Zakłady Automatyki "ROTAMETR" Sp. z o.o.
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METAL ROTAMETRES OF KM, KM1G, KM2G, KME TYPES

Float flowmeters are designed for liquid or gas volume measurment or as well as for mass measurment in closed conduit. The measuring set is put into the conduit. Rise of rotameter's float by liquid or gas flowing up from below above the beginning of the scale is a measurement of liquid or gas volume. Float indication is transmited by magnetic clutch. Flowmeters are made of mechanics and chemical resistant materials.

CONSTRUCTION

In a standard version flowmeters are entirely made of chromium – nickle steel, which is chemical resistant for most substances in chemical industry. The steel can be also used to apply in food industry.
The flowmeter can have a built-in heating jacket. A heating jacket is a chamber with contact terminals. It enables heating of frame flowmeter by gas or liquid heating medium. Such a solution is being used as counteraction to freezing of the liquid measured in the flowmeter.
In some circumstances the flowmeter is being equipped with a vibration damper when used to measurments of flows of gas. Vertical float oscillations are caused by characteristic of meter circuit.
In case of some ferromagnetic particles found in measured flow the flowmeter may include a special kind of a magnet on which the particles settle. It presents them to settle on the float. The magnet, which is a part of a magnetic clutch is situated inside the float. The errors of measurments can be caused by ferromagnetic particles settled on the float.

Standard versions of flowmeters

KM - with local reading
KM 1G - with local reading and one point signalling
KM 2G - with local reading and two points signalling
KME - with local reading and electrical output signal

Accuracy of reading

Flowmeters are calibrated by using verifing measurment instruments. In a standard version is 2,5 accuracy class guaranteed. The accuracy class can be improved when demanded. Accuracy class is characterized according to the PN-85/M-42371 norm.

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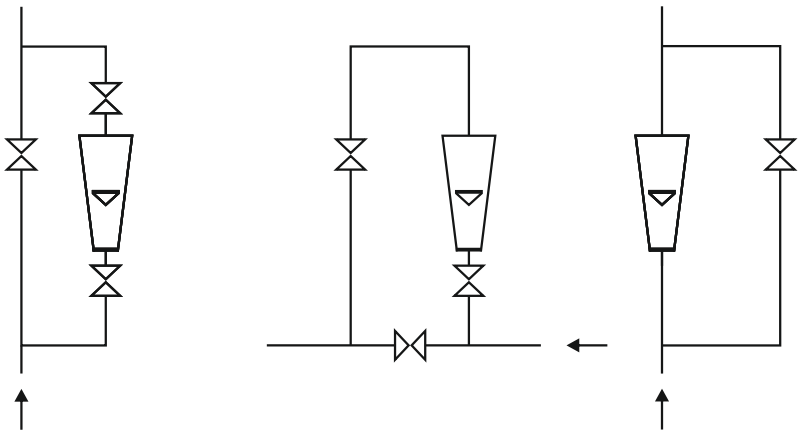
Installation

1.The flowmeter should be installed vertically. Acceptable deviation for vertical is 20.

2.Recommended to install side conduits (Pic. 1). It enables replacement of the flowmeter without process discontinue.

3.The sediments can settle on the measuring elements in case of pollutions of some mediums flown through the equipment. Use also solvent sediment agent.

Pic. 1



Main assembly dimensions of flowmeters

Size	a	b	d	e	f	g	h	i	k	l	Mass[1)]
	mm										
DN 15 I I II	95	45	89	152	90	12	65	6	28	2,5	2,0
DN 15 III	95	45	89	152	94	12	65	6	28	2,5	2,0
DN 25	115	68	89	148	100	14	85	8	42	2,5	3,2
DN 50	165	105	79	146	112	15	125	8	72	2,5	6,5
DN 80	200	140	79	-	135	18	160	8	105	2,5	11,2
DN 100	235	160	86	-	155	22	190	8	155	2,5	15,2

