(1) EU-TYPE EXAMINATION CERTIFICATE

(2) Equipment and Protective Systems intended for use in Potentially Explosive Atmosphere - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number

TÜV 17 ATEX 7731 X Issue: 01

(4) Equipment: **PROGNOST SILver, 2nd generation**

(5) Manufacturer: **PROGNOST Systems GmbH**
(6) Address: **Daimlerstr. 10**
48432 Rheine, Germany

(7) This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Rheinland Zertifizierungsstelle für Explosionsschutz of TÜV Rheinland Industrie Service GmbH, Notified Body No. 0035 in accordance with Article 21 of the Council Directive 2014/34/EU of 26th February 2014, certifies this product which has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmosphere, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report 557/Ex7731.01/17

(9) Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

EN IEC 60079-0:2018 EN IEC 60079-7:2015/A1:2018 EN 60079-11:2012 EN IEC 60079-15:2019

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and specification for construction of the equipment or protective system. It does not cover the process for actual manufacture or supply of the equipment or protective system, for which further requirements of the directive are applicable.

(12) The marking of the equipment shall include the following:

II 3(1) G Ex ec nC [ia Ga] IIC T4 Gc system marking

or **II (1) D [Ex ia Da] IIIC**

TÜV Rheinland Zertifizierungsstelle für Explosionsschutz Cologne, 2020-11-18

Dipl.-Ing. Christian Mehrhoff

Notified Body • TÜV Rheinland • ATEX • 0035

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(13) Annex

(14) # EU Type Examination Certificate

TÜV 17 ATEX 7731 X Issue: 01

(15) Description of equipment

15.1 Equipment and type:

PROGNOST SILver, 2nd generation

Type	Card Name	Ex marking	Assembly
DC1-2	Data Control	II 3 G Ex ec IIC T4 Gc	Data Control Board + DC/MP1-2 Power Board + DC1-2 Frontplate
MP1-2	Machine Protection	II 3 G Ex ec IIC T4 Gc	Machine Protection Board + DC/MP1-2 Power Board + MP1-2 Frontplate
DIO1-2	Input / Relay	II 3 G Ex ec nC IIC T4 Gc	Input / Relay Board + 3HU Mainboard + DIO1-2 Frontplate
PS1-2	Power Supply	II 3 G Ex ec IIC T4 Gc	Power Supply Board + PS1-2 Frontplate
CWF1-2	Casing	II 3 G Ex ec IIC T4 Gc	Wallmount Casing + Backplane + Backplane Memory
CRF1-2	Casing	II 3 G Ex ec IIC T4 Gc	Rackmount Casing + Backplane + Backplane Memory
MI1-2	Monitoring Interface	II 3 G Ex ec IIC T4 Gc	Interface Casing + Monitoring Interface Board + MI1-2 Frontplate
CA1-2	Card Adapter	II 3(1) G Ex ec [ia Ga] IIC T4 Gc or II (1) D [Ex ia Da] IIIC	required to use TI1, AI1-5
AI6-2	Temperature	II 3(1) G Ex ec [ia Ga] IIC T4 Gc or II (1) D [Ex ia Da] IIIC	AI6-2 Main Board+Sub Board+ Frontplate + System Cable + System Board

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15.2 Description / Details of Change

General product information

PROGNOST SILver offers continuous high-speed data analysis and protection for rotating machinery. It includes safe outputs for machine shutdown to minimize consequential damages in all critical conditions.
PROGNOST SILver consists of a 19" rack with several equipping options of the available cards. Some of the cards are used as an associated apparatus for sensors which can be used in hazardous areas of up to zone 0. If installed in a suitable enclosure, the PROGNOST SILver can be used in hazardous areas of zone 2.
All cards are hot swappable and can be exchanged only when no explosive atmosphere is present.
The peripheral equipment meaning intrinsically safe sensors installed at the machines, PC, as well as the process control or ESD system are not part of this assessment.
The system provides safe limited voltage supplies of Um = 30V and Um = 6.5V for the supply and digital communication signals for up to 17 certified Plug-In sensor modules PROGNOST SILver Type TI1 – Trigger, AI1 – ICP, AI2 - 4...20mA, AI3 - Eddy Current, AI4 – Voltage, AI5 - Eddy Current and AI6-2 - Temperature.

