WAGO I/O System 750

Controller PFC200; 2nd Generation; 2 x ETHERNET, RS-232/-485, CAN, CANopen

750-8214



Product manual
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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.

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1 Provisions

1.1 Scope of Applicability

This document applies to the following product:

750-8214 (PFC200; G2; 2ETH RS CAN)
Controller PFC200; 2nd Generation; 2 x ETHERNET, RS-232/-485, CAN, CANopen

Product Detail Page	http://www.wago.com/750-8214
Version Firmware	04.05.08(27) and higher

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 documents

System Manual I/O System 750/753

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

Function Manual Controller PFC100/200 G2

- Functions
- Commissioning
- Configuration
- Service

Additional documents

Manual to CODESYS V3.5

Manual Migration Guide; Migration from ***e!****COCKPIT* to CODESYS V3.5

2 Overview

The controller is an automation device that can perform PLC control tasks. The controller is suitable for mounting on a DIN-rail and characterized by various interfaces.

The controller can be used for applications in mechanical and systems engineering, in the processing industry and in building technology.

All available I/O modules of the WAGO I/O System 750/753 can be connected to the controller. The controller can process any analog and digital signals from the automation environment internally or provide them to other devices through one of the available interfaces.

Automation tasks can be executed in all IEC-61131-3-compatible languages with the CODESYS V3 programming system.

Implementation of task processing in the runtime system is optimized for Linux® with real-time extensions to provide maximal performance for automation tasks. Web visualization is also provided as visualization in addition to the development environment.

For IEC 61131-3 programming in CODESYS applications, the controller provides program and data memory, as well as remanent memory for retain and flag variables, in an integrated NVRAM. The memory sizes are specified in the technical data.

The controller has a slot for a memory card. The memory card can be used to transfer device parameters, boot projects and other files from one controller to another. The memory card can be accessed via FTP as an additional drive.

Two ETHERNET ports and the integrated configurable switch allow wiring in all necessary configurations with a common network and common IP address for both ports, or with two separate networks with a separate IP address for each port.

The physical interfaces (ports) are assigned via logical bridges and can be configured via the WBM, for example.

Both interfaces support:
- 10BASE-T / 100BASE-TX
- Full/half duplex
- Auto-negotiation
- Auto-MDI(X) (automatic uplink and crossover switching)

The following fieldbus interfaces are implemented for exchange of process data:
- Modbus TCP Master/Slave
- Modbus UDP Master/Slave
- Modbus RTU Master/Slave (via RS-232 or RS-485)
- CANopen Master/Slave

In the controller, all input signals from the sensors are combined. After connecting the controller, all I/O modules on the bus node are detected and a local process image is created from these. This process image may include a mixed arrangement of analog (word-by-word data transfer) and digital (bit-by-bit data transfer) I/O modules.

Based on IEC-61131-3 programming, data processing takes place on site in the controller. The logical process results can be output directly to the actuators or transmitted via a connected fieldbus to the higher level controller.

Note

No direct access from fieldbus to the process image for I/O modules!

Required data from the local bus process image must be mapped explicitly in the CODESYS program to the data in the fieldbus process image and vice versa! Direct access is not possible!

Fieldbus configuration can be performed with the CODESYS V3 controller configuration.

The Web-Based Management (WBM) is also available for configuration. This system includes various dynamic HTML pages from which, among other things, information about configuration and the status of the controller can be called up. The WBM is already stored in the device and is presented and operated using an Web browser. It is also possible to store individual HTML pages in the implemented file system or to launch programs directly.

In the controller's initial state, the installed firmware is based on Linux®, with special real-time extensions of the RT-Preempt patch. In addition, the following application programs are also installed on the controller, along with a number of different auxiliary programs:

- SNMP server/client
- FTP Server
- FTPS server (only explicit connections)
- SSH server/client
- Web server
- NTP Client
- BootP and DHCP Client
- DHCP Server
- DNS Server
- CODESYS V3 Runtime Environment

