

Pressure Measurement

Single-range transmitters for general applications

SITRANS LH300 Transmitter for hydrostatic level

1

Overview

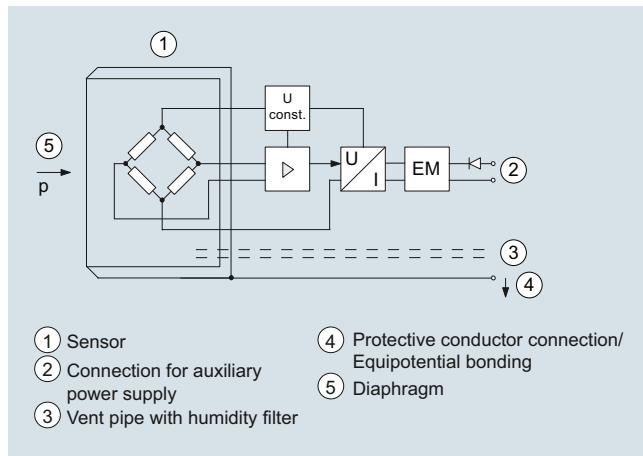


The pressure transmitter SITRANS LH300 is a submersible sensor for hydrostatic level measurement with cap made of PPE (left), stainless steel (mid) and ETFE (right).

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH300 pressure transmitters are available for various measuring ranges and with explosion protection as an option.

A junction box and a cable hanger are available as accessories for simple installation.

Function



SITRANS LH300 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

Benefits

- Compact design
- Simple installation
- Small error in measurement (0.15 % typical)
- Degree of protection IP68

Application

SITRANS LH300 pressure transmitters are used in the following branches, for example:

- Shipbuilding
- Water/waste water supply
- Drinking water facilities
- For use in unpressurized/open vessels and wells
- Desalination plants

Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel housing. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

The diaphragm is protected against external influences by a protective cap.

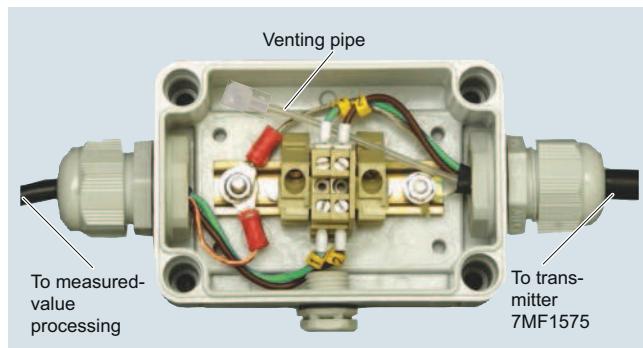
The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

Integration

It is generally recommended that the connecting cable of the SITRANS LH300 transmitter is connected to the junction box, which can be ordered separately, and secured with the cable hanger, also available separately. The junction box has to be installed near the measuring point, but outside the media.

If the medium is anything other than water, it is also necessary to check compatibility with the specified materials of the transmitter, cable and gasket.



Junction box 7MF1575-8AA, open, schematic diagram

Pressure Measurement

Single-range transmitters for general applications

SITRANS LH300 Transmitter for hydrostatic level

1



Measuring point setup, generally with junction box 7MF1575-8AA and 7MF1575-8AB cable hanger

Technical specifications**Pressure transmitter SITRANS LH300 (submersible sensor)****Mode of operation**

