



Flow - piston valve design



Characteristics

System	Flow - piston valve design
Evaluation	Display Switching
Nominal widths	DN 8..200
Range	1..1250 l/min
Media	Water Oils Gases Aggressive media
Pressure	Max. 100 bar
Temperature	-20..+350 °C
Approvals	ATEX, GL, TÜV

Applications

- Industrial metering and monitoring technology
- Cooling systems
- Lubrication circuits
-  applications
-  applications

Function and benefits

A piston rests in the valve seat of a housing and is moved vertically through the flowing medium, whereby the travel of the piston is proportional to the flow value.

Since the piston works against the force of a support spring, the device can be installed independently of the position and have a secure reset function if the volume flow is lagging.

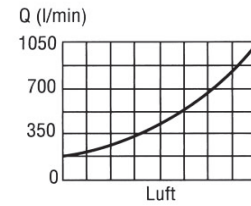
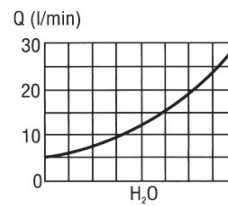
The devices are designed by standard for liquid media and the functional data is specified for water.

Some devices can also be used for viscous and gaseous media.














For the viscosities it must be observed that the measurements decrease as the viscosity increases according to the tendency of the table below.

	Water	Viscosity mm ² /s				l/min
		30	60	115	220	
MP	4	4.0	4.0	3.0	2.0	
	8	8.0	7.0	6.0	4.0	
	10	10.0	9.0	8.5	8.0	
	20	19.0	18.0	17.5	17.0	
VD	4	2.0	0.8	0.6	0.3	
	8	6.0	4.0	3.0	1.5	
	10	9.0	8.0	6.0	3.0	
	20	18.0	17.0	14.0	10.0	
VM	4	4.0	4.0	3.0	2.5	
	8	8.0	8.0	7.5	6.0	
	10	10.0	9.0	7.0	6.0	
	20	19.0	18.0	17.0	14.0	
TZ1	4	4.0	4.0	3.5	3.0	
	8	8.0	7.5	7.0	6.0	
	10	10.0	9.5	9.0	8.0	
	20	20.0	19.0	18.5	18.0	

The functional ratio for air and gases in relation to water is approx 1:35, which means 1 l/min water corresponds to approximately 35 Sl/min air at 20 °C. Feel free to contact us for advice for this application.




Device overview

Device	Switch	Connection	Materials	Range l/min	Pressure resistance	Medium temperature	Displays	Switching	Page	
MP		-	Female thread G 1/4..G 3	Red bronze	1.5..600	PN 16..200	-20..+100 °C	analog	-	5
FF		Reed switch	Female thread G 1/4..G 1 1/2	Red bronze	0.4..90 adjusted	PN 16..200	-20..+110 °C	-	normally open / nor- mally closed 230 VAC, 1A, 50 VA	7
FM		Micro switch	Female thread G 1/4..G 1/2	Red bronze	0.4..12 adjusted	PN 200	-20..+90 °C	-	Changeover 250 VAC, 6 A	9
G		Reed switch	Female thread G 1/4..G 1/2	Red bronze	0.015..0.4 adjusted	PN 16	-20..+80 °C	-	normally closed 250 VAC, 1A, 50 VA	11
VD		Reed switch	Female thread G 1/4..G 3	Red bronze	1..600	PN 16..25	-20..+120 °C	-	Changeover 250 VAC, 1.5 A, 50 VA	13
		Reed switch	Female thread G 1/2..G 2	Stainless steel	1..200	PN 100	-20..+120 °C	-	Changeover 250 VAC, 1.5 A, 50 VA	15
A-V1		ATEX switching head I M1 Ex ia I / II 1G Ex ia IIC T4 / II 1D Ex iaD 20 T135				-20..+120 °C	-	Changeover 15..36 V, 1.5 A, 50 W	17	
VM		Micro switch	Female thread G 1/4..G 3	Red bronze	1..600	PN 16..100	-20..+90 °C	-	Changeover 250 V AC, 5 A	18
		Micro switch	Female thread G 1/2..G 1	Stainless steel	2..250	PN 100	-20..+90 °C	-	Changeover 250 V AC, 5 A	20
A-V2		ATEX switching head I M1 Ex ia I / II 1G Ex ia IIC T4 / II 1D Ex iaD 20 T135				-20..+90 °C	-	Changeover 15..36 V, 1.5..5 A	22	
A-V3		ATEX switching head II 2G Ex d IIC T6				-20..+90 °C	-	Changeover 250 V AC, 5 A	23	
VDO		Reed switch	Female thread G 1/4..G 3	Red bronze	2..600	PN 16..100	-20..+120 °C	analog	Changeover 250 V AC, 1.5 A, 50 VA	24
TX		Micro switch	Flange DN 15..200	Cast steel	2..1250	PN 40	-20..+350 °C	analog	Changeover 250 V AC, 6 A	26

Product Information

Sensors and Instrumentation

Device	Switch	Connection	Materials	Range l/min	Pressure resistance	Medium temperature	Displays	Switching	Page
TZ1 	Micro switch or potentiometer	Female thread G ¹ / ₄ ..G3	Red bronze	2..600	PN 16..100	-20..+90 °C	analog	Changeover 250 V AC, 5 A	28
		Female thread G ¹ / ₂ ..G 2	Stainless steel	2..250	PN 100	-20..+90 °C	analog	2 x normally open 2 x normally closed 250 V AC, 0,6 A, 50 VA	30
	Additional devices for TZ1						-20..+90 °C	analog	0,6 A, 50 VA
Options	● Plug DIN 43650-A / ISO 4400								33
Accessories	● Type ZV / ZE (Filter)								33

Errors and technical modifications reserved.

Flow Indicator MP-...GR



- No electrical supply required
- Insensitive to dirt
- Also for dark or dirty media
- Rotatable scale, easy to read
- No glass parts under load from pressure or media

Characteristics

The volume flow raises a disc against a spring force. Via a tappet, the disc actuates a magnet which is coupled to a hermetically sealed display ring.

Technical data

Switch/sensor	without	
Nominal width	DN 8..80	
Process connection	female thread G 1/4 ..G 3	
Range	1.5..600 l/min	for details see table "Ranges"
Q _{max.}	to 600 l/min	
Tolerance	±5 % of full scale value	
Pressure resistance	G 1/4..G 1/2 - PN 200 G 3/4..G 1 - PN 25 G 1 1/4 .. G 1 1/2 - PN 16	
Medium temperature	-20..+100 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils and gases available on request)	
Electrical data	none	
Materials medium-contact	Rg 5 / Rg 6 nickelled, CW614N, 1.4310, hard ferrite, NBR	
Non-medium-contact materials	Acrylic, CW614N, NBR	
Weight	see table "Dimensions and weights"	
Installation location	Standard: horizontal inwards flow; display downwards not recommended; other installation positions are possible; the installation position affects the switching point and range.	

Ranges

Details in the table correspond to horizontal inwards flow with increasing flow rate.

● = Standard ○ = Option

G	Nominal width		Display range l/min H ₂ O	Q _{max.} recommended	Types
G 1/4	DN 8	●	1.5 - 6	6	MP-008GR006
		○	2.5 - 10	10	MP-008GR010
G 3/8	DN 10	○	1.5 - 6	6	MP-010GR006
		●	2.5 - 10	10	MP-010GR010
G 1/2	DN 15	○	1.5 - 6	6	MP-015GR006
		○	2.5 - 10	10	MP-015GR010
		●	5.0 - 20	20	MP-015GR020
G 3/4	DN 20	○	2.5 - 10	10	MP-020GR010
		○	5.0 - 20	20	MP-020GR020
		●	10.0 - 40	40	MP-020GR040
G 1	DN 25	○	2.5 - 10	10	MP-025GR010
		○	5.0 - 20	20	MP-025GR020
		●	10.0 - 40	40	MP-025GR040
G 1 1/4	DN 32	○	12.0 - 60	60	MP-032GR060
		●	20.0 - 100	100	MP-032GR100
G 1 1/2	DN 40	●	30.0 - 150	150	MP-040GR150
		○			MP-050GR150
G 2	DN 50	○	50.0 - 250	250	MP-050GR250
		●			MP-065GR250
G 2 1/2	DN 65	○	80.0 - 400	400	MP-065GR400
		●			MP-080GR400
G 3	DN 80	○	120.0 - 600	600	MP-080GR600
		●			

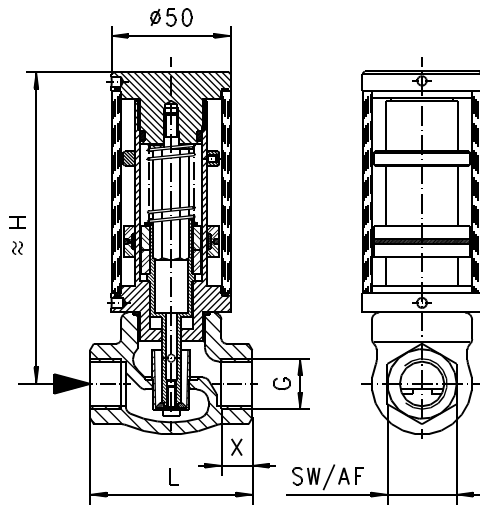
Special ranges are available.

Dimensions and weights

G	Types	H	L	SW	X	Weight kg
G 1/4	MP-008GR...	130	68	29	12	1.1
	MP-010GR...					
	MP-015GR...					
G 3/4	MP-020GR...	133	73	32	11	1.2
G 1	MP-025GR...	136	87	41	12	1.4
G 1 1/4	MP-032GR...	150	98	52	13	2.0
G 1 1/2	MP-040GR...	154	113	59	14	2.6
G 2	MP-050GR...	184	137	72	17	4.2
G 2 1/2	MP-065GR...	200	160	85	26	5.6

Product Information

Sensors and Instrumentation

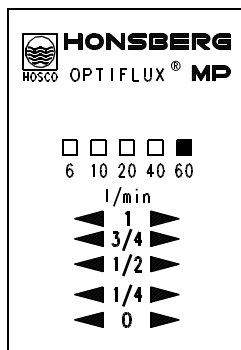


Handling and operation

Note

- Include straight calming section of 5 x DN in inlet and outlet.
- If the media are dirty, install a filter (use magnetic filter for ferritic components).

