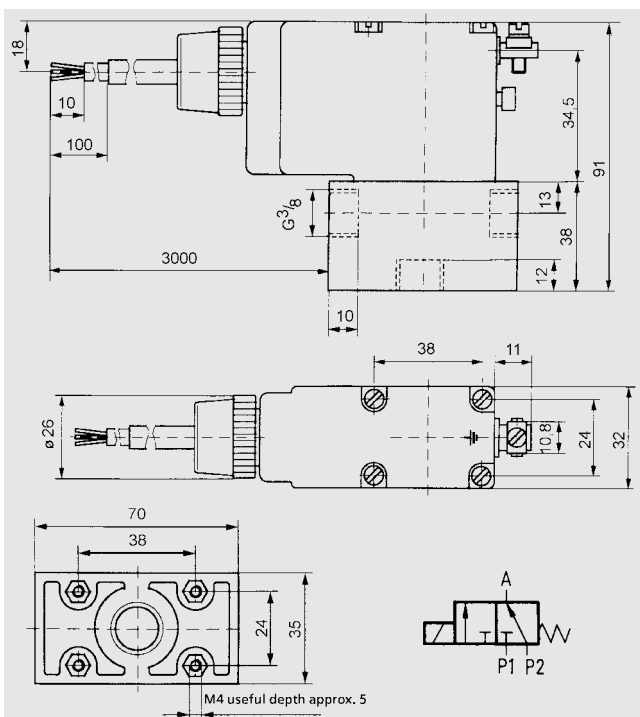


Fig. 4/28 3/2-way solenoid valve made of PTFE, explosion-proof

Technical data

Permissible pressure range	0 ... 2 bar
Nominal diameter	4.0 mm
Sealing material	Kalrez
Gas connection	G $\frac{3}{8}$ female thread
Electrical connection	Press-fit cable, 3 m
Degree of protection to EN 60 529	IP65
PTB No.	PTB 03 ATEX 1030X
Mounting position	Any
Power supply	24 V AC/DC, 40 VA (pick-up), 3 VA (operation)
Weight	Approx. 0.62 kg
Note:	The magnet system must be protected by a series-connected, medium-slow fuse suitable for the rated current. The current is printed on the magnet system. Fuse with 24 V: 2 A

Ordering data

Order No.

3/2-way solenoid valve made of PTFE, explosion-proof to II 2G EEx ed IIC T4

- Power supply 24 V AC/DC

7MB1 943-2BA68

Sample conditioning equipment

Solenoid valves

3/2-way solenoid valve as mixing valve made of stainless steel, for highly corrosive, dry gases

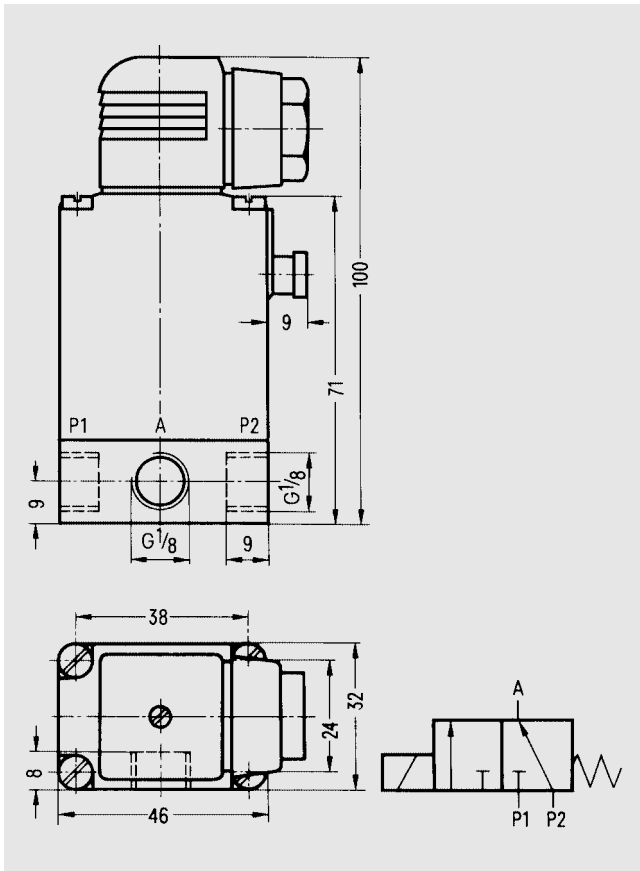


Fig. 4/29 3/2-way solenoid valve made of stainless steel

Technical data

Permissible pressure range	0 ... 3 bar
Nominal diameter	4.0 mm
Sealing material	Viton
Gas connection	G 1/8 female thread
Electrical connection	Appliance socket with LED and varistor
Degree of protection to EN 60 529	IP65
Mounting position	Any
Power supply	230 V AC, 50 Hz, 30 VA (pick-up), 15 VA (operation) or 24 V DC, 8 W (operation)
Weight	Approx. 0.47 kg

Ordering data

Order No.

3/2-way solenoid valve made of stainless steel

- Power supply 230 V AC, 50 Hz
- Power supply 24 V DC

7MB1 943-2BA70
7MB1 943-2BA75

3 male couplings are also required:

Male coupling G 1/8,
made of stainless steel,

See page 4/32

Appliance socket DIN 43 650 form A,
with LED and varistor

See page 4/20

3/2-way solenoid valve, explosion-proof, as mixing or distribution valve made of stainless steel

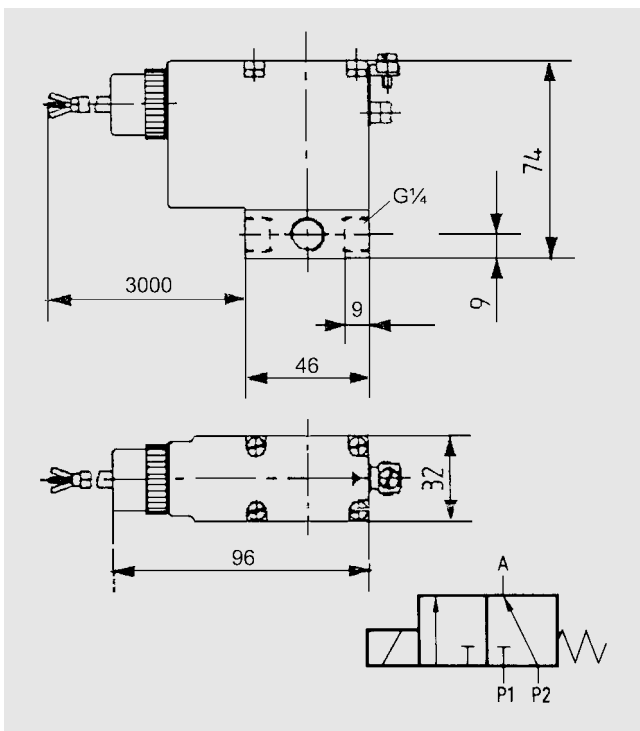


Fig. 4/30 3/2-way solenoid valve made of stainless steel, explosion-proof

Technical data

Permissible pressure range	0 ... 3.5 bar
Nominal diameter	4.0 mm
Sealing material	Viton
Gas connection	G 1/4 female thread
Electrical connection	Press-fit cable, 3 m
Degree of protection to EN 60 529	IP65
PTB No.	PTB 03 ATEX 1030X
Mounting position	Any
Power supply	230 V AC/DC or 24 V AC/DC, 40 VA (pick-up), 3 VA (operation)
Weight	Approx. 0.7 kg

Ordering data

Order No.

