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You have purchased a high quality, modern instrument
from ABB Automation Products. We thank you for your purchase
and the confidence you have shown in us.

This Instruction Bulletin contains the instructions relating to the assembly and
installation of the instrument and the specifications for this design.
ABB Automation Products reserves the right to make hardware and
software refinements without prior notice.
Any questions which may arise that are not specifically answered by
these instructions should be referred to our main plant in
Göttingen, Germany or to one of our Technical Sales Bureaus.

Introductory Safety Notes

Please read this Instruction Bulletin before attempting the installation of the flowmeter!

Ground the flowmeter system, if the indicator housing includes electrical components (see Instrument Tag and Interconnection Diagram).

Personnel contact protection is negated when the housing cover has been removed and the power is turned on!

Please observe the warning notes with this symbol:



Hazardous Material Regulations

In view of the Disposal Law of 27.08.86 (AbfG, §11 Special Wastes) the possessor of special wastes is responsible for their disposal and at the same time an employer has the responsibility, according to the Hazardous Material Law of 01.10.86 (GefStoffV, §17 General Responsibilities) to protect his employees, we must make note that

- a) all flowmeter primaries and/or converters returned to ABB Automation Products for repair are to be free of all hazardous materials (acids, bases, solutions, etc.).
 - b) the flowmeter primaries must be flushed so that the hazardous materials are neutralized.
There are cavities in the flowmeter primaries between the metering tube and the housing. Therefore after metering hazardous materials these cavities are to be neutralized (see Hazardous Material Law GefStoffV, Appendix I). This requires that the metering tube, float and float stops be removed from the flowmeter housing
 - c) for service and repair, **written confirmation** is required that the measures described in a) and b) have been carried out
 - d) any costs incurred to remove and dispose of the hazardous materials during the repair will be billed to the owner of the instrument.
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1. Installation Recommendations

See also VDI/VDE-Guideline 3513 Sheet 3, Selection and Installation Recommendations for Variable Area Flowmeters.

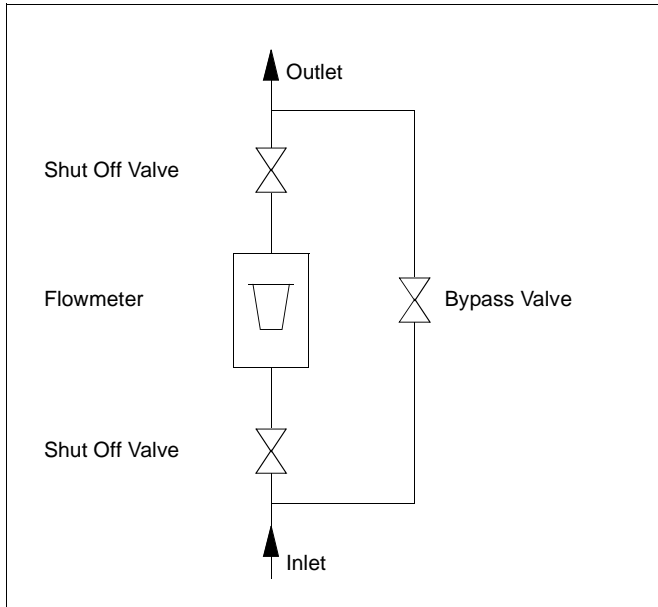


Fig. 1 Flowmeter Installation

The Variable Area Flowmeter 10A6100 is installed vertically in the pipeline. Pipeline vibrations and strong magnetic fields are to be kept at a distance from the flowmeter.

The pipeline size should correspond to the connection size of the flowmeter. In- and outlet straight sections are not required.

Accuracy and Operating Conditions

The floats and metering tubes are selected for a specific set of fluid operating conditions. For liquids and gases these are the pressure and temperature dependent density and viscosity values at the operating conditions. For gases this requires a specific operating pressure and a specific operating temperature. The specified accuracy of the flowmeter is always based on the operation conditions defined in the Specification Sheet.

Pressure Drop

The operating pressure at the flowmeter must be greater than the pressure drop listed in the flowmeter Specification Sheet. The pipeline and fitting losses downstream of the flowmeter must also be considered.

Damping and Compression Oscillations for Gas Flowmetering

When a certain critical volume up- and downstream to the next throttling location is exceeded at low operating pressures, compression oscillations (also called float bounce) may occur.

To prevent these auto-generated compression oscillations the following recommendations should be applied:

- Select a flowmeter with a minimum pressure drop.
- Install with the up- and downstream distances to the next throttling location as short as possible.
- Increase the operating pressure taking into account the resultant flowrate value changes due to the variation in the operating density of the gas

Pressure Shock

Especially when metering gases and liquids containing gas bubbles, fast opening of magnetic valves in combination with unthrottled pipeline sections can result in pressure shocks or oscillations. This can cause the float, due to the sudden change in the pressure, to violently impact the output float stop. In certain circumstances this can result in destruction of the flowmeter.

Solids Contained in the Fluid

Variable Area Flowmeters are suitable for metering fluids containing a limited quantity of solids. The wear on the flowmeter parts is a function of the concentration, particle size and the type of solids. Furthermore, solids can leave deposits on the float which could change its weight and shape. These effects can lead to errors in the flowrate measurements.

Generally in such case the installation of a suitable filter is to be recommended.

Purgemaster »SNAP-IN« Series 10A6100

2. Specifications

Flow Ranges

See Flow Capacity Tables in the Specification Sheet

Measurement Range

≥ 1:10

Accuracy Classes

70 mm scale length

Glass metering tube 4

Trogamid metering tube 10

100/130 mm scale length 6/1.6

38 mm scale length 6

Max. allow. Operating Conditions

Max. allow. operating pressure

for borosilicate glass metering tube: 18 bar

for Trogamid metering tube: 16 bar**

** 16 bar at 20 °C (the max. allow. operating pressure is reduced by 2.5 bar/10 °C temperature increase)

Max. allow. operating temperature

0 to 120 °C for Buna N O-rings

0 to 150 °C for Viton A O-rings

0 to 60 °C for Trogamid metering tube



Warning:

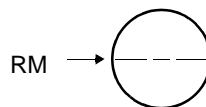
Only operate flowmeters with a protection shield or protection tube over the glass metering tube. It is essential that the maximum allowable operating conditions be observed. (See Instruction Bulletin for installation and start-up information).

3. Installation and Start-Up

The Purgemaster flowmeter is to be installed vertically in the pipeline with the highest scale values at the top. Dependent on the design ordered, the flowmeter is supplied for front or rear panel or wall mounting as well as for pipeline installation. The threaded connections on the rear side are R 1/4" or 1/4" NPT. Two holes or two adapter plates in the housing are provided for wall or panel mounting (see Panel Drilling). When the two holes are utilized for mounting the flowmeter, the procedure is as follows: remove protection shield, metering tube and contrast strip. Slotted, flat head, countersink screws (M5 per DIN 963) are to be used for mounting the flowmeter. When using the adapter plates the length of the M4-screw is to be selected based on the panel thickness. A special wall mount bracket is provided for mounting the differential pressure regulator when one is included.

