

# Speed Sensor Hall-Effect HA-Di



- ▶ Max. frequency:  $\leq 10$  kHz
- ▶ Air gap: 0.4 to 1.0 mm
- ▶ Bore diameter: 12 mm
- ▶ Max. vibration:  $1,200 \text{ m/s}^2$  at 10 Hz to 2 kHz
- ▶ Weight w/o wire: 12 g

This sensor is designed for incremental measurement of rotational speed (e.g. crankshaft or wheel speed).

Due to the rotation of a ferromagnetic target wheel in front of the HA-Di, the magnetic field of the built-in magnet is modulated at the place of the sensors diff.

The main feature and benefit of this sensor is the detection of the rotational direction.

## Application

Application	Speed
Max. frequency	$\leq 10$ kHz forward $\leq 6$ kHz backward
Target wheel air gap AG	0.4 to 1.0 mm
Temperature range	-40 to $150^\circ\text{C}$
Output circuit	Open collector for 1 kOhm
External magnetic fields	$\leq 100$ mT
Max. vibration	$1,200 \text{ m/s}^2$ at 10 Hz to 2 kHz

## Technical Specifications

### Mechanical Data

Weight w/o wire	12 g
Mounting	Screw 1 x M5
Bore diameter	$12 + 0.2$ mm
Installation depth L2	30 mm
Tightening torque	6 Nm

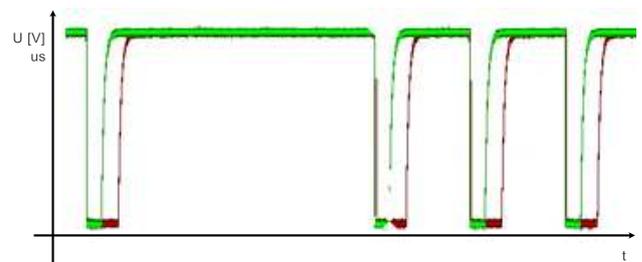
### Electrical Data

Power supply	5 to 16 V (24 V for max. 5 min.)
--------------	----------------------------------

Current IS	$< 20$ mA
Power-on time	1 ms

### Characteristic

Signal output width forward	37 to 53 $\mu\text{s}$ (45)
Signal output width backward	75 to 105 $\mu\text{s}$ (90)
Accuracy (tolerance)	$\pm 1.5^\circ$ (for forward direction)
Signal output	0.52 V to $< U_s$



Signal output width (forward: green, backward: red)

### Environment

Target wheel diameter D	162.34 mm
Thickness t	12.5 mm
Width of teeth b1	3.8 mm
Width of gap b2	4.7 mm
Width of sync. gap b3	20.79 mm
Depth of teeth h	3.4 mm
Number of teeth	60-2

### Alternative Target Wheel

Target wheel diameter	118 to 370 mm
Width of teeth b1	2.2 to 3.8 mm
Width of gap b2	$\geq 4$ mm
Depth of teeth h	$\geq 4$ mm

Target wheel width	≥5 mm
Relative magnetic permeability	$\mu (r) \geq 1000$

### Connectors and Wires

Connector	ASL606-05PC-HE
Mating connector	F 02U 000 228-01
ASL006-05SC-HE	
Pin 1	$U_s$
Pin 2	Gnd
Pin 3	Sig
Pin 4	Nc
Pin 5	Nc
Various motorsport and automotive connectors available on request.	
Sleeve	DR-25
Wire size	AWG 24
Wire length L	15 to 100 cm
Please specify the required wire length with your order.	

### Installation Notes

The HA-Di is no true-power-on sensor. It needs the falling edge of trigger wheel teeth for correct working. After a time of 0.68 s without rotation of the detected wheel it needs again the falling edge of two teeth.

Please specify the angle between the mounting and the target wheel.

Please avoid abrupt temperature changes.

For mounting please use only the integrated plug.

If a wheel with different dimensions is used (see Environment), the technical function has to be tested individually.

Please ensure that the environmental conditions do not exceed the sensor specifications.

Please find further application hints in the offer drawing at our homepage.

### Safety Note

The sensor is not intended to be used for safety related applications without appropriate measures for signal validation in the application system.

