

Temposonics®

Absolute, Non-Contact Position Sensors

R-Series Profinet

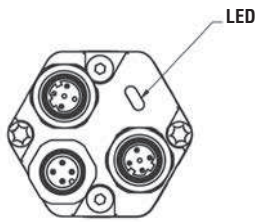
Temposonics® RP and RH
Stroke length 25...7600 mm



- Rugged industrial sensor
- Linear and absolute measurement
- LEDs for sensor diagnostics
- Non-contact sensing with highest durability
- Superior accuracy: linearity less than 0.01 %
- Repeatability less than 0.001 %
- Resolution up to 1 µm
- Direct Profinet output with:
 - Multi-position measurement with up to 19 magnets
 - Speed
 - Integrated IRT switch

Sensor diagnostic display

Integrated LED (green/red) provides basic visual feedback for normal sensor operation and troubleshooting.



Green	Red	Description
ON	OFF	Normal function
ON	ON	No master contact
ON	Flashing	Parametrization failed

See manual for more diagnostic functions

The most important characteristics of Profinet are:

- absolute position measurement
- speed measurement
- status announcement
- error message (e.g. of magnet)

Profinet interface

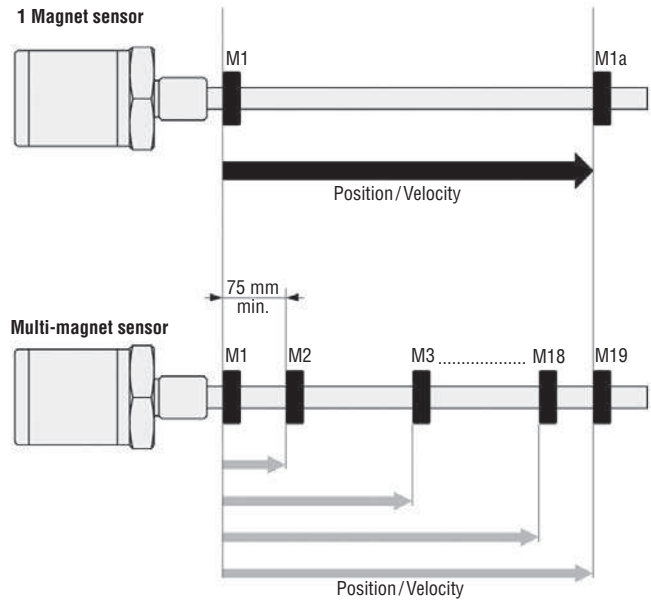
The sensor meets the requirements of the Profinet IO industrial Ethernet standards and can be directly operating in a network with decentralized peripherals. Profinet is characterized by a high data transfer and high real-time capability. It's officially certified by the PNO (Profinet user organization).

Profinet versions

The sensor can be ordered in following versions:

- Encoder Profile 4.1: PNO standardized profile
- MTS Communication Profile: It allows a simultaneous position measurement up to 19 positions. The configuration is similar to the sequence of Temposonics® Profibus sensors

1...19 multi-position measurement



Technical data
Input

Measured value	position or velocity, option: 1...19 multi-position measurement
Measuring length	profile: 25...5000 mm / rod: 25...7600 mm

Output

Interface/Data protocol	Profinet IO RT
Data transmission rate	100 MBit/s max.

Accuracy

Resolution	
- Position	1...100 µm selectable
- Velocity	1 mm/s
Linearity ¹	< ± 0.01 % F.S. (minimum ± 50 µm)
Repeatability	< ± 0.001 % F.S. (minimum ± 2.5 µm)
Update time	dependent on stroke length
Process data	maximum 1 kHz
Temperature coefficient	< 15 ppm/°C
Ripple	< 5 µm
Hysteresis	< 4 µm

