Operating Manual
DGMa In-Line Probe Housing

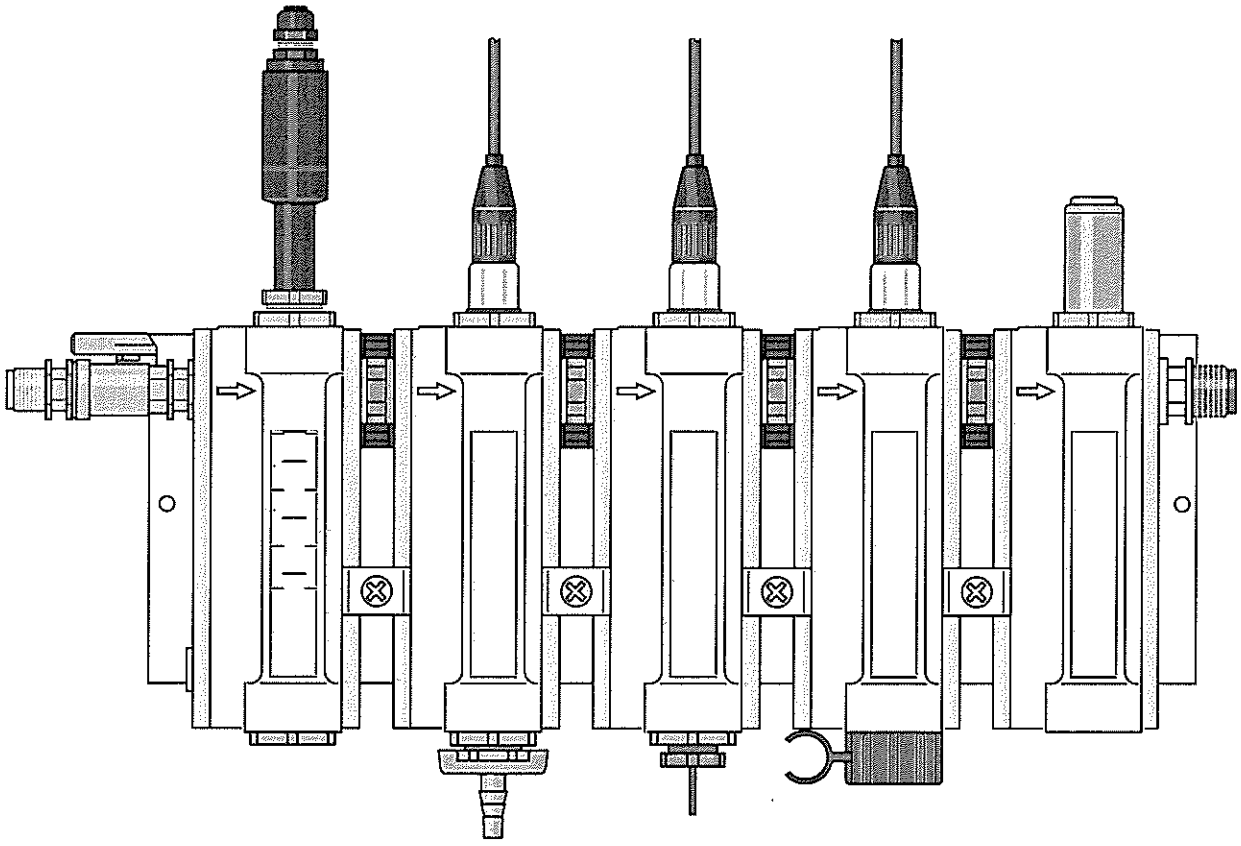


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Identity Code Ordering System For In-Line Probe Housing Modules

DGM — **Flow Housing Module**

A — **Series Version**

Flow monitor module:
- 0 No flow monitor
- 1 With l/h scale
- 2 With gph scale (US)
- 3 With flow monitor, l/h scale
- 4 With flow monitor, gph scale (US)

Number of PG 13.5 modules:
- 0 No PG 13.5 modules
- 1 One PG 13.5 module
- 2 Two PG 13.5 modules
- 3 Three PG 13.5 modules
- 4 Four PG 13.5 modules

Number of 25 mm modules:
- 0 No 25 mm modules
- 1 One 25 mm module*
- 2 Two 25 mm modules*

*assembly set required (791818)

Main material:
- T Transparent PVC

Seal material:
- 0 Viton® A

Connections:
- 0 8 x 5 hose
- 1 PVC DN 10 threaded connector
- 9 Connector nipple/expansion module

Versions:
- 0 With ProMinent® logo
- 1 Without ProMinent® logo

Accessories included:

Wall mounting
for Pg 13.5 module: calibration cup
Pg 13.5 probe assembly set

The identity code below describes a fully assembled combination of flow monitor with sensor, two Pg 13.5 modules (e.g. for pH and redox probes) and a 25 mm module (e.g. for chlorine probe CLE 3). Fitted with 8 x 5 hose connector.

