Temposonics
AN AMPHENOL COMPANY

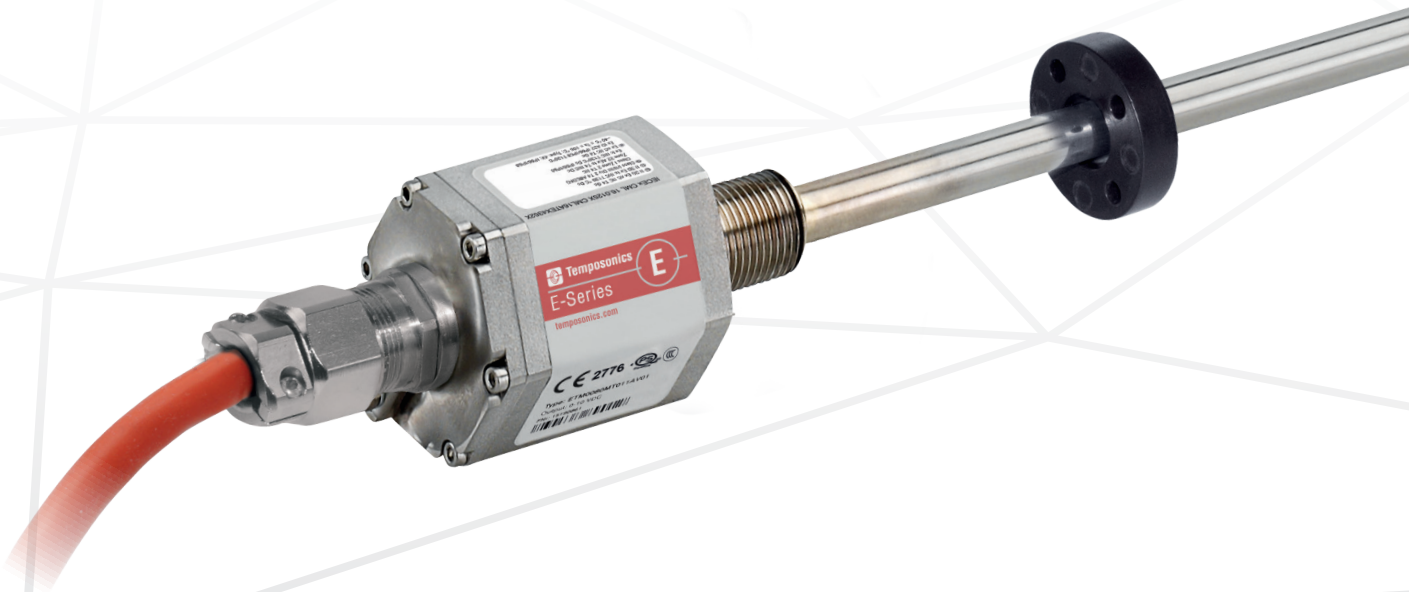
Operation Manual

E-Series – ET Start/Stop

Magnetostrictive Linear Position Sensors

Sensor with Ex approval

- ATEX/UK Ex/IECEx/CEC/NEC/CCC certified



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1. Introduction

1.1 Purpose and use of this manual

Before starting the operation of Temposonics position sensors, read this documentation thoroughly and follow the safety information. Keep this manual for future reference!

The content of this technical documentation and of its appendix is intended to provide information on mounting, installation and commissioning by qualified automation personnel [1] or instructed service technicians who are familiar with the project planning and dealing with Temposonics sensors.

1.2 Used symbols and warnings

Warnings are intended for your personal safety and for avoidance of damage to the described product or connected devices. In this documentation, safety information and warnings to avoid danger that might affect the life and health of operating as well as service personnel or cause material damage are highlighted by the preceding pictogram, which is defined below.

Symbol	Meaning
NOTICE	This symbol is used to point to situations that may lead to material damage, but not to personal injury.

2. Safety instructions

2.1 Intended use

This product may be used only for the applications defined under item 1 to item 4 and only in conjunction with the third-party devices and components recommended or approved by Temposonics. As a prerequisite of proper and safe operation, the product requires correct transport, storage, mounting and commissioning and must be operated with utmost care.

1. The sensor systems of all Temposonics® series are intended exclusively for measurement tasks encountered in industrial, commercial and laboratory applications. The sensors are considered as system accessories and must be connected to suitable evaluation electronics, e.g. a PLC, IPC, indicator or other electronic control unit.
2. The sensor's surface temperature class is T4.
3. The ATEX, UK Ex, IECEx, CEC, NEC and CCC certificates have to be taken into account, including any special conditions defined therein, as well as chapter "2.3 Installation, commissioning and operation" on page 4.
4. The position sensor may be used in hazardous areas according to Fig. 23. Any use of this product outside of these approved areas will void the warranty and all manufacturer's product responsibilities and liabilities. For non-hazardous areas Temposonics recommends to use the version N (not approved).

Zone	Explosion group
Zone 2 (Gas-Ex, category 3G, EPL Gc)	IIA, IIB and IIC
Zone 22 (Dust-Ex, category 3D, EPL Dc)	IIIA, IIIB and IIIC

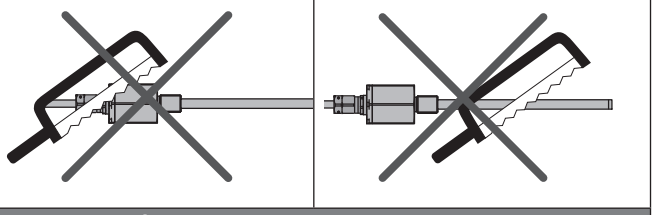
Class	Group
Class I (Gas, Division 2)	A, B, C, D
Class II/III (Dust, Division 2)	F, G

2.2 Forseeable misuse

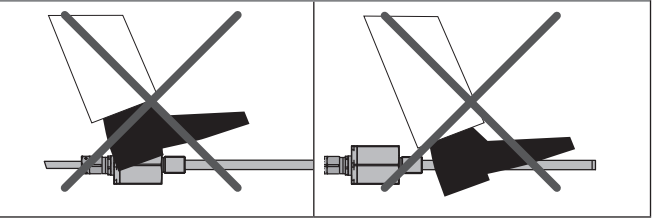
Forseeable misuse	Consequence
Lead compensating currents through the enclosure	The sensor will be damaged
Wrong sensor connection	The sensor will not work properly or will be destroyed
Operate the sensor out of the operating temperature range	No signal output The sensor can be damaged
Power supply is out of the defined range	Signal output is wrong / no signal output/ the sensor will be damaged
Position measurement is influenced by an external magnetic field	Signal output is wrong
Cables are damaged	Short circuit – the sensor can be destroyed/sensor does not respond
Spacers are missing/ are installed in a wrong order	Error in position measurement
Wrong connection of ground/shield	Signal output is disturbed The electronics can be damaged
Use of a magnet that is not certified by Temposonics	Error in position measurement
Wrong gradient in controller	Error in position measurement

1/ The term qualified technical personnel characterizes persons who:
- are familiar with the safety concepts of automation technology applicable to the particular project
- are competent in the field of electromagnetic compatibility (EMC)
- have received adequate training for commissioning and service operations
- are familiar with the operation of the device and know the information required for correct operation provided in the product documentation

Do not alter the sensor afterwards.
➔ The sensor might be damaged.



Do not step on the sensor.
➔ The sensor might be damaged.



2.3 Installation, commissioning and operation

The position sensors must be used only in technically safe condition. To maintain this condition and to ensure safe operation, installation, connection and service, work may be performed only by qualified technical personnel, according to IEC 60079-14, IEC 60079-17, TRBS 1203, Canadian Electrical Code (CEC), National Electrical Code (NEC), China Compulsory Certification (CCC) and local regulations.
If danger of injury to persons or of damage to operating equipment is caused by sensor failure or malfunction, additional safety measures such as plausibility checks, limit switches, EMERGENCY STOP systems, protective devices etc. are required. In the event of trouble, shut down the sensor and protect it against accidental operation.

Safety instructions for commissioning
To maintain the sensor's operability, it is mandatory to follow the instructions given below.

