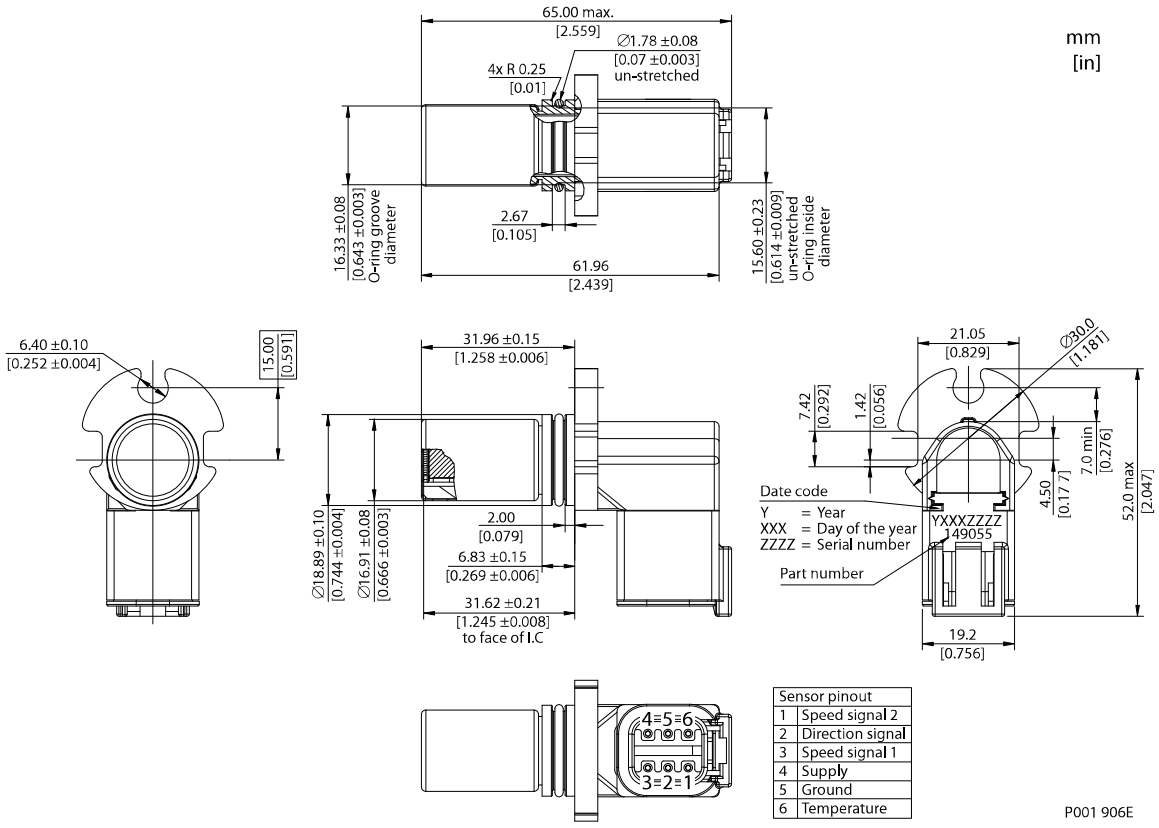
General Information

Description	Order number	
	149055	11102032
Direction signal	One	–
Temperature signal	One	–

For more information, see *Speed Sensor 4.5 – 8 V Technical Data* and *Speed Sensor 7 – 32 V Technical Data* on page 12.

Dimensions



For more details about Mating connector, see the chapters *Speed Sensor 4.5 – 8 V Technical Data* and *Speed Sensor 7 – 32 V Technical Data* on page 12

Sensor Installation

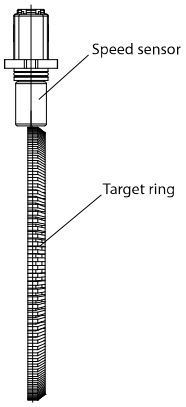
The sensor is positioned in the housing and fastened by one screw.

The gap between the sensor and the target does not need to be adjusted, nor it does need to be rotated for direction sensing.

