

Flow monitor

For monitoring the flow of liquid and gaseous media

Model FWS

WIKA data sheet FL 30.01



Applications

- Continuous flow indication without power supply
- Thirteen different versions and corrosion resistant materials make the products suitable for a broad range of applications
- Machine building, chemical industry, pharmaceutical industry, medical engineering
- Cooling systems and cooling circuits, transformers, central lubrication systems and recirculating oil lubrication systems
- Research and development

Special features

- High switching accuracy and functional safety
- Large switching range, low switch hysteresis
- Continuous switch point setting by the operator
- Viscosity compensated models available
- Explosion-protected versions

Description

The model FWS flow monitors are used for the display and monitoring of the flow of liquid and gaseous media, e.g. in cooling systems and cooling circuits of welding machinery, laser and piping systems, dosing systems, pumps, compressors, hydraulic systems, high-pressure plants and many more.

The flow monitors operate in accordance with the float-body measuring principle. A float body is guided within a cylindrical slotted nozzle or in a cylindrical measuring tube. A reed contact is mounted outside of the flow circuit.



Selection of different model FWS flow monitors

The reed contact is cast into a continuously adjustable case (switch case) and thus is protected from external influences.

The flowing medium moves the float body in the direction of the flow. When the float body, with its integrated magnet, reaches the position of the reed switch, this closes. When the flow rate rises, the float body moves further in the direction of the flow, maximally until it reaches a stop. This stop prevents the float body from being driven beyond the switching range of the reed switch (bistable characteristic).

Switching ranges

All flow monitors are factory-fitted as standard with a normally open contact (option change-over contact). The switch point can be adjusted continuously within the switching range. Depending on the flow rate itself, the actual flow volume can be much larger than the maximum scale value (typically: double).

Position dependance

The model FWS-DWG, FWS-DWM/A, FWS-DWM and FWS-DWM-L flow monitors must be installed vertically, with the flow from bottom to top. For all other models, the mounting position is up to the user, however during installation, care must be taken to ensure the correct flow direction.

Switch hysteresis

This refers to the travel of the float body between the switch-on and switch-off flow volume. The shorter the switch travel is, the lower the switch hysteresis. Through the selection of magnets and reed switches with small differences between response and drop-out excitation (close differential), a low switch hysteresis can be successfully maintained. A low switch hysteresis is always an advantage where precise control of the flow is required.

Display

A local display is also possible. With models with sight-glasses, the upper edge of the float body is also the reading edge and displays the flow against the scale etched onto the sight-glass. Models with pointer scales can be read according to the scale. Please note that that the respective scales are matched to a specific medium.

Voltage supply

A voltage supply is not required with the flow monitors as potential-free reed contacts are used.

Maintenance information

The flow monitor has been specifically engineered to require minimal maintenance. With media containing magnetic particles, cleaning should be performed at regular intervals. These cleaning intervals can be significantly extended by using a filter with a magnetic separator. The flow monitors work on a flow-dependent rather than a pressure-dependent basis.

Model overview

Flow monitor	Mounting position	Display	Viscosity compensation	Max. pressure in bar	Flow range l/min H ₂ O	NI/min air
Vertical mounting position, sight-glass display, for water and similar media, model FWS-DWG	Vertical	Sight-glass	No	10	0.1 ... 50	-
Vertical mounting position, dial indicator, for water and similar media, model FWS-DWM/A		Dial indicator	No	300	0.1 ... 50	-
Vertical mounting position, without display, for water and similar media, model FWS-DWM		Without	No	300	0.1 ... 50	-
Vertical mounting position, without display, for gaseous media, model FWS-DWM-L		Without	No	300	-	1 ... 1,450
Mounting position as required, sight-glass display, for water and similar media, model FWS-DUG	As required	Sight-glass	No	10	0.2 ... 250	-
Mounting position as required, dial indicator, for water and similar media, model FWS-DUM/A		Dial indicator	No	300	0.2 ... 250	-
Mounting position as required, sight-glass display, for oil and similar media, model FWS-DKG		Sight-glass	Yes	10/16	0.10 ... 90	-
Mounting position as required, dial indicator, for oil and similar media, model FWS-DKM/A		Dial indicator	Yes	300	0.5 ... 110	-
Mounting position as required, without display, for oil and similar media, model FWS-DKM		Without	Yes	350	0.5 ... 110	-
Mounting position as required, sight-glass display, for water and similar media, several variants, model FWS-RVO/U		Sight-glass	No	10/16	0.005 ... 150	-
Mounting position as required, sight-glass display, for gaseous media, several variants, model FWS-RVO/U-L		Sight-glass	No	10/16	-	0.2 ... 625
Mounting position as required, without display, for water and similar media, several variants, model FWS-RVM/U		Without	No	350	0.005 ... 150	-
Mounting position as required, without display, for gaseous media, several variants, model FWS-RVM/U-L		Without	No	350	-	0.6 ... 650

Materials

Two different material versions (brass or stainless steel version) can be supplied. Special materials on request (e.g. Hastelloy, Monel)

Component	Material	
	Brass version	Stainless steel version
Wetted		
Main body	Nickel-plated brass	Stainless steel 1.4571
Float body	Brass, nickel-plated brass	Stainless steel 1.4571
Slotted nozzle	Nickel-plated brass	Stainless steel 1.4571
Spring	Stainless steel 1.4571 (only models with mounting position as required)	
Compression fitting	Nickel-plated brass	Stainless steel 1.4571
Sight-glass	Duran 50	
Sealings	EPDM, NBR, FKM	
Non-wetted		
Exterior case	Anodised aluminium (only models with sight-glass)	

Flow monitor, vertical mounting position, sight-glass display, for water and similar media, model FWS-DWG

Option: Explosion-protected version



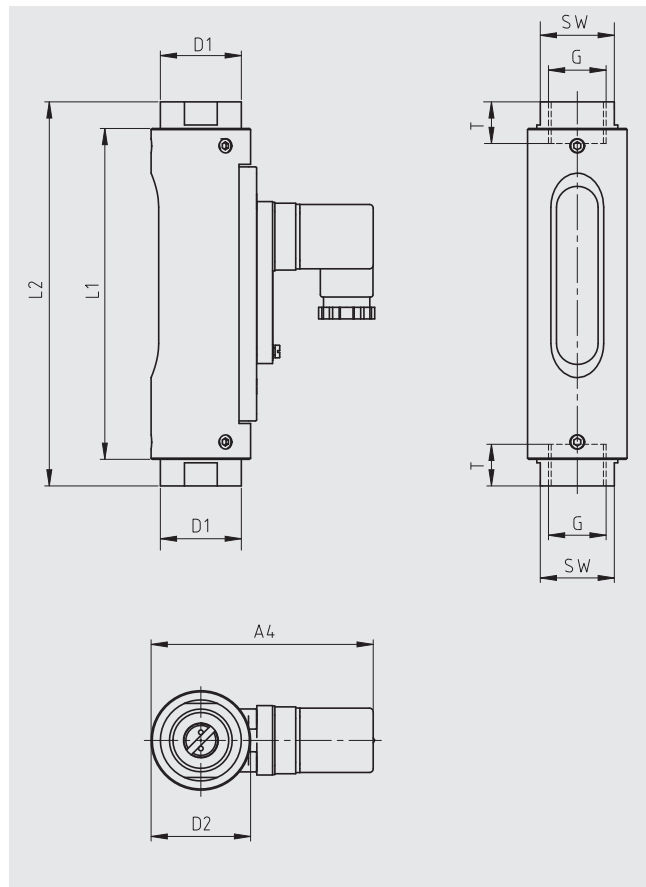
Specifications

Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	Vertical
Display	Sight-glass
Process connections	Female thread G 1/4 ... 1 or 1/4 ... 1 NPT
Max. operating pressure	10 bar
Pressure loss	0.01 ... 0.2 bar
Tolerance	±5 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

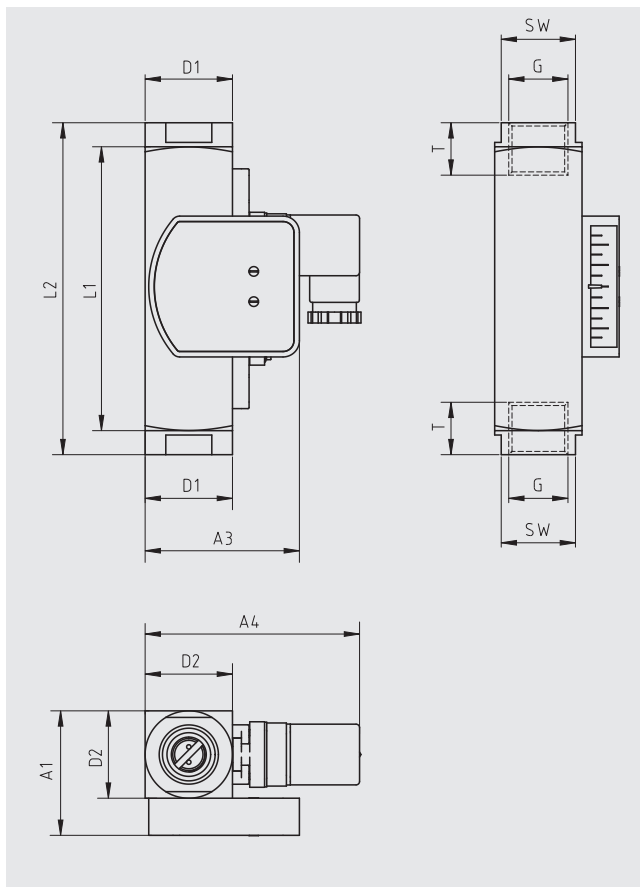
1) Minimum load 3 VA



Model	Switching ranges in l/min		Dimensions in mm					Weight in g			
	H ₂ O at 20 °C	Air	D1	D2	A4	G	T		L1	L2	SW
FWS-DWG-1.5	0.1 ... 1.5	-	35	43	approx. 96	1/4"	10	121	132	32	625
						3/8"	11	121	135		
						1/2"	14	121	135		
FWS-DWG-3	0.2 ... 3	-	35	43	approx. 96	1/4"	10	121	132	32	625
						3/8"	11	121	135		
						1/2"	14	121	135		
FWS-DWG-8	0.3 ... 8	-	35	43	approx. 96	1/4"	10	121	132	32	625
						3/8"	11	121	135		
						1/2"	14	121	135		
FWS-DWG-12	1 ... 12	-	35	43	approx. 96	1/4"	10	121	132	32	625
						3/8"	11	121	135		
						1/2"	14	121	135		
FWS-DWG-18	2 ... 18	-	35	43	approx. 96	1/2"	14	143	163	32	650
						3/4"	15	143	163		
FWS-DWG-35	3 ... 35	-	45	50	approx. 104	3/4"	15	143	163	41	850
FWS-DWG-50	4 ... 50	-	45	50	approx. 104	1"	17	143	163	41	1,000
						3/4"	15	143	163		

Flow monitor, vertical mounting position, dial indicator, for water and similar media, model FWS-DWM/A

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	Vertical
Display	Dial indicator
Process connections	Female thread G 1/4 ... 1 or 1/4 ... 1 NPT
Max. operating pressure	200 bar (stainless steel version 300 bar)
Pressure loss	0.02 ... 0.2 bar
Tolerance	±5 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

