# JAQUET
TECHNOLOGY GROUP

# Dual Channel Hall Effect Speed Sensor

# Y12AD

**GREEN LINE**
INDUSTRIAL SPEED SENSORS

## Product ID

| Type # | Product # | Drawing # |
|---|---|---|
| Y12AD | 385Z-05335 | 4-113.632 Rev.1 |

## General

| | |
|---|---|
| Function | The Y12AD series Hall effect speed sensors are suitable, in conjunction with a ferrous pole wheel, for generating square wave signals proportional to rotary speeds and direction signals. They exhibit a static function, whereby pulse generation down to 0 Hz is guaranteed. The internal two channel structure means that the sensor must be oriented. The sensors have a special orientation sleeve with pin for ease of installation. These sensors can also be used as proximity swiches. |

## Technical data

| | |
|---|---|
| Supply voltage | 11...32 VDC, protected against reverse polarity |
| Current consumption | Max. 20 mA (without load) |
| Signal output | Two output channels: <br>   Square wave signal indicating frequency <br>   DC signal indicating direction <br><br> NPN open collector outputs with internal 10 kOhm pull-up resistor: <br>   Sink current: max. 20 mA <br>   Output voltage: <br>     $U_{high}$ ~ supply voltage <br>     $U_{low} < 0.5$ V at I = 20 mA <br><br> The outputs are short-circuit proof and protected against reverse polarity. <br><br> The sensor is able to drive the coil of a relay by using a simple current limiting resistor. No additional protection against voltage peaks are needed. This is mainly used when the sensor acts as a proximity detection device. Limit values: $I_{sink} < 70$ mA, L < 800 mH |
| Frequency range | 0 Hz…15 kHz |
| Housing | M12x1, tightening torque: max. 12 Nm <br> Maximum pressure on front surface: **100 bar** (other pressure values upon request) |
| Connection | Connector: M12x1 thread, 4 pins, black |
| Protection | Sensor head: IP68 <br> Connector: IP67 |
| Insulation | Housing and electronics galvanically isolated (Test: 500 V, 50 Hz for 1 minute) |
| Pole wheel | Prerequisite: Toothed wheel of a ferrous material (e.g. Steel 1.0036). <br> Optimal performance with <br>   Involute gear <br>   Tooth width > 10 mm <br>   Side offset < 0.2 mm <br>   Eccentricity < 0.2 mm |
| Air gap between sensor and pole wheel | Module 1.0 (DP 25.4): 0.3…0.5 mm <br> Module 2.0 (DP 12.7): 0.3…1.5 mm |
| Electromagnetic compatibility | Please contact Jaquet for further details. |

| (EMC) | |
|---|---|
| Vibration & shock immunity | Jaquet Greenline sensors are approved for rough environments. Please contact Jaquet for further details. |
| Operating temperature | -40℃…125℃ |

## Further Information

| Safety | All mechanical installations must be carried out by an expert. General safety requirements have to be met. |
|---|---|
| Installation | These sensors use a two channel Hall probe structure. Therefore, the housing has to be aligned to the pole wheel according to the sensor drawing. Deviations in positioning may affect the performance and decrease the noise immunity of the sensor. During installation, the smallest possible pole wheel to sensor gap should be set. The gap should however be set to prevent the face of the sensor ever touching the pole wheel. Within the air gap specified the amplitude of the output signals is not influenced by the air gap.<br><br>A sensor should be mounted with the middle of the face side over the middle of the pole wheel. Dependent upon the wheel width, a certain degree of axial movement is permissible. However, the middle of the sensor must be at minimum in a distance of 3 mm from the edge of the pole wheel under all operating conditions.<br><br>A solid and vibration free mounting of the sensor is important. Eventual sensor vibration relative to the pole wheel can induce additional output pulses.<br><br>The sensors are insensitive to oil, grease etc. and can be installed in arduous conditions. |
| Maintenance | Product cannot be repaired. |
| Transport | Product must be handled with care to prevent damage of the front face. |
| Storage | Product must be stored in dry conditions. The storage temperature corresponds to the operation temperature. |
| Disposal | Product must be disposed of properly, it must not be disposed as domestic waste. |

orientation: ring and flat

Mounting holes

pole wheel

C 2:1

(74.5)

10    14    14    1

35.5

$\varnothing 10.4 \, ^{0}_{-0.1}$

M12x1$^{6g}$    $\varnothing 10.5 ^{96}$    sw17    M12x1$^{6g}$

6.5 ±0.2

$\varnothing 3^{h9}$

M12x1$^{8H}$    $\varnothing 15.3$    12$^{±0.1}$    H11

Marking:
Type, Logo,
CE, Date

4    7

0.5x45°    15

R0.2    R0.1

4±0.2

O-Ring
NBR 7ß Share A
<'1Iß.5x3.ß

8 = 20" adjusted by manufacturer

Modul 2 : ß = 2a•-3s•
Modul 1 : ß = Ja•-2a•

The signal "direction of rotation" will be
influenced by the orientation angle 8.

operational temperature: −zg•c − +Jgg•c
operational instructions:    385D/E-545?2
Tightening moment max.:    12Nm

## pulse diagram

direction of rotation A        direction of rotation B

D

S

gap

+V

4P

A
B

+V, brown
Signal, black
Direction, white
GND, blue

| used | Designation | Part-Nr. | Meterial/Remarks | | | | | | | |
|------|-------------|----------|------------------|--|--|--|--|--|--|--|

*Sensor kp l. Y12RD     385Z-65335  Jaquet*

| | | Dimension | 0.5 ...6 | >6 ..30 | >30 ..120 | >120 ..400 | >400 ..1000 | >1000 ..2000 |
|--|--|-----------|------|------|------|------|------|------|
| | | Toleronce ± | 0.1 | 0.2 | 0.3 | 0.5 | 0.8 | 1.2 |

replaced with:

replacement for:

| | | 6.12.04 | Pi |

16.03.07 CA    added Honeywell sensor
change description

rev.    ecn.    date/signature

scale    drawn

1:1    checked    16.3.07    Sch

Y12AD

file:

## speed sensor

Format    Drawing No.    Rev.

A4    1 13.632    1

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- Railway
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- Turbochargers
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- Ex models for hazardous areas
- Polebands and target wheels available where needed

## PRODUCTS- SYSTEMS
- Multi·channel overspeed protection systems
- 1-2 channel measurement, protection and control modules
- Engine diagnostic systems
- Redundant speed measurement and indication

## SPECIAL PROJECT EXAMPLES
- An automotive linear movement sensor
- Integrated power and torque measurement for display and gearbox control
- Naval spec. turbine protection for nuclear submarines
- Speed measurement in turreted, tracked vehicles

## QUALITY MANAGEMENT AND STANDARDS
- Quality management: TS 16949 and ISO 9001, ZELM ATEX 1020, KWU
- Sensors: GL, KWU, TÜV, ATEX, EN 50155, NF F 16-101102, ABS, EMC
- Systems: IEC 61508 SIL 2 and SIL 3, API 670, GL, TÜV, KWU, EX
- Environmental: RoHS · EU directive 2002I95 EC

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**IN CHARGE OF SPEED**

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