



DSE...V

**Electromagnetic Sensors,
with line amplifier**

Electromagnetic Sensor with line amplifier

The DSE...V series electromagnetic sensors essentially consist of an iron core with an inductive coil, behind which sits a permanent magnet. A line amplifier is also included. A ferromagnetic pole wheel passing the sensor head then influences the magnetic field, resulting in an A.C. voltage being induced in the coil. The induced voltage is proportional to the rate of flux change and hence pole wheel speed.

The level of induced voltage is dependent on the sensor to pole wheel air gap and the size and form of the pole wheel. Additionally, the induced voltage level is as a first approximation proportional to the angular speed of the pole wheel and hence of the shaft being measured (see diagram B3).

These sensors have a transistor amplifier, which is overdriven in normal operation by the induced voltage. The output signal level is then essentially constant and determined by the external supply and a pull up resistor. Should the induced voltage be too low the output sits at 1...3 V.

Where the sensor has a trigger stage, the output is digital even at low speeds i.e. low or high.

Electromagnetic sensors with line amplifiers require an external supply but may be 2 or 3 wire devices. They may generally be used wherever the speed to be measured or controlled exceeds 10 rpm.

GENERAL

B3

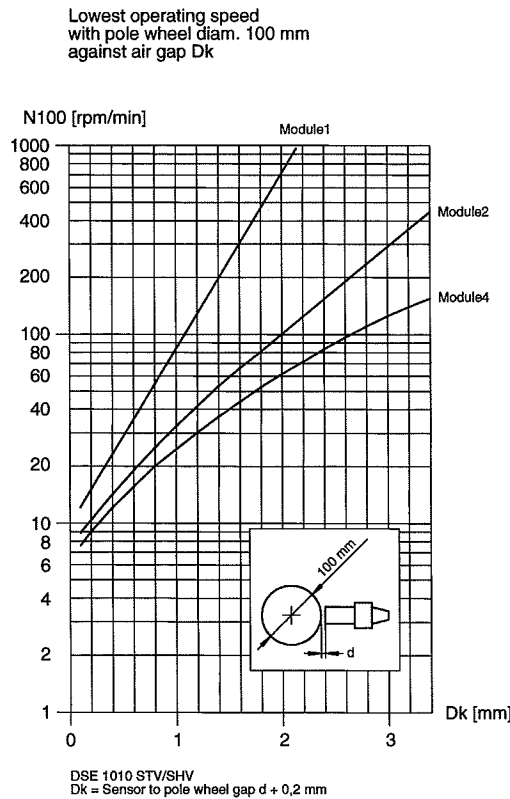
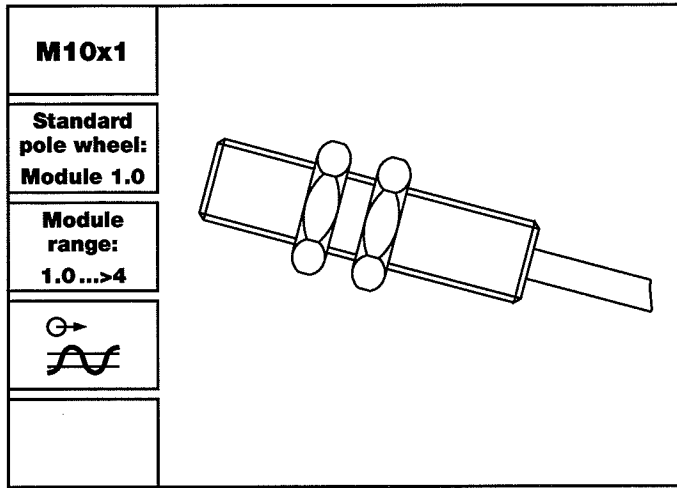


DIAGRAM AND CHARACTERISTICS

DSE 1010 S.V

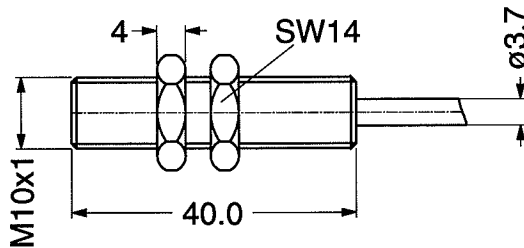


Features

- With line amplifier (2wire sensor)
- High temperatur version

Dimensions

Version S



Model overview

Type	Part nr.	Connection	Housing thread	Weight [g]	Operating temperature [°C]	Notes
DSE 1010 STV	304Z-03351	cable 3m	M10x1	75	-25...+85	previously FTG 262 S
DSE 1010 SHV	304Z-03352	cable 2m	M10x1	40	-40...+125	previously FTG 262 SH

Electromagnetic Sensor with line amplifier

Technical Data

Supply

Power supply

Supply voltage: +5...+30 V D.C., external pull-up resistance min. 1 k Ω .
No reverse polarity protection.
Current consumption: Dependent on pull-up resistance.

