



FVA Tubux M30 Variable Area Flowmeter

Operating Instructions

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1 Safety Instructions

1.1 Intended use

The FVA Tubux M30 variable area meters are used to measure the volume of transparent liquids and gases passing through closed piping. The variable area meters can also be used for flow monitoring if they are equipped with one or more switching contacts. Standard scales are available for liquids with a density of 1 kg/l (62.43 lb/cu.ft). The scales must be recalculated for all other media depending on the physical characteristics.

The devices are particularly suitable for the measurement of:

- Water
- Clear liquids
- Gas flows



Warning !

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.

No external loads may act upon the meter. The flowmeters are primarily designed for static applications.



Caution!

Hot surfaces resulting from hot process media.

Danger of burns resulting from surface temperatures above 70 °C.

- *Take appropriate protective measures, for example contact protection.*
- *The design of the contact protection must meet the maximum permissible ambient temperature of the meter.*

The flowmeter may only be operated within the pressure and voltage limits specified on the name plate.

Before taking the flowmeter out of operations, check that the unit is free of hazardous media and de-pressurized.

1.2 Certifications

CE marking



The manufacturer certifies for the device FVA Tubux M30 meets all statutory requirements of the following EC directives by applying the CE marking:

- Pressure equipment directive 2014/68/EU

The most gases are permitted Media Group 1

Classification according to Pressure Equipment Directive 2014/68/EU

	Permissible media	Categorie
≤ DN 25 (G¼ - G 1)	Gases fluid group 1 and liquids of fluid group 1	Art. 3.3
> DN 25 (G1¼ - G2)	Gases fluid group 1 and liquids of fluid group 1	I

1.3 Safety instructions from the manufacturer

Disclaimer

The manufacturer will not be liable for any damage resulting from the use of its product, including, but not limited to direct, indirect, incidental, punitive and consequential damages.

Any product purchased from the manufacturer is warranted in accordance with the relevant product documentation and our Terms and Conditions of Sale.

The manufacturer reserves the right to revise the content of its documents, including this disclaimer, without prior notification, and will not be liable in any way for possible consequences of such changes.

Product liability and warranty

Mecon GmbH assumes no guarantee for repair work carried out by the customer without prior notification and consultation. Any instruments or parts rejected by a customer must be returned to us, if no other arrangement has been made.

General information

This manual is intended for the correct installation as well as operation and maintenance of the devices. Read the instructions carefully before installing the device and placing it into operation.

Specially designed or customised models and specialised applications are not included in this manual.

2 Installation and 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 to your local sales representative. In such cases, a description of the defect, the type and the serial number of the appliance shall be provided.



Information!

Unpack the unit carefully to avoid damage.



Information!

Check the completeness of the delivery against the packing list. Check the name plate, if the delivered flowmeter according to your order. Check whether particular units with electrical components the correct supply voltage printed.

2.2 Installation

For specific device sizes the float is inserted with a plastic net for transport lock. This must be removed through the top of the meter before installation. After that the free movement of the float inside the flow tube should be checked again.

The device must be mounted vertically and stress-free. Reductions, extensions, and control elements upstream and downstream of the meter have no influence on the measurement accuracy with liquids. For gases, however, the installation of the meter is recommended before valves to prevent compression oscillations.

Since variable flow meters are very sensitive to changes in flow, control elements should always be adjusted slowly. The calibration is carried out for defined terms. Deviations of the density, pressure or temperature of gases, as well as density and viscosity of liquids, result in errors. It is essential to ensure compliance with the calibration conditions. Therefore be specified in the order also essential to provide data on the medium, the density and the viscosity at operating temperature and pressure. For gases, the exact reference point for the pressure (gauge or absolute pressure) is also required. Retrofitting of switching contacts is only possible when the floats are used in magnets. When first put the float completely past the contact to polarization.

3 Start-up

3.1 Standard device

When starting up the unit, the following points must be observed:

- Make sure that the actual operating conditions (pressure and temperature) shall not exceed the limits specified on the nameplate.

- **Avoid float impact!**

It is therefore recommendable to start during startup against a closed valve and adjust the operating pressure by slowly opening the valve. In particular, the use of solenoid valves is not recommended in this connection.

- When measuring liquids, make a careful release of the pipeline to prevent pressure peaks by gas bubbles.
- In the case of the measurement of gases, the operating pressure must be increased slowly to avoid pressure shock.
- With the commissioning of new plants can be enhanced to fix residues in the body levitation. Therefore we recommend in such a case the cleaning of the devices after a relatively short time.
- When using the device in the lowest range, the unit must be taken for a short time at a high flow rate in operation to allow a leveling off of the float.

Special features for the measurement of gas flows:

- Valves must be mounted behind the unit when $p_{abs} > 1.013 \text{ bar}$ and usually before the device when $p_{abs} = 1.013 \text{ bar}$ (free outlet).
- Install a throttle directly behind the meter to prevent compression vibrations during the measurement.
- To avoid incorrect measurements, the arrangement shall be such that the operating pressure in the meter corresponds to the reference pressure calibration.

4 Service

4.1 Storage

Store the device dry and dust-free.

Avoid direct exposure to the sun and heat.

Avoid external loads on the device.

The permissible storage temperature for standard units with electrical components is -40 ... +70°C.

4.2 Maintenance

Although the devices are maintenance-free, it is recommended to periodically check the flow meter for signs of corrosion, mechanical wear and damage.

We recommend routine inspections carried out at least once a year.