### Ordering Information

#### Hall-Effect Speed Sensor HA-Di 0

Order number **F 02U V01 802-01**

#### Hall-Effect Speed Sensor HA-Di 90

Order number **F 02U V01 803-01**

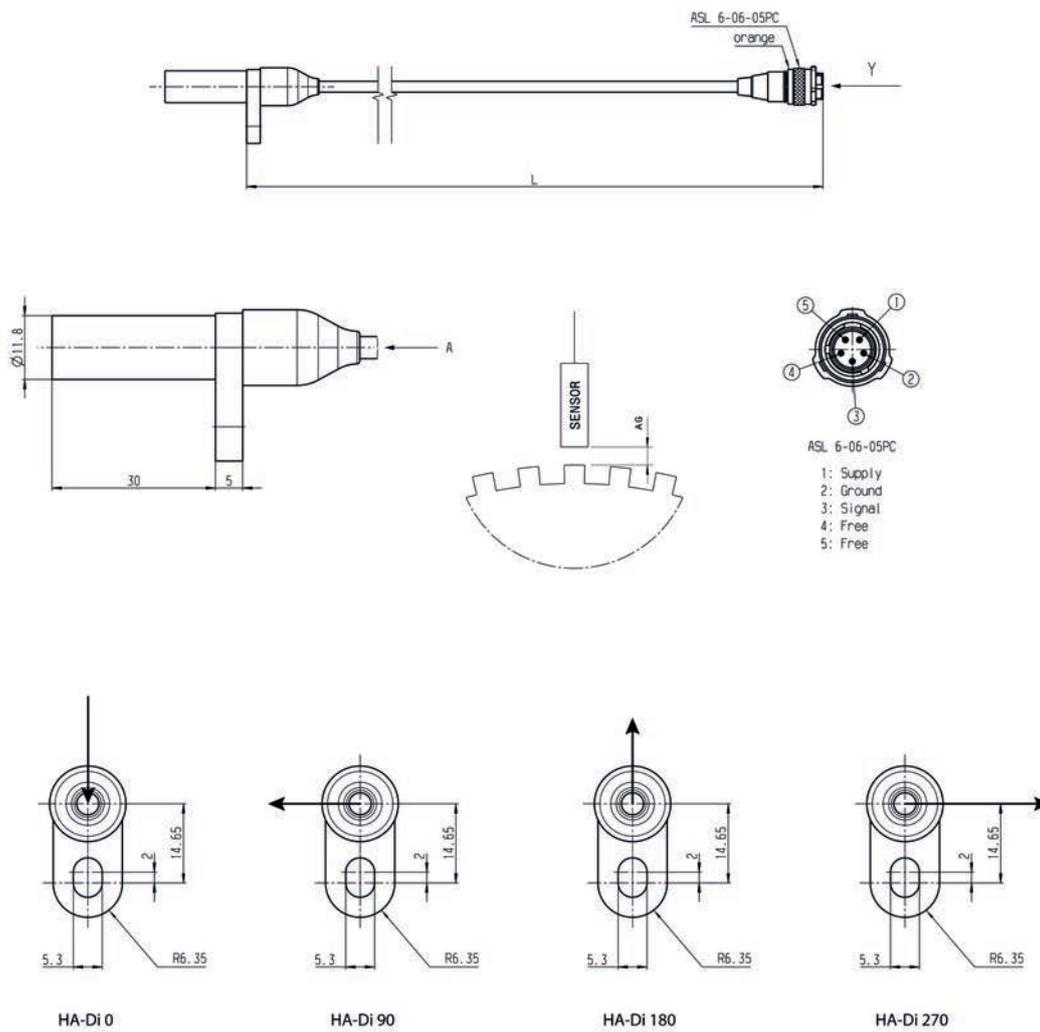
#### Hall-Effect Speed Sensor HA-Di 180

Order number **F 02U V01 804-01**

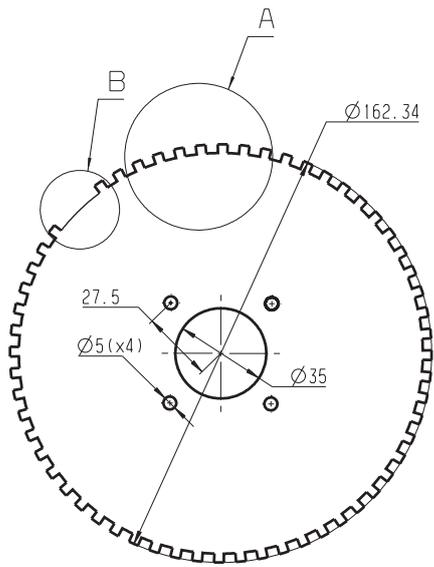
#### Hall-Effect Speed Sensor HA-Di 270

Order number **F 02U V01 805-01**

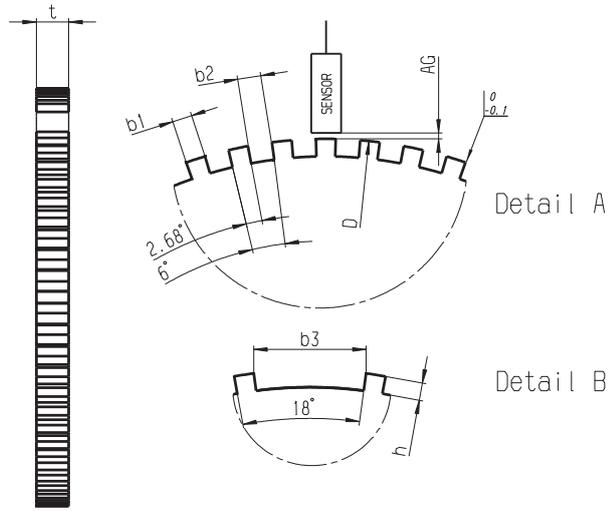
Dimensions



Direction of rotation of the target wheel, View A



60-2 Teeth



Left view

**Represented by:**

**Europe:**  
 Bosch Engineering GmbH  
 Motorsport  
 Robert-Bosch-Allee 1  
 74232 Abstatt  
 Germany  
 Tel.: +49 7062 911 9101  
 Fax: +49 7062 911 79104  
 motorsport@bosch.com  
 www.bosch-motorsport.de

**North America:**  
 Bosch Engineering North America  
 Motorsport  
 38000 Hills Tech Drive  
 Farmington Hills, MI 48331-3417  
 United States of America  
 Tel.: +1 248 876 2977  
 Fax: +1 248 876 7373  
 motorsport@bosch.com  
 www.bosch-motorsport.com

**Asia-Pacific:**  
 Bosch Engineering Japan K.K.  
 Motorsport  
 18F Queen's Tower C, 2-3-5 Minato  
 Mirai Nishi-ku, Yokohama-shi  
 Kanagawa 220-6218  
 Japan  
 Tel.: +81 45 650 5610  
 Fax: +81 45 650 5611  
 www.bosch-motorsport.jp

**Australia, New Zealand and South Africa:**  
 Robert Bosch Pty. Ltd  
 Motorsport  
 1555 Centre Road  
 Clayton, Victoria, 3168  
 Australia  
 Tel.: +61 (3) 9541 3901  
 motor.sport@au.bosch.com