

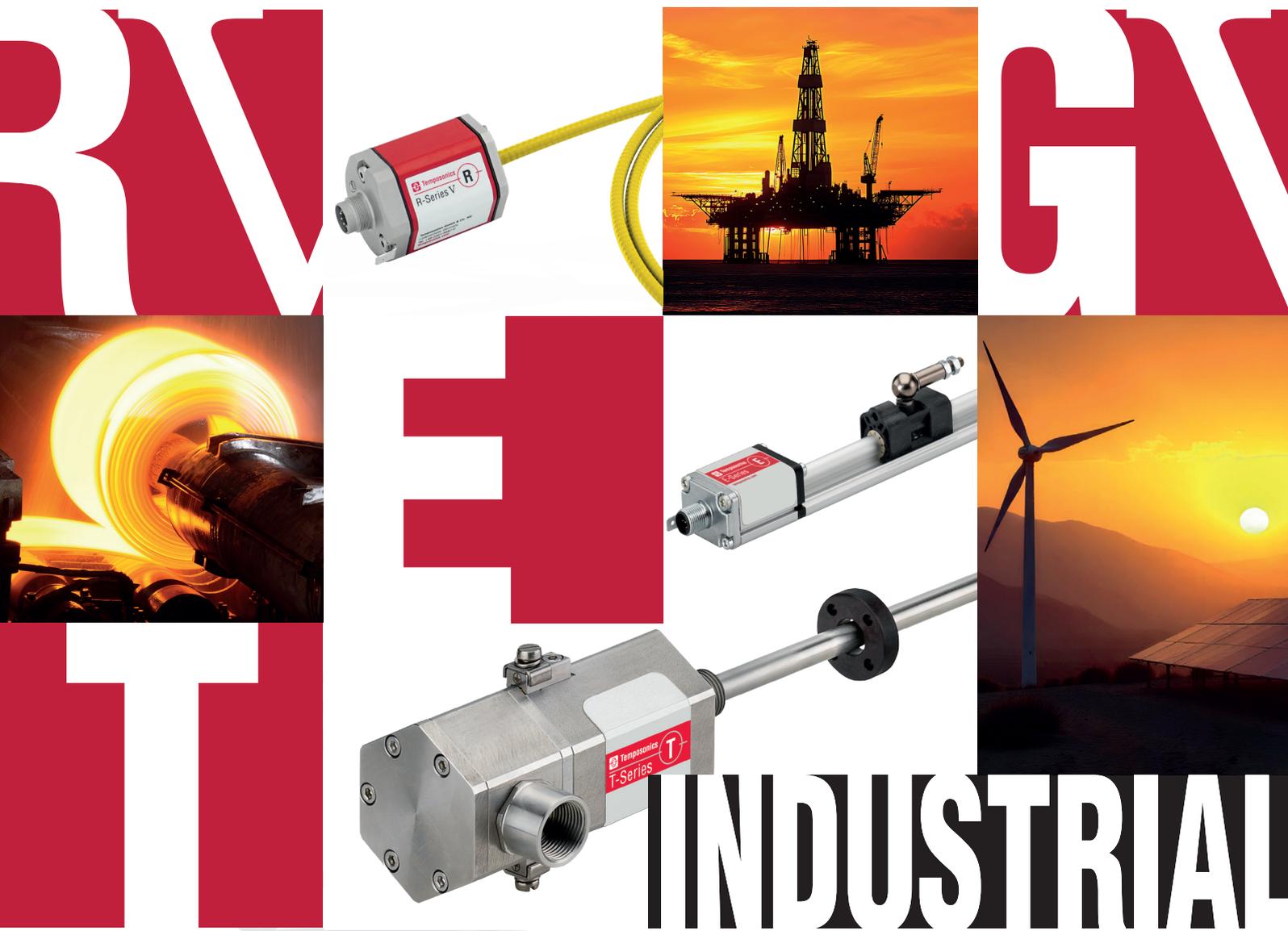


Temposonics

AN AMPHENOL COMPANY

Series Selector Guide

Magnetostrictive Linear Position Sensors



INDUSTRIAL

– TRUST THE EXPERTS –

| | | | |
|----------------------------|-----------------------------------|-----------------------------------|--------------------------------|
| RV | ROD & FLEXIBLE SE (RH5 & RH5xF) | PROFILE (RP5) | FLEXIBLE (RF5) |
| FLEXIBLE (RFV) | DETACHED SENSOR ELECTRONICS (RD5) | DETACHED SENSOR ELECTRONICS (RDV) | SUPER SHIELD HOUSING (RM5) |
| GV | ROD (GH5) | PROFILE (GP5) | E |
| ROD (EH) | PROFILE (EP) | LOW PROFILE (EL) | FLAT PROFILE (EP2) |
| GUIDED ROD (ER) | Ex-CERTIFIED (ET) | EMBEDDED IN CYLINDER (EE) | G |
| REDUNDANT (GT2/GT3) | EMBEDDED & REDUNDANT (GTE) | GB | THREADED FLANGE (GB-M,-T) 360° |
| PRESSURE FIT FLANGE (GB-S) | T | Ex-CERTIFIED (TH) | |

SERIES QUICK GUIDE

| R-Series V | G-Series V | E-Series | G-Series | GB-Series | T-Series |
|---|--|--|--|--|--|
| | | | | | |
| MAXIMUM PERFORMANCE with innovative diagnostics | BALANCED PERFORMANCE with backward compatibility | EFFICIENT PERFORMANCE with compact designs | REDUNDANT SENSOR SOLUTIONS for safety-relevant application | COMPACT DESIGN for high temperatures & tight space | CERTIFIED for use in hazardous areas |
| Metalworking | Lumber processing | Renewable energy | Watergates | Valves | Offshore |

TYPICAL APPLICATIONS

| FEATURES | R-Series V | G-Series V | E-Series | G-Series | GB-Series | T-Series |
|----------------------------|------------------------|------------|----------|----------|-----------|----------|
| Velocity measurement | • | | | | | |