Recommended accessories:	**Order No.**
Probe mounting kit 25 mm (CLE, BRE, CGE, CTE, CDE, OZE):	791818.8
for potential equaliser plug	791663.8
flow sensor	791635.6
additional calibration cup	791229.8
Sampling Tap for DGM	
for 13.5 module	1004737
for 25 mm module	1004739

Viton® is a registered trademark of DuPont Dow Elastomers.

DGM A 3 2 1 T 0 0 0

General Notes for the User

Please read through the following notes. This information will help you use the operating manual more effectively.

Points are highlighted as follows:

- lists

▶ instructions

Operating advice:

NOTES

Notes are intended to make your job easier.

and safety advice:



WARNING

Describes a potentially dangerous situation. Non-observance can lead to serious personal injury!



IMPORTANT

Describes a potentially dangerous situation. Non-observance can lead to damage to property!

1 About the In-Line Probe Housing

The in-line probe housing has a modular structure. To maximise volume, it is designed so that one probe can be installed in every module. The ideal flow around the probes keeps response times low. The flow is guided towards the probes from below.

The in-line probe housing modules are supplied pre-assembled on a mounting panel.

2 Safety

For use as specified below:

- The DGMa must be used exclusively for drinking water, swimming pool water or water of a similar quality that does not contain solid matter.
- All other applications and modifications are prohibited.
- The DGMa must not be used for gaseous or solid media.
- The DGMa must be assembled and installed by trained, authorized staff only.

Safety advice



IMPORTANT

- ***Before using the DGMa in corrosive media, check the resistance of the housing material (please refer to the chemical resistance list in ProMinent's product catalogue or www.prominent.de).***
- ***Observe the maximum operating parameters for the whole in-line probe housing (e.g. pressure, temperature). Take into account the lowest maximum operating parameters of the in-line probe housing components and probes (please refer to the individual operating manuals). Please also note any temperature dependences.***

3 Description of Component Function

The ball valve (1) regulates and stops the flow. The flow module (2) has a float (4), which indicates the flow.

A flow sensor (3) monitors the flow. There is a reed contact (changeover) in the tip of the flow sensor, which opens if the float moves more than 2 mm away from the sensor or closer towards it.

The flow plug ensures optimal flow to the membrane capped DULCOTEST® sensors ("25 mm", 10). It prevents air bubbles from forming on the membrane of the DULCOTEST® Perox sensor (PG 13.5, 5).

The equipotential plug (8) contains a potential equaliser pin.

The outlet nozzle (6 or 10 for 25 mm or PG 13.5 version) (standard) and the sampling tap (11, 25 mm or PG 13.5 version) (optional) allow you to take water samples and empty a module.

The calibration cup (8) can be used to calibrate the pH or redox probes without dismantling them. It also has a potential equaliser pin.

