



Turbo-Lux 2 orifice plate flowmeter

# Operating Instruction



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# 1 Safety Instructions

## 1.1 Intended use

The orifice plate flowmeter Turbo-Lux 2 is used to measure the volume of water in closed conduits. Mounting position and flow direction can be chosen arbitrarily.

***The main applications are in stationary water extinguishing systems and for application in test pipes for water supply.***

The necessary approval of the VdS GmbH is available.



### **Warning!**

***The responsibility for the use of the device regarding the suitability, intended use and in particular the corrosion resistance of the materials used to the construction rests solely with the operator. It must be ensured that the selected materials of the wetted parts of the instrument are suitable for the used process media. The manufacturer is not liable for damage caused by improper or incorrect use of this equipment.***

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

Before replacing the measuring tube, check that the device is free of hazardous media and pressure.

## 1.2 Certifications

- VdS-recognition number: G4060003

## 1.3 Safety instructions from the manufacturer

### **Disclaimer**

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 our 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.

### Product liability and warranty

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 the case of a complaint, the offending parts must be returned to us, unless otherwise agreed.

### General information

To prevent injury to the user or damage to the unit, it is necessary that you read the information in this manual carefully before operating the unit.

This manual is intended both for the correct installation, operation and maintenance of the equipment.

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

## 2 Installation & Mode of Operation

### 2.1 Installation instructions



#### **Information!**

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 local sale staff. In such cases, a description of the defect, the type and the serial number of the device is indicated.



#### **Information!**

Unpack the unit carefully to avoid damage.



#### **Information!**

Check the completeness of the delivery against the packing list (**Fig. 1**). Check the rating plate, if the delivered flow meter according to your order.

### 2.2 Installation

#### Installation of the differential pressure transducer

Before and after the differential pressure transducer a straight calming section is provided as a function of the nominal diameter. In general, prior to the diaphragm  $10 \times D$  and  $5 \times D$  behind observed calming section. The installation can be placed in any position - horizontal to vertical (**Fig. 6**). 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 (**Fig. 4, 7**) is in the horizontal position. For attachment of the bypass meter, sufficient clearance must be provided. Important for the compliance of the measuring tolerance is the central mounting between flanges of the pipeline. The center offset must not exceed 0.5 mm. As a tool for each size is for centering of the orifice plate assembly for mounting between flanges, a centering assembly (**Fig. 5**) is available.

## Mounting the bypass meter

The bypass meter can be used for all sizes listed. Before loosening the cap (**Fig. 4, 10**), the pipeline must be emptied to prevent the escape of liquids. The meter is plugged and screwed with a nut (**Fig. 4, 9**). There must always be mounted vertically so that the float (**Fig. 4, 4**) can move freely in the tube. About foreign bodies that have come behind the filter must be removed. The tightening of the nut or the cap should be done by hand as possible. The threads must - for example be slippery - by fat. To avoid air strikes, the tube should be slowly filled with water.

## 2.3 Mode of operation

The orifice plate flowmeter Turbo-Lux 2 consists of a differential pressure transducer (**Fig. 4, 1**) for stationary installation and a portable bypass meter (**Fig. 4, 2**). The bypass meter contains a conical measuring tube (**Fig. 4, 3**) with float. (**Fig. 4, 4**). The water flows vertically from top to bottom through the measuring tube at the upper end of a side panel (**Fig. 4, 5**) is arranged. A filter (**Fig. 4, 13**) at the inlet largely prevents the ingress of foreign bodies. Inlet and outlet port for the bypass to be measured are arranged concentrically, so that an easy to combine with the stationary primary element.

## 2.4 Maintenance

If the filter is blocked by dispoists (**Fig. 4, 13**) the flowmeter must be returned to the manufacturer to be cleaned and tested. Ensure that the O-ring (**Fig. 4, 8**) and the M 30 x 1,5 thread of the orifice plate are lubricated with grease.