1. Follow the specifications given in the technical data.
2. Ensure that equipment and associated components used in a hazardous environment are selected and installed in compliance with regulations governing the geographical location and facility. Only install equipment that complies with the types of protection relevant to the applicable Zones and Categories.
3. In explosive atmospheres use only such auxiliary components that meet all requirements of the local and national standards.
4. The potential equalisation of the system has to be established according to the regulations of erection applicable in the respective country of use (VDE 0100, part 540; IEC 364-5-54).
5. Sensors from Temposonics are approved only for the intended use in industrial environments (see chapter "2.1 Intended use" on page 3). Contact the manufacturer for advice, if aggressive substances are present in the sensor environment.
6. Measures for lightning protection have to be taken by the user.
7. The user is responsible for the mechanical protection of the sensor.
8. The cable gland of the sensor must be protected against any external impact energy exceeding 4 J. The maximum thermal load of the cables must be taken into account.
9. The user is responsible for meeting all safety conditions as outlined by:
   - Installation instructions
   - Local prevailing standards and regulations
10. Any parts of the equipment which got stuck (e.g. by frost or corrosion) may not be removed by force if potentially explosive atmosphere is present.
11. The formation of ice on the equipment has to be prevented.
12. It is not allowed to open the sensor.
13. The connecting cable has to be either led out of the hazardous area uncut or wired to outlets which comply with the type of protection required locally.
14. The surface temperatures of equipment parts must be kept clearly below the ignition temperature of the foreseeable air/dust mixtures in order to prevent the ignition of suspended dust.

How to ensure safe commissioning

1. Protect the sensor against mechanical damage during installation and operation.
2. Do not use damaged products and secure them against unintentional commissioning. Mark damaged products as being defective.
3. Prevent electrostatic charges.
4. Do not use the sensor in cathodic systems for corrosion protection. Do not led parasitic currents via the construction.
5. Switch off the supply voltage prior to disconnecting or connecting the equipment.
6. Connect the sensor very carefully and pay attention to the polarity of connections, power supply as well as where appropriate to the shape and duration of control pulses.
7. Use only approved power supplies.
8. Ensure that the specified permissible limit values of the sensor for supply voltage, environmental conditions, etc. are met.
9. Make sure that:
   - the sensor and associated components were installed according to the instructions
   - the sensor enclosure is clean
   - the magnet does not grind on the rod. This could cause damage to the magnet and the sensor rod. If there is contact between the moving magnet including the magnet holder and the sensor rod, make sure that the maximal speed of the moving magnet is less or equal 1 m/s.
10. Ground the sensor via the ground lug. Both the sensor and the moving magnet including magnet holder must be connected to protective ground (PE) to avoid electrostatic discharge (ESD).
11. Before applying power, ensure that nobody's safety is jeopardized by starting machines.
12. Check the function of the sensor regularly and provide documentation of the checks.
    (see chapter "6.2 Maintenance" on page 16).

2.4 Safety instructions for use in explosion-hazardous areas

The sensor has been designed for operation inside explosion-hazarded areas. It has been tested and left the factory in a condition in which it is safe to operate. Relevant regulations and European standards as well as Canadian and North American standards have been observed. According to Ex marking (see chapter “2.1 Intended use” on page 3) and the ATEX und UK Ex certificates (attached to this document), the sensor is approved only for operation in defined hazardous areas. All other certificates can be found at: www.temposonics.com.

2.5 Warranty

Temposonics grants a warranty period for the position sensors and supplied accessories relating to material defects and faults that occur despite correct use in accordance with the intended application [2]. The Temposonics obligation is limited to repair or replacement of any defective part of the unit. No warranty can be provided for defects that are due to improper use or above average stress of the product, as well as for wear parts. Under no circumstances will Temposonics accept liability in the event of offense against the warranty rules, no matter if these have been assured or expected, even in case of fault or negligence of the company.
Temposonics explicitly excludes any further warranties. Neither the company’s representatives, agents, dealers nor employees are authorized to increase or change the scope of warranty.

2.6 Return

For diagnostic purposes, the sensor can be returned to Temposonics. Any shipment cost is the responsibility of the sender [2]. For a corresponding form, see chapter “9. Appendix” on page 19.

NOTICE

When returning sensors, place protective caps on male and female connectors of the sensor. For pigtail cables, place the cable ends in a static shielding bag for electrostatic discharge (ESD) protection. Fill the outer packaging around the sensor completely to prevent damage during transport.

2/ See also applicable Temposonics terms of sales and delivery on www.temposonics.com

3. Identification

3.1 Order code Temposonics® ET

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
E	T										1		R	3
a		b	c					d			e	f	g	

a	Sensor model
E T	Rod

b	Design
ET rod-style sensor with housing and sensor rod material stainless steel 1.4404 (AISI 316L)	
F	Threaded flange ¾"-16 UNF-3A
W	Threaded flange M18×1.5-6g
ET rod-style sensor with housing material stainless steel 1.4305 (AISI 303) and sensor rod material stainless steel 1.4306 (AISI 304L)	
M	Threaded flange M18×1.5-6g
S	Threaded flange ¾"-16 UNF-3A

c	Stroke length	
X X X X M	0050…3000 mm	
Standard stroke length (mm)		**Ordering steps**
50… 500 mm		5 mm
500… 750 mm		10 mm
750…1000 mm		25 mm
1000…2500 mm		50 mm
2500…3000 mm		100 mm
X X X X U	002.0…118.0 in.	
Standard stroke length (in.)		**Ordering steps**
2… 20 in.		0.2 in.
20… 30 in.		0.5 in.
30… 40 in.		1.0 in.
40…100 in.		2.0 in.
100…118 in.		4.0 in.
Non-standard stroke lengths are available; must be encoded in 5 mm/0.1 in. increments		

d	Connection type
T X X	T01…T10 (1…10 m) XX m FEP cable (part no. 530 112) T03…T33 (3…33 ft.) XX ft. FEP cable (part no. 530 112) See “Frequently ordered accessories” for cable specifications.
V X X	V01…V10 (1…10 m) XX m silicone cable (part no. 530 113) V03…V33 (3…33 ft.) XX ft. silicone cable (part no. 530 113) See “Frequently ordered accessories” for cable specifications.
Encode in meters if using metric stroke length. Encode in feet if using US customary stroke length.	

e	Operating voltage
1	+24 VDC (–15/+20 %)

f	Version (see “Certification of Temposonics® ET (version A and E)” on page 26 for further information)
A	ATEX/UK Ex/IECEx/CEC/NEC/CCC
E	ATEX/UK Ex/IECEx/CEC/NEC/CCC with ½" NPT adapter
N	Not approved

NOTICE

Version E (section f) is only available with design »M« and »S« (section b) .

g	Output
R 3	Start/Stop with sensor parameters upload function

3.2 Nameplate (example)

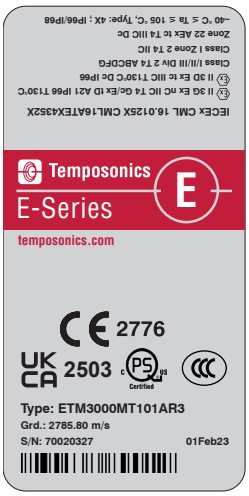


Fig. 1: Label of sensor for use in explosion hazardous areas

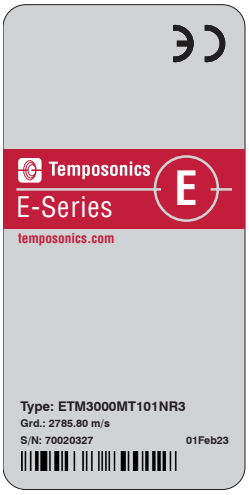


Fig. 2: Label of sensor without certification for use in explosion hazardous areas

3.3 Approvals

See chapter “8. Technical data of Temposonics® ET” on page 17 f.

3.4 Scope of delivery

ET (rod sensor):
- Sensor

4. Product description and commissioning

4.1 Functionality and system design

Product designation
- Position sensor Temposonics® E-Series

Sensor model
- Temposonics® E-Series ET (rod sensor)

Stroke length
- 50...3000 mm (2…118 in.)

Output signal
- Start/Stop

Application
Temposonics position sensors are used for measurement and conversion of the length (position) variable in the fields of automated systems and mechanical engineering.

Principle of operation and system construction
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.