Display



- The display is rotatable.

Ordering code

MP - 1. 2. 3. 4.
 MP - **G** **R**

●=Standard ○=Option

1. Nominal width											
008	DN 8 - G 1/4										
010	DN 10 - G 3/8										
015	DN 15 - G 1/2										
020	DN 20 - G 3/4										
025	DN 25 - G 1										
032	DN 32 - G 1 1/4										
040	DN 40 - G 1 1/2										
050	DN 50 - G 2										
065	DN 65 - G 2 1/2										
080	DN 80 - G 3										
2. Process connection		G female thread									
3. Connection material		R red bronze									
4. Display range H ₂ O for horizontal inwards flow											
006	1.5 - 6 l/min									○	○
010	2.5 - 10 l/min									○	○
020	5.0 - 20 l/min									○	○
040	10.0 - 40 l/min									●	●
060	12.0 - 60 l/min									○	
100	20.0 - 100 l/min									●	
150	30.0 - 150 l/min									○	●
250	50.0 - 250 l/min									○	●
400	80.0 - 400 l/min									○	●
600	120.0 - 600 l/min									●	

Options

- Housing made from stainless steel
- Special ranges/special scaling

Ordering information

- Specify direction of flow, medium, and display range.
- For oils. State viscosity, temperature and designation (e.g. ISO VG 68) (enquire about display range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request display range)

Product Information

Sensors and Instrumentation

Flow Switch FF-...GR



- Adjusted switching value
- Highly reproducible
- Insensitive to dirt

Characteristics

The volume flow raises a piston (fitted with a magnet) out from a valve seat against a spring force. The piston actuates a hermetically separated reed switch.

Technical data

Switch	reed switch	
Nominal width	DN 8..40 (DN 50..80 available on request)	
Process connection	female thread G 1/4 ..G 1 1/4	
Adjustment range	0.4..90 l/min	for details see table "Ranges"
Q_{max.}	to 150 l/min	
Tolerance	±3 % of the switching value, minimum ±0.3 l/min	
Pressure resistance	G 1/4..G 1/2 - PN 200 G 3/4..G 1 - PN 25 G 1 1/4..G 1 1/2 - PN 16	
Medium temperature	-20..+110 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils and gases available on request)	
Wiring	normally open (n.o.) no. 0.212 optionally, normally closed no. 0.214 (not all adjustment ranges are possible, please enquire) 	
Switching voltage	max. 230 V AC	
Switching current	max. 1 A	
Switching capacity	max. 50 VA	
Protection class	1 - PE connection	
Ingress protection	IP 65	
Electrical connection	cable 1.5 m	

Materials medium-contact	Rg 5 nickelled, 1.4310, CW614N nickelled, NBR, hard ferrite
Non-medium-contact materials	PA, PVC
Weight	see table "Dimensions and weights"
Installation location	Standard: horizontal inwards flow; switching head not recommended underneath; other installation positions are possible; the installation position affects the switching point and range.

Ranges

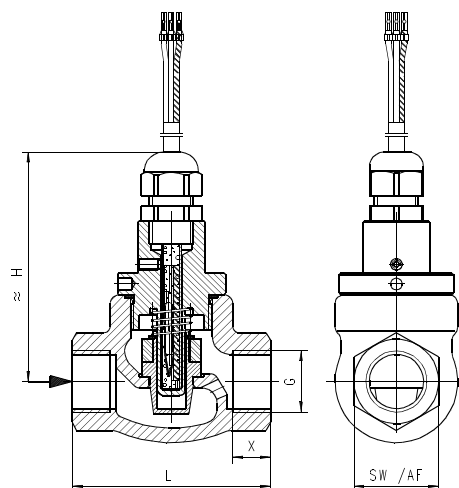
Details in the table correspond to horizontal inwards flow with decreasing flow rate.

G	DN	Switching point l/min H ₂ O Choose between	Types	Q _{max.} recommended
G 1/4	DN 8	0.4 - 9	FF-008GR009	10
G 3/8	DN 10	0.4 - 10	FF-010GR010	15
G 1/2	DN 15	0.4 - 12	FF-015GR012	20
G 3/4	DN 20	0.6 - 25	FF-020GR025	40
G 1	DN 25	1.5 - 40	FF-025GR040	60
G 1 1/4	DN 32	2.0 - 60	FF-032GR060	100
G 1 1/2	DN 40	3.0 - 90	FF-040GR090	150

Special ranges are available

Dimensions and weights

G	Types	H	L	SW	X	Weight kg
G 1/4	FF-008GR...	68	79	29	12	0.6
G 3/8	FF-010GR...				13	
G 1/2	FF-015GR...				13	
G 3/4	FF-020GR...	73	90	32	11	0.7
G 1	FF-025GR...	87		41	14	1.0
G 1 1/4	FF-032GR...	98		52	14	1.5
G 1 1/2	FF-040GR...	113		59		2.0



Product Information

Sensors and Instrumentation

Handling and operation

- Include straight calming section of 5 x DN in inlet and outlet
- If the media are dirty, install a filter (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series. The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Ordering code

FF - 1. 2. 3. 4. 5.
 FF - **G** **R**

○=Option

1. Nominal width	
008	DN 8 - G 1/4
010	DN 10 - G 3/8
015	DN 15 - G 1/2
020	DN 20 - G 3/4
025	DN 25 - G 1
032	DN 32 - G 1 1/4
040	DN 40 - G 1 1/2
2. Process connection	
G	female thread
3. Connection material	
R	red bronze
4. Switching point H₂O can be set as desired between	
009	0.4 - 9 l/min
010	0.4 - 10 l/min
012	0.4 - 12 l/min
025	0.6 - 25 l/min
040	1.5 - 40 l/min
060	2.0 - 60 l/min
090	3.0 - 90 l/min
5. Wiring	
S	'normally open', no. 0.212
O	○ 'normally closed', no. 0.214 (please enquire about range)

Options

- Adjustment for oil or gas
- Special values

Ordering information

- Specify direction of flow, medium, and switching point.
- For oils, state viscosity, temperature and designation (e.g. ISO VG 68) (enquire about range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (enquire about range).

Product Information

Sensors and Instrumentation

Flow Switch FM-...GR

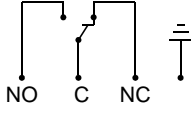


- Adjusted switching value
- Highly reproducible
- Insensitive to dirt
- High switching power

Characteristics

The volume flow raises a piston (fitted with a magnet) out from a valve seat against a spring force. The piston uses a magnetic coupling to actuate a hermetically separated micro switch.

Technical data

Switch	micro switch	
Nominal width	DN 8..15 (DN 20..80 available on request)	
Process connection	female thread G 1/4..G 1/2	
Adjustment range	0.4..12 l/min	for details see table "Ranges"
Q_{max.}	to 20 l/min	
Tolerance	±3 % of the switching value, minimum ±0.3 l/min	
Pressure resistance	PN 200	
Medium temperature	-20..+90 °C	
Ambient temperature	-20..+70 °C	
Media	Water (oils and gases available on request)	
Wiring	changeover no. 0.450 	
Switching voltage	max. 250 V AC	
Switching current	max. 6 A	
Protection class	1 - PE connection	
Ingress protection	IP 65	
Electrical connection	plug-in connection on the microswitch 2.8 x 0.5, cable screw gland Pg 9. optionally DIN 43650-A plug	
Materials medium-contact	Rg 5 nickelled, 1.4310, CW614N nickelled, CW614N, NBR, hard ferrite	
Non-medium-contact materials	PS, PA	
Weight	see table "Dimensions and weights"	

Installation location	Standard: horizontal inwards flow; switching head not recommended underneath; other installation positions are possible; the installation position affects the switching point and range.
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Ranges

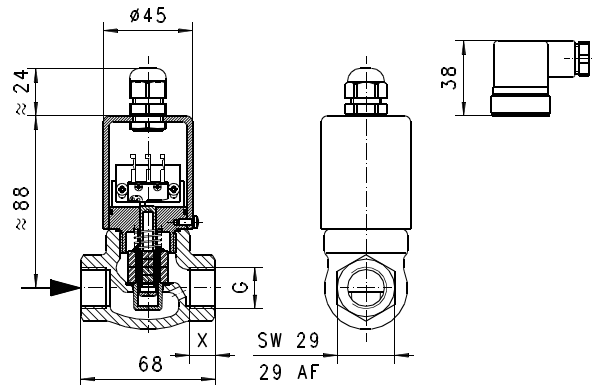
Details in the table correspond to horizontal inwards flow with decreasing flow rate.

G	DN	Switching point l/min H ₂ O Choose between	Types	Q _{max.} recommended
G 1/4	DN 8	0.4 - 9	FM-008GR009	10
G 3/8	DN 10	0.4 - 10	FM-010GR010	15
G 1/2	DN 15	0.4 - 12	FM-015GR012	20

Special ranges are available

Dimensions and weights

G	Types	X	Weight kg
G 1/4	FF-008GR...	12	0.65
G 3/8	FF-010GR...		
G 1/2	FF-015GR...	13	0.60



Product Information

Sensors and Instrumentation

Handling and operation

- Include straight calming section of 5 x DN in inlet and outlet.
- If the media are dirty, install a filter (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Ordering code

FM - 1. 2. 3. 4.

1. Nominal width			
008	DN 8 - G 1/4		
010	DN 10 - G 3/8		
015	DN 15 - G 1/2		
2. Process connection			
G	female thread		
3. Connection material			
R	red bronze		
4. Switching point H ₂ O can be set as desired between			
009	0.4 - 9 l/min		●
010	0.4 - 10 l/min		●
012	0.4 - 12 l/min	●	

Options

- Nominal width DN 20..80
- Adjustment for oil or gas
- Special values
- Plug DIN 43650-A / ISO 4400
- Signal lamp red or red / green in the plug

Ordering information

- Specify direction of flow, medium, and switching point.
- For oils, state viscosity, temperature and designation (e.g. ISO VG 68) (enquire about range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (enquire about range).

