MEETING THE CHALLENGES OF INDUSTRIAL APPLICATIONS

Metal Working • Wood Processing • Testing Machines • Drive Technology • Machine Tools
Packaging & Printing Machineries • Paper & Glass Processing • Food & Beverage Plants
Plastics & Rubber Processing • Textile Production • Renewable Energy • Power Generation

Tempsonics also offers solutions for Mobile Hydraulics (off-highway vehicles) and Liquid Level applications
R-SERIES
- The new generation + TempoLink® smart assistant

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COMPANY

Temposonics is recognized as an industry leader in sensing technologies and solutions. These sensors and transmitters permit high-precision and dynamic position and/or speed measurement in state-of-the-art automation and safety-relevant systems. With a versatile and ever-increasing product portfolio and a focus on superior regional support, Temposonics cooperates closely with customers, to optimize performance and reduce downtimes.

Outstanding quality associated with practical know-how ensures that customers achieve utmost productivity and success. Continuous research, development and production of sensor systems constantly enable new solutions for measuring tasks in the industrial, mobile hydraulics as well as process technology fields to be created.

Since April 2021, the company Temposonics is part of Amphenol Corporation (NYSE: APH). Amphenol is one of the largest manufacturers of interconnect products in the world. The company designs, manufactures and markets electrical, electronic and fiber optic connectors, coaxial and flat-ribbon cable, and interconnect systems. As sensor solutions manufacturer, Temposonics matches the portfolio of the group of companies that are all part of Amphenol, enabling customers to benefit from an extended, complementary product selection.

E-SERIES – Compact solutions for limited spaces

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G-SERIES – High durability in harsh environments

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MEASURING TECHNOLOGY

The absolute, linear position sensors provided by Temposonics rely on the company’s proprietary Temposonics® magnetostrictive technology, which can determine position with a high level of precision and robustness.

Each Temposonics position sensor consists of a ferromagnetic waveguide, a position magnet, a strain pulse converter and supporting electronics. The magnet, connected to the object in motion in the application, generates a magnetic field at its location on the waveguide. A short current pulse is applied to the waveguide. This creates a momentary radial magnetic field and torsional strain on the waveguide. The momentary interaction of the magnetic fields releases a torsional strain pulse that propagates the length of the waveguide. When the ultrasonic wave reaches the end of the waveguide it is converted into an electrical signal. Since the speed of the ultrasonic wave in the waveguide is precisely known, the time required to receive the return signal can be converted into a linear position measurement with both high accuracy and repeatability.

The technology, based on magnetostriction, does not rely on moving parts and is not exposed to mechanical stress. Therefore, the sensors exhibit considerably longer lifespans and much higher reliability when compared to other technologies, even in harsh working conditions. Furthermore, since the output from sensors with magnetostrictive technology corresponds to an absolute position, rather than a relative value, it is not required to recalibrate sensors.
THE NEW GENERATION

Temposonics® R-Series V position sensors are ready for Industry 4.0 applications. They support a variety of smart features that enable users to retrieve additional information from inside the application.

Users of the absolute, non-contact position sensors benefit from an improved performance as they have a higher resistance against shock, vibration, and high temperatures than ever before.

The backward compatibility of the R-Series V allows users to simply replace the current with the new generation of sensors. This means that also existing applications can benefit from the new features of Temposonics® R-Series V.

“Temposonics® R-Series V is the follow up to our current fourth generation. Based on our long-standing experiences, R-Series V is the next step in the innovative evolution of our sensors. By maintaining the qualities we are well-known for and at the same time pushing the boundaries, we are able to provide our customers the best R-Series we ever made.”

André Beste, Technical Marketing Manager

TRUST IN WHAT YOU KNOW. NOW EVEN BETTER.
SUPERIOR PERFORMANCE

Have a challenging application? Need reliable performance combined with resistance to high temperature, dirt and vibration?

Extreme demands require extraordinary solutions. Temposonics responds to this with an extensive range of measuring stroke options, simultaneous measurement of multiple magnets, smart electronic designs with built-in diagnostics, innovative housing concepts and a wide variety of controller interfaces. Our Temposonics® magnetostrictive technology is maximized with powerful electronics. The robust designs guarantee maximum reliability, high-precision position measurements and long-term operation in the harshest environments.

Success where others fail.
COMPACT SOLUTIONS

Need a reliable sensing solution designed for limited space or difficult access?

