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

Turbine Wheel Flow Meter/Monitor

for liquids

measuring • monitoring • analysing

DRS

- Measuring range: 2-40 l/min water
- Measuring accuracy: ± 1,5 % of full scale
- p_{max}: 200 bar; t_{max}: 80 °C (optional 150 °C)
- Viscosity range: low viscous
- Connection:
  G ½ female/male thread,
  G ¾ male/male thread
  ¾" NPT male/male thread
- Material:
  Noryl/Ultem/brass/stainless steel
- Output:
  pulses, 0-20, 4-20 mA,
  Switching output NPN

Model:
DRS-...Z

Model:
DRS-...0
DRS-...F5...

Model:
DRS-...C3

S4

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Application

KOBOLD model DRS flow meters are used for measuring andmonitoring liquids. Due to its compact construction the mini turbine is suitable for use with machines with minimum available space.

Application Examples

Beverage industry, devices for use in automatic beverage retail systems, washing machines, vehicles, farm equipment, developing machines in the photographic and printed-circuit board industries.

Working Principle

The flow meter operates on the turbine wheel principle. The liquid first flows through a laminar flow element to eliminate turbulence and to route the flow stream to the turbine wheel. The turbine wheel then starts to rotate. This rotary motion is sensed non-contacting by magnets embedded in the turbine wheel and converted to a frequency signal. The frequency is proportional to the flow velocity.

Frequency divider, analogue output or compact electronics with LED display and limit contacts are available as options. An integrated temperature sensor for simultaneous measuring of flow rate and temperature are available as an additional option. The vane is sapphire-supported: this ensures a high degree of linearity and long service life.

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Model Summary

- **DRS-0...K000, DRS-0...S000**
  OEM version (without CE mark)
  direct output from Hall-sensor signal
  for DRS-K000 no optional temperature sensor available
  DRS-0...S000 up to 150 °C medium temperature
- **DRS-...F300**
  Pulse output
- **DRS-...F390**
  Pulse output with adapted frequency
  Factor 0.25...2
- **DRS-...L...**
  Analogue output 0(4)-20 mA / 3-wire
- **DRS-...C30...**
  With compact electronics, 3-digit LED display,
  limit contacts, no optional temperature sensor available
- **DRS-...C34...**
  With compact electronics
  3-digit LED display, limit contact, analogue output
  no optional temperature sensor available
- **DRS-...Z...**
  with pointer indicator and analogue output
  no optional temperature sensor available

Technical Details

Measuring range:	2 - 40 l/min water
Sensor pulse output:	384 Hz at 40 l/min metal sensor (DRS-150; DRS-250) 352 Hz at 40 l/min plastic sensor (DRS-350)
Max. operating pressure:	200 bar (DRS-150; DRS-250) 16 bar (DRS-350)
Temperature:	-20 ... +80 °C (medium) -20 ... +100 °C (bearing) -20 ... +150 °C (medium with DRS-...S)
Measuring accuracy:	±1,5% of full scale ±5% of full scale (DRS-...K0000)
Linearity:	±0,5% of full scale
Repeatability:	±0,1% of full scale
Electrical connection:	plug connector M12x1 1,5 m cable (DRS-0 only) 2 m cable (DRS-...F5 only) 1,5 m silicone cable (DRS-...S)
Protection:	IP 65 (plug connector), IP 66 (cable)

Weight (sensor and electronics)

Sensor:	approx. 80 g (DRS-...350) approx. 550 g (DRS-...150; DRS-...250)
Electronics:	approx. 60 g (DRS-...K..; DRS-...F..; DRS-...L3...) approx. 100 g (DRS-...L442) approx. 450 g (DRS-...Z...) approx. 650 g (DRS-...C...)

Electrical Data

DRS-0...K0000, DRS-...S000

Supply:	6...28 V_{DC}
Output pulse:	rectangular pulse signal, open collector NPN, max. 10 mA

DRS-...F300; DRS-...F500

Supply:	12-28 V_{DC}
Power consumption:	10 mA
Pulse output:	PNP, open collector, max. 20 mA
Option:	Pt 100, 3-wire

DRS-...F390

Supply:	24 V_{DC} ± 20 %
Power consumption:	15 mA
Pulse output:	PNP, open collector, max. 20 mA
Factor:	1...1/128 set at the factory
Option:	Pt 100, 3-wire

DRS-...L...