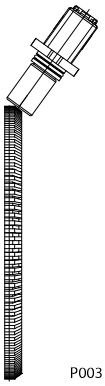
General Information

Example:

H1B Motor housing
SAE & DIN

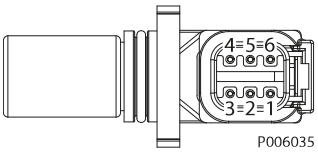


H1B Motor housing
Cartridge



Speed Sensor 4.5 – 8 V Technical Data

Speed sensor connector, 6-pin



1. Speed signal 2
2. Direction signal
3. Speed signal 1
4. Supply
5. Ground
6. Temperature

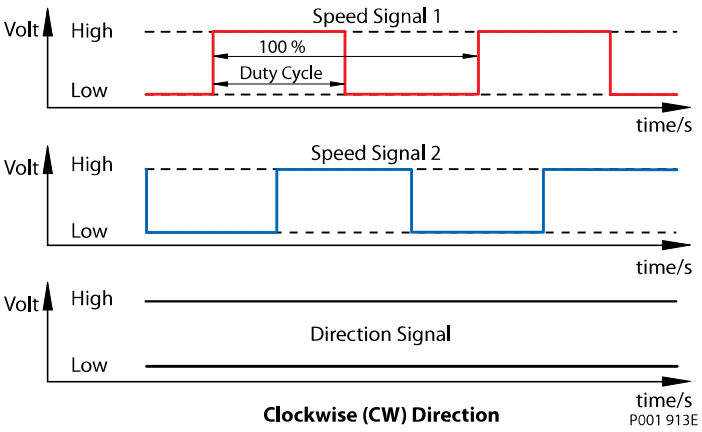
Technical data

Parameter	Min.	Nom.	Max.	Note
Supply voltage	4.5 V_{DC}	5 V_{DC}	8 V_{DC}	Regulated supply voltage. Reverse polarity protected.
Supply protection	–	–	30 V_{DC}	Shuts off above 9 V.
Max. required supply current	–	–	25 mA	At supply voltage
Max. output current	–	–	50 mA	
Operation mode	**NPN & PNP**			Push-Pull amplifier
Temperature signal	-40°C = 2.318V	–	100°C = 0.675V	
Output low speed signal	5 %	8.5 %	12 %	Ratiometric output voltage Low state > 0 V to provide wire fault detection
Output high speed signal	88 %	91.5 %	95 %	
Detectable frequency range	1 Hz	–	10 000 Hz	
Ordering number	**149055**			
Color of connector	Black			

Duty Cycles

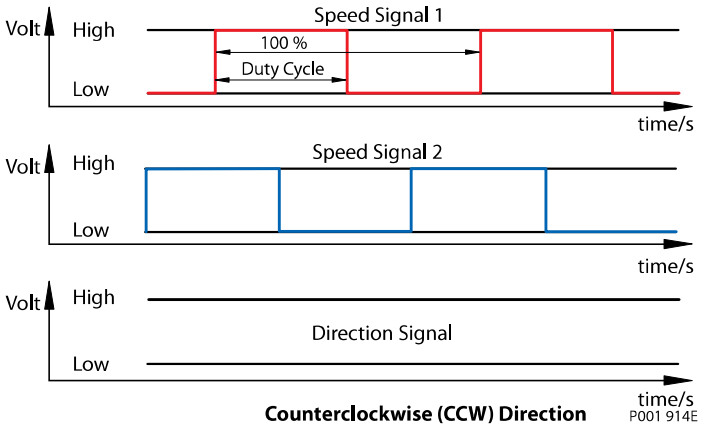
Output speed signal technical data and duty cycles graphs (clockwise and counterclockwise direction).