3/2-way solenoid valve made of stainless steel, explosion-proof to II 2G EEx ed IIC T4

- Power supply 230 V AC/DC
- Power supply 24 V AC/DC

7MB1 943-2BA72
7MB1 943-2BA77

Sample conditioning equipment

Solenoid valves

Appliance socket DIN 43 650 form A, with LED and varistor

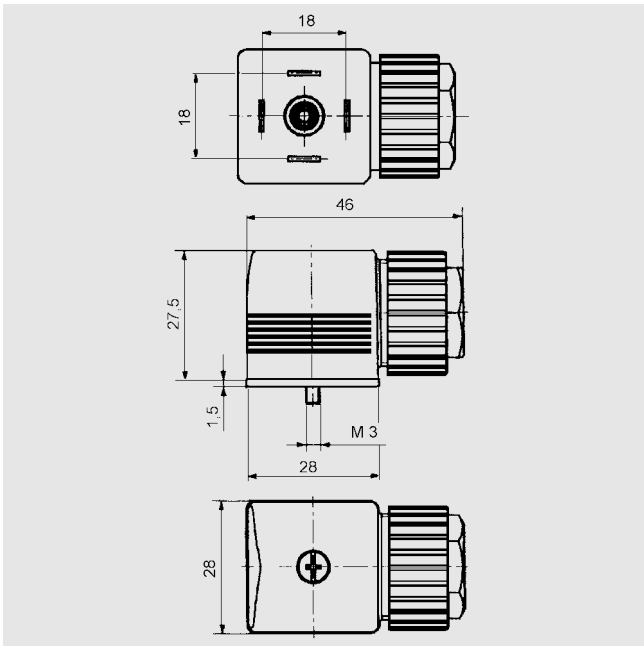


Fig. 4/31 Appliance socket DIN 43650 form A

Technical data

Material	
- Housing	Polyamide (PA)
- Contacts	Brass, electro-silverplated
Maximum continuous temperature	+125 °C
Cable diameter	6 ... 7 mm
Number of poles	2 poles + PE conductor
Seal between coil and socket	Flat gasket 1.5 mm
Degree of protection to EN 60 529	IP65
Status indicator	LED, red

Ordering data

Order No.

Appliance socket DIN 43 650 form A

- For 12 to 24 V AC/DC
- For 200 to 240 V AC/DC

7MB1 943-2BB20

7MB1 943-2BB22

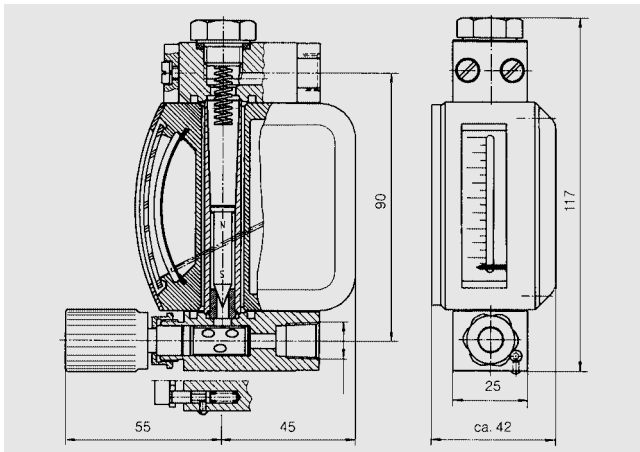


Fig. 4/32 All-metal flowmeter DK32

Application

To measure and display volume flows. Since the flowmeter is made completely of metal, it is primarily suitable for use in process measuring systems with high pressures and under rough operating conditions.

The flowmeter is available with or without a limit signal transmitter. An isolating switching amplifier is required when using a limit signal transmitter (see page 4/23).

Technical data

Max. permissible operating pressure	130 bar at 21 °C
Permissible sample temperature	
• Without limit signal transmitter	-80 ... +150 °C
• With limit signal transmitter	-80 ... +140 °C
Connection	¼ NPT female thread
Material	
• Heads	Stainless steel (mat. No. 1.4581)
• Valve, plug, cone, float	CrNi steel (mat. No. 1.4571)
• Housing	Die-cast aluminium
• Gasket	PTFE
Weight	Approx. 0.9 kg

Ordering data

Order No.

All-metal flowmeter

Without limit signal transmitter

- For air as medium (1013 mbar, 20 °C)
 - Sample gas to analyzer, measuring range 10 ... 100 l/h
 - Fast loop standard, measuring range 40 ... 400 l/h
 - Fast loop large, measuring range 80 ... 800 l/h
- For water as medium (20 °C)
 - Medium to sensor, measuring range 1 ... 10 l/h
 - Medium to sensor, measuring range 4 ... 40 l/h
 - Medium to sensor, measuring range 8 ... 80 l/h

7MB1 943-2BB50

7MB1 943-2BB53

7MB1 943-2BB58

7MB1 943-2BB60

7MB1 943-2BB62

7MB1 943-2BB64

With limit signal transmitter

- For air as medium (1013 mbar, 20 °C)
 - Sample gas to analyzer, measuring range 10 ... 100 l/h
 - Fast loop standard, measuring range 40 ... 400 l/h
 - Fast loop large, measuring range 80 ... 800 l/h
- For water as medium (20 °C)
 - Medium to sensor, measuring range 1 ... 10 l/h
 - Medium to sensor, measuring range 4 ... 40 l/h
 - Medium to sensor, measuring range 8 ... 80 l/h

7MB1 943-2BB51

7MB1 943-2BB52

7MB1 943-2BB55

7MB1 943-2BB61

7MB1 943-2BB63

7MB1 943-2BB65

Sample conditioning equipment

Flowmeters

Glass flowmeter

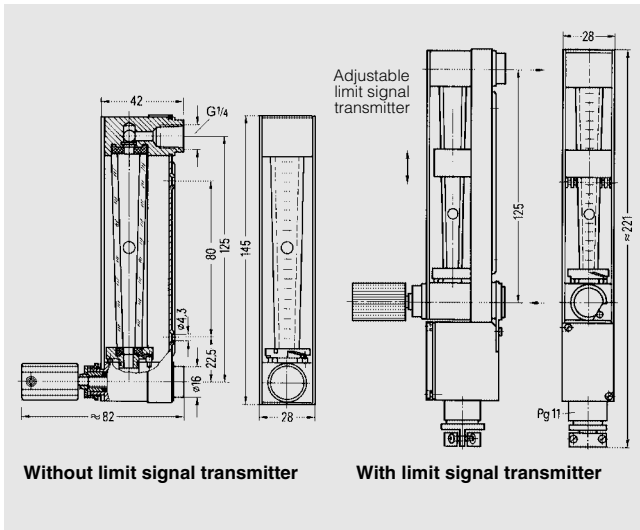


Fig. 4/33 Flowmeter DK 800

Application

To measure and display volume flows. The flowmeter version with PEEK float is also suitable for corrosive gases.