3 Properties

3.1 View

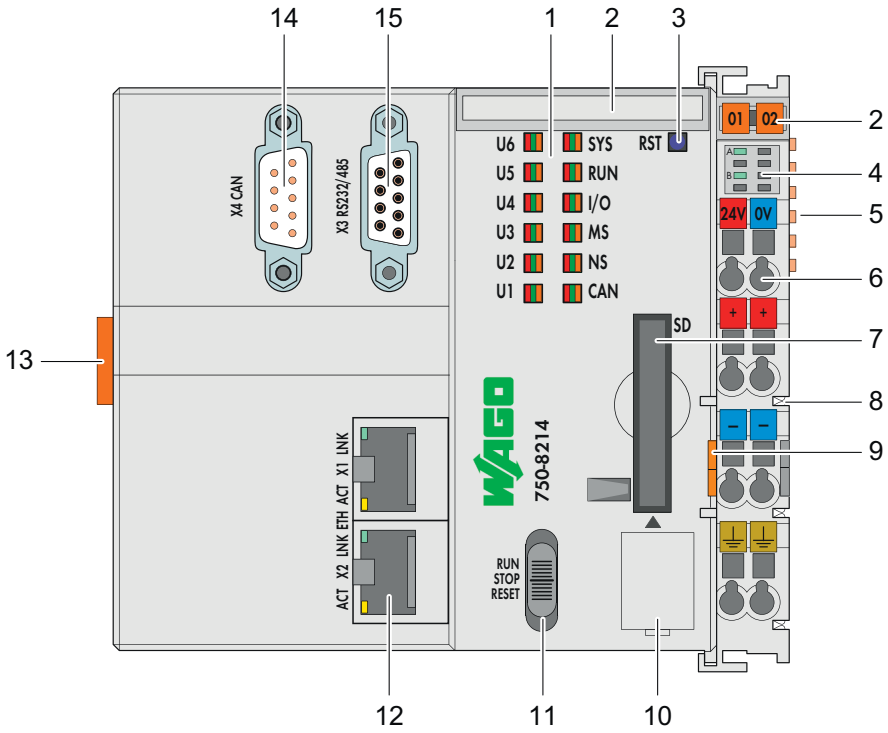


Figure 1: View

1	LED Indicators – System/Fieldbus	System/Fieldbus LED Indicators [▶ 13]
2	Slot for Mini-WSB (optional)	System Manual I/O System 750/753
3	Reset button (in hole)	Reset Button [▶ 14]
4	LED Indicators – Power Supply	LED Indicators – Power Supply [▶ 12]
5	Data contacts	System Manual I/O System 750/753
6	CAGE CLAMP® connections for power supply	Power Supply [▶ 9]
7	Slot for memory card	Memory Card Slot [▶ 12]
8	Power jumper contacts for power supply of down-circuit I/O modules	Power Jumper Contacts/Field Supply [▶ 11]
9	Release tab	System Manual I/O System 750/753
10	Service interface (behind the flap)	Service Interface [▶ 10]
11	Mode selector switch	Mode Selector Switch [▶ 14]
12	ETHERNET connections (RJ45) – X1, X2	Network Interfaces [▶ 9] Network Connection LED Indicators [▶ 13]
13	DIN-rail locking cam	System Manual I/O System 750/753
14	Fieldbus Connection – CAN – X4	CAN Interface [▶ 11]
15	Communication interface – X3	Communication Interface [▶ 10]

3.2 Connections

3.2.1 Power Supply

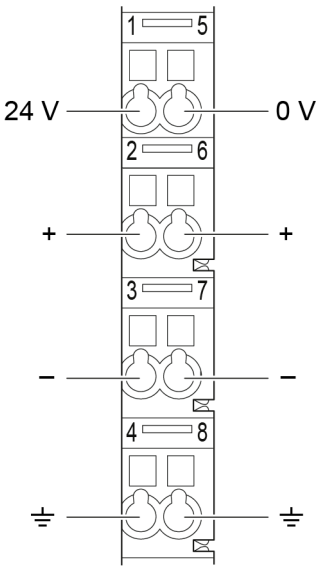


Figure 2: Wiring Interface

Connection	Designation	Description
1	24 V	System power supply voltage: +24 V
2	+	Field supply voltage U_V
3	–	Field supply voltage: 0 V
4	Ground	Field supply voltage ground
5	0 V	System power supply voltage: 0 V
6	+	Field supply voltage U_V
7	–	Field supply voltage: 0 V
8	Ground	Field supply voltage ground

3.2.2 Network Interfaces

The “X1” and “X2” network interfaces are designed as RJ45 sockets.

