EUROPEAN UNION RECOGNISED ORGANISATION (EU RO) MUTUAL RECOGNITION TYPE APPROVAL CERTIFICATE

Certificate No:
MRA000005U

In accordance with Article 10.1 of EU Regulation 391/2009

This Certificate is issued to

Siemens AG

Karlsruhe, **Germany**

for
Temperature Gauges/Sensors/Transmitters

with type designation(s)
SITRANS TS100, TS200, TS500; SITRANS TF320, TF420

The product is found to comply with
EU RO Mutual Recognition Technical Requirements for Sensors
EU RO Mutual Recognition Technical Requirements for Temperature Gauges and Transmitters

Intended service
Temperature sensors and transmitters intended to be used in control and monitoring systems subjects to classification.

Temperature [°C]:	**-25°C to 70°C**
Vibration:	**±1.6 mm / 4 g, (1.0 mm / 0.7 g)***
EMC:	**All locations including bridge and open deck**
IP Code:	**IP66**

This is to certify:

that the Product referred to herein has been inspected for the Manufacturer, pursuant to the relevant requirements of the European Union Recognised Organisation Mutual Recognition procedure, required by Article 10.1 of EU Regulation 391/2009, and has been found in accordance with those requirements.

This Certificate is valid until **2031-02-01**.

Issued at **Hamburg** on **2026-02-02**
DNV local unit: **Augsburg** for **DNV**

Approval Engineer: **Dariusz Lesniewski**

Frederik Tore Elter
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.
LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

SITRANS TS100
- Temperature sensor in cable version (with cable)

SITRANS TS200
- Temperature sensor in cable version (without cable)

SITRANS TS500
- Temperature sensor with connection head
- Temperature sensor which optional includes temperature transmitter types SITRANS TH100 or TH320 or TH420 (TH320/TH420 - reference is made to the EU RO MR Type approval certificate no. MRA000005F)

*Location class 'A' for vibration

SITRANS TF320/TF420
- Temperature field mounting transmitter and/or field indicator
- Configurable by using of transmitter SITRANS TH320 or TH420

SITRANS TS500 "BUILD IN"
7MC7500-1①②③④-⑤⑥⑦⑧-Z-xxx

①	Thread type	
	N	Without
	A-Z	Thread type (authorized if greater than M14)
②+③	Insertion length U	
	A0-G8	Length from 10mm to 700mm (according different ranges)
④	Insert diameter	
	3	Insert diameter = 3mm
	6	Insert diameter = 6mm
⑤	Extension X	
	0	Without
	1	DIN-Type X=65mm adjustable
	2	DIN-Type X=139mm adjustable
	3	DIN-Type X=149mm adjustable
	4	ANSI-Type Nipple X=150mm (1/2"NPT) unadjustable
	5	ANSI-Type NUN X=150mm (1/2"NPT) adjustable
	6	ANSI-Type nipple spring load X=74mm (1/2"NPT) unadjustable
	8	ANSI-Type NUN spring load X=150mm (1/2"NPT) adjustable
	9 and ⑨ = N1D	Customer specific extension length (max 150mm)
⑥	Connection Head	
	A	Material Aluminum; flange-lid
	B	Material Aluminum; low hinged lid
	C	Material Aluminum; high hinged lid
	G	Material Aluminum; screw-in lid; suitable for Ex d applications
	H	Material Aluminum; screw-in lid; Display; suitable for Ex d applications
	M	Material Plastic; screw-in lid
	P	Material Plastic; high hinged lid
	U, Authorized if ⑤ = [4,5,6,8]	Material Stainless steel; screw-in lid; suitable for Ex d applications
	V, Authorized if ⑤ = [4,5,6,8]	Material Stainless steel; screw-in lid; Display; suitable for Ex d applications
⑦+⑧	Sensor/Sensor number/ Accuracy	
	A0 - X8	RTD type: Pt100 Thin Film, Pt100 Wire wound / 1x, 2x / Class B, Class A, Class AA Thermocouple: all types of sensors / 1x, 2x / Class 1, Class 2
xxx	Relevant options	
	Marine Approval D01	DNV Certificate
	D10	EU RO - European Union Recognized Organization (EURO) Mutual Recognition Type Approval Certificate
	Explosion protection E00 – E99	Explosion protection according approvals for hazardous areas
	Head transmitter T00 – T99	Head transmitter Sitrans TH
	Length N1D	Specify customer specific extension length type DIN from 45mm to 150mm