The flowmeter works according to the variable-area measuring principle and therefore does not cause a delay in indication.

The flow is adjusted using a precision valve.

The flowmeter is available with or without a limit signal transmitter. An isolating switching amplifier is required when using a limit signal transmitter (see page 4/23).

Technical data

Flowmeter	
Measuring range	10 ... 100 l gas/h
Materials	PVDF Borosilicate glass
• Heads	
• Cone	
• Float	
- 7MB1 943-2BB30/35	Stainless steel (mat. No. 1.4401)
- 7MB1 943-2BB31/36	PEEK
• Gasket	Viton
Gas connection	G $\frac{1}{4}$ female thread
Max. permissible operating pressure	6 bar
Weight	Approx. 0.4 kg
Limit signal transmitter	
Rated voltage	8 V DC
Current consumption	
• Active area free	3 mA
• Active area covered	1 mA
Inherent inductance	170 μ H
Inherent capacitance	90 nF
Permissible ambient temperature	-25 ... +100 °C
Degree of protection to EN 60 529	IP67

Ordering data

Order No.

Flowmeter

Measuring range 10 to 100 l/h
 • Without limit signal transmitter
 • With limit signal transmitter

7MB1 943-2BB30
7MB1 943-2BB35

Flowmeter for corrosive gases

Measuring range 10 to 100 l/h
 • Without limit signal transmitter
 • With limit signal transmitter

7MB1 943-2BB31
7MB1 943-2BB36

2 male couplings, G $\frac{1}{4}$ female thread, may also be required

See page 4/31

4

PVDF flowmeter for highly corrosive gases

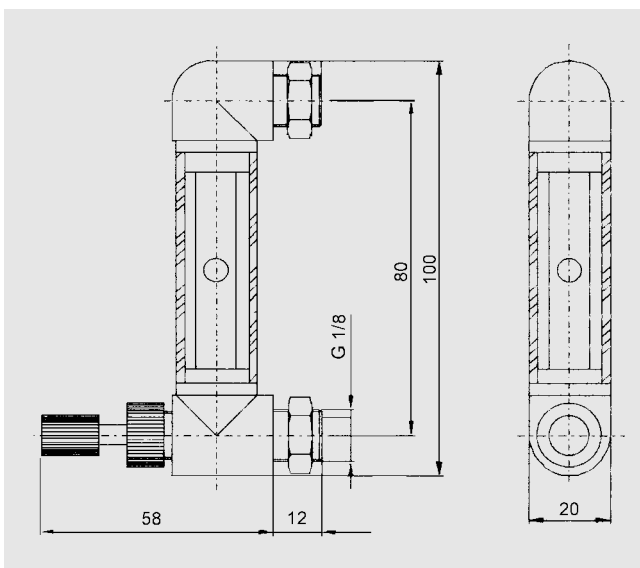


Fig. 4/34 Flowmeter for highly corrosive gases

Application

To monitor the flow of highly corrosive sample gases. The flowmeter does not cause any delay in indication.

Technical data

Flowmeter

Flow range for air (20 °C, 1 bar)	25 ... 140 l/h
Materials of parts in contact with sample gas	PVDF, Duran glass
Gas connections	G $\frac{1}{8}$ female thread
Max. pressure	1 bar
Float	Ferromagnetic soft-iron core, PVDF sheath
Data transmission	Float and ring initiator
Metering tube dimensions	10 mm diameter, 75 mm long

Ring initiator

Degree of protection to EN 60 529	IP67
PTB No.	PTB 03 ATEX 2111
Length of connection cable	2 m
Permissible ambient temperature	-20 ... +70 °C

Ordering data

Order No.

Flowmeter

with needle valve, flow range 25 to 140 l/h

7MB1 943-2BB45

Ring initiator

7MB1 943-2BB48

Threaded joint

See page 4/31

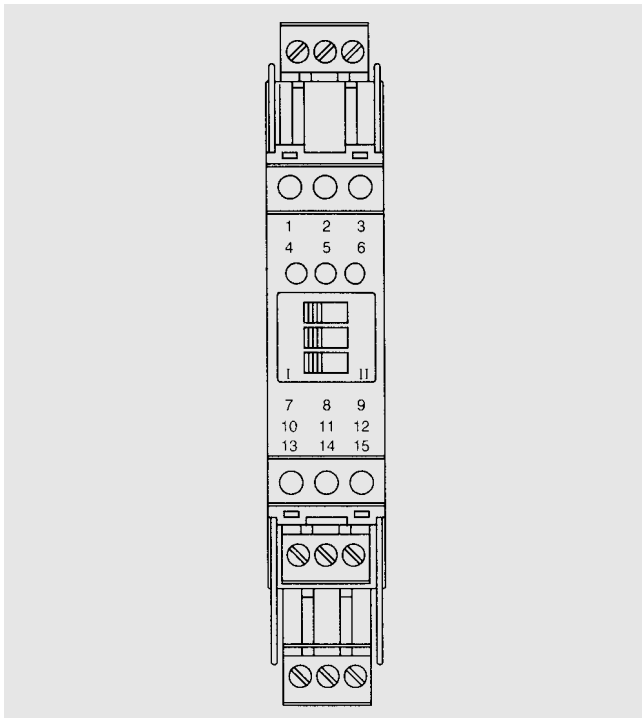


Fig. 4/35 Isolating switching amplifier, front view

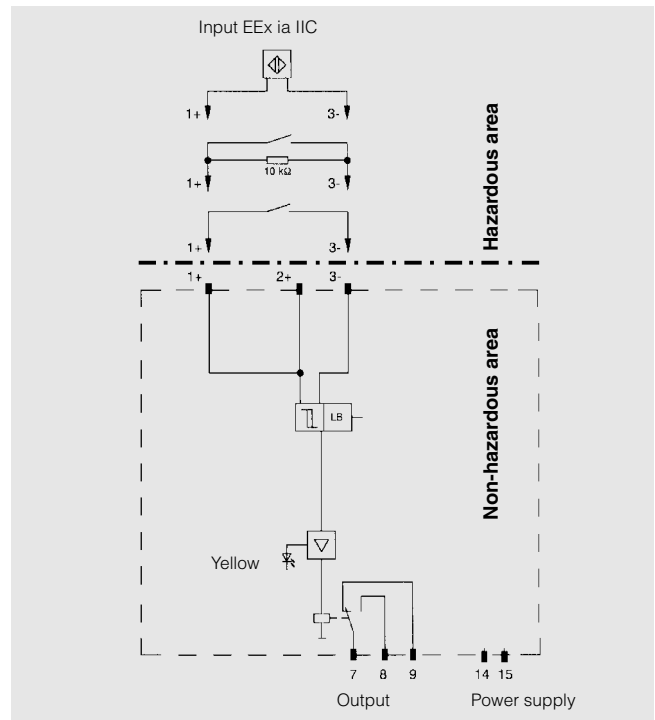


Fig. 4/36 Isolating switching amplifier, schematic diagram (1 channel)