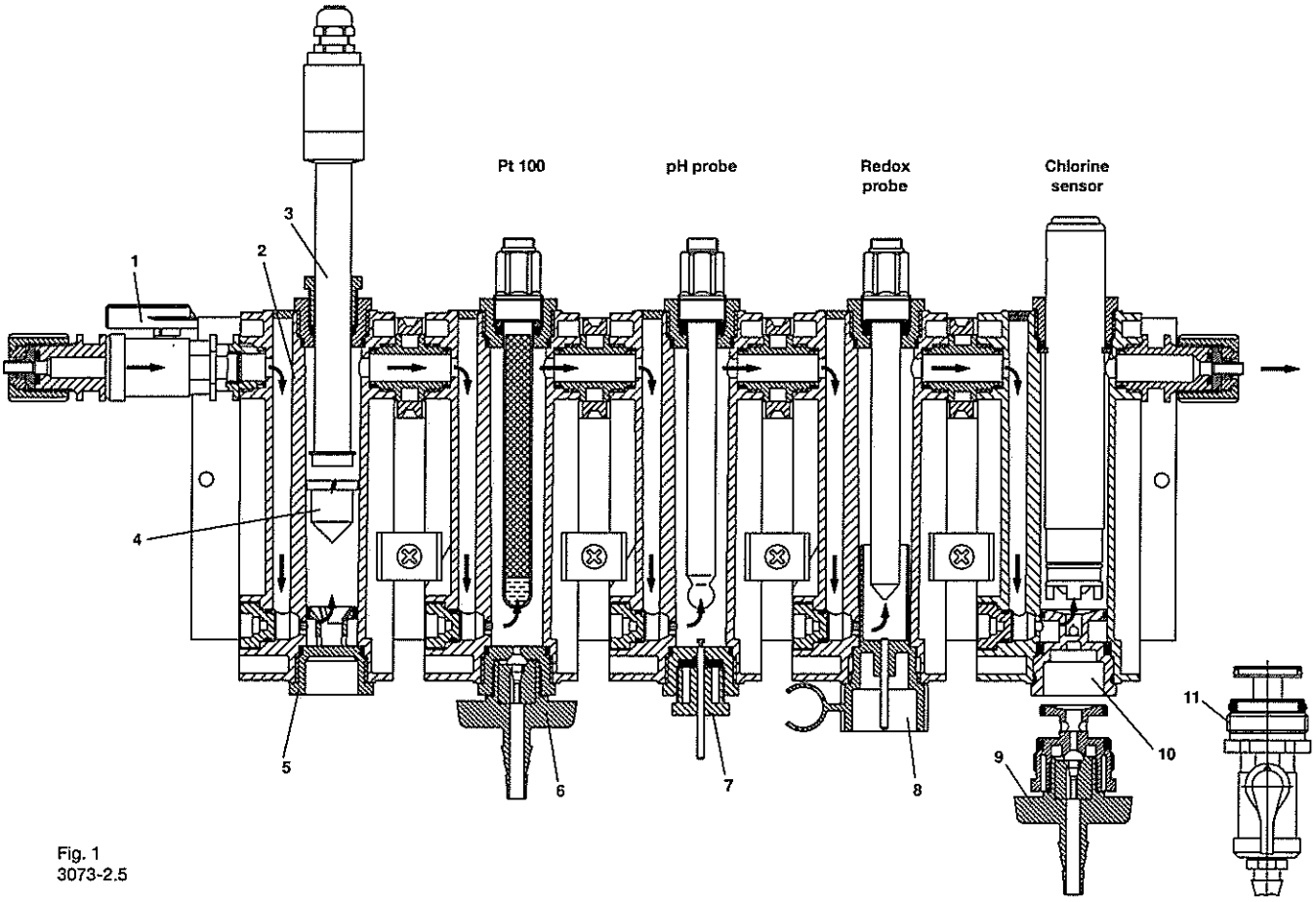


Fig. 1
3073-2.5

4 Storage and Transport

IMPORTANT

- ***Store and transport the DGMa in its original packaging.***
- ***Protect the DGMa from the effects of chemicals, even when packed.***

Environmental conditions:

Storage and transport temperature	-10 °C ... + 60 °C
Humidity	with flow sensor: max. 90 % relative humidity, non-condensing

5 Assembly and Installation

5.1 Assembly

IMPORTANT

- ***Observe the flow direction (there are arrows on the modules)***
- ***Install the in-line probe housing horizontally in an upright position***
- ***If it contains a flow module, install the in-line probe housing vertically***
- ***Failure to do so may lead to problems with flow measurement***
- ***Leave a space of approx. 300 mm above and 100 mm below the modules for:***
- ***Installing the probes***
- ***Setting the flow monitor***
- ***Screwing in the calibration cup***
- ***Taking samples.***

NOTE

Moistening the seals slightly first will make it easier to assemble the components of the in-line probe housing.

Securing the mounting panel (see figure 3044-31):

- ▶ Drill 2 mounting holes in a smooth wall
- ▶ Secure the mounting panel to the wall.

Installing the connections

- ▶ Screw the ball valve onto the in-flow side
- ▶ Screw a connector set onto the ball valve
- ▶ Screw a connector set onto the out-flow side

Installing the probes and flow sensor

IMPORTANT

The first module must be the in-line probe housing module.

Probe with PG 13.5 threaded connector (please refer to the probe operating manual):

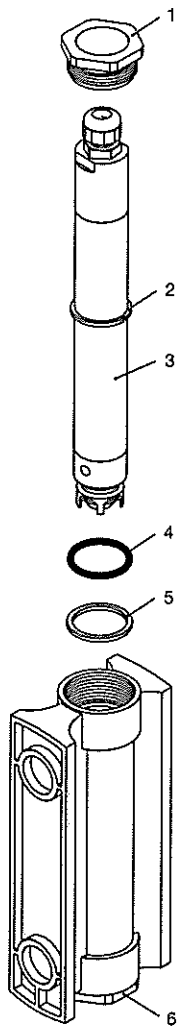
- ▶ Remove the upper blanking plug of a module
- ▶ With pH and redox probes, remove the transparent protective cap if there is one (do not discard the protective caps)
- ▶ Screw the reducing pipe nipple into the module
- ▶ Screw in the probe
- ▶ With DULCOTEST® Perox sensors, screw the flow plug of an in-line probe housing module into the module from below

Sensor with a diameter of 25 mm (please refer to the sensor operating manual and figure 2):

IMPORTANT
Lower the sensor into the in-line probe housing slowly to avoid stretching the membrane.