Duty cycle clockwise direction



Speed Sensor 4.5 – 8 V Technical Data

Duty cycle counterclockwise direction

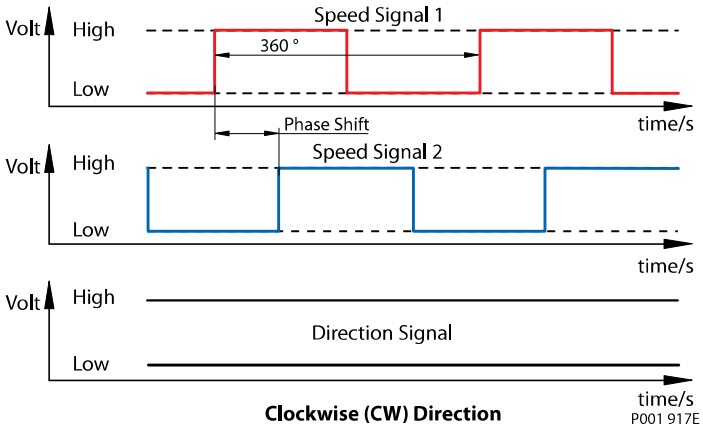


Counterclockwise (CCW) Direction

Output speed signal technical data

Parameter		Min.	Nom.	Max.
Output speed signal 1 Square wave	Low	5 %	8.5 %	12 %
	High	88 %	91.5 %	95 %
Output speed signal 2 Square wave	Low	5 %	8.5 %	12 %
	High	88 %	91.5 %	95 %
Duty cycle	Clockwise (CW)	42.5 %	50 %	57.5 %
	CounterClockWise (CCW)			
Phase shift		70°	97.5°	125°
Square wave Direction signal	Low = CW	5 %	8.5 %	12 %
	High = CCW	88 %	91.5 %	95 %

Phase shift clockwise direction



Clockwise (CW) Direction

Low state > 0 V to provide wire fault detection.

Ratiometric output voltage means that the output signal is proportional to the supply voltage. *Example:*

5 % of 5000 mV sensor supply = 250 mV sensor signal accepted as low output voltage
5 % of 4900 mV sensor supply = 245 mV sensor signal accepted as low output voltage

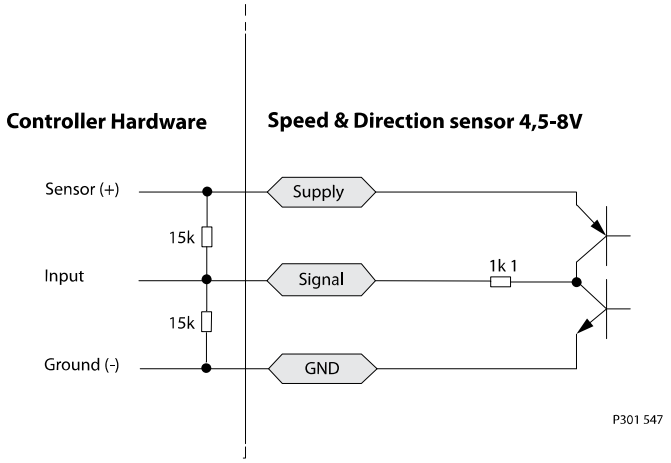
For more information see *Wire Fault Detection* on page 10 and *Output Signals* on page 10.

Speed Sensor 4.5 – 8 V Technical Data

Wire Fault Detection

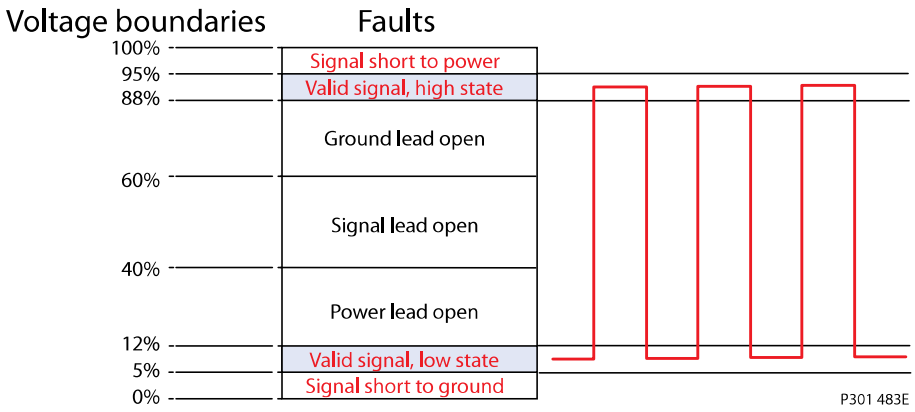
The output voltage levels are defined for a direct connection of the sensor to supply. The outputs are directly connected to a load which is 15k Ohm to ground and 15k Ohm to Supply.

The signal outputs are protected by an 1100 ohm (1k1) resistor. Speed signal 1 (pin 3) offers an advanced error detection by providing different signal levels in case of an error.

