M-Zert

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

DUK

- Measuring range:
  0.08 - 20 … 2.5 - 630 l/min
- Accuracy: 0.7 % of reading + 0.7 % of full scale
- Range span: 250
- p_{max}: 16 bar; t_{max}: 120 °C
- Connection: G ½ … G 3, ½" … 3" NPT female
- Material: brass or stainless steel 1.4408
- Analogue, frequency and switching outputs, compact electronic with digital display, dosing and counter electronic

S5

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Description

The new KOBOLD type DUK flow meters are used for the measurement, monitoring, metering and dosing of low viscosity fluids.

The devices work on the principle of the difference in running times. This is based on the fact that ultrasonic waves in a medium are influenced by the speed of flow.

Two sensors mounted opposite one another in the pipeline function simultaneously as transmitter and receiver of ultrasound signals.

If there is no flow, then the running times of both signals are identical. If the medium is flowing, then the running time of the signal against the flow is longer than that with the flow.

The running time difference, which is determined by a microprocessor, is proportional to the speed of flow.
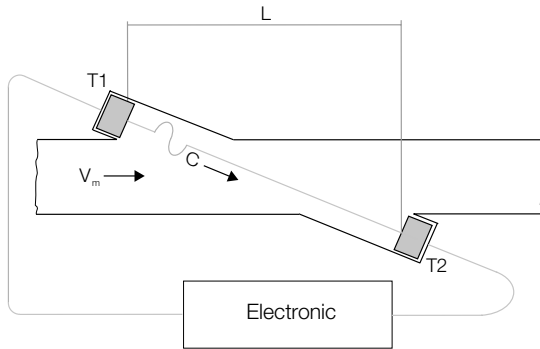
The devices can be equipped with a switching output, a frequency output or an analogue output. In addition, a compact circuit can be selected that features a digital display, a switching output and an analogue output.

The device series is rounded off by an optionally available dosing and meter circuit. The meter circuit indicates the momentary flow rate in the first line of the display and the partial or total quantity in the second line. A dosing circuit controls simple filling tasks and similarly measures flow rates, total amounts and filling amounts. The analogue output and two relay outputs can be used for further processing of the signals.

Advantages

- High range span of 1:250
- Small pressure loss
- High repeat accuracy ± 0.1 % of full scale
- Independent from density and temperature

Areas of Application

- Machine building
- Automotive
- Robotic
- Cooling
- Hot water

Technical Details

Sensor

Measuring principle:	ultrasonic
Range:	see table
Medium:	water with max. 1 % solid
Viscosity:	max. 5 mm²/s
Accuracy:	0.7 % of reading + 0.7 % of full scale
Repeat accuracy:	±0.1 % of full scale
Mounting position:	in all directions, fl ow in direction of the arrow (horizontal: electronic on top or below)
In-/Outlet:	10 x DN
Media temperature:	-20...+90 °C -20...+120 °C (high temp. version)
Ambient temperature:	-20 ... + 70 °C
Response time t90:	approx. 0.5...1 s at flow change >10 % FS (depending on electronic version)
Pressure:	0 …16 bar
Pressure loss:	max. 150 mbar at full scale
Protection:	IP 65

Wetted Parts

Sensor housing:	brass or stainless steel 1.4408
Sensors:	PEEK
Seal:	NBR, other on request high temp. version FPM

