Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Electromagnetic Flowmeter compact

for conductivity liquids

KOBOLD

measuring • monitoring • analysing

MIK

MIK with
frequency-, switching-, analogue output

MIK with
digital plug on display

- Range from liquids, acids and caustic solutions:
  0.01-0.5 … 35-700 l/min
- Accuracy: ±2.0 % of full scale
- p_{max}: 10 bar; t_{max}: 80 °C
- Connection: G½ … G 2¾ male, diverse accessories
- Material:
  normal liquids: PPS, stainless steel
  aggressive liquids:
  PVDF, Hastelloy® or Tantalum
- Advantage:
  · no moving parts in the measuring tube
  · low pressure loss
  · any mounting position
  · short reaction time – replacement for calorimetric flow switch
  · high quality for lowest price

MIK with
dosing electronic

MIK with
compact electronic

S5

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Description

The new KOBOLD flow meter Type MIK is used for measuring and monitoring smaller and medium-sized flow of conductivity liquids in pipes.

The device operates according to the electromagnetic measurement principle. According to Faraday's Law of magnetic induction a voltage is induced in a conductor moving through a magnetic field. The electrically conductive measuring agent acts as the moved conductor. The voltage induced in the measuring agent is proportional to the flow velocity and is therefore a value for the volumetric flow. The flowing media must have a minimum conductivity. The induced voltage is picked up by two sensing electrodes which are in contact with the measuring agent and sent to the measuring amplifier. The flow rate will be calculated based on the cross sectional area of the pipe.

The measurement is not depending on the process liquid and its material properties such as density, viscosity and temperature. The device may be equipped with a switch, frequency or analogue output. Moreover, there is a compact electronic system to be selected from, which contains a switch and an analogue output.

The device series is completed by an optionally obtainable dosing and counter electronic system. The counter electronics system shows the current flow rate on the first line of the display and shows the partial or overall volume on the second line. A dosing electronic system controls simple filling duties and also measures the flow rate, overall volume and filling volume. The analogue output and two relay outputs can be utilised for the further processing of signals.

Media

- Electric conductivity liquids
- Acids and caustic solutions
- Drinking, cooling and waste water
- Ground water, raw water
- Aggressive or salty solution
- Unsuitable for oil (missing conductivity)

Areas of Application

Flow monitoring, flow measuring, dosing and counting for

- Machine building
- Chemical Industry
- Paper Industry
- Automobile Industry
- Cement Industry
- Laboratory

Technical Details

Range:	see table
Accuracy:	±2.0 % of full scale
Repeat accuracy:	±1.0 % of full scale
Measurement process:	electromagnetic
Electrical conductivity:	min. 30 µS /cm (at MIK- ...08 and 10: min. 200 µS/cm)
Mounting position:	in all directions, flow in direction of the arrow
In-/Outlet:	3 x DN / 2 x DN
Media temperature:	-20 ... +80 °C (max. +60 °C with PVC-connection set)
Ambient temperature:	-10 ... +60 °C
Max. pressure:	10 bar
Max. pressure loss:	max. 250 mbar at full scale
Max. medium viscosity:	20 cSt ≤ G1; 70 cSt ≥ G1½

Wetted Parts

Sensor housing:	PPS or PVDF, fibreglass-reinforced
Connection set:	PVC-glue connection or hose connection, weld-on ends stainless steel 1.4404
Electrodes:	stainless steel 1.4404, Hastelloy® C4 or Tantalum
Seal:	NBR, FPM or FFKM
Response time t_{90}:	approximately 1 s (at flow changes >10% FS)
Protection:	IP 65

Connection/Ranges

Connection	Inside diameter	Flow velocity at full scale	Range
G ½ male	5 mm	approx. 0.45 m/s	10 ... 500 ml/min
		approx. 0.9 m/s	0.05 ... 1.0 l/min
		approx. 2.7 m/s	0.16 ... 3.2 l/min
G ¾ male	10 mm	approx. 2.2 m/s	0.5 ... 10.0 l/min
		approx. 3.5 m/s	0.8 ... 16.0 l/min
G 1 male	15 mm	approx. 3.0 m/s	1.6 ... 32.0 l/min
		approx. 4.7 m/s	2.5 ... 50 l/min
G 1½ male	20 mm	approx. 3.3 m/s	3.2 ... 63 l/min
		approx. 5.3 m/s	5.0 ... 100 l/min
G 2 male	32 mm	approx. 3.3 m/s	8 ... 160 l/min
		approx. 6.6 m/s	16 ... 320 l/min
G 2¾ male	54 mm	approx. 3.6 m/s	25 ... 500 l/min
		approx. 5.1 m/s	35 ... 700 l/min