For a more detailed inspection and cleaning of the unit must be removed from the pipeline.



Caution !

When removing the unit from the pipeline safety precautions must be taken. Basically new seals must be used in the installation into the pipeline.

5 Device Description

5.1 Scope of delivery



Fig. 1 Scope of delivery



Information !
Please check the delivery for completeness using the packing list.

5.2 Versions

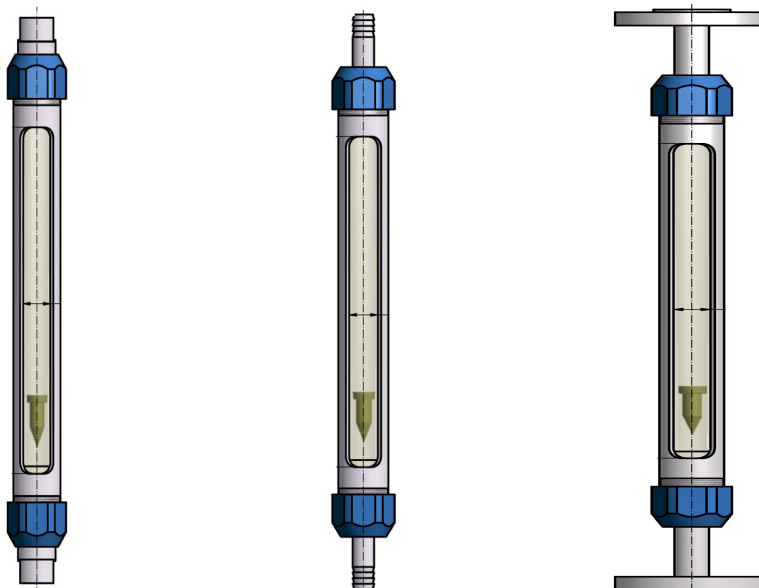


Fig.2 FVA Tubux M30 with female thread connection, hose bushing and flange connection

The main components of the FVA Tubux M30 are the measuring tube made of glass, the float and the connecting parts. A scale is printed on the flow tube (eg in l / h). The actual flowrate is read at the position of the largest diameter of the float. For process monitoring and control, the unit can be equipped with one or more contacts.

Special features

- Individual scales for liquids and gases
- Sturdy design with a variety of materials
- Suitabel for high pressures and temperatures
- Short lead times for standard versions

5.3 Nameplate



Important !

Please refer to the device nameplate to ensure that the device is built according to your order.

Check particularly for the correct supply voltage.

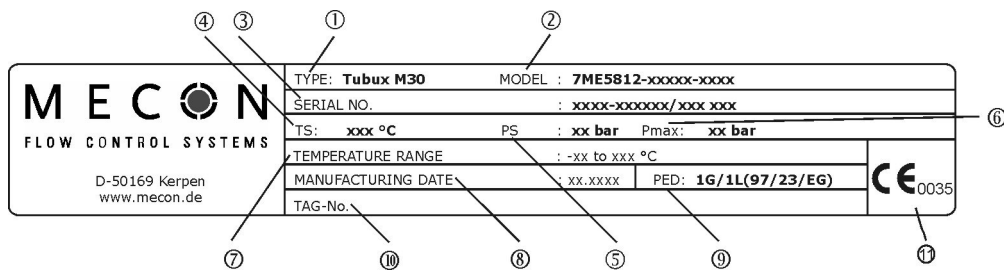


Fig.3 Nameplate of the FVA Tubux M30

- ① Type: Device type
- ② Model: Description code
- ③ Serial No.: Serial number
- ④ TS: maximum permitted temperature
- ⑤ PS: maximum permitted operating pressure
- ⑥ Pmax: maximum permitted operating pressure at TS
- ⑦ Temperature range: Temperature range
- ⑧ Manufacturing date: Date of manufacturing
- ⑨ PED: Pressure equipment directive (2014/68/EU)
- ⑩ TAG-No.: User defined device marking
- ⑪ CE-Identification: CE-Identification

6 Description Code

The description code consists of:

7ME5812 - - /...

①
②
③
④
⑤
⑥
⑦
⑧

① Measuring cone

		Available for Tubux M 30	45	60	90
1B	A 1		X		
1C	A 2		X		
1D	A 5		X		
1E	A 10		X		
2B	B 16		X		
2C	B 25		X		
2D	B 30		X		
2E	B 40		X		
2F	B 50		X		
2G	B 65		X		
2H	B 80		X		
2J	B 100		X		
3A	C 125		X		
3B	C 160		X		
3C	C 200		X		
3D	C 250		X		
3E	C 315		X		
3F	C 400		X		
3G	C 500		X		
4A	D 400			X	
4B	D 650			X	
4C	D 800			X	
4D	D 1000			X	
4E	D 1250			X	
4F	D 1600			X	
4G	D 2000			X	
4H	D 2500			X	
4J	D 3000			X	
5B	E 4000				X
5C	E 5000				X
5D	E 6500				X
5E	E 8000				X
5F	E 10000				X
5G	E 12500				X
5H	E 16000				X
5J	E 20000				X
5K	E 25000				X

② Float material

		Available for Tubux M 30	45	60	90
B	Stainless steel		X	X	X
C	Stainless steel viscosity stable		X	X	X
E	PVDF weighted		X	X	X
F	Aluminium		X	X	X
H	PVDF not weighted		X	X	X

③ Version

1	Fitting stainless steel, union nut aluminium		X	X	X
2	Fitting stainless steel, union nut stainless steel		X	X	X
3	Fitting PVC, union nut PVC		X	X	X