The flowmeter is started up in steps by slowly opening the separately installed shut off valve. The valve installed in the flowmeter is designed as a control valve and not as a shut off valve.

The diameter of the ball float is also its reading mark (see Figure).



RM = Reading mark for a ball float

4. Maintenance

The float and the metering must be kept clean to assure proper readability and flowmeter operation. The backcheck should also be inspected for cleanliness and functionality. When required, damaged parts are to be replaced.

The flowmeter is disassembled as follows:

1. Lightly squeeze the sides of the protection shield and pull it out from flowmeter housing.
2. For models without a valve or with a valve at the inlet, lightly press the metering tube upward against the spring (approx. 6 to 7 mm). Remove the lower end of the metering tube towards the front of the flowmeter and pull the metering tube away from the outlet fitting. (See Fig. 2)

For models with a valve in the outlet the metering tube is pressed downward against the spring in the inlet fitting (approx. 6 to 7 mm). Remove the upper end of the metering tube towards the front of the flowmeter and pull the metering tube away from the inlet fitting.

3. The metering tube can be cleaned with alcohol or a similar cleaning agent. Trogamid metering tubes must be cleaned with conventional cleaning agents (e.g. soapy water). The flowmeter is reassembled in the reverse order. Special attention must be given to the proper seating of the O-ring seals. It is advisable to lubricate any O-rings which have dried out to facilitate their assembly. O-rings for flowmeters used to meter Oxygen may not be lubricated with grease under any circumstances. Instead the use of Voltalef 90* (BAM tested) is recommended. Damaged O-rings should always be replaced.¹⁾

- 1) When selecting the O-ring material, the corrosion resistance of the O-ring for the fluid being metered must be considered.

* May be obtained from :
Lehmann & Voss & Co, Alsterufer 19, 20354 Hamburg, Germany

5. Disassembly

- 5.1 To clean the needle valve, backcheck or the O-rings, or to replace the metering tube holders it is necessary to first disassemble the flowmeter. Remove the protection shield, metering tube, float as described in Section 4.
- 5.2 The complete valve can be removed from the fitting by unscrewing the valve nut. Loosen cover and knob so that the valve stem can be removed. Check all parts for damage and if required, replace.
WARNING: The PTFE-ring is cut and serves only to stabilize the valve stem.

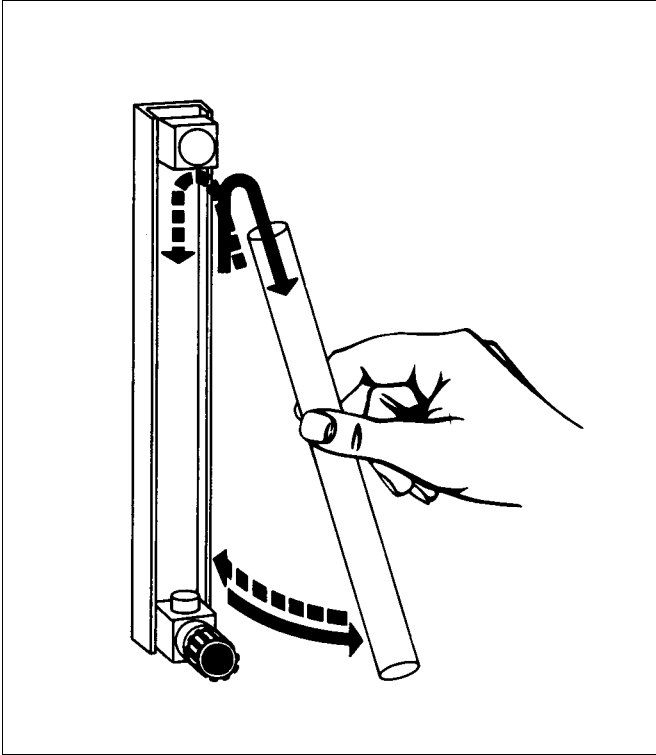


Fig. 2 Removal of the Metering Tube

- 5.3 To clean the backcheck the outlet metering tube holder must be removed from the fitting.
- 5.4 If a fitting is to be removed from the housing the fitting retaining clip (Item 18) located on the rear side must first be removed.
- 5.5 Reassemble in the reverse order.

Removal of the In- and Outlet Fittings

- Remove the metering tube as described in Chap. 4
- The retainer ring (Item 16) can be removed using a pointed object. If the retainer ring is lost, the flowmeter may be reassembled without it.

6. Purgemaster with Differential Pressure Regulator

The flowrate can be maintained at the constant value set using the flow control valve when a differential pressure regulator is combined with the Purgemaster. While the flowrate of liquids remains constant regardless of the up- or downstream pressure variations the regulator is only suitable for gases when the downstream pressure remains constant and only the upstream pressure varies. Under these restrictions the normal volume or mass flowrate of a gas will remain constant at the value set with the needle valve. Additional details may be found in the Instruction Bulletin for the Differential Pressure Regulator (53R2110).

7. Purgemaster with Alarm Transmitter Model 55AN3000 with Switch Amplifier WE77/Ex1-Bi

Interconnection Diagram, see Fig. 3.

A description of its operation may be found in the Specification Sheet D184S032U03.

8. Ordering Replaceable Parts

When ordering replaceable parts please include the flowmeter Serial Number. The Serial Number may be found on the Instrument Tag on the flowmeter housing. The replaceable parts lists are located at the end of this Instruction Bulletin.