Operating conditions

Magnet speed	any
Operating temperature	0...+75 °C
Dew point, humidity	90% rel. humidity, no condensation
Ingress protection ²	profile: IP65, rod: IP67 if appropriate mating cable connector is correctly fitted
Shock test	100 g (single shock) IEC-Standard 60068-2-27
Vibration test	15 g/10...2000 Hz, IEC-Standard 60068-2-6 (resonance frequencies excluded)
EMC test	Electromagnetic emission EN 61000-4-6 (for industrial environments) Electromagnetic immunity EN 61000-4-3 the sensor meets the requirements of the EC directives and is marked with CE

Design, material

Diagnostic display	LED beside connector
<u>Profile model:</u>	
Sensor head	aluminum
Rod	aluminum
Position magnet	magnet slider or removable U-magnet
<u>Rod model:</u>	
Sensor head	aluminum
Rod	stainless steel 1.4301 / AISI 304
Pressure rating	350 bar, 700 bar peak
Position magnet	Ring- or U-magnets

Installation

Mounting position	any
Profile	adjustable mounting feet or T-Slot nut in bottom groove
U-magnet, removable	mounting plate and screws from antimagnetical material
Rod	threaded flange M18x1.5 or ¾"-16 UNF-3A
Position magnet	mounting plate and screws from antimagnetical material

Electrical connection

Connection type	2 x 4 pin M12 (d-coded); 1 x 4 pin M12 (a-coded)
Supply voltage	24 VDC (-15 / +20 %); connection to an approved power supply with energy limitation (IEC 61010-1) resp. class 2 according to National Electric Code (USA)/Canadian Electric Code
- Polarity protection	up to -30 VDC
- Overvoltage protection	up to 36 VDC
Current consumption	typ. 110 mA
Ripple	≤ 0.28 Vpp
Electric strength	500 VDC (DC ground to machine ground)

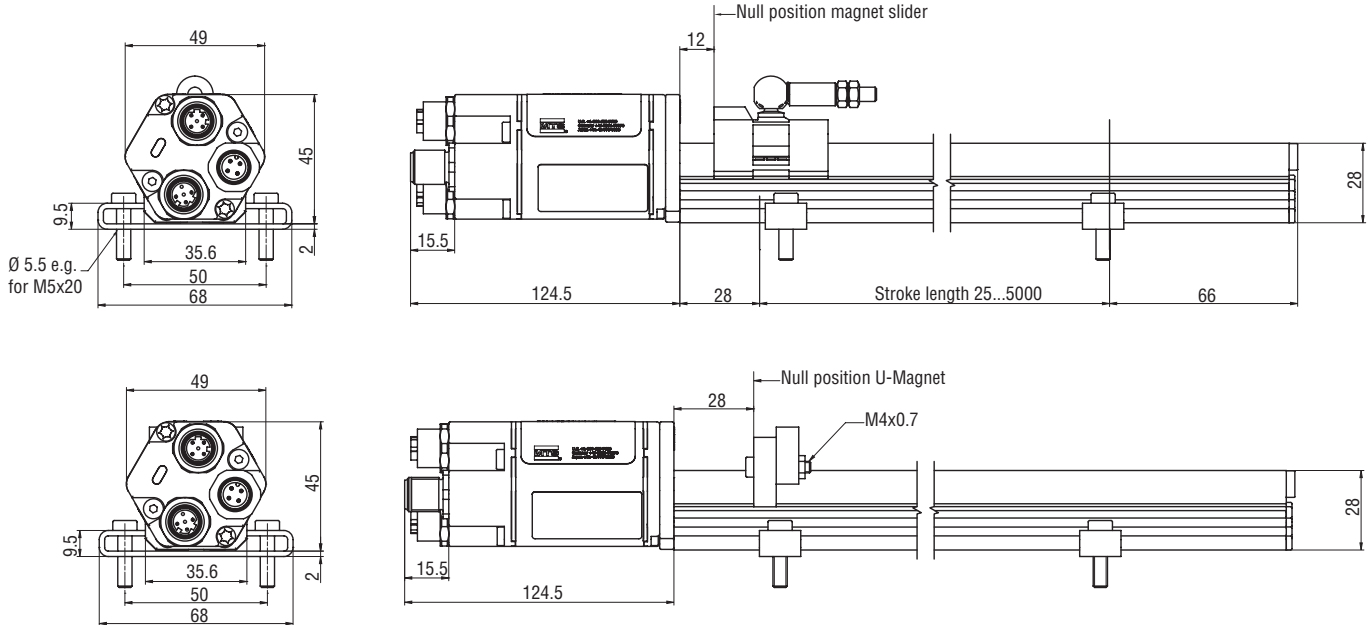
¹ with position magnet # 251 416-2.