In line with your application requirements, Temposonics delivers solutions which fit your exact needs in terms of design and performance – from ultra-low profiles and detached electronics to compact hazardous area approved housings. In food & beverage, plastics, textiles and other industries, Temposonics® technology guarantees maximum productivity.

Always the smartest solution.
MAXIMUM SAFETY

Explosive environment or a dangerous area?

The position sensors from Temposonics are the first choice when it comes to meeting hazardous area standards – including ATEX- (Europe), NEC- (USA), CEC- (Canada), EX- (Russian market), IECEx- (global market), KG- (South Korea), CCC (Chinese market) and the Japanese approval for use in Class I, II, III, Division 1, Division 2 and Zone 0/1, Zone 1, Zone 2, Zone 21 and Zone 22. Optimized for applications where there is potential for exposure to flames and caustic substances, as well as the possibility of explosive atmospheres, our sensors are highly suited to implementation in chemical plants, offshore oil/gas rigs and other applications of this kind.

Maximum safety for machines and their operators.

INNOVATIVE TECHNOLOGY

Our mission at Temposonics is to provide outstanding quality and application knowledge. We focus on understanding your requirements so you can attain the highest levels of productivity and that success is assured. Our resources are dedicated to the continual development of new products and delivering unparalleled application-oriented solutions to market with speed and agility. It is no coincidence that the engineering team at Temposonics is the largest professional team within our organization.

Pioneers and innovators.
At the head of our sensors, a threaded flange and O-ring allow the device to be mounted and sealed into a port opening in the cylinder end cap. Alternatively, some sensor designs enable direct embedding of the complete sensor (including the supporting electronics) inside the cylinder. Here the sensor’s pressure-resistant rod fits into a bore that is drilled through the center of the piston head and rod assembly. The position magnet is mounted on the top of the piston head or installed in a shallow counter-bore within the piston head.

Modular, environmentally friendly design

The modular design of the R-Series V, R-, G- and GB-Series devices allows for easy replacement of the sensing element and electronics without breaking the cylinder’s high pressure seal. This not only prevents leaks from the cylinder port, but also significantly reduces maintenance costs and downtime. Temposonics® technology is mounted inside cylinders across a broad range of industry sectors – from steel rollers to wood plants, from food processing to renewable energy.
## SERIES QUICK GUIDE

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<th>SERIES</th>
<th>FEATURES</th>
<th>OUTPUT</th>
<th>MINIMUM STROKE LENGTH</th>
<th>MAXIMUM STROKE LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E-Series</strong></td>
<td>Compact Solutions • High Durability • Innovative Design • The New Generation • Superior Performance • Rugged Design</td>
<td>Velocity measurement • Multi-position measurement • Programmable sensor parameters • Diagnostic LEDs • Redundant version</td>
<td>25 mm (1 in.) • 50 mm (2 in.)</td>
<td>1500 mm (60 in.) • 2540 mm (100 in.) • 2900 mm (114 in.) • 3000 mm (118 in.) • 3250 mm (128 in.) • 5080 mm (200 in.) • 6350 mm (250 in.) • 7620 mm (300 in.) • 20000 mm (787 in.)</td>
</tr>
<tr>
<td><strong>G-Series</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GB-Series</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>R-Series</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T-Series</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FEATURES
- Velocity measurement
- Multi-position measurement
- Programmable sensor parameters
- Diagnostic LEDs
- Redundant version

### OUTPUT
- Analog - Current
- Analog - Voltage
- Start/Stop
- PWM
- SSI
- Profibus
- CANbus
- DeviceNet
- EtherCAT
- EtherCAT/P
- POWERLINK
- PROFIBUS
- IO-Link

### MINIMUM STROKE LENGTH
- 25 mm (1 in.) • 50 mm (2 in.) •

### MAXIMUM STROKE LENGTH
- 1500 mm (60 in.) ER
- 2540 mm (100 in.) ER, EE, GTE
- 2900 mm (114 in.) GTE/G3
- 3000 mm (118 in.) ER, EL, EP, ET
- 3250 mm (128 in.) GB
- 5080 mm (200 in.) GP
- 6350 mm (250 in.) RP5
- 7620 mm (300 in.) GH
- 20000 mm (787 in.) RF

### SERIES QUICK GUIDE CERTIFICATES

<table>
<thead>
<tr>
<th>SERIES</th>
</tr>
</thead>
</table>
| **E-Series** | EH • ET • EP • EL • EP2 • ER • EE •
| **G-Series** | GH • GP • GT2/G3 • GTE •
| **GB-Series** | GB •
| **R-Series** | RH • RP • RF • RD4 • RT4 • RS •
| **T-Series** | TH (Analog) • TH (SSI, CANbus) •
| **HPH FOR** |
| **G-/R-Series** | GH • RH •
SAVE YOUR TIME
FOR THE THINGS YOU LOVE.
...trust the experts!