Measuring Ranges and Weights

Model	Measuring range [l/min]	Size [G/NPT]	DUK-...S30x DUK-…F3xo DUK-...Lxx3	DUK-...C3xx	DUK-...Exxx DUK-...Gxxx	DUK with ADI 24 V	DUK with ADI 230/115/48 V
DUK-1xx4	0.08 - 20	½"	approx. 850 g	approx. 1050 g	approx. 1000 g	approx. 2150 g	approx. 2700 g
DUK-1xx5	0.16 - 40	¾"	approx. 1050 g	approx. 1250 g	approx. 1200 g	approx. 2350 g	approx. 2900 g
DUK-1xx6	0.25 - 63	1"	approx. 1450 g	approx. 1650 g	approx. 1600 g	approx. 2750 g	approx. 3300 g
DUK-1xx8	0.6 - 150	1½"	approx. 2350 g	approx. 2550 g	approx. 2500 g	approx. 3650 g	approx. 4200 g
DUK-1xx9	1 - 250	2"	approx. 3800 g	approx. 4000 g	approx. 3950 g	approx. 5100 g	approx. 5650 g
DUK-1xxB	2.5 - 630	3"	approx. 7100 g	approx. 7300 g	approx. 7250 g	approx. 8400 g	approx. 8950 g

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DUK-...S300, DUK-...S30D

Display:	Duo-LED for switch status
Switching output (..S300):	relay SPDT max. 1 A / 30 V$_{DC}$
Switching output (..S30D):	aktive 24 V$_{DC}$, N/C and N/O
Switch point:	10...90 % FS in 10 % - steps that can be confi gured by the customer using a rotary switch
Power supply:	24 V$_{DC}$ ± 20 %
Power consumption:	30 mA
Electrical connection:	plug M 12, 5-pin
Meas. range overflow:	flash of the DUO-LED (red/green) from 105 % of full scale

DUK-...F300, DUK-…F390

Impulse output:	PNP, open collector, max. 200 mA
Frequency at F.S.:	500 Hz (…F300) 50…1000 Hz (…F390) proportional to flowrate
Power supply:	24 V$_{DC}$ ± 20 %
Power consumption:	25 mA
Electrical connection:	plug M 12, 5-pin
Meas. range overflow:	F$_{out}$ approx. 2 kHz from 105 % of full scale

DUK-...L303; DUK-...L343

Output:	0(4)-20 mA, 3-wire
Load:	max. 500 Ω
Power supply:	24 V$_{DC}$ ± 20 %
Power consumption:	max. 45 mA
Electrical connection:	plug M 12x1
Meas. range overflow:	I$_{out}$ approx. 20.5 mA from 103 % of full scale

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

Output:	4 - 20 mA, 3-wire
Load:	max. 500 Ω
Power supply:	24 V$_{DC}$ ± 20 %
Power consumption:	max. 45 mA
Electrical connection:	plug DIN 43650
Meas. range overflow:	I$_{out}$ approx. 20.5 mA from 103 % of full scale

DUK-...C3xx (Compact electronic)

Display:	3-digit LED
Analogue output:	0(4)...20 mA adjustable (only DUK-...C34x)
Load:	max. 500 Ω
Switching output:	1(2) semiconductor PNP or NPN, set at factory
Contact function:	N/C-N/O-frequency programmable (approx. 1400 Hz at F.S., uncalibrated)
Settings:	via 2 buttons
Power supply:	24 V$_{DC}$ ± 20 %
Power consumption:	approx. 100 mA
Electrical connection:	plug M 12x1

DUK-...Exxx (Counter electronic)

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Display:	LCD, 2 x 8 digit, illuminated total, part and flow quantities, units selectable
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. 170 mA
Electrical connection:	cable connection or M12 plug

More technical details see data sheet ZED.

DUK-...Gxxx (Dosing electronic))

Display:	LCD, 2 x 8 digit, illuminated dosing-, total-, and fl ow quantity, units selectable
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. 170 mA
Electrical connection:	cable connection or M12 plug

More technical details see data sheet ZED.