Technical Data

Ambient temperature range: -25 °C ≤ T_a ≤ +65 °C

Electrical data:

External power supply

Rated voltage		18....32V DC
Maximum voltage	Um	60 V DC (SELV/ PELV)

DIO 1-2 (Input/Relay):

Rated Voltage	0....32V DC
Maximum voltage (U_m)	≤ 375V

MI 1-2 (Monitoring Interface)

Ethernet Network	Fibre Optic, GBit

Signal Acquisition Cards:

The sensor circuits of the signal acquisition cards are allocated to the I/O slots (1-17) of the PROGNOST SILver system casing.

AI6-2 Temperature card:

It is recomended to connect the temperature sensors via the AI6-2 system cable and board. For this assembly the following values are valid:

Max. output voltage U_o ≤ 7.2V

Max. output current I_o ≤ 12 mA

Max. output Power P_o ≤ 21mW

Max. external inductance L_o for Group IIC ≤ 5mH

Max. external capacity C_o for Group IIC ≤ 10µF

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List of additional input cards adapted via the card adapter CA1-2:

Gerät / Device	Typ / Type	Ex-Kenn-zeichnung / Marking	Bescheinig.Nr./ Certificate
Data acquisition plug-in module	AI1	II (1) G [Ex ia] IIC/ II (1) D [Ex ia] IIIC Ta = -25°C to +65°C	ZELM 09 ATEX 0402X
Data acquisition plug-in module	AI2	II (1) G [Ex ia] IIC/ II (1) D [Ex ia] IIIC Ta = -25°C to +65°C	ZELM 09 ATEX 0414X
Data acquisition plug-in module	AI3	II (1) G [Ex ia] IIC/ II (1) D [Ex ia] IIIC Ta = -25°C to +65°C	ZELM 09 ATEX 0405X
Data acquisition plug-in module	AI4	II (1) G [Ex ia] IIC/ II (1) D [Ex ia] IIIC Ta = -25°C to +65°C	ZELM 09 ATEX 0406X
Data acquisition plug-in module	AI5	II (1) G [Ex ia] IIC/ II (1) D [Ex ia] IIIC Ta = -25°C to +65°C	ZELM 09 ATEX 0405X
Data acquisition plug-in module	TI1	II (1) G [Ex ia] IIC/ II (1) D [Ex ia] IIIC Ta = -25°C to +65°C	ZELM 09 ATEX 0415X

Tabelle 1

The card adapter CA1-2 provides the terminal interface for the wiring of sensors and signals. Wiring can be done directly via a connector or via system cable plus system board.

The PROGNOST SILver system can acquire intrinsically safe and non-safe signals, but they must not mixed on one card adapter CA1-2.

External Sensor Interfaces of signal acquisition cards:

TI1, Trigger

Characteristic Curve			Linear			
Max. output voltage U_o			10.8 V			
Max. output current I_o			11.1 mA			
Max. output power P_o			34 mW			
Explosion group			IIA	IIB	IIC	
Max. external induction L_o			2308 mH	1154 mH	288 mH	
Max. external capacity C_o			66 µF	15 µF	2.1 µF	
Group IIC, if concentrated inductances or capacities are connected						
L_o(mH)	0,5	1	2	3	4	5
C_o(nF)	1	0.9	0.8	0.75	0.7	0.68
Group IIB/IIIC, if concentrated inductances or capacities are connected						
L_o(mH)	0.5	1	2	3	4	5
C_o(µF)	5.6	4.9	4.2	3.9	3.7	3.4

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AI1, ICP

Characteristic Curve			Linear			
Max. output voltage U_o			27.5 V			
Max. output current I_o			91 mA			
Max. output power P_o			630 mW			
Explosion group			IIA	IIB	IIC	
Max. external induction L			34.0 mH	16.9 mH	4.0 mH	
Max. external capacity C			2.2 µF	671 nF	85 nF	
Group IIC, if concentrated inductances or capacities are connected						
L_o(mH)	0.15	0.25	0.5	0.75	1	2
C_o(nF)	79	70	62	54	48	42
Group IIB/IIIC, if concentrated inductances or capacities are connected						
L_o(mH)	0.15	0.5	1	2	3	5
C_o(µF)	510	410	345	300	280	250