Have you ever thought about how much time you’re wasting waiting for adequate support or your order?

Our commitment at Temposonics is to consistently deliver quality products on time to meet your schedules and provide first-class service. Trust in our continuous product development of high-performance position sensors and rely on our highly qualified personnel.

At Temposonics, we live by the promise of unparalleled service that enables us to take all available means to exceed your expectations. Our goal is to support you optimizing your productivity and we love the idea to make you save your valuable time.

Your Temposonics Team
**E-SERIES**

*(EH, ET, EP, EL, EP2, ER, EE)*

The Temposonics® E-Series are very compact sensor models suitable for situations where space-constrained mounting is a critical factor. Temposonics offers different designs to meet the needs of various industrial applications.

This series features three rod models for in-cylinder integration: EH, ET, EE (embedded in cylinder) and three profile models with a slim housing: EP and EP2. On the EP2 sensor, the position magnet can travel along the entire flat housing profile.

The ER sensor has an aluminum cylinder with a guided driving rod which contains both the sensor element and the electronics. The position is detected via the solid extractable driving rod.

Typical applications for E-Series sensors are plastics processing, food & beverage processing, control systems and packaging.

### Output (resolution)

<table>
<thead>
<tr>
<th></th>
<th>EH</th>
<th>ET</th>
<th>EP/EL</th>
<th>EP2</th>
<th>ER</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Infinite</td>
<td>16 bit*</td>
<td>Infinite</td>
<td>Infinite</td>
<td>Infinite</td>
<td>Infinite</td>
</tr>
<tr>
<td>Voltage</td>
<td>Infinite</td>
<td>16 bit*</td>
<td>Infinite</td>
<td>Infinite</td>
<td>Infinite</td>
<td>Infinite</td>
</tr>
<tr>
<td>Start/Stop</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>ISII</td>
<td>20 μm</td>
<td>5 μm</td>
<td>20 μm</td>
<td>20 μm</td>
<td>20 μm</td>
<td>20 μm</td>
</tr>
<tr>
<td>CANopen</td>
<td>10 μm</td>
<td>–</td>
<td>10 μm</td>
<td>10 μm</td>
<td>10 μm</td>
<td>–</td>
</tr>
<tr>
<td>IO-Link</td>
<td>5 μm</td>
<td>–</td>
<td>5 μm</td>
<td>5 μm</td>
<td>5 μm</td>
<td>–</td>
</tr>
</tbody>
</table>

### Operating conditions

**Temperature**

EH/EP/EL/EP2/ER: −40…+75 °C (−40…+167 °F)

ET (Analog): −40…+85 °C (−40…+185 °F)

ET (SSI): −40…+90 °C (−40…+194 °F)

ET (Start/Stop): −40…+105 °C (−40…+221 °F)

EE: −40…+85 °C (−40…+185 °F)

**Shock test**

100 g (single shock), IEC standard 60068-2-27

**Vibration test**

EH/EP/EL/EE: 15 g/10…2000 Hz

ET: 20 g/10…2000 Hz

EP2: 8 g/10…2000 Hz

ER: 5 g/10…2000 Hz

IEC standard 60068-2-6 (excluding resonant frequencies)

### Design

**Stroke length**

EH/EE: 50…2540 mm (2…100 in.)

ET/EP/EL/EP2: 50…3000 mm (2…118 in.)

ER: 50…1500 mm (2…60 in.)

### Accuracy

**Linearity**

≤ ±0.02 % F.S.

### Electrical connection

**Operating voltage**

+24 VDC (−15+20 %)

*Minimum 1 μm depending on stroke length

**Controller dependent

More information available at: www.temposonics.com
G-SERIES
(GH, GP, GT2/GT3, GTE)

The Temposonics® G-Series provides high durability and accurate position measurement solutions in harsh industrial settings. The sensor element is installed in a pressure-resistant stainless steel rod or aluminum profile. A double-shielded housing protects the electronics and offers excellent EMI immunity.