Product Information

Sensors and Instrumentation

Flow Switch G-...GR

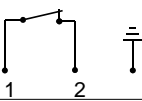


- Adjusted switching value
- Small switching point

Characteristics

Balls fitted with magnets rise in proportion to the flow against the magnetic force of an opposite-poled magnet and actuate a reed contact.

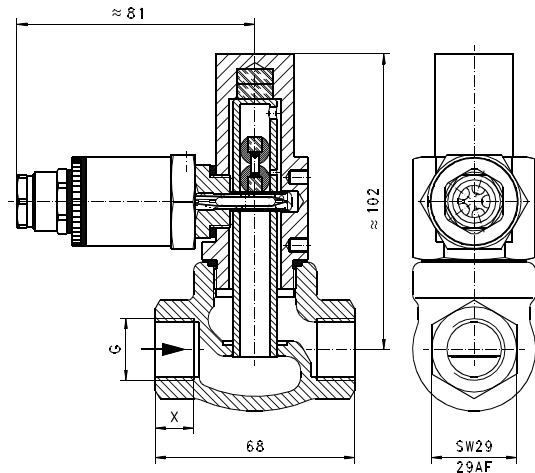
Technical data

Switch	reed switch
Nominal width	DN 8..15
Process connection	female thread G 1/4..G 1/2
Adjustment range	0.15..0.4 l/min horizontal inwards flow with decreasing flow rate
Q_{max. recommended}	G 1/4 - 4 l/min G 3/8 - 8 l/min G 1/2 - 12 l/min
Tolerance	±10 % of full scale value
Pressure resistance	PN 16
Medium temperature	-20..+80 °C
Ambient temperature	-20..+70 °C
Media	water (oils up to 20 mm ² /s, and gases on request)
Wiring	normally closed (n.c.) no. 0.214 
Switching voltage	max. 250 V AC
Switching current	max. 1 A
Switching capacity	max. 50 VA
Protection class	1 - PE connection
Ingress protection	IP 65
Electrical connection	Standard: cable screw gland Pg 9, optionally DIN 43650-A / ISO 4400 plug GL - Germanischer Lloyd: cable screw gland Pg 11 with cable, 2.5 m
Materials medium-contact	Rg 5 nickelled, CW614N nickelled, POM, Klingersil C-4400, hard ferrite
Non-medium-contact materials	CW614N, NBR
Weight	0.6 kg

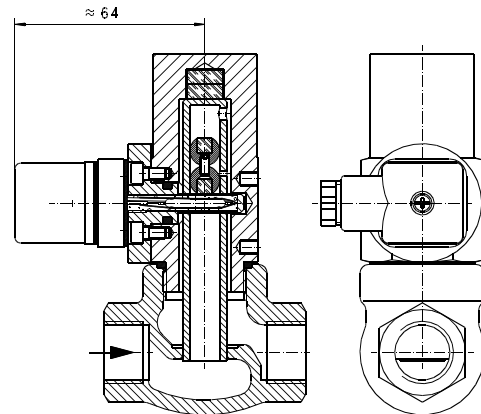
Installation location	Standard: horizontal inwards flow; switching head upwards
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Dimensions and weights

G	Types	X
G 1/4	G-008..	12
G 3/8	G-010..	
G 1/2	G-015..	13



optionally DIN 43650-A / ISO 4400 plug



Handling and operation

- Include straight calming section of 5 x DN in inlet and outlet.
- If the media are dirty, install a filter (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series. The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Product Information

Sensors and Instrumentation

Ordering code

Standard device

1. 2. 3.
 G -

1. Nominal width	
008	DN 8 - G 1/4
010	DN 10 - G 3/8
015	DN 15 - G 1/2
2. Process connection	
G	female thread
3. Connection material	
R	red bronze

Germanischer Lloyd (GL) certified



1. 2. 3.
 G -

1. Nominal width	
008	DN 8 - G 1/4
010	DN 10 - G 3/8
015	DN 15 - G 1/2
2. Connection material	
R	red bronze
3. Process connection	
I	female thread

Options

- Transformer
- Adjustment for oil or gas
- Special values

Ordering information

- Specify direction of flow, medium, and switching point.
- For oils, state viscosity, temperature and designation (e.g. ISO VG 68) (enquire about range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (enquire about range).

Product Information

Sensors and Instrumentation

Flow Switch VD-...GR

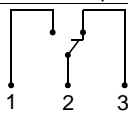


- Highly reproducible
- Precise, stepless adjustment of the switching value
- Insensitive to dirt
- Short installation length

Characteristics

The volume flow raises a piston (fitted with a magnet) out from a valve seat against a spring force. The piston actuates a hermetically separated reed switch.

Technical data

Switch	reed switch	
Nominal width	DN 8..80	
Process connection	female thread G 1/4..G 3	
Switching range	1..600 l/min	for details see table "Ranges"
Q_{max.}	to 720 l/min	
Tolerance	±5 % of full scale value	
Pressure resistance	G 1/4..G 1 - PN 25 G 1 1/4..G 3 - PN 16	
Medium temperature	-20..+120 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils and gases available on request)	
Wiring	changeover no. 0.213 	
Switching voltage	max. 250 V AC	
Switching current	max. 1.5 A	
Switching capacity	max. 50 VA	
Protection class	2 - safety insulation	
Ingress protection	IP 44, optionally IP 65	
Connection	plug DIN 43650-A / ISO 4400	
Materials medium-contact	Rg 5 / Rg 6 nickelled, POM, 1.4310, CW614N, NBR, hard ferrite	

Non-medium-contact materials	ABS, PA
Weight	see table "Dimensions and weights"
Installation location	Standard: horizontal inwards flow; switching head not recommended underneath; other installation positions are possible; the installation position affects the switching point and range.

Ranges

Details in the table correspond to horizontal inwards flow with decreasing flow rate.

G	Nominal width	Switching range l/min H ₂ O	Q _{max.} recommended	Type
G 1/4	DN 8	1 - 10	15	VD-008GR010
G 3/8	DN 10			VD-010GR010
G 1/2	DN 15	4 - 20	20	VD-015GR010
G 3/4	DN 20			10 - 40
		40	VD-020GR020	
G 1	DN 25	20 - 60	60	VD-020GR040
			85	VD-025GR040
G 1 1/4	DN 32	30 - 100	100	VD-025GR060
			145	VD-032GR060
G 1 1/2	DN 40	50 - 150	150	VD-032GR100
			220	VD-040GR100
G 2	DN 50	100 - 200	250	VD-040GR150
			290	VD-050GR150
G 2 1/2	DN 65	180 - 330	400	VD-050GR200
			475	VD-065GR200
G 3	DN 80	300 - 600	600	VD-065GR330
			720	VD-080GR330
				VD-080GR600

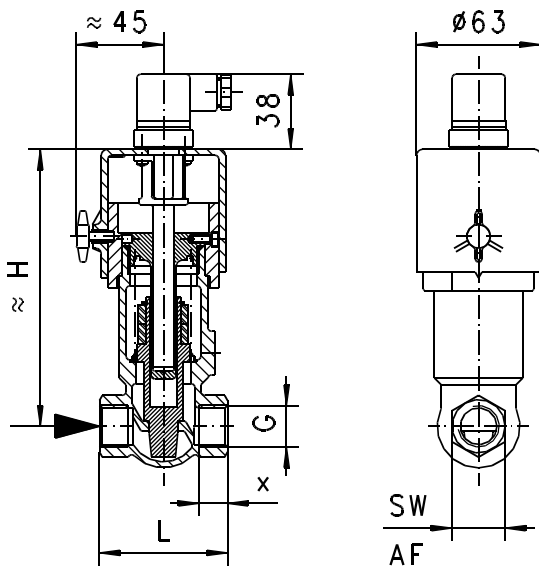
Special ranges are available

Product Information

Sensors and Instrumentation

Dimensions and weights

G	Types	H	L	SW	X	Weight kg	
G 1/4	VD-008GR	150	65	29	12	1.0	
G 3/8	VD-010GR				14		
G 1/2	VD-015GR						
G 3/4	VD-020GR						
G 1	VD-025GR	156	80	32	16	1.1	
G 1 1/4	VD-032GR				41	18	1.3
G 1 1/2	VD-040GR				52	13	2.1
G 2	VD-050GR				59	14	2.8
G 2 1/2	VD-065GR				72	17	4.0
G 3	VD-080GR				85	26	4.0
					100	23	7.0



Handling and operation

Note

- Include straight calming section of 5 x DN in inlet and outlet
- Include a filter if the media are dirty (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Adjustment

To adjust the switching point, the fixing screw for the switching head must be loosened. The switching head can then be rotated. Turning to the right increases the switching point, and vice-versa. Then retighten the fixing screw.



Ordering code

VD - 1. 2. 3. 4. 5.
 VD - G R

1. Nominal width	
008	DN 8 - G 1/4
010	DN 10 - G 3/8
015	DN 15 - G 1/2
020	DN 20 - G 3/4
025	DN 25 - G 1
032	DN 32 - G 1 1/4
040	DN 40 - G 1 1/2
050	DN 50 - G 2
065	DN 65 - G 2 1/2
080	DN 80 - G 3
2. Process connection	
G	female thread
3. Connection material	
R	red bronze
4. Switching range H ₂ O for horizontal inwards flow	
010	1 - 10 l/min
020	4 - 20 l/min
040	10 - 40 l/min
060	20 - 60 l/min
100	30 - 100 l/min
150	50 - 150 l/min
200	100 - 200 l/min
330	180 - 330 l/min
600	300 - 600 l/min
5. Optionally for ATEX	
A	for switching head ATEX A-V1 (The switching head is ordered in addition)

Options

- Special plugs, Tuchel / Harting
- Signal lamp red or red/green in the plug DIN 43650-A
- Other signal lamp
- Protection class IP 65
- Temperature display 0..120 °C
- Temperature monitoring 40..90 °C
- Temperature resistant up to 150 °C
- Metal cap
- Rhodium contact 250 V AC, 0.5 A, 30 VA
- Solid metal – Ms / VA
- GL certified (types VR)
- Switching ranges for oil or gas
- Special values
- Internal parts are brass or stainless steel

Ordering information

- Specify direction of flow, medium, and switching range.
- For oils. State viscosity, temperature and designation (e.g. ISO VG 68) (enquire about switching range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request switching range).