1) Minimum load 3 VA

Model	Switching ranges in l/min		Dimensions in mm						G	T	L1	L2	SW	Weight in g
	H ₂ O at 20 °C	Air	D1	D2	A1	A3	A4							
FWS-DWM/A-1.5	0.1 ... 1.5	-	30	30	47	65.5	approx. 88	1/4"	10	117	131	27	850	
								3/8"	11					
								1/2"	14					
FWS-DWM/A-3	0.2 ... 3	-	30	30	47	65.5	approx. 88	1/4"	10	117	131	27	850	
								3/8"	11					
								1/2"	14					
FWS-DWM/A-8	0.3 ... 8	-	30	30	47	65.5	approx. 88	1/4"	10	117	131	27	850	
								3/8"	11					
								1/2"	14					
FWS-DWM/A-12	1 ... 12	-	30	30	47	65.5	approx. 88	1/4"	10	117	131	27	850	
								3/8"	11					
								1/2"	14					
FWS-DWM/A-18	2 ... 18	-	30	30	47	65.5	approx. 88	1/2"	14	132	146	27	800	
			35	30				3/4"	15	132	174	32	1,010	
			FWS-DWM/A-35	3 ... 35				-	40	40	57	70.5	approx. 98	3/4"
1"	17	156			156	40	1,500							
FWS-DWM/A-50	4 ... 50	-			40	40	57							70.5
			1"	17				156	156	40	1,500			

Flow monitor, vertical mounting position, without display, for water and similar media, model FWS-DWM

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	Vertical
Display	Without
Process connections	Female thread G 1/4 ... 1 or 1/4 ... 1 NPT
Max. operating pressure	200 bar (stainless steel version 300 bar)
Pressure loss	0.02 ... 0.2 bar
Tolerance	±5 % of full scale value

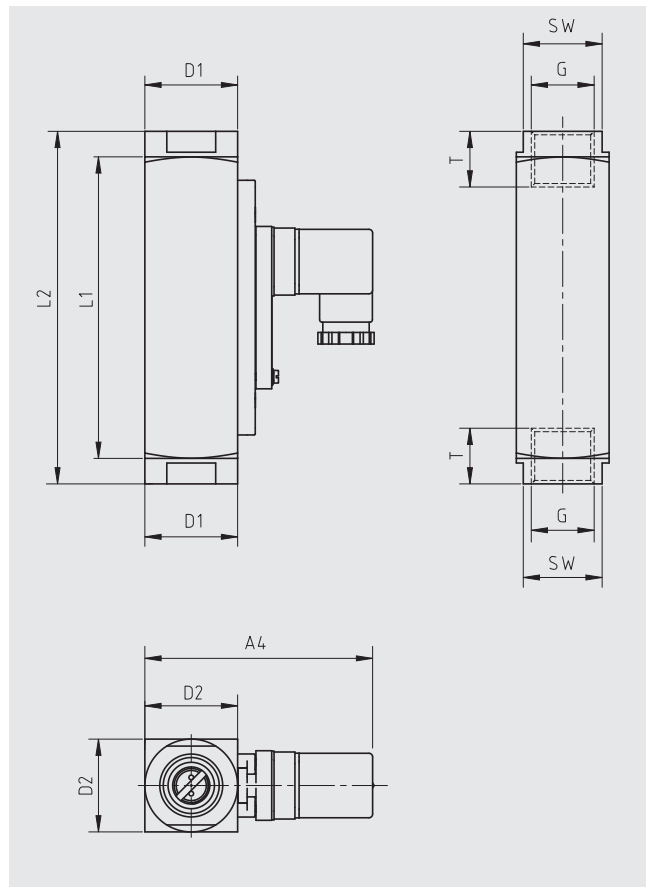
Versions

	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data

	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

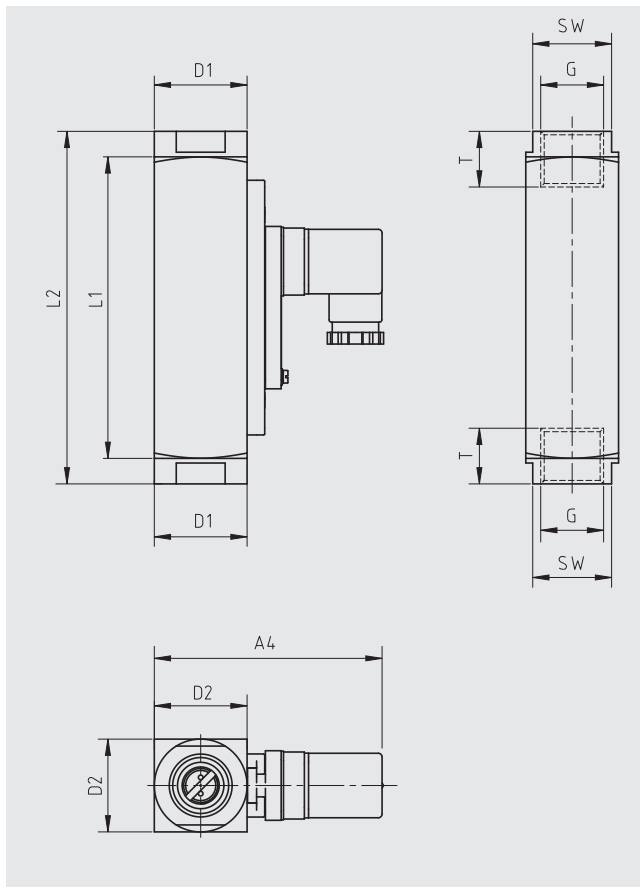
1) Minimum load 3 VA



Model	Switching ranges in l/min		Dimensions in mm					L1	L2	SW	Weight in g
	H ₂ O at 20 °C	Air	D1	D2	A4	G	T				
FWS-DWM-1.5	0.1 ... 1.5	-	30	30	approx. 88	1/4"	10	117	131	27	800
						3/8"	11				
						1/2"	14				
FWS-DWM-3	0.2 ... 3	-	30	30	approx. 88	1/4"	10	117	131	27	800
						3/8"	11				
						1/2"	14				
FWS-DWM-8	0.3 ... 8	-	30	30	approx. 88	1/4"	10	117	131	27	800
						3/8"	11				
						1/2"	14				
FWS-DWM-12	1 ... 12	-	30	30	approx. 88	1/4"	10	117	131	27	800
						3/8"	11				
						1/2"	14				
FWS-DWM-18	2 ... 18	-	30	30	approx. 88	1/2"	14	132	146	27	800
			35			3/4"	15	132	174	32	960
FWS-DWM-35	3 ... 35	-	40	40	approx. 98	3/4"	15	130	152	34	1,450
						1"	17	156	156	40	1,450
FWS-DWM-50	4 ... 50	-	40	40	approx. 98	3/4"	15	130	152	34	1,450
						1"	17	156	156	40	1,450

Flow monitor, vertical mounting position, without display, for gaseous media, model FWS-DWM-L

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	Vertical
Display	Without
Process connections	Female thread G 1/4 ... 1 or 1/4 ... 1 NPT
Max. operating pressure	200 bar (stainless steel version 300 bar)
Pressure loss	0.02 ... 0.4 bar
Tolerance	±10 % of full scale value

Versions

	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	80 °C	IP 65
1 m cable	80 °C	IP 67
Instrument connector M12 x 1	80 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data

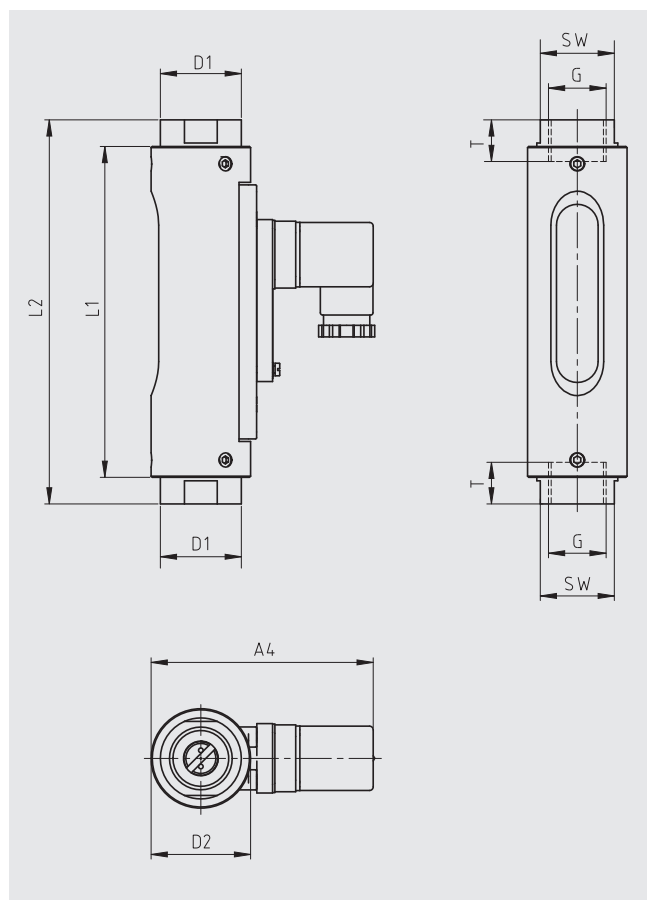
	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

1) Minimum load 3 VA

Model	Switching ranges in l/min		Dimensions in mm					L1	L2	SW	Weight in g
	H ₂ O	Air at 1 bar abs. and 20 °C	D1	D2	A4	G	T				
FWS-DWM-L-1.5	-	1 ... 28	30	30	approx. 88	1/4"	10	117	131	27	800
						3/8"	11				
						1/2"	14				
FWS-DWM-L-3	-	4 ... 60	30	30	approx. 88	1/4"	10	117	131	27	800
						3/8"	11				
						1/2"	14				
FWS-DWM-L-8	-	6 ... 160	30	30	approx. 88	1/4"	10	117	131	27	800
						3/8"	11				
						1/2"	14				
FWS-DWM-L-12	-	20 ... 240	30	30	approx. 88	1/4"	10	117	131	27	800
						3/8"	11				
						1/2"	14				
FWS-DWM-L-18	-	40 ... 360	30	30	approx. 88	1/2"	14	132	146	27	800
			35			3/4"	15	132	174	32	960
FWS-DWM-L-50	-	60 ... 700	40	40	approx. 98	3/4"	15	130	152	34	1,450
FWS-DWM-L-100	-	200 ... 1,450	40	40	approx. 98	1"	17	156	156	40	1,450
						1"	17	200	200	40	2,750

Flow monitor, mounting position as required, sight-glass display, for water and similar media, model FWS-DUG

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	As required
Display	Sight-glass
Process connections	Female thread G 1/4 ... 1 1/4 or 1/4 ... 1 1/4 NPT
Max. operating pressure	10 bar
Pressure loss	0.02 ... 0.8 bar
Tolerance	±5 % of full scale value