- ▶ Remove the upper Welsh plug of a 25 mm module
- ▶ First push the O-ring (4) and then the clamping disc (5) onto the sensor (3) from below
- ▶ Then push the attachment screw (1) onto the sensor (3) from above
- ▶ Insert the sensor carefully into the modul
- ▶ Tighten the attachment screw (1)
- ▶ Screw a flow plug (6) into the bottom of the module

Fig. 2



Flow sensor (see figure 3)

- ► Remove the upper Welsh plug of the flow module
- ► Push the flow sensor (1) into the flow module
- ► Tighten the reducing pipe nipple (3)
- ► Tighten the clamping nipple (2)

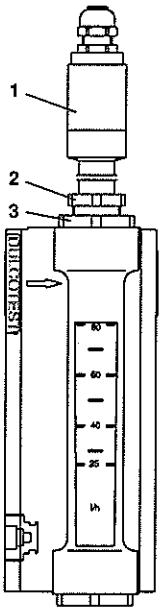


Fig. 3

Installing additional accessories:

- ► Screw in the equipotential plug underneath the appropriate probe
- ► Instead of a lower Welsh plug, screw in the sampling tap (two sizes: PG 13.5 or d = 25 mm).

5.2 Hydraulic Installation

IMPORTANT

- ***Observe the maximum operating parameters for the whole in-line probe housing (e.g. pressure, temperature, flow)! Take into account the lowest maximum operating parameters of the in-line probe housing components and probes (please refer to the individual operating manuals)! Please also note the temperature dependence of the maximum pressure!***
- ***Assemble the in-line probe housing in such a way that the modules cannot drain off and fill with air, even when the water is stationary!***
- ***There must be stop valves in the in-flow and out-flow of the module block!***
- ***When assembling the in-line probe housing, take steps to prevent positive suction pressure from building up inside it!***
- ***When installing the in-line probe housing in a free flow system, lay the out-flow cable in an ascending S-shape.***
- ***Install a filter in the supply cable of the in-line probe housing if the water is contaminated (take into account any depletion caused by the filter).***
- ***If the in-line probe housing is installed in a fixed pipe, the power supply must be switched off before the module block is fitted.***

- ► Connect the in-flow cable to the ball valve connector set
- ► Connect the out-flow cable to the connector set on the out-flow side.

5.3 Electrical Installation



WARNING

- ***Connect the flow sensor to extra-low voltage circuits only ((SELV) in accordance with EN 60335-1)!***
- ***The cable must have a diameter of 4 mm for the screwed cable gland to possess the type of protection IP 65.***

- ► Take hold of the upper part of the flow sensor, turn it a quarter of a turn anticlockwise and remove it (bayonet fitting).
- ► Loosen the locking screw of the M12 connection and insert the cable from the alarm device.
- ► Strip 2 cm off the cable.
- ► Strip the ends of the wires and fit connector sleeves.
- ► Connect the flow sensor to the alarm unit in accordance with the following table:

Terminal	Contact
1	N/C
2	Source (C)
3	N/O

Technical data (voltage-free reed contact):

Switch power	max. 3 W
Switch voltage	max. 42 V (protective extra-low voltage (SELV))
Switch current	max. 0.25 A

- ► Provide approx. 5 cm of spare cable inside the flow sensor and tighten the attachment screw of the M12 connection.
- ► Push the upper part of the sensor right into the housing and carefully turn it clockwise until it locks into place, taking care that the notches on the bayonet fitting do not break off.

6 Commissioning the DGMa

6.1 Setting the Flow

Use the ball valve to change the flow. Read the flow off the flow module (upper edge of the float).

6.2 Setting the Switch Point of the Flow Sensor



IMPORTANT

- ***It is possible for water to escape and spray arround.***
- ***Take appropriate measures, if necessary.***

- ► A drop in the flow should cause the contact to open (the flow sensor is connected via an N/C contact (T1 – T2; (NC – C)):
- ► Use the ball valve to set the flow at 50 l/h
- ► Hold the flow sensor tightly and loosen the clamping nipple slightly
- ► Use the flow sensor to push the float down to 40 l/h – the connected alarm should be deactivated automatically
- ► Hold the flow sensor tightly and tighten the clamping nipple
- ► To test it, decrease the flow – this should activate the alarm
- ► Check that the threaded connector is sealed properly.

6.3 Calibrating the Probes

IMPORTANT

- ***It is possible for water to escape and spray arround. Take appropriate measures, if necessary.***
- ***If a potential equaliser pin is used during measurement, a potential equaliser pin must also be connected during calibration and immersed in the same medium as the probe (please refer to the operating manual of the measurement and control system).***

pH and redox probes:

pH and redox probes can also be calibrated/checked after installation. Use the calibration cup supplied for this purpose.

- ▶ Close the ball valve in the in-flow of the in-line probe housing
- ▶ Close the stop valve in the out-flow of the in-line probe housing
- ▶ Unscrew the blanking plug of the appropriate module
- ▶ Fill the calibration cup with buffer solution up to the mark
- ▶ Screw the calibration cup carefully into the module from below
- ▶ If a potential equaliser pin is used during measurement, connect the potential equaliser pin to the calibration cup.
- ▶ Calibrate/check the probe (please refer to the operating manual of the control system).
- ▶ Unscrew the calibration cup and screw in the Welsh plug
- ▶ Connect the potential equaliser pin of the Welsh plug
- ▶ Open the ball valve slightly and check that the module is sealed properly before opening the system fully
- ▶ Set the flow as required (see section 6.1).

