



Turbine Wheel Flow Meter/Monitor for Liquids



measuring
•
monitoring
•
analysing

- Measuring range: 2 - 40 L/min water
- Measuring accuracy: $\pm 1.5\%$ f. s.
- p_{\max} : 200 bar, t_{\max} : 80 °C
- Viscosity range: low viscous
- Connection:
G 1/2 female thread/male thread,
G 3/4 male thread/male thread,
3/4 NPT male thread/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

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Model:
DRS

Application

KOBOLD type DRS flow meters are used for measuring and monitoring 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.





Model summary

- **DRS-0...K000**
OEM version (without CE mark)
direct output from Hall-sensor signal
no optional temperature sensor available
- **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 to +80 °C (medium)
-20 to +100 °C (bearing)
- Measuring accuracy: ±1.5% of F. S.
±5% of F. S. (DRS-0...)
- Linearity: ±0.5% of F. S.
- Repeatability: ±0.1% of F. S.
- Electrical connection: plug connector M12x1
1.5 m cable (DRS-0 only)
2 m cable (DRS-...F5 only)
- 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...K000**
 - Supply: 6...16 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,
factory set
 - 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-...C34...**
Compact electronics
 - Display: 3-digit LED
 - Analogue output (0)4...20 mA adjustable, max. 500 Ω
 - Switching outputs: 1 semiconductor PNP or NPN,
factory set
 - 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

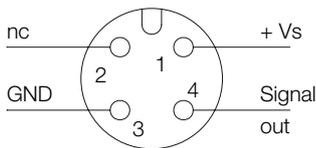
Materials

Housing: Noryl (PPO),
 Brass or stainless steel 1.4301
 Turbine: Ultem (PEI)
 Magnets: Ceramic
 Axle: Hard metal
 Bearing: Sapphire
 Seal: NBR (others upon request)

Electrical connection

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

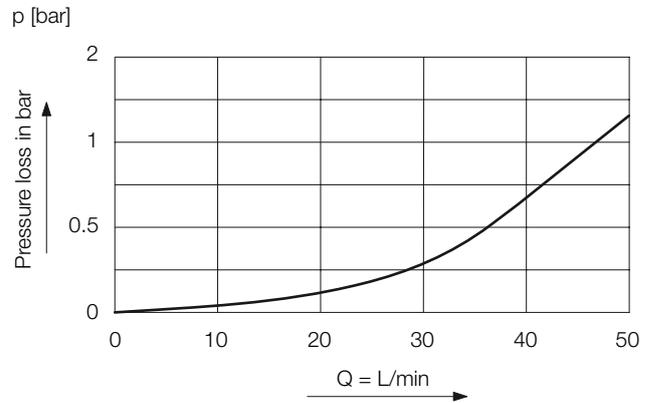
Plug



Cable

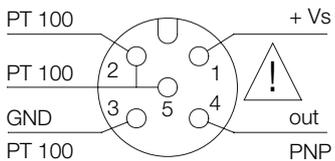
brown: + Vs
 blue: GND
 black: Signal

Pressure loss



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

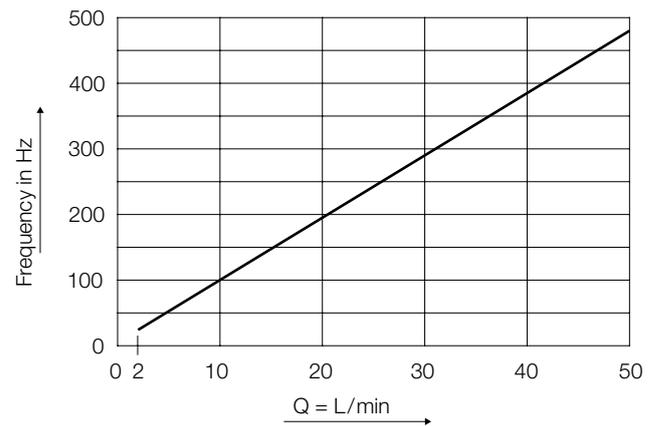
Plug



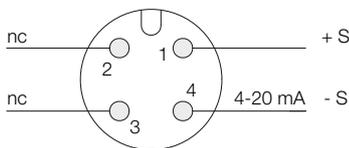
Cable

brown: + Vs
 blue: GND / PT100 (+)
 black: Signal
 white: PT 100 (-)
 grey: PT 100 (-)

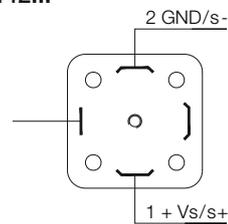
Frequency diagram



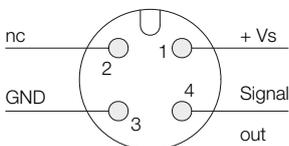
DRS-...L342 (2-wire)



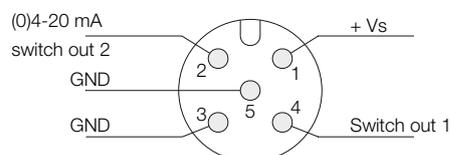
DRS-...L442...



DRS-...Z...



DRS-...C3...





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

Material sensor housing	Model	Connection	Evaluating electronics	Option
			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 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 43650, 4-20 mA, 2-wire Compact electronics¹⁾ 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 con. M12x1 Z340 = Pointer indication, 4-20 mA, Plug con. M12x1	
Brass	DRS-9150	I4 = G 1/2 female thread		0 = without P = Pt 100 ²⁾ Y = Special model
Stainless steel	DRS-9250	G4 = G 1/2 female/male thread		
Plastic (Noryl)	DRS-9350	G5 = G 3/4 male thread		
		N5 = 3/4 NPT male thread		

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 1/2 female thread	Frequency output K0000 = 1.5 m PVC cable, NPN, OEM without CE
Stainless steel	DRS-0250	G4 = G 1/2 female/male thread	
Plastic (Noryl)	DRS-0350	G5 = G 3/4 male thread N5 = 3/4 NPT male thread	

Dimensions

