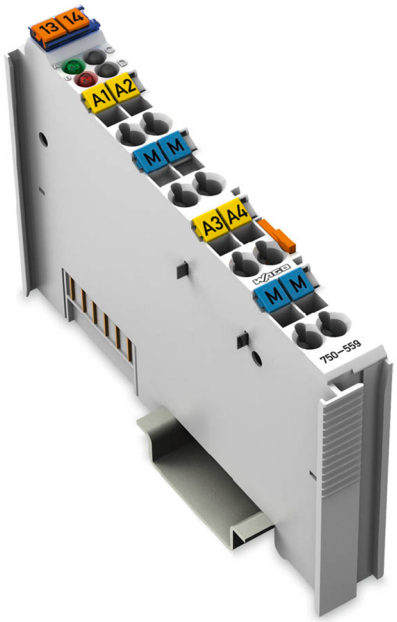
TECHDOCS

WAGO I/O System 750/753

4-channel analog output; 0 … 10 VDC

750-559; 750-559/025-000



Product manual
Valid as of HW version 08 | FW version 04
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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

E-Mail: **documentation@wago.com**

We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present documentation are generally protected by trademark or patent.

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Table of Contents

1 Provisions

1.1 Scope of Applicability

This document applies to the following products:

750-559 (4AO 0-10V DC) 4-channel analog output; 0 … 10 VDC.

From hardware version	08
From firmware version	04
Product detail page	**www.wago.com/750-559**

750-559/025-000 (4AO 0-10V DC /T) 4-channel analog output; 0 … 10 VDC; ext. temperature.

From hardware version	07
From firmware version	04
Product detail page	**www.wago.com/750-559/025-000**

ⓘ Note

Note applicable documents!

The complete operating instructions for the products consist of several applicable documents. The products must only be installed and operated in accordance with the complete operating instructions. Knowledge of all applicable documents is required for proper use. Please find all documents and information on the detailed product pages.

Applicable document

System Manual I/O System 750/753

- Provisions
- Safety
- Planning
- Transport and Storage
- Assembly and Disassembly
- Conductor Termination
- Decommissioning

2 Overview

The I/O module generates standard 0 … 10 V signals for the field range.

The I/O module has four output channels, allowing direct wiring of four 2-wire actuators.

The channels have a common ground potential.

One green status LED indicates the operating status and error-free local bus communication.

One red error LED indicates short circuit or overcurrent.

The output signal is electrically isolated and transmitted with a resolution of 12 bits.

The I/O module can be operated on all head stations of the WAGO I/O System 750/753 with the exception of the economy variants 750-320, 750-323, 750-324 and 750-327.

3 Properties

3.1 View

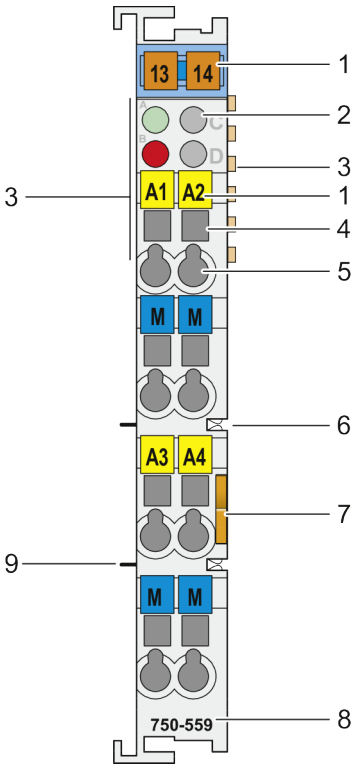

Figure 1: View

1	Slot for Mini-WSB (optional)	🕮 System Manual I/O System 750/753
2	Status LEDs	🖱 Indicators [▸ 7]
3	Data contacts	🕮 System Manual I/O System 750/753
4	Access to open the associated CAGE CLAMP® connection	🕮 System Manual I/O System 750/753
5	CAGE CLAMP® connections	🖱 Wiring Interface [▸ 7] and 🕮 System Manual I/O System 750/753
6	Power jumper contacts (spring)	🖱 Power Jumper Contacts [▸ 8] and 🕮 System Manual I/O System 750/753
7	Release tab	🕮 System Manual I/O System 750/753
8	Item number	🖱 Scope of Applicability [▸ 4]
9	Power jumper contacts (blade)	🖱 Power Jumper Contacts [▸ 8] and 🕮 System Manual I/O System 750/753

3.2 Indicators

One green status LED indicates the operating status and error-free local bus communication.