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MIK-...F300, MIK-...F390

Impulse output:	PNP, Open Collector, max. 200 mA 500 Hz at full scale (...F300) 50...1000 Hz at full scale (...F390) factory set as per customer request
Power supply:	24 V_{DC} ±20 %
Power consumption:	60 mA
Electrical connection:	plug M 12 x 1

MIK-...S300, MIK-...S30D

Display:	duo-LED for switch status
Switching output:	relay SPDT, max. 1A/30V_{DC} or aktive 24 V_{DC}, N/C / N/O
Switch point:	10 ...100% of full scale in 10%-steps that can be configured by the customer using a rotary switch
Power supply:	24 V_{DC} ±20 %
Power consumption:	80 mA
Electrical connection:	plug M 12 x 1.5-pin

MIK-...L303; MIK-...L343

Output:	0(4)-20 mA, 3-wire
Max. load:	500 Ω
Power supply:	24 V_{DC} ±20%
Power consumption:	80 mA
Electrical connection:	plug M 12 x 1

MIK-...L443 (usage with AUF-3000)

Output:	4-20 mA, 3-wire
Max. load:	500 Ω
Power supply:	24 V_{DC} ±20%
Power consumption:	80 mA
Electrical connection:	plug DIN 43650

MIK-...C3xx (Compact electronics)

Display:	3-digit LED
Analogue output:	(0)4...20 mA adjustable (only MIK-...C34x)
Max. load:	500 Ω
Switching output:	1(2) semiconductor PNP or NPN, set at factory
Contact function:	N/C / N/O-frequency programmable
Settings:	via 2 buttons
Power supply:	24 V_{DC} ±20 %, 3-wire
Power consumption:	120 mA
Electrical connection:	plug M 12 x 1

MIK-...Exxx (Counter electronics)

Display:	LCD, 2 x 8 digit, illuminated total, part and flow quantities, units selectable
Quantity meter:	8-digit
Analogue output:	(0)4...20 mA adjustable
Load:	max. 500 Ω
Switching output:	2 relays, max. 30 $V_{AC/DC}$/2 A/60 VA
Settings:	via 4 buttons
Functions:	reset, MIN/MAX memory, flow monitor, monitoring for part and total quantity, language
Power supply:	24 V_{DC} ±20 %, 3-wire
Power consumption:	approx. 150 mA
Electrical connections:	cable connection or M 12 plug

More technical details see data sheet ZED

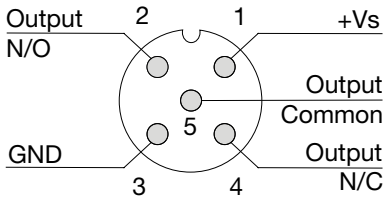
MIK-...Gxxx (Dosing electronics)

Display:	LCD, 2 x 8 digit, illuminated dosing-, total-, and flow quantity, units selectable
Quantity meter:	8-digit
Dosage:	5-digit
Analogue output:	(0)4...20 mA adjustable
Load:	max. 500 Ω
Switching output:	2 relays, max. 30 $V_{AC/DC}$/2 A/60 VA
Settings:	via 4 buttons
Functions:	dosing (relay S2), start, stop, reset, fine dosing, correction amount, flow switch, total quantity, language
Power supply:	24 V_{DC} ±20 %, 3-wire
Power consumption:	approx. 150 mA
Electrical connection:	cable connection or M 12 plug

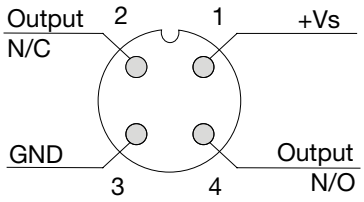
More technical details see data sheet ZED