Measuring principle Piezo-resistive

Input

Measured variable	Hydrostatic level
Measuring range	Max. permissible operating pressure
• 0 ... 1 mH ₂ O (0 ... 3 ftH ₂ O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O))
• 0 ... 2 mH ₂ O (0 ... 6 ftH ₂ O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O))
• 0 ... 3 mH ₂ O (0 ... 9 ftH ₂ O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O))
• 0 ... 4 mH ₂ O (0 ... 12 ftH ₂ O)	• 2 bar (29 psi) (corresponds to 20 mH ₂ O (60 ftH ₂ O))
• 0 ... 5 mH ₂ O (0 ... 15 ftH ₂ O)	• 2 bar (29 psi) (corresponds to 20 mH ₂ O (60 ftH ₂ O))
• 0 ... 6 mH ₂ O (0 ... 18 ftH ₂ O)	• 2 bar (29 psi) (corresponds to 20 mH ₂ O (60 ftH ₂ O))
• 0 ... 10 mH ₂ O (0 ... 30 ftH ₂ O)	• 5 bar (72.5 psi) (corresponds to 50 mH ₂ O (150 ftH ₂ O))
• 0 ... 20 mH ₂ O (0 ... 60 ftH ₂ O)	• 10 bar (145 psi) (corresponds to 100 mH ₂ O (300 ftH ₂ O))
• 0 ... 40 mH ₂ O (0 ... 120 ftH ₂ O)	• 20 bar (290 psi) (corresponds to 200 mH ₂ O (600 ftH ₂ O))
Special measuring ranges	
• Up to 100 mH ₂ O (300 ftH ₂ O)	• 20 bar (290 psi) (corresponds to 200 mH ₂ O (600 ftH ₂ O))
• Up to 160 mH ₂ O (480 ftH ₂ O)	• 24 bar (348 psi) (corresponds to 240 mH ₂ O (720 ftH ₂ O))

Measuring range

• 0 ... 0.1 bar	• 1.5 bar
• 0 ... 0.2 bar	• 1.5 bar
• 0 ... 0.3 bar	• 1.5 bar
• 0 ... 0.4 bar	• 2 bar
• 0 ... 0.5 bar	• 2 bar
• 0 ... 0.6 bar	• 2 bar
• 0 ... 1 bar	• 5 bar
• 0 ... 2 bar	• 10 bar
• 0 ... 4 bar	• 20 bar

Special measuring range

• Up to 10 bar	• 20 bar
• Up to 16 bar	• 24 bar

Output

Output signal 4 ... 20 mA

Measuring accuracyError in measurement at limit setting including hysteresis and reproducibility
≤ 0.15 % of full-scale value (typical)
≤ 0.3 % of full-scale value (maximum)Influence of ambient temperature
≤ 0.05 %/10 K of full-scale value (zero and span)Long-term stability
≤ 0.15 % of full-scale value/year (zero and span)**Rated conditions**

Ambient conditions

- Process temperature
- Storage temperature

-10 ... +80 °C (14 ... 176 °F)
-20 ... +80 °C (-4 ... +176 °F)Degree of protection according to IEC 60529
IP68

Pressure Measurement

Single-range transmitters for general applications

1

SITRANS LH300 Transmitter for hydrostatic level

Design		Junction box
Weight	≈ 0.4 kg (≈ 0.88 lb)	For connecting the transmitter cable
• Pressure transmitter	0.08 kg/m (≈ 0.059 lb/ft)	
• Cable		
Maximal freely suspended length	300 m (990 ft)	
Electrical connection	Cable with 2 conductors, vent pipe and integrated humidity filters	
Material		
• Seal diaphragm	Al ₂ O ₃ ceramic, 99.6 %	
• Enclosure	Stainless steel, mat. no. 1.4404/316L and 1.4539/904L (sea water applications) respectively	
• Gasket	FPM (standard)	
• Connecting cable	EPDM (optional) PE (standard/drinking water applications)	
• Cap	FEP (for aggressive media) Stainless steel, PPE or ETFE	
Auxiliary power		
Terminal voltage on pressure transmitter U_B	10 ... 33 V DC for transmitter without explosion protection 10 ... 30 V DC for transmitter with intrinsic safety explosion protection	
Certificates and approvals		
Drinking water approval (ACS)	17 ACC NY 055	
Drinking water approval (WRAS)	Pending	
Drinking water approval (DVGW/KTW W270)	Pending	
EAC	TC N RU Δ-DE.ГA02.B.05092	
Underwriters Laboratories (UL)	ML File No. E344532, issued 2017-08-17	
Shipbuilding approval (LR)	Pending	
Shipbuilding approval (DNV/GL)	Pending	
Shipbuilding approval (BV)	Pending	
Shipbuilding approval (ABS)	Pending	
Pressure equipment directive	The transmitter is not subject to the pressure equipment directive (PED 2014/68/EU)	
Explosion protection		
• ATEX	SEV 16 ATEX 0121	
• IEC Ex	IEC Ex SEV 16.0003	
• EAC Ex	TC RU C-DE.AA87.B.00324	
• Intrinsic safety "i"		
- Marking	II 1 G Ex ia IIC T4 Ga	