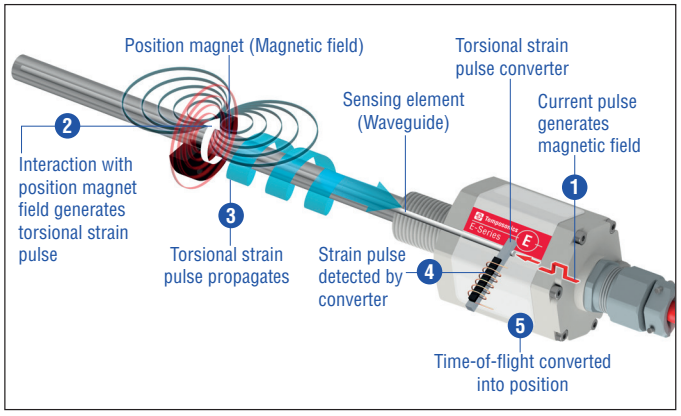
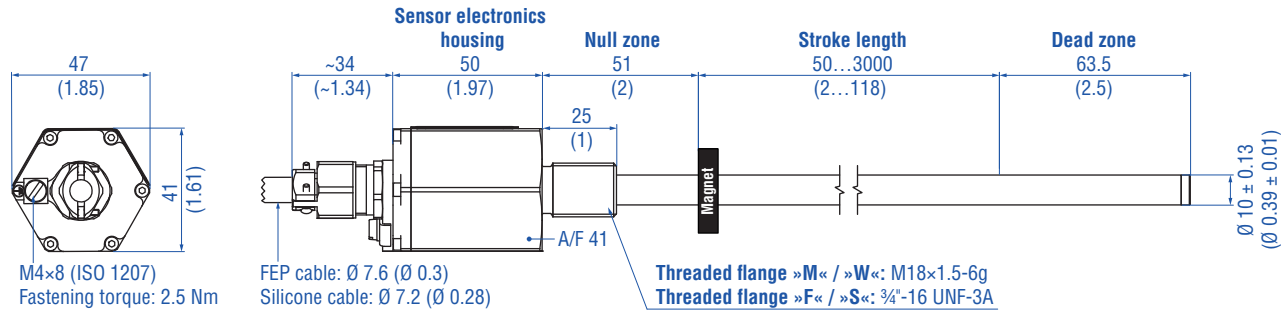


Fig. 3: Time-of-flight based magnetostrictive position sensing principle

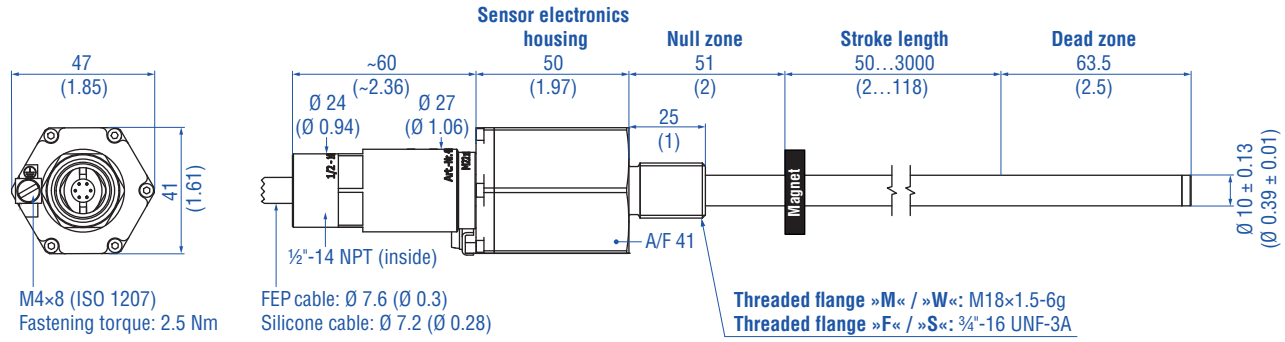
Modular mechanical and electronic construction
- The sensor rod protects the inner sensor element.
- The sensor electronics housing, a rugged stainless steel construction, contains the complete electronic interface with active signal conditioning.
- The external position magnet is a permanent magnet. Mounted on the mobile machine part, it travels along the sensor rod and triggers the measurement through the sensor rod wall.
- The sensor can be connected directly to a control system. Its electronics generates a strictly position proportional signal output between start and end position.

4.2 Installation and design of Temposonics® ET

ET-F/-M/-S/-W, example: Version A/N



ET-F/-M/-S/-W, example: Version E



Controlling design dimensions are in millimeters and measurements in ( ) are in inches

Fig. 4: Temposonics® ET with ring magnet

Installation of ET with threaded flange »F«, »M«, »S« & »W«
Fix the sensor rod via threaded flange M18×1.5-6g or ¾"-16 UNF-3A. Lightly oil the thread before tightening. Lightly oil the thread before tightening.

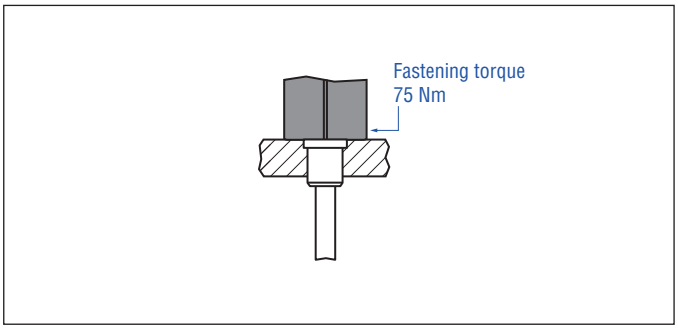


Fig. 5: Mounting example of threaded flange »F«, »M«, »S«, »W«

Installation of a rod-style sensor in a fluid cylinder
The rod-style version has been developed for direct stroke measurement in a fluid cylinder. Mount the sensor via threaded flange or a hex nut.

- Mounted on the face of the piston, the position magnet travels over the rod without touching it and indicates the exact position through the rod wall – independent of the hydraulic fluid.
- The pressure resistant sensor rod is installed into a bore in the piston rod.

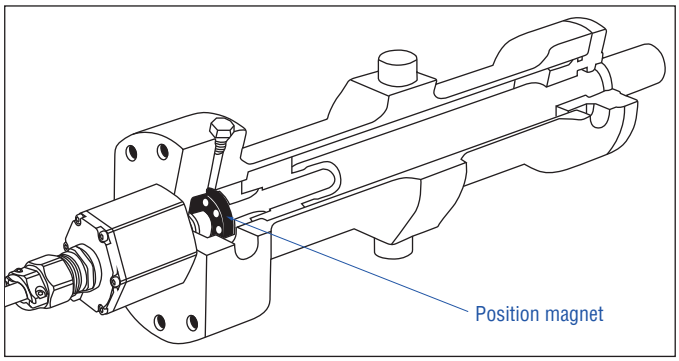


Fig. 6: Sensor in cylinder

Hydraulics sealing

There are two ways to seal the flange contact surface (Fig. 7):

1. A sealing by using an O-ring (e.g. 22.4 × 2.65 mm (0.88 × 0.1 in.), 25.07 × 2.62 mm (0.99 × 0.1 in.)) in a cylinder end cap groove.
2. A sealing by using an O-ring in the undercut.
   For threaded flange (¾"-16 UNF-3A) »F«/»S«:
   O-ring 16.4 × 2.2 mm (0.65 × 0.09 in.) (part no. 560 315)
   For threaded flange (M18×1.5-6g) »M«/»W«:
   O-ring 15.3 × 2.2 mm (0.60 × 0.09 in.) (part no. 401 133)

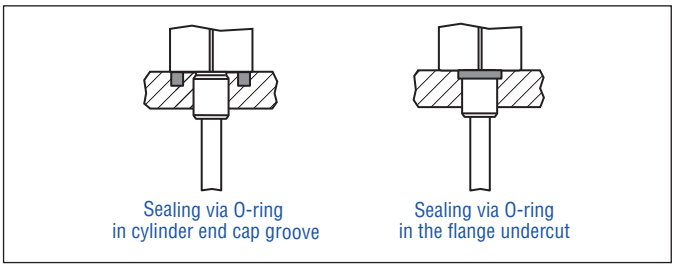


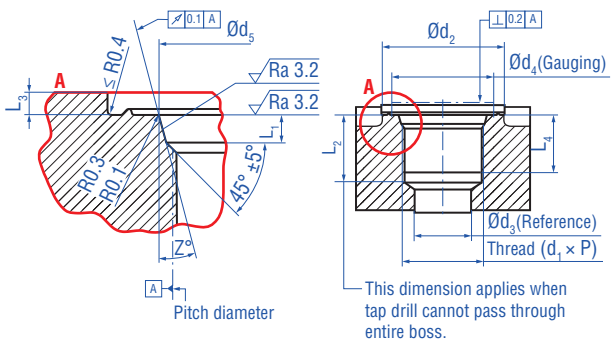
Fig. 7: Possibilities of sealing

- Note the fastening torque of 75 Nm.
- Seat the flange contact surface completely on the cylinder mounting surface.
- The cylinder manufacturer determines the pressure-resistant gasket (copper gasket, O-ring, etc.).
- The position magnet should not grind on the sensor rod.
- The piston rod drilling (≥ Ø 13 mm (≥ Ø 0.51 in.)) depends on the pressure and piston speed.
- Adhere to the information relating to operating pressure.
- Protect the sensor rod against wear.