Versions

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data

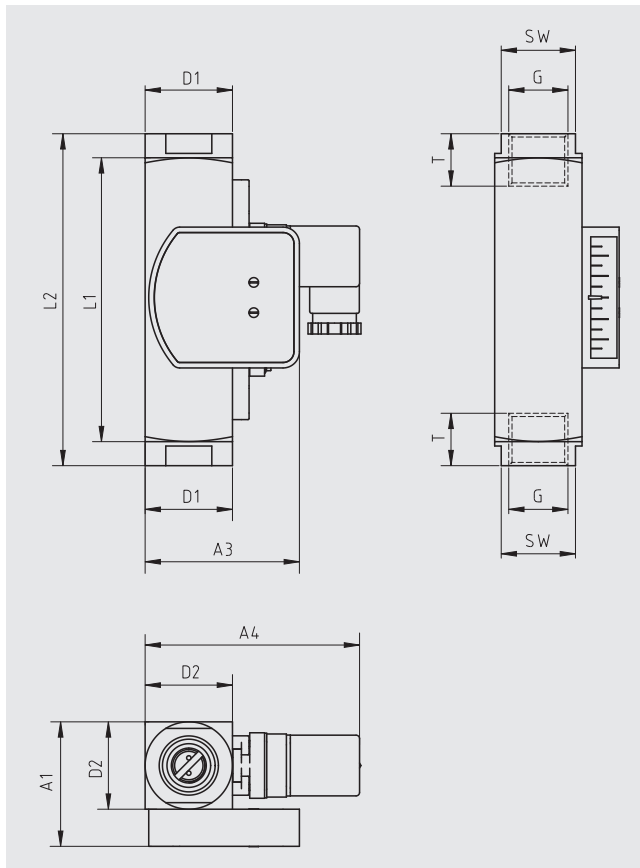
	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

¹⁾ Minimum load 3 VA

Model	Switching ranges in l/min		Dimensions in mm				G	T	L1	L2	SW	Weight in g
	H ₂ O at 20 °C	Air	D1	D2	A4							
FWS-DUG-4	0.2 ... 4	-	35	43	approx. 96	1/4"	10	121	132	32	625	
						3/8"	11	121	135			
						1/2"	14	121	135			
FWS-DUG-6	0.5 ... 6	-	35	43	approx. 96	1/4"	10	121	132	32	625	
						3/8"	11	121	135			
						1/2"	14	121	135			
FWS-DUG-8	0.5 ... 8	-	35	43	approx. 96	1/4"	10	121	132	32	625	
						3/8"	11	121	135			
						1/2"	14	121	135			
FWS-DUG-14	0.5 ... 14	-	35	43	approx. 96	1/4"	10	121	132	32	625	
						3/8"	11	121	135			
						1/2"	14	121	135			
FWS-DUG-22	2 ... 22	-	35	43	approx. 96	1/2"	14	121	135	32	650	
FWS-DUG-28	1 ... 28	-	35	43	approx. 96	1/2"	14	121	135	32	650	
FWS-DUG-45	1 ... 45	-	35	43	approx. 96	3/4"	15	143	166	32	850	
FWS-DUG-80	2 ... 80	-	45	50	approx. 104	3/4"	15	143	163	41	1,000	
						1"	17	143	181	41	1,000	
FWS-DUG-90	6 ... 90	-	45	50	approx. 104	3/4"	15	143	163	41	1,000	
						1"	17	143	181	41	1,000	
FWS-DUG-110	6 ... 110	-	45	50	approx. 104	1"	17	143	181	41	1,000	
FWS-DUG-150	15 ... 150	-	55	55	approx. 109	1 1/4"	20	174	122	50	1,300	
FWS-DUG-220	50 ... 220	-	60	60	approx. 113	1 1/4"	20	159	209	55	1,700	
FWS-DUG-250	50 ... 250	-	55	55	approx. 109	1 1/4"	20	174	222	50	1,400	

Flow monitor, mounting position as required, dial indicator, for water and similar media, model FWS-DUM/A

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Dial indicator
Process connections	Female thread G 1/4 ... 1 1/2 or 1/4 ... 1 1/2 NPT
Max. operating pressure	200 bar (stainless steel version 300 bar)
Pressure loss	0.02 ... 0.8 bar
Tolerance	±5 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

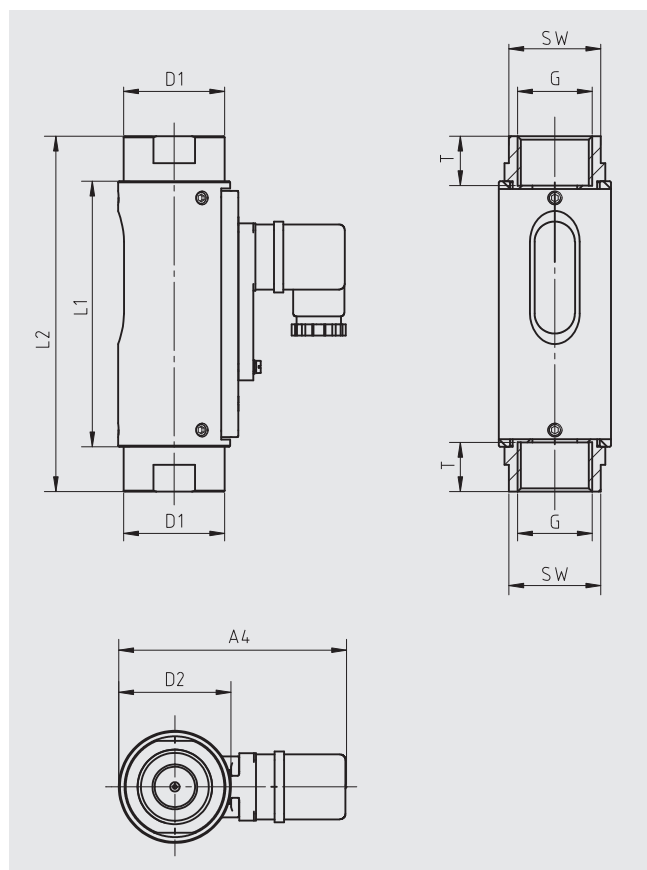
Electrical data	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA	250 V / 1 A / 30 VA ¹⁾

¹⁾ Minimum load 3 VA

Model	Switching ranges in l/min		Dimensions in mm						Normally open		Change-over contact		Weight in g
	H ₂ O at 20 °C	Air	D1	D2	A1	A3	A4	G	T	L1	L2	SW	
FWS-DUM/A-4	0.2 ... 4	-	30	30	47	65.5	approx. 88	1/4"	10	117	131	27	900
								3/8"	11				
								1/2"	14				
FWS-DUM/A-5	0.6 ... 5	-	30	30	47	65.5	approx. 88	1/4"	10	117	131	27	900
								3/8"	11				
								1/2"	14				
FWS-DUM/A-8	0.5 ... 8	-	30	30	47	65.5	approx. 88	1/4"	10	117	131	27	900
								3/8"	11				
								1/2"	14				
FWS-DUM/A-14	1 ... 14	-	30	30	47	65.5	approx. 88	1/4"	10	117	131	27	900
								3/8"	11				
								1/2"	14				
FWS-DUM/A-28	1 ... 28	-	30	30	47	65.5	approx. 88	1/4"	10	117	131	27	900
								3/8"	11				
								1/2"	14				
FWS-DUM/A-40	2 ... 40	-	30	30	47	65.5	approx. 88	1/2"	14	132	146	27	950
			35	30				3/4"	15				
			30	30				1/2"	14				
35	30	3/4"	15										
FWS-DUM/A-55	4 ... 55	-	30	30	47	65.5	approx. 88	1/2"	14	132	146	27	950
			35	30				3/4"	15				
			30	30				1/2"	14				
35	30	3/4"	15										
FWS-DUM/A-70	1 ... 70	-	40	40	57	70.5	approx. 98	3/4"	15	130	152	34	1,450
			40	40				1"	17				
			40	40				3/4"	15				
40	40	1"	17										
FWS-DUM/A-90	8 ... 90	-	40	40	57	70.5	approx. 98	3/4"	15	130	152	34	1,450
			40	40				1"	17				
			40	40				3/4"	15				
40	40	1"	17										
FWS-DUM/A-110	5 ... 110	-	40	40	57	70.5	approx. 98	3/4"	15	130	152	34	1,450
			40	40				1"	17				
FWS-DUM/A-150	10 ... 150	-	50	50	67	75.5	approx. 108	1 1/4"	20	200	200	50	2,800
			50	50				1 1/4"	20				
FWS-DUM/A-220	35 ... 220	-	50	50	67	75.5	approx. 108	1 1/4"	20	200	200	50	1,450
			60	60				1 1/2"	20				
FWS-DUM/A-250	35 ... 250	-	50	50	67	75.5	approx. 108	1 1/4"	20	200	200	50	1,450
			60	60				1 1/2"	20				

Flow monitor, mounting position as required, sight-glass display, for oil and similar media, model FWS-DKG-1

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	As required
Display	Sight-glass
Process connections	Female thread G 1/4 ... 1 or 1/4 ... 1 NPT
Max. operating pressure	10 bar
Pressure loss	0.02 ... 0.4 bar
Viscosity compensation	up to 600 mm ² /s
Tolerance	±10 % of full scale value

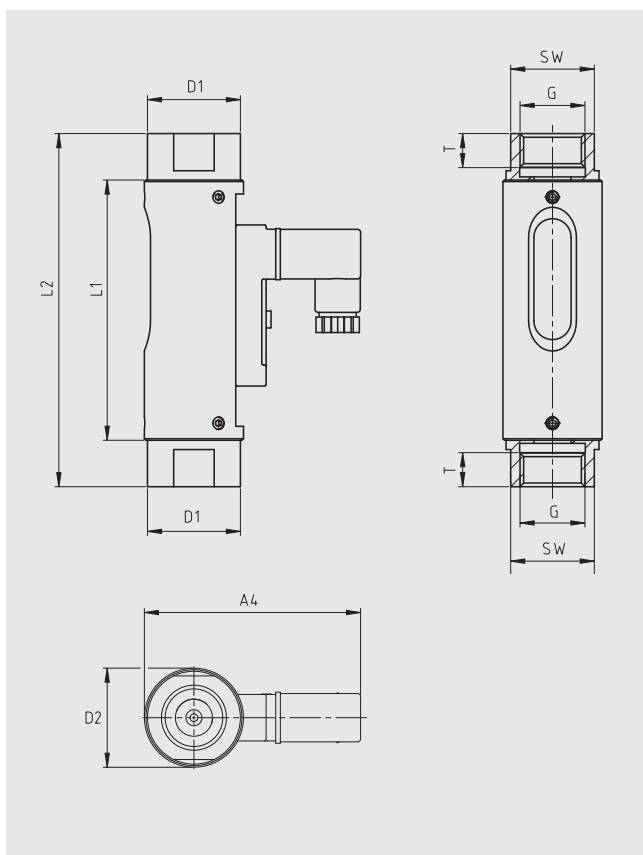
Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	120 °C (option 160 °C)	IP 65
1 m cable	120 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

