



Fig. 1 Turbo-Lux orifice plate flowmeter

Application

The Turbo-Lux orifice plate flowmeter is used to measure the volume of water in closed pipelines. Any mounting position and flow direction are possible.

The main applications are for use in stationary sprinkler systems and use in pipes for water supply. The flowmeter complies with the requirements of the VdS Schadenverhütung GmbH (association of damage insurers).

Mode of operation and design

The Turbo-Lux orifice plate flowmeter consists of a differential pressure sensor (Fig. 2, 1) for stationary installation, and a portable bypass meter (Fig. 2, 2). The bypass meter contains a conical glass tube (Fig. 2, 3) with float (Fig. 2, 4). The water flows vertically upwards through the glass tube. A bypass orifice (Fig. 2, 5) is located at the top of the tube. A filter (Fig. 2, 6) at the inlet largely prevents the penetration of foreign matter. The inlet and outlet for the flow measured in the bypass are arranged concentrically so that it is easy to combine with the stationary differential pressure sensor.

Installation of the differential pressure sensor

A straight pipe section to achieve non-turbulence and with a length depending on the diameter must be provided upstream of the differential pressure sensor. When installing in sprinkler systems, note that $10 \times D$ upstream and $5 \times D$ downstream of the sensor. The installation is possible in any pipe direction – horizontal up to vertical (see Fig. 3). However, make sure that the flow direction is according to the arrow on the instrument and that the differential pressure sampling tube (Fig. 2, 7) is orientated horizontal. Provide sufficient space for connection of the bypass meter. The concentric installation between the pipeline flanges is important to guarantee the observation of the tolerance. The center offset must not exceed 0,5 mm (0.197 inch). A centring assembly (Fig. 4) is available for every size of differential pressure sensor to assist centring.

Assembly of the bypass meter

The bypass meter can be used for all nominal diameters specified. Empty the pipeline before loosening the screw cap (Fig. 2, 10) to prevent the leakage of liquid. Connect the meter, and screw tight using the union nut (Fig. 2, 9). The meter must always be positioned truly vertically so that the float (Fig. 2, 4) can move freely in the glass tube (Fig. 2, 3). Remove any foreign matter which has passed through the filter. Tighten the union nut and the screw cap by hand if possible. The threads must slide easily, e.g. by using grease.

To prevent water hammer, fill the pipeline slowly with water.

Measurement

Read the exact value once a constant flow has resulted, i.e. when the float is stable. Read the value at the largest diameter of the float. The pipeline must always be full.

When using the bypass meter, air bubbles will initially collect at the top, and must be removed. To do this, loosen the union nut (Fig. 2, 9) a little again during operation, and rotate the device by 360° so that the air bubbles can escape into the pipeline. Then tighten the union nut again.

Reading the measured value

The flow values corresponding to the % values read on the scale are listed on the rating plate for every nominal diameter. An extended table, in which a flow value is assigned to each line on the % scale, can be found on page 4

Maintenance

If the filter (Fig. 2, 6) is blocked by deposits, remove it and clean. Keep the O-ring (Fig. 2, 8) and the G 1 thread of the orifice plate lubricated using grease.

Clean the glass tube when contamination is visible.

Removal

Following removal of the pressure plug (Fig. 2, 11), the orifice plate insert (Fig. 2, 12) can be removed by gently rotating. Then remove the glass tube from the fitting.

Caution!

Damage to the bypass orifice (Fig. 2, 5) has an effect on the accuracy, and should absolutely be avoided.

Note of application

The operator of these measuring instruments is responsible for suitability, proper use and corrosion resistance of the used materials with regard to the measuring material. It must be ensured that the materials selected for the flowmeter parts in contact with the medium are suitable for the used process media. The flowmeter may only be used within the pressure and voltage limits specified in the operating instructions. Before replacing the measuring tubes, check that the unit is free of hazardous media and pressures.

