MECON
SAFETY CONTROL

TURBO-LUX® 2

Fire pump flowmeter system analog / digital with VdS approval

VdS

made in Germany

EN OPERATING MANUAL

IMPRINT

CONTENT

1 SAFETY INSTRUCTIONS

1.1 Intended use

The orifice plate flowmeter Turbo-Lux® 2 is used to measure the volume of transparent liquids in closed conduits.
Installation position and flow direction can be chosen freely. The Turbo-Lux® 2 is mainly used in the test line of water supplies for stationary fire-fighting systems.

The required approval from VdS Schadenverhütung GmbH is available.

NOTICE!

The operator of these measuring devices is solely responsible for the suitability, intended use and corrosion resistance of the selected materials. It must be particularly ensured that the materials selected for the wetted parts of the flowmeter are suitable for the process media to be measured.

The manufacturer is not liable for any damage resulting from improper or unintended use of these devices.

The device may only be used within the pressure and temperature limits specified in the operating manual.

No external loads must act on the measuring device. The flow meters are primarily designed for static applications.

ATTENTION!

Before exchanging a measuring device, it is absolutely necessary to check that the flow meter is free of dangerous pressures.

1.2 Approvals

» VdS G 4030006
- Approval basis: VdS 2344, 2100-29

VdS

Fig. 1: Logo of the certification body

1.3 Manufacturer's safety instructions

The manufacturer is not liable for damages of any kind caused by the use of the device, including, but not limited to direct, indirect, incidental, punitive and consequential damages.

For every product purchased from the manufacturer warranty applies, according to the relevant product documentation and the valid terms and conditions.

The manufacturer reserves the right to revise the content of the documents, including this disclaimer, without notice, and is not liable in any way for possible consequences of such changes.

The responsibility that the instruments are suitable for the particular application rests solely with the operator. The MECON GmbH assumes no liability for the consequences of misuse, modifications or re-

pairs that were carried out by the customer without prior consultation.

In case of a complaint the contested elements must be cleaned of hazardous substances and to be returned to the manufacturer unless otherwise agree (see 5.3).

To prevent injury to the user or damage to the unit, it is necessary that you reading this operating instruction carefully before starting using the device.

The instruction is intended for both the correct installation, operation and maintenance of the equipment.

Special designs for special applications and custom models are not covered by this documentation.

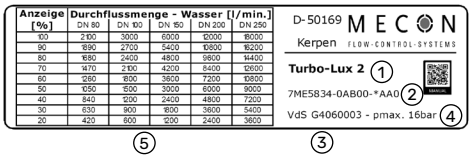
2 SCOPE OF DEVICES

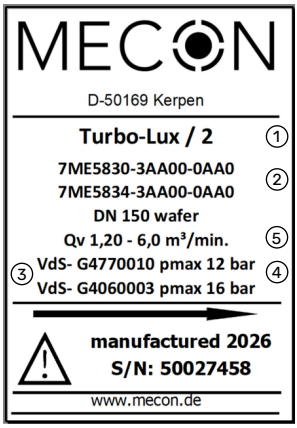
2.1 Scope of delivery

Im Lieferumfang enthalten sind:

- » Orifice plate flowmeter Turbo-Lux® 2 analog or digital
- » Operating manual
- » Certificate (partially optional)
- » Replacement gaskets

2.2 Nameplates





① Device type
② Product number and order code
③ Nominal diameter and process connection
④ Max. operating pressure
⑤ Pump rate and flow range
⑥ Serial number

Fig. 2: Name plates Turbo-Lux® 2

3 INSTALLATION AND MODE OF OPERATION

3.1 Installation instructions

NOTICE!

The following document is valid for the analog and digital version of the Turbo-Lux® 2. Please note that for the digital version an additional operating manual must be consulted for commissioning.

NOTICE!

All instruments are carefully checked for proper function before shipment. Check immediately on receipt, the outer packing carefully for damage or signs of improper handling.

Report damage to the carrier and your locale sale staff. In such cases, a description of the defect, the type and the serial number of the device is indicated.

Unpack the unit carefully to avoid damages.

Check the completeness of the delivery against the packing list. Check the name plate, if the delivered flowmeter according to your order.