1) Minimum load 3 VA

Model	Switching ranges in l/min		Dimensions in mm				G	T	L1	L2	SW	Weight in g
	Oil, density 0.9 kg/m ³	Air	D1	D2	A4							
FWS-DKG-1/1	0.1 ... 0.8	-	41	50	approx. 99	1/4"	10	118.5	144.5	41	850	
						1/2"	14	118.5	144.5			
						3/4"	15	118.5	138.5			
						1"	17	118.5	158.5			
FWS-DKG-1/2	0.5 ... 1.5	-	41	50	approx. 99	1/4"	10	118.5	144.5	41	850	
						1/2"	14	118.5	144.5			
						3/4"	15	118.5	138.5			
						1"	17	118.5	158.5			
FWS-DKG-1/4	1 ... 4	-	41	50	approx. 99	1/4"	10	118.5	144.5	41	850	
						1/2"	14	118.5	144.5			
						3/4"	15	118.5	138.5			
						1"	17	118.5	158.5			
FWS-DKG-1/8	2 ... 8	-	41	50	approx. 99	1/2"	14	118.5	144.5	41	850	
						3/4"	15	118.5	138.5			
						1"	17	118.5	158.5			
FWS-DKG-1/10	3 ... 10	-	41	50	approx. 99	1/2"	14	118.5	144.5	41	850	
						3/4"	15	118.5	138.5			
						1"	17	118.5	158.5			
FWS-DKG-1/15	5 ... 15	-	41	50	approx. 99	1/2"	14	118.5	144.5	41	850	
						3/4"	15	118.5	138.5			
						1"	17	118.5	159.5			
FWS-DKG-1/24	8 ... 24	-	41	50	approx. 99	1/2"	14	118.5	144.5	41	850	
						3/4"	15	118.5	138.5			
						1"	17	118.5	158.5			
FWS-DKG-1/30	10 ... 30	-	41	50	approx. 99	3/4"	15	118.5	138.5	41	850	
						1"	17	118.5	158.5			
FWS-DKG-1/45	15 ... 45	-	41	50	approx. 99	3/4"	15	118.5	138.5	41	850	
						1"	17	118.5	158.5			
FWS-DKG-1/60	20 ... 60	-	41	50	approx. 99	3/4"	15	118.5	138.5	41	850	
						1"	17	118.5	158.5			
FWS-DKG-1/90	30 ... 90	-	41	50	approx. 99	3/4"	15	118.5	138.5	41	850	
						1"	17	118.5	158.5			

Flow monitor, mounting position as required, sight-glass display, for oil and similar media, model FWS-DKG-2



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	As required
Display	Sight-glass
Process connections	Female thread G 1/2 or 1/2 NPT
Max. operating pressure	16 bar
Pressure loss	0.02 ... 0.2 bar
Viscosity compensation	up to 600 mm ² /s
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	120 °C (option 160 °C)	IP 65
1 m cable	120 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65

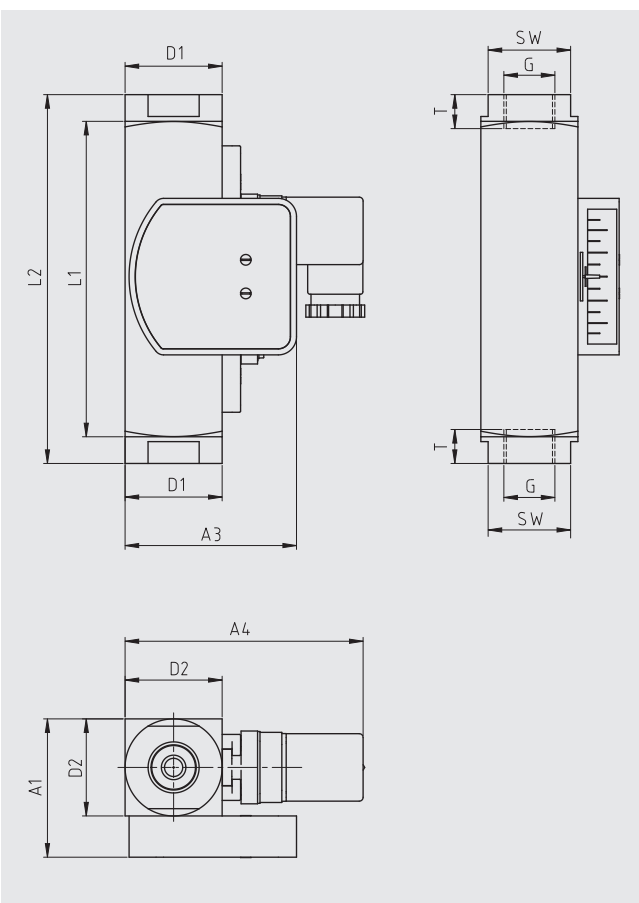
Electrical data	Normally open	Change-over contact
Standard	230 V / 3 A / 60 VA	250 V / 1.5 A / 50 VA ^{1) 2)}

1) Minimum load 3 VA
2) Only with instrument connector

Model	Switching ranges in l/min		Dimensions in mm							Weight in g	
	Oil, density 0.9 kg/m ³	Air	D1	D2	A4	G	T	L1	L2		SW
FWS-DKG-2/2	0.5 ... 1.7										
FWS-DKG-2/4	1.3 ... 4	-	30	32	approx. 70	1/2"	14	84	114	27	300
FWS-DKG-2/8	2.5 ... 8										

Flow monitor, mounting position as required, dial indicator, for oil and similar media, model FWS-DKM/A-1

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Dial indicator
Process connections	Female thread G 1/4 ... 1 or 1/4 ... 1 NPT
Max. operating pressure	200 bar (stainless steel version 300 bar)
Pressure loss	0.02 ... 0.4 bar
Viscosity compensation	up to 600 mm ² /s
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	120 °C (option 160 °C)	IP 65
1 m cable	120 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

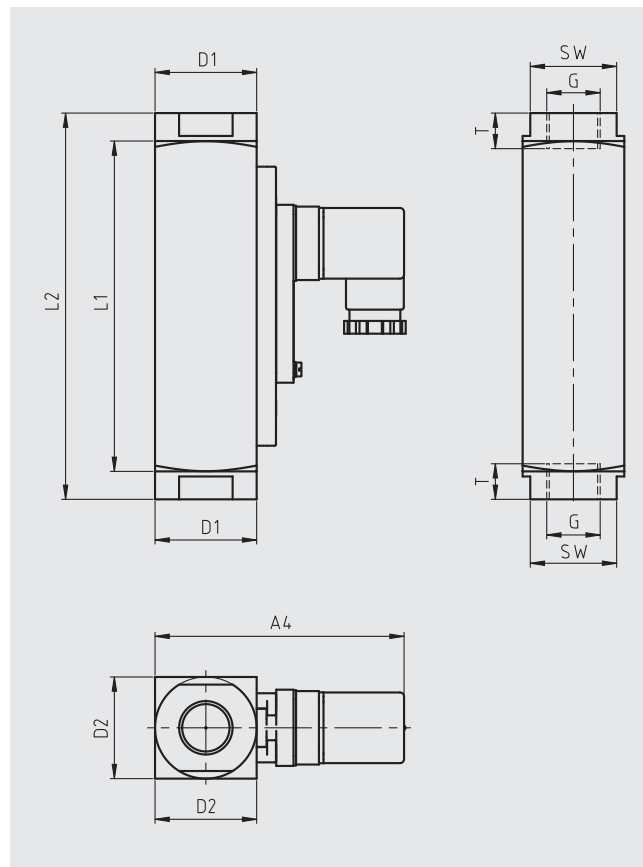
Electrical data	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

1) Minimum load 3 VA

Model	Switching ranges in l/min		Dimensions in mm					G	T	L1	L2	SW	Weight in g
	Oil, density 0.9 kg/m ³	Air	D1	D2	A1	A3	A4						
FWS-DKM/A-1/2	0.5 ... 1.5	-	40	40	57	70.5	approx. 98	1/4"	10	130	152	34	1,590
								1/2"	14	130	152	34	1,515
								3/4"	15	130	152	34	1,430
								1"	17	130	130	40	1,250
FWS-DKM/A-1/4	1 ... 4	-	40	40	57	70.5	approx. 98	1/4"	10	130	152	34	1,590
								1/2"	14	130	152	34	1,515
								3/4"	15	130	152	34	1,430
								1"	17	130	130	40	1,250
FWS-DKM/A-1/8	2 ... 8	-	40	40	57	70.5	approx. 98	1/2"	14	130	152	34	1,515
								3/4"	15	130	152	34	1,430
								1"	17	130	130	40	1,250
								1/2"	14	130	152	34	1,515
FWS-DKM/A-1/10	3 ... 10	-	40	40	57	70.5	approx. 98	3/4"	15	130	152	34	1,430
								1"	17	130	130	40	1,250
								1/2"	14	130	152	34	1,515
								3/4"	15	130	152	34	1,430
FWS-DKM/A-1/15	5 ... 15	-	40	40	57	70.5	approx. 98	1"	17	130	130	40	1,250
								1/2"	14	130	152	34	1,515
								3/4"	15	130	152	34	1,430
								1"	17	130	130	40	1,250
FWS-DKM/A-1/24	8 ... 24	-	40	40	57	70.5	approx. 98	3/4"	15	130	152	34	1,430
								1"	17	130	130	40	1,250
								1/2"	14	130	152	34	1,515
								3/4"	15	130	152	34	1,430
FWS-DKM/A-1/30	10 ... 30	-	40	40	57	70.5	approx. 98	1"	17	130	130	40	1,250
								3/4"	15	130	152	34	1,430
								1"	17	130	130	40	1,250
								3/4"	15	130	152	34	1,430
FWS-DKM/A-1/45	15 ... 45	-	40	40	57	70.5	approx. 98	1"	17	130	130	40	1,250
								3/4"	15	130	152	34	1,430
								1"	17	130	130	40	1,250
								3/4"	15	130	152	34	1,430
FWS-DKM/A-1/60	20 ... 60	-	40	40	57	70.5	approx. 98	1"	17	130	130	40	1,250
								3/4"	15	130	152	34	1,430
								1"	17	130	130	40	1,250
								3/4"	15	130	152	34	1,430
FWS-DKM/A-1/90	30 ... 90	-	40	40	57	70.5	approx. 98	1"	17	130	130	40	1,250
FWS-DKM/A-1/110	35 ... 110	-	40	40	57	70.5	approx. 98	1"	17	130	130	40	1,250

Flow monitor, mounting position as required, without display, for oil and similar media, model FWS-DKM-1

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Without
Process connections	Female thread G 1/4 ... 1 or 1/4 ... 1 NPT
Max. operating pressure	200 bar (stainless steel version 300 bar)
Pressure loss	0.02 ... 0.4 bar
Tolerance	±10 % of full scale value

Versions

	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	120 °C (option 160 °C)	IP 65
1 m cable	120 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data

	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA	250 V / 1 A / 30 VA ¹⁾

¹⁾ Minimum load 3 VA

Model	Switching ranges in l/min		Dimensions in mm				G	T	L1	L2	SW	Weight in g
	Oil, density 0.9 kg/m ³	Air	D1	D2	A4							
FWS-DKM-1/2	0.5 ... 1.5	-	40	40	approx. 98	1/4"	10	130	152	34	1,500	
						1/2"	14	130	152	34	1,425	
						3/4"	15	130	152	34	1,340	
						1"	17	130	130	40	1,160	
FWS-DKM-1/4	1 ... 4	-	40	40	approx. 98	1/4"	10	130	152	34	1,500	
						1/2"	14	130	152	34	1,425	
						3/4"	15	130	152	34	1,340	
						1"	17	130	130	40	1,160	
FWS-DKM-1/8	2 ... 8	-	40	40	approx. 98	1/2"	14	130	152	34	1,425	
						3/4"	15	130	152	34	1,340	
						1"	17	130	130	40	1,160	
FWS-DKM-1/10	3 ... 10	-	40	40	approx. 98	1/2"	14	130	152	34	1,425	
						3/4"	15	130	152	34	1,340	
						1"	17	130	130	40	1,160	
FWS-DKM-1/15	5 ... 15	-	40	40	approx. 98	1/2"	14	130	152	34	1,425	
						3/4"	15	130	152	34	1,340	
						1"	17	130	130	40	1,160	
FWS-DKM-1/24	8 ... 24	-	40	40	approx. 98	1/2"	14	130	152	34	1,425	
						3/4"	15	130	152	34	1,340	
						1"	17	130	130	40	1,160	
FWS-DKM-1/30	10 ... 30	-	40	40	approx. 98	3/4"	15	130	152	34	1,340	
						1"	17	130	130	40	1,160	
FWS-DKM-1/45	15 ... 45	-	40	40	approx. 98	3/4"	15	130	152	34	1,340	
						1"	17	130	130	40	1,160	
FWS-DKM-1/60	20 ... 60	-	40	40	approx. 98	3/4"	15	130	152	34	1,340	
						1"	17	130	130	40	1,160	
FWS-DKM-1/90	30 ... 90	-	40	40	approx. 98	1"	17	130	130	40	1,160	
FWS-DKM-1/110	35 ... 110	-	40	40	approx. 98	1"	17	130	130	40	1,160	