④ Gasket material

4	FKM (Viton®)		X	X	X
5	EPDM		X	X	X
8	FFKM (not available for measuring cone A1 – A10)		X	X	X

⑤ Contacts

0	Without		X	X	X
1	Contact K17/A		X	X	X
2	Contact K17/B		X	X	X
3	Two contacts K17/A		X	X	X
4	Two contacts K17/B		X	X	X
6	Contact K17/A and Contact K17/B		X	X	X
5	Contact K33 changer		X	X	X
7	Contact K33i		X	X	X

⑥ Connections

AA	Adhesive bushing		X	X	X
Cx	Connection female thread DIN ISO 228 in PVDF		X	X	X
Dx	Connection female thread DIN ISO 228 in stainless steel		X	X	X
Fx	Connection female thread NPT in PVDF		X	X	X
Gx	Connection female thread NPT in stainless steel		X	X	X
xB	G ¼ / NPT ¼"		X		
xC	G ⅜ / NPT ⅜"		X		
xD	G ½ / NPT ½"		X	X	
xE	G ¾ / NPT ¾"			X	
xF	G 1 / NPT 1"			X	X
xG	G 1¼ / NPT 1¼"				X
xH	G 1½ / NPT 1½"				X
xJ	G 2 / NPT 2"				X
Hx	Connection hose bushing in PVDF		X	X	X
Jx	Connection hose bushing in stainless steel		X	X	X
xB	LW 10 (⅜")		X		
xC	LW 13 (½")		X	X	
xD	LW 19 (¾")			X	
xE	LW 25 (1")			X	X
xF	LW 32 (1¼")			X	X
xG	LW 38 (1½")			X	X
xH	LW 50(2")				X

		45	60	90
Available for Tubux M 30				
Kx	Flange conn. EN 1092-1, PVDF, built-in length 425 mm	X	X	X
Lx	Flange conn. EN 1092-1, PVDF, built-in length 500 mm	X	X	X
Mx	Flange conn. EN 1092-1, stainless steel, built-in length 425 mm	X	X	X
Nx	Flange conn. EN 1092-1, stainless steel, built-in length 500 mm	X	X	X
xA	DN 10 PN 40	X		
xB	DN 15 PN 40	X		
xC	DN 20 PN 40	X		
xD	DN 25 PN 40	X	X	
xE	DN 32 PN 40		X	
xF	DN 40 PN 40		X	X
xG	DN 50 PN 40		X	X
xH	DN 65 PN 16			X
xJ	DN 80 PN 16			X
Px	Flange conn. ANSI B16.5, in PVDF, built-in length 425 mm	X	X	X
Qx	Flange conn. ANSI B16.5, in PVDF, built-in length 500 mm	X	X	X
Rx	Flange conn. ANSI B16.5, stainless steel, built-in length 425 mm	X	X	X
Sx	Flange conn. ANSI B16.5, stainless steel, built-in length 500 mm	X	X	X
xB	½" ANSI 150 RF	X		
xC	¾" ANSI 150 RF	X		
xD	1" ANSI 150 RF	X	X	
xE	1¼" ANSI 150 RF		X	
xF	1½" ANSI 150 RF		X	X
xG	2" ANSI 150 RF		X	X
xH	2½" ANSI 150 RF			X
xJ	3" ANSI 150 RF			X

⑦ Float version

0	Standard	X	X	X
1	With magnet	X	X	X
2	Guided	X	X	X

⑧ Further versions

B06	With calibration certificate
B11	Name plate inscription in English
C05	Certificate of Compliance with the order 2.2 according to EN 10204
C07	Pressure test according to EN 10204
C09	Leak test according EN 10204
C12	Inspection certificate 3.1 according EN10204
C15	ATEX-approval
S05	Splitter protection up to max. 80° C
S06	Stopper in stainless steel
Y01	Measured medium, always required, specify in plain text: Medium; Measuring range; Device range, Density; Viscosity, Device; Operating temperature, Operating pressure
Y02	With engraved scale (> 90°C/194 °F)
Y03	Special scale (Measuring accuracy 1 %)
Y04	Silicone-free version
Y07	Cleaning class VA – with marking: free of oil and grease
Y17	TAG plate

7 Measuring ranges for liquids

Standard measuring ranges for liquids (density: 1kg/l, viscosity 1mPa.s)

Size	Measuring cone	Ratio	Pressure loss	Max. measuring range for selected floats			
				Stainless steel	Stainless steel with magnet	Stainless steel viscosity stable	PVDF weighted PVDF weighted with magnet (cone C 125 and larger)
			mbar	l/h	l/h	l/h	l/h
45	A 1	1:10	10	1	-	-	-
	A 2	1:10	10	3	-	-	-
	A 5	1:10	10	5	-	-	-
	A 10	1:10	10	10	-	-	-
	B 16	1:10	10	16	-	-	7
	B 25	1:10	10	25	-	-	11
	B 30	1:10	10	30	-	-	11
	B 40	1:10	10	40	-	-	15
	B 50	1:10	10	50	-	-	20
	B 65	1:10	10	65	-	-	25
	B 80	1:10	10	80	-	-	32
	B 100	1:10	10	100	-	-	40
	C 125	1:10	20	125	120	100*	65
	C 160	1:10	20	160	150	125*	90
	C 200	1:10	20	200	180	160*	110
	C 250	1:10	20	250	240	200*	140
	C 315	1:10	40	315	300	240*	175
C 400	1:10	40	400	360	300*	220	
C 500	1:10	40	500	480	360*	250	

* guided float

Standard versions of floats are printed in bold.