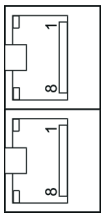


Figure 3: Network Interfaces (RJ45)

Contact	Signal	Description
1	TD+	Transmit data +
2	TD−	Transmit data −
3	RD+	Receive data +
4	NC	Not assigned
5	NC	Not assigned
6	RD−	Receive data −
7	NC	Not assigned

Contact	Signal	Description
8	NC	Not assigned

3.2.3 Service Interface

The service interface is designed as a 4-pole male header and is located behind a cover flap.

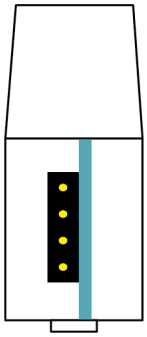


Figure 4: Service Interface (Cover Flap Open)

It is used for communication with “WAGO-I/O-CHECK” and “WAGO Ethernet Settings.”

The connection is made via the WAGO communication cable (see **Accessories [▶ 22]**).

3.2.4 Communication Interface

The communication interface is designed as a 9-pole SUB-D socket.

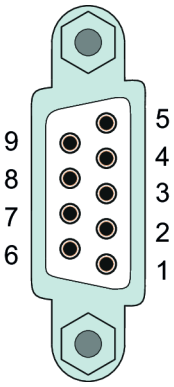


Figure 5: Communication Interface

Table 1: Pin Assignment of Communication Interface

Contact	RS-232 (DCE)		RS-485	
	Signal	Description	Signal	Description
1	NC	Not assigned	NC	Not assigned
2	RxD (out)	Receive Data	NC	Not assigned
3	TxD (in)	Transmit Data	A (Tx/Rx+)	Transmit/receive data +
4	NC	Not assigned	NC	Not assigned
5	FB_GND	Ground	FB_GND	Ground
6	NC	Not assigned	FB_5V	Power supply
7	RTS (in)	Request to Send	NC	Not assigned
8	CTS (out)	Clear to Send	B (Tx/Rx−)	Transmit/receive data −

Contact	RS-232 (DCE)		RS-485	
	Signal	Description	Signal	Description
9	NC	Not assigned	NC	Not assigned
Housing	Shield	Shield	Shield	Shield

3.2.5 CAN Interface

The CAN interface is designed as a 9-pole D-SUB connector.

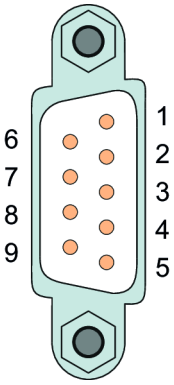


Figure 6: CAN Interface

Contact	Signal	Description
1	NC	Not assigned
2	CAN_L	CAN Signal Low
3	GND	Ground
4	NC	Not assigned
5	Drain Shield	Shield termination
6	NC	Not assigned
7	CAN_H	CAN Signal High
8	NC	Not assigned
9	CAN_V+	Not used

DC/DC converters and optocouplers in the fieldbus interface provide electrical isolation between the CAN bus system and the electronics.

3.3 Power Jumper Contacts/Field Supply

The self-cleaning power jumper contacts on the housing side have a spring-contact design.
The field supply voltage is passed on to downstream I/O modules via these contacts.

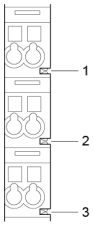


Figure 7: Power Jumper Contacts

Contact	Type	Function
1	Spring contact	Potential transmission (U_V) for field supply
2	Spring contact	Potential transmission (0 V) for field supply
3	Spring contact	Potential transmission (ground) for field supply

3.4 Memory Card Slot

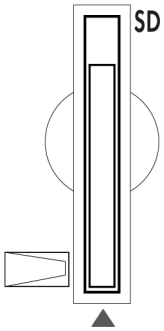


Figure 8: Memory Card Slot

The slot for the SD memory card is located on the front of the housing. The memory card is locked in the housing with a push-push mechanism. Inserting and removing the memory card is described in the section **Inserting and Removing a Memory Card [▶ 29]**! The memory card is protected by a cover flap. The cover flap is sealable.

3.5 Indicators

3.5.1 LED Indicators – Power Supply

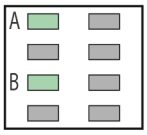


Figure 9: LED Indicators – Power Supply

Designation	Color	Description
A	Green/off	Status of system power supply voltage
B	Green/off	Status of field-side power supply voltage

The meanings of the indicated states are described in **Diagnostics via LED Indicators – Power Supply [▶ 24]**.