Product Information

Sensors and Instrumentation

**Flow Switch
 VD-...GK**



- Highly reproducible
- Precise, stepless adjustment of the switching value
- Insensitive to dirt
- Short installation length

Characteristics

The volume flow raises a piston (fitted with a magnet) out from a valve seat against a spring force. The piston actuates a hermetically separated reed switch.

Technical data

Switch	reed switch	
Nominal width	DN 15..50	
Process connection	female thread G 1/2..G 1	
Switching range	1..200 l/min	for details see table "Ranges"
Q_{max.}	to 290 l/min	
Tolerance	±5 % of full scale value	
Pressure resistance	PN 100	
Medium temperature	-20..+120 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils, gases and aggressive media available on request)	
Wiring	changeover no. 0.213	
Switching voltage	max. 250 V AC	
Switching current	max. 1.5 A	
Switching capacity	max. 50 VA	
Protection class	2 - safety insulation	
Ingress protection	IP 44, optionally IP 65	
Connection	Plug DIN 43650-A / ISO 4400	
Materials medium-contact	1.4305, 1.4571, 1.4310, FKM, hard ferrite	
Non-medium-contact materials	PTFE-coated	
Non-medium-contact materials	ABS, PA	
Weight	see table "Dimensions and weights"	

Installation location	Standard: horizontal inwards flow; switching head not recommended underneath; other installation positions are possible; the installation position affects the switching point and range.
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Ranges

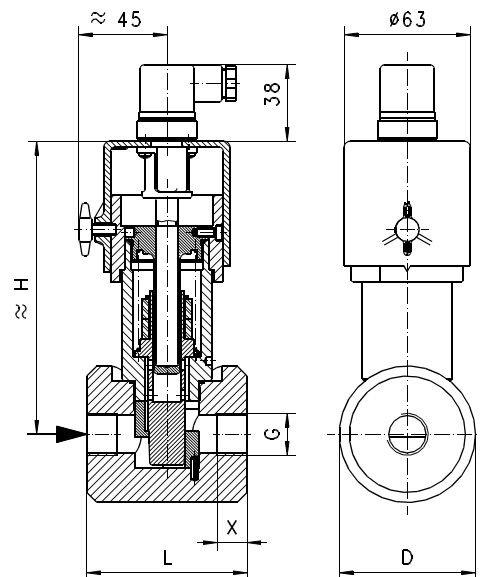
Details in the table correspond to horizontal inwards flow with decreasing flow rate.

G	Nominal width	Switching range l/min H ₂ O	Q _{max.} recommended	Type
G 1/2	DN 15	1 - 10	20	VD-015GK010
			30	VD-015GK020
G 3/4	DN 20	4 - 20	40	VD-020GK020
				VD-020GK040
G 1	DN 25	10 - 40	60	VD-025GK040
			85	VD-025GK060
G 1 1/4	DN 32	20 - 60	100	VD-032GK060
			145	VD-032GK100
G 1 1/2	DN 40	30 - 100	150	VD-040GK100
			220	VD-040GK150
G 2	DN 50		250	VD-050GK150
			290	VD-050GK200

Special ranges are possible

Dimensions and weights

G	Types	H	L	D	X	Weight kg
G 1/2	VD-015GK	166	80	68	15	2.8
G 3/4	VD-020GK				16	2.6
G 1	VD-025GK				18	2.5
G 1 1/4	VD-032GK	180	95	78	24	3.7
G 1 1/2	VD-040GK	186	105	88	25	4.8
G 2	VD-050GK	194	120	102	27	7.0



Product Information

Sensors and Instrumentation

Handling and operation

Note

- Include straight calming section of 5 x DN in inlet and outlet.
- Include a filter if the media are dirty (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Adjustment

To adjust the switching point, the fixing screw for the switching head must be loosened. The switching head can then be rotated. Turning to the right increases the switching point, and vice-versa. Then retighten the fixing screw.



Ordering code

VD - 1. 2. 3. 4. 5.
 VD - **G** **K**

1. Nominal width									
015	DN 15 - G 1/2								
020	DN 20 - G 3/4								
025	DN 25 - G 1								
032	DN 32 - G 1 1/4								
040	DN 40 - G 1 1/2								
050	DN 50 - G 2								
2. Process connection									
G	female thread								
3. Connection material									
K	stainless steel								
4. Switching range H₂O for horizontal inwards flow									
010	1 - 10 l/min								●
020	4 - 20 l/min								● ●
040	10 - 40 l/min								● ●
060	10 - 60 l/min								●
	20 - 60 l/min								●
100	20 - 100 l/min								●
	30 - 100 l/min								●
150	50 - 150 l/min								● ●
200	100 - 200 l/min								●
5. Optionally for ATEX									
A	for switching head ATEX A-V1 (The switching head is ordered in addition)								●

Options

- Special plugs, Tuchel / Harting
- Signal lamp red or red / green in the plug DIN 43650-A
- Other signal lamp
- Ingress protection P 65
- Temperature display 0..120 °C
- Temperature monitoring 40..90 °C
- Temperature resistant up to 150 °C
- Metal cap
- Rhodium contact 250 V AC, 0.5 A, 30 VA
- Solid metal – Ms / VA
- GL certified (types VR)
- Switching ranges for oil or gas
- Special values
- Internal parts are brass or stainless steel

Ordering information

- Specify direction of flow, medium, and switching range.
- For oils. State viscosity, temperature and designation (e.g. ISO VG 68) (enquire about switching range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request switching range).

Product Information

Sensors and Instrumentation

Switching Head A-V1

For devices VD-

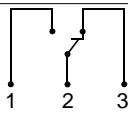
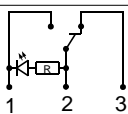


- I M1 Ex ia I
- II 1G Ex ia IIC T4
- II 1D Ex iaD 20 T135

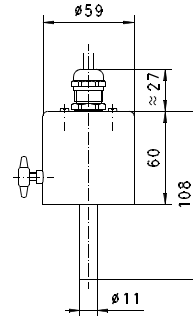
Characteristics

Intrinsically safe switching head with reed switch and ATEX approval, for the VD range of devices, for use in intrinsically safe power circuits.

Technical data

Switch	reed switch
Medium temperature	-20..+120 °C
Ambient temperature	-20..+50 °C
Weight	0.5 kg additionally
Without diode	
Wiring	changeover no. 0.213 
Switching voltage	max. 30 V
Switching current	max. 1.5
Switching capacity	max. 50 W
With diode	
Wiring	changeover with diode no. 0.208 
Switching voltage	max. 15 V, 28 V or 36 V
Switching current	max. 1.5 A
Switching capacity	max. 50 W
Protection class	3 - protective extra low voltage
Ingress protection	IP 65
Connection	cable 2.5 m, other cable lengths optionally available

Dimensions



Handling and operation

Note

- For use only in intrinsically safe power circuits; provide a suitable isolating amplifier.
- Cable lengths max. 5 m.
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Adjustment

To adjust the switching point, the fixing screw for the switching head must be loosened. The switching head can then be rotated. Turning to the right increases the switching point, and vice-versa. Then retighten the fixing screw.

Ordering code

The base device is ordered, e.g. VD-015GR020A with switching head e.g. A-V1-1.

A-V1 - 1.

1. Wiring - switching voltage	
1	wiring no. 0.213 - 30 V
2	wiring no. 0.208 - 15 V
3	wiring no. 0.208 - 28 V
4	wiring no. 0.208 - 36 V

Use for devices

Switching head	Device type
A-V1	VD-...

Product Information

Sensors and Instrumentation

Flow Switch
VM-...GR

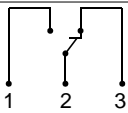


- Highly reproducible
- Precise, stepless adjustment of the switching value
- High switching power
- Insensitive to dirt
- Short installation length

Characteristics

The volume flow raises a disc unit with magnet against a spring force. A magnetic coupling actuates a hermetically separated micro switch.

Technical data

Switch	micro switch	
Nominal width	DN 8..80	
Process connection	female thread G 1/4..G 3	
Switching range	1..600 l/min	for details see table "Ranges"
Q_{max.}	to 720 l/min	
Tolerance	±5 % of full scale value	
Pressure resistance	G 1/4..G 1/2 - PN 100 G 3/4..G 1 - PN 25 G 1 1/4..G 3 - PN 16	
Medium temperature	-20..+90 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils and gases available on request)	
Wiring	changeover no. 0.213	
Switching voltage	max. 250 V AC	
Switching current	max. 6 A	
Protection class	2 - safety insulation	
Ingress protection	IP 65	
Connection	plug DIN 43650-A / ISO 4400	
Materials medium-contact	Rg 5 / Rg 6 nickelled, POM, 1.4310, CW614N, NBR, hard ferrite	
Non-medium-contact materials	ABS, PA	
Weight	see table "Dimensions and weights"	

Installation location	Standard: horizontal inwards flow; switching head not recommended underneath; other installation positions are possible; the installation position affects the switching point and range.
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Ranges

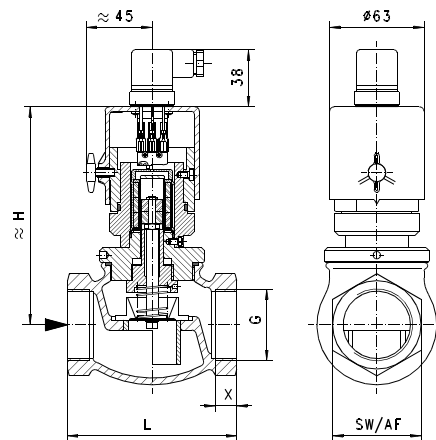
Details in the table correspond to horizontal inwards flow with decreasing flow rate.