# 3 Start-up

When a constant flow is established you can read the exact value.

The largest diameter of the float is the reference edge. The pipe must always be full.

When commissioning the bypass meter, air bubbles are initially collect in the upper part, which must be removed. To this end, the swivel nut (**Fig. 4, 9**) is again slightly loosened during the operation, and the device is rotated through 360 °, so that the air bubbles can escape into the pipe. After the nut is tightened again.

### Measured value reading

On the scale is the flow rate in m<sup>3</sup>/min for each nominal size. For the main values (100/90/80/70/60/50/40/20%) is printed. The scale division is listed in brackets to help with the intermediate value determination. An extended table in which each line is associated with a flow value is to be found on page 11 of this manual.

# 4 Device Description

## 4.1 Scope of delivery

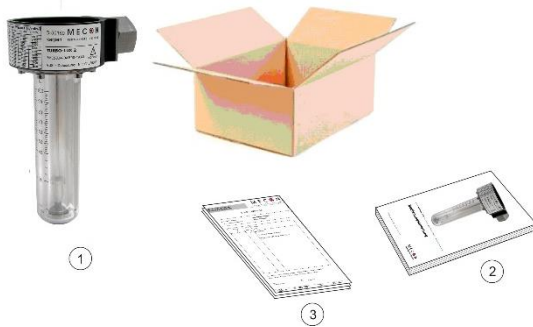
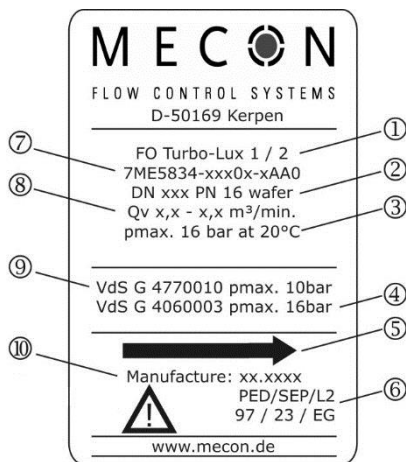


Fig. 1

- ① Orifice plate flowmeter Turbo-Lux 2
- ② Operation instructions
- ③ Certificates (optionally)

## 4.2 Name plate



- ① - Device type
- ② - Nominal diameter and pressure
- ③ - Max. pressure
- ④ - VDS approval no.
- ⑤ - flow direction
- ⑥ - Category acc. to Pressure Equipment directive (PED)
- ⑦ - Model no.
- ⑧ - Measuring range Qv
- ⑨ - VDS approval no.
- ⑩ - Device specific serial no. and the year it was built

Fig. 2

Anzeige	Durchflussmenge - Wasser [l/min.]					D-50169 Kerpen	MECON FLOW-CONTROL-SYSTEMS
	[%]	DN 80	DN 100	DN 150	DN 200		
100	2100	3000	6000	12000	18000	FO Turbo Lux 2 7ME5834-xxx0x-xAA0 VdS G4060003 - pmax. xxbar	 PED/SEP/L2
90	1890	2700	5400	10800	16200		
80	1680	2400	4800	9600	14400		
70	1470	2100	4200	8400	12600		
60	1260	1800	3600	7200	10800		
50	1050	1500	3000	6000	9000		
40	840	1200	2400	4800	7200		
30	630	900	1800	3600	5400		
20	420	600	1200	2400	3600		

Fig. 3

- ① - Flow range / ④ - Max. pressure
- ② - Model no. / ⑤ - Device type
- ③ - VDS approval no.