Pressure Measurement

Single-range transmitters for general applications

SITRANS LH300 Transmitter for hydrostatic level

Selection and ordering data		Article No.	Order code	Selection and ordering data	Article No.	Order code
Pressure transmitter SITRANS LH300 (submersible sensor)		7MF1575 -		Pressure transmitter SITRANS LH300 (submersible sensor)	7MF1575 -	
For hydrostatic level measurement, submersible transmitter, two-wire connection, 4 ... 20 mA, body material see Order option, measuring cell Al_2O_3 ceramics (99.6 % purity), with fixed mounted cable, material of protective cap at PE cable: PPE (colour black) material of protective cap at FEP cable: PPE (colour white)				PE cable for general purpose and drinking water applications		
Note: junction box and cable hanger have to be ordered separately.				Special cable length Please add „-Z“ to Article No. and specify Order code and plain text: Y01: Cable length	9X	H.. + Y01
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				3 m (\approx 10 ft) 5 m (\approx 16 ft) 7 m (\approx 23 ft) 10 m (\approx 33 ft) 15 m (\approx 50 ft)		H1A H1B H1C H1D H1E
Measuring range	Cable length (PE cable)			20 m (\approx 65 ft) 25 m (\approx 80 ft) 30 m (\approx 100 ft) 40 m (\approx 130 ft) 50 m (\approx 160 ft)		H1F H1G H1H H1J H1K
0 ... 1 mH_2O	5 m	1A		60 m (\approx 200 ft) 70 m (\approx 230 ft) 80 m (\approx 265 ft) 90 m (\approx 295 ft) 100 m (\approx 330 ft)		H1L H1M H1N H1P H1Q
0 ... 2 mH_2O	5 m	1B		125 m (\approx 410 ft) 150 m (\approx 495 ft) 175 m (\approx 575 ft) 200 m (\approx 650 ft) 225 m (\approx 740 ft)		H1R H1S H1T H1U H1V
0 ... 3 mH_2O	10 m	1C		250 m (\approx 820 ft) 275 m (\approx 900 ft) 300 m (\approx 990 ft) 350 m (\approx 1150 ft) 400 m (\approx 1320 ft)		H1W H1X H2A H2B H2C
0 ... 4 mH_2O	10 m	1D		450 m (\approx 1480 ft) 500 m (\approx 1650 ft) 550 m (\approx 1815 ft) 600 m (\approx 1980 ft) 650 m (\approx 2145 ft)		H2D H2E H2F H2G H2H
0 ... 5 mH_2O	10 m	1E		700 m (\approx 2310 ft) 750 m (\approx 2475 ft) 800 m (\approx 2640 ft) 850 m (\approx 2800 ft) 900 m (\approx 2970 ft)		H2J H2K H2L H2M H2N
0 ... 6 mH_2O	10 m	1F		950 m (\approx 3135 ft) 1000 m (\approx 3300 ft)		H2P H2Q
0 ... 10 mH_2O	20 m	1H			9X	H1Y + Y01
0 ... 20 mH_2O	30 m	1K				
0 ... 40 mH_2O	50 m	1L				
0 ... 3 ftH_2O	5 m (\approx 15 ft)	2A				
0 ... 6 ftH_2O	5 m (\approx 15 ft)	2B				
0 ... 9 ftH_2O	10 m (\approx 30 ft)	2C				
0 ... 12 ftH_2O	10 m (\approx 30 ft)	2D				
0 ... 15 ftH_2O	10 m (\approx 30 ft)	2E				
0 ... 18 ftH_2O	10 m (\approx 30 ft)	2F				
0 ... 30 ftH_2O	20 m (\approx 60 ft)	2H				
0 ... 60 ftH_2O	30 m (\approx 90 ft)	2K				
0 ... 120 ftH_2O	50 m (\approx 150 ft)	2L				
0 ... 0.1 bar	5 m	3A				
0 ... 0.2 bar	5 m	3B				
0 ... 0.3 bar	10 m	3C				
0 ... 0.4 bar	10 m	3D				
0 ... 0.5 bar	10 m	3E				
0 ... 0.6 bar	10 m	3F				
0 ... 1 bar	20 m	3H				
0 ... 2 bar	30 m	3K				
0 ... 4 bar	50 m	3L				
Special versions:						
<u>Measuring ranges</u> for special versions between						
0 ... 1 mH_2O and 0 ... 160 mH_2O or						
0 ... 3 ftH_2O and 0 ... 530 ftH_2O or						
0 ... 0.1 bar and 0 ... 16 bar possible.						
				Other special cable length Please add „-Z“ to Article No. and specify Order codes and plain text: H1Y: Cable length		
				Y01: Measuring range		