	Y44	Specify special insertion length "U" within specified range (with dataplace 10) in plain text, max 700 mm in combination with option D01…D05
	Y45	Specify special extension length "X" within specified range in plain text, max 150mm

Sitrans TS500 "Welded"
7MC751①-②③④⑤⑥-⑦⑧⑨⑩-Z-xxx

①	Protective tube material	
	1	316 Ti (1.4571)
	2	316 L (1.4404)
②+③	Process connection	
	0N	Without
	0A - 9X	Thread type (authorized if greater than M14) Flange type (authorized if greater than Flange ASME, 1"RF150)
④	Thermowell form	
	A	Form 2/2G/2F according DIN 43722 / Form 2N; D=9mm
	B	Form 2/2G/2F according DIN 43722 ; D=12mm
	K	Form 3/3G/3F according DIN 43722 ; D=12mm/9mm
⑤+⑥	Insertion length U	
	01 - 34	Length from 80mm to 700mm (according different ranges)
⑦	Extension X	
	0	Without extension
	1	According DIN 43772, length "X" depends on type of thermowell
	9 and xxx = N1D	Customer specific extension length (max 150mm)
⑧	Connection Head	
	M	Material Plastic; screw-in lid
	P	Material Plastic; high hinged lid
	Authorized if ④ = [B,K] (thermowell with D≥12) or if ②+③ ≠ 0N and ④ = A and ⑦ = 0 (thermowell form 2N)	
	A	Material Aluminum; flange-lid
	B	Material Aluminum; low hinged lid
	C	Material Aluminum; high hinged lid
	G	Material Aluminum; screw-in lid; suitable for Ex d applications
	H	Material Aluminum; screw-in lid; Display; suitable for Ex d applications
	Authorized if ②+③ ≠ 0N and ④ = A and ⑦ = 0 (thermowell form 2N)	
	U	Material Stainless steel; screw-in lid; suitable for Ex d applications
	V	Material Stainless steel; screw-in lid; Display; suitable for Ex d applications
⑨+⑩	Sensor / Sensor number / Accuracy	
	A0 - X8	RTD type: Pt100 Thin Film, Pt100 Wire wound / 1x, 2x / Class B, Class A, Class AA Thermocouple: all types of sensors / 1x, 2x / Class 1, Class 2
xxx	Relevant options	
	Marine Approval D01	DNV Certificate
	D10	EU RO - European Union Recognized Organization (EURO) Mutual Recognition Type Approval Certificate
	Explosion protection E00 – E99	Explosion protection according approvals for hazardous areas
	Head transmitter T00 – T99	Head transmitter Sitrans TH
	Length N1D	Specify customer specific extension length type DIN from 45mm to 150mm

		Y44	Specify special insertion length "U" within specified range (with dataplace 11) in plain text, max 700 mm in combination with option D01…D05
		Y45	Specify special extension length "X" within specified range in plain text, max 150mm
	Surface treatment Form 3F	W01	Stained, neutralized and passivized
		W02	Electro polished

SITRANS TS500 "BARSTOCK"
7MC752①-②③④⑤⑥-⑦⑧⑨⑩-Z-xxx

①	Protective tube material		
		1	316 Ti (1.4571)
		2	316 L (1.4404)
②+③	Process connection		
		0N	Without
		0A - 9X	Flange type (authorized if greater than Flange ASME, 1"RF150)
④+⑤+⑥	Protective tube form: Type - D L/C/d D : Outer diameter L : Thermowell length C : Cone length d : Inside diameter		
		A00	4/4F - 24 140/65/7
		B00	4/4F - 24 200/65/7
		D00	4/4F - 24 200/125/7
		E00	4/4F - 24 260/125/7
⑦	Extension X		
		1	According DIN 43772, length "X" depends on type of thermowell
		9 and xxx = N1D	Customer specific extension length (max 150mm)
⑧	Connection Head		
		A	Material Aluminum; flange-lid
		B	Material Aluminum; low hinged lid
		C	Material Aluminum; high hinged lid
		G	Material Aluminum; screw-in lid; suitable for Ex d applications
		H	Material Aluminum; screw-in lid; Display; suitable for Ex d applications
		M	Material Plastic; screw-in lid
		P	Material Plastic; high hinged lid
⑨+⑩	Sensor / Sensor number / Accuracy		
		A0 - X8	RTD type: Pt100 Thin Film, Pt100 Wire wound / 1x, 2x / Class B, Class A, Class AA Thermocouple: all types of sensors / 1x, 2x / Class 1, Class 2
xxx	Relevant options		
	Marine Approval	D01	DNV Certificate
		D10	EU RO - European Union Recognized Organization (EURO) Mutual Recognition Type Approval Certificate
	Explosion protection	E00 – E99	Explosion protection according approvals for hazardous areas
	Head transmitter	T00 – T99	Head transmitter Sitrans TH
	Length	N1D	Specify customer specific extension length type DIN from 45mm to 150mm
		Y44	Insertion length "U" : Select range (dataplace 10), enter desired length in plain text (Min:U=C; Max U=L-50mm, no entry = standard length U=L-70mm)
		Y45	Specify special extension length "X" within specified range in plain text, max 150mm