Purgemaster »SNAP-IN« Series 10A6100

9. Interconnection Diagram

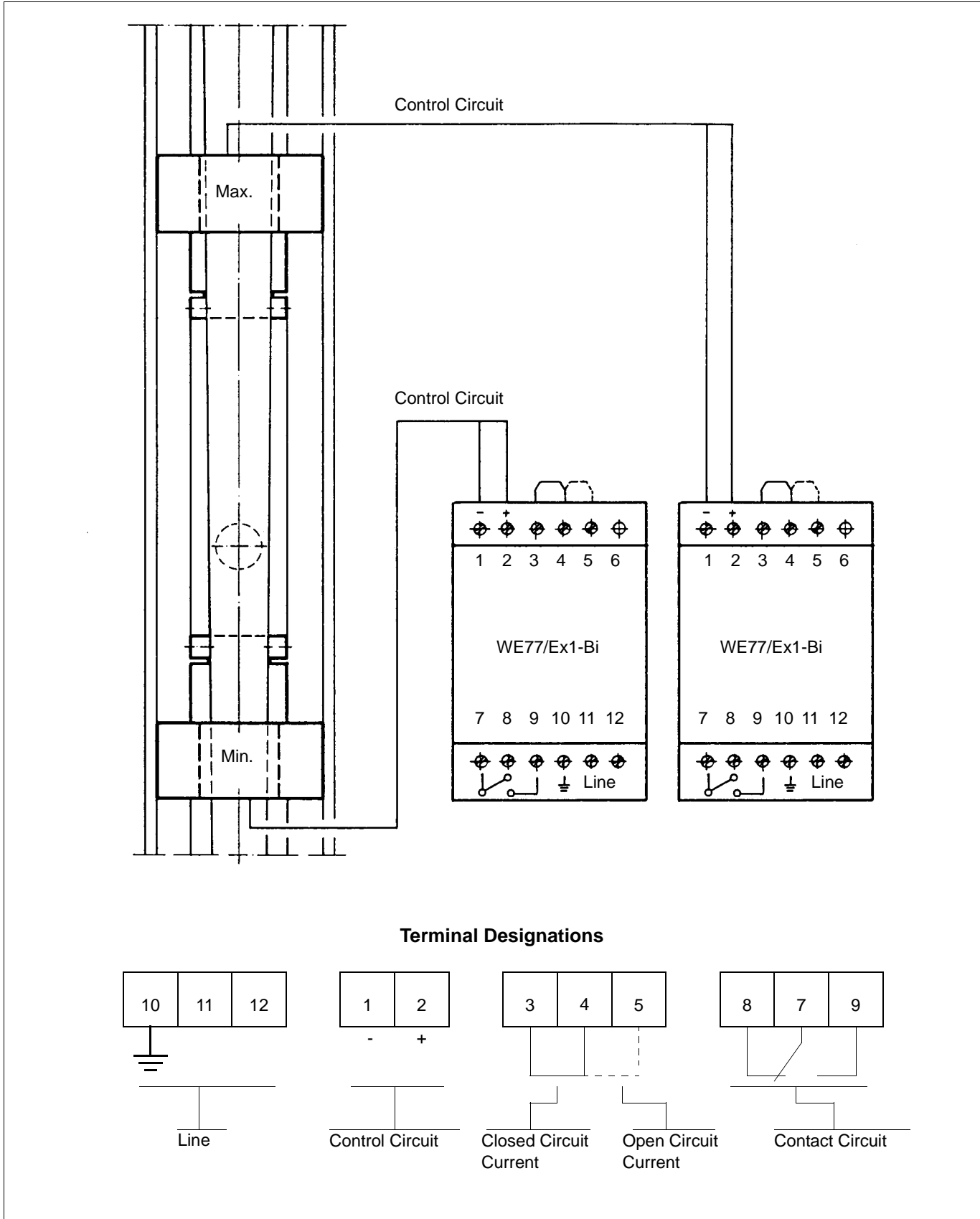


Fig. 3 Interconnection Diagram Alarm Transmitter 55AN3000 with Switching Amplifier WE 77/Ex1-Bi