The GT2/GT3 and GTE models feature multiple independent measuring systems contained in one compact housing. Each measuring system has its own channel with sensor element, power and evaluation electronics and output signal. The GTE model is embedded in a cylinder for added robustness. Example applications include control valves, fluid cylinders, turbine pitch control, ship control systems and floodgates.

### Output (resolution)

<table>
<thead>
<tr>
<th></th>
<th>GH</th>
<th>GP</th>
<th>GT2/GT3</th>
<th>GTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Infinite</td>
<td>Infinite</td>
<td>Analog</td>
<td>Infinite</td>
</tr>
<tr>
<td>Voltage</td>
<td>Infinite</td>
<td>Infinite</td>
<td>Analog</td>
<td>Infinite</td>
</tr>
<tr>
<td>Start/Stop</td>
<td>*</td>
<td>*</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PWM</td>
<td>*</td>
<td>*</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

### Operating conditions

**Temperature**
- GH/GP: −40…+80 °C (−40…+176 °F)
- GT2/GT3: −40…+75 °C (−40…+167 °F)
- GTE: −20…+75 °C (−4…+167 °F)

**Shock test**
- 100 g (single shock), IEC standard 60068-2-27

**Vibration test**
- GH**: 15 g/10…2000 Hz
- GP: 15 g/10…2000 Hz
- GT2/GT3: 5 g/10…2000 Hz
- GTE: 10 g/10…2000 Hz

IEC standard 60068-2-6 (excluding resonant frequencies)

### Design

**Stroke length**
- GH: 50…7620 mm (2…300 in.)
- GP: 50…5080 mm (2…200 in.)
- GT2/GT3: 50…2900 mm (2…114 in.)
- GTE: 50…2540 mm (2…100 in.)

### Accuracy

**Linearity** < ±0.02 % F.S.

### Electrical connection

**Operating voltage** +24 VDC (−15/+20 %)

* Controller dependent
** Option: High vibration resistant

More information available at: www.temposonics.com
GB-SERIES
With threaded flange (GB-M, GB-T) or pressure fit flange (GB-M, GB-T)

The Temposonics® GB-Series is designed to be incorporated into hydraulic cylinders, such as those typically used in power generation plants. The flat, compact electronics housing facilitates deployment in restricted spaces.

The operational advantages of these sensors are: high pressure resistance (the new GB-J sensor offers up to 800 bar operating pressure), strong immunity to EMI and ability to operate in temperatures up to +100 °C (+212 °F). High durability and increased resistance to rust is achieved by using 316L stainless steel (GB-N model). GB-Series sensors can be programmed using a hand-programmer unit, through the USB port.

The GB with threaded flange (GB-M/GB-T) offers further advantages such as a sensor electronics housing with its electrical connection that can be rotated 360 degrees to easily achieve the necessary connection orientation. If needed, the sensor element and electronics can be replaced while the flange is still installed in the cylinder. This means that the hydraulic circuit is not interrupted which results in lower maintenance costs and reduced downtime.

Output (resolution)
- Current: 16 bit
- Voltage: 16 bit
- SSI: 5 µm

Operating conditions
- Temperature: -40...+100 °C (-40...+212 °F)
- Shock test: 100 g (single shock), IEC standard 60068-2-27
- Vibration test: 15 g/10...2000 Hz, IEC standard 60068-2-6 (excluding resonant frequencies)

Design
- Stroke length: 25...3250 mm (1...128 in.)

Accuracy
- Linearity: < ±0.02 % F.S.

Electrical connection
- Operating voltage: +24 VDC (-15/+20 %)

More information available at:
www.temposonics.com
R-SERIES V
The new generation (RH5, RP5)

Temposonics® R-Series V is the successor to our current fourth generation. The new sensors have higher resistance to vibration and high temperatures, are ready for Industry 4.0 and fit perfectly into existing applications.

The new Industry 4.0 features for all outputs offer users unique advantages, as they provide additional information about the process in addition to the pure process data (position/speed). Status and statistical data are recorded and processed during operation and can be used to better understand the processes within the application.

In combination with the increased performance and improved robustness, the user is offered the certainty that existing applications work even more reliably and that future requirements are already being met.