| Multi-position measurement | • | • | | | | • |
| Program. sensor parameters | • | • | | | • | • |
| Diagnostic LEDs | • | • | | | | |
| Redundant | | | | • | | |
| Ex-certified | | | | • | | • |
| ← Sensor assistant | TempoLink®, TempoGate® | TempoLink® | | | | |

| OUTPUTS | R-Series V | G-Series V | E-Series | G-Series | GB-Series | T-Series |
|------------------|------------|------------|----------|----------|-----------|----------|
| PROFINET | • | | | | | |
| EtherCAT® | • | | | | | |
| EtherNet/IP™ | • | | | | | |
| POWERLINK | • | | | | | |
| SSI | • | | | | • | • |
| IO-Link | | | | | | |
| CANBus/CANopen | | | | | | • |
| Analog – Current | • | • | • | • | • | • |
| Analog – Voltage | • | • | • | • | • | |
| Start/Stop | | • | • | • | | |
| PWM | | • | | • | | |

| MAX. OPERATING TEMPERATURE | R-Series V | G-Series V | E-Series | G-Series | GB-Series | T-Series |
|----------------------------|--------------|------------|------------------------|----------|-----------|----------|
| | +85 °C | +80 °C | +75 °C | +75 °C | +100 °C | +75 °C |
| | RD5: +120 °C | | EE: +85 °C/ET: +105 °C | | | |

| MAXIMUM STROKE LENGTH | R-Series V | G-Series V | E-Series | G-Series | GB-Series | T-Series |
|-----------------------|------------|------------|----------|----------|-----------|----------|
| 1500 mm | | | | | | |
| 2540 mm | | | | | | |
| 3000 mm | | | | | | |
| 3250 mm | | | | | | |
| 3500 mm | | | | | • | |
| 5080 mm | RDV, RD5 | GP5 | | | | |
| 6350 mm | RP5 | | | | | |
| 7615 mm | RM5 | | | | | |
| 7620 mm | RH5 | GH5 | | | | • |
| 20000 mm | RFV, RF5 | | | | | |