Purgemaster »SNAP-IN« Series 10A6100

Dimensions

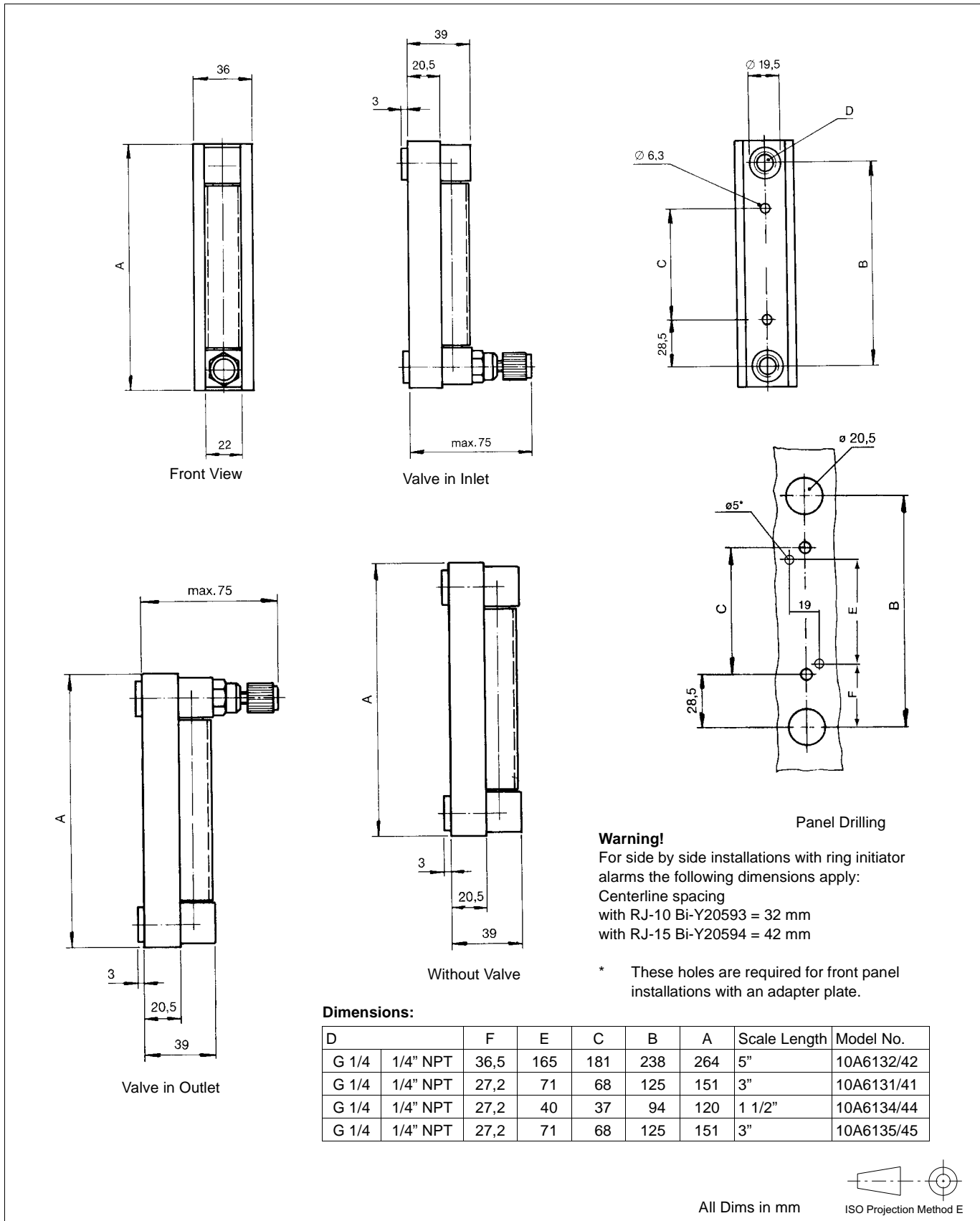


Fig. 5 Pipeline and Front Panel Installation

Dimensions

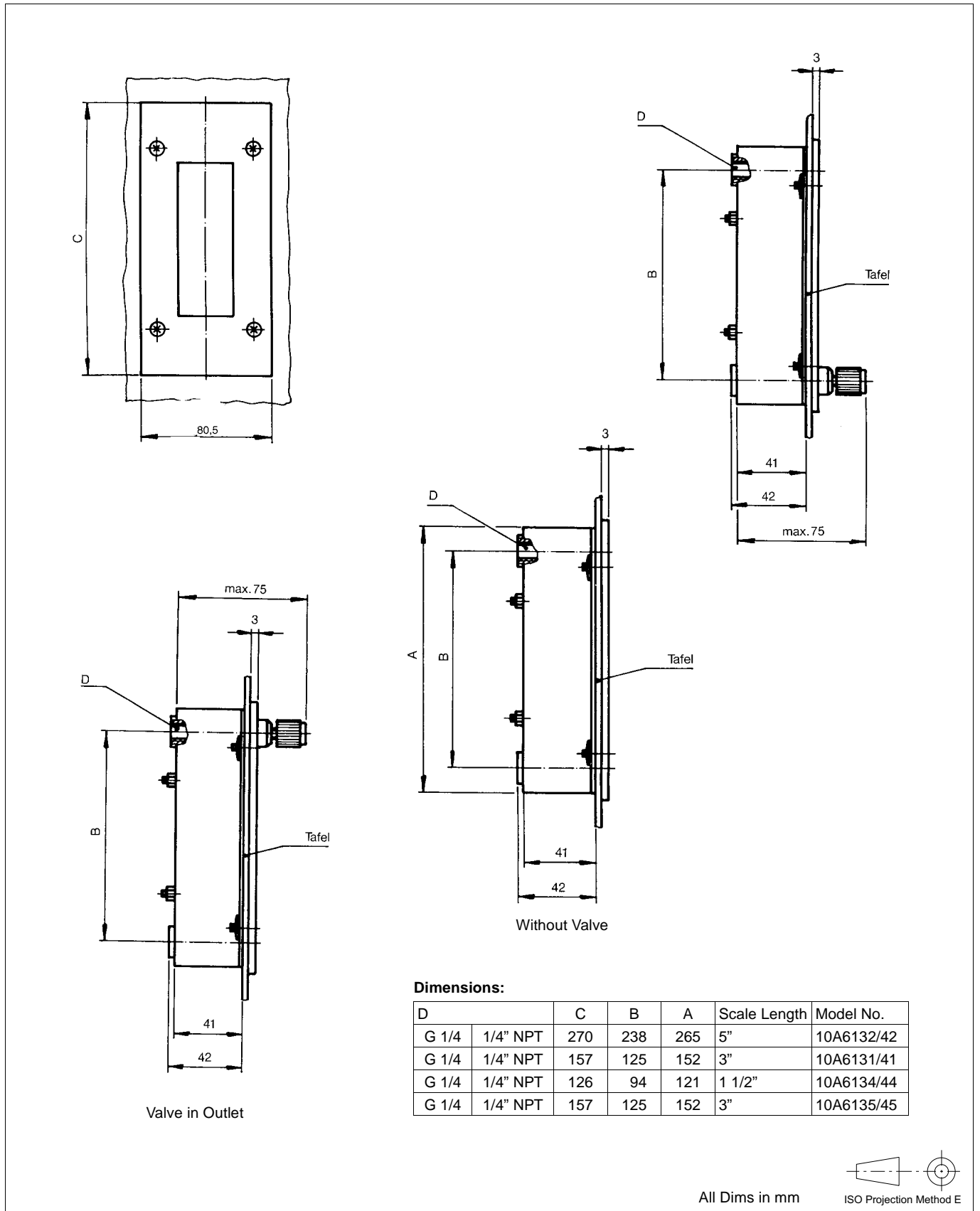
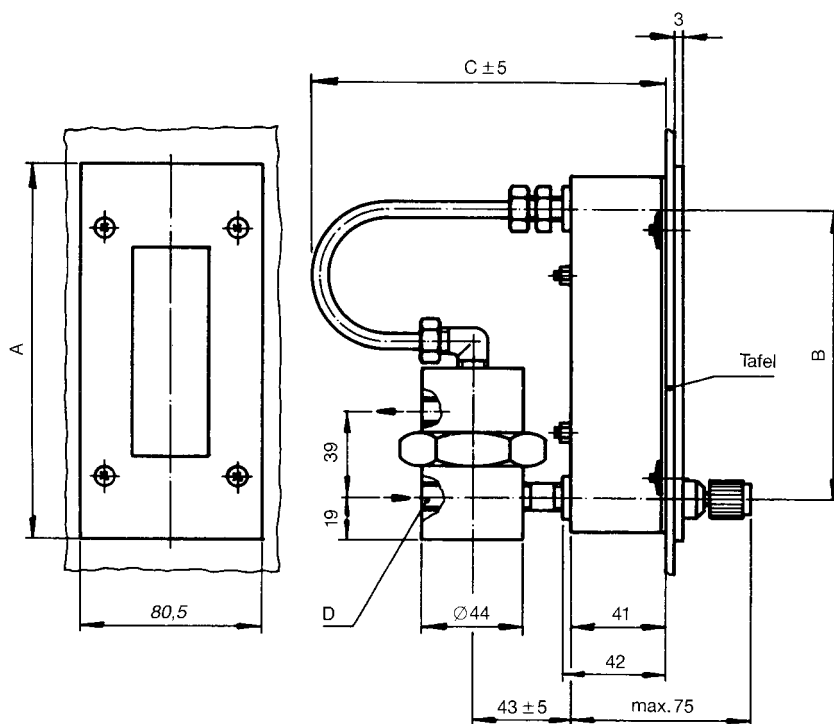


Fig. 6 Rear Panel Installation without Differential Pressure Regulator

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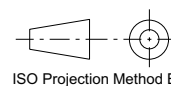
Dimensions



Dimensions:

D		C	B	A	Scale Length	Model No.
G 1/4	1/4" NPT	121	238	270	5"	10A6132/42
G 1/4	1/4" NPT	149	125	157	3"	10A6131/41
G 1/4	1/4" NPT	149	94	126	1 1/2"	10A6134/44
G 1/4	1/4" NPT	149	125	157	3"	10A6135/45