Application

- Inputs (intrinsically-safe) to DIN EN 60947-5-6 (NAMUR) or mechanical contacts
- Control circuits EEx ia IIC
- Reversible direction of control action
- Signal outputs (not intrinsically-safe) with changeover contact max. 253 V AC / 2 A
- EMC according to EN 61326, EN 50081-2, NAMUR NE 21
- Electrical isolation according to EN 50020

Technical data

Switching capacity	Signal outputs (not intrinsically-safe) with changeover contact max. 253 V; 2 A
Ambient temperature	-20 ... +60 °C
Dimensions (D x W x H) in mm	120 x 20 x 115 (DIN rail mounting)
Degree of protection	Control circuit EEx ia IIC
Weight	Approx. 0.15 kg

Ordering data

Order No.

Isolating switching amplifier

- 24 V DC
 - 1-channel
 - 2-channel
- 230 V AC, 45-65 Hz
 - 1-channel
 - 2-channel
- 115 V AC, 45-65 Hz
 - 1-channel
 - 2-channel

2 male couplings, G $\frac{1}{4}$ female thread, may also be required

7MB1 943-2BB41
7MB1 943-2BB42

7MB1 943-2BB43
7MB1 943-2BB44

7MB1 943-2BB46
7MB1 943-2BB47

See page 4/31

Sample conditioning equipment

Pressure reducers

Single-stage pressure reducer for reference gas of OXYMAT gas analyzers



Fig. 4/37 Single-stage pressure reducer for N₂ or O₂ for connection to gas cylinders

Application

For use with OXYMAT gas analyzers for reference gases N₂ and O₂. Chromium-plated brass housing. For connection to gas cylinders.

Technical data

Pressure reducer	Metal diaphragm
Inlet pressure	Max. 200 bar
Outlet pressure	Non-adjustable at 3.2 bar
Gas connection	For pipe with 6 mm outer diameter (Swagelok fitting)

Ordering data

Order No.

Single-stage pressure reducer

- For N₂
- For O₂

7MB1 943-6AD01

7MB1 943-6AD02

Single-stage pressure reducer for installation in pipes



Fig. 4/38 Single-stage pressure reducer for installation in pipes

Application

For corrosive gases (stainless steel housing) or non-corrosive gases (chromium-plated brass housing). For installation in pipes.

Technical data

Gas connection, inlet and outlet	Threaded joint for pipe with 6 mm outer diameter (Swagelok fitting)
Inlet pressure	
- 7MB1 943-1LA04 / -1LA24	Max. 50 bar
- 7MB1 943-1LA05 / -1LA25	Max. 20 bar
Outlet pressure range	0.05 ... 1 bar

Ordering data

Order No.

Single-stage pressure reducer for installation in pipes

- Outlet pressure range 0.05 to 1 bar
 - For corrosive gases; material: stainless steel
 - For non-corrosive gases; material: chromium-plated brass
- Outlet pressure range 0.5 to 8 bar
 - For corrosive gases; material: stainless steel
 - For non-corrosive gases; material: chromium-plated brass

7MB1 943-1LA04

7MB1 943-1LA05

7MB1 943-1LA24

7MB1 943-1LA25

Sample conditioning equipment

Pressure reducers

Two-stage pressure reducer for calibration gas cylinders



Fig. 4/39 Two-stage pressure reducer for connection to gas cylinders

Application

Two-stage pressure reducer for corrosive and non-corrosive gases for connection to gas cylinders.

High-vacuum-proof housing made of stainless steel (for corrosive gases) or chromium-plated brass (for non-corrosive gases).

Contact gauge on the high-pressure side. Piston pressure reducer as high-pressure stage, and low-pressure stage with metal bellows.

When using Teflon hose 4 x 6 instead of piping, always ensure that the connection between the hose and the Swagelok fitting is secure.

With contact gauge:

Electric signal when a minimum pressure is reached to ensure early replacement of the gas cylinder.

Technical data

Two-stage pressure reducer

Outlet	Threaded joint for pipe or hose with 6 mm outer diameter (Swagelok fitting)
Inlet pressure	Max. 200 bar
Outlet pressure range	0.05 ... 1 bar or 0.5 ... 8 bar

Contact gauge

Switching function	Opens with falling pressure
Connection	2-pin plug
Floating contact	
• Load capacity	24 V AC/DC, max. 0.8 A
• Switching capacity	Max. 10 VA or 10 W

Ordering data

Order No.

Two-stage pressure reducer for connection to gas cylinders

- Outlet pressure range 0.05 to 1 bar
 - For corrosive gases; material: stainless steel
 - For non-corrosive gases; material: chromium-plated brass
- Outlet pressure range 0.5 to 8 bar
 - For corrosive gases; material: stainless steel
 - For non-corrosive gases; material: chromium-plated brass

7MB1 943-1LA02

7MB1 943-1LA03

7MB1 943-1LA14

7MB1 943-1LA06

Two-stage pressure reducer with contact gauge on the high-pressure side for connection to gas cylinders

- Outlet pressure range 0.05...1 bar
 - For corrosive gases; material: stainless steel
 - For non-corrosive gases; material: chromium-plated brass
- Outlet pressure range 0.5...8 bar
 - For corrosive gases; material: stainless steel
 - For non-corrosive gases; material: chromium-plated brass

7MB1 943-1LA10

7MB1 943-1LA12

7MB1 943-1LA18

7MB1 943-1LA16

Type of gas	Cylinder connection to DIN 477	Order code
Hydrogen H ₂	No. 1	Y02
Synthetic air or oxygen O ₂	No. 9	Y03
Nitrogen N ₂	No. 10	Y04
Calibration gas mixtures	No. 14	Y05
Other type of gas Specify in plain text: Type of gas ... and Residual gas ...		Y01

Sample conditioning equipment

Gases

Calibration gases

Technical data

Cylinder body	Steel, seamfree, or aluminium alloy	
Connection thread to DIN 477 O ₂ above 21% v/v	M19 x 1.5 left-hand, No. 14, DIN 477, No. 9	
<u>Filling pressure</u>		
• Standard	150 bar	
• With CO ₂ > 17% and SF ₆ > 6.2%	< 150 bar	
<u>Tolerance</u>		
Component concentration	Manufacturer's tolerance ¹⁾	Analytical accuracy ¹⁾
• 1 ... 99 ppm	±10%	±2 ... ±5%
• 100 ... 999 ppm	±5%	±2%
• 0.1 ... 4.9%	±2%	±2%
• 5 ... 50%	±1%	±1%
<u>Cylinder identification</u>		
• Stamped identification	According to TRG 102	
• Analysis certificate	Under cylinder cap	
• Item No.	On cylinder shoulder	
• Cylinder color	According to European standard DIN EN 1089-3	
	<u>Cylinder body</u>	<u>Shoulder</u>
- Inert gases	Blue	Bright green
- Oxidizing gases	Blue ²⁾	Light blue
- Flammable gases	Blue	Red
- Toxic gas	Blue	Yellow
<u>Storage temperature</u>		
• Winter delivery	- 10 ... +40 °C	
• Summer delivery	+10 ... +40 °C	

Before use, the calibration gases must be left for at least 24 h to ensure the right temperature and homogenization.