Membrane capped sensors:

Please refer to the operating manual for the sensor.

6.4 Replacing/Adding Modules

IMPORTANT

- ***It is possible for water to escape and spray arround. Take appropriate measures, if necessary.***
- ***All module connections are fragile. Tighten them gently by hand.***

NOTE

- ***If you would like 4 or 5 modules instead of just 2 or 3, a mounting panel for 4 to 5 modules is required.***
- ***Moistening the seals slightly first will make it easier to assemble the modules.***

To replace a module, proceed as follows:

- ▶ Close the ball valve and, if there is one, the stop valve on the out-flow side
- ▶ Unscrew and store the probes (please refer to the probe operating manuals)
- ▶ Remove all hoses from the in-line probe housing
- ▶ Unscrew all modules and release them from the clamps
- ▶ Empty the modules
- ▶ If a larger mounting panel is required, remove the existing mounting panel from the wall
- ▶ Release the module that is to be replaced from the module block (figure 4 in reverse)
- ▶ Check that all O-rings are inserted on the connection nipples of the new module
- ▶ Moisten the connection nipple of the new module with water
- ▶ Place the new module on the module block as shown in figure 4.

IMPORTANT

- ***All of the arrows on the modules must point in the same direction.***
- ***If the modules cannot be screwed in easily, start again.***

  If you do not, the connection will not be sealed properly and you will not be able to separate the modules again without damaging them.

- ▶ Turn the module clockwise until it is straight upside down
- ▶ If a larger mounting panel is required, move the clamps
- ▶ Press the new module block into the mounting panel clamps
- ▶ Close the outlet nozzle or the sampling tap
- ▶ If it has been removed, screw the mounting panel back onto the wall
- ▶ Screw in the probes and, if necessary, calibrate them (please refer to the probe operating manuals)
- ▶ Connect the hoses of the in-line probe housing
- ▶ Open the ball valve and, if there is one, the stop valve on the out-flow side slightly
- ▶ Check that the modules are sealed properly
- ▶ Set the flow.

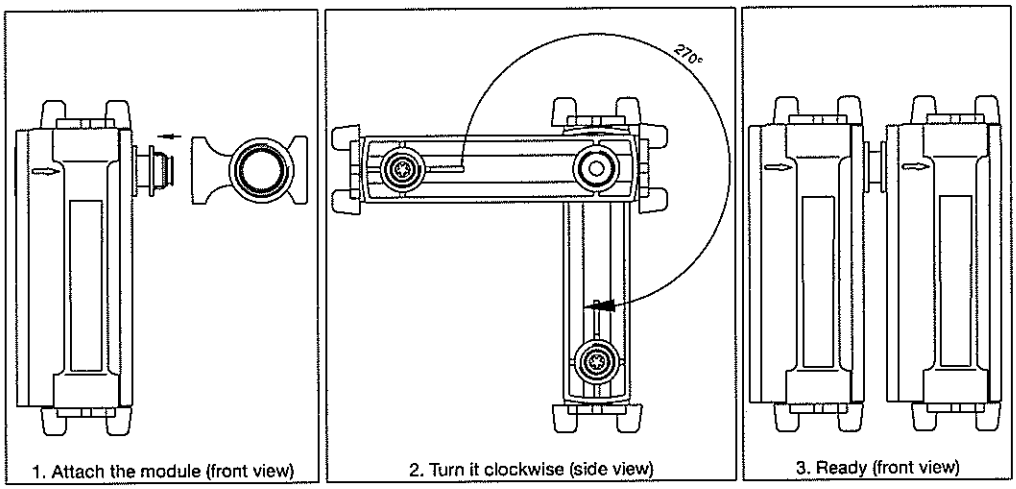


Fig. 4
3075-3

7 Troubleshooting

IMPORTANT

- ***It is possible for water to escape and spray arround.***
- ***Take appropriate measures, if necessary.***

Failure: the float does not show the correct flow rate or has become stuck
Reason: dirt in the water in the in-line probe housing module
Remedy: clean the module and the float using a cloth and test tube brush, or other similar item, and, if necessary, insert a filter

IMPORTANT

- ***Do not use chemical cleaning agents!***
- ***They may attack the DGMa!***

Reason: the in-line probe housing module is not completely straight
Remedy: install the in-line probe housing module so that it is vertical

Failure: the flow sensor contact does not open
Reason: the reed contact has jammed because the electrical voltage was too high (even if only for a short period)
Remedy: reduce the voltage using a protective resistor and replace the flow sensor

Failure: the reading produced by a pH or redox probe is unstable. It cannot be calibrated.
Reason: a potential equaliser pin has not been connected although the measurement and control system has been prepared for it.
Remedy: connect a potential equaliser pin (use an equipotential plug)