Flow monitor, mounting position as required, without display, for oil and similar media, model FWS-DKM-2

Option: Explosion-protected version



Specifications

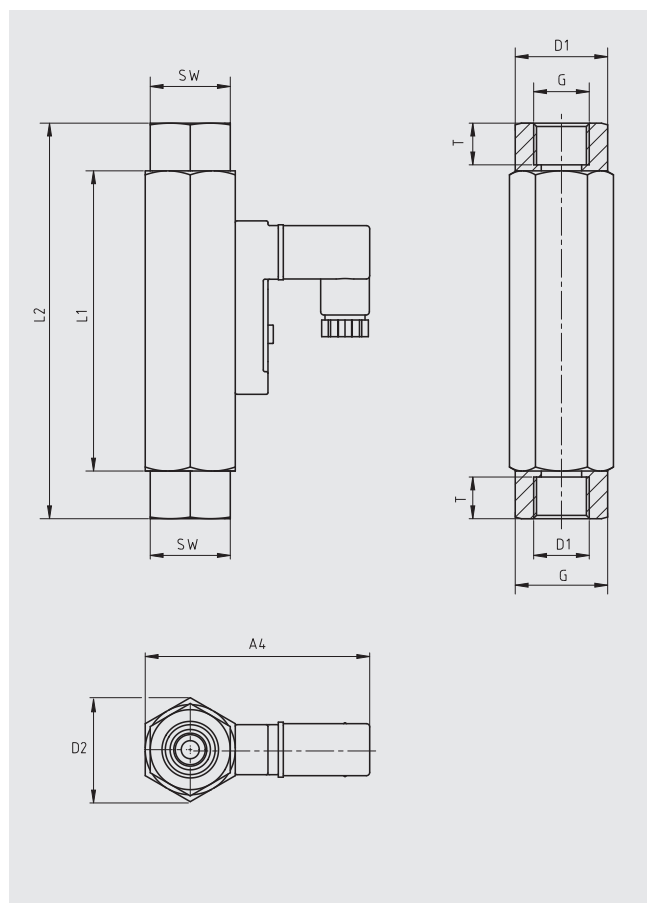
Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Without
Process connections	Female thread G 1/4 ... 1/2 or 1/4 ... 1/2 NPT
Max. operating pressure	300 bar (stainless steel version 350 bar)
Pressure loss	0.02 ... 0.2 bar
Viscosity compensation	up to 600 mm ² /s
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	120 °C (option 160 °C)	IP 65
1 m cable	120 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65
Ex version (2 m cable)	75 °C	IP 67

Electrical data	Normally open	Change-over contact
Standard	230 V / 3 A / 60 VA	250 V / 1.5 A / 50 VA ^{1) 2)}
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

1) Minimum load 3 VA

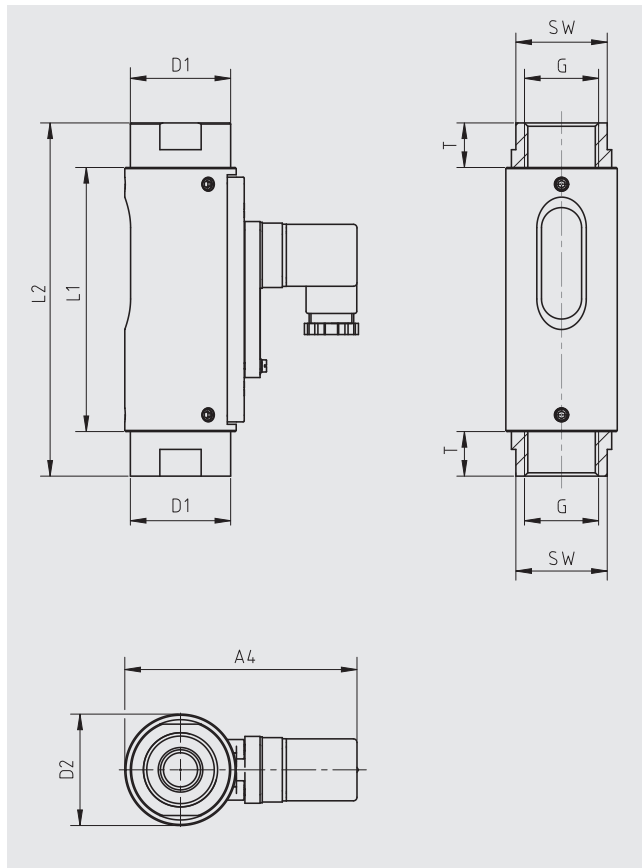
2) Only with instrument connector



Model	Switching ranges in l/min		Dimensions in mm					Weight in g			
	Oil, density 0.9 kg/m ³	Air	D1	D2	A4	G	T		L1	L2	SW
FWS-DKM-2/2	0.5 ... 1.6	-	27.5	31	approx. 68	1/4"	10	90	98	24	400
			27.5	31	approx. 68	3/8"	11	90	119	24	450
FWS-DKM-2/3	0.8 ... 3	-	31	31	approx. 68	1/2"	14	90	90	27	350
			31	31	approx. 68	1/2"	14	90	90	27	350

Flow monitor, mounting position as required, sight-glass display, for water and similar media, model FWS-RVO/U-1

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	As required
Display	Sight-glass
Process connections	Female thread G 3/4 ... 1 or 3/4 ... 1 NPT
Max. operating pressure	10 bar
Pressure loss	0.02 ... 0.4 bar
Tolerance	±10 % of full scale value

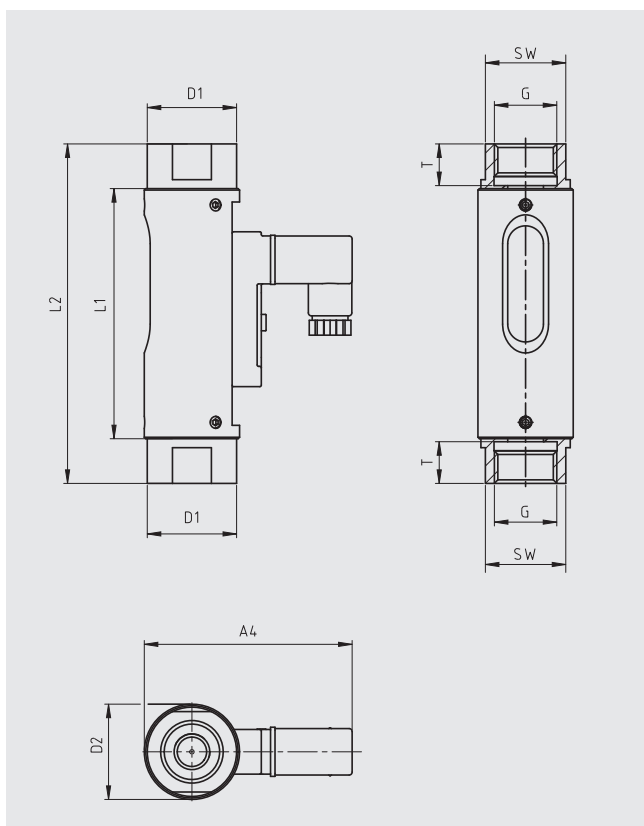
Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

¹⁾ Minimum load 3 VA

Model	Switching ranges in l/min		Dimensions in mm					G	T	L1	L2	SW	Weight in g
	H ₂ O at 20 °C	Air	D1	D2	A4								
FWS-RVO/U-1/30	8 ... 30	-	45	50	approx. 105	3/4"	15	119	139	41	800		
						1"						17	119
FWS-RVO/U-1/45	15 ... 45	-	45	50	approx. 105	3/4"	15	119	139	41	800		
						1"						17	119
FWS-RVO/U-1/90	30 ... 90	-	45	50	approx. 105	3/4"	15	119	139	41	800		
						1"						17	119
FWS-RVO/U-1/150	60 ... 150	-	45	50	approx. 105	1"	17	119	159	41	900		

Flow monitor, mounting position as required, sight-glass display, for water and similar media, model FWS-RVO/U-2



Specifications	
Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	As required
Display	Sight-glass
Process connections	Female thread G 1/2 or 1/2 NPT
Max. operating pressure	16 bar
Pressure loss	0.02 ... 0.3 bar
Tolerance	±10 % of full scale value

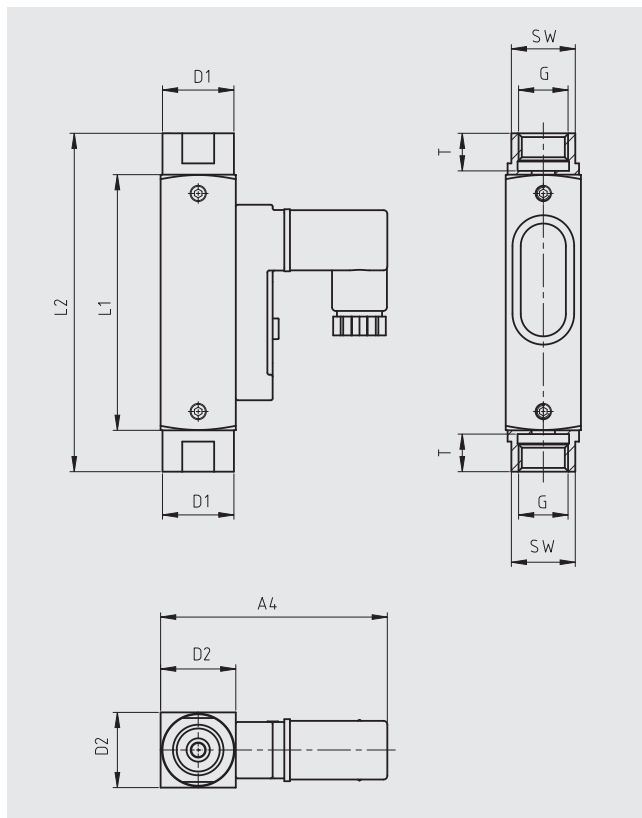
Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65

Electrical data	Normally open	Change-over contact
Standard	230 V / 3 A / 60 VA	250 V / 1.5 A / 50 VA ^{1) 2)}