3.5.2 System/Fieldbus LED Indicators



Figure 10: System/Fieldbus LED Indicators

Designation	Color	Description
SYS	Red/green/orange/off	System status
RUN	Red/green/orange/off	PLC program status
I/O	Red/green/orange/off	Local bus status
MS	Red/green/orange/off	Module status
NS	Red/green/orange/off	No function
CAN	Red/green/orange/off	CAN status
U6 ... U1	Red/green/orange/off	User LED, programmable using function blocks from the WAGO libraries for LED control

The meanings of the indicated states are described in **Diagnostics via LED Indicators – System/Fieldbus [▶ 24]**.

3.5.3 Network Connection LED Indicators

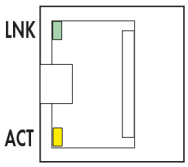


Figure 11: Network Connection LED Indicators

Designation	Color	Description
LNK	Green/yellow/off	ETHERNET connection status
ACT	Yellow/off	ETHERNET data exchange

The meanings of the indicated states are described in **Diagnostics via LED Indicators – Network Connections [▶ 27]**.

3.5.4 Memory Card Slot LED Indicator

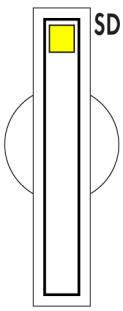


Figure 12: Memory Card Slot LED Indicator

Designation	Color	Description
SD	Yellow/off	Memory card status

The meanings of the indicated states are described in Diagnostics via LED Indicators – Memory Card Slot [▶ 28].

3.6 Control Elements

3.6.1 Mode Selector Switch



Figure 13: Mode Selector Switch

The operating mode switch has the following functions:

Table 2: Mode Selector Switch

Pos.	Actuation	Function
RUN	Latching	**Normal operation** CODESYS V3 applications are running
STOP	Latching	**Stop** All CODESYS V3 applications have stopped
RESET	Spring-return	Warmstart Reset or Coldstart Reset (depending on how long it is actuated)

Other functions can also be triggered with the reset button.

3.6.2 Reset Button



Figure 14: Reset Button

The reset button is installed within a recess to prevent accidental operation. It is a short-travel button with a low actuating force of 1.1 … 2.1 N (110 … 210 gf). The button can be pressed with suitable object (e.g., a pen).

You can use the reset button to trigger various functions depending on the position of the mode selector switch:

- Temporarily set fixed IP addresses
- Perform a software reset (restart)
- Reset settings

3.7 Schematic Circuit Diagram

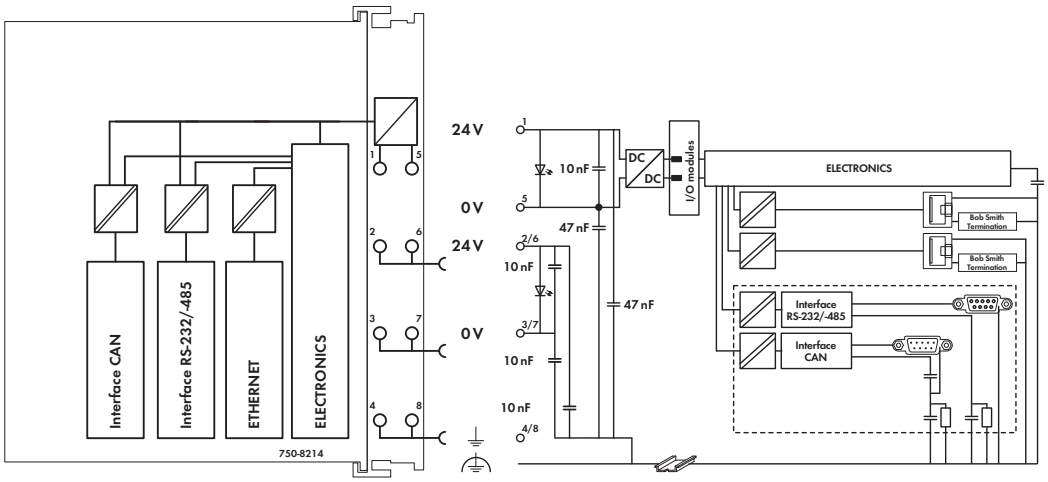


Figure 15: Schematic Circuit Diagram

4 Functions

4.1 Function Overview

The following functions are available for use:

System Functions

- Product and system status
- Real-time clock
- Data backup
- Memory card function
- CODESYS V3 runtime environment

Hardware Functions

- Mode selector switch/reset button
- Communication Interface
- Service Interface

Configuration Functions

- Web-based Management (WBM)

Network Functions

- Network configuration
- Network security
- Network services

Cloud Connectivity

Fieldbus Functions

- BACnet
- OPC UA
- CANopen Master and Slave

Diagnostic Functions

- Diagnostics via Indicators
- Diagnostics via WBM

4.2 WBM Page Overview and Access Rights

The WBM pages require the access rights listed in the table below. Users with lower privileges may not be able to access the pages or may only be able to view them.