Test

In accordance with transport regulations (GGVS) and pressurized container regulations (TRG 102), pressurized containers must be regularly tested by an approved expert.

Dimensions (including cap)

• 10-l steel cylinder	Diameter 140 mm, length approx. 1000 mm
• 10-l aluminium cylinder	Diameter 140 mm, length approx. 1100 mm

Weight (empty, including cap)

• 10-l steel cylinder	Approx. 20 kg
• 10-l aluminium cylinder	Approx. 12 kg

1) Referred to the component concentration

2) Exceptions are possible

Ordering data

Order No.

10-l cylinder with one calibration gas component in residual gas N₂ with certificate

Calibration gas

- CO	> 10 vpm
- NO	> 100 vpm > 20 vpm
- SO ₂	> 100 vpm > 10 vpm
- O ₂	< 21% > 21%
- CO ₂	< 17% > 17%
- H ₂	% v/v
- SF ₆	> 100 vpm > 6.2%
- C ₃ H ₈	> 10 < 100 vpm
- CH ₄	< 5%

7MB1 943-5AA00

7MB1 943-5AA01
7MB1 943-5AA02

7MB1 943-5AA03
7MB1 943-5AA04

7MB1 943-5AA05
7MB1 943-5AA26

7MB1 943-5AA06
7MB1 943-5AA07

7MB1 943-5AA08

7MB1 943-5AA28
7MB1 943-5AA10

7MB1 943-5AA27

7MB1 943-5AA31

Calibration gas concentration

Specify in plain text

10-l cylinder with two calibration gas components in residual gas N₂ with certificate

Calibration gas component 1 Calibration gas component 2

CO >10 vpm	O ₂ <21%
CO >10 vpm	NO >100 vpm
CO >10 vpm	CO ₂ <17% CO ₂ >17%
CO >10 vpm	SO ₂ >100 vpm SO ₂ >10 vpm
SO ₂ >100 vpm SO ₂ >10 vpm	O ₂ < 21%
SO ₂ >100 vpm	NO > 100 vpm

7MB1 943-5AA11

7MB1 943-5AA12

7MB1 943-5AA13
7MB1 943-5AA14

7MB1 943-5AA15
7MB1 943-5AA16

7MB1 943-5AA17
7MB1 943-5AA18

7MB1 943-5AA30

Calibration gas concentration

Specify in plain text

- Calibration gas component 1
- Calibration gas component 2

Concentration ... vpm

Concentration ... vpm or ... %
or ... mg/m³

10-l cylinder with three calibration gas components in residual gas N₂ with certificate

Calib. gas comp. 1 Calib. gas comp. 2 Calib. gas comp. 3

CO >10 vpm	CO ₂ < 17% CO ₂ > 17%	O ₂ < 21%
CO >10 vpm	SO ₂ > 100 vpm	O ₂ < 21%
CO >10 vpm	CO ₂ < 17% CO ₂ > 17%	H ₂
CO >10 vpm	NO > 100 vpm	SO ₂ > 100 vpm

7MB1 943-5AA20
7MB1 943-5AA21

7MB1 943-5AA22

7MB1 943-5AA23
7MB1 943-5AA24

7MB1 943-5AA25

Calibration gas concentration

Specify in plain text

- Calibration gas component 1
- Calibration gas component 2
- Calibration gas component 3

Concentration ... vpm

Concentration ... vpm or ... %
Concentration ... vpm or ... %
or ... mg/m³

Further designs

Special labeling of cylinder
Specify in plain text:

(max. 10 characters, e.g. owner's name)

.....

Sample conditioning equipment

Gases

Pure gases

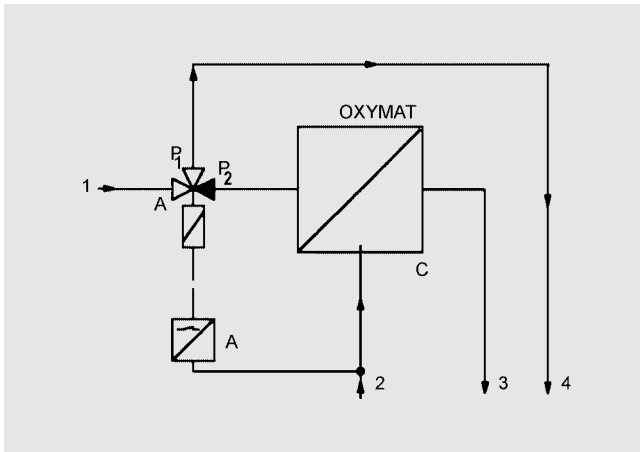
Technical data		Technical data	
Cylinder body	Steel, seamfree	Storage temperature	-20 ... +50 °C
Max. filling pressure	200 bar	Test	In accordance with transport regulations (GGVS) and pressurized container regulations (TRG 101), pressurized containers for pure gases must be regularly tested by an approved expert.
<u>Cylinder identification</u>		<u>Dimensions</u> (including cap)	
• Stamped identification	According to TRG 101	• 10- l cylinder	Diameter 140 mm, length approx. 1000 mm
• Identification of contents	On cylinder shoulder (with purity data)	• 50-l cylinder	Diameter 230 mm, length approx. 1700 mm
• Item No.	On cylinder shoulder	<u>Weight</u>	
• TÜV mark	Stamped on cylinder	• 10- l cylinder	Approx. 16 kg
• Cylinder color	According to European standard DIN EN 1089-3	• 50-l cylinder	Approx. 70 kg
	<u>Cylinder body</u>		
- Hydrogen	Red		
- Nitrogen	Gray ¹⁾		
- Oxygen	Blue ¹⁾		
- Synthetic air	White ¹⁾		
	<u>Shoulder</u>		
	Red		
	Black		
	White		
	White with black ring		
		1) Exceptions are possible	