3.2 Installation

3.2.1 Installation of the orifice plate

Before and after the orifice plate a straight calming section is provided as a function of the nominal diameter (D).

An inlet path of at least 10 x D is required before the measuring orifice. The outlet zone after the measuring orifice must be at least 5 x D.

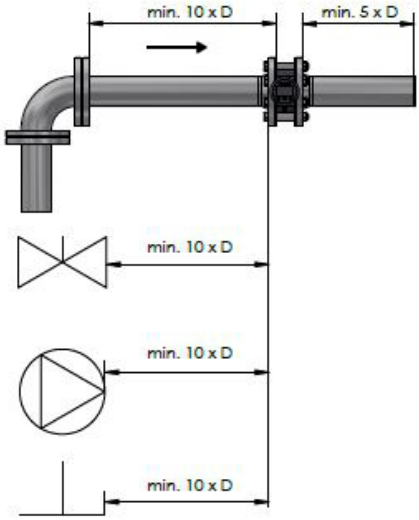


Fig. 3: Inlet path and outflow zone

The technical data of the respective measuring device can be taken from the current technical data sheet or nameplate.

The installation can be in any line routing - horizontal to vertical - place (fig. 4). However, it is important to ensure that the flow direction of the arrow marked on the device and corresponds to the differential pressure sampling tube is in the vertical position.

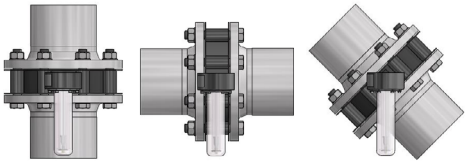


Fig. 4: Turbo-Lux® 2 examples of installation

For attachment of the bypass meter, sufficient clearance must be provided. Important for the compliance of the measuring tolerance is the central mounting of the pipeline.

The connected pipelines must be the same size as the orifice plate. Important for maintaining the measurement tolerance is the concentric installation between the flanges of the pipeline. The center offset must not exceed 0.5 mm. As an aid for each size, a centering kit is available for the alignment from the measuring aperture to the installation between flanges.

The pipelines must be completely filled at all times. Examples of special installation situations are illustrated in figures 5 to 8.

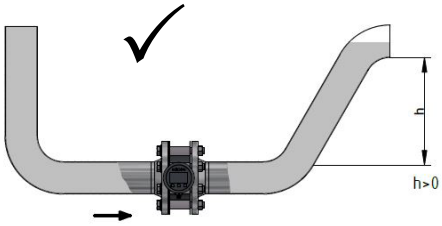


Fig. 5: Turbo-Lux® 2 correct horizontal installation

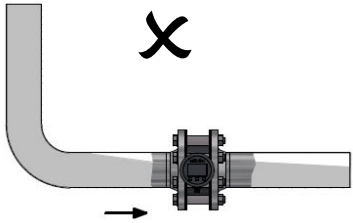


Fig. 6: Turbo-Lux® 2 wrong horizontal installation

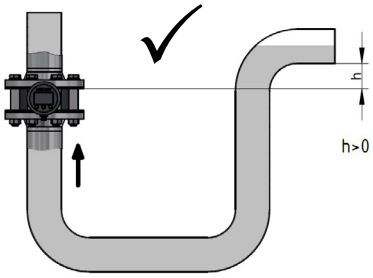


Fig. 7: Turbo-Lux® 2 correct ertical installation

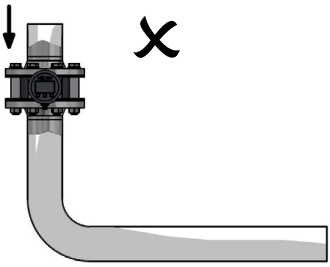


Fig. 8: Turbo-Lux® 2 wrong vertical installation

3.2.2 Mounting the bypass meter / digital indicator

The bypass meter can be used for all specified nominal diameters.
The digital indicator could be mounted on each orifice plate. See Turbo-Lux® 2 digital operating manual for more information on the installation.

Before loosening the cap of the orifice plate, the pipeline must be emptied to prevent the escape of liquids. The meter is plugged and screwed with the nut.