In the case of threaded flange M18×1.5-6g provide a screw hole based on ISO 6149-1 (Fig. 8). See ISO 6149-1 for further information.

Notice for metric threaded flange

Thread (d_1×P)	d_2	d_3	d_4	d_5 +0.1 0	L_1 +0.4 0	L_2	L_3	L_4	Z° ±1°
ET-F/-M/-S/-W									
M18×1.5-6g	55	≥ 13	24.5	19.8	2.4	28	2	≥ 25.5	15°



Controlling design dimensions are in millimeters

Fig. 8: Notice for metric threaded flange M18×1.5-6g based on DIN ISO 6149-1

4.3 Magnet installation

Typical use of magnets

Magnet	Typical sensors	Benefits
Ring magnets 	**Rod model** (ET-F/-W/-M/-S)	• Rotationally symmetrical magnetic field
U-magnets 	**Profile & rod models** (ET-P/-F/-W/-M/-S)	• Height tolerances can be compensated, because the magnet can be lifted off
Block magnets 	**Profile & rod models** (ET-P/-F/-W/-M/-S)	• Height tolerances can be compensated, because the magnet can be lifted off

Fig. 9: Typical use of magnets

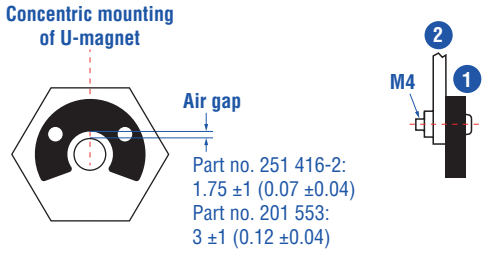
Mounting ring magnets, U-magnets & block magnets

Install the magnet using non-magnetic material for mounting device, screws, spacers etc.. The magnet must not grind on the sensor rod. Alignment errors are compensated via the air gap.

- Permissible surface pressure: Max. 40 N/mm² (only for ring magnets and U-magnets)
- Fastening torque for M4 screws: 1 Nm; use washers, if necessary
- Minimum distance between position magnet and any magnetic material has to be 15 mm (0.6 in.) (Fig. 11).
- If no other option exists and magnetic material is used, observe the specified dimensions (Fig. 11).

NOTICE

- Mount ring magnets and U-magnets concentrically.
- Mount block magnets centrically over the sensor rod or the sensor profile. The maximum permissible air gap must not be exceeded (Fig. 13/Fig. 14). Take care to mount the primary sensor axis in parallel to the magnet path in order to avoid damage to the carriage, magnet and sensor rod profile.



1 U-magnet
2 Non-magnetic mounting plate and fasteners

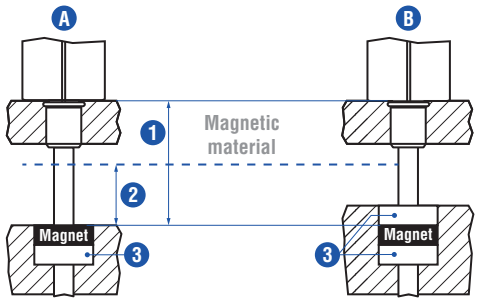
Fig. 10: Mounting of U-magnet (part no. 251 416-2)

Magnet mounting with magnetic material

When using magnetic material the dimensions of Fig. 11 must be observed.

A. If the position magnet aligns with the drilled piston rod

B. If the position magnet is set further into the drilled piston rod, install another non-magnetic spacer (e.g. part no. 400 633) above the magnet.



1 Null zone, depends on sensor model
2 Distance between position magnet and any magnetic material (≥ 15 mm (≥ 0.6 in.))
3 Non-magnetic spacer (≥ 5 mm (≥ 0.2 in.)) – Recommendation: 8 mm (0.31 in.)

Fig. 11: Installation with magnetic material

Sensors with stroke lengths ≥ 1 meter (3.3 ft.)

Support horizontally installed sensors with a stroke length of 1 meter (3.3 ft.) and more mechanically at the rod end. Without using a support, the sensor rod bends over and the rod and the position magnet may be damaged. A false measurement result is also possible. Longer rods require evenly distributed mechanical support over the entire length (e.g. part no. 561 481). Use an U-magnet (Fig. 12) for measurement.

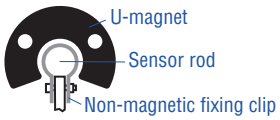
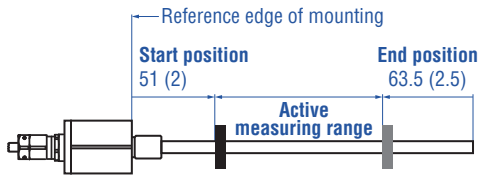


Fig. 12: Example of sensor support (part no. 561 481)

Controlling design dimensions are in millimeters and measurements in ( ) are in inches

Start and end positions of the position magnets
Consider the start and end positions of the position magnets during the installation. To ensure that the entire stroke length is electrically usable, the position magnet must be mechanically mounted as follows.

ET-F/-W/-M/-S with ring magnet & U-magnet



ET-F/-W/-M/-S mit block magnet

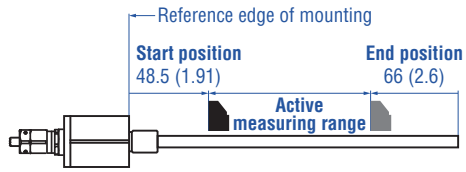


Fig. 13: Start and end positions of magnets

NOTICE

On all sensors, the areas left and right of the active stroke length are provided for null and dead zone (see “4.2 Styles and installation of Temposonics® ET” on page 8). These zones should not be used for measurement, however the active stroke length can be exceeded.

4.4 Electrical connection

Placement of installation and cabling have decisive influence on the sensor‘s electromagnetic compatibility (EMC). Hence correct installation of this active electronic system and the EMC of the entire system must be ensured by using suitable metal connectors, shielded cables and grounding. Overvoltages or faulty connections can damage the sensor electronics despite protection against wrong polarity.

NOTICE

1. Do not mount the sensors in the area of strong magnetic or electric noise fields.
2. Never connect/disconnect the sensor when voltage is applied.

Instruction for connection

- Connect the shield to ground externally via the controller equipment.
- Keep control and signal leads separate from power cables and sufficiently far away from motor cables, frequency inverters, valve lines, relays, etc..
- Use only connectors with metal housing, if you use a connector. Connect the shielding to the connector housing.
- Keep all non-shielded leads as short as possible.
- Keep the earth connection as short as possible with a large cross section. Avoid ground loops.
- With potential differences between machine and electronics earth connections, no compensating currents are allowed to flow across the cable shielding.
  Recommendation:
  Install potential compensating leads with large cross section.
- Use only stabilized power supplies in compliance with the specified electrical ratings.

Grounding of rod sensors
Connect the sensor electronics housing to machine ground. Ground sensor type ET version A (with ATEX/IECEx/CEC NEC/CCC approval) via ground lug as shown in Fig. 14. Ground the sensor type ET version N (not approved) via ground lug as shown in Fig. 14 or via thread. Ground sensor type ET version E (with ATEX/IECEx/CEC NEC/CCC approval) via ground lug as shown in Fig. 15.