Orifice plate flowmeter Turbo-Lux

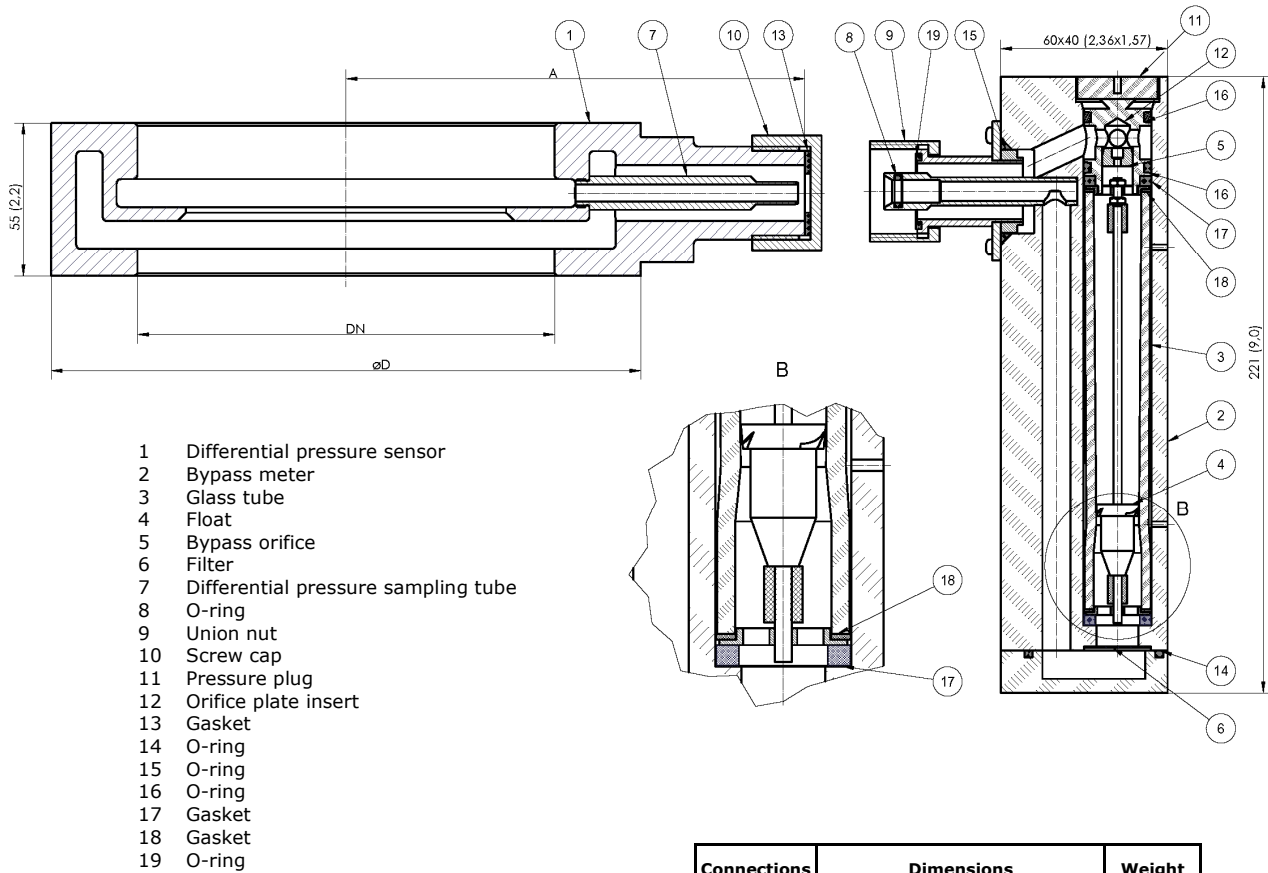


Fig. 2 Turbo-Lux, components and dimensions in mm (inch)

Connections	Dimensions		Weight
DN PN 10 (MWP 145 psi)	A in mm (inch) ±0,5 (0,020)	øD in mm (inch) ±0,5 (0,020)	kg (lb)
80 (3")	130 (5,12)	138 (5,43)	1,3 (2,87)
100 (4")	140 (5,51)	158 (6,22)	1,6 (3,53)
150 (6")	165 (6,50)	212 (8,35)	2,1 (4,63)
200 (8")	190 (7,48)	268 (10,55)	3,0 (6,61)
250 (10")	215 (8,46)	320 (12,60)	4,0 (8,82)
Display unit	-	-	0,9 (1,98)