Size	Measuring cone	Ratio	Pressure loss	Max. measuring range for selected floats			
				Stainless steel	Stainless steel with magnet	Stainless steel viscosity stable	PVDF weighted PVDF weighted with magnet (cone C 125 and larger)
			mbar	l/h	l/h	l/h	l/h
60	D 650	1:10	19	650	600	400*	500
	D 800	1:10	19	800	750	500*	600
	D 1000	1:10	19	1000	950	600*	750
	D 1250	1:10	19	1250	1200	750*	1000
	D 1600	1:10	24	1600	1500	1000*	1250
	D 2000	1:10	24	2000	1800	1200*	1600
	D 2500	1:10	33	2500	2400	1400*	2000
	D 3000	1:10	33	3000	2800	1800*	2400
90	E 4000	1:10	25	4000	3800*	2500*	3200
	E 5000	1:10	25	5000	4800*	3000*	3800
	E 6500	1:10	25	6500	6400*	4000*	5000
	E 8000	1:10	25	8000	7500*	4500*	6400
	E 10000	1:10	25	10000	9500*	5500*	7500
	E 12500	1:6	25	12500	12000*	-	-
	E 16000	1:4	25	16000	16000*	-	-
	E 20000	1:3	25	20000	19000*	-	-
	E 25000	1:3	25	25000	24000*	-	-

* guided float

Standard versions of floats are printed in bold.

8 Measuring ranges for air

Measuring ranges for air ($p_{abs}=1,013 \text{ bar}$, $T=0^\circ\text{C}$, $\rho=1,293 \text{ kg/m}^3$, $V=0,0181 \text{ mPa}\cdot\text{s}$)

Size	Measuring cone	Ratio	Pressure loss	Max. measuring range for selected floats			
				Aluminium	Aluminium with magnet	PVDF	PVDF with magnet
				mbar	l/h	l/h	l/h
45	A 1	1:10	4	16	-	10	-
	A 2	1:10	4	50	-	25	-
	A 5	1:10	4	80	-	50	-
	A 10	1:10	4	160	-	80	-
	B 16	1:10	4	300	-	230	-
	B 25	1:10	4	450	-	300	-
	B 30	1:10	4	500	-	360	-
	B 40	1:10	4	650	-	500	-
	B 50	1:10	4	800	-	650	-
	B 65	1:10	4	1100	-	800	-
	B 80	1:10	4	1400	-	1000	-
	B 100	1:10	4	1600	-	1250	-
	C 125	1:10	6,5	2000	2500	1500	2200
	C 160	1:10	6,5	3000	3200	2000	3000
	C 200	1:10	6,5	3600	4000	2500	3600
	C 250	1:10	6,5	4000	5000	3000	4500
	C 315	1:10	15	5000	6400	3600	6000
	C 400	1:10	15	6400	8000	5000	7000
C 500	1:10	15	8000	10000	5500	9500	

*guided float

Standard versions of floats are printed in bold.

Size	Measuring cone	Ratio	Pressure loss	Max. measuring range for selected floats			
				Aluminium	Aluminium with magnet	PVDF	PVDF with magnet
			mbar	l/h	l/h	l/h	l/h
60	D 650	1:10	7	10000	12000	8000	10000
	D 800	1:10	7	13000	15000	9000	13000
	D 1000	1:10	7	16000	20000	12000	16000
	D 1250	1:10	7	20000	24000	15000	20000
	D 1600	1:10	9	28000	32000	20000	28000
	D 2000	1:10	9	36000	40000	25000	36000
	D 2500	1:10	12	40000	50000	30000	40000
	D 3000	1:10	12	50000	60000	36000	50000
90	E 4000	1:10	10	64000*	75000*	50000	64000
	E 5000	1:10	10	80000*	100000*	65000	80000
	E 6500	1:10	10	100000*	125000*	80000	100000
	E 8000	1:10	10	140000*	150000*	100000	140000
	E 10000	1:10	10	160000*	180000*	125000	160000
	E 12500	1:6	10	200000*	220000*	150000	-
	E 16000	1:4	10	280000*	300000*	190000	-
	E 20000	1:3	10	350000*	400000*	240000	-
	E 25000	1:3	10	430000*	480000*	300000	-

*guided float

Standard versions of floats are printed in bold.

9 Technical Data

Input

Flow	Vertically upwards
------	--------------------

Mechanical construction

Measuring pipe connections	Threaded connection G $\frac{1}{4}$ to G2 Flange connection DN 10– DN 80 / $\frac{1}{2}$ "- 3" Hose bushing $\frac{3}{8}$ " - 2" (LW 10-50 mm)
----------------------------	--

Material

Measuring cone	Borosilicate glass
----------------	--------------------

Connection	Stainless steel (1.4571, 1.4404) PVDF PVC (adhesive bushing)
------------	--

Float	Stainless steel (1.4571, 1.4404) Aluminium PVDF
-------	---

Float guide rod	Stainless steel (1.4571, 1.4404)
-----------------	----------------------------------

Gasket	Viton® FKM EPDM FFKM
--------	----------------------------

Stopper	PVDF optional Stainless steel (1.4571, 1.4404)
---------	---

Fitting	Stainless steel (1.4301, 1.4571, 1.4404) PVC
---------	---

Optional	
- splinter protection	in Plexiglass (max. 80°C)
- engraved scale	absolutely essential at medium temperature > 90°C