*Start/Stop

CERTIFICATES

| R-SERIES V | CE | UKCA | UL/cUL | ATEX | UK Ex | NEC/CEC | IECEx | KCs | Japanese approval | CCC | ClassNK |
|------------|----|------|--------|------|-------|---------|-------|-----|-------------------|-----|---------|
| RH5 | • | • | • | | | | | | | | |
| RP5 | • | • | • | | | | | | | | |
| RF5 | • | • | • | | | | | | | | |
| RFV | • | • | • | | | | | | | | |
| RD5 | • | • | • | | | | | | | | |
| RDV | • | • | • | | | | | | | | |
| RM5 | • | • | • | | | | | | | | |

| G-SERIES V | CE | UKCA | UL/cUL | ATEX | UK Ex | NEC/CEC | IECEx | KCs | Japanese approval | CCC | ClassNK |
|------------|----|------|--------|------|-------|---------|-------|-----|-------------------|-----|---------|
| GH5 | • | • | • | | | | | | | | |
| GP5 | • | • | • | | | | | | | | |

| E-SERIES | CE | UKCA | UL/cUL | ATEX | UK Ex | NEC/CEC | IECEx | KCs | Japanese approval | CCC | ClassNK |
|----------|----|------|--------|------|-------|---------|-------|-----|-------------------|-----|---------|
| EH | • | • | • | | | | | | | | |
| EP | • | • | • | | | | | | | | |
| EL | • | • | • | | | | | | | | |
| EP2 | • | • | • | | | | | | | | |
| ER | • | • | • | | | | | | | | |
| ET | • | • | • | • | • | | • | • | | | • |
| EE | • | • | • | | | | | | | | |

| G-SERIES | CE | UKCA | UL/cUL | ATEX | UK Ex | NEC/CEC | IECEx | KCs | Japanese approval | CCC | ClassNK |
|----------|----|------|--------|------|-------|---------|-------|-----|-------------------|-----|---------|
| GT2/GT3 | • | • | • | | | | | | | | |
| GTE | • | • | • | • | • | | • | • | | | • |

| GB-SERIES | CE | UKCA | UL/cUL | ATEX | UK Ex | NEC/CEC | IECEx | KCs | Japanese approval | CCC | ClassNK |
|-----------|----|------|--------|------|-------|---------|-------|-----|-------------------|-----|---------|
| GB | • | • | • | | | | | | | | |

| T-SERIES | CE | UKCA | UL/cUL | ATEX | UK Ex | NEC/CEC | IECEx | KCs | Japanese approval | CCC | ClassNK |
|------------------|----|------|--------|------|-------|---------|-------|-----|-------------------|-----|---------|
| TH (Analog) | • | • | • | • | • | | • | • | • | • | • |
| TH (SSI, CANBus) | • | • | • | • | • | | • | • | • | • | • |

| HPH FOR R-/G-SERIES V | CE | UKCA | UL/cUL | ATEX | UK Ex | NEC/CEC | IECEx | KCs | Japanese approval | CCC | ClassNK |
|-----------------------|----|------|--------|------|-------|---------|-------|-----|-------------------|-----|---------|
| RH5 | • | • | • | • | • | | • | • | • | • | • |
| GH5 | • | • | • | • | • | | • | • | • | • | • |

* SAVE YOUR TIME FOR THE THINGS YOU LOVE!

MAGNETOSTRICTION AND ITS ADVANTAGES

Our absolute, linear position sensors are based on the proprietary **Temposonics® magnetostrictive technology** and capture position by measuring the time of flight of an acoustic wave. We measure time in picoseconds within a waveguide that we design, manufacture, and control – this makes our measurement more precise, reliable, and durable.

The speed of sound – **tempo** – is embedded in our name.