AI2, 4..20mA

Characteristic Curve			Linear			
Max. output voltage U_o			27.5 V			
Max. output current I_o			96 mA			
Max. output power P_o			652 mW			
Explosion group			IIA	IIB	IIC	
Max. external induction L_o			30.6 mH	15.2 mH	3.6 mH	
Max. external capacity C_o			2.2 µF	671 nF	85 nF	
Group IIC, if concentrated inductances or capacities are connected						
L_o(mH)	0.15	0.25	0.35	0.5	0.75	1.6
C_o(nF)	78	67	65	60	54	42
Group IIB/IIIC, if concentrated inductances or capacities are connected						
L_o(mH)	0.15	0.5	1	2	3	5
C_o(µF)	500	400	340	300	280	250
The maximum input parameters are:						
Max. value voltage U_i			30 V			
Max. value current I_i			100 mA			
Max. value power P_i			1 W			
Max. effective internal inductance L_i			0.25 mH			
Max. effective internal capacitance C_i			0.85 nF			

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AI3, Eddy Current

Characteristic Curve			Linear			
Max. output voltage U_o			27.5 V			
Max. output current I_o			112 mA			
Max. output power P_o			765 mW			
Explosion group			IIA	IIB	IIC	
Max. external induction L_O			22.2 mH	10.9 mH	2.4 mH	
Max. external capacity C_O			2.2 µF	670 nF	85 nF	
Group IIC, if concentrated inductances or capacities are connected						
L_O(mH)	0.2	0.3	0.5	0.7	0.9	1
C_O(nF)	63	58	54	50	46	42
Group IIB/IIIC, if concentrated inductances or capacities are connected						
L_O(mH)	0.6		1.6		4.6	
C_O(µF)	370		280		230	
The maximum input parameters are:						
Max. value voltage U_I			30 V			
Max. value current I_I			100 mA			
Max. value power P_I			1 W			
Max. effective internal inductance L_i			0.42 mH			
Max. effective internal capacitance C_i			0.85 nF			

AI4, Voltage

Characteristic			Linear			
Max. output voltage U_O			6.6 V			
Max. output current I_O			0.5 mA			
Max. output power P_O			0.5 mW			
Max. external induction L_O			142 H			
Max. external capacity C_O			22 µF			
Group IIC, if concentrated inductances or capacities are connected						
L_O(mH)	1	2	5	10	20	50
C_O(nF)	2.2	2	1.7	1.6	1.5	1.4
The maximum input parameters are:						
Max. value voltage U_I			30 V			
Max. value current I_I			100 mA			
Max. value power P_I			1 W			
Max. effective internal inductance L_i			0.3 mH			
Max. effective internal capacitance C_i			1.35 nF			

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AI5, Eddy Current

Characteristic Curve			Linear			
Max. output voltage U_o			27.5 V			
Max. output current I_o			104 mA			
Max. output power P_o			711 mW			
Explosion group			IIA	IIB	IIC	
Max. external induction L_O			22.2 mH	10.9 mH	2.87 mH	
Max. external capacity C_O			2.2 µF	671 nF	85 nF	
Group IIC, if concentrated inductances or capacities are connected						
L_O(mH)	0.4	0.5	0.7	0.9	1.1	1.2
C_O(nF)	63	58	54	50	46	42
Group IIB/IIIC, if concentrated inductances or capacities are connected						
L_O(mH)	0.6		1.6		4.6	
C_O(µF)	380		290		240	
The maximum input parameters are:						
Max. value voltage U_I			30 V			
Max. value current I_I			100 mA			
Max. value power P_I			1 W			
Max. effective internal inductance L_i			0.42 mH			
Max. effective internal capacitance C_i			0.85 nF			

Details of Changes:

- Standard update of EN 60079-0, EN 60079-15 and EN 60079-7.
- Change of the marking nA to ec.
- Adding of AI6-2 temperature card.

(16) Test-Report No. 557/Ex7731.01/17

(17) Special Conditions for safe use

1. The PROGNOST SILver remote I/O system shall be supplied with a SELV or PELV supply only.
2. The equipment shall only be used in an area of not more than pollution degree 2, as defined in EN/IEC 60664-1.
3. If used in zone 2, the equipment shall be installed in an enclosure that provides a degree of protection not less than IP 54 in accordance with EN/IEC 60079-0 or EN/IEC 60079-7. If not used in an explosive atmosphere, the equipment shall be placed inside a cabinet of IP20 or higher.
4. The enclosure in use must be able to safely dissipate the generated heat and the temperature inside the enclosure must not exceed 65°C.

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(18) Basic Safety and Health Requirements

Covered by afore mentioned standard

TÜV Rheinland Zertifizierungsstelle für Explosionsschutz Cologne, 2020-11-18

Dipl.-Ing. Christian Mehrhoff

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