Output (resolution)

<table>
<thead>
<tr>
<th></th>
<th>RH5</th>
<th>RP5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>16 bit</td>
<td>16 bit</td>
</tr>
<tr>
<td>Voltage</td>
<td>16 bit</td>
<td>16 bit</td>
</tr>
<tr>
<td>SSI</td>
<td>0.1 µm</td>
<td>0.1 µm</td>
</tr>
<tr>
<td>EtherCAT®</td>
<td>0.5 µm</td>
<td>0.5 µm</td>
</tr>
<tr>
<td>EtherNet/IP®</td>
<td>1 µm</td>
<td>1 µm</td>
</tr>
<tr>
<td>POWERLINK</td>
<td>0.5 µm</td>
<td>0.5 µm</td>
</tr>
<tr>
<td>PROFINET</td>
<td>0.5 µm</td>
<td>0.5 µm</td>
</tr>
</tbody>
</table>

Operating conditions

<table>
<thead>
<tr>
<th></th>
<th>RH5</th>
<th>RP5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>−40…+85 °C (−40…+185 °F)</td>
<td></td>
</tr>
<tr>
<td>Shock test</td>
<td>150 g/11 ms, IEC standard 60068-2-27</td>
<td></td>
</tr>
<tr>
<td>Vibration test</td>
<td>30 g/10…2000 Hz, IEC standard 60068-2-6 (excluding resonant frequencies)</td>
<td></td>
</tr>
</tbody>
</table>

Design

<table>
<thead>
<tr>
<th></th>
<th>RH5</th>
<th>RP5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke length</td>
<td>25…7620 mm (1…300 in.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25…6350 mm (1…250 in.)</td>
<td></td>
</tr>
</tbody>
</table>

Accuracy

<table>
<thead>
<tr>
<th></th>
<th>RH5</th>
<th>RP5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linearity deviation</td>
<td>&lt; 0.01 % F.S. (minimum ±50 µm)</td>
<td></td>
</tr>
</tbody>
</table>

Electrical connection

<table>
<thead>
<tr>
<th></th>
<th>RH5</th>
<th>RP5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>+12…30 VDC ±20 % (9.6…36 VDC)</td>
<td></td>
</tr>
</tbody>
</table>
The Temposonics® R-Series features the highest performance, accuracy and reliability in magnetostrictive linear position sensors designed for advanced motion control implementations. With a variety of housing styles and electrical interfaces, the R-Series can be integrated into a wide range of applications. They have a modular construction and are extremely robust. The double-shielded design assures the best immunity against EMI. Whether it is a rod version (RH), profile version (RP), has detached electronics (RD4), built-in redundancy (RT4) or a flexible rod (RF), the R-Series is a highly compelling sensor solution. For extremely harsh environments, Temposonics offers the RS sensor with IP69K protective housing.

Output (resolution)

<table>
<thead>
<tr>
<th></th>
<th>RH</th>
<th>RP</th>
<th>RF</th>
<th>RD4</th>
<th>RT4</th>
<th>RS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>—</td>
<td>—</td>
<td>16 bit</td>
<td>16 bit</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Voltage</td>
<td>—</td>
<td>—</td>
<td>16 bit</td>
<td>16 bit</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>SSI</td>
<td>—</td>
<td>—</td>
<td>2 µm</td>
<td>1 µm</td>
<td>1 µm</td>
<td>—</td>
</tr>
<tr>
<td>Profibus</td>
<td>—</td>
<td>—</td>
<td>1 µm</td>
<td>1 µm</td>
<td>1 µm</td>
<td>—</td>
</tr>
<tr>
<td>CANbus</td>
<td>—</td>
<td>—</td>
<td>2 µm</td>
<td>2 µm</td>
<td>2 µm</td>
<td>—</td>
</tr>
<tr>
<td>DeviceNet</td>
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<td>—</td>
<td>1 µm</td>
<td>1 µm</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>EtherCAT*</td>
<td>—</td>
<td>—</td>
<td>1 µm</td>
<td>1 µm</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>EtherCAT/IP**</td>
<td>—</td>
<td>—</td>
<td>1 µm</td>
<td>1 µm</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>POWERLINK</td>
<td>—</td>
<td>—</td>
<td>1 µm</td>
<td>1 µm</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PROFINET</td>
<td>—</td>
<td>—</td>
<td>1 µm</td>
<td>1 µm</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Operating conditions