One red error LED indicates short circuit or overcurrent.

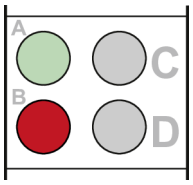

Figure 2: Indicators

Designation	LED	State	Function
Function	A	Off	Not ready for operation, or no/faulty local bus communication
		Green	Operational readiness and fault-free local bus communication
Error	B	Off	No error
		Red	Overload or short circuit of an output signal

3.3 Wiring Interface

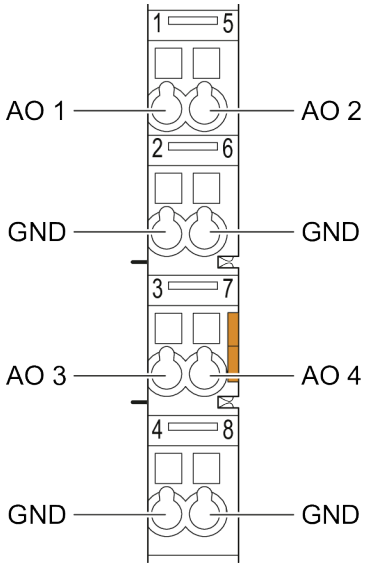

Figure 3: CAGE CLAMP® Connections

Channel	Designation	Connection	Function
1	AO 1	1	Analog output 1: signal voltage
	Ground	2	Analog output 1: ground
2	AO 2	5	Analog output 2: signal voltage
	Ground	6	Analog output 2: ground
3	AO 3	3	Analog output 3: signal voltage
	Ground	4	Analog output 3: ground
4	AO 4	7	Analog output 4: signal voltage
	Ground	8	Analog output 4: ground

3.4 Power Jumper Contacts

The potential for the field supply is fed in via the blade contacts and passed on via the spring contacts.

For additional information on the Power Jumper Contacts, please see
📖 System Manual I/O System 750/753.

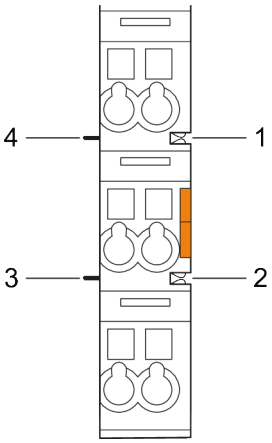

Figure 4: Power Jumper Contacts

No.	Type
1	Groove with spring contact
2	
3	Blade contact
4	

Arrangement in the Bus Node

For mechanical arrangement of the I/O module, the previous component must have at least 2 open grooves for accommodating the blade contacts.

For electrical compatibility requirements see Section Circuit Diagram [▸ 9].