Electrical Connections

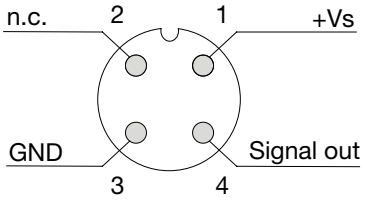
MIK-...S300



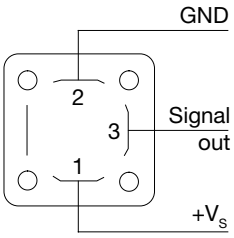
MIK-...S30D



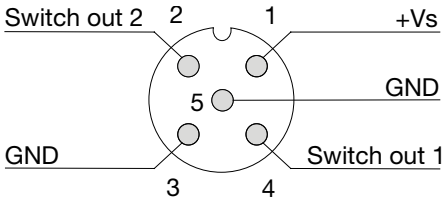
MIK-...L3x3, MIK-...F3x0



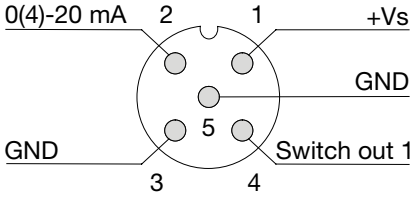
MIK-...L443



MIK-...C30*



MIK-...C34*

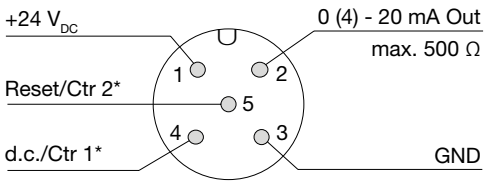


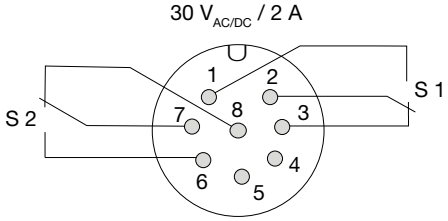
MIK-...E14R, MIK-...G14 Cable Connection

Wire number	MIK-...E14R Counter electronics	MIK-...G14R Dosing electronics
1	+24 V_{DC}	+24 V_{DC}
2	GND	GND
3	4-20 mA	4-20 mA
4	GND	GND
5	n.c.	Control 1*
6	Reset part quantity	Control 2*
7	Relay S1	Relay S1
8	Relay S1	Relay S1
9	Relay S2	Relay S2
10	Relay S2	Relay S2

Control 1 <-> GND: Start-Dosing
Control 2 <-> GND: Stop-Dosing
Control 1 <-> Control 2: Reset-Dosing

Plug Connection





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Order Details (Example: **MIK-5NA 10 A F300**)