Supply:	24 V_{DC} ± 20 %
Output:	0(4)-20 mA, 3-wire or 2-wire
Max. load:	500 Ω
Option:	Pt 100 (3-wire only)

DRS-...C30...

Compact electronics	
Display:	3-digit LED
Switching outputs:	2 semiconductor PNP or NPN, set at the factory
Contact operation:	N/C / N/O contact frequency programmable
Setting:	with 2 buttons
Supply:	24 V_{DC} ±20%, 3-wire
Electrical connection:	plug connector M12x1

DRS-...C34...

Compact electronics	
Display:	3-digit LED
Analogausgang:	(0)4...20 mA adjustable
Switching outputs:	1 semiconductor PNP or NPN, set at the factory
Contact operation:	N/C / N/O contact / frequency programmable
Setting:	with 2 buttons
Supply:	24 V_{DC} ±20%, 3-wire
Power consumption:	approx. 100 mA
Electrical connection:	plug connector M12x1

DRS-...Z...

Pointer indicator with analogue output	
Housing:	aluminum
Display:	moving-coil instrument, 240° display
Power supply:	24 V_{DC} ±20%
Output:	0-20 mA or 4-20 mA, 3-wire
Max. load:	250 Ω
Electrical connection:	plug connector M12x1

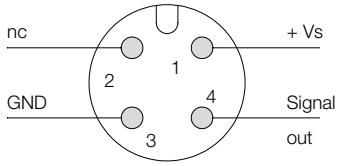
Materials

Housing:	Noryl (PPO), Brass or stainless steel 1.4301
Turbine:	Ultem (PEI)
Magnets:	Ceramic
Axle:	Hard metal
Bearing:	Sapphire
Seal:	NBR (others on request) FKM (DRS-0...S000)

Electrical Connection

DRS-...F.., DRS-...L3... (3-wire without Pt 100)

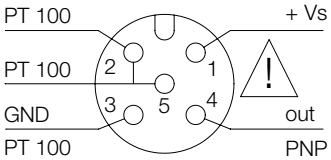
Plug **Cable**



brown: +Vs
blue: GND
black: Signal

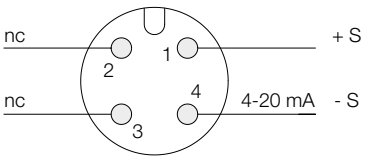
DRS-...F.., DRS-...L3... (3-wire with Pt 100)

Plug **Cable**

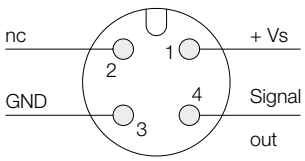


brown: +Vs
blue: GND
black: Signal
white: Pt 100 2-wire
grey: Pt 100 3-wire

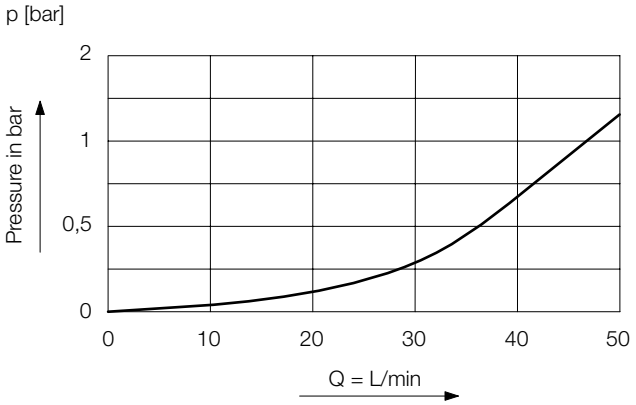
DRS-...L342 (2-wire)



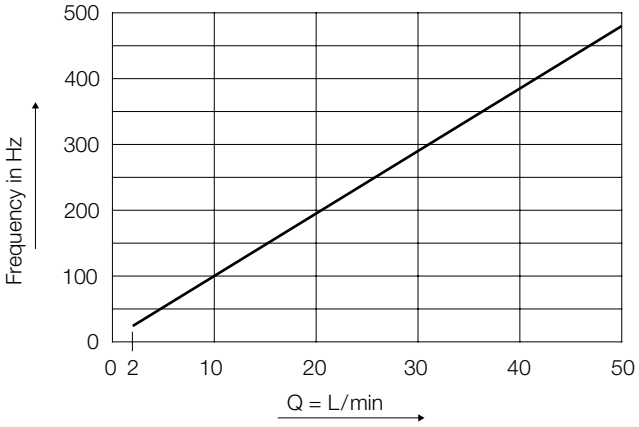
DRS-...Z...