SITRANS TS100
7MC7111-①②③④⑤-Z-xxx

SITRANS TS200
7MC7212-①②③④⑤-Z-xxx

①	Insert diameter 6	 Insert diameter = 6mm
②	Basic Length B B C D	 Length from 70mm to 100mm Length from 101mm to 250mm Length from 251mm to 500mm
③+④	Sensor / Sensor number / Accuracy A0 - X8	 RTD type: Pt100 Thin Film, Pt100 Wire wound / 1x, 2x / Class B, Class A, Class AA Thermocouple: all types of sensors / 1x, 2x / Class 1, Class 2
⑤	Connection side (TS200 only) 0 1 2 3 4 (TS200 only) 5	 Solid wire ends (sensor element) Flying leads (enclosure is customer responsibility) LEMO coupling 1S M12 connector Thermocouple coupling from TC-material (only available for dry accommodation spaces and dry control room) Mini connection head, aluminum not for double Pt100
xxx	Relevant options Marine Approval D01 Explosion protection E00 – E99 Process connection (customer responsibility) A20 A21 A22 A23 A30 A31 A32 A50 Connection cable, type and length (TS100 only) S01-S99 L01-L99 Sensor length Y44	 DNV Certificate Explosion protection according approvals for hazardous areas Soldering nipple G¼", enclosed Soldering nipple G½", enclosed Soldering nipple NPT½", enclosed Soldering nipple M18x1.5, enclosed Compression fitting G¼", enclosed Compression fitting G½", enclosed Compression fitting NPT ½", enclosed Surface connection piece, enclosed (non Ex) With xx meters connection cable (SLFP) Silicone/Fluorpolymer, operating temperature -50 ... +180 °C (-58 ... +356 °F) With xx meters connection cable (TGLV) PTFE/glass fiber/reinforced with stainless steel), Operating temperature -100...+205°C (148 ... 401°F) Specify special Insertion length "B" within specified range in plain text, max 500mm

Note for TS100/TS200:
- Support of the TS100/200 needs to be constructed in such a way that the unit will be supported with 150 mm offset or less full-length, while the free end of the insert should not exceed 100 mm

SITRANS TF 320 Single chamber
7NG034①-②③④⑤⑥-0⑦⑧⑨-Z-x

①	Communication 0	

		7	HART (4 … 20 mA) 4 to 20 mA (w/o HART)
②	Primary Value Mapping	0	Input 1
③	Input 1 type	B-Z	RTD+TC sensor type
④	Input 2 type	A	None
⑤	CJC configuration for TC	0-8	Internal CJC and External CJC
⑥	Non wetted parts materials	1 3	Die-cast aluminum Stainless steel precision casting, 316
⑦	Ex approval	A B C L S T	General purpose Intrinsic safety (Ex i) / Non-incendive field wiring (NIFW) Flameproof enclosure (Ex d) / Explosion proof (XP) Zone 21/22 (Ex t) / Dust ignition proof (DIP) / Increased safety Flameproof enclosure (Ex d) / Intrinsic safety (Ex i) / Dust ignition protection by enclosure Zone 21/22 (Ex t / Increased safety Zone 2 (Ex ec) Flameproof enclosure (Ex d) / Intrinsic safety (Ex i) / Zone 21/22 (Ex t / Increased safety Zone 2 (Ex ec) / (DIP) / (XP) / (NI)
⑧	Cable entry thread	F G H M	2 x M20 x 1.5 / closed 1 x M20 x 1.5 / M24 x 1.5 1 x M20 x 1,5 / 1/2" - 14 NPT 2 x 1/2"-14 NPT / closed
⑨	Local operation	0 1 2	Without local operation Local operation (closed lid) Local operation (lid with glass window)
x	Options Shipping certificates Other options	 E50 E60 XYY	 DNV EU RO MR Type Approval Certificate Combination of character (X) and digits (YY) for additional features (not relevant for this certification)