Input

Frequency range

~10 Hz...50 kHz

Noise immunity

Cable shield connected to the supply negative pole. Noise generator between housing and electronics.
1.5 kV/1.5 ms/max. 5 Hz (source resistance 500 Ω),
2.0 kV/HF-bursts (level 4 in accordance with IEC 801-4),
2.5 kV/1 MHz damped resonance (class III in accordance with IEC 255-4).

Pole wheel

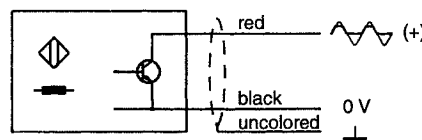
Ferromagnetic toothed wheel i.e. Ust37-2, involute gear form preferred.
Module ≥ 1 , min. tooth width 3 mm, side offset with min. tooth width: < 0.2 mm, eccentricity < 0.2 mm.
Pole wheel-sensor gap ≥ 0.1 mm. Gap depending on rotational speed (circumferential) and module acc. to diagram B3.

Output

Signal output

The output signal corresponds to an overdriven half sine wave.
Open collector output: With an external pull-up resistance of at least 1 k Ω across an auxiliary voltage $V_{cc} = +5...+30$ V and with minimum detectable speed N100 according to diagram B3, the peak-to-peak output voltage is 10% and 90% of the auxiliary voltage.
TTL: The driving of TTL gates with hysteresis requires a pull up resistance of 4.7 k Ω across +5 V: $U_{lo} = 0.4$ V with sink current = 2.6 mA/ $U_{hi} = 2.4$ V.
2wire sensor: Control of frequency measuring instruments with ferostat or NAMUR inputs with device-side pull-up resistance = 820 Ω across $V_{cc} = +12...+24$ V.

Connection



Shield to be connected with 0 V of power supply.

Mechanical

Protection class

IP68 (head), IP67 (cable connection).

Vibration immunity

5 g_n in the range 5...2000 Hz.

Shock immunity

50 g_n during 20 ms, half sine wave.

Operating temperature

-25...+85 $^{\circ}$ C (version T)
-40...+125 $^{\circ}$ C (version H)

Insulation

Housing, cable screen and system galvanically isolated (500 V/50Hz/1 min).

Gehäuse

German silver (Argentan) 2.0770, front side hermetically sealed, electronic components potted in a chemical- and age-proof synthetic resin.
Dimensions acc. to dimensional drawing.

Weight

Acc. to model overview.

Operating instructions

304E-63925

Versions

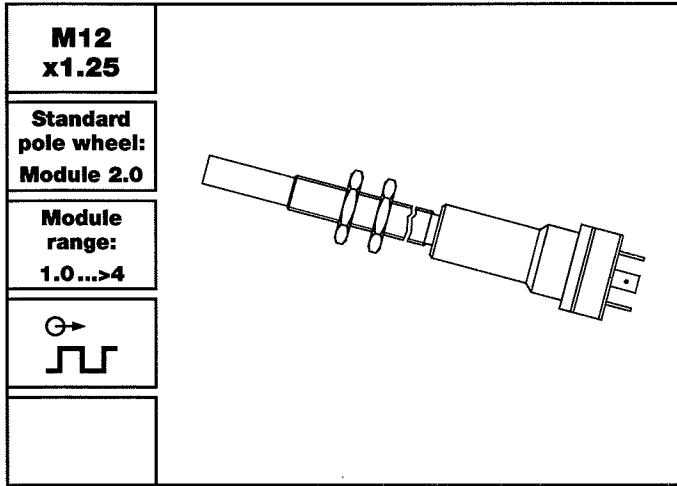
Version ST

PVC cable: Part nr. 824L-35546, 2wire, 2 x 0.22 mm² (AWG 24), stranded wire (thermoplastic screening with continuity conductor, insulated from housing), grey. Outer \varnothing max. 4.2 mm, bending radius min. 60 mm, weight 19 g/m.

Version SH

Teflon cable: Part nr. 824L-35647, 4wire, 2 x 0.092 mm² (AWG 28), stranded wire (metal net insulated from the housing), white. Outer \varnothing max. 2.4 mm, bending radius min. 24 mm, weight 9 g/m. Standard length for version SH: 2 m.