Temperature

Measuring cone	-10 °C to +150 °C	
Stopper in PVDF	-10 °C to +100 °C	
Float material		
PVC	-10 °C to +50 °C	
PVDF	-10 °C to +100 °C	
Stainless steel	-10 °C to +150 °C	
Gasket material		
Viton® FKM	max. +150 °C	
EPDM	max. +150 °C	
FFKM	max. +150 °C	
Connection material		
Stainless steel	-10 °C to +150 °C	
PVC and PVDF	Temperature	Pe [bar]= eff. Pressure
Water and non-aggressive fluids	+20 °C	10,0
	+40 °C	10,0
	+50 °C	2,5
	+20 °C	10,0
	+40 °C	4,0
For aggressive fluids	+40 °C	4,0
	+50 °C	1,0

Ambient temperature -20°C to +80°C

operating pressure range for the cone Depending on temperature

A 1 to D 3000 max. 10 bar (at 20 °C)
 E 4000 to E 25000 max. 8 bar (at 20 °C)

Accuracy

Liquids G 1,6 qG 50% (acc. to VDE/VDI 3513 page 2)
 Gases G 2,5 qG 50% (acc. to VDE/VDI 3513 page 2)

Measuring range

For liquids 0,1 l/h to 25.000 l/h
 Measuring ranges refer to water.
 See also table measuring ranges.
 Special measuring range is available (media data and measuring range needed)

For gases 1 l/h to 480.000 l/h
 Measuring ranges refer to air.
 See also table measuring ranges.
 Special measuring range is available (media data and measuring range needed)

Units of measure

l/h (to measuring cone D 2500)
 m³/h (to measuring cone D 3000)
 %-Division on scale

9.1 Dimensions and weights

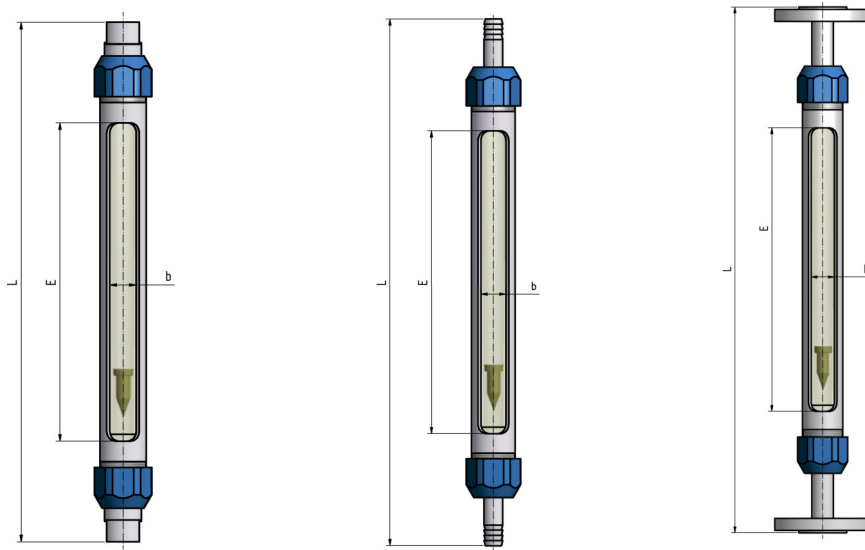


Fig. 4 Dimensions

Size	E [mm]	B [mm]	L [mm]			Weight [kg]		
			Threaded connection	Hose bushing	Flange connection	Threaded connection	Hose bushing	Flange connection
45	235	19	375	400	425 / 500	0,65	0,6	1,9
60	235	38	375	400*	425 / 500	1,9	1,7	3,7
90	235	58	375	450	425 / 500	3,8	4,1	8,7

* Built-in length for hose bushing LW38 450 mm

9.2 Connection options

Size	Female thread DIN ISO 228	Female thread	Hose bushing	Flange EN 1092-1	Flange ANSI B16.5
45	G 1/4	NPT 1/4"	LW13	DN 10 PN 40	1/2" 150RF
	G 3/8	NPT 3/8"	LW17	DN 15 PN 40	3/4" 150RF
	G 1/2	NPT 1/2"		DN 20 PN 40	1" 150RF
				DN 25 PN40	
60	G 1/2	NPT 1/2"	LW17	DN 25 PN 40	1" 150RF
	G 3/4	NPT 3/4"	LW19	DN 32 PN 40	1 1/4" 150RF
	G 1	NPT 1"	LW25	DN 40 PN 40	1 1/2" 150RF
			LW32	DN 50 PN 40	2" 150RF
			LW38		
90	G 1	NPT 1"	LW25	DN 40 PN 40	1 1/2" 150RF
	G 1 1/4	NPT 1 1/4"	LW32	DN 50 PN40	2" 150RF
	G 1 1/2	NPT 1 1/2"	LW38	DN 65 PN 16	2 1/2" 150RF
	G2	NPT 2"	LW50	DN 80 PN 16	3" 150RF

Standard sizes are bold.