Table 3: WBM Page Overview and Access Rights

Tab	Navigation	WBM Page Title	User
Information	Device Status	Device Status	user
	Vendor Information	Vendor Information	user
	PLC Runtime	PLC Runtime Information	user

Tab	Navigation		WBM Page Title	User
	Legal Information			
		WAGO Licenses	WAGO Software License Agreement	user
		Open Source Licenses	Open Source Licenses	user
		WBM Licenses	WBM Third Party License Information	user
		Trademarks Information	Trademarks Information	
	WBM Version		WBM Version Info	user
Configuration	PLC Runtime		PLC Runtime Configuration	user
	Networking			
		TCP/IP Configuration	TCP/IP Configuration	user
		Ethernet Configuration	Ethernet Configuration	user
		Host/Domain Name	Configuration of Host and Domain Name	user
		Routing	Routing	user
		STP/RSTP	Spanning Tree Protocol	user
	Clock		Clock Settings	user
	Administration			
		Serial Interface	Configuration of RS232/RS485 Serial Interface	admin
		Service Interface	Configuration of Service Interface	admin
		Create Image	Create bootable Image	admin
	Package Server			
		Firmware Backup	Firmware Backup	admin
		Firmware Restore	Firmware Restore	admin
		Active System	Active System	admin
	Mass Storage		Mass Storage	admin
	Software Uploads		Software Uploads	admin
	Ports and Services			
		Network Services	Configuration of Network Services	admin
		NTP Client	Configuration of NTP Client	admin
		PLC Runtime Services	PLC Runtime Services	admin
		SSH	SSH Server Settings	admin
		DHCP Server	DHCP Server Configuration	admin
		DNS	Configuration of DNS Server	admin
	Cloud Connectivity			
		Status	Overview	admin
		Connection 1	Configuration	admin
		Connection 2	Configuration	admin
	SNMP			
		General Configuration	Configuration of general SNMP parameters	admin
		SNMP v1/v2c	Configuration of SNMP v1/v2c Parameters	admin
		SNMP v3	Configuration of SNMP v3 Parameters	admin
	Commissioning		Commissioning Settings	admin
	Docker		Docker Settings	admin
	Users		WBM User Configuration	admin
Fieldbus	OPC UA		OPC UA Configuration	admin
	BACnet			
		Status	BACnet Status	admin
		Configuration	BACnet Configuration	admin

Tab	Navigation		WBM Page Title	User
		Data Link	BACnet Data Link	admin
		Storage Location	BACnet Storage Location	admin
Security	Open VPN/IPsec		OpenVPN / IPsec Configuration	admin
	Firewall			
		General Configuration	General Firewall Configuration	admin
		Interface Configuration	Interface Configuration	admin
		MAC Address Filter	Configuration of MAC address filter	admin
		User Filter	Configuration of User Filter	admin
	Certificates		Certificates	admin
	Boot Mode		Boot Mode Configuration	admin
	TLS		Security Settings	admin
	Integrity		Advanced Intrusion Detection Environment (AIDE)	admin
	WAGO Device Access		WAGO Device Access	admin
Diagnostic	Log Message		Log Message Viewer	user
	Download		Download	admin
	Network Capture		Network Capture	admin

5 Planning

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

5.1 Requirements for Wiring and Accessories

5.1.1 Overcurrent Protection

The controller has no internal overcurrent protection.

For each power supply to the controller, appropriate overcurrent protection must be implemented externally, e.g., via fuses.

Without overcurrent protection, the controller electronics can be damaged.

If you implement overcurrent protection for the power supply via external fuses, use the following fuses:

Table 4: Protection of the Power Supply

24 V Input Voltage	Suitable Fuse
System power supply	Max. 2 A, slow; min. 30 VDC
Field supply	max. 10 A; min. 30 VDC

Additional information, e.g., on the type of power supply (SELV/PELV), can be found in 🕮 **System Manual I/O System 750/753**.