² The IP rating is not part of the UL approval


Temposonics® RP – Profile design

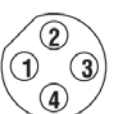
Temposonics® RP offers modular construction, flexible mounting configurations and easy installation. Position measurement is contactless via two versions of position magnets.

- A sliding position magnet running in profile housing rails. Connection with the mobile machine part is via a ball jointed arm to taking up axial forces
 - A floating magnet, mounted directly on the moving part, travels over the profile at low distance.
- Its air-gap allows the correction of misalignments at installation.



Connector wiring (connector view, sensor)

BUS On/Off	Pin	Cable	Function
 Female	1	YE	Tx+
	2	WH	Rx+
	3	OG	Tx-
	4	BU	Rx-

Supply	Pin	Cable	Function
 Connector	1	BN	+24 VDC (-15/+20 %)
	2	WH	n.c.
	3	BU	0 V (GND)
	4	BK	n.c.

All dimensions in mm

Standard position magnet included in delivery (see chapter accessories)

Position magnets

Magnet slider S (Part No. 252 182)
 Magnet slider V (Part No. 252 184)
 U-magnet OD33 (Part No. 251 416-2)

Connection types

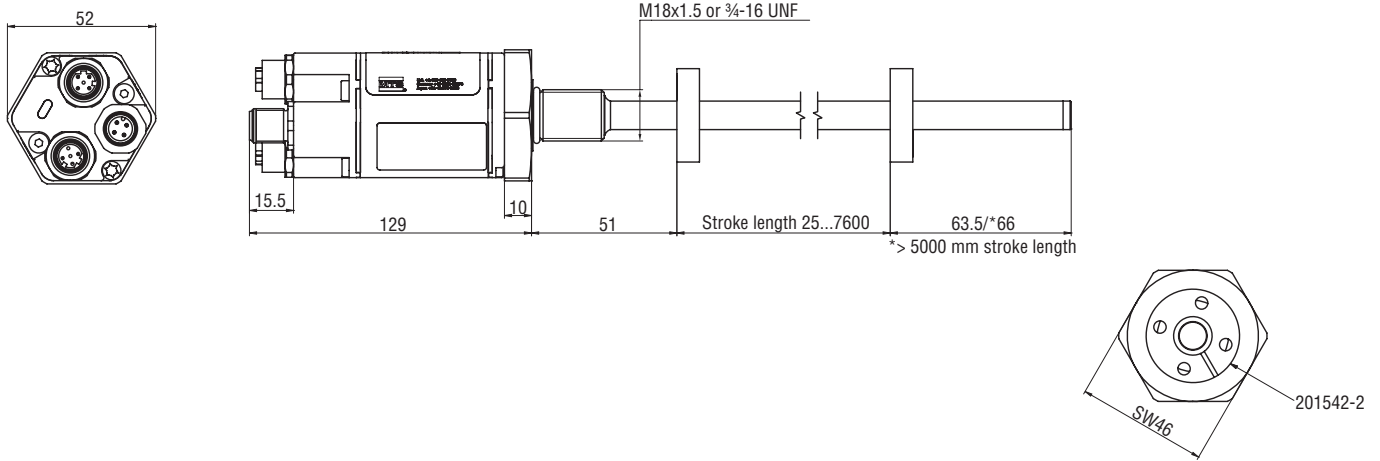
5 pin female connector M12, power supply (Part No. 370 677)
 4 pin bus cable connector (Part No. 370 523)
 Cable connector 5 m M12-M12 (Part no. 530 064)
 Cable connector 5 m M12-RJ45 (Part no. 530 065)