9.3 Float selection

Three float versions are available:

- Float not guided (A)
- Float guided (B)
- Float viscosity stable (C)

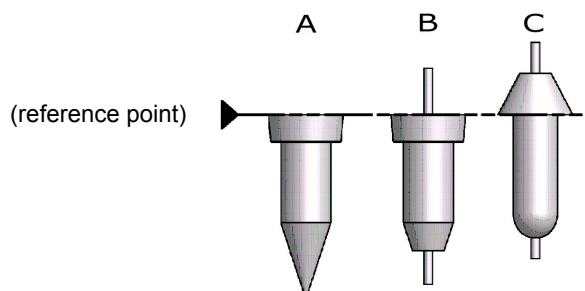
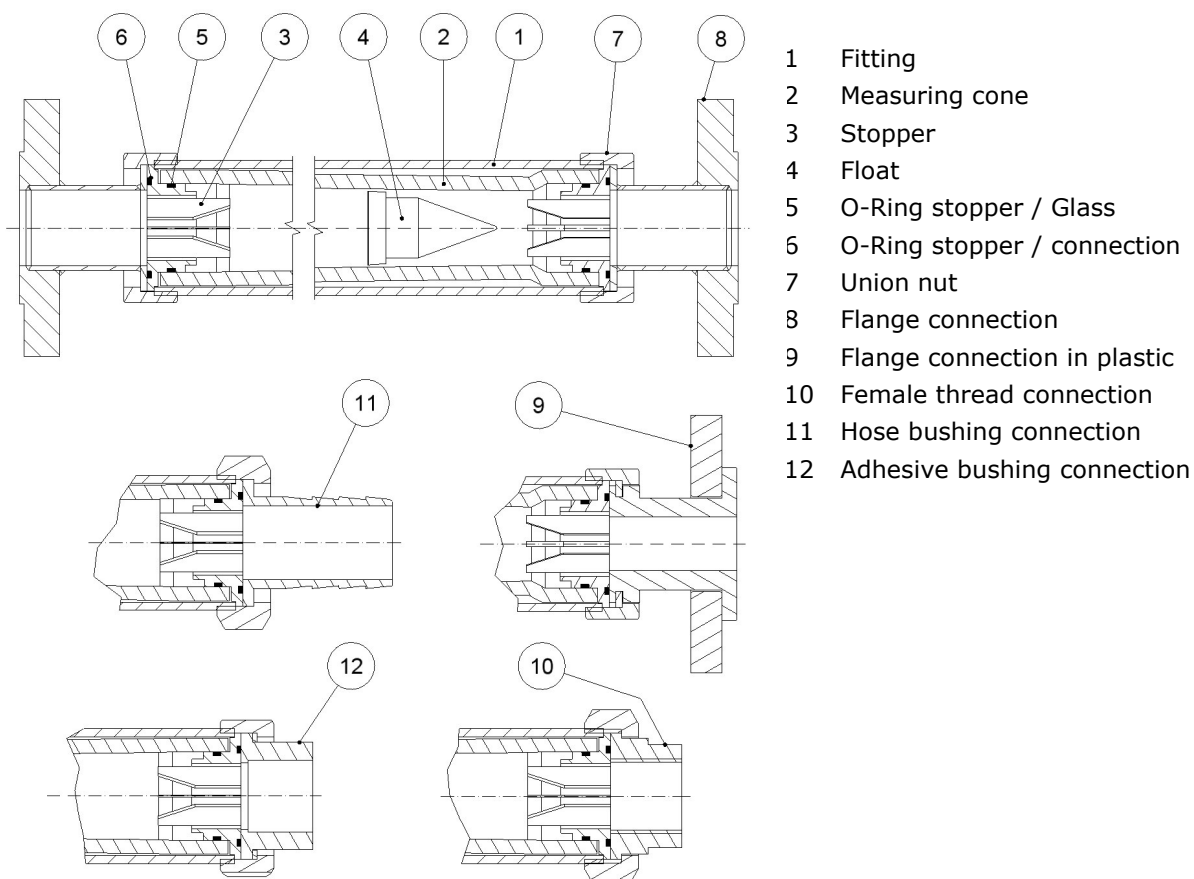


Fig. 5 Float versions

The use of the viscosity-float is required from the following viscosities:

Measuring cone	mPa·s (cP)
C 125 to C 500	≥ 3
D 650 to D 3000	≥ 5
E 4000 to F 10000	≥ 8

9.4 Parts list



- 1 Fitting
- 2 Measuring cone
- 3 Stopper
- 4 Float
- 5 O-Ring stopper / Glass
- 6 O-Ring stopper / connection
- 7 Union nut
- 8 Flange connection
- 9 Flange connection in plastic
- 10 Female thread connection
- 11 Hose bushing connection
- 12 Adhesive bushing connection

Fig. 6 Sectional drawing FVA Tubex M30

10 Contacts

10.1 Contact K17

The bistable magnetic contact K17 indicates the position of the float. In this way, measurement values are indicated without contact or feedback.

Special features:

- Bistable behavior
- High agitation resistance
- Switching without feedback
- No mutual influencing between the contacts
- Switching with almost no inertia
- Simple plug connection

Name	K17 A, K17 B
Housing/connector	PP/PA 6
Contact material	Rhodium
Protection class	IP65
Ambient temperature	-20 bis +80°C / -4 bis 176°F
max. switching frequency	5/min.
max. switching capacity	AC 250 V/0,5 A/10 VA
Power rating	DC 250 V/0,5 A/5 W (apply to resistive load, inductive load, inductive load circuit is required)
Electrical connection	Rectangular connector, type A (EN 175301-803)

The bistable contact assembly K17 consists of a contact spring set is sealed in a glass tube filled with inert gas. The spring contacts are polarized by a fixed magnet such that they exhibit a bistable behavior. There are two contacts for selection:

- K17 A: contact closes when the limit is fallen below
- K17 B: contact closes when the limit is exceeded

Caution: The maximum switching capacity and the maximum allowable inrush current must not be exceeded, otherwise a welding effect occurs at the contact tongues, thereby bonding with each other.