It must always be mounted vertically so that the float (fig. 4) can move freely in the tube. About foreign bodies that have come behind the filter must be removed (by flushing tool or return to the factory). The tightening of the nut or the cap should be done by hand. The threads must - for example be slippery - by fat. To avoid air strikes, the tube should be slowly filled with water.

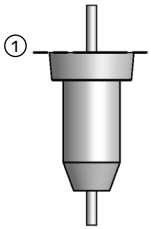
3.3 Mode of operation

The orifice plate flowmeter Turbo-Lux® 2 consists of an orifice plate for stationary installation and a portable bypass meter or digital indicator. The bypass meter contains a conical glass tube with float - digital indicator see separate operating manual. The water flows vertically from bottom to top through the measuring tube at the upper end of a side panel is arranged. A filter at the inlet largely prevents the ingress of foreign bodies. The water flows upwards in the inner tube where the float is located.

Inlet and outlet port for the bypass to be measured are arranged concentrically, so that an easy to combine with the stationary primary element.

4 COMMISSIONING (ANALOG)

Read the exact value when a consistent flow has been attained and the float has reached a stable position. The pipeline must always be filled. Read the value at the greatest diameter (upper edge) of the float.
For the digital indicator see separate operating manual.



1 Reference point

Fig. 9: Float element

For the bypass meter it is important that when starting up the pump, the shut-off-/control valve of the bypass orifice is opened min. 30 % to avoid hydraulic shocks or pressure surges that could damage the bypass meter.

When the bypass meter is commissioned or set into operation, bubbles of air will initially accumulate at the top part, which must be removed. For this purpose, the union nut must be somewhat loosened during operation and the device must be rotated by 360°, so that the air bubbles can escape. Then the bypass meter has to be positioned vertically and the union nut has to be tightened once again.

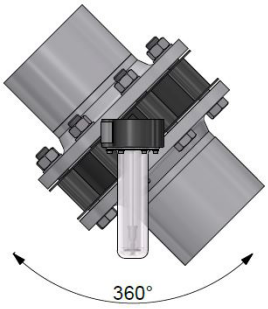


Fig. 10: Rotation of the analog bypass meter

4.1 Measurement reading

For the percentage values read from the scale, the corresponding flow rates for each nominal size can be found on the nameplate. The flow rates assigned to each mark of the % scale can be found in the following table.

Scale	DN 80		DN 100		DN 150		DN 200		DN 250	
%	m³/min	l/min	m³/min	l/min	m³/min	l/min	m³/min	l/min	m³/min	l/min
100	2,10	2 100	3,00	3 000	6,00	6 000	12,00	12 000	18,00	18 000
98	2,06	2 058	2,94	2 940	5,88	5 880	11,76	11 760	17,64	17 640
96	2,02	2 016	2,88	2 880	5,76	5 760	11,52	11 520	17,28	17 280
94	1,97	1 974	2,82	2 820	5,64	5 640	11,28	11 280	16,92	16 920
92	1,93	1 932	2,76	2 760	5,52	5 520	11,04	11 040	16,56	16 560
90	1,89	1 890	2,70	2 700	5,40	5 400	10,80	10 800	16,20	16 200
88	1,85	1 848	2,64	2 640	5,28	5 280	10,56	10 560	15,84	15 840
86	1,81	1 806	2,58	2 580	5,16	5 160	10,32	10 320	15,48	15 480
84	1,76	1 764	2,52	2 520	5,04	5 040	10,08	10 080	15,12	15 120
82	1,72	1 722	2,46	2 460	4,92	4 920	9,84	9 840	14,76	14 760
80	1,68	1 680	2,40	2 400	4,80	4 800	9,60	9 600	14,40	14 400
78	1,64	1 638	2,34	2 340	4,68	4 680	9,36	9 360	14,04	14 040
76	1,60	1 596	2,28	2 280	4,56	4 560	9,12	9 120	13,68	13 680
74	1,55	1 554	2,22	2 220	4,44	4 440	8,88	8 880	13,32	13 320
72	1,51	1 512	2,16	2 160	4,32	4 320	8,64	8 640	12,96	12 960
70	1,47	1 470	2,10	2 100	4,20	4 200	8,40	8 400	12,60	12 600
68	1,43	1 428	2,04	2 040	4,08	4 080	8,16	8 160	12,24	12 240
66	1,39	1 386	1,98	1 980	396	3 960	7,92	7 920	11,88	11 880
64	1,34	1 344	1,92	1 920	3,84	3 840	7,68	7 680	11,52	11 520
62	1,30	1 302	1,86	1 860	3,72	3 720	7,44	7 440	11,16	11 160
60	1,26	1 260	1,80	1 800	3,60	3 600	7,20	7 200	10,80	10 800
58	1,22	1 218	1,74	1 740	3,48	3 480	6,96	6 960	10,44	10 440
56	1,18	1 176	1,68	1 680	3,36	3 360	6,72	6 720	10,08	10 080
54	1,13	1 134	1,62	1 620	3,24	3 240	6,48	6 480	9,72	9 720