3.5 Circuit Diagram

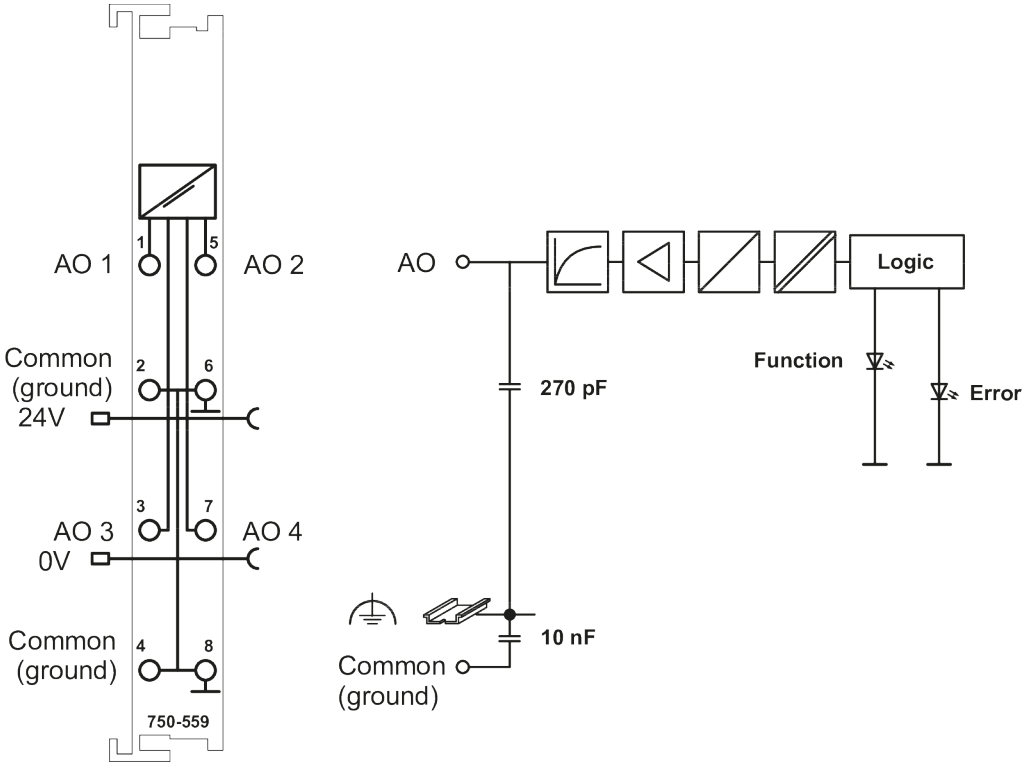

Figure 5: Circuit Diagram

For information on the system power supply, please see 🕮 **System Manual I/O System 750/753**.

4 Functions

4.1 Signal Processing

The I/O module generates standard 0 … 10 V signals for the field range.

The module provides 16 bits of data and eight status bits per channel.

The digitized output value is output in a data word (16 bits) via the process image of the head station as output byte 0 (low) and output byte 1 (high). This value is mapped onto bits B3 … B14 with a resolution of 12 bits. The three least significant bits (B0 … B2) are not evaluated.

4.2 Process Image

In this I/O module, the numerical value range from 0x0000 to 0x7FFF is scaled to the output voltage range from 0 V to 10 V.

Table 1: Process Values

Output Voltage 0 V … 10 V	Numerical Value			Status Byte, Hex.
	Binary	Hex.	Dec.	
0.00	'1000.0000.0000.0000'	0x0000	0	0x00
1.25	'0001.0000.0000.0000'	0x1000	4096	0x00
2.50	'0010.0000.0000.0000'	0x2000	8192	0x00
3.75	'0011.0000.0000.0000'	0x3000	12288	0x00
5.00	'0100.0000.0000.0000'	0x4000	16384	0x00
6.25	'0101.0000.0000.0000'	0x5000	20480	0x00
7.50	'0110.0000.0000.0000'	0x6000	24576	0x00
8.75	'0111.0000.0000.0000'	0x7000	28672	0x00
10.00	'0111.1111.1111.1111'	0x7FFF	32767	0x00

Some fieldbus systems process status information about the process value with the help of a status byte. Zero is always returned as the status byte of this I/O module, so it is not evaluated.

5 Planning

This section provides helpful information for planing the use of the product in a node.

5.1 Compatibility

The I/O module can be operated on all head stations of the WAGO I/O System 750/753 with the exception of the economy variants 750-320, 750-323, 750-324 and 750-327.

5.2 Connection Example

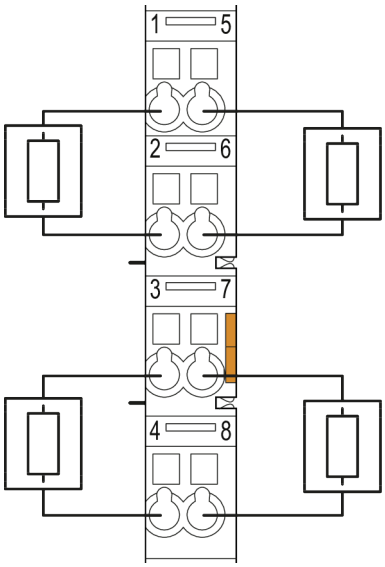

Figure 6: Connection Example

6 Appendix

6.1 Technical Data, Approvals, Guidelines and Standards

Note

Subject to changes!