[1)] mass without installation of heating set

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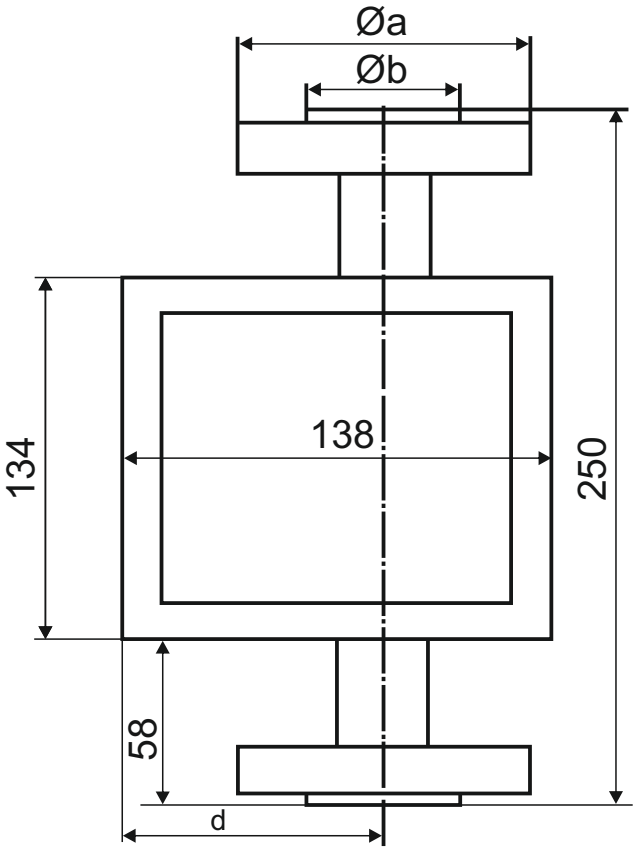
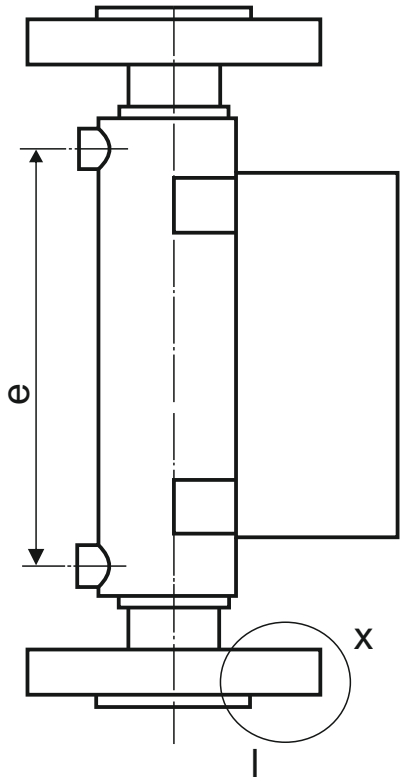
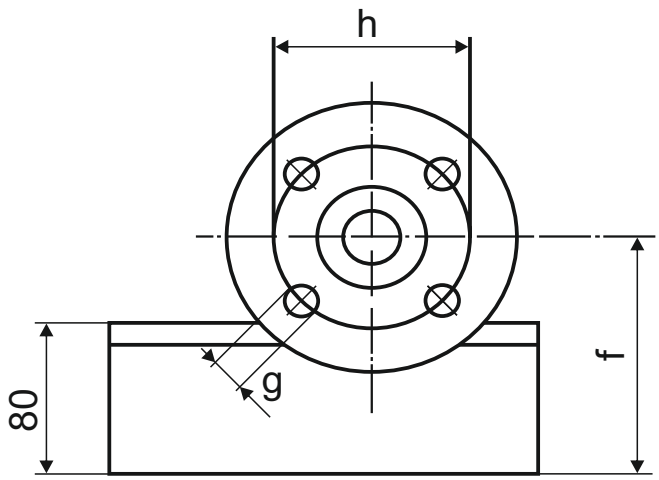
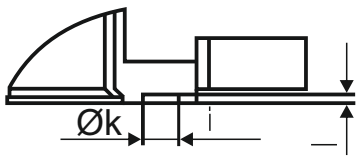
without heating



with heating







x – version with rebate and gasket groove according to DIN 2512 norm

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Specification

On the flowmeter's frame the reading us shown. Independently of the local reading KM typ may be equipped with one or two point signalling of set boundary value.
On the reading output the are current signals generate for each point. Current signals can be changed by the state of its fan-out contacts 500VA relay.
In a KME typ on the output reading there a current signal generated of the value of 0…20 mA or 4…20 mA or there is other signal according to the use'rs needs.