Pressure Measurement

Single-range transmitters for general applications

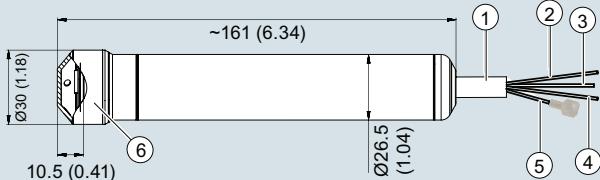
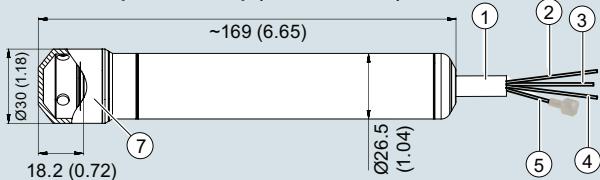
1

SITRANS LH300 Transmitter for hydrostatic level

Selection and ordering data	Article No.	Order code	Selection and ordering data	Article No.	Order code	
Pressure transmitter SITRANS LH300 (submersible sensor)	7MF1575 -		Pressure transmitter SITRANS LH300 (submersible sensor)	7MF1575 -		
FEP cable for aggressive media			Material of housing	Material of protective cap		
Special cable length Please add „-Z“ to Article No. and specify Order code and plain text: Y01: Cable length	9 X	H . . + Y 0 1	Stainless steel 316L (1.4404) Stainless steel 316L (1.4404) Stainless steel 316L (1.4404) Stainless steel 316L (1.4404) Stainless steel 904L (1.4539) for sea water applications Stainless steel 904L (1.4539) for sea water applications Stainless steel 904L (1.4539) for seawater applications FPM (Standard) EPDM (for drinking water)	Protective capability made of PPE (recommended for PE cable) Protective cap made of ETFE (standard with FEP cable) Stainless steel 316L (1.4404) Protective cap PPE (1.4539) for sea water applications Protective cap ETFE (1.4539) for sea water applications Stainless steel 904L (1.4539) for seawater applications	A B C D E F 1 2	
3 m (≈ 10 ft) 5 m (≈ 16 ft) 7 m (≈ 23 ft) 10 m (≈ 33 ft) 15 m (≈ 50 ft) 20 m (≈ 65 ft) 25 m (≈ 80 ft) 30 m (≈ 100 ft) 40 m (≈ 130 ft) 50 m (≈ 160 ft) 60 m (≈ 200 ft) 70 m (≈ 230 ft) 80 m (≈ 265 ft) 90 m (≈ 295 ft) 100 m (≈ 330 ft) 125 m (≈ 410 ft) 150 m (≈ 495 ft) 175 m (≈ 575 ft) 200 m (≈ 650 ft) 225 m (≈ 740 ft) 250 m (≈ 820 ft) 275 m (≈ 900 ft) 300 m (≈ 990 ft) 350 m (≈ 1150 ft) 400 m (≈ 1320 ft) 450 m (≈ 1480 ft) 500 m (≈ 1650 ft) 550 m (≈ 1815 ft) 600 m (≈ 1980 ft) 650 m (≈ 2145 ft) 700 m (≈ 2310 ft) 750 m (≈ 2475 ft) 800 m (≈ 2640 ft) 850 m (≈ 2800 ft) 900 m (≈ 2970 ft) 950 m (≈ 3135 ft) 1000 m (≈ 3300 ft) Other special cable length Please add „-Z“ to Article No. and specify Order codes and plain text: H1Y: Cable length, Y01: Measuring range	9 X	H 5 A H 5 B H 5 C H 5 D H 5 E H 5 F H 5 G H 5 H H 5 J H 5 K H 5 L H 5 M H 5 N H 5 P H 5 Q H 5 R H 5 S H 5 T H 5 U H 5 V H 5 W H 5 X H 6 A H 6 B H 6 C H 6 D H 6 E H 6 F H 6 G H 6 H H 6 J H 6 K H 6 L H 6 M H 6 N H 6 P H 6 Q	9 Y + Y 0 1	Sealing material between sensor and housing without With ATEX II1 G Ex ia IIC T4 Ga, IECEx Ex ia IIC T4 Ga and EAC Ex (only possible for cable length ≤ 300 m (990 ft))		0 1
			Additional versions Quality Inspection Certificate (factory calibration) to IEC 60770-2 (6 points upward)	Order code	C11	
			Accessories/spare parts	Article No.		
			Junction box	7MF1575-8AA		
			Cable hanger	7MF1575-8AB		
			Protective caps, PPE, as spare part (10-pack)	7MF1575-8AD		
			Protective caps, ETFE, as spare part (10-pack)	7MF1575-8AE		
			Humidity filters as spare part (10-pack)	7MF1575-8AF		
			Protective cap, stainless steel 316L (1.4404) for waste water applications	7MF1575-8AG		
			Protective cap, stainless steel 904L (1.4539) for sea water applications	7MF1575-8AH		