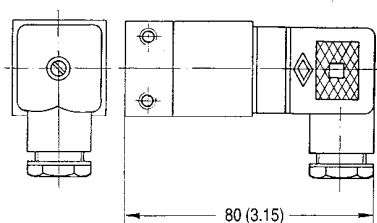


Fig. 7 Contact K17, Dimensions in mm (inch)

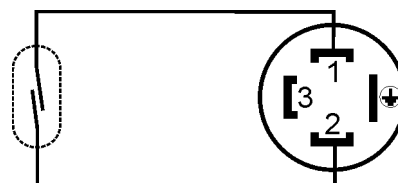
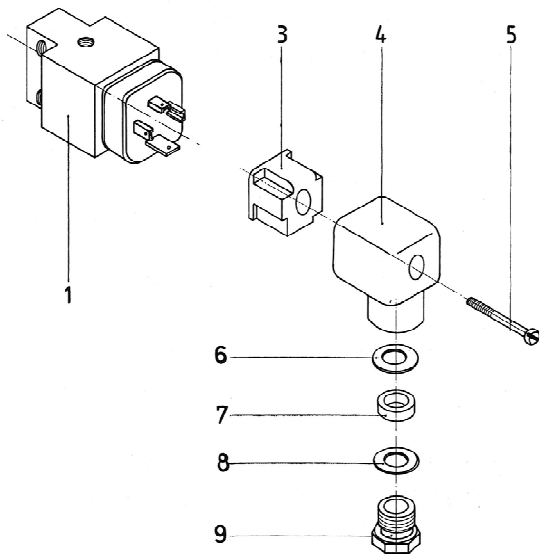


Fig. 8 Electrical connection K17

Installation of the connection cable to the connector:



1. Remove the cable gland (9) and take out the gasket kit (8, 7, 6).
2. Remove the locking screw (5) and pull of the housing (4) from the insert connector (3).
3. Insert the connection cable through the cable gland (9), the gasket kit (6, 7, 8) and the housing.
4. Connect the wires to terminal 1 and 2 of the insert connector.
5. Assemble the rectangular connector in reverse order as described above. Please note, that the cable outlet can be varied by rotating the insert connector (4) through 90°.

Fig. 9 Explosion drawing contact K17

Commissioning:

When commissioning by the users, we recommend the float of the device once a contact or make contact according to the past out the float. Thus, the correct position of the contact is ensured.

Contact mounting K17:

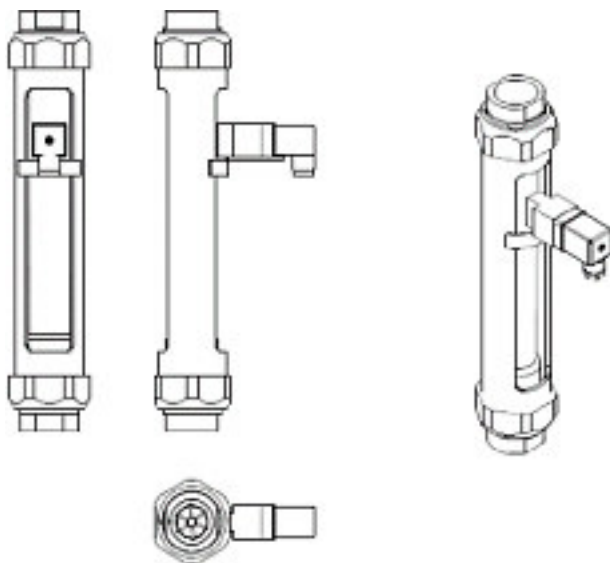


Fig. 10 Contact mounting K17 for FVA Tubux M30

10.2 Contact K33

Housing	Aluminium
Contact material	AgPd
Protection class	IP54
Switching capacity	AC 220 V / DC 250 V
Permanent current	1.5 A
Circuit resistance	0,2 Ohm
Insulation resistance	50 M Ohm
Breakdown voltage	1150 V
Mech. lifetime	10 ⁸ circuits
Max. switching frequency	7200 / h
Electrical connection	Rectangular connector, type A (EN 175301-803)

The magnetic reed contact in conjunction with the measuring instrument is used in applications to be where measurement conditions open or close electrical circuits.

Application:

The particular advantage of this switch is in the gas-tight encapsulation of the contacts to prevent sparking. The risk of gas explosion is eliminated by switching sparks and unnecessary in many cases more expensive explosion protection.

Mode of operation:

In a glass tube filled with inert gas (gas-tight sealed), the contact springs of silver-palladium. The central movable contact is attracted by a magnet support secured to the glass tube and held in the rest position. A top mounted tilting magnet can be rotated by an actuating magnet so that one of its poles facing the holding magnet.

The stronger magnetic field of the tilting contact attracts the contact arm and a switchover. If the tilting magnet turned back by the operation magnet back to its starting position, the contact is due to the attraction of the holding magnet back to its original position. Since there is a change-over, both resting and a shunt circuit can be applied.