Ordering data				
Pure gas	Purity	Connection thread to DIN 477	Cylinder size	
Hydrogen H₂	5.0	W 21.80 x 1/14 left-hand	10 l	7MB1 943-5AB00 7MB1 943-5AB02
	5.0	(No. 1)	50 l	
Nitrogen N₂	4.6	W 24.32 x 1/14 right-hand	10 l	7MB1 943-5AB04 7MB1 943-5AB05 7MB1 943-5AB06 7MB1 943-5AB07
	5.0	(No. 10)	10 l	
	4.6		50 l	
	5.0		50 l	
Oxygen O₂	5.0	R ¾ right-hand (No. 9)	50 l	7MB1 943-5AB11
Synthetic air	C _n H _m < 0.1 vpm	R ¾ right-hand (No. 9)	10 l 50 l	7MB1 943-5AB08 7MB1 943-5AB10
Special labeling Specify in plain text: (max. 10 characters, e.g. owner's name)			

Sample conditioning equipment

Gases

Reference gas monitoring for OXYMAT gas analyzers



- A Pressure switch
 B Solenoid valve
 C OXYMAT gas analyzer
 1 Sample gas from gas preparation equipment
 2 Reference gas inlet
 3 Sample gas outlet
 4 Bypass outlet

Fig. 4/40 Reference gas monitoring, function diagram

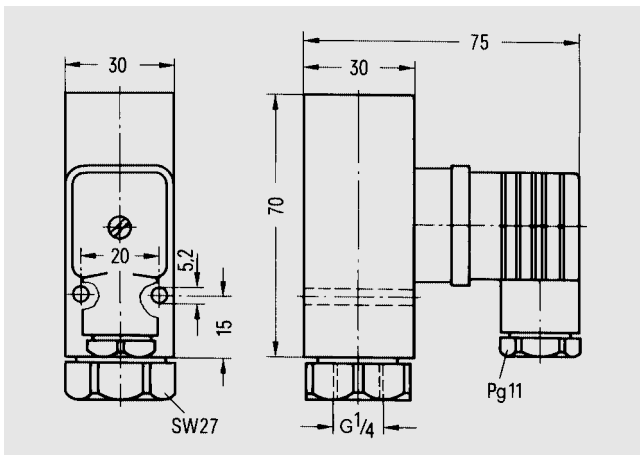


Fig. 4/41 Pressure switch for non-corrosive gases, dimensions

Application

Monitoring the reference gas pressure (N_2 or air) of gas cylinders.

If the pressure drops, the solenoid valve switches the sample gas to a bypass. This routes the sample gas past the OXYMAT into the open air.

The following are required for reference gas monitoring (see Ordering data):

- Pressure switch with threaded joint ¹⁾
- T-piece
- 3-way solenoid valve with threaded joints.

1) Omitted if pressure switch is fitted in OXYMAT 6.

Technical data

Aluminium pressure switch

Medium	N_2 or air
Switching element	Microswitch
- Load capacity of floating contact at 220 V	Max. 3 A
Switching pressure range	0.5 ... 8 bar
Switching pressure difference	
- At start-of-scale	0.35 bar
- At full-scale	1.1 bar
Limit (= max. test pressure)	80 bar
Gas connection	$G\frac{1}{4}$
Permissible ambient temperature	-25 ... +80 °C
Degree of protection to EN 60 529	IP65
Weight	Approx. 0.2 kg

3-way solenoid valve

Material of parts in contact with sample gas	Stainless steel
Gas connections	$G\frac{1}{8}$ female thread
Electrical connection	Cable head, degree of protection IP65
Power supply	230 V AC, 50...60 Hz
Weight	Approx. 0.3 kg

Ordering data

Order No.

Pressure switch
 for N_2 or air from gas cylinder,
 switching pressure range 0.5 to
 8 bar

7MB1 940-1NA00

3/2-way solenoid valve,
 stainless steel, 230 V AC

7MB1 943-2BA70

3/2-way solenoid valve,
 stainless steel, 24 V DC

7MB1 943-2BA75

T-piece,
 stainless steel, for pipe with 6 mm
 outer diameter

7MB1 940-6AF00

Male coupling $G\frac{1}{8}$
 for Teflon hose 4 x 6

See page 4/31

Male coupling $G\frac{1}{4}$,
 brass, for pipe with 6 mm outer
 diameter

See page 4/31

Sample conditioning equipment NO₂-NO converter

NO₂-NO converter

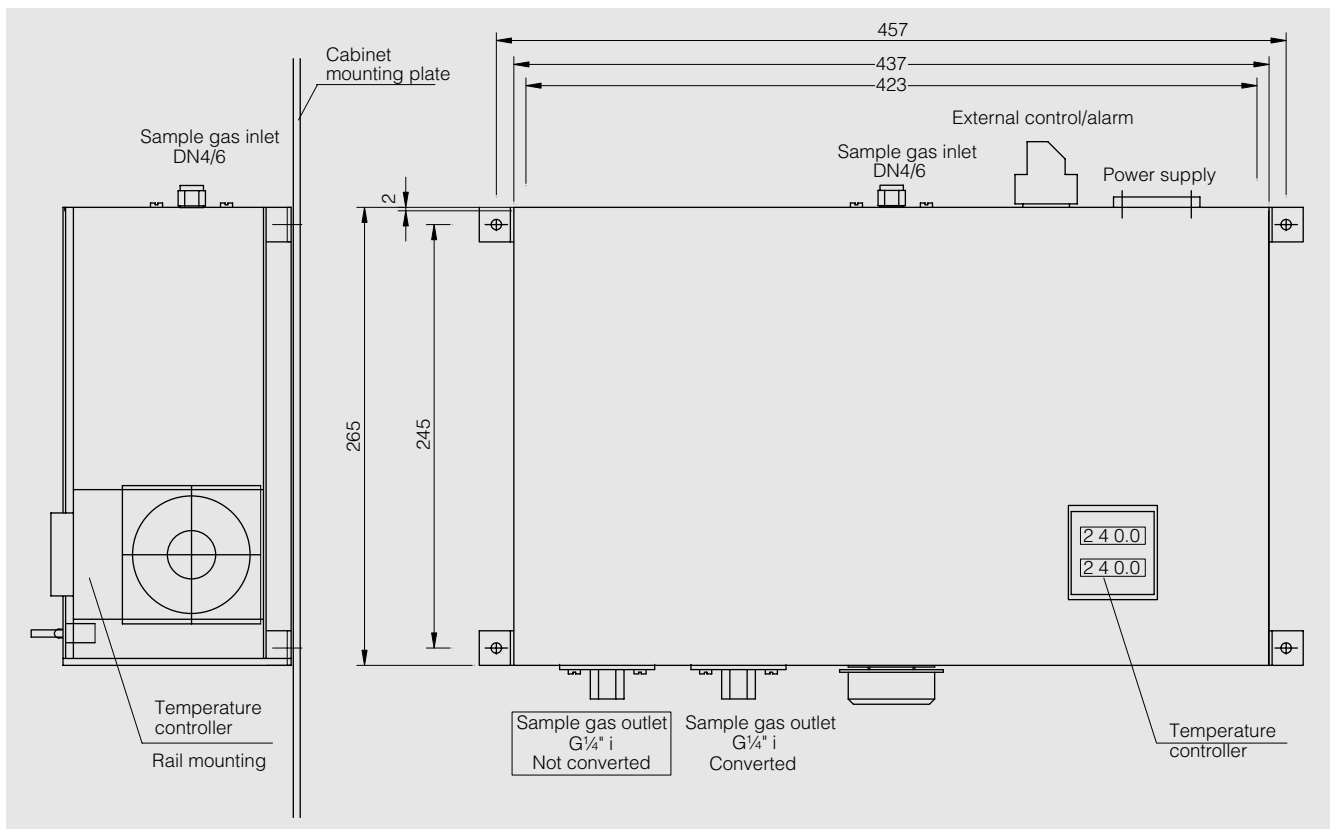


Fig. 4/42 NO₂-NO converter as 19" rack unit, dimensions and control elements

Application

Conversion of NO₂ content in dry sample gases (following sample gas cooler) into NO.