SITRANS TF 420 Single chamber
7NG044①-②③④⑤⑥-0⑦⑧⑨-Z-x

①	Communication	0 1	HART (4 … 20 mA) PROFIBUS PA
②	Primary Value Mapping	0-9	Average, difference, Minimum, Maxmum
③	Input 1 type	B-Y	RTD+TC sensor type
④	Input 2 type	B-Y	RTD+TC sensor type
⑤	CJC configuration for TC	0-9	Internal CJC and External CJC
⑥	Non wetted parts materials	1 3	Die-cast aluminum Stainless steel precision casting, 316
⑦	Ex approval	A B C L	General purpose Intrinsic safety (Ex i) / Non-incendive field wiring (NIFW) Flameproof enclosure (Ex d) / Explosion proof (XP) Zone 21/22 (Ex t) / Dust ignition proof (DIP) / Increased safety

		S	Flameproof enclosure (Ex d) / Intrinsic safety (Ex i) / Dust ignition protection by enclosure Zone 21/22 (Ex t / Increased safety Zone 2 (Ex ec)
		T	Flameproof enclosure (Ex d) / Intrinsic safety (Ex i) / Zone 21/22 (Ex t / Increased safety Zone 2 (Ex ec) / (DIP) / (XP) / (NI)
⑧	Cable entry thread		
		F	2 x M20 x 1.5 / closed
		G	1 x M20 x 1.5 / M24 x 1.5
		H	1 x M20 x 1,5 / 1/2" - 14 NPT
		M	2 x 1/2"-14 NPT / closed
⑨	Local operation		
		0	Without local operation
		1	Local operation (closed lid)
		2	Local operation (lid with glass window)
x	Options		
	Shipping certificates		
		E50	DNV
		E60	EU RO MR Type Approval Certificate
	Other options		
		XYY	Combination of character (X) and digits (YY) for additional features (not relevant for this certification)

SITRANS TF 320 Dual chamber
7NG034①-②③④⑤⑥-0⑦⑧⑨-Z-x

①	Communication		
		0	HART (4 … 20 mA)
		7	4 to 20 mA (w/o HART)
②	Primary Value Mapping		
		0	Input 1
③	Input 1 type		
		B-Z	RTD+TC sensor type
④	Input 2 type		
		A	None
⑤	CJC configuration for TC		
		0-8	Internal CJC and External CJC
⑥	Non wetted parts materials		
		1	Die-cast aluminum
		2	Stainless steel precision casting, 316
⑦	Ex approval		
		A	General purpose
		B	Intrinsic safety (Ex i) / Non-incendive field wiring (NIFW)
		C	Flameproof enclosure (Ex d) / Explosion proof (XP)
		L	Zone 21/22 (Ex t) / Dust ignition proof (DIP) / Increased safety
		S	Flameproof enclosure (Ex d) / Intrinsic safety (Ex i) / Dust ignition protection by enclosure Zone 21/22 (Ex t / Increased safety Zone 2 (Ex ec)
		T	Flameproof enclosure (Ex d) / Intrinsic safety (Ex i) / Zone 21/22 (Ex t / Increased safety Zone 2 (Ex ec) / (DIP) / (XP) / (NI)
⑧	Cable entry thread		
		F	2 x M20 x 1.5 / closed
		M	2 x 1/2"-14 NPT / closed
⑨	Local operation		
		0	Without local operation
		1	Local operation (closed lid)
		2	Local operation (lid with glass window)
x	Options		
	Shipping certificates		
		E50	DNV
		E60	EU RO MR Type Approval Certificate
	Other options		

	XYY (not: H01, H02, H03)	Combination of character (X) and digits (YY) for additional features, excluded options: H01, H02 & H03. (not relevant for this certification)