Please also observe the further product documentation! You can generate the current datasheet at any time at: www.wago.com /<item number>.

See also

- Data sheet 750-559 [▸ 13]
- Data sheet 750-559/025-000 [▸ 16]

Data Sheet | Item Number: 750-559
4-channel analog output; 0 … 10 VDC
https://www.wago.com/750-559

Technical data

Number of analog outputs	4
Total number of channels (module)	4
Signal type	Voltage
Signal type (voltage)	0 … 10 VDC
Actuator connection	4 x (2-wire)
Resolution [bit]	12 bits
Data width	4 x 16-bit data; 4 x 8-bit control/status (optional)
Load impedance (voltage output)	≥ 5 kΩ
Conversion time (typ.)	10 ms
Output error, reference temperature	25 °C
Output error, deviation (max.) of the upper-range value	0.1 %
Temperature error (max.) of the output range value	0.01 %/K
Recovery time (typ.)	100 ms
Supply voltage (system)	5 VDC; via data contacts
Current consumption (5 V system supply)	125 mA
Supply voltage (field)	24 VDC (-25 … +30 %); via power jumper contacts (power supply via blade contact; transmission (field side supply voltage only) via spring contact)
Isolation	500 V system/field
Indicators	LED (A) green: function; LED (B) red: Error
Number of incoming power jumper contacts	2
Number of outgoing power jumper contacts	2
Current carrying capacity (power jumper contacts)	10 A

Connection Data

Connection technology: I/O	8 x CAGE CLAMP®
Connectable conductor materials	Copper
Connection type	Inputs/outputs
Solid conductor	0.08 … 2.5 mm² / 28 … 14 AWG
Fine-stranded conductor	0.08 … 2.5 mm² / 28 … 14 AWG
Strip length	8 … 9 mm / 0.31 … 0.35 inches

Physical data

Width	12 mm / 0.472 inches
Height	100 mm / 3.937 inches
Depth	69.8 mm / 2.748 inches
Depth from upper-edge of DIN-rail	62.6 mm / 2.465 inches

Continued on next page

Mechanical data

Mounting type	DIN-35 rail
Pluggable connector	fixed

Material data

Color	light gray
Housing material	Polycarbonate; polyamide 6.6
Fire load	0.686 MJ
Weight	51 g
Conformity marking	CE

Environmental requirements

Ambient temperature (operation)	0 … +55 °C
Ambient temperature (storage)	-40 … +85 °C
Protection type	IP20
Pollution degree	2 per IEC 61131-2
Operating altitude	0 … 2000 m / 0 … 6562 ft
Mounting position	Horizontal left, horizontal right, horizontal top, horizontal bottom, vertical top and vertical bottom
Relative humidity (without condensation)	95 %
Vibration resistance	4g per IEC 60068-2-6
Shock resistance	15g per IEC 60068-2-27
EMC immunity to interference	per EN 61000-6-2, marine applications
EMC emission of interference	per EN 61000-6-4, marine applications
Exposure to pollutants	per IEC 60068-2-42 and IEC 60068-2-43
Permissible H_2S contaminant concentration at a relative humidity 75 %	10 ppm
Permissible SO_2 contaminant concentration at a relative humidity 75 %	25 ppm

Product Classification

UNSPSC	32101505
eCl@ss 10.0	27-24-26-01
eCl@ss 9.0	27-24-26-01
ETIM 9.0	EC001596
ETIM 10.0	EC001596
ECCN	NO US CLASSIFICATION

Environmental Product Compliance

CAS-No.	1303-86-2 1317-36-8 7439-92-1
REACH Candidate List Substance	Diboron trioxide Lead Lead monoxide
RoHS Compliance Status	Compliant,With Exemption
RoHS Exemption	6(c) 7(a) 7(c)-I 7(c)-II
SCIP notification number (Austria)	0616c2ad-57b5-427e-a40c-604831616275
SCIP notification number (Belgium)	9d24f743-3939-48e2-80f5-12c1a8f4ff67
SCIP notification number (Bulgaria)	93888563-9249-4f9d-8aee-d5b3dd10b4a7
SCIP notification number (Czech Republic)	ee38f8e1-d7a3-4bf0-b6a8-dc6df33551c7
SCIP notification number (Denmark)	257deb8a-818f-4f5d-b5e6-02fcee25c1a8
SCIP notification number (Finland)	adda6141-230f-489f-a145-9ae0d80a32d4
SCIP notification number (France)	30b0c506-f780-40b6-8b6f-dad47163f23a
SCIP notification number (Germany)	06bd4ef5-934c-46fe-b7eb-c21892b001df