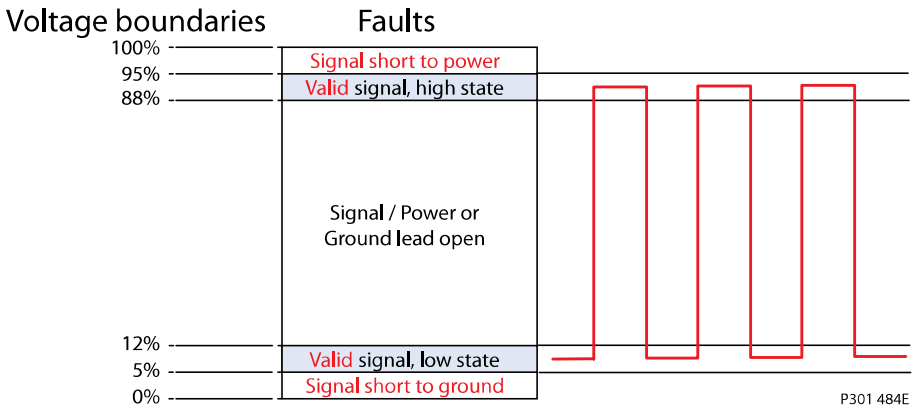


Output Signals

Speed signal 1 (pin 3) signal conditions:



Speed signal 2 (pin 1) and direction signal (pin 2) signal conditions:



Speed Sensor 4.5 – 8 V Technical Data

Temperature Sensor Data

For calculation of the case fluid temperature and the output signal voltage, see the formulas below:

V_O – Measured output voltage (V)

$V_o = (-3.88 \cdot 10^{-6} \cdot T^2) + (-1.15 \cdot 10^{-2} \cdot T) + 1.8639$

T – Temperature (°C)

$$T = -1481.96 + \sqrt{2.1962 \cdot 10^{6} + \frac{(1.8639 - V_o)}{3.88 \cdot 10^{-6}}}$$

Output signal voltage vs. Temperature

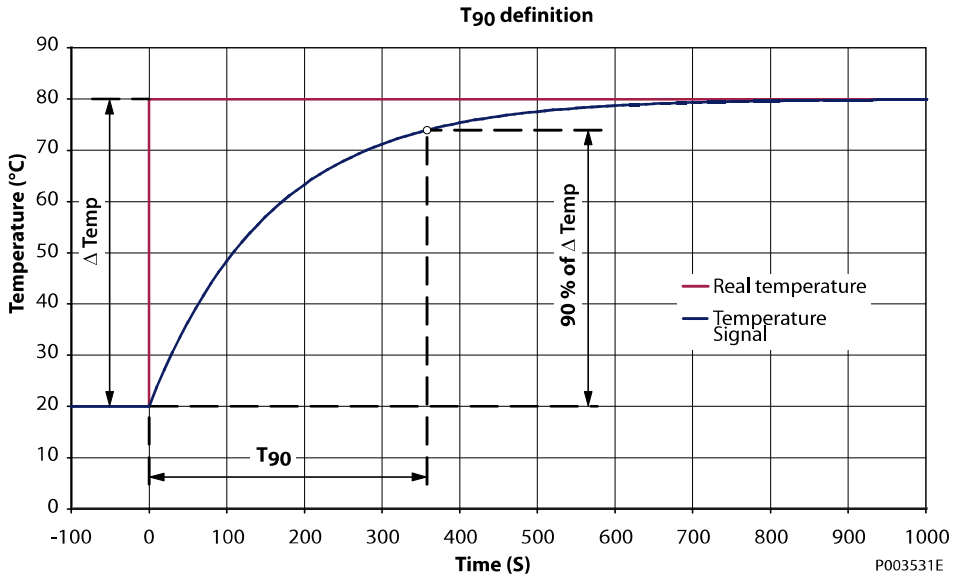
Temperature range							
-55 °C**	**-40 °C**	**-30 °C**	**0 °C**	**+30 °C***	**+80 °C**	**+100 °C**	**+130 °C****
2.485 V	2.318 V	2.205 V	1.864 V	1.515 V	0.919 V	0.675 V	0.303 V

* Accuracy: ±1. 5 to ± 4 °C

** Accuracy: ±2.5 to ± 5 °C

Response time in fluid

T_{90} definition

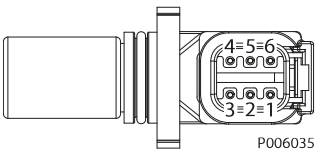


Response time in fluid (T_{90}) = 360 s

Speed Sensor 7 – 32 V Technical Data

Speed Sensor 7 – 32 V_{DC} technical data and information about connector.