All Dims in mm



ISO Projection Method E

Fig. 7 Rear Panel Installation with Differential Pressure Regulator

Dimensions

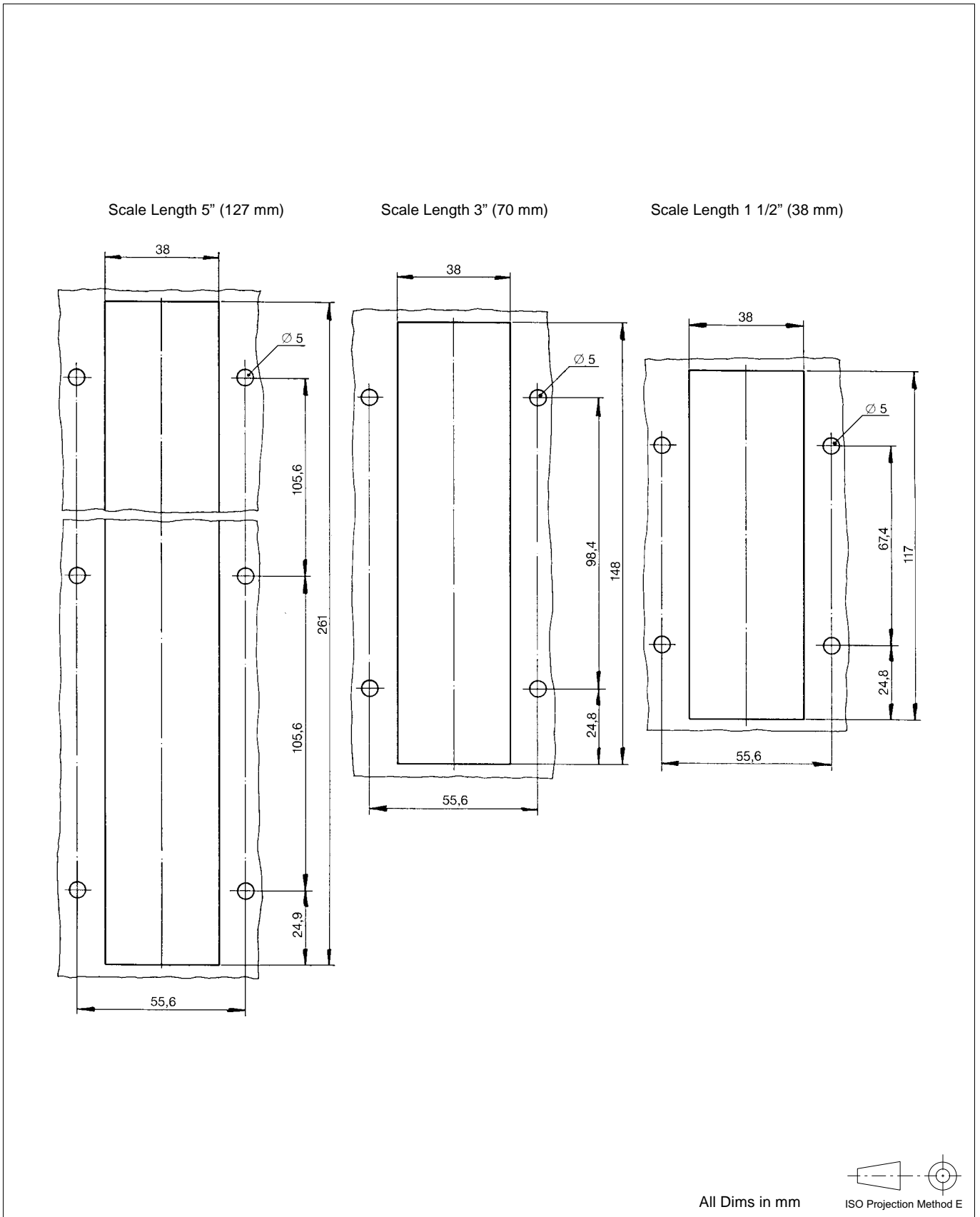