General date

Operating pressure:	p_N4 / p $_N$10MPa
Operating temperature:	-30...+250℃
Ambient temperature:	-40...+80℃
Scale lenght:	100 mm / 90^0
Float jump:	25 / 35 mm
Connection:	Flange according to DIN 2501

Construction materials

Connection and frame:	chromium – niclke steel, carbon steel with teflon lining
Reading:	plastics

Heater

Material:	chromium – nickle steel
Heating medium:	gas or liquid
Feeding pressure:	0,6 MPa
Medium temperature:	40...+130℃
Connection:	Internal thread R/$_4$

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Types KM 1G and KM 2G

With one or two sygnalling points of boundary value:	1 or 2 sensors typ SJ 2-N
Input resistance:	8V, DC (R~1kÙ)
Self – inductance:	29 ìH
Self – capacity:	20 nF
Current sygnal:	⩾3 mA = 1 ⩽1 mA = 0
Protection degree:	IP 67

Typ KME

Working voltage:	12 V to 24 V
Feed current:	~ 25mA
Plug round joint:	max cable 1,5 mm^2
Output signal:	
Signal selection:	0…20 mA, 4…20 mA, diffrent
Load:	three ranges o operating value 0…1000 ?, 24 V, 0… 400 ?, 12 V

For claim receiver

Feeder cable:	typ MS 82-2404 output 24 V 0,4 A
Plug joint:	max cable 1,5 mm^2

Additional accessories

Signal converter:	Typ WE77/Ex-1, typ WE77/Ex-2
Input current:	220 V
Output:	1 or 2 normal open contacts
Load capacity contacts:	⩽250 V, 4 A
Power rating:	500 VA
Power factor:	cos ö = 0,7
Protection degree:	IP 20

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Product symbol formation

Symbol Position							
	1	**2**	**3**	**4**	**5**	**6**	**7**

Position 1	
KM	with local reading
KM 1G	with local reading and one sygnalling point
KM 2G	with local reading and two sygnalling points
KME	with local reading and electrical output signal

Position 2 **DN**	**Position 3** **Pipe dimension**	**Measuring range**		**Loss of pressure** **kPa**
		water 15℃ dm³/h	**air 20℃, 101,3 kPa m³/h**	
1	2	3	4	5
15	0,025 0,040 0,063 0,10 0,16 0,25 0,40 0,63	2,5…25 4…40 6,3…63 10…100 16…160 25…250 40…400 63…630	0,09…0,9 0,13…1,3 0,2…2 0,33…3,3 0,53…5,3 0,77…7,7 1,2…12 2…20	1,2 1,2 1,2 1,2 1,2 2,1 2,1 2,1
1	2	3	4	5
25	0,25 0,4 0,63 1 1,6 2,5 4	25…250 40…400 63…630 100…1000 160…1600 250…2500 400…4000	0,77…7,7 1,2…12 2…20 3…30 5…50 7…70 12…120	2,1 2,1 2,1 3,4 3,4 3,4 3,5
50	4 6,3 10 16	400…4000 630…6300 1000…10000 1600…16000	12…120 19…190 30…300 50…500	5,1 5,1 5,1 5,1
80	16 25 40	1600…16000 2500…25000 4000…40000	50…500 75…750 120…1200	4,7 4,7 5,1
100	40 63 100	4000…40000 6300…63000 10000…100000	- - -	- - -

This measurment ranges and loss of preasure values concern a float made chromium – nickle steel. Positive gauge pressure on the entry of the flowmeter should be above five – times higher than loss of pressure in gas flow measurements.

Position 4	
Material version	
1	chromium – nickle steel

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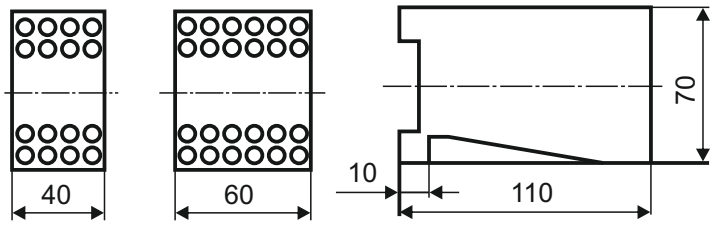
Position 5	
Flanges type	
1	for standard pressure 4 MPa, with smooth rebate
2	for standard pressure 4 MPa, with gasket groove
3	for standard pressure 10 MPa, with smooth rebate
4	for standard pressure 10 MPa, with gasket groove
5	other

Position 6	
Ancilary sets	
0	without heating, output 0…20 mA for KME
1	with heating, output 0…20 mA for KME
2	without heating, output 4…20 mA for KME
3	with heating, output 4…20 mA for KME

Position 7	
Accuracy class according PN-85/M-423371 norm	
1	class 1,6 only for water or air
2	class 2,5 for all mediums
3	class 4 for all mediums