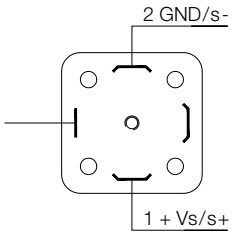
Pressure loss



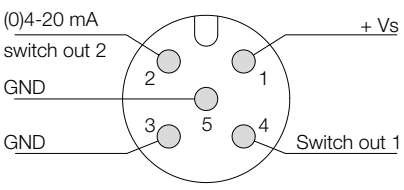
Frequency diagramm (DRS-*150, DRS-*250)



DRS-...L442...



DRS-...C3...



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Order Details (example: **DRS-9350 I4 L303 0**)

Material sensor housing	Model	Connection	Evaluating electronics	Option
Brass	**DRS-9150**	**I4** = G ½ female thread **G4** = G ½ female/ male thread **N5** = ¾" NPT male thread **G5** = G ¾ male thread	**Frequency output** **F300** = Plug connector M12x1, PNP **F320** = Plug connector M12x1, PNP, divider 1:2 **F340** = Plug connector M12x1, PNP, divider 1:4 **F390** = Plug connector M12x1, PNP, divider 1...$^{1}/_{128}$ adjusted **F500** = 2 m PVC cable, PNP **Analogue output** **L303** = Plug connector M12x1, 0-20 mA, 3-wire **L342** = Plug connector M12x1, 4-20 mA, 2-wire **L343** = Plug connector M12x1, 4-20 mA, 3-wire **L442** = Plug connector DIN 43 650, 4-20 mA, 2-wire **Compact electronics**[1] **C30M** = LED display, 2 x NPN switching output, Plug connector M12x1 **C30R** = LED display, 2 x PNP switching output, Plug connector M12x1 **C34N** = LED display, 4-20 mA, 1 NPN switching output, Plug connector M12x1 **C34P** = LED display, 4-20 mA, 1 PNP switching output, Plug connector M12x1 **Pointer indication, 240°**[1] **Z300** = Pointer indication, 0-20 mA, Plug connector M12x1 **Z340** = Pointer indication, 4-20 mA, Plug connector M12x1	**0** = without **P** = Pt 100[2] **Y** = Special model
Stainless steel	**DRS-9250**			
Plastic (Noryl)	**DRS-9350**			

[1] Please specify flow direction in writing.
[2] for PNP frequency output and 3-wire analogue output only

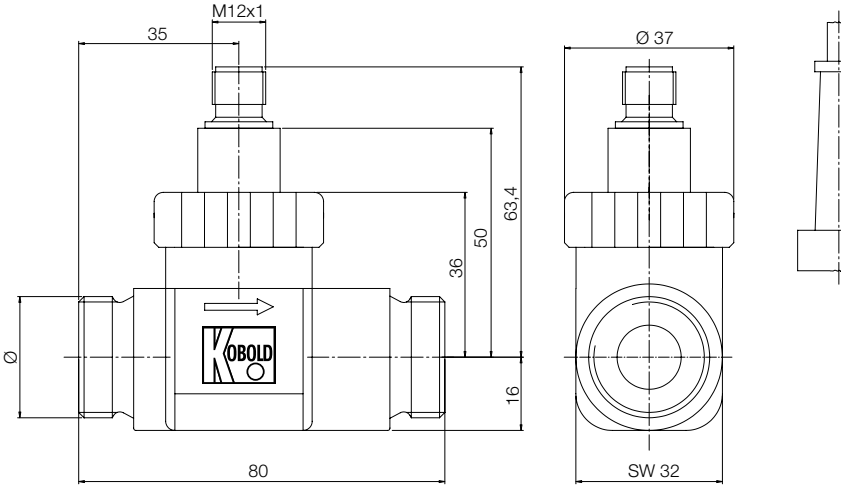
Plug-on Display
for model DRS-...L442 (with 4-20 mA output and DIN plug connector)