1) Minimum load 3 VA
2) Only with instrument connector

Model	Switching ranges in l/min		Dimensions in mm									Weight in g
	H ₂ O at 20 °C	Air	D1	D2	A4	G	T	L1	L2	SW		
FWS-RVO/U-2/05	0.2 ... 0.5	-	30	32	approx. 69	1/2"	14	84	114	27	300	
FWS-RVO/U-2/1	0.3 ... 1.0	-										
FWS-RVO/U-2/2	0.7 ... 2.0	-										
FWS-RVO/U-2/4	1.6 ... 4	-										
FWS-RVO/U-2/8	3 ... 8	-										
FWS-RVO/U-2/15	6 ... 15	-										
FWS-RVO/U-2/20	8 ... 20	-										
FWS-RVO/U-2/28	12 ... 28	-										

Flow monitor, mounting position as required, sight-glass display, for water and similar media, model FWS-RVO/U-4



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	As required
Display	Sight-glass
Process connections	Female thread G 1/2 or 1/2 NPT
Max. operating pressure	16 bar
Pressure loss	0.02 ... 0.2 bar
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65

Electrical data	Normally open	Change-over contact
Standard	200 V / 1 A / 20 VA	200 V / 1 A / 20 VA ¹⁾

1) Only with instrument connector

Model	Switching ranges in l/min		Dimensions in mm								Weight in g	
	H ₂ O at 20 °C	Air	D1	D2	A4	G	T	L1	L2	SW		
FWS-RVO/U-4/01	0.005 ... 0.06	-										
FWS-RVO/U-4/02	0.025 ... 0.13	-										
FWS-RVO/U-4/06	0.1 ... 0.6	-										
FWS-RVO/U-4/1	0.2 ... 1.2	-	19	20	approx. 60	1/2"	10	68	90	17	140	
FWS-RVO/U-4/2	0.4 ... 2	-										
FWS-RVO/U-4/3	0.5 ... 3	-										
FWS-RVO/U-4/5	1 ... 5	-										

Flow monitor, mounting position as required, sight-glass display, for gaseous media, model FWS-RVO/U-L1

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	As required
Display	Sight-glass
Process connections	Female thread G 3/4 ... 1 or 3/4 ... 1 NPT
Max. operating pressure	10 bar
Pressure loss	0.02 ... 0.4 bar
Tolerance	±10 % of full scale value

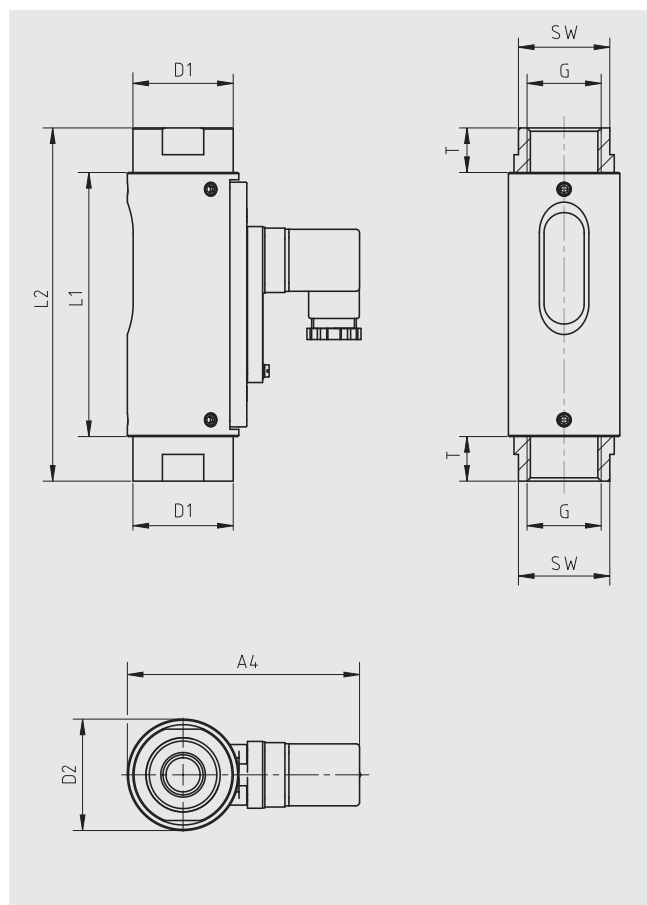
Versions

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data

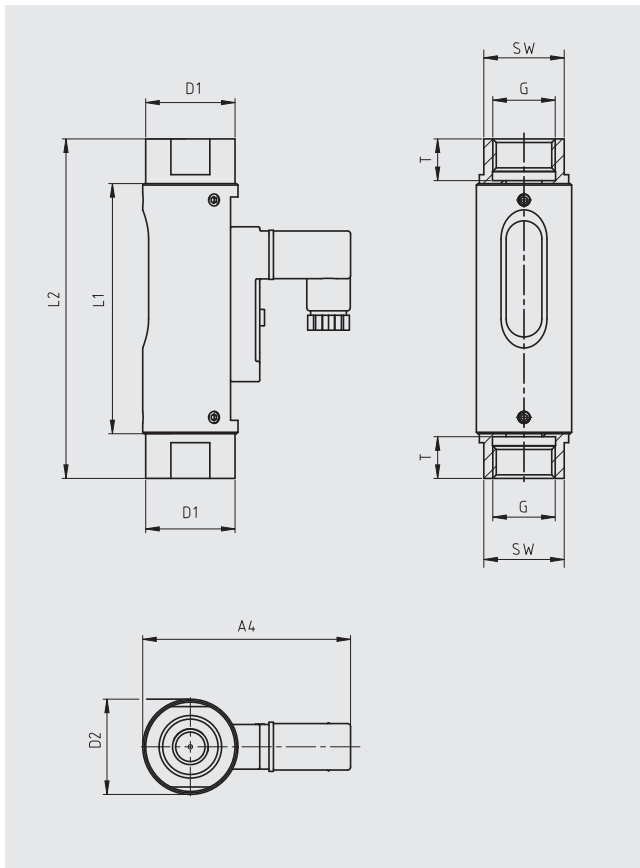
	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

1) Minimum load 3 VA



Model	Switching ranges in l/min		Dimensions in mm								Weight in g
	H ₂ O	Air at 1 bar abs. and 20 °C	D1	D2	A4	G	T	L1	L2	SW	
FWS-RVO/U-L10080	-	22.5 ... 80	45	50	approx. 105	3/4"	15	119	139	41	800
						1"	17	119	159	41	900
FWS-RVO/U-L10130	-	50 ... 130	45	50	approx. 105	3/4"	15	119	139	41	800
						1"	17	119	159	41	900
FWS-RVO/U-L10420	-	130 ... 420	45	50	approx. 105	3/4"	15	119	139	41	800
						1"	17	119	159	41	900
FWS-RVO/U-L10625	-	200 ... 625	45	50	approx. 105	3/4"	15	119	139	41	800
						1"	17	119	159	41	900

Flow monitor, mounting position as required, sight-glass display, for gaseous media, model FWS-RVO/U-L2



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	As required
Display	Sight-glass
Process connections	Female thread G 1/2 or 1/2 NPT
Max. operating pressure	16 bar
Pressure loss	0.02 ... 0.3 bar
Tolerance	±10 % of full scale value

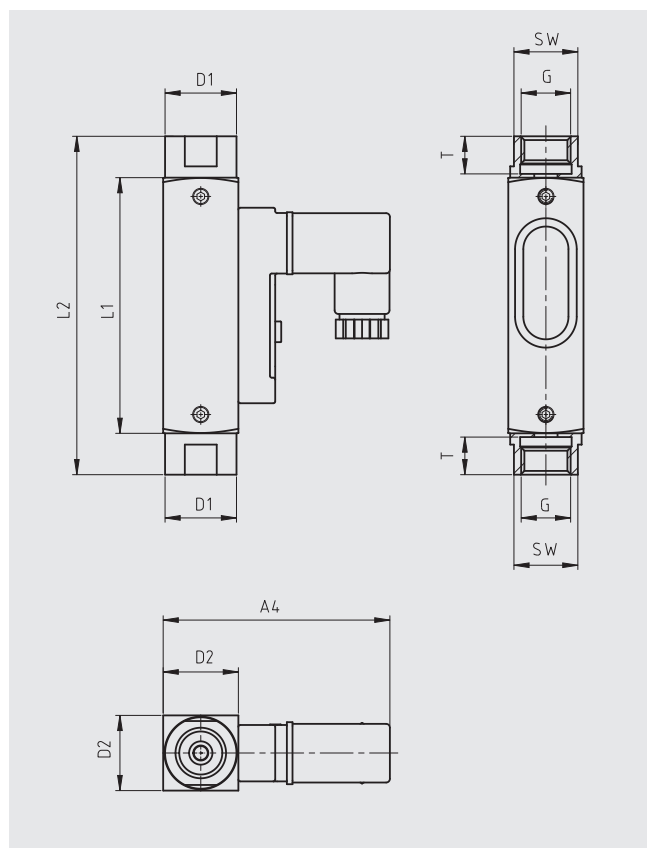
Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65

Electrical data	Normally open	Change-over contact
Standard	230 V / 3 A / 60 VA	250 V / 1.5 A / 50 VA ^{1) 2)}

1) Minimum load 3 VA
2) Only with instrument connector

Model	Switching ranges in l/min		Dimensions in mm								Weight in g	
	H ₂ O	Air at 1 bar abs. and 20 °C	D1	D2	A4	G	T	L1	L2	SW		
FWS-RVO/U-L20012	-	3 ... 12										
FWS-RVO/U-L20030	-	7 ... 30										
FWS-RVO/U-L20040	-	12 ... 40										
FWS-RVO/U-L20125	-	28 ... 125	30	32	approx. 70	1/2"	14	84	114	27	300	
FWS-RVO/U-L20200	-	50 ... 200										
FWS-RVO/U-L2/15L	-	100 ... 420										
FWS-RVO/U-L2/20L	-	120 ... 480										

Flow monitor, mounting position as required, sight-glass display, for gaseous media, model FWS-RVO/U-L4



Specifications	
Main body	Nickel-plated brass or stainless steel 1.4571 Exterior case from anodised aluminium
Mounting position	As required
Display	Sight-glass
Process connections	Female thread G 1/4 or 1/4 NPT
Max. operating pressure	16 bar
Pressure loss	0.02 ... 0.2 bar
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65

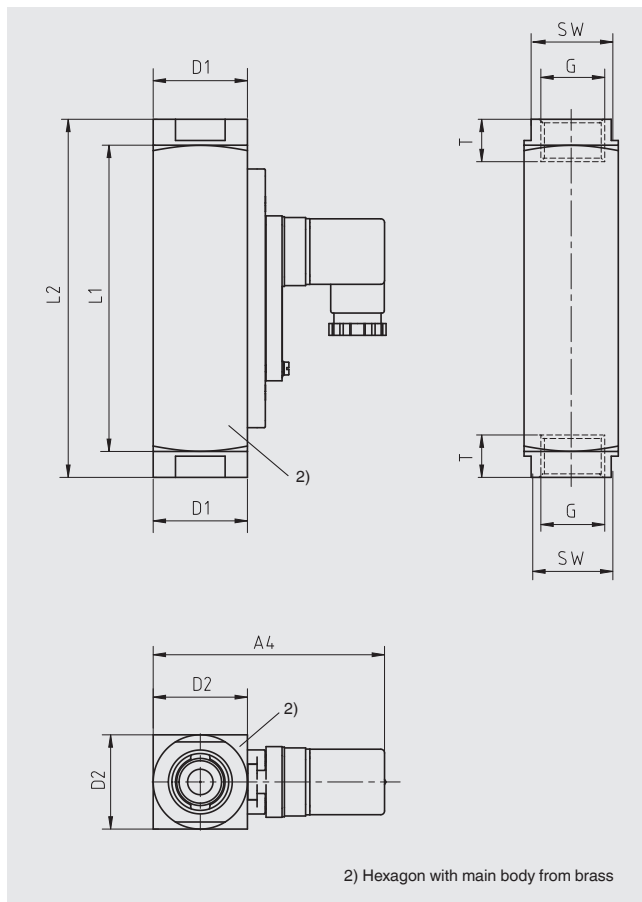
Electrical data	Normally open	Change-over contact
Standard	200 V / 1 A / 20 VA	200 V / 1 A / 20 VA ¹⁾