SITRANS TF 420 Dual chamber
7NG044①-②③④⑤⑥-0⑦⑧⑨-Z-x

①	Communication		
		0 1	HART (4 … 20 mA) PROFIBUS PA
②	Primary Value Mapping		
		0-9	Average, difference, Minimum, Maxmum
③	Input 1 type		
		B-Y	RTD+TC sensor type
④	Input 2 type		
		B-Y	RTD+TC sensor type
⑤	CJC configuration for TC		
		0-9	Internal CJC and External CJC
⑥	Non wetted parts materials		
		1 2	Die-cast aluminum Stainless steel precision casting, 316
⑦	Ex approval		
		A B C L S T	General purpose Intrinsic safety (Ex i) / Non-incendive field wiring (NIFW) Flameproof enclosure (Ex d) / Explosion proof (XP) Zone 21/22 (Ex t) / Dust ignition proof (DIP) / Increased safety Flameproof enclosure (Ex d) / Intrinsic safety (Ex i) / Dust ignition protection by enclosure Zone 21/22 (Ex t / Increased safety Zone 2 (Ex ec) Flameproof enclosure (Ex d) / Intrinsic safety (Ex i) / Zone 21/22 (Ex t / Increased safety Zone 2 (Ex ec) / (DIP) / (XP) / (NI)
⑧	Cable entry thread		
		F M	2 x M20 x 1.5 / closed 2 x 1/2"-14 NPT / closed
⑨	Local operation		
		0 1 2	Without local operation Local operation (closed lid) Local operation (lid with glass window)
x	Options Shipping certificates		
		E50 E60	DNV EU RO MR Type Approval Certificate
	Other options		
		XYY (not: H01, H02, H03)	Combination of character (X) and digits (YY) for additional features, excluded options: H01, H02 & H03. (not relevant for this certification)

Application/Limitation

The Type Approval covers hardware listed under type designation.

Applicable for a ship as defined in Mutual Recognition provisions Article 10 Regulation on Common Rules and Standards for Ship Inspection and Survey Organizations.

Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to class requirements and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body.

Type Approval documentation

Marking of product

The products to be marked with:
- manufacturer name

- model name
- serial number

Other conditions

The temperature sensors and transmitters have been verified for compliance with EU Mutual Recognition Technical Requirements for Temperature gauges and transmitters version 0.4, dated 2024-07-01. including EU Mutual Recognition Technical Requirements for Sensors version 0.6, dated 2025-01-01.
The testing covers IACS UR E10 Rev.9.
The 100 g / 11 ms impact (shock) test according to IEC 60068-2-27 has not been tested.

Environmental test parameters		DNV location classes
Temperature:	-25°C to 70°C	D
Vibration:	±1.6 mm / 4 g	B
	1.0 mm / 0.7 g (for TS500 with TH100, TH 320 or TH420)	A
Humidity:	95%RH @ 55°C, damp heat cyclic	B
EMC:	All locations including bridge and open deck	B
Enclosure:	IP66 (IP-ratings according to IEC 60529)	C

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer’s product type marking and the type approval certificate

Periodical assessment will be performed annually and at renewal of the certificate.

END OF CERTIFICATE

Generic Statement for EU RO MR Type Approval Certificate

When a product is presented with this EU RO MR Type Approval Certificate for given application, its acceptability with regards to the limitations stated in the certificate conditions defined in 1b, 1c and 1d of the applied Technical Requirement will be evaluated by the EU RO in charge of classing the ship or being in charge of the unit/system certification.

In accordance with Article 10 of Regulation (EC) No 391/2009 of the European Parliament and of the Council of 23 April 2009 "on common rules and standards for ship inspection and survey organizations", the following organizations, recognized by the EU on this date, have agreed on the technical and procedural conditions under which they will mutually recognize this certificate:

- American Bureau of Shipping (ABS);
- Bureau Veritas (BV);
- China Classification Society (CCS);
- Croatian Register of Shipping (CRS);
- DNV;
- Indian Register of Shipping (IRS);
- Korean Register (KR);
- Lloyd's Register Group Ltd. (LR);
- Nippon Kaiji Kyokai General Incorporated Foundation (ClassNK);
- Polish Register of Shipping (PRS);
- RINA Services S.p.A. (RINA);

The scheme for the mutual recognition of class certificates for materials, equipment and components laid down by Article 10(1) of Regulation (EC) No 391/2009 is only enforceable within the Union in respect of ships flying the flag of a Member State. As far as foreign vessels are concerned, the acceptance of relevant certificates remains at the discretion of relevant non-EU flag States in the exercise of their exclusive jurisdiction, notably under the United Nations Convention on the Law of the Sea (UNCLOS). (In accordance with COMMISSION IMPLEMENTING REGULATION (EU) No 1355/2014 amending Regulation (EC) No 391/2009 - recital (25)).