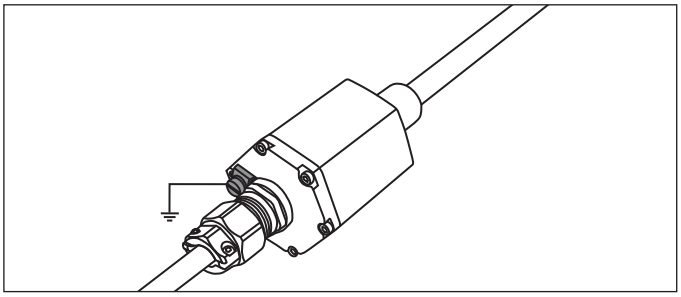


Fig. 14: Grounding via ground lug (version A, N)

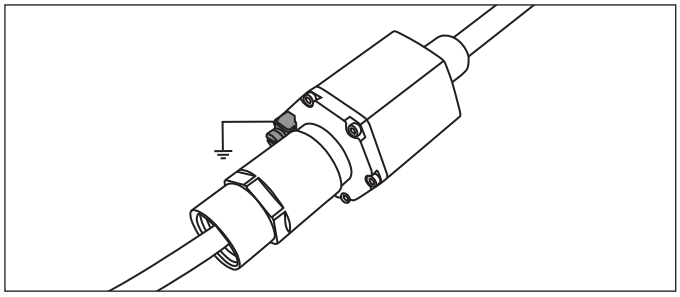


Fig. 15: Grounding via ground lug (version E)

Connector wiring
Connect the sensor directly to the controller, indicator or other evaluating systems as follows:

TXX/VXX

Signal + power supply

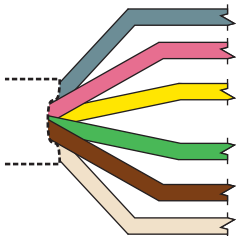
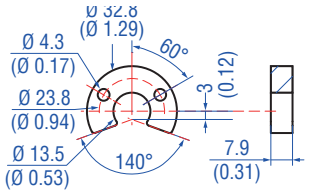
Cable	Color	Function
	GY	Stop (–)
	PK	Stop (+)
	YE	Start (+)
	GN	Start (–)
	BN	+24 VDC (–15/+20 %)
	WH	DC Ground (0 V)

Fig. 16: Connector wiring TXX/VXX

Controlling design dimensions are in millimeters and measurements in ( ) are in inches

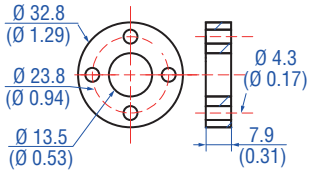
4.5 Frequently ordered accessories for ET-F/-W/-M/-S – Additional options available in our Accessories Catalog 551 444

Position magnets



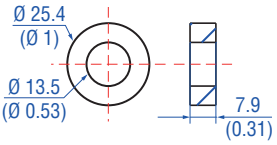
U-magnet OD33
Part no. 251 416-2

Material: PA ferrite GF20
Weight: Approx. 11 g
Surface pressure: Max. 40 N/mm²
Fastening torque for M4 screws: 1 Nm
Operating temperature:
–40…+105 °C (–40…+221 °F)



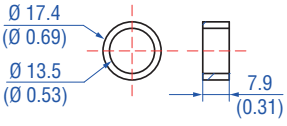
Ring magnet OD33
Part no. 201 542-2

Material: PA ferrite GF20
Weight: Approx. 14 g
Surface pressure: Max. 40 N/mm²
Fastening torque for M4 screws: 1 Nm
Operating temperature:
–40…+105 °C (–40…+221 °F)



Ring magnet OD25.4
Part no. 400 533

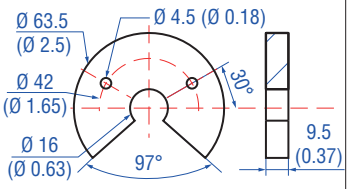
Material: PA ferrite
Weight: Approx. 10 g
Surface pressure: Max. 40 N/mm²
Operating temperature:
–40…+105 °C (–40…+221 °F)



Ring magnet OD17.4
Part no. 401 032

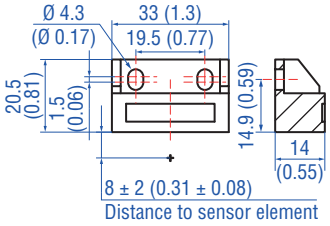
Material: PA neobond
Weight: Approx. 5 g
Surface pressure: Max. 20 N/mm²
Operating temperature:
–40…+105 °C (–40…+221 °F)

Position magnets



U-magnet OD63.5
Part no. 201 553

Material: PA 66-GF30,
magnets compound-filled
Weight: Approx. 26 g
Surface pressure: 20 N/mm²
Fastening torque for M4 screws: 1 Nm
Operating temperature:
–40…+75 °C (–40…+167 °F)

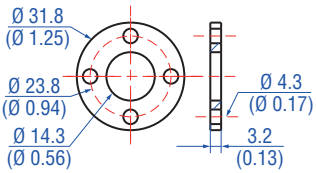


Block magnet L
Part no. 403 448

Material: Plastic carrier with hard
ferrite magnet
Weight: Approx. 20 g
Fastening torque for M4 screws: 1 Nm
Operating temperature:
–40…+75 °C (–40…+167 °F)

This magnet may influence the sensor performance specifications for some applications.

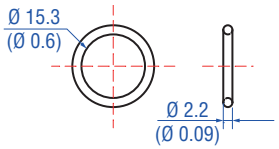
Magnet spacer



Magnet spacer
Part no. 400 633

Material: Aluminum
Weight: Approx. 5 g
Surface pressure: Max. 20 N/mm²
Fastening torque for M4 screws: 1 Nm

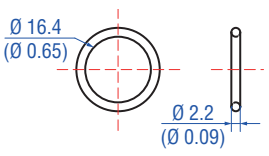
O-ring



O-ring for threaded flange
M18×1.5-6g
Part no. 401 133

Material: Fluoroelastomer
Durometer: 75 ± 5 Shore A
Operating temperature:
–40…+204 °C (–40…+400 °F)

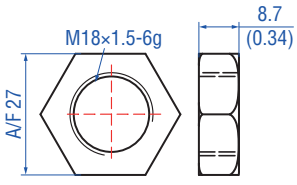
O-ring



O-ring for threaded flange
¾"-16 UNF-3A
Part no. 560 315

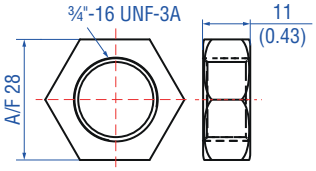
Material: Fluoroelastomer
Durometer: 75 ± 5 Shore A
Operating temperature:
–40…+204 °C (–40…+400 °F)

Mounting accessories



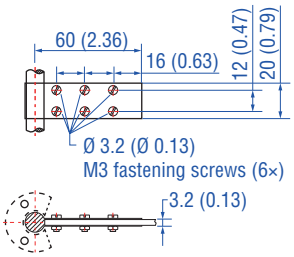
Hex jam nut M18×1.5-6g
Part no. 500 018

Material: Steel, zinc plated



Hex jam nut ¾"-16 UNF-3A
Part no. 500 015

Material: Steel, zinc plated



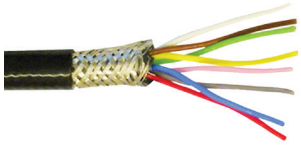
Fixing clip
Part no. 561 481

Application: Used to secure sensor rods (Ø 10 mm (Ø 0.39 in.)) when using an U-magnet or block magnet
Material: Brass, non-magnetic

Controlling design dimensions are in millimeters and measurements in ( ) are in inches

4.6 Frequently ordered accessories for Start/Stop output – Additional options available in our Accessories Catalog 551 444

Cables



FEP cable
Part no. 530 112

Material: FEP jacket; black
Features: Twisted pair, shielded, flexible, high thermal resistance, mostly oil & acid resistant
Cable Ø: 7.6 mm (0.3 in.)
Cross section: 4 × 2 × 0.25 mm²
Bending radius: 8 – 10 × D
(fixed installation)
Operating temperature:
–100…+180 °C (–148…+356 °F)

Silicone cable
Part no. 530 113

Material: Silicone jacket; red
Features: Twisted pair, shielded, highly flexible, halogen free, high thermical resistance
Cable Ø: 7.2 mm (0.28 in.)
Cross section: 3 × 2 × 0.25 mm²
Bending radius: 5 × D
(fixed installation)
Operating temperature:
–50…+180 °C (–58…+356 °F)

Controlling design dimensions are in millimeters and measurements in ( ) are in inches

5. Operation

5.1 Getting started

The sensor is factory-set to its order sizes and adjusted, i.e. the required output signal corresponds exactly to the selected stroke length.

NOTICE

Observe during commissioning

1. Before switching on for the first time, check the connection of the sensor carefully.
2. Position the magnet in the measuring range of the sensor during first commissioning and after replacement of the magnet.
3. Ensure that the sensor control system cannot be displaced in an uncontrolled way when switching on.
4. Ensure that the sensor is ready and in operation mode after switching on.

5.2 Programming and configuration

The functional diagram of the sensor with Start/Stop interface is shown in Fig. 17. The start pulse of the controller is acknowledged by the sensor with a stop pulse; the position measurement starts. At the end of the measurement the sensor generates a second stop pulse. The time between the start pulse and the second stop pulse is the travel time.