Temposonics® RH – High pressure design

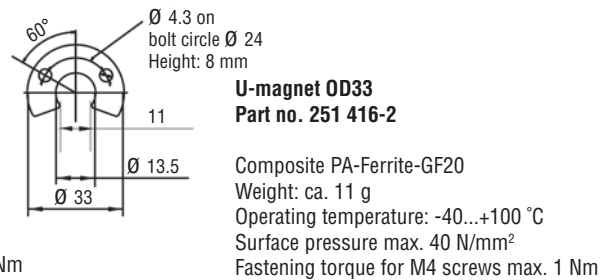
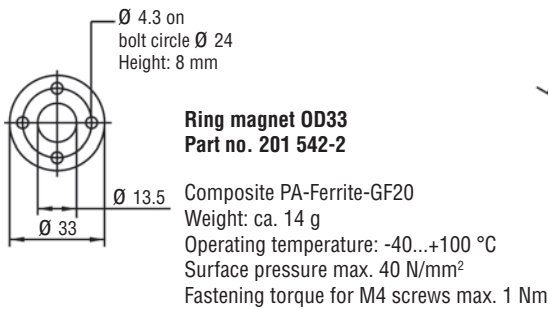
Temposonics® RH with a pressure stainless steel flange and sensing rod is suitable for use in hydraulic cylinders and externally in all applications where space is a problem. Position measurement is via ring or U-magnets travelling along the sensing rod without any mechanical contact.

Advantage...

the completely operable sensor cartridge can be replaced for servicing easily without opening the fluid circuit.



Position magnets (not included in delivery, please order separately)



Other position magnets on request.

All dimensions in mm

Standard position magnet *not* included in delivery (see chapter accessories)

Position magnets

Ring magnet OD33 (Part No. 201 542-2)
Ring magnet OD25,4 (Part No. 400 533)
U-magnet OD33 (Part No. 251 416-2)

Connection types

5 pin female connector M12, power supply (Part No. 370 677)
4 pin bus cable connector (Part No. 370 523)
Cable connector 5 m M12-M12 (Part no. 530 064)
Cable connector 5 m M12-RJ45 (Part no. 530 065)

**Temposonics®
ordering information**

R M D 5 8 1 U 4 Z

Specification

RP - Profile
RH - Rod

Design

Profile Temposonics® RP:

S - Magnet slider, joint at top
V - Magnet slider, joint at front
G - Magnet slider, joint at top, backlash free
M - U-Magnet, OD33

Rod Temposonics® RH:

M - Flange M18x1.5 (standard)
V - Flange M18x1.5 (Fluorelastomer housing-seal)
D - Flange M18x1.5 with bushing on rod end
R - Flange M18x1.5 with thread M4 at rod end
J - Flange M22x1.5, rod Ø 12.7 mm, 800 bar
S - Flange ¾" - 16 UNF - 3A

Stroke length

Profile - 0025...5000 mm
Rod - 0025...7600 mm
Standard: see chart
Other length upon request.

Connection type

D58 - 2 x 4 pin M12 d-coded, 1 x 4 pin M12 a-coded

Supply voltage

1 - +24 VDC

Output

U401 - Profinet RT, Encoder Profile, 1 magnet
U402 - Profinet RT, MTS Profile, 1...19 magnets

Magnet number for multi-position measurement³

Z02...Z19 = 2...19 pcs

Profile

Delivery includes:

Sensor, position magnet, 2 mounting clamps up to 1250 mm + 1 clamp for each 500 mm. GDSML file on CD

Rod

Delivery includes:

Sensor and O-ring, GDSML file on CD
Please order separately: Magnets, connectors

Stroke length standard RP

Stroke	Ordering steps
≤ 500 mm	25 mm
500...2500 mm	50 mm
2500...5000 mm	100 mm

Stroke length standard RH

Stroke	Ordering steps
≤ 500 mm	5 mm
500...750 mm	10 mm
750...1000 mm	25 mm
1000...2500 mm	50 mm
2500...5000 mm	100 mm
> 5000 mm	250 mm

³ Note: Please specify magnet numbers for your sensing application and order separately