G	Nominal width	Switching range l/min H ₂ O	Q _{max.} recommended	Types
G 1/4	DN 8	1 - 5	8	VM-008GR005
		3 - 12	15	VM-008GR012
G 3/8	DN 10	2 - 6	10	VM-010GR006
		3 - 12	15	VM-010GR012
G 1/2	DN 15	2 - 6	30	VM-015GR006
		4 - 20		VM-015GR020
G 3/4	DN 20	4 - 12	20	VM-020GR012
		10 - 40	50	VM-020GR040
G 1	DN 25	10 - 60	70	VM-025GR060
G 1 1/4	DN 32	20 - 100	120	VM-032GR100
G 1 1/2	DN 40	30 - 150	180	VM-040GR150
G 2	DN 50	50 - 250	300	VM-050GR250
G 2 1/2	DN 65	50 - 400	480	VM-065GR400
G 3	DN 80	100 - 600	720	VM-080GR600

Special ranges are available

Dimensions and weights

G	Types	H	L	SW	X	Weight kg
G 1/4	VM-008GR	144	68	29	12	1.2
G 3/8	VM-010GR					1.3
G 1/2	VM-015GR				13	1.4
G 3/4	VM-020GR	73	32	11	1.5	1.5
G 1	VM-025GR					87
G 1 1/4	VM-032GR	155	98	52	13	2.3
G 1 1/2	VM-040GR	156	113	59	14	3.0
G 2	VM-050GR	164	137	72	17	4.3
G 2 1/2	VM-065GR	195	160	85	26	5.8
						7.0
G 3	VM-080GR	148	100	23		



Product Information

Sensors and Instrumentation

Handling and operation

Note

- Include straight calming section of 5 x DN in inlet and outlet
- Include a filter if the media are dirty (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive and inductive loads must be operated using a protective circuit.

Adjustment

To adjust the switching point, the fixing screw for the switching head must be loosened. The switching head can then be rotated. Turning to the right increases the switching point, and vice-versa. Then retighten the fixing screw.



Ordering code

VM - 1. 2. 3. 4. 5.

VM - **G** **R**

1. Nominal width	
008	DN 8 - G 1/4
010	DN 10 - G 3/8
015	DN 15 - G 1/2
020	DN 20 - G 3/4
025	DN 25 - G 1
032	DN 32 - G 1 1/4
040	DN 40 - G 1 1/2
050	DN 50 - G 2
065	DN 65 - G 2 1/2
080	DN 80 - G 3
2. Process connection	
G	female thread
3. Connection material	
R	red bronze
4. Switching range H ₂ O for horizontal inwards flow	
005	1 - 5 l/min
006	2 - 6 l/min
012	3 - 12 l/min
	4 - 12 l/min
020	3 - 20 l/min
	4 - 20 l/min
040	10 - 40 l/min
060	10 - 60 l/min
100	20 - 100 l/min
150	30 - 150 l/min
250	50 - 250 l/min
400	50 - 400 l/min
600	100 - 600 l/min
5. Optional for ATEX	
A	for switching head ATEX A-V2 or A-V3 (The switching head is ordered in addition)

Options

- Special plugs, Tuchel / Harting
- Signal lamp red or red / green in the plug DIN 43650-A
- Other signal lamp
- Temperature display 0..120 °C
- Temperature monitoring 40..90 °C
- Temperature resistant up to 150 °C
- Metal cap
- Gold contact microswitch 125 V AC / 30 V DC, 100 mA
- Germanischer Lloyd
- Switching ranges for oil or gas
- Special values

Ordering information

- Specify direction of flow, medium, and switching range.
- For oils. State viscosity, temperature and designation (e.g. ISO VG 68) (enquire about switching range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request switching range).

Product Information

Sensors and Instrumentation

**Flow Switch
 VM-...GK**



- Highly reproducible
- Precise, stepless adjustment of the switching value
- High switching power
- Insensitive to dirt
- Short installation length

Characteristics

Mechanical flow switch, for fluid or gaseous media, with non-contact triggering of an adjustable micro switch.

Technical data

Switch	micro switch	
Nominal width	DN 15..50	
Process connection	female thread G 1/2..G 2	
Switching range	2..250 l/min	for details see table "Ranges"
Q_{max.}	to 300 l/min	
Tolerance	±5 % of full scale value	
Pressure resistance	PN 100	
Medium temperature	-20..+90 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils, gases and aggressive media available on request)	
Wiring	changeover no. 0.213	
Switching voltage	max. 250 V AC	
Switching current	max. 6 A	
Protection class	2 - safety insulation	
Ingress protection	IP 65	
Connection	plug DIN 43650-A / ISO 4400	
Materials medium-contact	1.4305, 1.4571, 1.4310, CW614N, FKM, hard ferrite PTFE-coated	
Non-medium-contact materials	ABS, PA	
Weight	see table "Dimensions and weights"	

Installation location	Standard: horizontal inwards flow; switching head not recommended underneath; other installation positions are possible; the installation position affects the switching point and range.
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Ranges

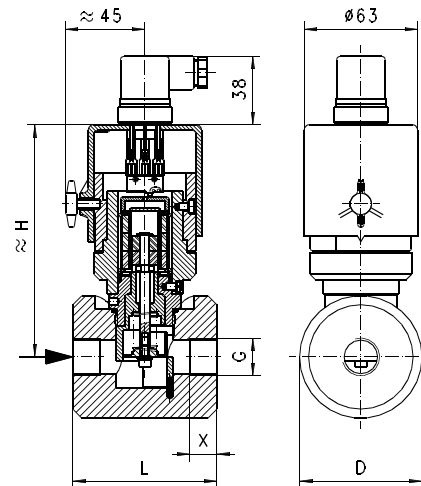
Details in the table correspond to horizontal inwards flow with decreasing flow rate.

G	Nominal width	Switching range l/min H ₂ O	Q _{max.} recommended	Type
G 1/2	DN 15	2 - 6	15	VM-015GK006
		4 - 20	30	VM-015GK020
G 3/4	DN 20	4 - 12	40	VM-020GK012
		10 - 40	50	VM-020GK040
G 1	DN 25	10 - 60	70	VM-025GK060
G 1 1/4	DN 32	20 - 100	120	VM-032GK100
G 1 1/2	DN 40	30 - 150	180	VM-040GK150
G 2	DN 50	50 - 250	300	VM-050GK250

Special ranges are available

Dimensions and weights

G	Types	H	L	D	X	Weight kg
G 1/2	VM-015GK	139	80	68	15	2.8
	VM-020GK				16	2.6
G 1	VM-025GK				18	2.5
G 1 1/4	VM-032GK	141	95	78	24	3.5
G 1 1/2	VM-040GK	152	105	88	25	4.5
G 2	VM-050GK	154	120	102	27	6.7



Product Information

Sensors and Instrumentation

Handling and operation

Note

- Include straight calming section of 5 x DN in inlet and outlet
- Include a filter if the media are dirty (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive and inductive loads must be operated using a protective circuit.

Adjustment

To adjust the switching point, the fixing screw for the switching head must be loosened. The switching head can then be rotated. Turning to the right increases the switching point, and vice-versa. Then retighten the fixing screw.



Ordering code

VM - 1. 2. 3. 4. 5.
VM - **G** **K**

1. Nominal width	
015	DN 15 - G 1/2
020	DN 20 - G 3/4
025	DN 25 - G 1
032	DN 32 - G 1 1/4
040	DN 40 - G 1 1/2
050	DN 50 - G 2
2. Process connection	
G	female thread
3. Connection material	
K	stainless steel
4. Switching range H₂O for horizontal inwards flow	
006	2 - 6 l/min
012	4 - 12 l/min
020	4 - 20 l/min
040	10 - 40 l/min
060	10 - 60 l/min
100	20 - 100 l/min
150	30 - 150 l/min
250	50 - 250 l/min
5. Optionally for ATEX	
A	for switching head ATEX A-V2 or A-V3 (The switching head is ordered in addition)

Options

- Special plugs, Tuchel / Harting
- Signal lamp red or red / green in the plug DIN 43650-A
- Other signal lamp
- Temperature display 0..120 °C
- Temperature monitoring 40..90 °C
- Temperature resistant up to 150 °C
- Metal cap
- Gold contact microswitch 125 V AC / 30 V DC, 100 mA
- Germanischer Lloyd
- Switching ranges for oil or gas
- Special values

Ordering information

- Specify direction of flow, medium, and switching range.
- For oils. State viscosity, temperature and designation (e.g. ISO VG 68) (enquire about switching range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request switching range).

Product Information

Sensors and Instrumentation

Switching Head A-V2

For devices VM-

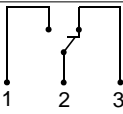
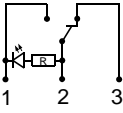


- I M1 Ex ia I
- II 1G Ex ia IIC T4
- II 1D Ex iaD 20 T135

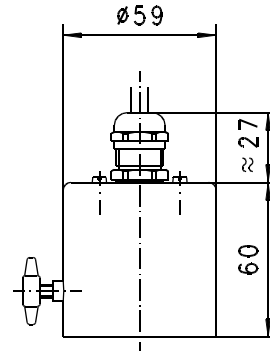
Characteristics

Intrinsically safe switching head with reed switch and ATEX approval, for the VM range of devices, for use in intrinsically safe power circuits.

Technical data

Switch	micro switch
Medium temperature	-20..+90 °C
Ambient temperature	-20..+50 °C
Weight	0.5 kg additionally
Without diode	
Wiring	changeover no. 0.213 
Switching voltage	max. 30 V
Switching current	max. 1.5 A
Switching capacity	max. 50 W
Protection class	3 -protective extra low voltage
With diode	
Wiring	changeover with diode No. 0.208 
Switching voltage	max. 15 V, 28 V or 36 V
Switching current	max. 1.5 A
Switching capacity	max. 50 W
Protection class	3 - protective extra low voltage
Ingress protection	IP 65
Electrical connection	cable 2.5 m, other cable lengths optionally available

Dimensions



Handling and operation

Note

- For use only in intrinsically safe power circuits; provide a suitable isolating amplifier.
- Cable lengths max. 5 m.
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Adjustment

To adjust the switching point, the fixing screw for the switching head must be loosened. The switching head can then be rotated. Turning to the right increases the switching point, and vice-versa. Then retighten the fixing screw.