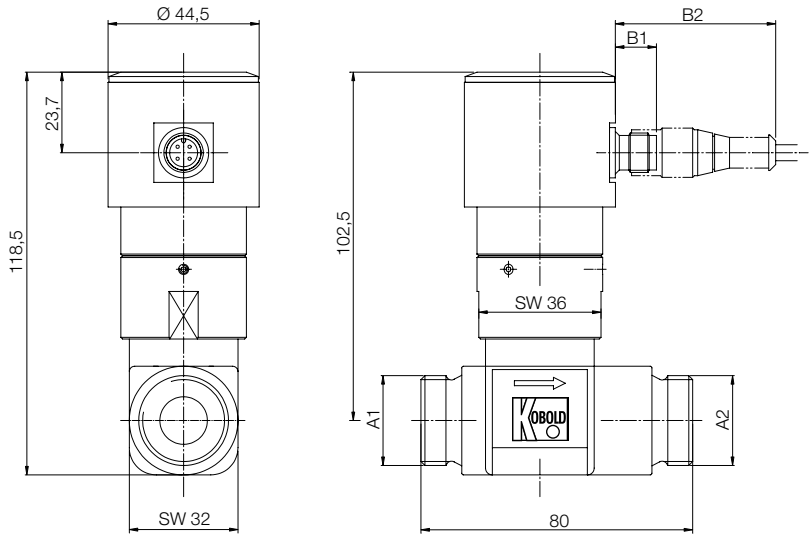
Description	Order number
4-digit LED, connector DIN 43650, 2-wire, supply through analogue output	**AUF-1000**
as above however with additional open collector output	**AUF-1001**

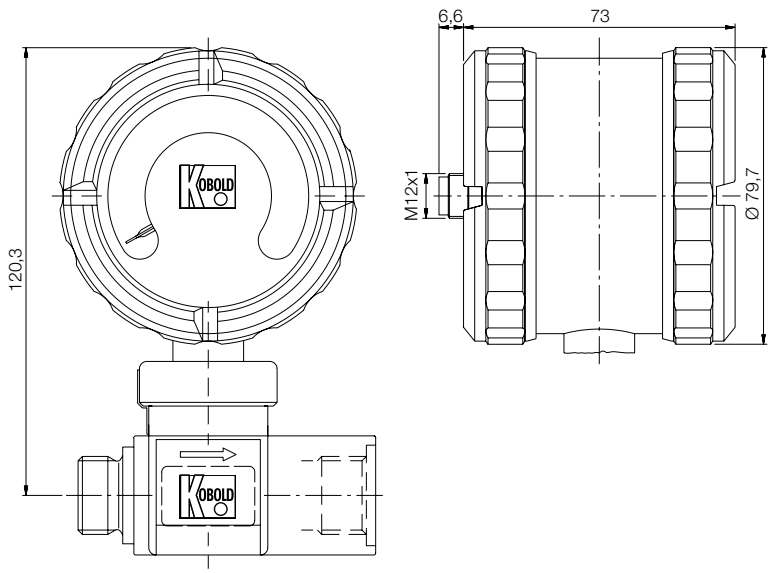
Order Details OEM Version (example: **DRS-0350 I4 K0000**)

Material sensor housing	Model	Connection	Evaluating electronics
Brass	**DRS-0150**	**I4** = G ½ female thread **G4** = G ½ female/male thread **N5** = ¾" NPT male thread **G5** = G ¾ male thread	**Frequency output** **K0000** = 1.5 m PVC cable, NPN, OEM without CE **S0000** = 1.5 m silicone cable, NPN, OEM without CE, max. 150 °C (not for DRS-0350) **S000P** = 1.5 m silicone cable, NPN, OEM without CE, Pt 100, max. 150 °C (not for DRS-0350)
Stainless steel	**DRS-0250**		
Plastic (Noryl)	**DRS-0350**		

Dimensions


M12x1
35
Ø 37
63,4
50
36
Ø
16
80
SW 32


Ø 44,5
23,7
118,5
SW 32
B2
B1
102,5
SW 36
A1
A2
80


6,6
73
120,3
M12x1
Ø 79,7