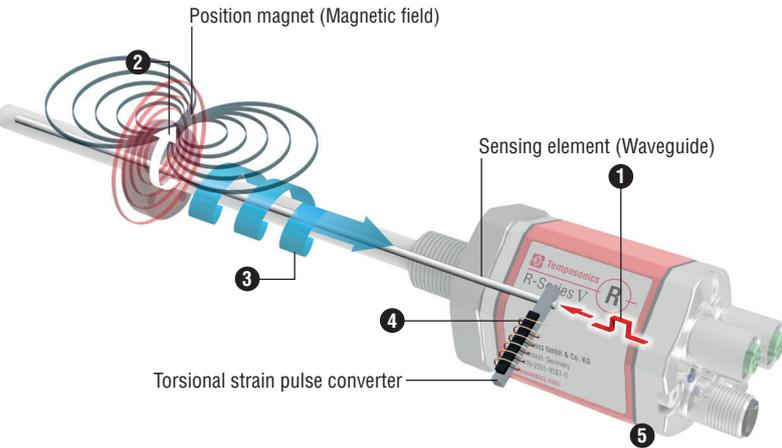
 **Absolute, non-contact measurement**

 **No mechanical wear**

 **No recalibration required**

 **Robust and durable**

 **Highest sensor reliability**



Measurement Cycle

- 1 Current pulse generates magnetic field
- 2 Interaction with position magnet field generates torsional strain pulse
- 3 Torsional strain pulse propagates
- 4 Strain pulse detected by converter
- 5 Time-of-flight converted into position

IN PRACTICE ...

MINIMUM RESOLUTION:
0.1 µm

SHOCK:
150 g/11 ms

VIBRATION:
30 g

TEMPERATURE RESISTANCE
-40 °C
+120 °C

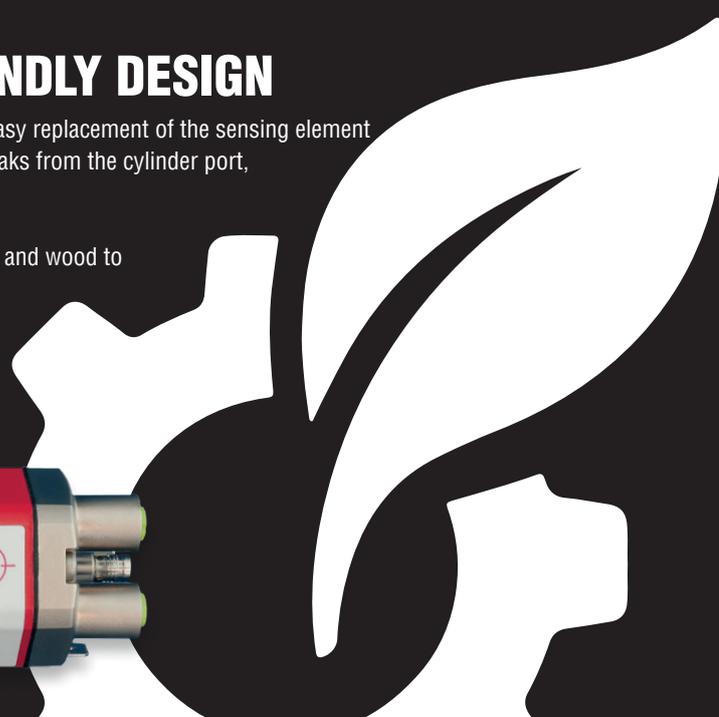
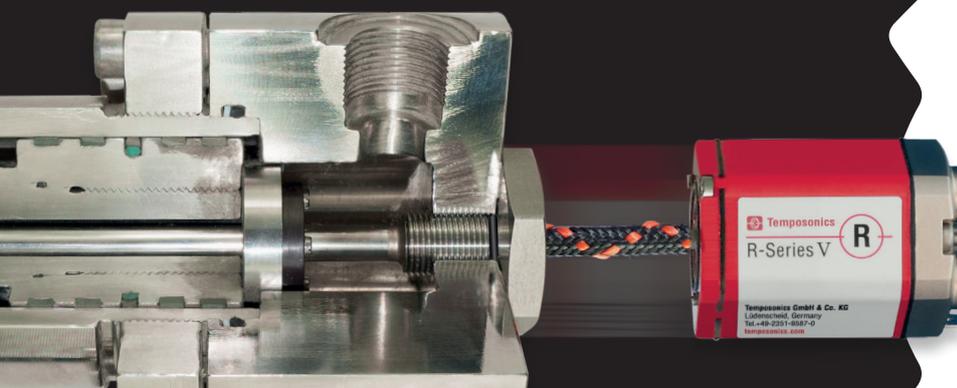
MULTIPOSITION MEASUREMENTS UP TO
30 Magnets