Fig. 8 Panel Cutout for Rear Panel Installation

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11. Replaceable Parts Lists

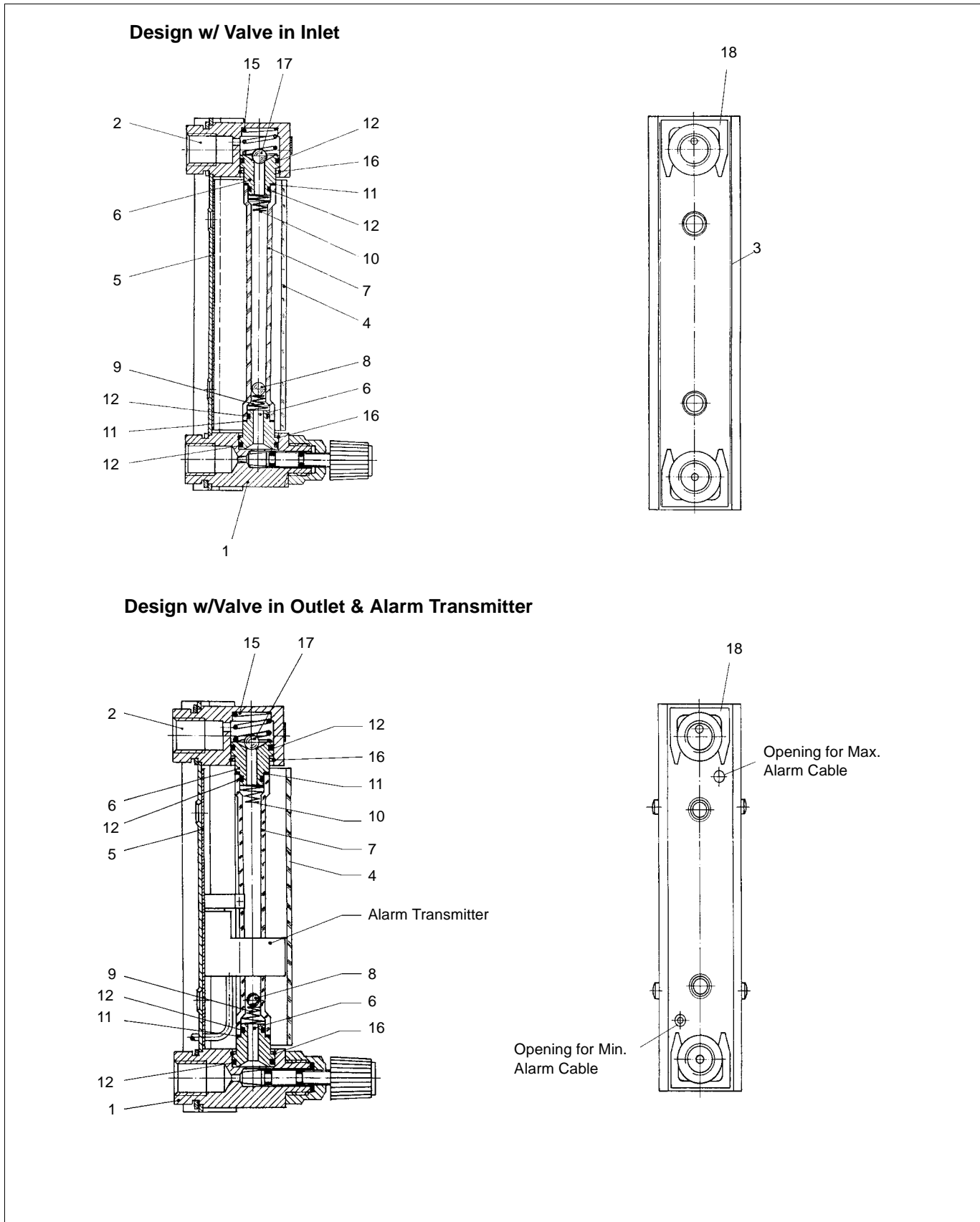
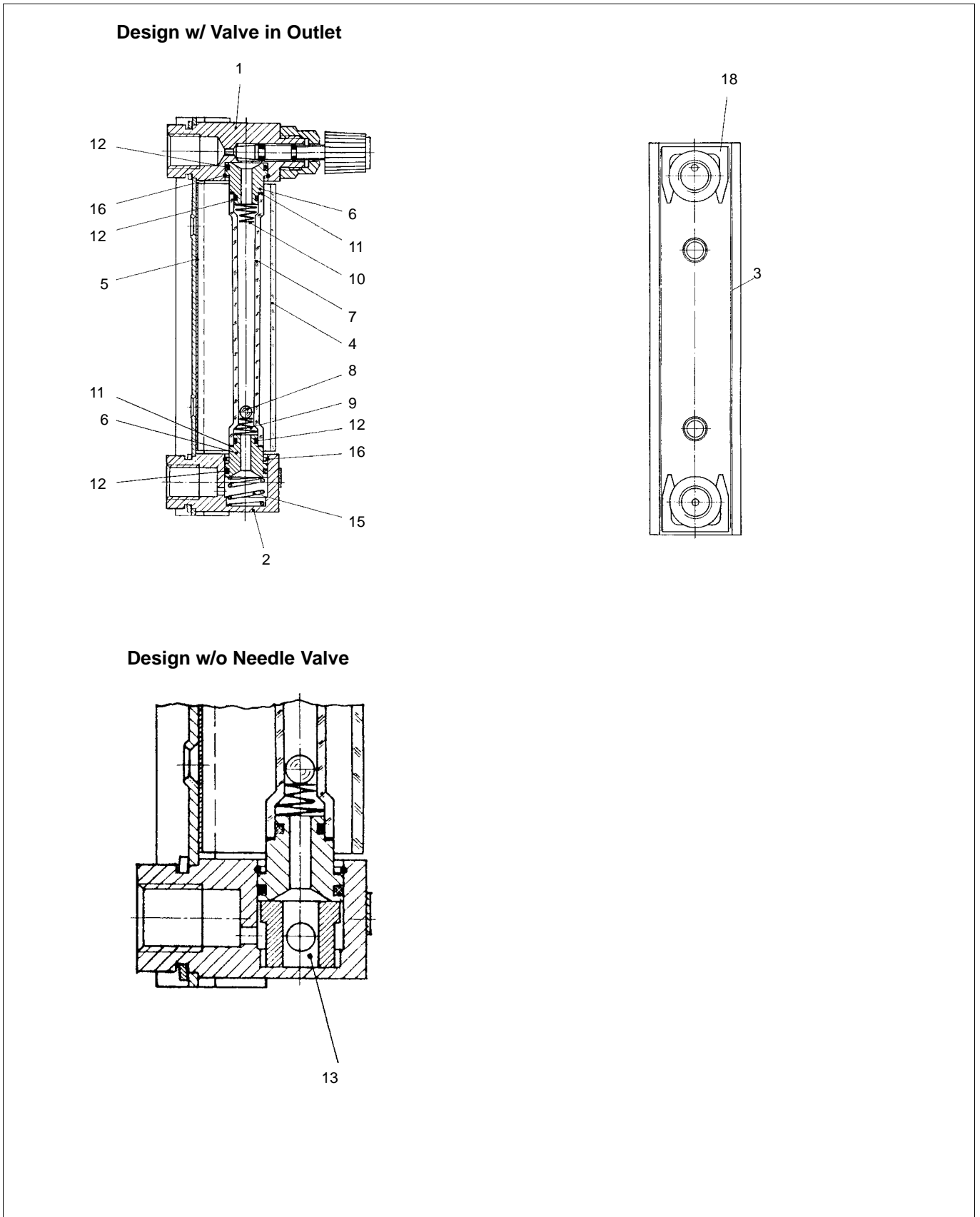