## 5 Description Code

The description code consists of the following elements:

7ME5834 -    0  -  AA0

①
②
③
④
⑤

### ① Orifice plate for installation between flanges

0	Without	
1	DN 80	Qv: 0,42 – 2,1 m <sup>3</sup> /min.
2	DN 100	Qv: 0,60 – 3,0 m <sup>3</sup> /min
3	DN 150	Qv: 1,20 – 6,0 m <sup>3</sup> /min
4	DN 200	Qv: 2,40 – 12,0 m <sup>3</sup> /min
5	DN 250	Qv: 3,60 – 18,0 m <sup>3</sup> /min

### ② Centering kit for orifice plate installation between flanges

A	Without
B	DN 80 PN 16
C	DN 100 PN 16
E	DN 150 PN 16
F	DN 200 PN 10
K	DN 200 PN 16
G	DN 250 PN 10/16

### ③ By-pass flowmeter

A	Without
B	For orifice plate installation between flanges

### ④ Replacement cap

0	Without
1	With replacement cap and gaskets

### ⑤ Calibration certificate for by-pass flowmeter

0	Without
1	With calibration certificate for by-pass flowmeter

## 6 Technical Data

<b>Measuring principle</b>	Orifice plate as differential pressure sensor with variable areas meter in by-pass.
<b>Input</b>	
Nominal diameter	DN 80 PN 10/16 DN 100 PN 10/16 DN 150 PN 10/16 DN 200 PN 10/16 DN 250 PN 10
Nominal pressure	PN 16
Pressure limit	max. 16 bar
<b>Accuracy</b>	±2,5 % of full scale value (VdS 2100-29)