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Environmental Product Compliance

SCIP notification number (Hungary)	ec05ac2f-6d18-41ce-b11d-25d47806de5b
SCIP notification number (Italy)	ef9ddadf-cf0a-42de-aa44-596406597b04
SCIP notification number (Netherlands)	a65babf8-fb57-4fcd-8f2f-b1a244012918
SCIP notification number (Poland)	3c907192-cf98-4161-9f1a-661e7a8c8f86
SCIP notification number (Romania)	554014c9-2a8c-4ad6-9e6e-9565d186eabc
SCIP notification number (Sweden)	c97bc518-b714-49a9-8f5d-49f18ed428b6

Approvals / Certificates

General approvals

Approval	Standard	Certificate Name
EAC GZO Almaty Standart	TP TC 020/2011	EAC CoC 03083
KC National Radio Research Agency	Article 58-2, Clause 3	MSIP-REM-W43-AOM750
UL Underwriters Laboratories Inc. (ORDINARY LOCATIONS)	UL 508	E175199

Declarations of conformity and manufacturer's declarations

Approval	Standard	Certificate Name
EU-Declaration of Conformity WAGO GmbH & Co. KG	-	-
UK-Declaration of Conformity WAGO GmbH & Co. KG	-	-

Approvals for marine applications

Approval	Standard	Certificate Name
ABS American Bureau of Shipping	-	22-2219060
BSH Bundesamt fuer Seeschifffahrt und Hydrographie	-	1104
BV Bureau Veritas S.A.	-	13453/E0 BV
DNV DNV GL SE	DNV-CG-0339,Aug.2021	TAA0000194
KR Korean Register of Shipping	-	KR HMB05880-AC001
LR Lloyds Register EMEA	-	LR22180952TA
PRS Polski Rejestr Statków	-	TE/1101/880590/23
RINA RINA Germany GmbH	-	ELE343521XG001

Approvals for hazardous areas

Approval	Standard	Certificate Name
ATEX TUEV Nord Cert GmbH	EN 60079-0	TUEV14ATEX148929X (II 3 G Ex ec IIC T4 Gc)
CCCEx CQST/CNEx	CNCA-C23-01	2020312310000213 (Ex ec IIC T4 Gc)
INMETRO TÜV Rheinland do Brasil Ltda.	IEC 60079-0	TÜV 12.1297 X
KTL Korea Testing Laboratory	KOSHA Article 34, IEC60079-0	21-KA4BO-0551X
UKEx WAGO GmbH & Co. KG	EN 60079-0	UKCA_WA GO22UKEX003X_ec
UL Underwriters Laboratories Inc. (HAZARDOUS LOCATIONS)	UL 121201	E198726

Data Sheet | Item Number: 750-559/025-000

4-channel analog output; 0 … 10 VDC; Ext. Temperature

https://www.wago.com/750-559/025-000

Technical data

Number of analog outputs	4
Total number of channels (module)	4
Signal type	Voltage
Signal type (voltage)	0 … 10 VDC
Actuator connection	4 x (2-wire)
Resolution [bit]	12 bits
Data width	4 x 16-bit data; 4 x 8-bit control/status (optional)
Load impedance (voltage output)	≥ 5 kΩ
Conversion time (typ.)	10 ms
Output error, reference temperature	25 °C
Output error, deviation (max.) of the upper-range value	0.1 %
Temperature error (max.) of the output range value	0.01 %/K
Recovery time (typ.)	100 ms
Supply voltage (system)	5 VDC; via data contacts
Current consumption (5 V system supply)	125 mA
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Number of outgoing power jumper contacts	2