5.1.2 Using the Network Interfaces

As delivered, all ports are assigned to Bridge1. The “Configuration mode” is set to “DHCP.”

One common network with one common IP address for both ports



Figure 16: 1 bridge with 2 ports

Table 5: Assignment of MAC IDs and IP addresses for 1 bridge with 2 ports

Bridge	MAC ID	IP Addr.	Port	MAC ID	Port	MAC ID
1	01	1	X1	02	X2	03

Two separate networks where each port has its own IP address



Figure 17: 2 bridges with 1/1 ports

Table 6: MAC ID and IP address assignment for 2 bridges with 1/1 ports

Bridge	MAC ID	IP Addr.	Port	MAC ID	Port	MAC ID
1	01	1	X1	01		
2	02	2			X2	02

5.1.3 Using the CAN Interface

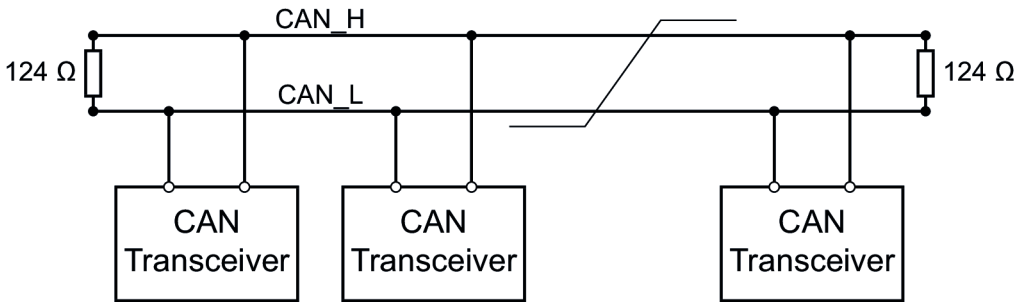


Figure 18: CAN Bus Termination

5.1.4 Using the Communication Interface

NOTICE

Incorrect parameterization can damage the communication partners!

The voltage levels for RS-232 and RS-485 are not compatible! If the controller's interfaces differ from the communication partners' (RS-232 <> RS-485 or RS-485 <> RS-232), this may damage the communication partner's interface. Therefore, always ensure that the controller's interface matches its communication partners' when configuring these items!

5.1.4.1 Use as an RS-232 Interface

Depending on the device type, DTE (Data Terminal Equipment, e.g., PC) or DCE (Data Communication Equipment, e.g., PFC, modem), the RS-232 signals have different data directions.

Table 7: Function of RS-232 Signals for DTE/DCE

Contact	Signal	Data Direction	
		DTE	DCE
2	RxD	Input	Output
3	TxD	Output	Input

Contact	Signal	Data Direction	
		DTE	DCE
5	FB_GND	---	---
7	RTS	Output	Input
8	CTS	Input	Output

For a DTE-to-DCE connection, the signals are connected directly (1-to-1).

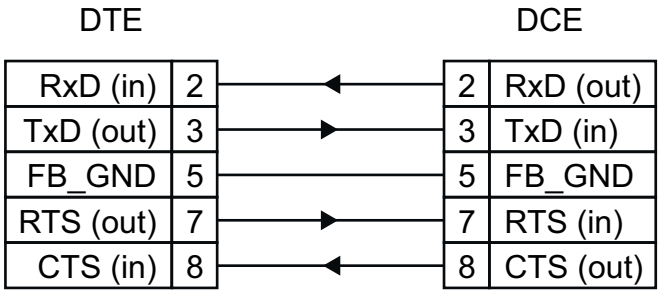


Figure 19: Termination with DTE-DCE Connection (1-to-1)

For a DCE-to-DCE connection, the signal connections are crossed.

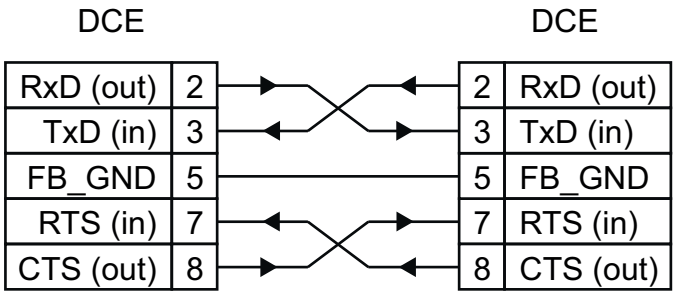


Figure 20: Termination with DCE-DCE Connection (Cross-Over)

5.1.4.2 Use as an RS-485 Interface

To minimize reflection at the end of the line, the RS-485 line must be connected at both ends with a line terminator. If required, one pull-up/pull-down resistor may be used. These resistors ensure a defined level on the bus when no subscriber is active, i.e., when all subscribers are in “Tri-state.”