Signal relay typ WE 77/Ex-1 and WE 77/Ex-2	
Body	plastics NORYL SE (self – extinguishing)
Assembly	for assembly rail 35 mm or by screw
Connection	apparat clip to cable 2,5 mm
Mass	WE 77/Ex-1 ~ 390g WE 77/Ex-2 ~ 410g



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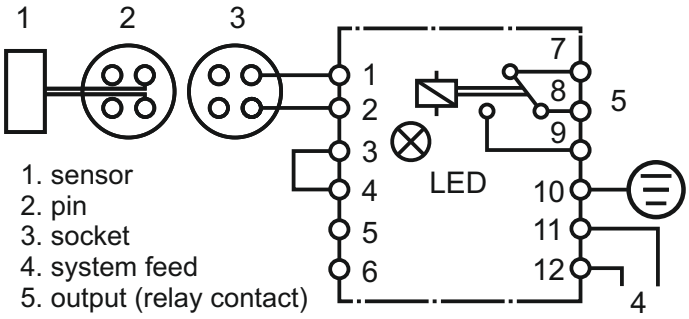
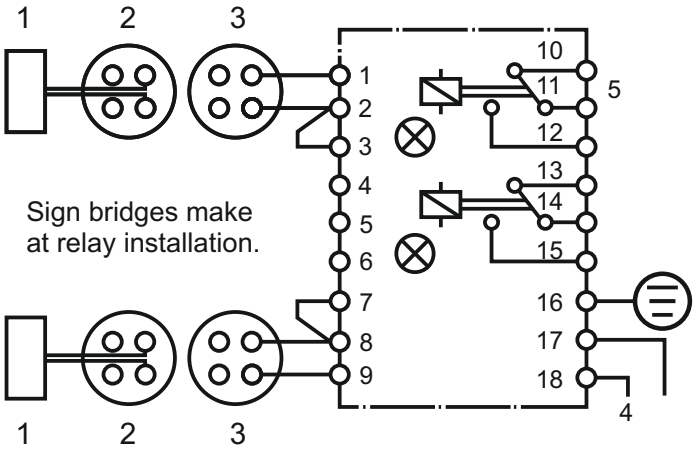
WE 77/Ex-1

Action direction	Bridge between clamps
Operating current	3-4
Quiscent current	4-5
Quiscent current with neutralization cable controll	lack

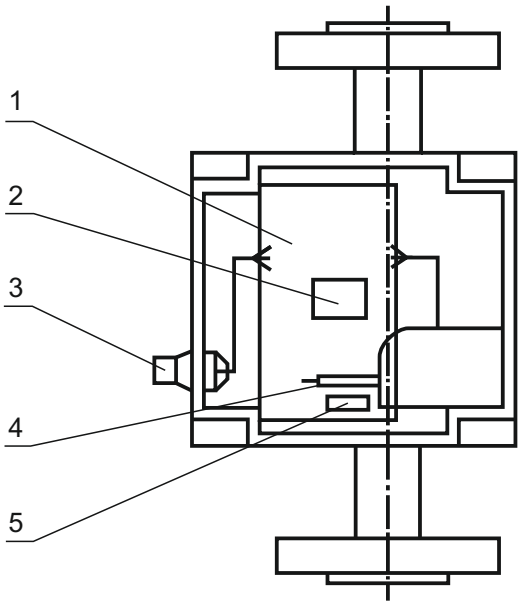


WE 77/Ex-2

Action direction	Bridge between clamps
Operating current	2-3 7-8
Quiscent current	3-4 6-7
Quiscent current with neutralization cable controll	lack lack



Scheme connection in KME flowmeter

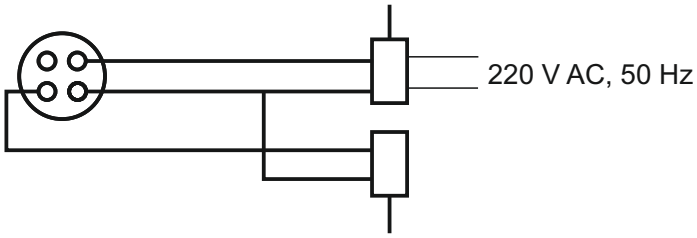


1.Connection table
2.EPROM
3.Plug-in socket
4.Pointer
5.Switch DIL

Position switch DIL

1	2	
ON	ON	registration (measurement valves)
ON	OFF	registration (setting opearting conditions)
OFF	ON	registration (standby)
OFF	OFF	registration (standby)

Triple cable connection



Four cable connection