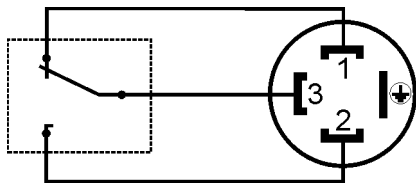


Fig. 11 Electrical connection

10.3 Contact K33i

Housing	Aluminium
Switching element function	NC contact
Output polarity	NAMUR (DIN EN 60947-5-6)
Protection class	IP54
Voltage U_0	DC 8 V
Operating voltage U_B	DC 5...25 V
Max. switching frequency	3000 Hz
Electrical connection	Rectangular connector, design A (EN 175301-803)

The inductive switch contact K33i is particularly used where in hazardous areas with gas, vapor or mist measurement condition, an electrical circuit is to be opened or closed.

Application:

The particular advantage of the inductive proximity switch is used in the joints tight welding of the housing body and the housing cover, and the void-free encapsulation of the Sensors under vacuum, thereby preventing the ingress of moisture. The protection class of the sensor is IP 68. Due to the intrinsically safe version of the sensor, an operation in hazardous areas is possible.

Mode of operation:

In the magnetic carrier of a top mounted tilting magnet a control flag is mounted so that depending on the position of the tilting magnet, the free end of the control lug which projects into the slot of an inductive sensor or not.

By sweeping past the actuating magnet on the switch body tilting magnet can be rotated.

The damping of the internal magnetic field sensor, which is caused by a protruding into the slot control flag is evaluated by the sensor and converted into an output signal according to NAMUR standard (DIN EN 60947-5-6)

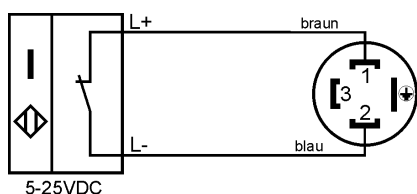


Fig. 12 Electrical connection

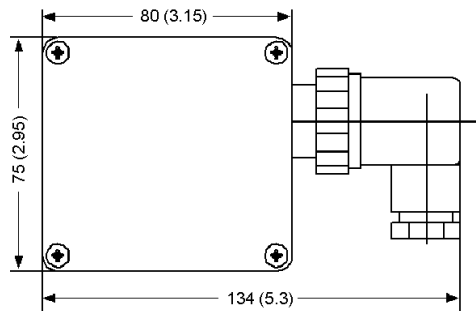
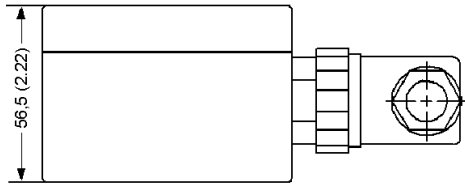


Fig. 13 Contact K33, K33i, measured in mm

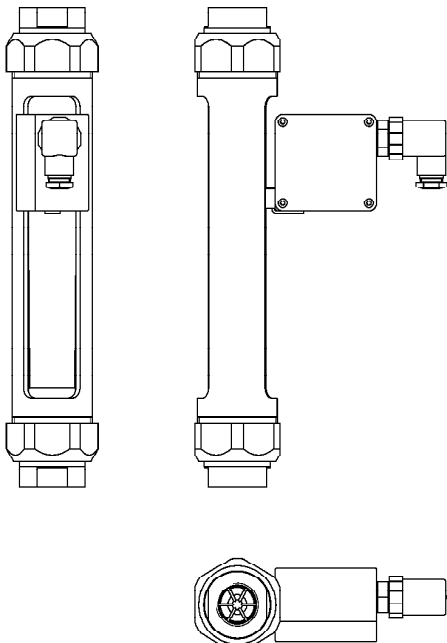
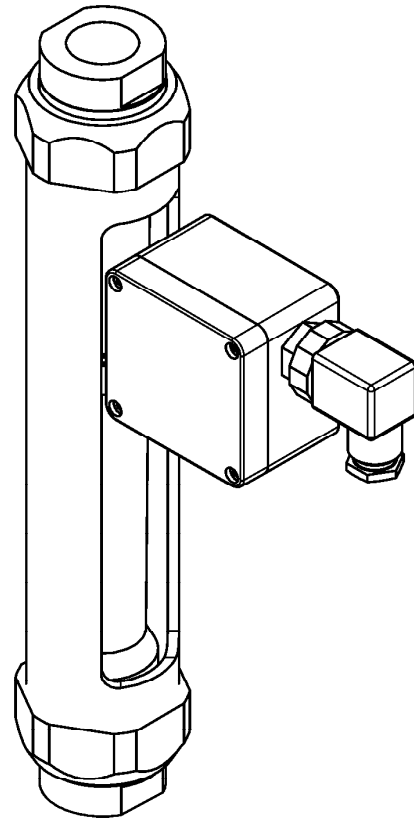


Fig.14 Mounting Contact K33, K33i on Tubux M30

11 Return and Disposal

11.1 Returning to the manufacturer

Due to careful production process and final inspections of the unit, when installed and operated in accordance with this manual is a trouble-free use of FVA Tubux M30 expected.

Should it be necessary to return the unit to the MECON GmbH, the following points should be noted:



Caution!

For reasons of legal regulations on environmental protection and occupational safety and preservation of the health and safety of our employees, all have to be returned for repair to the Mecon GmbH Device free of toxic and hazardous substances. This also applies to the device cavities. When needed, the device is prior to returning to the Mecon GmbH by the customer to neutralize or flush.

The customer has to confirm this by completing an appropriate Formulare, which is located for download at the website of the Mecon GmbH:

www.mecon.de/en/Declaration/Decontamination.pdf

11.2 Disposal



Caution!

For the disposal of the equipment with the relevant requirements of your country must be observed.

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