Speed sensor connector, 6-pin



Pinout:
1. NC
2. NC
3. Speed signal 1
4. Supply
5. Ground
6. NC

Technical data

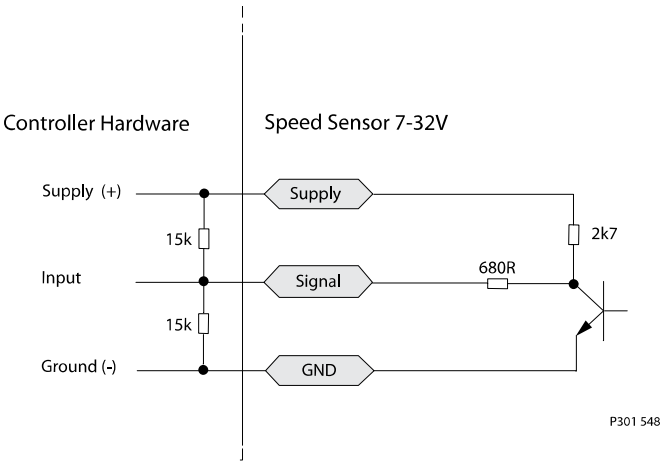
Parameter	Min.	Max.	Note
Supply voltage range	7 V_{DC}	32 V_{DC}	
Supply protection	–	36 V_{DC}	36 V_{DC} over voltage protection -36 V_{DC} permanent reverse polarity protection
Max. required supply current	–	30 mA	
Max. output current	–	50 mA	
Operation mode	**NPN open collector**		Internal 2k7 pull-up resistor to supply
Output low signal range	2 %	8 %	Max. output voltage 24 V_{DC}
Output high signal range	55 %	85 %	
Detectable frequency range	1 Hz	10 000 Hz	
Speed sensor order number	**11102032**		
Color of connector	White (natural plastic)		

Wire Fault Detection

The output voltage levels are defined for a direct connection of the sensor to supply. The outputs are directly connected to a load which is 15k Ohm to ground and 15k Ohm to Supply.

The internal voltage regulator will limit the output signal to max. 24 V in high state. The output is protected by an 680 Ω resistor. The pull-up resistor to supply is 2k7 Ω.

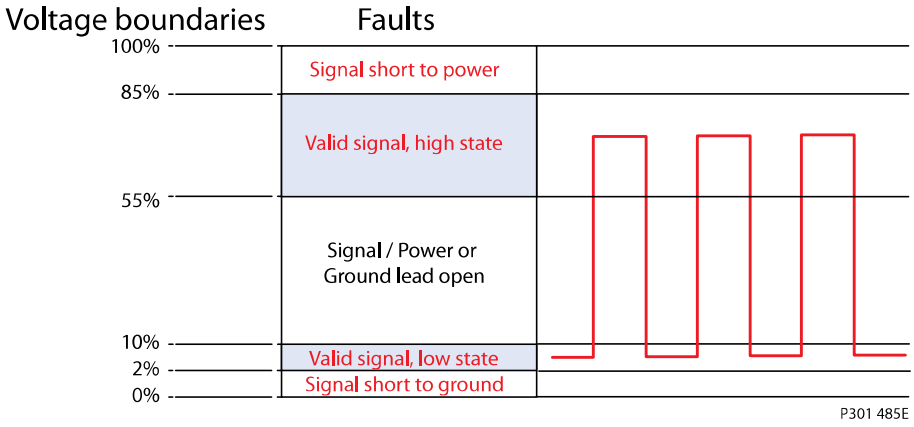
This circuitry will generate voltage levels per condition as follows (typical outputs shown for reference only):



Speed Sensor 7 – 32 V Technical Data

Output Signals

Speed Signal 1 (pin 3) signal conditions



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