Design

The NO₂-NO converter is available as a 19" rack unit or in a housing for wall mounting.

Mode of operation

The NO₂ is converted into NO in a heated stainless steel pipe filled with catalyst material.

Catalyst material

With an NO₂ concentration above 100 ppm, the converter model with metallic filling should be used to achieve an appropriately long service life.

Service life

The service life of the converter filling depends on the concentration of NO₂ and O₂ and on the gas flow. It is possible to achieve the following approximate service lives for a gas flow of 60 l/h:

NO ₂	O ₂	Graphite	Metallic
50 ppm	5%	Up to 10 000 h	–
500 ppm	5%	–	Up to 10 000 h

Sample conditioning equipment

NO₂-NO converter

NO₂-NO converter

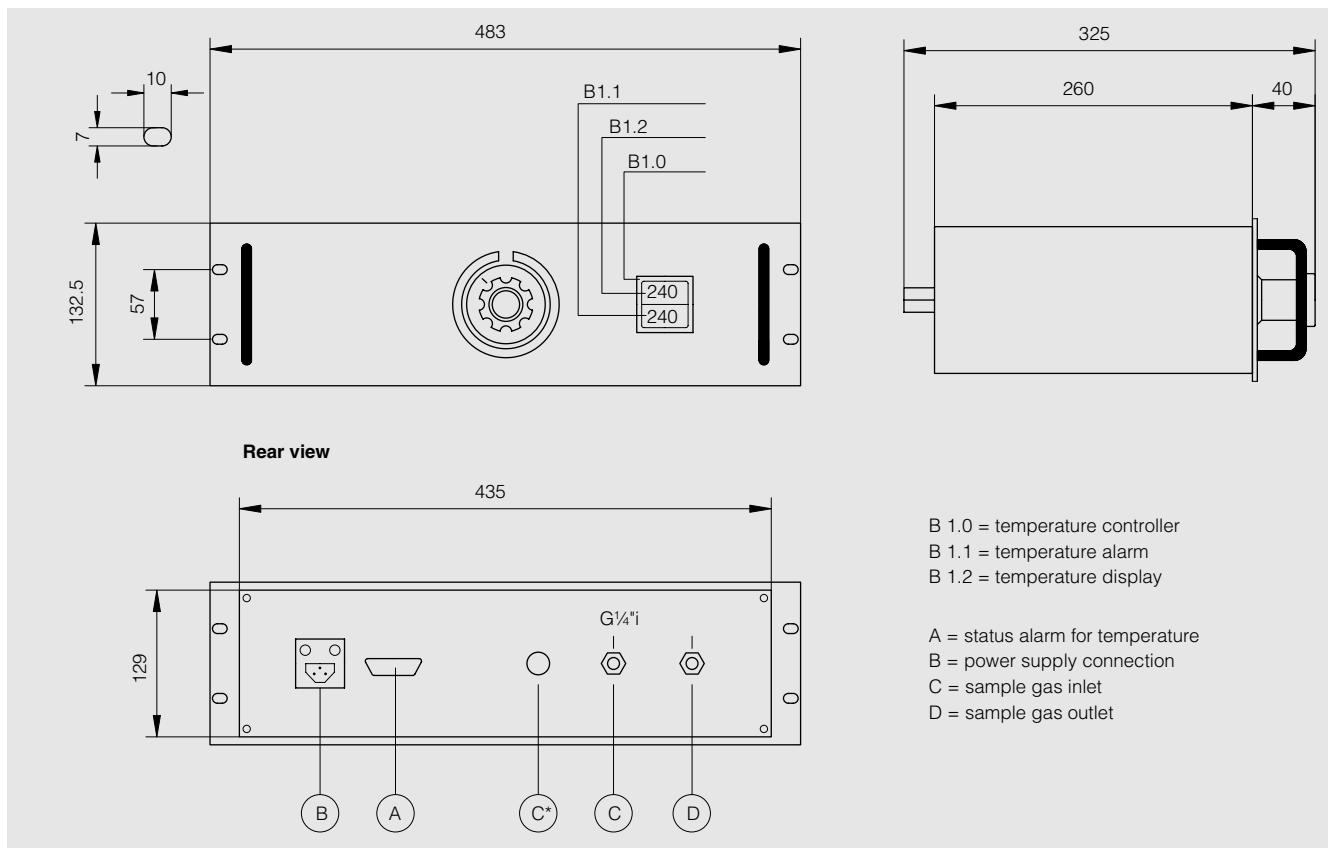


Fig. 4/43 NO₂-NO converter in wall housing, dimensions and control elements

4

Technical data

NO ₂ /NO conversion rate with new converter	> 95%
Converter material	Graphite or metallic (stainless steel)
Operating temperature of converter	
• Graphite	240 °C
• Metallic	680 °C
Gas inlet temperature	Max. +80 °C
Operating pressure	Max. 2 bar
Pressure drop	< 20 mbar
Gas flow	Max. 90 l/h
Volume of converter cartridge	32 cm ³
Preheating time	Approx. 45 min
Materials of parts in contact with sample gas	Stainless steel, PVDF, PTFE, FPM
Gas inlet and outlet	PVDF fitting G ¹ / ₄ "; DIN 228/1
Permissible ambient temperature	
• Operation	10 ... 50 °C
• Transport and storage	-25 ... +65 °C
Permissible relative humidity	< 80%
Power consumption	140...520 VA depending on model
Status contacts	Max. load capacity 24 V, 1 A
Degree of protection to EN 60 529	IP20
Dimensions	See figure
Weight	Approx. 6.0 kg

Ordering data

- NO₂-NO converter, 19-inch rack unit**
3 height units, selectable
- Model as graphite converter, power supply:
 - 230 V AC, 48...62 Hz
 - 115 V AC, 48...62 Hz
 - Model as metallic converter, power supply:
 - 230 V AC, 48...62 Hz
 - 115 V AC, 48...62 Hz
- NO₂-NO converter, wall housing, selectable**
- Model as graphite converter, power supply:
 - 230 V AC, 48...62 Hz
 - 115 V AC, 48...62 Hz
 - Model as metallic converter, power supply:
 - 230 V AC, 48...62 Hz
 - 115 V AC, 48...62 Hz

Replacement graphite converter cartridge

Replacement metallic converter cartridge

Order No.