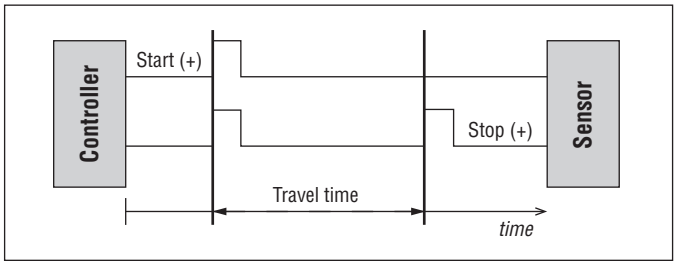


Fig. 17: Functional diagram of sensor with Start/Stop interface

Set the start pulse width and the cycle time according to the stroke length on the controller:

- Start impuls width: 1…2.5 µs
- Minimal cycle time:
  50…1000 mm (2 … 40 in.) stroke length: 500 µs
  1001…2000 mm (40… 79 in.) stroke length: 900 µs
  2001…3000 mm (79…118 in.) stroke length: 1250 µs

If the position magnet is out of the stroke length, the sensor does not send a reply signal. This behavior can be evaluated and used for monitoring by the controller.

NOTICE

If the stroke length is exceeded only insignificantly, the sensor generates a reply signal.

Parameter upload

The parameter upload function allows transfer of sensor parameters to the controller. It is easy to measure and store the sensor parameters given below using the same physical interface, without additional connections, via the communication mode to the controller.

Technical data:
Interface: RS-422
Data format: Serial, 4800 baud, 8 bit data

The diagram of the data transfer for parameter upload of the sensor with Start/Stop interface is shown in Fig. 18. The start pulse width has to be > 10 µs to start the parameter upload function. A start pulse width > 2.5 µs and < 10 µs is not permitted. The data is sent to the controller with the low bit first (one start bit “0”, one stop bit “1”, no parity).

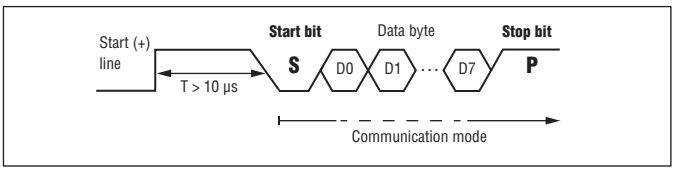


Fig. 18: Diagram of data transfer for parameter upload

The following parameters are transfered via parameter upload function:
1. Gradient
The gradient specifies the travelling speed of the measuring pulse. Gradient and travel time between start pulse and stop pulse are used to determine the position of the position magnet.
Position = gradient × travel time

The speed of the measuring pulse is approx. 2780 m/s (9.14 µs/inch.). The exact value is determined during final component checking and specified as a gradient on the sensor label.

2. Offset
The offset indicates the value of the position magnet’s position at span start. It is used as a reference value to detect when the stroke length is left and to adapt the position values.
Position = gradient × travel time – offset

NOTICE Check gradient after replacing the sensor to avoid errors in position measurement.

3. Stroke length
Indicates the useful measurement displacement of the sensor.

4. Serial number
Every sensor is provided with a unique serial number, which is printed on the sensor label and stored in the sensor.

5. Manufacturer identification
Due to the manufacturer identification, the controller can take manufacturer specific particularities into account.

6. Status
Provides information on the sensor status.

7. Minimum cycle time

The minimum cycle time specifies the time, which has to be between two consecutive start pulses of position measurement. The start pulse for each measurement is generated by the controller.

Data communication

As shown in Fig. 17 communication between controller and sensor is performed via the already provided connections. So the start lines are used for sending from the controller to the sensor, while the stop lines are used for receiving. For data exchange using the parameter upload function the start line is set to level High. The start pulse width has to be > 10 µs to ensure that the sensor switches over safely to the communication mode. Subsequently, the required command can be transmitted to the sensor.

NOTICE

Setting the start line to Low level is considered as a start bit of data transfer and treated accordingly by the sensor. Note that a bit combination which does not correspond to the controller command set is treated as a data fault and re-activates the Start/Stop operation (measuring mode). The occurrence of a data fault can be detected subsequently by a status request.

Read command	Code hex.	Transmitted bytes hex.	Note
Gradient	0x55	4	in cm/s
Offset	0x57	4	in µm
Stroke length	0x59	4	in mm
Serial number	0x5D	4	
Manufacturer recognition Temposonics	0x61	4	0
Status	0x5F	4	
Minimum cycle time	0x73	4	in µs
General commands			
Stop communication	0x3D	—	

Fig. 19: Command set for parameter upload function

Telegram formats

Read commands:

Data is transmitted from the sensor to the controller. For this purpose, the controller sends a request command and receives the required data, after the sensor has processed the command. Only after data transmission to the controller, the sensor is ready to receive and process further commands. The communication telegram looks like this:

1. Data request: E.g. "read gradient"
Controller ⟶ command 0x55 ⟶ sensor

2. Data reception: Output of gradient (message with a length of 4 bytes)
Sensor ⟶ **Byte 3** (High byte) ⟶ controller
Sensor ⟶ **Byte 2** ⟶ controller
Sensor ⟶ **Byte 1** ⟶ controller
Sensor ⟶ **Byte 0** (Low byte) ⟶ controller

Fig. 20: Communication telegram

NOTICE

The High byte is sent first!

The pause time between bytes is approximately 6 ms.

Status:

The status command is an exception, since the command can be used to retrieve current sensor status information.
After requesting the status, the controller can receive the following message:

1. Everything o.k.
Sensor ⟶ **0x00 00 00 00** ⟶ controller
The sensor did not detect an error.

2. Unknown command
Sensor ⟶ **0x00 00 00 AA** ⟶ controller
An unknown command which is not mentioned in Fig. 19 was received by the sensor. This can be due to trouble on the data line or malfunction of the controller. In this case, the sensor sets the status to 0xAA, leaves the communication mode and starts operating in Start/Stop mode for position determination and position output. After restarting the communication mode, the status byte which is reset to 0x00 can be retrieved. Thus the controller realizes that cancellation is due to trouble.

3. Defective data set in EEPROM
Sensor ⟶ **0x00 00 00 FF** ⟶ controller
When checking the EEPROM data set during start-up, divergence of the calculated checksum from the stored checksum was found. Consequently, there is a risk to use faulty data.
If this should be the case, the status is set to 0xFF and the sensor must be re-adjusted. Therefore it is recommended to start a status request after switching on the supply voltage.

Fig. 21: Status command

Terminate communication
Changing from the communication mode to the Start/Stop mode is performed by the command “terminating the communication”:

Sensor → **0x3D** → controller

This command terminates the communication. The operation is continued with the operation in Start/Stop mode for position determination and position output.

6. Maintenance and troubleshooting

6.1 Error conditions, troubleshooting

Error condition	Status
Unknown command	Sensor sets the status to 0xAA

6.2 Maintenance

The required inspections need to be performed by qualified personnel according to IEC 60079-17/TRBS 1203. These inspections should include at least a visual inspection of the housing, associated electrical equipment entrance points, retention hardware and equipment grounding. Inside the Ex-atmosphere the equipment has to be cleaned regularly. The user determines the intervals for checking according to the environmental conditions present at the place of operation. After maintenance and repair all protective devices removed for this purpose must be refitted.
In case of equipment faults, remove the equipment. The inner parts cannot be maintained by the customer. In this case send the equipment to the manufacturer for inspection.

NOTICE
It is not allowed to open the sensor.

Type of inspection	Visual inspection every 3 months	Close inspection every 6 months
Visual inspection of the sensor for intactness, removal of dust deposits	●	
Check of entire system	User‘s responsibility	

Fig. 22: Schedule of inspection

Maintenance: Defines a combination of any actions carried out to retain an item in, or restore it to, conditions in which it is able to meet the requirements of the relevant specification and perform its required functions.

Inspection: Defines an activity with the purpose to check a product carefully, aiming at a reliable statement on the condition of the product. The inspection is carried out without dismantling, or, if necessary, with partial dismantling, and supplemented by other measures, e.g. measurements.
Visual inspection: Optical inspection of product aims at the recognition of visible defects like missing bolts without using auxiliary equipment and tools.
Close inspection: Defines an inspection which encompasses those aspects covered by a visual inspection and, in addition, identifies those defects, such as loose bolts, which will be apparent only by the use of access equipment, for example steps, where necessary, and tools.

6.3 Repair

Repairs on the sensor may be performed only by Temposonics or an explicitly authorized body.

6.4 List of spare parts

No spare parts are available for this sensor.