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Connection technology: I/O	8 x CAGE CLAMP®
Connectable conductor materials	Copper
Connection type	Inputs/outputs
Solid conductor	0.08 … 2.5 mm² / 28 … 14 AWG
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Width	12 mm / 0.472 inches
Height	100 mm / 3.937 inches
Depth	69.8 mm / 2.748 inches
Depth from upper-edge of DIN-rail	62.6 mm / 2.465 inches

Continued on next page

Mechanical data

Mounting type	DIN-35 rail
Pluggable connector	fixed

Material data

Color	light gray
Housing material	Polycarbonate; polyamide 6.6
Fire load	0.667 MJ
Weight	50.7 g
Conformity marking	CE

Environmental requirements

Ambient temperature (operation)	-20 … +60 °C
Ambient temperature (storage)	-40 … +85 °C
Protection type	IP20
Pollution degree	2 per IEC 61131-2
Operating altitude	0 … 2000 m / 0 … 6562 ft
Mounting position	Horizontal left, horizontal right, horizontal top, horizontal bottom, vertical top and vertical bottom
Relative humidity (without condensation)	95 %
Relative humidity (with condensation)	Short-term condensation per Class 3K6/IEC EN 60721-3-3 and E-DIN 40046-721-3, accounting for a temperature range of −20 to +60 °C (except for wind-driven precipitation, water and ice formation)
Vibration resistance	4g per IEC 60068-2-6
Shock resistance	15g per IEC 60068-2-27
EMC immunity to interference	per EN 61000-6-2, marine applications
EMC emission of interference	per EN 61000-6-4, marine applications
Exposure to pollutants	per IEC 60068-2-42 and IEC 60068-2-43
Permissible H_2S contaminant concentration at a relative humidity 75 %	10 ppm
Permissible SO_2 contaminant concentration at a relative humidity 75 %	25 ppm

Product Classification

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eCl@ss 10.0	27-24-26-01
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ETIM 9.0	EC001596
ETIM 10.0	EC001596
ECCN	NO US CLASSIFICATION

Environmental Product Compliance

CAS-No.	1303-86-2 1317-36-8 25550-51-0 7439-92-1
REACH Candidate List Substance	4-Methyl-1,2-cyclohexanedicarboxylic anhydride Diboron trioxide Lead Lead monoxide
RoHS Compliance Status	Compliant,With Exemption
RoHS Exemption	6(c) 7(a) 7(c)-I 7(c)-II
SCIP notification number (Austria)	42a91ab6-2a04-401f-81cf-2820f903124f
SCIP notification number (Belgium)	da26b909-3e3f-4267-81d3-03d1c26a5df0
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SCIP notification number (Sweden)	e4399466-db12-4505-b1db-79d2034828ae

Approvals / Certificates

General approvals

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EAC GZO Almaty Standart	TP TC 020/2011	EAC CoC 03083
KC National Radio Research Agency	Article 58-2, Clause 3	MSIP-REM-W43-AOM750
UL Underwriters Laboratories Inc. (ORDINARY LOCATIONS)	UL 508	E175199

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UK-Declaration of Conformity WAGO GmbH & Co. KG	-	-

Approvals for marine applications

Approval	Standard	Certificate Name
ABS American Bureau of Shipping	-	22-2227356-PDA
BSH Bundesamt fuer Seeschifffahrt und Hydrographie	-	1104
DNV DNV Germany GmbH	DNV-CG-0339,Aug.2021	TAA00001J4
LR Lloyds Register	-	LR2475997TA
PRS Polski Rejestr Statków	-	TE/1102/880590/23

Approvals for hazardous areas

Approval	Standard	Certificate Name
ATEX TUEV Nord Cert GmbH	EN 60079-0	TUEV14ATEX148929X (II 3 G Ex ec IIC T4 Gc)
CCCEx CQST/CNEx	CNCA-C23-01	2020312310000213 (Ex ec IIC T4 Gc)
INMETRO TÜV Rheinland do Brasil Ltda.	IEC 60079-0	TÜV 12.1297 X
UKEx WAGO GmbH & Co. KG	EN 60079-0	UKCA_WA GO22UKEX003X_ec
UL Underwriters Laboratories Inc. (HAZARDOUS LOCATIONS)	UL 121201	E198726

List of Tables

List of Figures

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