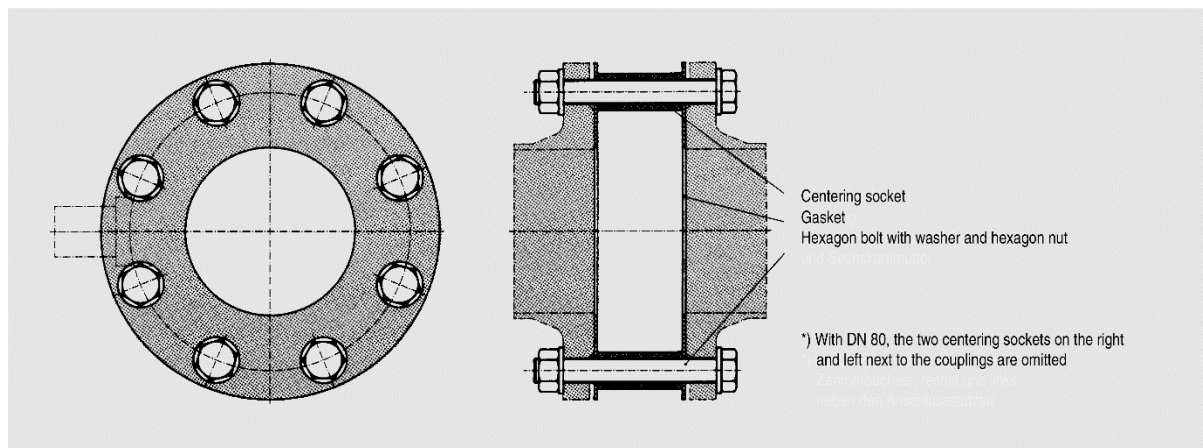


Fig. 3 Centering kit

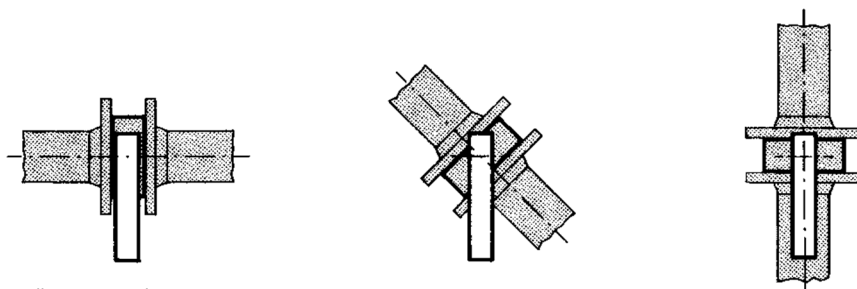


Fig. 4 Installation examples

Flow table for bypass meter

Display %	Flow quantity - water									
	DN 80 l/min	(3 inch) (USgpm)	DN 100 l/min	(4 inch) (USgpm)	DN 150 l/min	(6 inch) (USgpm)	DN 200 l/min	(8 inch) (USgpm)	DN 250 l/min	(10 inch) (USgpm)
100	2100	(555)	3000	(792)	6000	(1585)	12000	(3170)	18000	(4754)
98	2058	(544)	2940	(777)	5880	(1553)	11760	(3106)	17640	(4659)
96	2016	(532)	2880	(761)	5760	(1521)	11520	(3043)	17280	(4564)
94	1974	(521)	2820	(745)	5640	(1490)	11280	(2979)	16920	(4469)
92	1932	(510)	2760	(729)	5520	(1458)	11040	(2916)	16560	(4374)
90	1890	(499)	2700	(713)	5400	(1426)	10800	(2853)	16200	(4279)
88	1848	(488)	2640	(697)	5280	(1395)	10560	(2789)	15840	(4184)
86	1806	(477)	2580	(681)	5160	(1363)	10320	(2726)	15480	(4089)
84	1764	(466)	2520	(666)	5040	(1331)	10080	(2662)	15120	(3994)
82	1722	(455)	2460	(650)	4920	(1299)	9840	(2599)	14760	(3898)
80	1680	(444)	2400	(634)	4800	(1268)	9600	(2536)	14400	(3803)
78	1638	(433)	2340	(618)	4680	(1236)	9360	(2472)	14040	(3708)
76	1596	(422)	2280	(602)	4560	(1204)	9120	(2409)	13680	(3613)
74	1554	(410)	2220	(586)	4440	(1173)	8880	(2345)	13320	(3518)
72	1512	(399)	2160	(571)	4320	(1141)	8640	(2282)	12960	(3423)
70	1470	(388)	2100	(555)	4200	(1109)	8400	(2219)	12600	(3328)
68	1428	(377)	2040	(539)	4080	(1078)	8160	(2155)	12240	(3233)
66	1386	(366)	1980	(523)	3960	(1046)	7920	(2092)	11880	(3138)
64	1344	(355)	1920	(507)	3840	(1014)	7680	(2028)	11520	(3043)
62	1302	(344)	1860	(491)	3720	(983)	7440	(1965)	11160	(2948)
60	1260	(333)	1800	(475)	3600	(951)	7200	(1902)	10800	(2853)
58	1218	(322)	1740	(460)	3480	(919)	6960	(1838)	10440	(2757)
56	1176	(311)	1680	(444)	3360	(887)	6720	(1775)	10080	(2662)
54	1134	(300)	1620	(428)	3240	(856)	6480	(1712)	9720	(2567)
52	1092	(288)	1560	(412)	3120	(824)	6240	(1648)	9360	(2472)
50	1050	(277)	1500	(396)	3000	(792)	6000	(1585)	9000	(2377)
48	1008	(266)	1440	(380)	2880	(761)	5760	(1521)	8640	(2282)