### Operating conditions

Temperature limit +4 to +50 °C

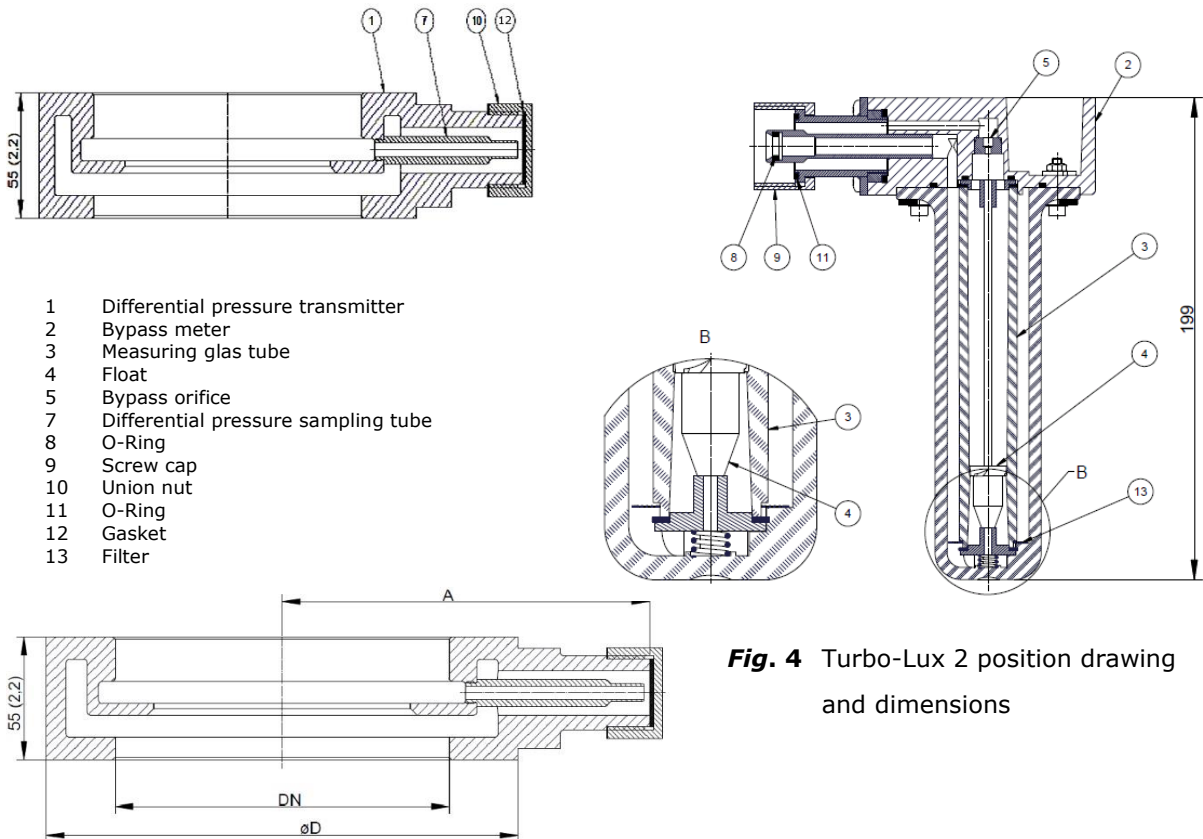
### Design / materials

- Differential pressure transducer	Aluminium
- Differential pressure sampling tube	Brass
- Float	Stainless steel
- orifice plate	Stainless steel
- Mech filter	Stainless steel
- Gasket	Perbunan

### Certificates and approvals

VdS approval no. G4060003

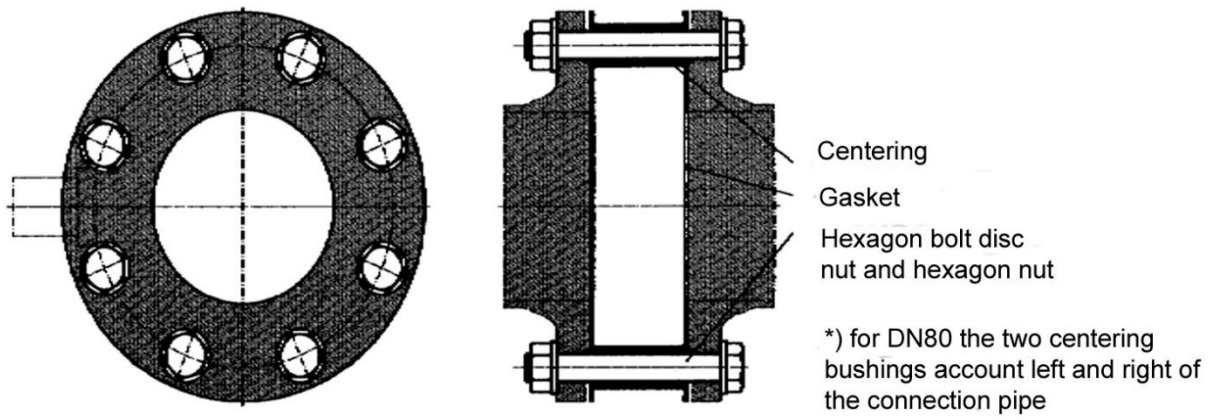
## 7 Dimensions and Weights



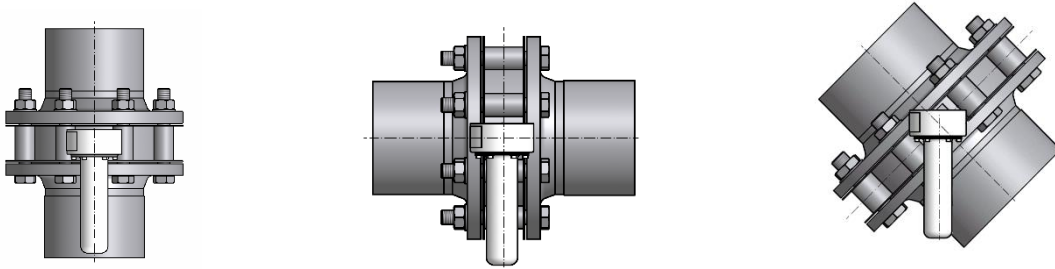
**Fig. 4** Turbo-Lux 2 position drawing and dimensions

Connections DN	Dimensions		Weights [kg]
	A ± 0,5 [mm]	ØD ± 0,5 [mm]	
80 PN 10/16	130	138	1,3
100 PN 10/16	140	158	1,6
150 PN 10/16	165	212	2,1
200 PN 10/16	190	268	3,0
250 PN 10	215	320	4,0
Display part	-	-	0,7