DUK with ADI electronic

|	
Display:	bar graph and 5-digit digital display
Analogue output:	0(4)...20 mA, 0…10 V$_{DC}$
2 Switching outputs:	relay /changeover contact max. 250 V$_{AC}$, 5 A resistive load max. 30 V$_{DC}$ / 5 A
Settings:	via 4 buttons
Power supply:	100...240 V$_{AC}$ ± 10% or 18...30 V$_{AC}$ / 10...40 V$_{DC}$
Electrical connection:	pluggable terminal block via cable gland

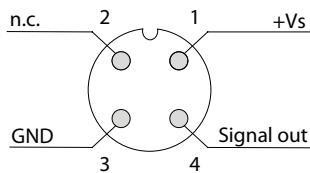*More technical details see data sheet ADI.*

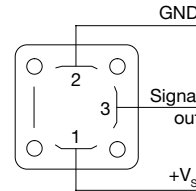## Electrical Connection

DUK-...S300
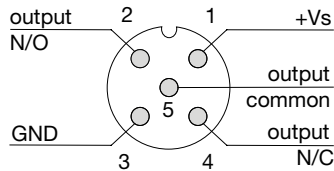
DUK-...S30D
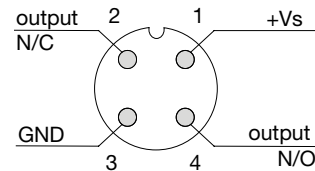
DUK-…F3x0, DUK-...L3x3
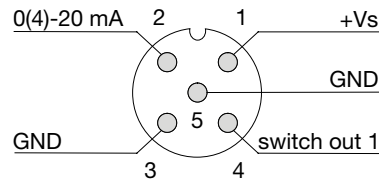

DUK-...L443

DUK-...C30*
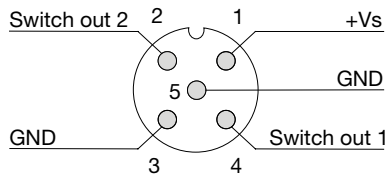
DUK-...C34*

DUK-...E14R, DUK-...G14R Cable Connection

Wire number	DUK-...E14R counter electronic	DUK-...G14R dosing electronic
1	+24 V$_{DC}$	+24 V$_{DC}$
2	GND	GND
3	0(4)-20 mA	0(4)-20 mA
4	GND	GND
5	reset part quantity	Control 1*
6	n. c.	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 <-> GND: Reset-Dosing

DUK-...E34R, DUK-...G34R Plug Connection

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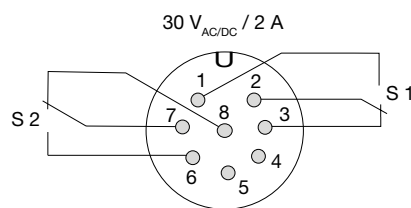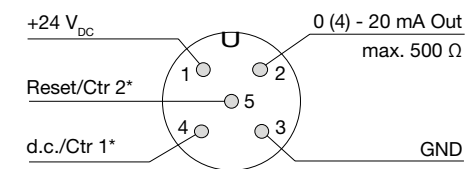
Order Details (Example: **DUK-11 G4H S300 L**)

Model / Housing material	Connection*	Electronic				Flow direction
DUK-11 = brass **DUK-12** = st. steel 1.4408 **DUK-21** = high temp. version brass **DUK-22** = st. steel 1.4408 high temp. version	**G4H** = G ½ female **G5H** = G ¾ female **G6H** = G 1 female **G8H** = G 1½ female **G9H** = G 2 female **GBH** = G 3 female **N4H** = ½" NPT female **N5H** = ¾" NPT female **N6H** = 1" NPT female **N8H** = 1½" NPT female **N9H** = 2" NPT female **NBH** = 3" NPT female	**Switching output** **S300** = relay, M12-plug **S30D** = aktiv 24 V_{DC}, M12-plug **Frequency output** **F300** = M12-plug, 500 Hz **F390** = M12-plug, 50…1000 Hz **Analogue output** **L303** = M12-plug, 0-20 mA **L343** = M12-plug, 4-20 mA **L443** = DIN-plug, 4-20 mA **Compact electronic** **C30R** = 2 x open collector, PNP **C30M** = 2 x open collector, NPN **C34P** = 0(4)-20 mA, 1 x open collector, PNP **C34N** = 0(4)-20 mA, 1 x open collector, NPN **ADI electronic**				**L** = from left to right **R** = from right to left **T** = from top to bottom **B** = from bottom to top
		Display	Power supply	Output	Contacts	
		K = bar graph/ digital display	**0** = 100-230 $V_{AC/DC}$ **3** = 18-30 V_{AC}, 10-40 V_{DC}	**0** = without **4** = 0(4)-20 mA, 0-10 V	**2** = 2 change-over contacts	
		Counter electronic **E14R** = LCD, 0(4)-20 mA, 2 x relays, 1 m cable **E34R** = LCD, 0(4)-20 mA, 2 x relays, M12-plug **Dosing electronic** **G14R** = LCD, 0(4)-20 mA, 2 x relays, 1 m cable **G34R** = LCD, 0(4)-20 mA, 2 x relays, M12-plug				