Fig. 9

Replaceable Parts Lists



Purgemaster »SNAP-IN« Series 10A6100

Replaceable Parts List

Item	Description	Qty.	Materials		Comments
			316 Ti No. 1.4571	Brass	
1	Fitting R 1/4"	1	D301A105U02	D301A105U01	
	Fitting 1/4" NPT	1	D301A104U02	D301A104U01	
2	Fitting R 1/4"	1	D301A109U02	D301A109U01	
	Fitting 1/4" NPT	1	D301A108U02	D301A108U01	
3	Housing 1 1/2"	1	D355A023U02	D355A023U02	
	Housing 3"	1	D355A023U03	D355A023U03	
	Housing 5"	1	D355A023U04	D355A023U04	
4	Housing 1 1/2" w/ Alarm	1	D609A665U02	D609A665U02	
	Housing 3"	1	D455A065U03	D355A065U03	
	Housing 5"	1			
5	Protection Shield 1 1/2"	1	D351C041U02	D351C041U02	
	Protection Shield 3"	1	D351C041U03	D351C041U03	
	Protection Shield 5"	1	D351C041U04	D351C041U04	
6	Protection Shield 1 1/2" w/ Alarm	1	D351C066U03	D351C066U03	
	Protection Shield 3"	1	D351C066U04	D351C066U04	
	Protection Shield 5"	1			
7*	Cover strip 1 1/2"		D331C001U01	D331C001U01	
	Cover strip 3"		D331C001U02	D331C001U02	
	Cover strip 5"		D331C001U03	D331C001U03	
8*	Cover strip 3" mit Alarm		D331C002U02	D331C002U02	
	Cover strip 5"		D331C002U03	D331C002U03	
9*	Metering tube holder 1/16"	2	D376C063U01	D376C063U04	
	Metering tube holder 1/8"	2	D376C064U01	D376C064U04	
	Metering tube holder 1/4"	2	D376C065U01	D376C065U04	
7*	Metering tube	1	see SP D184S032U03		
8*	Float	1	see SP D184S032U03		
9*	Inlet float stop 1/16"	1	1D304B1032U01	1D304B1032U01	
	Inlet float stop 1/8"	1	1D304B1023U01	1D304B1023U01	
	Inlet float stop 1/4"	1	1D304B1021U01	1D304B1021U01	
	Only for metering tube FP 1/4"-25-G-5	1	1D304B1022U01	1D304B1022U01	
10*	Outlet float stop 1/16"	1	1D304B1001U01	1D304B1001U01	
	Outlet float stop 1/8"	1	1D304B1002U01	1D304B1002U01	
	Outlet float stop 1/4"	1	1D304B1004U01	1D304B1004U01	
	Only for metering tube FP 1/4"-25-G-5	1	1D304B1003U01	1D304B1003U01	
11*	Only for metering tube FP 1/4"-40-G-6	1	D304B008U01	D304B008U01	
	Washer 1/16"	2	D333C043U01	D333C043U01	
	Washer 1/8"	2	D333C044U01	D333C044U01	
	Washer 1/4"	2	D333C045U01	D333C045U01	
12*	O-ring Kit 1/16" + 1/8" (w/o valve)				for scale length 1 1/2"
	Buna N	1	D605A007U01	D605A007U01	
	Viton	1	D605A007U02	D605A007U02	
	Ethylene Propylene	1	D605A007U03	D605A007U03	
	O-ring Kit 1/16" + 1/8" (w/ valve)				for scale length 1 1/2"
	Buna N	1	D605A007U04	D605A007U04	
	Viton	1	D605A007U05	D605A007U05	
	Ethylene Propylene	1	D605A007U06	D605A007U06	
	O-ring Kit 1/4" (w/o valve)				for scale length 1 1/2"
	Buna N	1	D605A007U13	D605A007U13	
	Viton	1	D605A007U14	D605A007U14	
	Ethylene Propylene	1	D605A007U15	D605A007U15	
O-ring Kit 1/4" (w/ valve)				for scale length 1 1/2"	
Buna N	1	D605A007U16	D605A007U16		
Viton	1	D605A007U17	D605A007U17		
Ethylene Propylene	1	D605A007U18	D605A007U18		

* Recommended replacement parts

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Replaceable Parts List

Item	Description	Qty.	Materials		Comments
			316 Ti No. 1.4571	Brass	
12*	O-ring Kit 1/8" (w/o valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U01 D605A007U02 D605A007U03	D605A007U01 D605A007U02 D605A007U03	for scale length 3"
	O-ring Kit 1/8" (w/ valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U04 D605A007U05 D605A007U06	D605A007U04 D605A007U05 D605A007U06	for scale length 3"
	O-ring Kit 1/4" (w/o valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U13 D605A007U14 D605A007U15	D605A007U13 D605A007U14 D605A007U15	for scale length 3"
	O-ring Kit 1/4" (w/ valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U16 D605A007U17 D605A007U18	D605A007U16 D605A007U17 D605A007U18	for scale length 3"
	O-ring Kit 1/8" (w/o valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U01 D605A007U02 D605A007U03	D605A007U01 D605A007U02 D605A007U03	for scale length 5"
	O-ring Kit 1/8" (w/ valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U04 D605A007U05 D605A007U06	D605A007U04 D605A007U05 D605A007U06	for scale length 5"
	O-ring Kit 1/16" (w/o valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U07 D605A007U08 D605A007U09	D605A007U07 D605A007U08 D605A007U09	for scale length 5"
	O-ring Kit 1/16" (w/ valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U10 D605A007U11 D605A007U12	D605A007U10 D605A007U11 D605A007U12	for scale length 5"
	O-ring Kit 1/4" (w/o valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U13 D605A007U14 D605A007U15	D605A007U13 D605A007U14 D605A007U15	for scale length 5"
	O-ring Kit 1/4" (w/ valve) Buna N Viton Ethylene Propylene	1 1 1	D605A007U16 D605A007U17 D605A007U18	D605A007U16 D605A007U17 D605A007U18	for scale length 5"
13	Intermediate ring	1	D301C002U01	D301C002U01	
15*	Spring	1	D424A015U01	D424A015U01	
16	Retaining ring	2	D376H003U01	D376H003U01	
17*	Ball	1	1D103A1001	1D103A1001	
18	Fitting clip	2	1D390C1002	1D390C1002	
19	Text label (not shown)	1	1D338C1104	1D338C1104	
20	Company Tag (not shown)	1	1D338B1009	1D338B1009	