1) Only with instrument connector

Model	Switching ranges in l/min		Dimensions in mm							Weight in g	
	H ₂ O	Air at 1 bar abs. and 20 °C	D1	D2	A4	G	T	L1	L2		SW
FWS-RVO/U-L40001	-	0.2 ... 1.3									
FWS-RVO/U-L40002	-	0.5 ... 2									
FWS-RVO/U-L40003	-	0.8 ... 3									
FWS-RVO/U-L40005	-	1.5 ... 5									
FWS-RVO/U-L40008	-	2 ... 8									
FWS-RVO/U-L40012	-	3 ... 12	19	20	approx. 60	1/4"	10	68	90	17	140
FWS-RVO/U-L40014	-	3.5 ... 14									
FWS-RVO/U-L40020	-	5.5 ... 20									
FWS-RVO/U-L40024	-	7 ... 24									
FWS-RVO/U-L40035	-	10 ... 35									
FWS-RVO/U-L40042	-	10 ... 42									

Flow monitor, mounting position as required, without display, for water and similar media, model FWS-RVM/U-1

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Without
Process connections	Female thread G 3/4 ... 1 or 3/4 ... 1 NPT
Max. operating pressure	250 bar (stainless steel version 300 bar)
Pressure loss	0.02 ... 0.4 bar
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

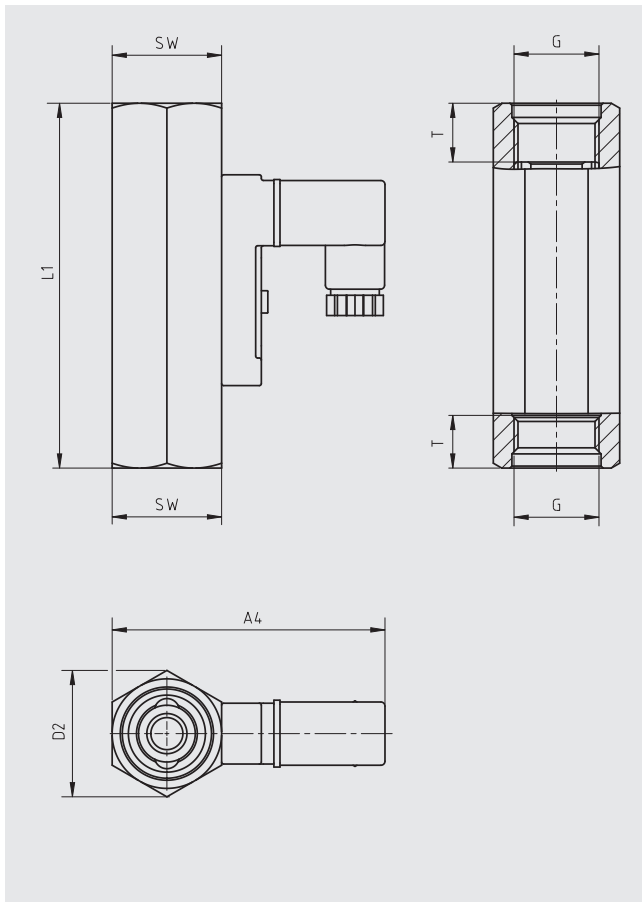
1) Minimum load 3 VA

Model	Switching ranges in l/min		Dimensions in mm							Weight in g	
	H ₂ O at 20 °C	Air	D1	D2	A4	G	T	L1	L2		SW
FWS-RVM/U-1/30	10 ... 30	-	40	40 ³⁾	approx. 98	3/4"	15	130	152	34	1,200
						1"	17	130	130	41	1,050
FWS-RVM/U-1/45	15 ... 45	-	40	40 ³⁾	approx. 98	3/4"	15	130	152	34	1,200
						1"	17	130	130	41	1,050
FWS-RVM/U-1/60	20 ... 60	-	40	40 ³⁾	approx. 98	3/4"	15	130	152	34	1,200
						1"	17	130	130	41	1,050
FWS-RVM/U-1/90	30 ... 90	-	40	40 ³⁾	approx. 98	3/4"	15	130	152	34	1,200
						1"	17	130	130	41	1,050
FWS-RVO/U-1/150	60 ... 150	-	40	40 ³⁾	approx. 98	1"	17	130	152	41	1,050

3) With main body from brass, hexagon: 47.3 mm

Flow monitor, mounting position as required, without display, for water and similar media, model FWS-RVM/U-2

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Without
Process connections	Female thread G 1/2 or 1/2 NPT
Max. operating pressure	250 bar (stainless steel version 300 bar)
Pressure loss	0.02 ... 0.3 bar
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65
Ex version (2 m cable)	75 °C	IP 67

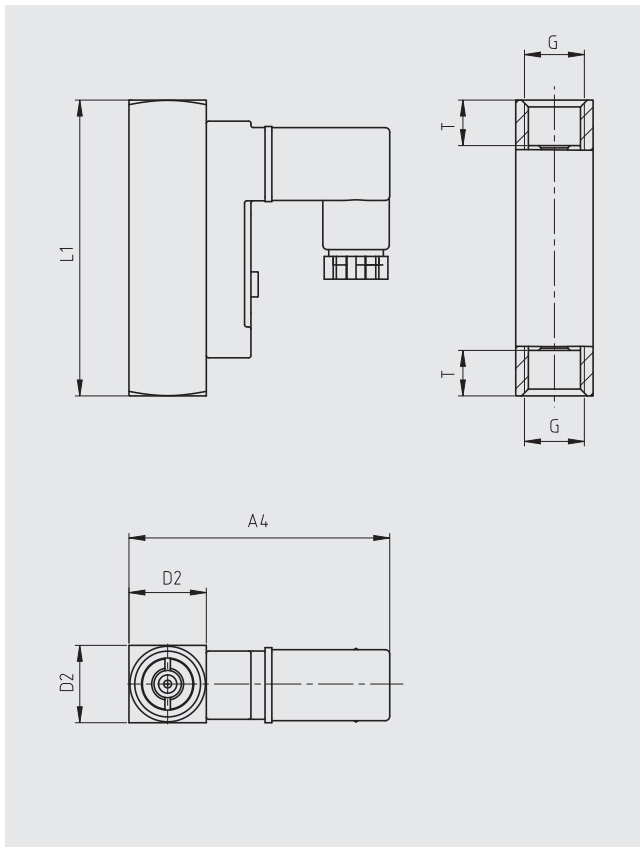
Electrical data	Normally open	Change-over contact
Standard	230 V / 3 A / 60 VA	250 V / 1.5 A / 50 VA ^{1) 2)}
Ex version	250 V / 2 A / 60 VA	250 V / 1 A / 30 VA ¹⁾
	ATEX II 2G Ex mb II T6	

1) Minimum load 3 VA

2) Only with instrument connector

Model	Switching ranges in l/min		Dimensions in mm						Weight in g
	H ₂ O at 20 °C	Air	D2	A4	G	T	L1	SW	
FWS-RVM/U-2/02	0.02 ... 0.2	-	32	approx. 67	1/2"	14	90	27	350
FWS-RVM/U-2/06	0.2 ... 0.6	-							
FWS-RVM/U-2/1	0.4 ... 1.8	-							
FWS-RVM/U-2/3	0.8 ... 3.2	-							
FWS-RVM/U-2/7	2 ... 7	-							
FWS-RVM/U-2/13	3 ... 13	-							
FWS-RVM/U-2/20	4 ... 20	-							
FWS-RVM/U-2/30	8 ... 30	-							

Flow monitor, mounting position as required, without display, for water and similar media, model FWS-RVM/U-4



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Without
Process connections	Female thread G 1/4 or 1/4 NPT
Max. operating pressure	300 bar (stainless steel version 350 bar)
Pressure loss	0.02 ... 0.2 bar
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65

Electrical data	Normally open	Change-over contact
Standard	200 V / 1 A / 20 VA	200 V / 1 A / 20 VA ¹⁾

1) Only with instrument connector

Model	Switching ranges in l/min		Dimensions in mm						Weight in g
	H ₂ O at 20 °C	Air	D2	A4	G	T	L1	SW	
FWS-RVM/U-4/01	0.005 ... 0.06	-							
FWS-RVM/U-4/02	0.04 ... 0.13	-							
FWS-RVM/U-4/06	0.1 ... 0.6	-							
FWS-RVM/U-4/1	0.2 ... 1.2	-	17	approx. 57	1/4"	10	65	17	140
FWS-RVM/U-4/2	0.4 ... 2	-							
FWS-RVM/U-4/3	0.5 ... 3	-							
FWS-RVM/U-4/5	1 ... 5	-							

Flow monitor, mounting position as required, without display, for gaseous media, model FWS-RVM/U-L1

Option: Explosion-protected version



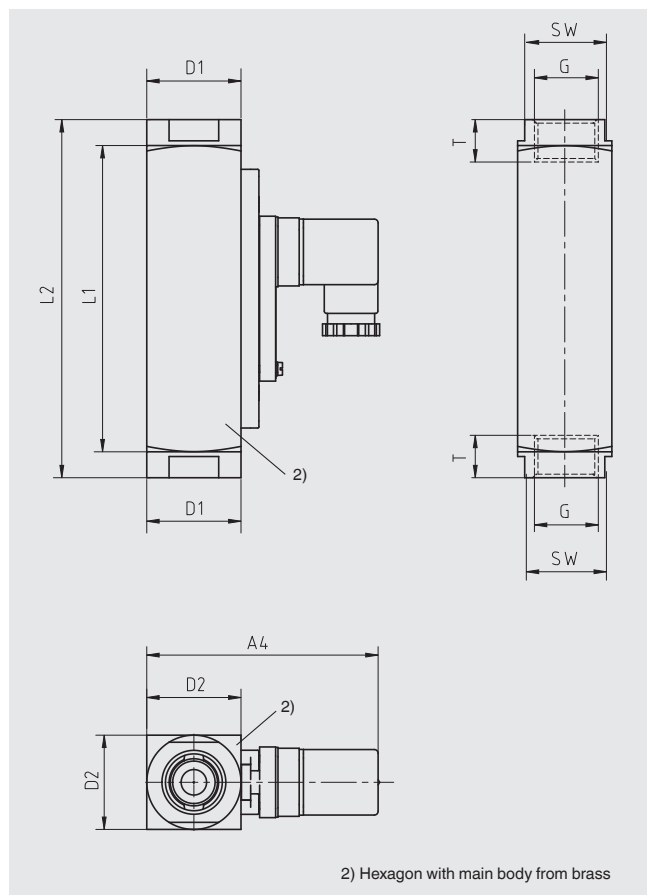
Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Without
Process connections	Female thread G 3/4 ... 1 or 3/4 ... 1 NPT
Max. operating pressure	250 bar (stainless steel version 300 bar)
Pressure loss	0.02 ... 0.4 bar
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form A	100 °C (option 160 °C)	IP 65
1 m cable	100 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 67
Ex version (2 m cable)	75 °C	IP 67