7MB1 943-2DB20
7MB1 943-2DB21

7MB1 943-2DB30
7MB1 943-2DB31

7MB1 943-2DB24
7MB1 943-2DB25

7MB1 943-2DB34
7MB1 943-2DB35

7MB1 943-2DB28

7MB1 943-2DB38

Overview

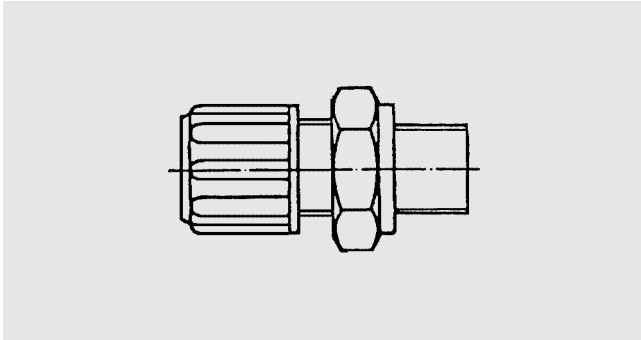


Fig. 4/44 Straight male coupling

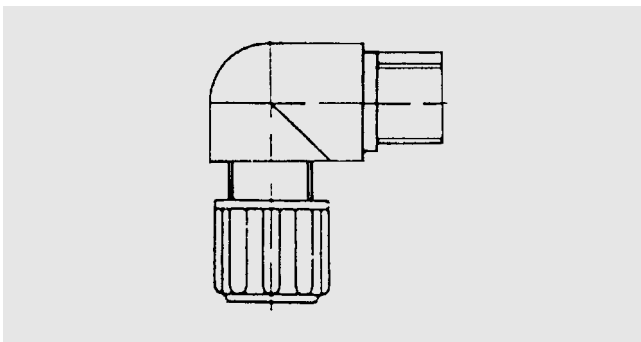


Fig. 4/45 Elbow male coupling

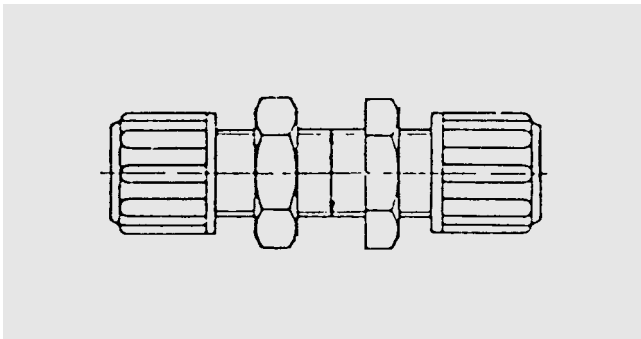


Fig. 4/46 Bulkhead union

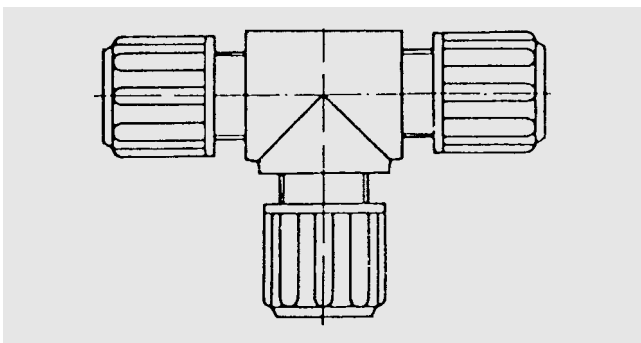


Fig. 4/47 T-coupling

Ordering data

Order No.

PVDF couplings for PTFE hose DN 4/6

- Straight male coupling G $\frac{1}{8}$
- Straight male coupling G $\frac{1}{4}$
- Straight male coupling G $\frac{3}{8}$
- Elbow male coupling G $\frac{1}{8}$
- Elbow male coupling G $\frac{1}{4}$
- Elbow male coupling G $\frac{3}{8}$

7MB1 940-6AA08

7MB1 940-6AA06

7MB1 943-2DA02

7MB1 943-2DA12

7MB1 943-2DA15

7MB1 943-2DA16

PVDF couplings for PTFE hose DN 4/6

- Bulkhead union
- T-coupling
- Elbow coupling

7MB1 943-2DA18

7MB1 943-2DA17

7MB1 943-2DA06

Sample conditioning equipment

Fittings

Fittings made of stainless steel

Overview



Fig. 4/48 Straight male coupling NPT



Fig. 4/49 Elbow male coupling NPT



Fig. 4/50 Straight male coupling



Fig. 4/51 T-coupling



Fig. 4/52 Straight reducer coupling



Fig. 4/53 Straight bulkhead union



Fig. 4/54 Straight male coupling

Ordering data

Order No.

Stainless steel fittings

For pipe with 6 mm outer diameter

- Straight male coupling $1/8$ NPT **7MB1 943-2DA13**
- Straight male coupling $1/4$ NPT **7MB1 943-2DA20**
- Elbow male coupling $1/8$ NPT **7MB1 943-2DA21**
- Elbow male coupling $1/4$ NPT **7MB1 943-2DA22**
- Straight coupling to connect pipes with 6 mm outer diameter **7MB1 943-2DA27**
- T-coupling to connect pipes with 6 mm outer diameter **7MB1 940-6AF00**
- Straight bulkhead union to connect pipes with 6 mm outer diameter **7MB1 943-2DA32**
- Straight male coupling G $1/8$ **7MB1 943-2DA40**
- Straight male coupling G $1/4$ **7MB1 943-2DA42**

For pipe with 8 mm outer diameter

- Straight male coupling $1/4$ NPT **7MB1 940-6AA01**
- Straight male coupling $3/8$ NPT **7MB1 943-2DA14**
- Elbow male coupling $1/4$ NPT **7MB1 943-2DA24**
- Elbow male coupling $3/8$ NPT **7MB1 943-2DA26**
- Straight coupling to connect pipes with 8 mm outer diameter **7MB1 943-2DA28**
- T-coupling to connect pipes with 8 mm outer diameter **7MB1 943-2DA30**
- Straight bulkhead union to connect pipes with 8 mm outer diameter **7MB1 943-2DA33**
- Straight male coupling G $1/4$ **7MB1 943-2DA43**
- Straight male coupling G $3/8$ **7MB1 943-2DA45**

For connection of pipes with 6 mm and 8 mm outer diameters

- Straight reducer coupling **7MB1 940-6AC00**

Accessories

Stainless steel supporting sleeve

- For hose 4/6 **7MB1 943-2DA10**
- For hose 6/8 **7MB1 940-6AB01**

PTFE hose 4/6 (per m)

Natural color, suitable for clamping ring coupling methods

- 7MB1 943-2DB10**