Scale	DN 80		DN 100		DN 150		DN 200		DN 250	
%	m³/min	l/min	m³/min	l/min	m³/min	l/min	m³/min	l/min	m³/min	l/min
52	1,09	1 092	1,56	1 560	3,12	3 120	6,24	6 240	9,36	9 360
50	1,05	1 050	1,50	1 500	3,00	3 000	6,00	6 000	9,00	9 000
48	1,01	1 008	1,44	1 400	2,88	2 880	5,76	5 760	8,64	8 640
46	0,97	966	1,38	1 380	2,76	2 760	5,52	5 520	8,28	8 280
44	0,92	924	1,32	1 320	2,64	2 640	5,28	5 280	7,92	7 920
42	0,88	882	1,26	1 260	2,52	2 520	5,04	5 040	7,56	7 560
40	0,84	840	1,20	1 200	2,40	2 400	4,80	4 800	7,20	7 200
35	0,74	735	1,05	1 050	2,10	2 100	4,20	4 200	6,30	6 300
30	0,63	630	0,90	900	1,80	1 800	3,60	3 600	5,40	5 400
25	0,53	525	0,75	750	1,50	1 500	3,00	3 000	4,50	4 500
20	0,42	420	0,60	600	1,20	1 200	2,40	2 400	3,60	3 600

Tab. 1: Flow table for the bypass meter Turbo-Lux® 2

⚠ ATTENTION!

Before pressure test in pipes, the bypass meter has to be disassembled and the connection of the orifice plate has to be screwed pressure-tight with the cap.

4.2 After device usage

⚠ ATTENTION!

After completing the measurement, remove and empty the flowmeter, then store it as described in section 5.1. Before doing so, make sure the piping is depressurized and completely drained. Re-seal the open measuring orifice with the closure cap, including the gasket, to ensure it is pressure-tight.

5 SERVICE

5.1 Storage

Store the emptied device in a dry and dust-free place. Keep away from direct and permanent sun and heat. The storage temperature range is -20 ... 60 °C (-4 °F ... 140 °F). Keep away from direct external load to the device.

5.2 Maintenance

If the filter has become clogged due to dirt deposits, the measuring device must be sent to the factory for cleaning and inspection.

The O-ring as well as the G1 connection thread of the flange should be kept lubricated with grease.

ATTENTION!

When removing the device from the pipeline, appropriate safety precautions must be taken. As a rule, new seals must be used in the pipeline during reinstallations.

5.3 Returning the device to the manufacturer

Due to careful manufacturing processes and final inspections of the measuring device, a trouble-free operation of the Turbo-Lux® 2 can be expected when installed and operated according to this manual.

Should it nevertheless become necessary to return the measuring device to MECON GmbH, the following should be noted:

ATTENTION!

According to the latest waste disposal directives, the owner/customer is responsible for the waste management of hazardous and toxic waste. For reasons of environmental protection and safeguarding the health and safety of our personnel, all devices sent to MECON GmbH to be repaired must be free of toxic and hazardous substances. This also applies to cavities of the devices. If necessary, the customer is kindly requested to neutralize or rinse the devices before returning them to MECON GmbH.

The customer has to confirm this by filling in an appropriate form and to be added to the device, which is available for download on the MECON website: https://www.mecon.de/files/daten/downloads/en/Confirmation-of-decontamination.pdf

5.4 Disposal

ATTENTION!

The pertinent regulations of your country must be complied with when disposing of the devices.

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SAFETY CONTROL

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