STROKE LENGTHS UP TO
20 Meters

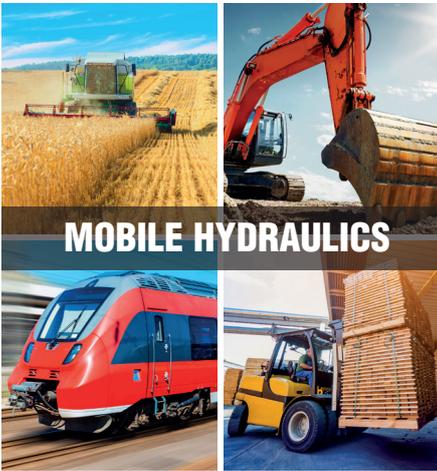
MODULAR, ENVIRONMENTALLY FRIENDLY DESIGN

The modular sensor design of the R-Series V, G-Series V and GB-Series allows easy replacement of the sensing element and electronics without interrupting the hydraulic circuit. This not only prevents leaks from the cylinder port, but also significantly reduces maintenance costs and downtime.

Temposonics® technology is used in cylinders in almost all industries – from steel and wood to energy production.



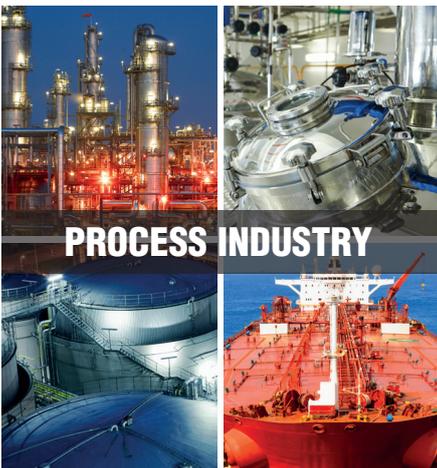
INDUSTRY DIVERSITY WITH A CLEAR FOCUS



The magnetostrictive position sensors of the **Temposonics® MH- and C-Series** enable highly precise measurements and thus controlled, fast, and smooth movements in mobile working machines, vehicles for logistics and transportation, as well as in the automotive sector.

Key benefits:

- ✓ **Versatile designs:** Tailored to a wide range of application requirements.
- ✓ **Flexible installation:** Can be directly integrated into the hydraulic cylinder or mounted externally.
- ✓ **Large measuring range:** From 50 mm up to 10.5 m.
- ✓ **Extremely robust:** Resistant to shock and vibration for maximum safety and comfort for the operator, as well as high machine availability.



The magnetostrictive level transmitters of the **Level Plus® LP- and LL-Series** are designed for automatic level measurement in above-ground storage tanks and processvessels – ideal for the oil, gas, chemical and pharmaceutical industries.

Key benefits:

- ✓ **5-in-1 measurement:** A single sensor captures level, interface, temperature, volume, and high-level alarm - space-saving and efficient.
- ✓ **Versatile designs:** Tailored to diverse application requirements.



Temposonics – Pioneer and innovator in magnetostrictive sensing technology

For more than 50 years, Temposonics has been setting standards in performance and reliability. With decades of expertise in this field, the broadest portfolio of sensor solutions, and a consistent focus on our core technology, we deliver unmatched application know-how and first-class service. We operate production facilities in Lüdenscheid and Dortmund (Germany) and Cary, NC (USA), along with direct sales offices and authorized distributors worldwide.



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