6.5 Transport and storage

The conditions of transport and storage of the sensor match the operating conditions mentioned in this document.

7. Removal from service/dismantling

The product contains electronic components and must be disposed of in accordance with the local regulations.

8. Technical data of Temposonics® ET

Output	
Start/Stop	RS-422 differential signal Serial parameter upload available for: Stroke length, offset, gradient, status, serial number and manufacturer number
Measured value	Position
Measurement parameters	
Resolution	Controller dependent
Cycle time	Controller and stroke length dependent Recommendation: Stroke length ≤ 1000 mm | ≤ 2000 mm | ≤ 3000 mm Cycle time 500 µs | 900 µs | 1250 µs
Linearity [3]	≤ ±0.02 % F.S. (minimum ±60 µm)
Repeatability	≤ ±0.005 % F.S. (minimum ±20 µm) typical
Operating conditions	
Operating temperature	–40…+105 °C (–40…+221 °F)
Humidity	90 % relative humidity, no condensation
Ingress protection	With FEP cable (part no. 530 112): IP66 With silicone cable (part no. 530 113): IP68 (2 bar (29 psi) @ 30 min)
Shock test	100 g (single shock), IEC standard 60068-2-27
Vibration test	20 g/10…2000 Hz, IEC 60068-2-6 (excluding resonant frequencies)
EMC test	Electromagnetic emission according to EN 61000-6-3 Electromagnetic immunity according to EN 61000-6-2 The ET sensors fulfill the requirements of the EMC directives 2014/30/EU, UKSI 2016 No. 1091 and TR CU 020/2011
Operating pressure	Up to 350 bar (5076 psi)
Magnet movement velocity [4]	Any
Design/Material	
Sensor electronics housing/ Flange	Stainless steel 1.4305 (AISI 303); option: Stainless steel 1.4404 (AISI 316L)
Sensor rod	Stainless steel 1.4306 (AISI 304L); option: Stainless steel 1.4404 (AISI 316L)
RoHS compliance	The used materials are compliant with the requirements of EU directive 2011/65/EU and EU regulation 2015/863 as well as UKSI 2012 No. 3032
Stroke length	50…3000 mm (2…118 in.)
Mechanical mounting	
Mounting position	Any
Mounting instruction	Please consult the technical drawings on page 8
Electrical connection	
Connection type	Cable outlet
Operating voltage	+24 VDC (–15/+20 %)
Ripple	≤ 0.28 V_{PP}
Current consumption	Maximum 50 mA
Dielectric strength	700 VDC (DC ground to machine ground)
Polarity protection	Up to –30 VDC
Overvoltage protection	Up to ≤ 32 VDC

3/ With position magnet # 251 416-2

4/ If there is contact between the moving magnet including the magnet holder and the sensor rod, make sure that the maximal speed of the moving magnet is ≤ 1 m/s (Ex requirement due to ESD [Electro Static Discharge])

Certification
Ⓔx II 3G Ex nC IIC T4 Gc
Ⓔx II 3D Ex tc IIIC T130 °C Dc
Ⓒ Class I/II/III Div 2 T4 ABCDFG
Class I Zone 2 T4 IIC
Zone 22 AEx tc T4 IIIC Dc
Ex tc IIIC T130°C Dc IP66/IP68
Ⓒ Ex nC IIC T4 Gc
Ex tD A22 IP66/IP68 T130°C
–40 °C ≤ Ta ≤ 105 °C; Type: 4X; IP66/IP68

Fig. 23: Certification of Temposonics® ET (version A and E)

9. Appendix

Safety declaration

Dear Customer,
If you return one or several sensors for checking or repair, we need you to sign a safety declaration. The purpose of this declaration is to ensure that the returned items do not contain residues of harmful substances and/or that people handling these items will not be in danger.

Temposonics order number: _____

Sensor type(s): _____

Serial number(s): _____

Sensor length(s):_____

The sensor has been in contact with the following materials:

Do not specify chemical formulas.
Please include safety data sheets of the substances, if applicable.

In the event of suspected penetration of substances into the sensor, consult Temposonics to determine measures to be taken before shipment.

Short description of malfunction:

Corporate information

Company:_____

Address: _____

_____

Contact partner

Phone: _____

Fax: _____

Email: _____

We hereby certify that the measuring equipment has been cleaned and neutralized.
Equipment handling is safe. Personnel exposure to health risks during transport and repair is excluded.

Stamp

Signature

Date

Temposonics GmbH & Co.KG
Auf dem Schüffel 9
58513 Lüdenscheid
Germany

Tel. +49 2351/95 87-0
Fax. +49 2351/56 49 1
info.de@temposonics.com
www.temposonics.com

10. Declaration of conformity

EU22.009A

EU Declaration of Conformity

Temposonics
declares as manufacturer in sole responsibility that the position sensor type

Temposonics
ET-x-xxxxx-xxx-1-A-Axx-x
ET-x-xxxxx-xxx-1-E-Axx-x
ET-x-xxxxx-xxx-1-A-Vxx-x
ET-x-xxxxx-xxx-1-E-Vxx-x
ET-x-xxxxx-xxx-1-A-Sxxxxxx
ET-x-xxxxx-xxx-1-E-Sxxxxxx

comply with the regulations of the following European Directives:

2014/30/EU Electromagnetic Compatibility

2014/34/EU Equipment and protective systems for use in potentially explosive atmospheres

2011/65/EU Restriction of the use of hazardous substances in electrical and electronic equipment

Applied harmonized standards:
EN IEC 60079-0 :2018
EN IEC 60079-15 :2010
EN 60079-31 :2014
EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Manufacture test report: **605895**

Marking:
II 3G Ex nC IIC T4 Gc
II 3D Ex tc IIIC T130°C Dc

EU Konformitätserklärung

Temposonics
erklärt als Hersteller in alleiniger Verantwortung, dass der Positionssensor Typ

Temposonics
ET-x-xxxxx-xxx-1-A-Axx-x
ET-x-xxxxx-xxx-1-E-Axx-x
ET-x-xxxxx-xxx-1-A-Vxx-x
ET-x-xxxxx-xxx-1-E-Vxx-x
ET-x-xxxxx-xxx-1-A-Sxxxxxx
ET-x-xxxxx-xxx-1-E-Sxxxxxx

den Vorschriften folgender Europäischen Richtlinien entsprechen:

2014/30/EU Elektromagnetische Verträglichkeit

2014/34/EU Geräte und Schutzsysteme zur Verwendung in explosionsgefährdeten Bereichen

2011/65/EU Beschränkung der Verwendung gefährlicher Stoffe in Elektro- und Elektronikgeräten

Angewandte harmonisierte Normen:
EN IEC 60079-0 :2018
EN IEC 60079-15 :2010
EN 60079-31 :2014
EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Hersteller-Prüfbericht: **605895**

Kennzeichnung:
II 3G Ex nC IIC T4 Gc
II 3D Ex tb IIIC T130°C Dc

Déclaration UE de Conformité

Temposonics
déclare en qualité de fabricant sous sa seule responsabilité que les capteurs de position de type

Temposonics
ET-x-xxxxx-xxx-1-A-Axx-x
ET-x-xxxxx-xxx-1-E-Axx-x
ET-x-xxxxx-xxx-1-A-Vxx-x
ET-x-xxxxx-xxx-1-E-Vxx-x
ET-x-xxxxx-xxx-1-A-Sxxxxxx
ET-x-xxxxx-xxx-1-E-Sxxxxxx

sont conformes aux prescriptions des directives européennes suivantes:

2014/30/EU Compatibilité électromagnétique

2014/34/EU Appareils et systèmes de protection à être utilisés en atmosphères explosibles

2011/65/EU Limitation de l'utilisation de substances dangereuses dans les équipements électriques et électroniques

Normes harmonisées appliquées:
EN IEC 60079-0 :2018
EN IEC 60079-15 :2010
EN 60079-31 :2014
EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Rapport d'essai du fabricant: **605895**

Marquage:
II 3G Ex nC IIC T4 Gc
II 3D Ex tb IIIC T130°C Dc

Luedenscheid, 17 Mar. 2023

Dr.-Ing. Eugen Davidoff
Approvals Manager

EU22.011A

EU Declaration of Conformity

Temposonics
declares as manufacturer in sole responsibility that the position sensor type

Temposonics
ET-x-xxxxx-xxx-1-N-Axx-x
ET-x-xxxxx-xxx-1-N-Vxx-x
ET-x-xxxxx-xxx-1-N-Sxxxxxx

comply with the regulations of the following European Directives:

2014/30/EU Electromagnetic Compatibility

2011/65/EU Restriction of the use of hazardous substances in electrical and electronic equipment

Applied harmonized standards:
EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

EU Konformitätserklärung

Temposonics
erklärt als Hersteller in alleiniger Verantwortung, dass der Positionssensor Typ

Temposonics
ET-x-xxxxx-xxx-1-N-Axx-x
ET-x-xxxxx-xxx-1-N-Vxx-x
ET-x-xxxxx-xxx-1-N-Sxxxxxx

den Vorschriften folgender Europäischen Richtlinien entsprechen:

2014/30/EU Elektromagnetische Verträglichkeit

2011/65/EU Beschränkung der Verwendung gefährlicher Stoffe in Elektro- und Elektronikgeräten

Angewandte harmonisierte Normen:
EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Déclaration UE de Conformité

Temposonics
déclare en qualité de fabricant sous sa seule responsabilité que les capteurs de position de type

Temposonics
ET-x-xxxxx-xxx-1-N-Axx-x
ET-x-xxxxx-xxx-1-N-Vxx-x
ET-x-xxxxx-xxx-1-N-Sxxxxxx

sont conformes aux prescriptions des directives européennes suivantes:

2014/30/EU Compatibilité électromagnétique

2011/65/EU Limitation de l'utilisation de substances dangereuses dans les équipements électriques et électroniques

Normes harmonisées appliquées:
EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Luedenscheid, 17 Mar. 2023

Dr.-Ing. Eugen Davidoff
Approvals Manager

Temposonics
AN AMPHENOL COMPANY

UK23.009A

UK Declaration of Conformity

Temposonics
declares as manufacturer in sole responsibility that the position sensor type

Temposonics
ET-x-xxxxx-xxx-1-A-Axx-x
ET-x-xxxxx-xxx-1-E-Axx-x
ET-x-xxxxx-xxx-1-A-Vxx-x
ET-x-xxxxx-xxx-1-E-Vxx-x
ET-x-xxxxx-xxx-1-A-Sxxxxxx
ET-x-xxxxx-xxx-1-E-Sxxxxxx

comply with the regulations of the following UK Directives:

UKSI 2016 :1091 Electromagnetic Compatibility

UKSI 2016 :1107 The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres

UKSI 2012 :3032 Restriction of the use of hazardous substances in electrical and electronic equipment (as amended)

Applied harmonized approved standards:

EN IEC 60079-0 :2018
EN IEC 60079-15 :2010
EN 60079-31 :2014
EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Manufacture test report: **605895**

Marking:
II 3G Ex nc IIC T4 Gc
II 3D Ex tc IIIC T130°C Dc

UK Konformitätserklärung

Temposonics
erklärt als Hersteller in alleiniger Verantwortung, dass der Positionssensor Typ

Temposonics
ET-x-xxxxx-xxx-1-A-Axx-x
ET-x-xxxxx-xxx-1-E-Axx-x
ET-x-xxxxx-xxx-1-A-Vxx-x
ET-x-xxxxx-xxx-1-E-Vxx-x
ET-x-xxxxx-xxx-1-A-Sxxxxxx
ET-x-xxxxx-xxx-1-E-Sxxxxxx

den Vorschriften folgender UK Richtlinien entsprechen:

UKSI 2016 :1091 Elektromagnetische Verträglichkeit

UKSI 2016 :1107 Geräte und Schutzsysteme für Einsatz in explosionsgefährdeten Bereichen

UKSI 2012 :3032 Einschränkung zur Verwendung von gefährlichen Stoffen in Elektro- und Elektronikgeräten (mit Ergänzungen)

Angewandte harmonisierte zugelassene Normen:

EN IEC 60079-0 :2018
EN IEC 60079-15 :2010
EN 60079-31 :2014
EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Hersteller-Prüfbericht: **605895**

Kennzeichnung:
II 3G Ex nc IIC T4 Gc
II 3D Ex tc IIIC T130°C Dc

Déclaration de Conformité UK

Temposonics
déclare en qualité de fabricant sous sa seule responsabilité que les capteurs de position de type

Temposonics
ET-x-xxxxx-xxx-1-A-Axx-x
ET-x-xxxxx-xxx-1-E-Axx-x
ET-x-xxxxx-xxx-1-A-Vxx-x
ET-x-xxxxx-xxx-1-E-Vxx-x
ET-x-xxxxx-xxx-1-A-Sxxxxxx
ET-x-xxxxx-xxx-1-E-Sxxxxxx

sont conformes aux prescriptions des directives UK suivantes:

UKSI 2016 :1091 Compatibilité électromagnétique

UKSI 2016 :1107 Appareils et systèmes de protection à être utilisés en atmosphères explosibles

UKSI 2012 :3032 Restriction de l'utilisation de substances dangereuses dans les équipements électriques et électroniques (avec amendements)

Normes harmonisées approuvées appliquées:

EN IEC 60079-0 :2018
EN IEC 60079-15 :2010
EN 60079-31 :2014
EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Rapport d´essai du fabricant: **605895**

Marquage:
II 3G Ex nc IIC T4 Gc
II 3D Ex tc IIIC T130°C Dc

Luedenscheid, 10 Mar. 2023

Dr.-Ing. Eugen Davidoff
Approvals Manager

UK23.011A

UK Declaration of Conformity

Temposonics
declares as manufacturer in sole responsibility that the position sensor type

Temposonics
ET-x-xxxxx-xxx-1-N-Axx-x
ET-x-xxxxx-xxx-1-N-Vxx-x
ET-x-xxxxx-xxx-1-N-Sxxxxxx

comply with the regulations of the following UK Directives:

UKSI 2016 :1091 Electromagnetic Compatibility

UKSI 2012 :3032 Restriction of the use of hazardous substances in electrical and electronic equipment (as amended)

Applied harmonized approved standards:

EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

UK Konformitätserklärung

Temposonics
erklärt als Hersteller in alleiniger Verantwortung, dass der Positionssensor Typ

Temposonics
ET-x-xxxxx-xxx-1-N-Axx-x
ET-x-xxxxx-xxx-1-N-Vxx-x
ET-x-xxxxx-xxx-1-N-Sxxxxxx

den Vorschriften folgender UK Richtlinien entsprechen:

UKSI 2016 :1091 Elektromagnetische Verträglichkeit

UKSI 2012 :3032 Einschränkung zur Verwendung von gefährlichen Stoffen in Elektro- und Elektronikgeräten (mit Ergänzungen)

Angewandte harmonisierte zugelassene Normen:

EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Déclaration de Conformité UK

Temposonics
déclare en qualité de fabricant sous sa seule responsabilité que les capteurs de position de type

Temposonics
ET-x-xxxxx-xxx-1-N-Axx-x
ET-x-xxxxx-xxx-1-N-Vxx-x
ET-x-xxxxx-xxx-1-N-Sxxxxxx

sont conformes aux prescriptions des directives UK suivantes:

UKSI 2016 :1091 Compatibilité électromagnétique

UKSI 2012 :3032 Restriction de l'utilisation de substances dangereuses dans les équipements électriques et électroniques (avec amendements)

Normes harmonisées approuvées appliquées:

EN 61000-6-2 :2005
EN 61000-6-4 :2007+A1 :2011

Luedenscheid, 10 Mar. 2023

Dr.-Ing. Eugen Davidoff
Approvals Manager

Temposonics
AN AMPHENOL COMPANY

Sensor with Ex approval

Document Part Number:
551677 Revision G (EN) 05/2023

UNITED STATES
Temposonics, LLC
Americas & APAC Region
3001 Sheldon Drive
Cary, N.C. 27513
Phone: +1 919 677-0100
E-mail: info.us@temposonics.com

GERMANY
Temposonics
GmbH & Co. KG
EMEA Region & India
Auf dem Schüffel 9
58513 Lüdenscheid
Phone: +49 2351 9587-0
E-mail: info.de@temposonics.com

ITALY
Branch Office
Phone: +39 030 988 3819
E-mail: info.it@temposonics.com

FRANCE
Branch Office
Phone: +33 6 14 060 728
E-mail: info.fr@temposonics.com

UK
Branch Office
Phone: +44 79 21 83 05 86
E-mail: info.uk@temposonics.com

SCANDINAVIA
Branch Office
Phone: +46 70 29 91 281
E-mail: info.sca@temposonics.com

CHINA
Branch Office
Phone: +86 21 3405 7850
E-mail: info.cn@temposonics.com

JAPAN
Branch Office
Phone: +81 3 6416 1063
E-mail: info.jp@temposonics.com

temposonics.com