Reason: the measurement and control system has not been prepared for measurement with a potential equaliser pin (e.g. there is no jumper in the system)
Remedy: prepare the measurement and control system for this type of measurement (e.g. jumper two terminals in the system)

Reason: the measurement and control system has not been prepared for measurement without a potential equaliser pin (e.g. terminals 9 and 10 in the D1C have not been jumpered)
Remedy: prepare the measurement and control system for this type of measurement (e.g. connect a jumper in the system)

Reason: the probe is dirty, defective or requires regeneration
Remedy: clean, replace or regenerate the probe (please refer to the probe operating manual)

Failure: there is air in the in-line probe housing
Reason: the in-line probe housing has been installed incorrectly
Remedy: install the in-line probe housing correctly (please refer to the "Installation" section)
Open the stop valves fully and increase the flow rate to a maximum of 100 l/h until the air is forced out of the in-line probe housing

Failure: the sampling tap does not release any water
Reason: positive suction pressure in the in-line probe housing
Remedy: install the in-line probe housing correctly (please refer to the "Installation" section)

Failure: the flow changes over a few hours
Reason: the module admission pressure is not constant
Remedy: check the function of the pump in front of the in-line probe housing.
Check that the pump has been installed correctly.

8 Disposal

IMPORTANT

Please comply with the current regulations in your country!
In Germany, old components can be deposited at communal collection points in towns and communities!

9 Technical Data

IMPORTANT

- ***The maximum operating parameters for the whole in-line probe housing (e.g. pressure, temperature, flow) are the lowest maximum operating parameters of the in-line probe housing components and probes (please refer to the individual operating manuals)!***
- ***Please also take the technical data of all other parts used, e.g. probes, and their operating manuals into account!***

Storage and transport temperature	-10 °C ... + 60 °C
Humidity	with flow sensor: max. 90 % relative humidity, non-condensing

9.1 Flow Modules

Weight	approx. 245 g (PG 13.5 module) approx. 475 g (25 mm module)	
Material	all modules	transparent PVC
	all fittings	grey PVC
	seals	Viton
	calibration cup	PP
	mounting panel	white PVC
Temperature	max. 50 °C	
Max. pressure	without flow sensor, 30 °C:	6 bar
	without flow sensor, 50 °C:	1 bar
	with flow sensor, 30 °C:	2 bar
Flow rate	max. 80 l/h (40 l/h recommended)	
Measuring accuracy of the flow module	±5 l	
Pressure loss in fitted modules	flow module:	12 mbar (12 cm WS)
	PG 13.5 module:	2 mbar (2 cm WS)
	25 mm module:	20 mbar (20 cm WS)

9.2 Flow Sensor

Protection system	IP 65
Terminal connector cross section	0.1 mm² ...1.0 mm²
Connecting cable cross section	4 mm

Data for the voltage-free reed contact in the flow sensor:

Switch power	max. 3 W
Switch voltage	max. 42 V (protective extra-low voltage (SELV))
Switch current	max. 0.25 A
Operating current	max. 1.2 A
Contact resistance	max. 150 mW
Switch hysteresis of the flow sensor	approx. 15 %

Terminal	Contact
1	N/C
2	Source (C)
3	N/O

10 Replacement Parts and Accessories

	Order No.
Assembly set for 25 mm probe (CLE, BRE, CGE, CTE, CDE, OZE)	791818
Equipotential plug	791663
Flow sensor, complete	791635
Calibration cup	791229
Sampling tap	
for 25 mm module	1004739
for PG 13.5 module	1004737
Flow plug for PG 13.5 module	791703

11 Scale Drawing

(all dimensions in mm)