## 7.1 Centering kit



**Fig. 5** Centering kit (only for the intermediate flange model)



**Fig. 6** Examples of installation

## 8 Flow Chart

Flow rate – Water										
Orifice for wafer										
Display [%]	DN 80		DN 100		DN 150		DN 200		DN 250	
	m <sup>3</sup> /min	l/min	m <sup>3</sup> /min	l/min	m <sup>3</sup> /min	l/min	m <sup>3</sup> /min	l/min	m <sup>3</sup> /min	l/min
100	2,10	2100	3,00	3000	6,00	6000	12,00	12000	18,00	18000
98	2,06	2058	2,94	2940	5,88	5880	11,76	11760	17,64	17640
96	2,02	2016	2,88	2880	5,76	5760	11,52	11520	17,28	17280
94	1,97	1974	2,82	2820	5,64	5640	11,28	11280	16,92	16920
92	1,93	1932	2,76	2760	5,52	5520	11,04	11040	16,56	16560
90	1,89	1890	2,70	2700	5,40	5400	10,80	10800	16,20	16200
88	1,85	1848	2,64	2640	5,28	5280	10,56	10560	15,84	15840
86	1,81	1806	2,58	2580	5,16	5160	10,32	10320	15,48	15480
84	1,76	1764	2,52	2520	5,04	5040	10,08	10080	15,12	15120
82	1,72	1722	2,46	2460	4,92	4920	9,84	9840	14,76	14760
80	1,68	1680	2,40	2400	4,80	4800	9,60	9600	14,40	14400
78	1,64	1638	2,34	2340	4,68	4680	9,36	9360	14,04	14040
76	1,60	1596	2,28	2280	4,56	4560	9,12	9120	13,68	13680
74	1,55	1554	2,22	2220	4,44	4440	8,88	8880	13,32	13320
72	1,51	1512	2,16	2160	4,32	4320	8,64	8640	12,96	12960
70	1,47	1470	2,10	2100	4,20	4200	8,40	8400	12,60	12600
68	1,43	1428	2,04	2040	4,08	4080	8,16	8160	12,24	12240
66	1,39	1386	1,98	1980	3,96	3960	7,92	7920	11,88	11880
64	1,34	1344	1,92	1920	3,84	3840	7,68	7680	11,52	11520
62	1,30	1302	1,86	1860	3,72	3720	7,44	7440	11,16	11160
60	1,26	1260	1,80	1800	3,60	3600	7,20	7200	10,80	10800
58	1,22	1218	1,74	1740	3,48	3480	6,96	6960	10,44	10440
56	1,18	1176	1,68	1680	3,36	3360	6,72	6720	10,08	10080
54	1,13	1134	1,62	1620	3,24	3240	6,48	6480	9,72	9720
52	1,09	1092	1,56	1560	3,12	3120	6,24	6240	9,36	9360
50	1,05	1050	1,50	1500	3,00	3000	6,00	6000	9,00	9000
48	1,01	1008	1,44	1400	2,88	2880	5,76	5760	8,64	8640
46	0,97	966	1,38	1380	2,76	2760	5,52	5520	8,28	8280
44	0,92	924	1,32	1320	2,64	2640	5,28	5280	7,92	7920
42	0,88	882	1,26	1260	2,52	2520	5,04	5040	7,56	7560
40	0,84	840	1,20	1200	2,40	2400	4,80	4800	7,20	7200
35	0,74	735	1,05	1050	2,10	2100	4,20	4200	6,30	6300
30	0,63	630	0,90	900	1,80	1800	3,60	3600	5,40	5400
25	0,53	525	0,75	750	1,50	1500	3,00	3000	4,50	4500
20	0,42	420	0,60	600	1,20	1200	2,40	2400	3,60	3600