Ordering code

The base device is ordered, e.g. VM-015GR020A with switching head e.g. A-V2-1.

A-V2 - 1.

1. Wiring - switching voltage	
1	wiring no. 0.213 - 30 V
2	wiring no. 0.208 - 15 V
3	wiring no. 0.208 - 28 V
4	wiring no. 0.208 - 36 V

Use for devices

Switching head	Device type
A-V2	VM-...



Product Information

Sensors and Instrumentation

Switching Head A-V3

For devices VM-

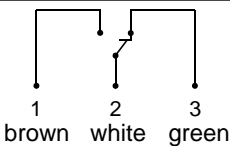


- II 2G Ex d IIC T6

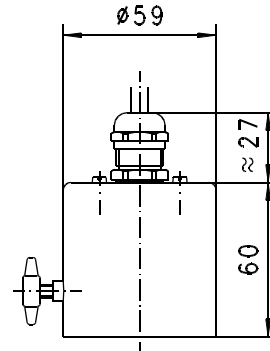
Characteristics

Switching head with pressure-resistant encapsulation and ATEX approval for the VM range of devices.

Technical data

Switch	micro switch
Medium temperature	-20..+90 °C
Ambient temperature	-20..+50 °C
Weight	0.5 kg additionally
Wiring	changeover no. 0.283 
Switching voltage	max. 250 V AC
Switching current	max. 5 A
Protection class	2 - safety insulation
Ingress protection	IP 65
Electrical connection	cable 2.5 m, other cable lengths optionally available

Dimensions



Handling and operation

Note

- Cable lengths max. 5 m.
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Adjustment

To adjust the switching point, the fixing screw for the switching head must be loosened. The switching head can then be rotated. Turning to the right increases the switching point, and vice-versa. Then retighten the fixing screw.

Ordering code

The base device is ordered, e.g. VM-015GR020A with switching head e.g. A-V3-1.

A-V3 - ^{1.} 1

1. Wiring	
1	No. 0.283

Use for devices

Switching head	Device type
A-V3	VM-...



Product Information

Sensors and Instrumentation

**Flow Switch /
 Indicator VDO-...GR**



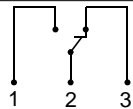
- No glass parts under load from pressure or media
- Monitor and display
- Highly reproducible
- Precise, stepless adjustment of the switching value
- Insensitive to dirt
- Short installation length

Characteristics

The volume flow raises a piston (fitted with a magnet) out from a valve seat against a spring force. The piston actuates a hermetically separated reed switch and a hermetically separated display ring.

Technical data

Switch	reed switch	
Nominal width	DN 8..80	
Process connection	female thread G 1/4..G 3	
Switching range	2..600 l/min	for details see table "Ranges"
Q _{max.}	to 720 l/min	
Tolerance	±5 % of full scale value	
Pressure resistance	G 1/4..G 1/2 - PN 100 G 3/4..G 1 - PN 25 G 1 1/4..G 3 - PN 16	
Medium temperature	-20..+120 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils and gases available on request)	
Wiring	changeover no. 0.213	
Switching voltage	max. 250 V AC	
Switching current	max. 1.5 A	
Switching capacity	max. 50 VA	
Protection class	2 - safety insulation	
Ingress protection	IP 44, optionally IP 65	
Connection	plug DIN 43650-A / ISO 4400	
Materials medium-contact	Rg 5 / Rg 6 nickelled, POM, 1.4310, CW614N, NBR, hard ferrite	
Non-medium-contact materials	ABS, PA, acrylic XT	



Weight	see table "Dimensions and weights"
Installation location	Standard: horizontal inwards flow; switching head not recommended underneath; other installation positions are possible; the installation position affects the switching point and range.

Ranges

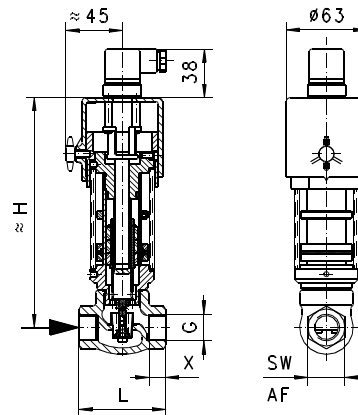
Details in the table correspond to horizontal inwards flow with decreasing flow rate.

G	Nominal width	Switching range l/min H ₂ O	Q _{max.} recommended	Type		
G 1/4	DN 8	2 - 10	15	VDO-008GR010		
G 3/8	DN 10			VDO-010GR010		
G 1/2	DN 15			VDO-015GR010		
G 3/4	DN 20	4 - 20	30	VDO-015GR020		
				10 - 40	40	VDO-020GR020
					60	VDO-020GR040
G 1	DN 25	20 - 60	85	VDO-025GR040		
G 1 1/4	DN 32			30 - 100	100	VDO-032GR060
					145	VDO-032GR100
G 1 1/2	DN 40	50 - 150	150	VDO-040GR100		
			220	VDO-040GR150		
G 2	DN 50	30 - 100	250	VDO-050GR100		
			290	VDO-050GR200		
G 2 1/2	DN 65	100 - 200	400	VDO-065GR200		
			475	VDO-065GR330		
G 3	DN 80	180 - 330	600	VDO-080GR330		
			720	VDO-080GR600		

Special ranges are available

Dimensions and weights

G	Types	H	L	SW	X	Weight kg
G 1/4	VD-008GR	183	68	29	12	1.3
G 3/8	VD-010GR					
G 1/2	VD-015GR				13	
G 3/4	VD-020GR	184	73	32	11	1.5
G 1	VD-025GR	188	87	41	12	1.7
G 1 1/4	VD-032GR	190	98	52	13	2.2
G 1 1/2	VD-040GR	195	113	59	14	2.9
G 2	VD-050GR	203	137	72	17	4.2
G 2 1/2	VD-065GR	224	160	85	26	5.8
G 3	VD-080GR		148	100	23	7.8



Product Information

Sensors and Instrumentation

Handling and operation

Note

- Include straight calming section of 5 x DN in inlet and outlet
- Include a filter if the media are dirty (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Adjustment

To adjust the switching point, the fixing screw for the switching head must be loosened. The switching head can then be rotated. Turning to the right increases the switching point, and vice-versa. Then retighten the fixing screw.



Display

- The display is rotatable.



Ordering code

VDO - 1. 2. 3. 4.

1. Nominal width	
008	DN 8 - G 1/4
010	DN 10 - G 3/8
015	DN 15 - G 1/2
020	DN 20 - G 3/4
025	DN 25 - G 1
032	DN 32 - G 1 1/4
040	DN 40 - G 1 1/2
050	DN 50 - G 2
065	DN 65 - G 2 1/2
080	DN 80 - G 3
2. Process connection	
G	female thread
3. Connection material	
R	red bronze
4. Switching range H ₂ O for horizontal inwards flow	
010	1 - 10 l/min
020	4 - 20 l/min
040	10 - 40 l/min
060	20 - 60 l/min
100	30 - 100 l/min
150	50 - 150 l/min
200	100 - 200 l/min
330	180 - 330 l/min
600	400 - 600 l/min

Options

- Special plugs, Tuchel / Harting
- Signal lamp red or red / green in the plug DIN 43650-A
- Other signal lamp
- Ingress protection IP 65
- Temperature display 0..120 °C
- Temperature monitoring 40..90 °C
- Temperature resistant up to 150 °C
- Metal cap
- Rhodium contact 250 V AC, 0.5 A, 30 VA
- Housing made from stainless steel
- Flange housing made from grey iron, gun metal, cast steel, or stainless steel
- Switching ranges for oil or gas
- Special values
- Internal parts are brass or stainless steel
- Damping for gas monitoring

Ordering information

- Specify direction of flow, medium, and switching range.
- For oils. State viscosity, temperature and designation (e.g. ISO VG 68) (enquire about switching range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request switching range).

Product Information

Sensors and Instrumentation

Flow Switch / Indicator TX-...FT



- Monitor and display
- Media temperature up to 350 °C
- Highly reproducible
- Insensitive to dirt
- DIN flange housing

Characteristics

The volume flow raises a disc unit with tappet rod and magnet against a spring force. This actuates a hermetically separated micro switch and a hermetically separated display

Technical data

Switch	micro switch	
Nominal width	DN 15..200	
Process connection	flange DIN 2545 PN 40	
Switching range	2..1250 l/min	for details see table "Ranges"
Q_{max.}	to 4,000 l/min	
Tolerance	±5 % of full scale value	
Pressure resistance	PN 40 /20°C fore more informations see "Handling and operation"	
Medium temperature	-20..+350 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils available on request)	
Wiring	changeover no. 0.213	
Switching voltage	max. 250 V AC	
Switching current	max. 6 A	
Protection class	2 - safety insulation	
Ingress protection	IP 44	
Connection	plug DIN 43650-A / ISO 4400 or cable screw gland with 2.5 m cable	
Materials medium-contact	cast steel GGS 25, 1.4571, 1.4301, 1.4305, 1.4310, Sigraflex V20011Z3l, hard ferrite, FKM	
Non-medium-contact materials	Acrylic (XT), PA, POM, CW614N nickelled, steel coated with Rilsan	

Weight	see table "Dimensions and weights"
Installation location	Standard: horizontal inwards flow; switching head not recommended underneath; other installation positions are possible; the installation position affects the switching point and display range.

Ranges

Details in the table correspond to horizontal inwards flow with decreasing flow rate.