46	966	(255)	1380	(364)	2760	(729)	5520	(1458)	8280	(2187)
44	924	(244)	1320	(349)	2640	(697)	5280	(1395)	7920	(2092)
42	882	(233)	1260	(333)	2520	(666)	5040	(1331)	7560	(1997)
40	840	(222)	1200	(317)	2400	(634)	4800	(1268)	7200	(1902)
35	735	(194)	1050	(277)	2100	(555)	4200	(1109)v	6300	(1664)
30	630	(166)	900	(238)	1800	(475)	3600	(951)	5400	(1426)
25	525	(139)	750	(198)	1500	(396)	3000	(792)	4500	(1189)
20	420	(111)	600	(158)	1200	(317)	2400	(634)	3600	(951)

Orifice plate flowmeter Turbo-Lux

Technical specification

Application	See page 1
Mode of operation	See page 1
Measuring principle	Orifice plate as differential pressure sensor with float bypass meter

Inlet

Nominal diameters	DN 80 (3 inch) DN 100 (4 inch) DN 150 (6 inch) DN 200 (8 inch) DN 250 (10 inch)
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Nominal pressure	PN 10 (145 psi)
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Pressure limit	max. 12 bar
	±2,5 % of full scale value (VdS 2100-29)

Accuracy

Rated operating conditions	
Temperature limits	+4 to +50 °C

Design

Materials (Fig. 2)	
- Differential pressure sensor (1)	Aluminium
- Diff. pressure sampling tube (7)	Brass
- Float (4)	Stainless steel
- Bypass orifice (5)	Stainless steel
- Filter (6)	Stainless steel
- Gasket (13)	Perbunan

Certificates and approvals

Vds certification number	G4770010
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Selection and ordering data

Bypass Meter

7ME5830-0AB 0-AA0
① ②

① Case for storage

0	without
1	with

② Calibration certificate

0	without
1	with

Orifice plate, centering kit and replacement cap

7ME5834- A0-0AA0
① ② ③

① Orifice plate for installation between flanges

0	without	
1	DN 80	Qv: 0,42 – 2,1 m ³ /min.
2	DN 100	Qv: 0,60 – 3,0 m ³ /min.
3	DN 150	Qv: 1,2 – 3,0 m ³ /min.
4	DN 200	Qv: 2,4 – 12,0 m ³ /min.
5	DN 250	Qv: 3,6 – 18,0 m ³ /min.

② Centering kit for 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
G	DN 250	PN 10/16

③ Replacement kit

0	without
1	with (incl. gasket)