- **Temperature**: −40...+75 °C (−40...+167 °F)
- **Shock test**: 100 g (single shock), IEC standard 60068-2-27
- **Vibration test**: RH/RP*: 15 g/10...2000 Hz
  - RF: 5 g/10...150 Hz
  - RD4: 10 g/10...2000 Hz
  - RT4: 5 g/10...2000 Hz
  - IEC standard 60068-2-6 (excluding resonant frequencies)

Design

- **Stroke length**: RH: 25...7620 mm (1...300 in.)
  - RP/RD4: 25...5080 mm (1...200 in.)
  - RF: 150...2000 mm (6...787 in.)
  - RT4: 25...2540 mm (1...100 in.)
  - RS: 50...7620 mm (1...300 in.)

Accuracy

- **Linearity**: RH/RP/RS: < ±0.01 % F.S.
  - RF/RD4/RT4: < ±0.02 % F.S.

Electrical connection

- **Operating voltage**: ±24 VDC (−15%+20%)

*Option: High vibration resistant

More information available at: www.temposonics.com
The Temposonics® T-Series sensors are designed for hazardous working environments, where they may have to deal with flames, caustic substances and potentially explosive atmospheres (such as chemical plants, offshore oil/gas rigs, etc.).

The T-Series carries the ATEX certification for Europe, the NEC and CEC certificates for the US and Canada, the EAC Ex certificate for the Russian market, the IECEx certificate for the global market, the KCs certificate for the South Korean market, the CCC certificate for the Chinese market as well as the Ex certificate for Japan for use in Class I, II, III, Division 1, Division 2 and Zone 0/1, Zone 1, Zone 2, Zone 21 and Zone 22.

Output (resolution)
- Current Minimum 16 bit
- SSI Minimum 0.5 µm
- CANbus Minimum 2 µm

Operating conditions
- Temperature
  - Standard: −40…+75 °C (−40…+167 °F)
- Shock test
  - 100 g (single shock), IEC standard 60068-2-27
- Vibration test
  - 15 g/10…2000 Hz, IEC standard 60068-2-6 (excluding resonant frequencies)

Design
- Stroke length
  - Standard: 25…7620 mm (1…300 in.)

Accuracy
- Linearity
  - < ±0.01 % F.S.

Electrical connection
- Operating voltage
  - +24 VDC (−15%<20 %)
### HAZARDOUS AREAS

Temposonics responds to the user’s need of maximum safety with sensor models specifically designed for applications found in hazardous (increased safety & flameproof).

| G-Series GH/GP | Marking | II 3G Ex ec IIC T4 Gc | II 3D Ex tc IIC T101°C Dc
| Stroke length | 50…1650 mm (2…65 in.) |
| Operating temperature | -20 °C (−4 °F) ≤ Ta ≤ 75 °C (+167 °F) |
| IP ingress protection | GH: IP67/GP: IP65 |
| Outputs | Analog & Start/Stop |

| GH Sensor |

| G-Series GTE | Marking | II 3G Ex ec IIC T4 Gc |
| Stroke length | 50…1650 mm (2…65 in.) |
| Operating temperature | -20 °C (−4 °F) ≤ Ta ≤ 75 °C (+167 °F) |
| IP ingress protection | IP54/IP64 |
| Outputs | Analog |

| GTE Sensor |

| HPH (G-/R-Series/R-Series V) | Marking | II 2G Ex db IIC T4 6c |
| cucumber | II 2D Ex tb IIC T100°C Dc |
| Operating temperature | -40…+75 °C (−40…+167 °F) |
| IP ingress protection | IP66 |
| Outputs | Analog, Start/Stop & PWM |

| HPH Sensor |

| E-Series ET | Marking | II 2G Ex db IIC T4 6c |
| cucumber | II 2D Ex tb IIC T100°C Dc |
| cucumber | Class I Zone 2 T4 IIC Zone 22 AEx tc/Ex tc IIIC T100°C Dc |
| Operating temperature | -40 °C (−40 °F) ≤ Ta ≤ 105 °C (+221 °F) (Start/Stop) |
| IP ingress protection | IP66/IP68 |
| Outputs | Analog, Start/Stop & PWM |

| ET Rod Sensor |

More information available at: www.temposonics.com
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