DSE 1210 AHV

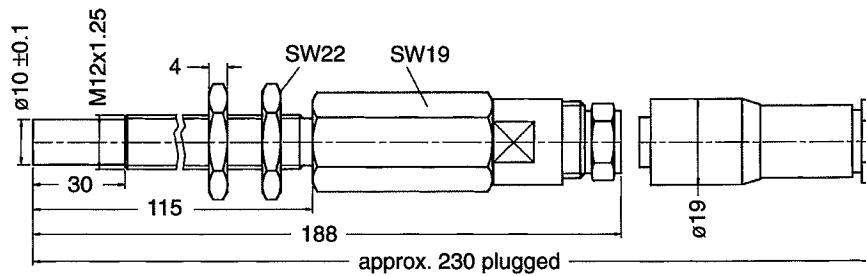


Features

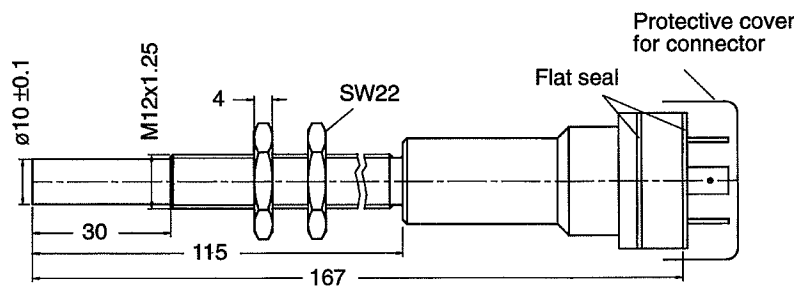
- With line amplifier
- Turbocharger application

Dimensions

Version A



Version .04



Version .05

Model overview

Type	Part nr.	Connection	Housing thread	Weight [g]	Operating temperature [°C]	Notes
DSE 1210.04 AHV	304Z-03964	Connector	M12x1.25	200	-25...+85 (+125)	previously FTG 233.01 A
DSE 1210.05 AHV	304Z-03965	Connector	M12x1.25	170	-25...+110 (+125)	previously FTG 233.02 A

Electromagnetic Sensor with line amplifier

Technical Data

Supply

Power supply

Supply voltage: 24 V D.C., internal pull up resistor, ripple 25 mVpp max.
Reverse polarity protection.
Current consumption: max. 12 mA without load.

Input

Frequency range

~10 Hz...50 kHz (acc. to turbocharger specification).

Noise immunity

Cable shield connected to the supply negative pole. Noise generator between housing and electronics.

1.5 kV/1.5 ms/max. 5 Hz (source resistance 500 Ω),
2.0 kV/HF-bursts (level 4 in accordance with IEC 801-4),
2.5 kV/1 MHz damped resonance (class III in accordance with IEC 255-4).

Pole wheel

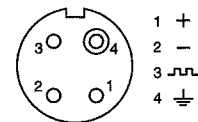
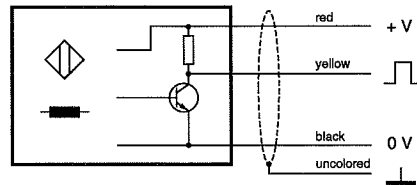
Ferromagnetic toothed wheel i.e. Ust37-2, involute gear form preferred.
Module ≥ 1 , min. tooth width 3 mm, side offset with min. tooth width: < 0.2 mm, eccentricity < 0.2 mm or turbocharger specification.
Pole wheel-sensor gap ≥ 0.1 mm. Gap depending on rotational speed (circumferential) and module acc. to diagram.

Output

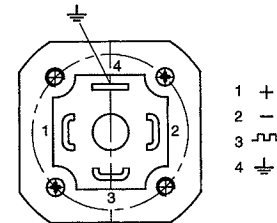
Signal output

The output signal corresponds to an overdriven half sine wave.
The output is connected to the positive side of the supply via internal 2.4 k Ω pull up resistor.
Sink current = 10 mA max.
Saturation voltage at a 10 mA sink current < 1.25 V.

Connection



DSE 1210.04 AHV



DSE 1210.05 AHV

Shield to be connected with 0 V of power supply.

Mechanical

Protection class

Version .04: IP68 (head), IP67 (jack connection)
Version .05: IP68 (head), IP65 (jack connection)

Vibration immunity

5 g_n in the range 5...2000 Hz.

Shock immunity

50 g_n during 20 ms, half sine wave.

Operating temperature

Acc. to model overview.

Insulation

Housing, cable screen and system galvanically isolated (500 V/50 Hz/1 min).

Housing

Stainless steel 1.4305, front side hermetically sealed, electronic components potted in a chemical- and age-proof synthetic resin. Material and dimensions acc. to dimensional drawing.

Weight

Acc. to model overview.

Operating instructions

304E-63925

Versions

Version .04 AH

Connection type: 820A-36309. Connection plug: 820A-36310.

Version .05 AH

Connection type: 820P-36090. Connection plug: 820P-36089.