MECON
SAFETY CONTROL

TURBO-LUX® 3

Analog/Digital[1] Fire pump flowmeter system

FM APPROVED · LPCB · VdS · made in Germany

[1] *FM and VdS approved*

EN OPERATING MANUAL

IMPRINT

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1 SAFETY INSTRUCTIONS

1.1 Intended use

The orifice plate flowmeter Turbo-Lux® 3 is used to measure the flow of water in closed conduits. It is suitable for any point of installation, mounting position and flow direction (in compliance of the directional arrow).

The necessary approvals of the FM Approvals, LPCB and VdS Schadenverhütung GmbH are available (Turbo-Lux® 3 Digital is FM and VdS approved).

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.

ATTENTION!

The device may only be used in the specified pressure and temperature limits displayed on the name plate.

1.2 Approvals

» FM Identification PR 455022:
  - Approval basis: FM 1046
» LPCB Certificate No. 1385a
  - Approval basis: LPS 1045
» VdS G 415006
  - Approval basis: VdS 2344, 2100-29

Fig. 1: Logos of the certification bodies

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 repairs 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.

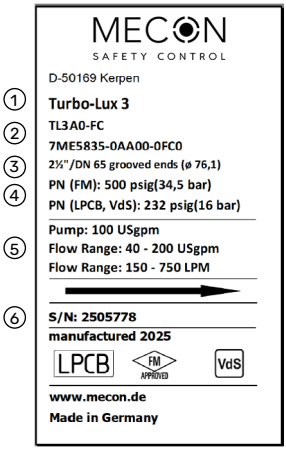
2 SCOPE OF DEVICES

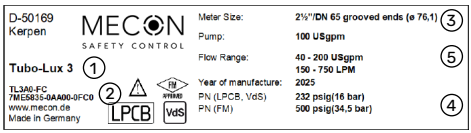
2.1 Scope of delivery

Im Lieferumfang enthalten sind:

» Orifice plate flowmeter Turbo-Lux® 3 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® 3

2.3 Flow ranges

2.3.1 Assignment of products to the flow ranges

Die folgende Tabelle weist in der ersten Spalte den Artikelcode für die dazugehörige Nennweite, Nennleistung der Pumpe und den Messbereich aus.

Order code	Nominal diameter	Pump rating	Flow range		Approval		
		USgpm	USgpm	l/min	FM	LPCB	VdS
EB	2"/DN 50 (Ø 60.3 mm / 2.4 in)	50	20 - 100	75 - 375	X	X	X
UC	2½"/DN 65 (Ø 73.0 mm / 2.9 in)	100	40 - 200	150 - 750	X	-	-
FC	2½"/DN 65 (Ø 76.1 mm / 3.0 in)	100	40 - 200	150 - 750	X	X	X
GD	3"/DN 80 (Ø 88.9 mm / 3.5 in)	150	60 - 300	220 - 1 100	X	X	X
GE	3"/DN 80 (Ø 88.9 mm / 3.5 in)	200	80 - 400	300 - 1 500	X	X	X
HF	4"/DN 100 (Ø 114.3 mm / 4.5 in)	250	100 - 500	380 - 1 900	X	X	X
HG	4"/DN 100 (Ø 114.3 mm / 4.5 in)	300	120 - 600	460 - 2 300	X	X	X
HH	4"/DN 100 (Ø 114.3 mm / 4.5 in)	400	160 - 800	600 - 3 000	X	X	X
HJ	4"/DN 100 (Ø 114.3 mm / 4.5 in)	450	180 - 900	680 - 3 400	X	X	X
XK	6"/DN 150 (Ø 165.1 mm / 6.5 in)	500	200 - 1 000	760 - 3 800	X	X	X
XL	6"/DN 150 (Ø 165.1 mm / 6.5 in)	750	300 - 1 500	1 130 - 5 650	X	X	X
XM	6"/DN 150 (Ø 165.1 mm / 6.5 in)	1 000	400 - 2 000	1 500 - 7 500	X	X	X
XN	6"/DN 150 (Ø 165.1 mm / 6.5 in)	1 250	500 - 2 500	1 900 - 9 500	X	X	X
KK	6"/DN 150 (Ø 168.3 mm / 6.6 in)	500	200 - 1 000	760 - 3 800	X	X	X
KL	6"/DN 150 (Ø 168.3 mm / 6.6 in)	750	300 – 1 500	1 130 - 5 650	X	X	X
KM	6"/DN 150 (Ø 168.3 mm / 6.6 in)	1 000	400 - 2 000	1 500 - 7 500	X	X	X
KN	6"/DN 150 (Ø 168.3 mm / 6.6 in)	1 250	500 - 2 500	1 900 - 9 500	X	X	X
LP	8"/DN 200 (Ø 219.1 mm / 8.6 in)	1 500	600 - 3 000	2 200 - 11 000	X	X	X
LQ	8"/DN 200 (Ø 219.1 mm / 8.6 in)	2 000	800 - 4 000	3 000 - 15 000	X	X	X
LR	8"/DN 200 (Ø 219.1 mm / 8.6 in)	2 500	1 000 - 5 000	3 800 - 19 000	X	X	X
LS	8"/DN 200 (Ø 219.1 mm / 8.6 in)	3 000	1 200 - 6 000	4 500 - 22 500	X	X	X*
MT	10"/DN 250 (Ø 273.0 mm / 10.8 in)	3 500	1 400 - 7 000	5 300 - 26 500	X	-	-
MU	10"/DN 250 (Ø 273.0 mm / 10.8 in)	4 000	1 600 - 8 000	6 000 - 30 000	X	-	-
MV	10"/DN 250 (Ø 273.0 mm / 10.8 in)	4 500	1 800 - 9 000	6 800 - 34 000	X	-	-
NW	12"/DN 300 (Ø 323.9 mm / 10.8 in)	5 000	2 000 - 10 000	7 600 - 38 000	X	-	-