Model	Range	Connection set	Electronics
MIK-5NA.. = PPS-housing, NBR-seal, stainless steel-electrode **MIK-5VA..** = PPS-housing, FPM-seal, stainless steel-electrode	**..08..** = 10…500 ml/min, G ½ **..10..** = 0.05…1.0 l/min, G ½ **..15..** = 0.16…3.2 l/min, G ½	**..A..** = without[1] **..P..** = PVC-hose connection **..E..** = stainless steel-weld-on ends	**Frequency output** **..F300** = M12-plug, 500 Hz **..F390** = M12-plug, 50...1000 Hz [2] **Switching output** **..S300** = relay, M12-plug **..S30D** = aktive 24 V_{DC}, M12-plug **Analogue output** **..L303** = M12-plug, 0 - 20 mA **..L343** = M12-plug, 4 - 20 mA **..L443** = DIN-plug, 4 - 20 mA **Compact electronics**[4] **..C30R** = 2 x Open Coll. PNP **..C30M** = 2 x Open Coll. NPN **..C34P** = 0(4) - 20 mA, 1 x Open Coll. PNP **..C34N** = 0(4) - 20 mA, 1 x Open Coll. NPN **Counter electronics** **..E14R** = LCD, 0(4)-20 mA, 2 x relay, 1.5 m cable **..E34R** = LCD, 0(4)-20 mA, 2 x relay, M12 plug **..E94R** = LCD, 0(4)-20 mA, 2 x relay, cable >1.5 m[3] **Dosing electronics** **..G14R** = LCD, 0(4)-20 mA, 2 x relay, 1.5 m cable **..G34R** = LCD, 0(4)-20 mA, 2 x relay, M12 plug **..G94R** = LCD, 0(4)-20 mA, 2 x relay, cable >1.5 m[3]
	..20.. = 0.5…10.0 l/min, G ¾ **..25..** = 0.8…16.0 l/min, G ¾	**..A..** = without[1] **..K..** = PVC-glue connection **..P..** = PVC-hose connection **..E..** = stainless steel-weld-on ends	
	..30.. = 1.6…32.0 l/min, G 1 **..35..** = 2.5…50.0 l/min, G 1		
MIK-6FC.. = PVDF-housing, FFKM-seal, Hastelloy®-electrode	**..50..** = 3.2...63 l/min, G 1½ **..55..** = 5.0...100 l/min, G 1½	**..A..** = without[1] **..K..** = PVC-glue connection **..E..** = stainless steel-weld-on ends	
MIK-6FT.. = PVDF-housing, FFKM-seal, Tantalum-electrode	**..60..** = 8...160 l/min, G 2 **..65..** = 16...320 l/min, G 2		
	..80.. = 25...500 l/min, G 2 ¾ **..85..** = 35...700 l/min, G 2 ¾		

[1] Incl. frontal gaskets (2 pc. o-rings)
[2] Please specify frequency at full scale in clear text while ordering
[3] Please specify cable length in clear text
[4] Please specify flow direction in clear text

Weight Sensor

Model	PPS	PVDF
MIK-...08/10/15 (½")	approx. 180 g	approx. 210 g
MIK-...20/25 (¾")	approx. 190 g	approx. 225 g
MIK-...30/35 (1")	approx. 270 g	approx. 325 g
MIK-...50/55 (1 ½")	approx. 410 g	approx. 500 g
MIK-...60/65 (2")	approx. 560 g	approx. 610 g
MIK-...80/85 (2 ¾")	approx. 1200 g	approx. 1370 g

Weight Electronics

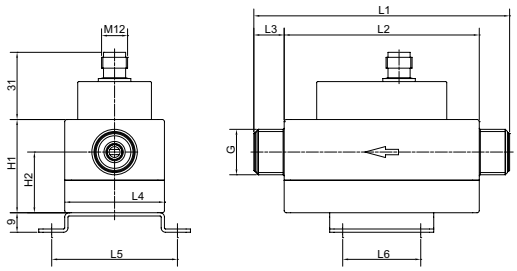
Model	Weight
MIK-...F3x0 **MIK-...S30x** **MIK-...Lxx3**	approx. 80 g
MIK-...C3xx	approx. 300
MIK-...Exxx **MIK-...Gxxx**	approx. 250 g

Total weight = weight sensor + weight electronics

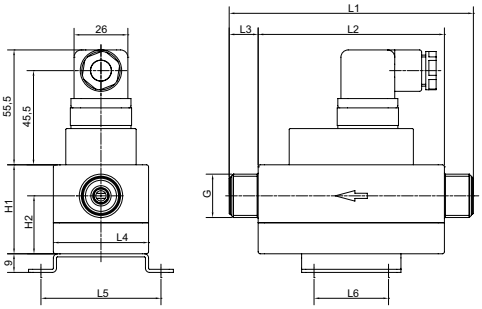
Dimensions [mm]

Model	G	L1	L2	L3	L4	L5	L6	H1	H2
MIK-xxx08A MIK-xxx10A MIK-xxx15A	G ½	118	90	14	46	58	36	43	28
MIK-xxx20A MIK-xxx25A	G ¾	122	90	16	46	58	36	43	28
MIK-xxx30A MIK-xxx35A	G 1	126	90	18	46	58	36	49.5	29.5
MIK-xxx50A MIK-xxx55A	G1 ½	134	90	22	68	80	36	66	31.5
MIK-xxx60A MIK-xxx65A	G 2	138	90	24	68	80	36	72	36
MIK-xxx80A MIK-xxx85A	G 2¾	202	150	26	96	110	75	104	52