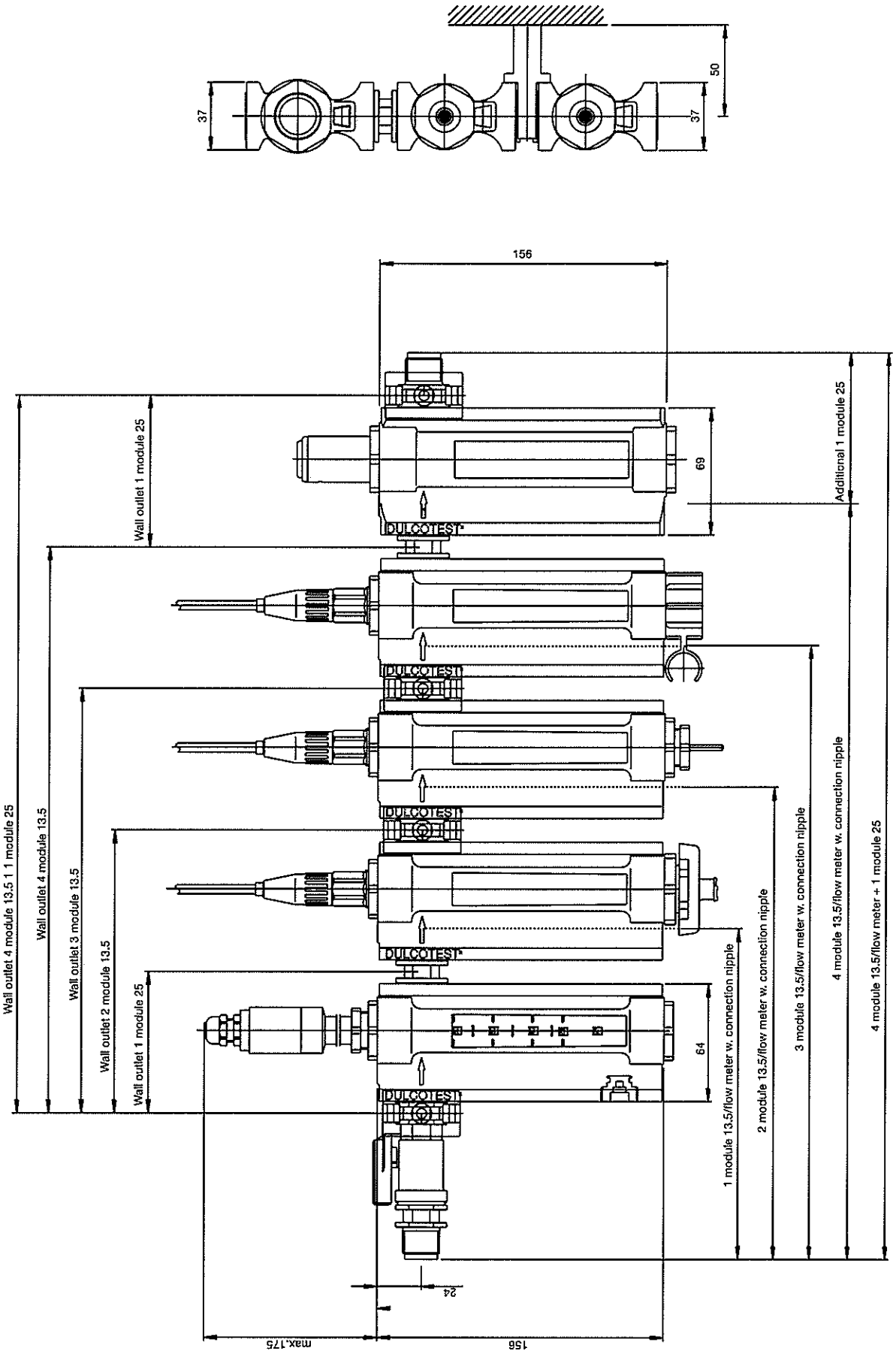


Fig. 5
3044-31

12 List of Replacement Parts

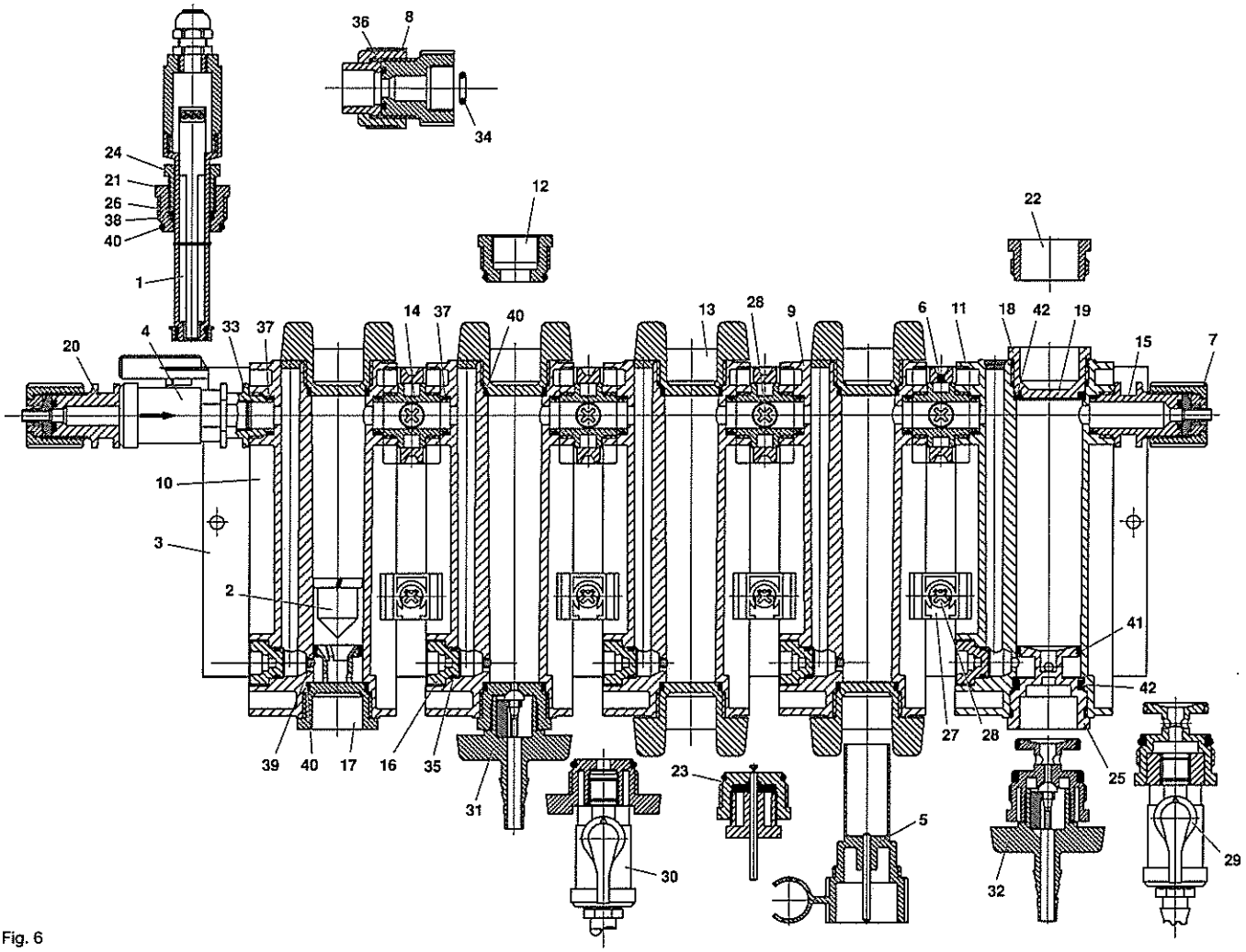


Fig. 6

Pos.	Type	No. of	Description	Code No.
			DGMa in-line probe housing	
1		1	Flow sensor cpl. PC	791635
2		1	Floating cpl. PC	791634
3		1	Mount. plate 258x10x135 (2/3 mod.)	1001853
3		1	Mount. plate 412x10x135 (4/5 mod.)	1001855
4		1	Labor ball valve PVC	1010380
5		1	Calibration cup PP	791229
6		1	Wall fastening	791228
7		1	Connect. set 8x5-1 PC3	790886
8		2	Screwing set cpl. DN10 PC1	791665
9		1	DLG-module without logo PVC-transp.	791667
9		1	DLG-module with logo PVC-transp.	791217
10		1	Fl.met.mod.gph.without logo PVC-tra.	791672
10		1	Fl.meter mod.gph.with logo PVC-tra.	791671
10		1	Fl.met.mod.l/h without logo PVC-tra.	791670
10		1	Fl.meter mod.l/h with logo PVC-tra.	791637

Pos.	Type	No. of	Description	Code No.
			DGMa in-line probe housing	
11		1	DLG-mod. 25mm without logo PVC-tran.	791674
11		1	DLG-module 25mm with logo PVC-tran.	791673
12		1	Red.nipple M30/Pg13.5-d14.8 PVDF	791219
13		2	Blanking plug M30x4 P2 PVDF	791220
14		1	Connection nipple M20x6 P2 P	791226
15		1	Connec. nipple M20x6P2-M20x1.5 P	791227