* Recommended replacement parts

Purgemaster »SNAP-IN« Series 10A6100

Replaceable Parts List

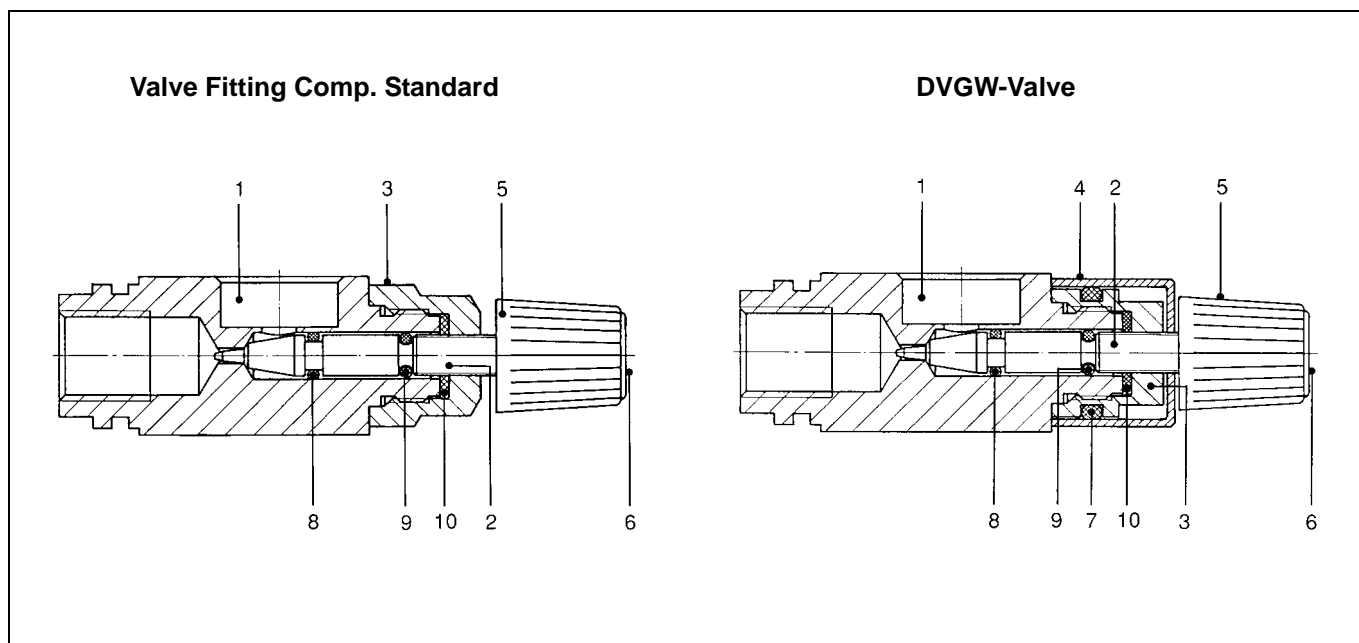


Fig. 11

Item	Description	Qty.	Materials		Comments
			316 Ti No. 1.4571	Brass	
1	Fitting, complete R 1/4" 1/4" NPT	1	D601B065U05	D601B065U01	for larger flow capacities
		1	D601B066U05	D601B066U01	
1	Fitting, complete R 1/4" 1/4" NPT	1	D601B067U05	D601B067U01	for smaller flow capacities
		1	D601B068U05	D601B068U01	
1	Fitting, complete R 1/4" 1/4" NPT	1	D601B069U05	D601B069U01	DVGW-Design, large flow capacities
		1	D601B070U05	D601B070U01	
1	Fitting, complete R 1/4" 1/4" NPT	1	D601B071U05	D601B071U01	DVGW-Design, small flow capacities
		1	D601B072U05	D601B072U01	
2	Valve stem	1	D668B003U02	D668B003U02	small flow capacities
2	Valve stem	1	D668B003U06	D668B003U06	large flow capacities
3	Valve nut	1	D433B003U01	D433B003U01	
3	Valve nut	1			DVGW-Design
4	Protection Shield	1	D433B004U01	D433B004U01	DVGW-Design
5	Rotation ball	1	D124A004U06	D124A004U06	
6	Cover	1	D124A004U07	D124A004U07	
7	O-ring	1	101A711	101A711	DVGW-Design
8	O-ring Viton Buna N Ethylene Propylene	1	101V701	101V701	
		1	101A701	101A701	
		1	101F701	101F701	
9	O-ring	1	101C701	101C701	
10	Flat gasket	1	D377A011U01	D377A011U01	

12. Accessories

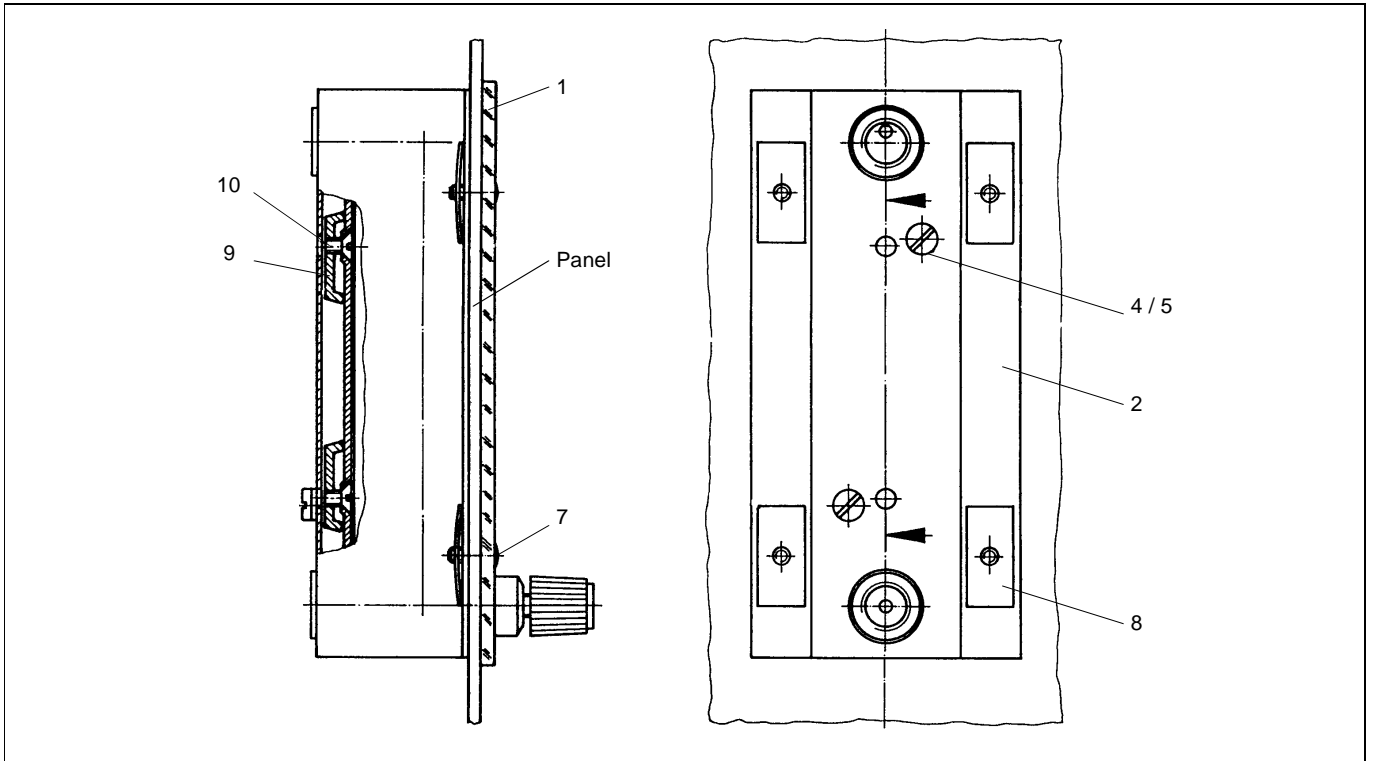


Fig. 12

Item	Description	Qty.	Model 10A6100 1 1/2"	Model 10A6100 3"	Model 10A6100 5"
1	Front plate	1	D351C054U01	D351C055U01	D351C056U01
1	Front plate (for flowmeter w/o valve)	1	D351C054U02	D351C055U02	D351C056U02
2	Mounting bracket	1	D353F057U01	D353F058U01	D353F059U01
4	Screw M4x6 DIN 85	2	D003G106AU20	D003G106AU20	D003G106AU20
5	Spring washer A4.3 DIN 6797	2	D085F021AU32	D085F021AU32	D085F021AU32
7	Phillips phillister head screw M4x12 DIN 7985	4	D004G109AU20	D004G109AU20	D004G109AU20
8	Special nut M4	4	D092K003U01	D092K003U01	D092K003U01
9	Adapter plate	2	D355A040U01	D355A040U01	D355A040U01
10	Slotted flat head csk screw	2	D005G106AU20	D005G106AU20	D005G106AU20



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