Nominal width	Switching range	Q _{max.} recommended	Type
	l/min H2O		
DN 15	2 - 8	20	TX-015FT0008
	4 - 20	30	TX-015FT0020
DN 20	10 - 40	40	TX-020FT0020
		55	TX-020FT0040
DN 25	20 - 60	60	TX-025FT0040
		80	TX-025FT0060
DN 32	30 - 100	100	TX-032FT0060
		135	TX-032FT0100
DN 40	50 - 200	150	TX-040FT0100
		270	TX-040FT0200
DN 50	100 - 250	340	TX-050FT0200
		400	TX-050FT0250
DN 65	150 - 300	600	TX-065FT0250
			TX-065FT0300
DN 80	300 - 450	950	TX-080FT0300
			TX-080FT0450
DN 100	200 - 400	2000	TX-100FT0400
	350 - 500		TX-100FT0500
DN 150	600 - 750	4000	TX-150FT0750
	700 - 950		TX-150FT0950
DN 200	850 - 1050	1250	TX-200FT1050
	1050 - 1250		TX-200FT1250

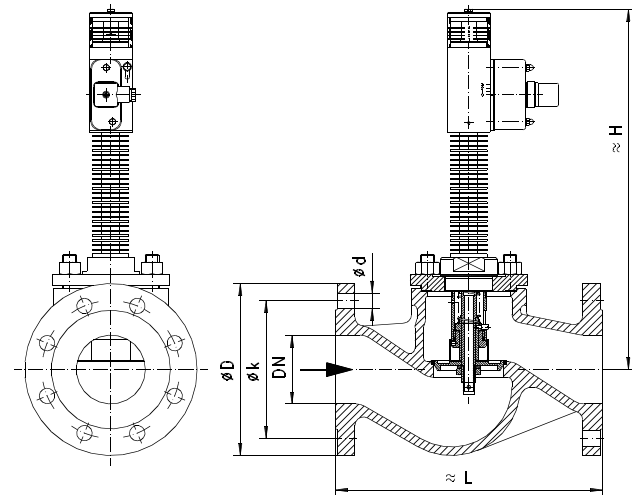
Special ranges are available

Dimensions and weights

DN	Types	H	L	D	k	d	Weight kg
15	TX-015FT	370	130	95	65	4 x 14	6.0
20	TX-020FT		150	105	75		6.5
25	TX-025FT	380	160	115	85		8.5
32	TX-032FT		180	140	100	4 x 18	10.5
40	TX-040FT	390	200	150	110		13.0
50	TX-050FT		230	165	125	15.5	
65	TX-065FT	410	290	185	145	8 x 18	25.5
80	TX-080FT	430	310	200	160		31.0
100	TX-100FT	450	350	235	190	8 x 22	38.0
150	TX-150FT	510	480	300	250		8 x 26
200	TX-200FT	580	600	375	320	12 x 30	154.0

Product Information

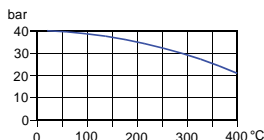
- Overall length DIN 3202, range F1
- Flange DIN 2545 PN 40
- Flange size DIN 2501 PN 40
- Sealing bar DIN 2526 form C



Handling and operation

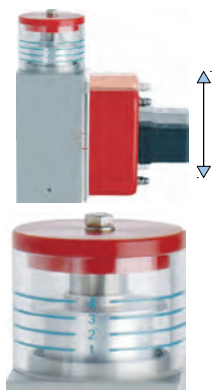
Note

- Include straight calming section of 5 x DN in inlet and outlet
- Include a filter if the media are dirty (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive and inductive loads must be operated using a protective circuit.
- Stability to pressure depends on operating temperature



Adjustment

Loosen screw slightly, push the switching head into the desired position, and then retighten the screw.



Display

- The display is rotatable.

Ordering code

TX - 1. [] 2. [F] 3. [T] 4. [] 5. []

1. Nominal width											
015	DN 15										
020	DN 20										
025	DN 25										
032	DN 32										
040	DN 40										
050	DN 50										
065	DN 65										
080	DN 80										
100	DN 100										
150	DN 150										
200	DN 200										
2. Process connection											
F	flange										
3. Connection material											
T	cast steel										
4. Switching range H₂O for horizontal inwards flow											
0008	2 - 8 l/min										●
0020	4 - 20 l/min										● ●
0040	10 - 40 l/min										● ● ●
0060	20 - 60 l/min										● ● ● ●
0100	30 - 100 l/min										● ● ● ● ●
0200	50 - 200 l/min										● ● ● ● ● ●
0250	100 - 250 l/min										● ● ● ● ● ● ●
0300	150 - 300 l/min										● ● ● ● ● ● ● ●
0400	200 - 400 l/min										● ● ● ● ● ● ● ● ●
0450	300 - 450 l/min										● ● ● ● ● ● ● ● ● ●
0500	350 - 500 l/min										● ● ● ● ● ● ● ● ● ● ●
0750	600 - 750 l/min										● ● ● ● ● ● ● ● ● ● ● ●
0950	700 - 950 l/min										● ● ● ● ● ● ● ● ● ● ● ● ●
1050	850 - 1,050 l/min										● ● ● ● ● ● ● ● ● ● ● ● ● ●
1250	1050 - 1,250 l/min										● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
5. Connection											
B	plug DIN 43650-A / ISO 4400										
K	cable screw gland with 2.5 m cable and TÜV approval										
		TÜV.SW.02-021									

Options

- DIN 43650-A plug
- Signal lamp red or red/green in the plug DIN 43650-A
- Other signal lamp
- Stainless steel housing
- Switching ranges for oil
- Special values

Ordering information

- Specify direction of flow, medium, and switching range.
- For oils. State viscosity, temperature and designation (e.g. ISO VG 68) (enquire about switching range).

Product Information

Sensors and Instrumentation

Flow Meter TZ1-...GR



- Large analog display
- Monitor and display
- Simple adjustment by means of drag indicator
- Insensitive to dirt
- Short installation length

Characteristics

The volume flow raises a piston out from a valve seat against a spring force. The piston actuates the display movement by means of a magnetic coupling.

Technical data

Switch	optionally micro switch	
Nominal width	DN 8..80	
Process connection	female thread G 1/4..G 3	
Metering range	2..600 l/min	for details see table "Ranges"
Q _{max.}	to 600 l/min	
Tolerance	±3 % of full scale value	
Pressure resistance	G 1/4..G 1/2 - PN 100 G 3/4..G 1 - PN 25 G 1 1/4.. - PN 16 G 3	
Medium temperature	-20..+90 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils and gases available on request)	
Wiring	changeover no. 0.282	
Switching voltage	max. 250 V AC	
Switching current	max. 5 A	
Protection class	2 - safety insulation	
Ingress protection	IP 65	
Connection	plug DIN 43650-A / ISO 4400	
Materials medium-contact	Rg 5 / Rg 6 nickelled, CW614N, 1.4310, NBR, hard ferrite	
Non-medium-contact materials	CW614N chromed, steel chromed, Acrylic, NBR	
Weight	see table "Dimensions and weights"	

Installation location	Standard: horizontal inwards flow; display downwards not recommended; other installation positions are possible; the installation position affects the switching point and display range.
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Ranges

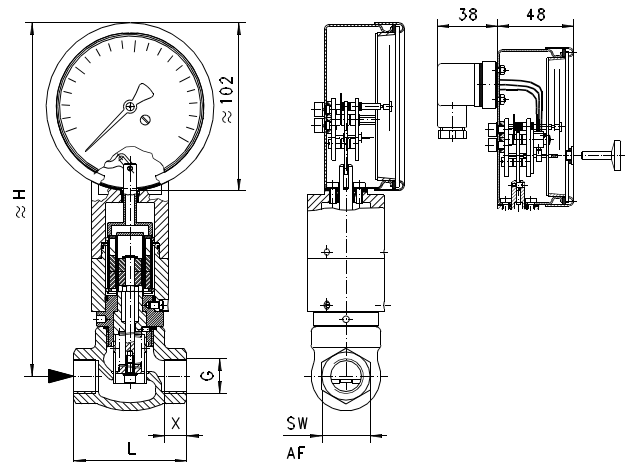
Details in the table correspond to horizontal inwards flow with increasing flow rate.

G	Nominal width	Metering range l/min H ₂ O	Q _{max.} recommended	Type
G 1/4	DN 8	2 - 6	8	TZ1-008GR006
		3 - 12	12	TZ1-008GR012
G 3/8	DN 10	2 - 6	10	TZ1-010GR006
		3 - 12	12	TZ1-010GR012
G 1/2	DN 15	2 - 6	20	TZ1-015GR006
		4 - 20		TZ1-015GR020
G 3/4	DN 20	10 - 40	40	TZ1-020GR020
				TZ1-020GR040
G 1	DN 25	10 - 60	60	TZ1-025GR060
G 1 1/4	DN 32	10 - 100	100	TZ1-032GR100
G 1 1/2	DN 40	10 - 150	150	TZ1-040GR150
G 2	DN 50	20 - 250	250	TZ1-050GR250
G 2 1/2	DN 65	30 - 400	400	TZ1-065GR400
G 3	DN 80	30 - 600	600	TZ1-080GR600

Special ranges are available

Dimensions and weights

G	Types	H	L	SW	X	Weight kg
G 1/4	TZ1-008GR	212	68	29	12	1.6
G 3/8	TZ1-010GR					
G 1/2	TZ1-015GR				13	
G 3/4	TZ1-020GR	213	73	32	11	1.7
G 1	TZ1-025GR	216	87	41	12	2.0
G 1 1/4	TZ1-032GR	226	98	52	13	2.6
G 1 1/2	TZ1-040GR	228	113	59	14	3.1
G 2	TZ1-050GR	236	137	72	17	6.4
G 2 1/2	TZ1-065GR	268	160	85	26	7.5
					23	8.7



Product Information

Sensors and Instrumentation

Handling and operation

Note

- Include straight calming section of 5 x DN in inlet and outlet
- Include a filter if the media are dirty (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive and inductive loads must be operated using a protective circuit.

Adjustment

The micro switch (optional) is adjusted by means of the knurled adjusting screw provided. The screw allows the drag indicator to be set to the desired switching value. The value displayed corresponds to a switching point for a decreasing flow rate.



Ordering code

TZ1 1. 2. 3. **G** 4. **R** 5.