Electrical data	Normally open	Change-over contact
Standard	250 V / 3 A / 100 VA	250 V / 1.5 A / 50 VA ¹⁾
Ex version	250 V / 2 A / 60 VA ATEX II 2G Ex mb II T6	250 V / 1 A / 30 VA ¹⁾

1) Minimum load 3 VA



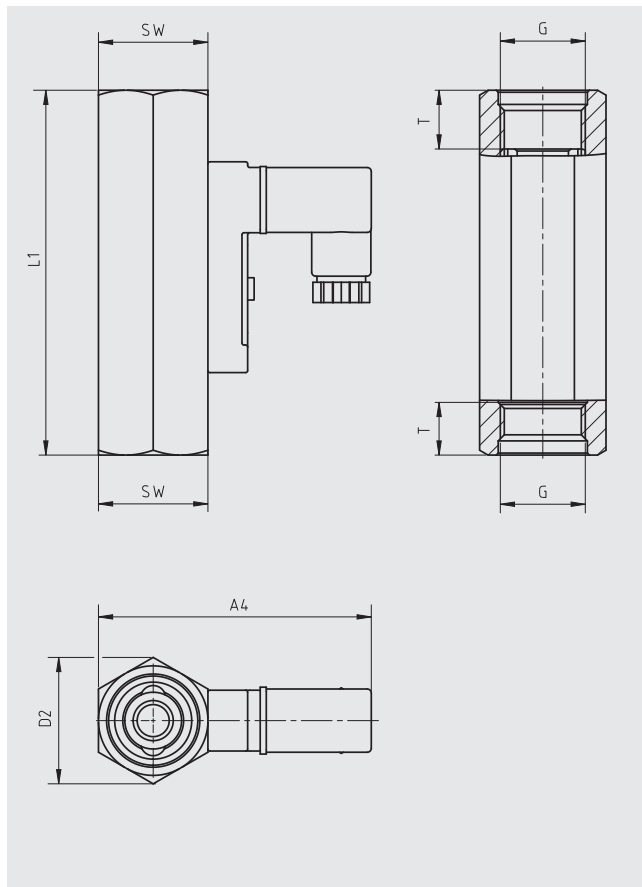
2) Hexagon with main body from brass

Model	Switching ranges in l/min		Dimensions in mm								Weight in g
	H ₂ O	Air at 1 bar abs. and 20 °C	D1	D2	A4	G	T	L1	L2	SW	
FWS-RVM/U-L10180	-	60 ... 180	40	40 ³⁾	approx. 98	3/4"	15	130	152	34	1,200
						1"	17	130	130	41	1,050
FWS-RVM/U-L10180	-	100 ... 300	40	40 ³⁾	approx. 98	3/4"	15	130	152	34	1,200
						1"	17	130	130	41	1,050
FWS-RVM/U-L10650	-	200 ... 650	40	40 ³⁾	approx. 98	3/4"	15	130	152	34	1,200
						1"	17	130	130	41	1,050

3) With main body from brass, hexagon: 47.3 mm

Flow monitor, mounting position as required, without display, for gaseous media, model FWS-RVM/U-L2

Option: Explosion-protected version



Specifications

Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Without
Process connections	Female thread G 1/2 or 1/2 NPT
Max. operating pressure	300 bar (stainless steel version 350 bar)
Pressure loss	0.02 ... 0.3 bar
Tolerance	±10 % of full scale value

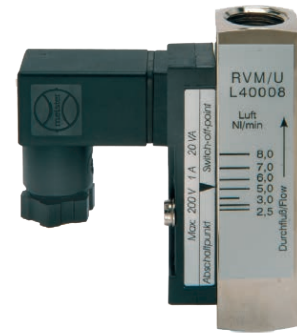
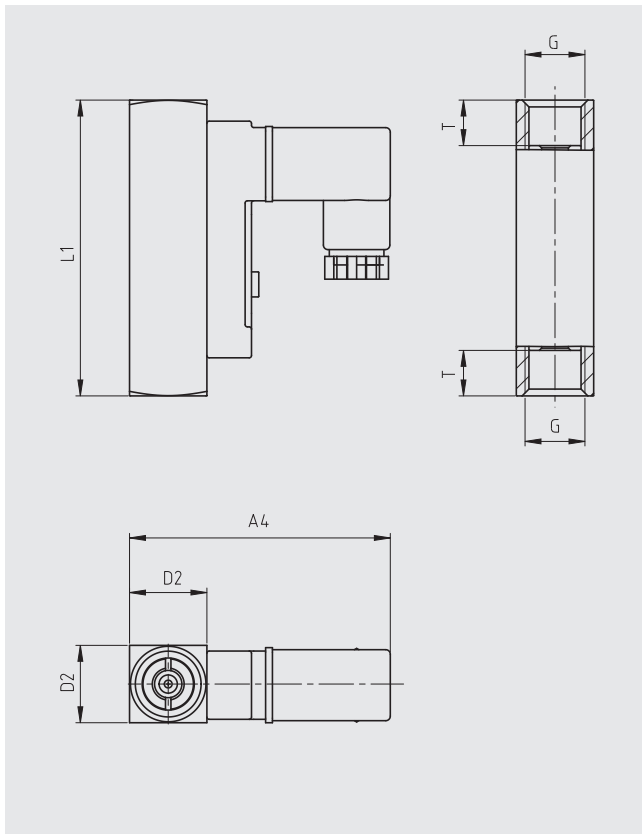
Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	120 °C (option 160 °C)	IP 65
1 m cable	120 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65
Ex version (2 m cable)	75 °C	IP 67

Electrical data	Normally open	Change-over contact
Standard	230 V / 3 A / 60 VA	250 V / 1.5 A / 50 VA ^{1) 2)}
Ex version	250 V / 2 A / 60 VA	250 V / 1 A / 30 VA ¹⁾

1) Minimum load 3 VA
2) Only with instrument connector

Model	Switching ranges in l/min		Dimensions in mm						Weight in g
	H ₂ O	Air at 1 bar abs. and 20 °C	D2	A4	G	T	L1	SW	
FWS-RVM/U-L20010	-	2.5 ... 10	32	approx. 67	1/2"	14	90	27	350
FWS-RVM/U-L20020	-	5.5 ... 20							
FWS-RVM/U-L20030	-	8 ... 30							
FWS-RVM/U-L20035	-	10 ... 35							
FWS-RVM/U-L20090	-	45 ... 90							
FWS-RVM/U-L20220	-	55 ... 220							
FWS-RVM/U-L20240	-	65 ... 240							
FWS-RVM/U-L20300	-	80 ... 300							
FWS-RVM/U-L20525	-	140 ... 525							

Flow monitor, mounting position as required, without display, for gaseous media, model FWS-RVM/U-L4



Specifications	
Main body	Nickel-plated brass or stainless steel 1.4571
Mounting position	As required
Display	Without
Process connections	Female thread G 1/4 or 1/4 NPT
Max. operating pressure	300 bar (stainless steel version 350 bar)
Pressure loss	0.02 ... 0.2 bar
Tolerance	±10 % of full scale value

Versions	Max. ambient temperature	Ingress protection
Instrument connector DIN 43650 form C	120 °C (option 160 °C)	IP 65
1 m cable	120 °C (option 160 °C)	IP 67
Instrument connector M12 x 1	85 °C	IP 65

Electrical data	Normally open	Change-over contact
Standard	200 V / 1 A / 20 VA	200 V / 1 A / 20 VA ¹⁾

1) Only with instrument connector

Model	Switching ranges in l/min		Dimensions in mm					SW	Weight in g
	H ₂ O	Air at 1 bar abs. and 20 °C	D2	A4	G	T	L1		
FWS-RVM/U-L40002	-	0.6 ... 2.2							
FWS-RVM/U-L40006	-	1.7 ... 6							
FWS-RVM/U-L40008	-	2.5 ... 8							
FWS-RVM/U-L40012	-	3 ... 12							
FWS-RVM/U-L4/06L	-	3 ... 22	17	approx. 57	1/4"	10	65	17	140
FWS-RVM/U-L40024	-	7 ... 24							
FWS-RVM/U-L40034	-	12 ... 34							
FWS-RVM/U-L4/2L	-	16 ... 56							
FWS-RVM/U-L4/3L	-	20 ... 80							

Contact protection measures

The reed contacts should be protected against any voltage or current spikes that might occur.

Depending on the different load types different protective circuits are used.



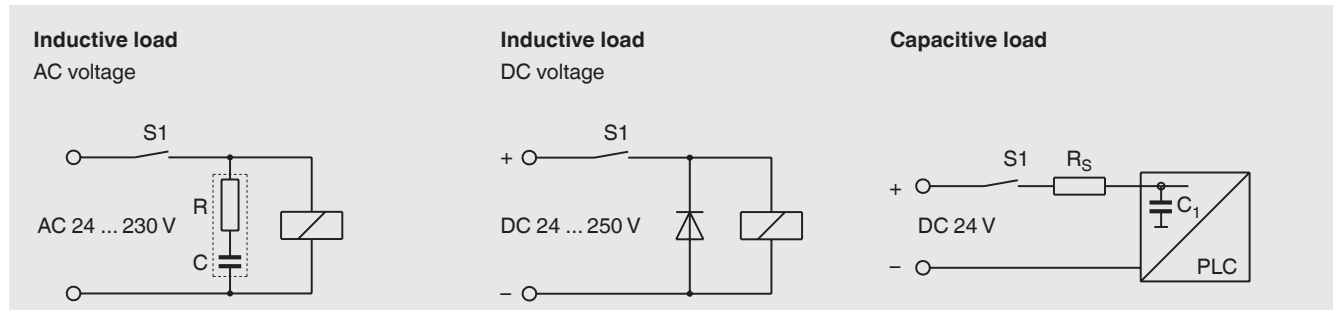
Model KR 24



RC module

Contact protection relays	Contacts	Input	Power supply	Approval number	Order no.
KR 24	1 x change-over AC 250 V, 2 A	2 x contacts	DC 20 ... 30 V		112941
KR 24-EX	2 x change-over AC 253 V, 2 A	2 x contacts	DC 20 ... 30 V	II 1 GD EEx ia IIC, PTB 02 ATEX 2073	112944
KR 230	1 x change-over AC 250 V, 2 A	2 x contacts	AC 230 V		112942
KR 230-EX	2 x change-over AC 253 V, 2 A	2 x contacts	AC 230 V	II 1 GD EEx ia IIC, PTB 02 ATEX 2073	112943

RC module	Capacitance	Resistance	Voltage	Order no.
B3/115	0.33 μ F	470 Ohm	AC 115 V	110446
B3/230	0.33 μ F	1,000 Ohm	AC 230 V	110460



Ordering information

To order the described product the order number (if available) is sufficient.

Alternatively:

Model / Medium / Process specifications (operating temperature and pressure) / Mounting position / Display / Switching range / Material / Thread size / Switch contact / Options (approvals)

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