**VdS-limited flow range up tp 10 m/s (corresponds to 20 800 l/min (5 495 USgpm))*

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® 3. 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).

By default, there should be a 5 x D straight calming section in front of the orifice plate and a 2 x D straight calming section behind it.

For the installation of valves, pumps, or T-piece pipes, an inlet path of at least 10 x D is required. Of this, at least 5 x D must be a straight section directly in front of the orifice plate.

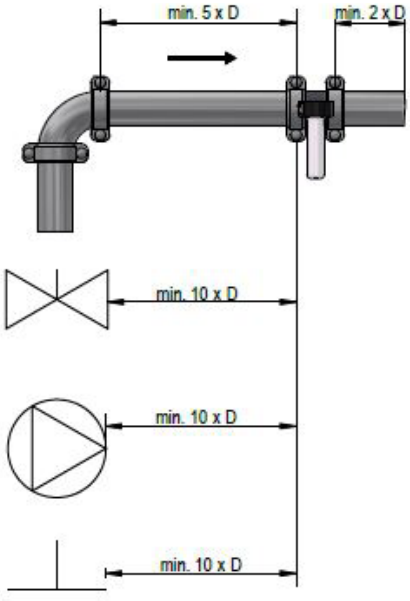


Fig. 3: Inlet path and outflow zone

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

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® 3 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.

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

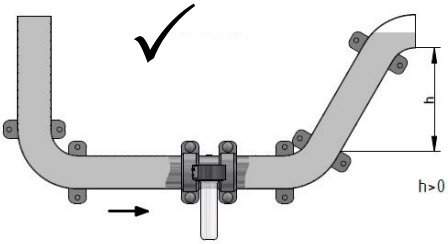


Fig. 5: Turbo-Lux® 3 correct horizontal installation

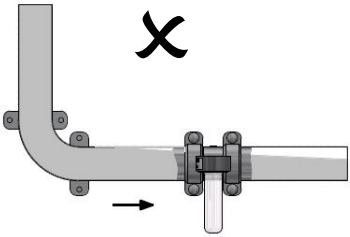


Fig. 6: Turbo-Lux® 3 wrong horizontal installation

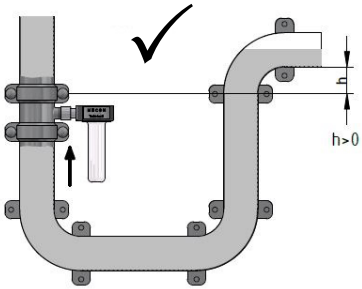


Fig. 7: Turbo-Lux® 3 correct vertical installation

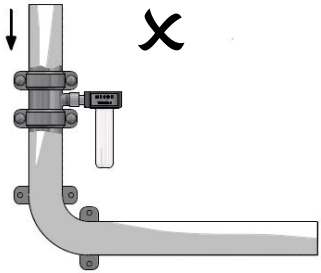


Fig. 8: Turbo-Lux® 3 wrong vertical installation

3.2.2 Mounting the bypass meter / digital indicator

The bypass meter is compatible with the delivered orifice plate. Please make sure that the technical data, pump rate and diameter of the orifice plate and the bypass meter are similar before installation. The digital indicator could be mounted on each orifice plate. See Turbo-Lux® 3 digital operating manual.

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® 3 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 top to bottom through the flow 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.

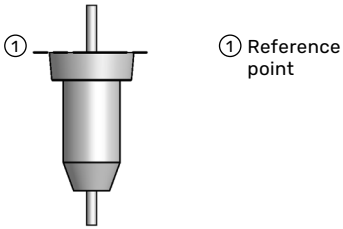


Fig. 9: Float element

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.

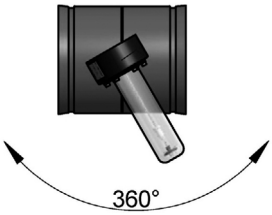


Fig. 10: Rotation of the analog bypass meter

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.

⚠ 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.

4.1 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 is blocked by deposits the flowmeter must be returned to the manufacturer to be cleaned and tested. Ensure that the O-ring and the M 30 x 1.5 thread of the orifice plate are lubricated with grease.

5.3 Returning the device to the manufacturer

All flowmeters were manufactured in accordance with the highest quality standards and were thoroughly tested prior to shipment.

Should you nevertheless need to return a device to MECON GmbH please observe the following points:

⚠ 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.

MECON
SAFETY CONTROL

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