○=Option

1. Additional devices				
-	only analog display			
M-	with integrated micro switch			
P- ○	with potentiometer			
M2- ○	with 2 x normally open (n.o.)			
M3- ○	with 2 x normally closed (n.c.)			
see „Additional devices for TZ1“				
2. Nominal width				
008	DN 8 - G 1/4			
010	DN 10 - G 3/8			
015	DN 15 - G 1/2			
020	DN 20 - G 3/4			
025	DN 25 - G 1			
032	DN 32 - G 1 1/4			
040	DN 40 - G 1 1/2			
050	DN 50 - G 2			
065	DN 65 - G 2 1/2			
080	DN 80 - G 3			
3. Process connection				
G	female thread			
4. Connection material				
R	red bronze			
5. Metering range H ₂ O for horizontal inwards flow				
006	2 - 6 l/min	●	●	●
012	3 - 12 l/min			●
020	4 - 20 l/min			●
040	10 - 40 l/min			●
060	10 - 60 l/min			●
100	10 - 100 l/min			●
150	10 - 150 l/min			●
250	20 - 250 l/min			●
400	30 - 400 l/min			●
600	30 - 600 l/min			●

Options

- Gold contact micro switch 125 V AC / 30 V DC, 100 mA
- Special Harting plug
- Metering ranges for oil or gas
- Special values

Ordering information

- Specify direction of flow, medium, and metering range.
- For oils. State viscosity, temperature and designation (e.g. ISO VG 68) (enquire about metering range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request metering range)

Product Information

Sensors and Instrumentation

Flow Meter TZ1-...GK



- Large analog display
- Monitor and display
- Simple adjustment by means of drag indicator
- Insensitive to dirt
- Short installation length

Characteristics

The volume flow raises a disc unit (fitted with a magnet) out from a valve seat against a spring force. The magnet actuates the display movement by means of a magnetic coupling.

Technical data

Switch	optionally micro switch	
Nominal width	DN 15..50	
Process connection	female thread G 1/2..G 2	
Metering range	2..250 l/min	for details see table "Ranges"
Q_{max.}	to 250 l/min	
Tolerance	±3 % of full scale value	
Pressure resistance	PN 100	
Medium temperature	-20..+90 °C	
Ambient temperature	-20..+70 °C	
Media	water (oils, gases and aggressive media available on request)	
Wiring	changeover no. 0.282	
Switching voltage	max. 250 V AC	
Switching current	max. 5 A	
Protection class	2 - safety insulation	
Ingress protection	IP 65	
Electrical connection	plug DIN 43650-A / ISO 4400	
Materials medium-contact	1.4305, 1.4571, 1.4310, NBR, hard ferrite PTFE-coated	
Non-medium-contact materials	CW614N chromed, steel chromed, acrylic, FKM	
Weight	see table "Dimensions and weights"	

Installation location	Standard: horizontal inwards flow; display downwards not recommended; other installation positions are possible; the installation position affects the switching point and display range.
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Ranges

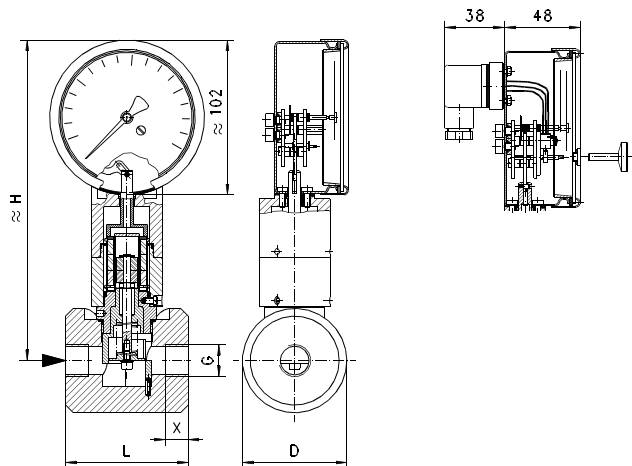
Details in the table correspond to horizontal inwards flow with increasing flow rate.

G	Nominal width	Metering range l/min H ₂ O	Q _{max.} recommended	Type
G 1/2	DN 15	2 - 6	8	TZ1-015GK006
		4 - 20	20	TZ1-015GK020
G 3/4	DN 20	5 - 40	40	TZ1-020GK020
				TZ1-020GK040
G 1	DN 25	10 - 60	60	TZ1-025GK060
G 1 1/4	DN 32	10 - 100	100	TZ1-032GK100
G 1 1/2	DN 40	10 - 150	150	TZ1-040GK150
G 2	DN 50	20 - 250	250	TZ1-050GK250

Special ranges are available

Dimensions and weights

G	Types	H	L	D	X	Weight kg
G 1/2	TZ1-015GK	210	80	68	15	2.9
	G 3/4 TZ1-020GK				16	2.8
	G 1 TZ1-025GK				18	2.7
G 1 1/4	TZ1-032GK		95	78	24	3.4
G 1 1/2	TZ1-040GK	223	105	88	25	3.7
G 2	TZ1-050GK	225	120	102	27	5.1



Product Information

Sensors and Instrumentation

Handling and operation

Note

- Include straight calming section of 5 x DN in inlet and outlet
- Include a filter if the media are dirty (use magnetic filter for ferritic components).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive and inductive loads must be operated using a protective circuit.

Adjustment

The micro switch (optional) is adjusted by means of the knurled adjusting screw provided. The screw allows the drag indicator to be set to the desired switching value. The value displayed corresponds to a switching point for a decreasing flow rate.



Ordering code

TZ1 1. 2. 3. G 4. K 5.

○=Option

1. Additional devices			
-	only analog display		
M-	with integrated micro switch		
P-	○ with potentiometer	see „Additional devices for TZ1“	
M2-	○ with 2 x normally open (n.o.)		
M3-	○ with 2 x normally closed (n.c.)		
2. Nominal width			
015	DN 15 - G 1/2		
020	DN 20 - G 3/4		
025	DN 25 - G 1		
032	DN 32 - G 1 1/4		
040	DN 40 - G 1 1/2		
050	DN 50 - G 2		
3. Process connection			
G	female thread		
4. Connection material			
K	stainless steel		
5. Metering range H ₂ O for horizontal inwards flow			
006	2 - 6 l/min		●
020	4 - 20 l/min		● ●
040	5 - 40 l/min		●
060	10 - 60 l/min		●
100	10 - 100 l/min		●
150	10 - 150 l/min	●	
250	20 - 250 l/min	●	

Options

- Gold contact micro switch 125 V AC / 30 V DC, 100 mA
- Special Harting plug
- Metering ranges for oil or gas
- Special values

Ordering information

- Specify direction of flow, medium, and metering range.
- For oils. State viscosity, temperature and designation (e.g. ISO VG 68) (enquire about metering range).
- For gases, state pressure (relative or absolute), temperature and medium (e.g. air) (request metering range)

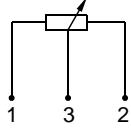
Product Information

Sensors and Instrumentation

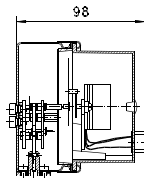
Additional Devices for TZ1

TZ1P - 10 kOhm potentiometer

Technical data

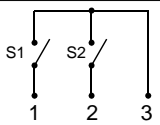
Switch/sensor	potentiometer
Wiring	no. 0.269 
Switching voltage	max. 50 V DC
Switching current	max. 100 mA
Switching capacity	max. 1.5 W
Protection class	2 - safety insulation
Additional Tolerance	±3 %
resistance tolerance	±1 %
Linearity tolerance	±0,3 %
Ingress protection	IP 60
Electrical connection	plug Hirschmann G 4
Additional Weight	0.3 kg

Dimensions

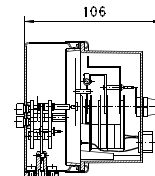


TZ1M2 - 2-pole normally open (n.o.)

Technical data

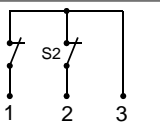
Switch/sensor	micro switch
Wiring	2 x normally open (n.o.) no. 0.268 
Switching voltage	max. 250 V AC
Switching current	max. 0.6 A
Switching capacity	max. 50 VA
Protection class	2 -safety insulation
Ingress protection	IP 60
Electrical connection	plug Hirschmann G 4
Additional Weight	0.3 kg

Dimensions

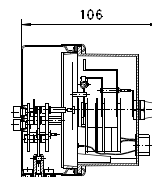


TZ1M3 - 2-pole normally open (n.o.)

Technical data

Switch/sensor	Micro switch
Wiring	2 x normally closed (n.c.) wiring 0.285 
Switching voltage	max. 250 V AC
Switching current	max. 0.6 A
Switching capacity	max. 50 VA
Protection class	2 -safety insulation
Ingress protection	IP 60
Electrical connection	plug Hirschmann G 4
Additional Weight	0.3 kg

Dimensions

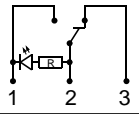


Options

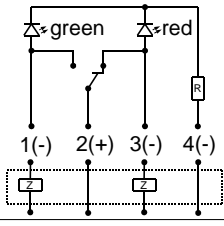
Plug DIN 43650-A / ISO 4400 with diodes



Diode red

Wiring	changeover with diode No. 0.208	
Switching voltage	max. 12 V AC, 24 V AC, 48 V AC, 115 V DC or 230 V DC (when ordering please state)	

Red / green diode

Wiring	changeover with diode No. 0.347	
Switching voltage	max. 12 V AC, 24 V AC, 48 V AC, 115 V DC or 230 V DC (when ordering please state)	

Accessories

Filter

Type ZV



Type ZE



The HONSBURG filters are offered for the protection of the devices from dirt or as independent components for coarse and fine filtration of liquids.

For more information, see additional product information.

Product Information

Sensors and Instrumentation

Product overview

„Industrial Sensors and Instrumentation“

- Temperature
- Flow
- Level / Filling Height
- Analysis
- Humidity
- Pressure
- Weighing Instruments



„Process Instrumentation Hygienic Design“

- GHMadapt
- Temperature
- Flow
- Level / Filling Height
- Analysis



“Laboratory Instrumentation”



„Industrial Electronics“

- Displays / Controller
- Transmitter / Signal conditioning
- Isolating converters
- Safety and Monitoring Devices
- Power Electronics
- Calibration and Testing



“Measuring Data Acquisition“

- Data Logging and Monitoring
- Test Bench Measurement Technology
- Renewable Energies