* Standard display in l/min, optional: display GPM (code G instead of H)

Dimensions DUK-Sensor

Model	G/NPT	SW [mm]	H [mm]	H* [mm]	L [mm]	B [mm]
DUK-xxx4	½"	30	57.5	77.5	114	approx. 72
DUK-xxx5	¾"	36	59.5	79.5	126.5	approx. 76
DUK-xxx6	1"	46	63.5	83.5	146	approx. 80
DUK-xxx8	1½"	60	69.5	89.5	190	approx. 90
DUK-xxx9	2"	76	74.5	94.5	238	approx. 97
DUK-xxxB	3"	105	84.5	104.5	306	approx. 122

* High Temp.-Version
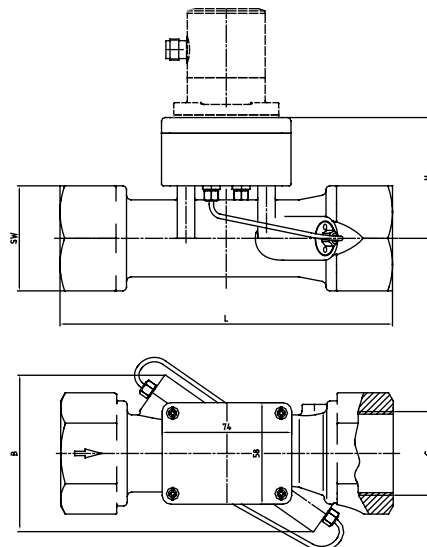
Dimensions

DUK-…S30x, DUK-…F3x0, DUK-…L3x3
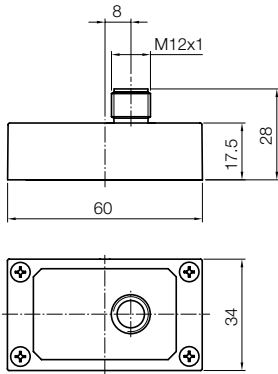
DUK-…L443
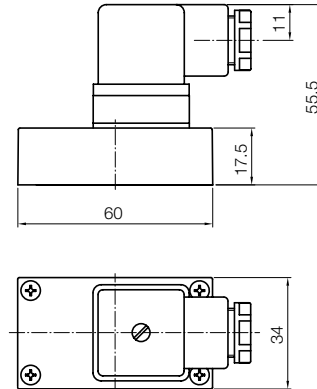
DUK-…C3xx
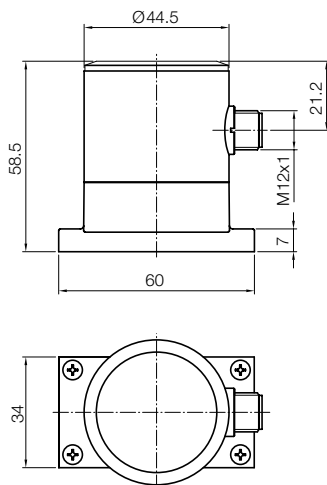
DUK-…ExxR, DUK-…GxxR

DUK with ADI electronic

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