16		1	Blanking plug M20x1.5 P	791235
17		1	Flow plug M30x4 P2 P	791703
18		1	Blanking plug M34x1.5 PVDF	791734
19		1	Clamped disk d31.3/25.5x1.5 P	791733
20		1	Connection nipple G1/4xM20x1.5 P	1006236
21		1	Red.nipple M30/Pg13.5-d16	791688
22		1	Attachment screw M34x1.5-d25.5 PVDF	791732
23		1	Equipotential plug w. rod PC1	791663
24		1	Clamped nipple Pg 13.5-d15.5 P	791223
25		1	Flow plug M34x1.5 P	740207
26		1	Clamped disk d18.5/d15.5x2 P	791225
27		1	Holding nut for mount. plate PP	1001856
28		1	PT-screw KB 50x20 galv.	468445
29		1	Sampling tap for 25 mm module	1004739
30		1	Sampling tap for PG 13,5 module	1004737
31		1	Outlet nozzle DGMa cpl. M13.5	1008770
32		1	Outlet nozzle DGMa cpl. M25	1008771
33		1	Connection nipple M20x6 P2xG1/4 P	1006235
34		1	O-ring/m 9.00 - 2.50 83FPM-A	791496
35		1	O-ring/m 10.00 - 2.00 83FPM-A	481027
36		1	O-ring/K 13.00 - 2.50 67FPM-A	481013
37		2	O-ring/m 14.00 - 2.00 83FPM-A	791639
38		1	O-ring/m 15.00 - 2.00 83FPM-A	481017
39		1	O-ring/m 17.17 - 1.78 83FPM-A	791989
40		1	O-ring/m 20.00 - 2.50 83FPM-A	481020
41		1	O-ring/m 24.00 - 2.00 83FPM-A	481034
42		1	O-ring/m 25.00 – 3.50 83FPM-A	481034

Subject to technical alterations.