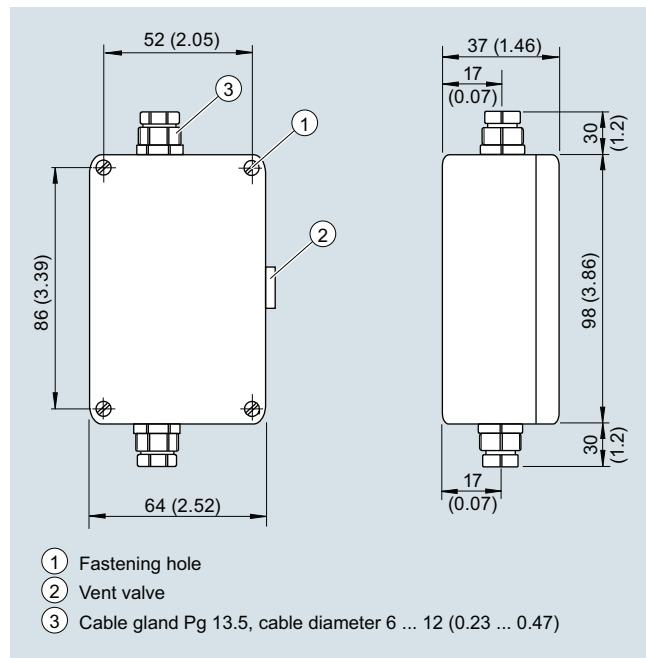
Pressure Measurement

Single-range transmitters for general applications

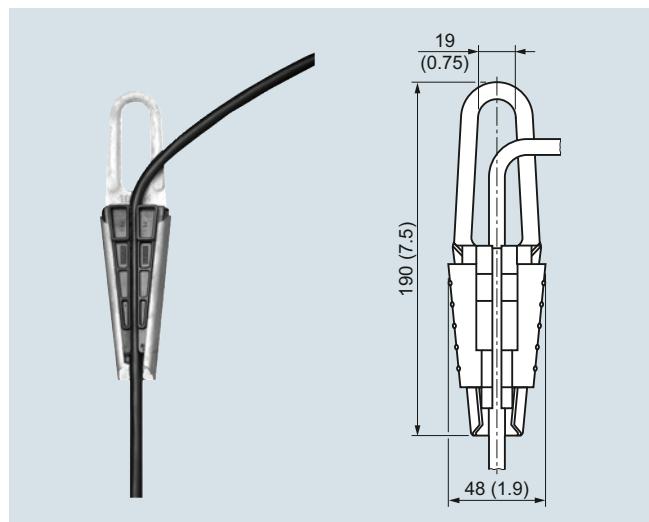
SITRANS LH300 Transmitter for hydrostatic level**Dimensional drawings****Sensor with protective cap (PPE, ETFE)****Sensor with protective cap (stainless steel)**

- (1) Cable, sheet Ø 8.3 (0.33)
- (2) - (blue)
- (3) + (brown)
- (4) Protective conductor connection/Equipotential bonding (black)
- (5) Vent pipe with humidity filter Ø 1 (0.04) (inner diameter)
- (6) Protective cap (PPE or PTFE) with 4 x Ø 2.5 (0.10) holes
- (7) Protective cap (stainless steel) with 4 x Ø 5 (0.20) holes

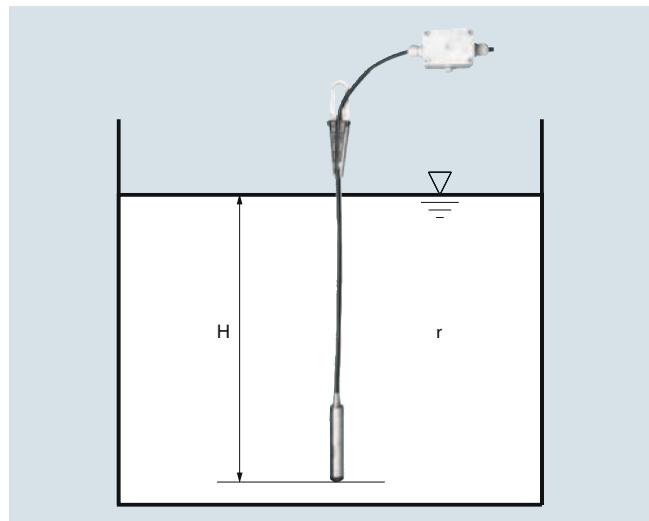
SITRANS LH300 pressure transmitter, dimensions in mm (inch)



Junction box, dimensions in mm (inch)



Cable hanger, dimensions in mm (inch)

More information**Determination of the measuring range for medium water**Calculation of the measuring range:

$$p = \rho \times g \times H$$

with:

ρ = density of medium
 g = local acceleration due to gravity
 H = maximum level

Example:

Medium: Water, $\rho = 1\,000 \text{ kg/m}^3$
 Acceleration due to gravity: 9.81 m/s^2
 Start-of-scale: 0 m
 Maximum level: 6.0 m
 Cable length: 10 m

Calculation:

$$\begin{aligned} p &= 1\,000 \text{ kg/m}^3 \times 9.81 \text{ m/s}^2 \times 6.0 \text{ m} \\ p &= 58\,860 \text{ N/m}^2 \\ p &= 589 \text{ mbar} \end{aligned}$$

Transmitter to be ordered:

7MF1575-1FA10

Plus, if required, junction box 7MF1575-8AA and cable hanger 7MF1575-8AB

**EU Declaration of Conformity
EU-Konformitätserklärung
EU-Déclaration de Conformité**

No. A5E39677475A/001

Manufacturer: Siemens AG

Hersteller:

Fabricant:

Address: DE-76181 Karlsruhe

Anschrift:

Adresse:

Product description: Pressure transmitter / Druckmessumformer

Produktbezeichnung: SITRANS LH300

Identificateur: Type / Typ 7MF1575-abcde

The product described above in the form as delivered is in conformity with the provisions of the following European Directives:**Das bezeichnete Produkt stimmt in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:****Le produit mentionné ci-dessus, tel qu'il est livré, est conforme aux dispositions des Directives Européennes suivantes :**

2014/30/EU Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

EMC Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit

Directive du parlement Européen et du conseil relative à l'harmonisation des législations des États membres concernant la compatibilité électromagnétique

2014/34/EU Directive of the European Parliament and the Council on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres

Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen

Directive du parlement Européen et du conseil relative à l'harmonisation des législations des États membres concernant les appareils et les systèmes de protection destinés à être utilisés en atmosphères explosives

2011/65/EU Directive of the European Parliament and the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Richtlinie des Europäischen Parlaments und des Rates zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten.