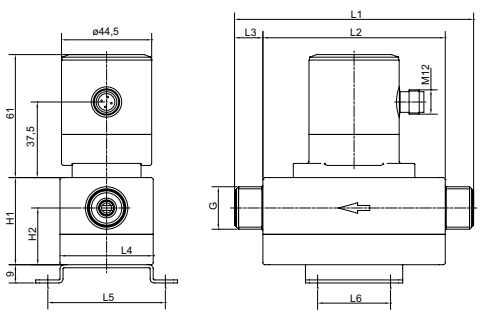
MIK-...F3x0, MIK-...S30x, MIK-...L3x3



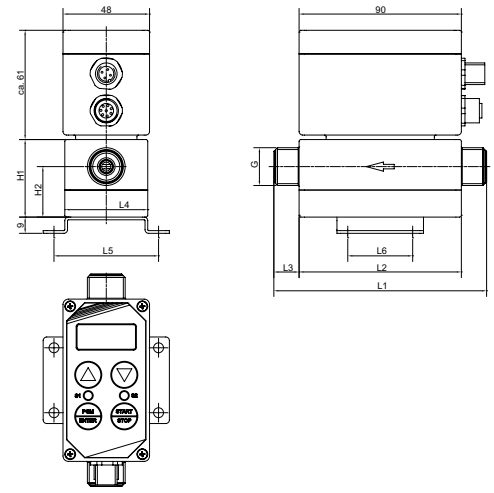
MIK-...L443



MIK-...C3xx



MIK-...Ex4R, MIK-...Gx4R



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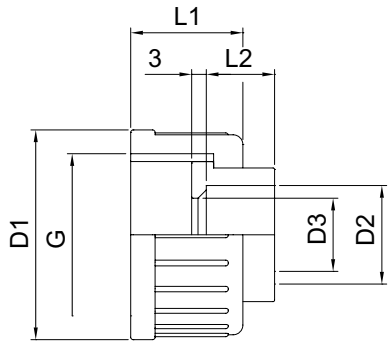
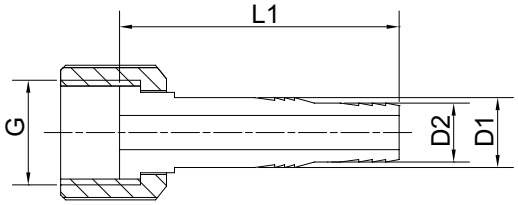


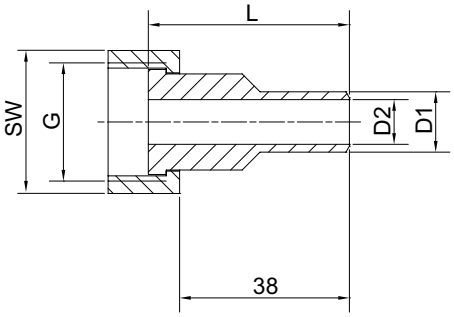
Dimensions connection set PVC-glue connection

G	D1	D2	D3	L1	L2
G ½	not available				
G ¾	Ø 35	Ø 16	Ø 10.5	21	14
G 1	Ø 43	Ø 20	Ø 15	23	16
G 1 ½	Ø 60	Ø 32	Ø 26	27	22
G 2	Ø 74	Ø 40	Ø 33	30	26
G 2¾	Ø 103	Ø 63	Ø 54	38	38



Dimensions connection set PVC-hose connection

G	D1	D2	L
G ½	Ø 14	Ø 12	56
G ¾	Ø 18	Ø 16	60
G 1	Ø 22	Ø 20	67
G 1 ½	not available		
G 2	not available		
G 2¾	not available		



Dimensions connection set stainless steel weld-on ends

G	SW	L	D1	D2
G ½	24	45	Ø 10.2	Ø 5
G ¾	32	45	Ø 13.5	Ø 10
G 1	41	45	Ø 19	Ø 15
G 1 ½	55	60	Ø 25	Ø 20
G 2	70	60	Ø 38	Ø 32
G 2¾	90	60	Ø 60.3	Ø 54