Directive du parlement Européen et du relative à la limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques

Karlsruhe, 10.11.2016

Siemens Aktiengesellschaft

Volker Rissland,
Research & Development / Entwicklung
(Name, function / Funktion)Jürgen Pflaum,
Quality / Qualität
(Name, function / Funktion)

signature / Unterschrift

signature / Unterschrift

Annex A is integral part of this declaration.

Anhang A ist integraler Bestandteil dieser Erklärung.

L'annexe A fait partie intégrante de la présente déclaration

This declaration certifies the conformity to the specified directives but contains no assurance of properties.

The safety documentation accompanying the product shall be considered in detail.

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffungs- oder Haltbarkeitsgarantie nach §443 BGB.

Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

La présente déclaration atteste la conformité aux Directives citées. Elle n'est pas assimilable à un descriptif justifiant certaines propriétés.

La documentation relative à la sécurité accompagnant le produit doit être examiné en détail.

Siemens Aktiengesellschaft: Chairman of the Supervisory Board: Gerhard Cromme; Managing Board: Joe Kaeser, Chairman, President and Chief Executive Officer; Roland Busch, Lisa Davis, Klaus Helmrich, Janina Kugel, Siegfried Russwurm, Ralf P. Thomas; Registered offices: Berlin and Munich, Germany; Commercial registries: Berlin Charlottenburg, HRB 12300, Munich, HRB 6684; WEEE-Reg.-No. DE 23691322

Annex A to the EU Declaration of Conformity
Anhang A zur EU-Konformitätserklärung
Annexe A de la Déclaration de conformité

No. A5E39677475A/001

Product description: **Pressure transmitter / Druckmessumformer**
SITRANS LH300
Identificateur: Type / Typ 7MF1575-abcde

Conformity to the Directives indicated on page 1 is assured through the application of the following standards (depending on versions):

Die Konformität mit den auf Blatt 1 angeführten Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen (variantenabhängig):

La conformité aux Directives indiquées sur la page 1 est garantie par l'application des normes suivantes (selon les versions):

Directive Richtlinie Directive	Standard / Reference number Norm / Referenznummer Norme / référence	Edition Auszabedatum Edition	a=	b=	c=	d=	e=
2014/30/EU	EN 61326-1 *	2013	1, 2, 3, 9	A, B, C, D, E, F, H, K, L, X	A, B, C, D, E, F	1,2	0,1
2014/30/EU	EN 61326-2-3 *	2013					
2014/30/EU	EN 55011	2009/A1:2010					
2014/34/EU	EN 60079-0	2012/A11:2013					
2014/34/EU	EN 60079-11	2012					
2014/34/EU	EN 60079-26	2015					1

Note 1: The manufacturer declares that this product complies with the requirements of the new editions of the standards. The changes of the new editions have been checked and do not affect this product.

* all environments included / *beinhaltet alle Umgebungen / dans tout type d'environnement*

Certificates:

Zertifikate:

Certificat:

EC-type examination certificate EG-Baumusterprüfung Certificat évaluation de type	Marking Kennzeichnung Marquage
SEV 16 ATEX 0121	II 1 G

Inspection / Surveillance:

Kontrolle / Überwachung:

Controle / Supervision:

Directive Richtlinie Directive	Notified Body Product Quality Assurance Benannte Stelle Qualitätssicherung Produktion Organisme notifié			No.:
2014/34/EU	ATEX	Sira Certification Service, CSA Group Testing UK Ltd – Unit 6, Hawarden Industrial Park, Hawarden, Deeside, CH5 3US, United Kingdom		0518