ⓘ Note

Attention — bus termination!

The RS-485 bus must be terminated at both ends! No more than two terminations per bus segment may be used! Terminations may not be used in stub and branch lines! Drop cables must be kept as short as possible! Operation without proper termination of the RS-485 network may result in transmission errors.

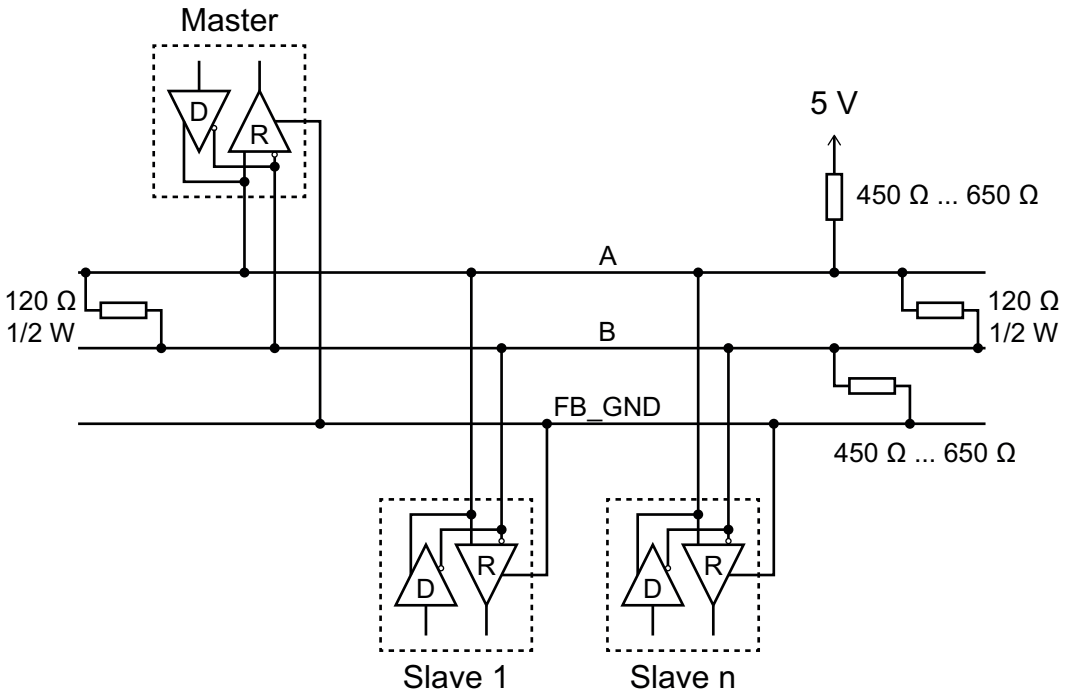


Figure 21: RS-485 Bus Termination

Note

Transmission errors in the event of inappropriate RS-485 configuration!

For baud rates lower than 115200 baud, configure the RS-485 interface with two stop bits and parity enabled (even or odd) to avoid transmission errors.

5.1.5 Using the Memory Card

Use of a memory card is optional. A memory card is not included with delivery and must be ordered separately (see **Accessories [▶ 22]**).

Only use memory cards available from and recommended by WAGO, as these are specified for industrial applications under adverse environmental conditions and for use in this device. Compatibility with other commercially available memory cards cannot be guaranteed.

5.1.6 Accessories

Table 8: Recommended Accessories

Item No.	Item Description
Communication Cable	
750-923	Configuration Cable; USB connection; 2.5 mm long
750-923/000-001	Configuration Cable; USB connection; 5 mm long
Memory Cards	
758-879/000-001	SD Memory Card; SLC NAND, 2 GB; temperature: −40 … 90 °C
758-879/000-2108	SD Memory Card; pSLC-NAND; 8 GB Temperature range: −40 … +90 °C

5.2 CODESYS V3 Compatibility

Table 9: Compatibility Overview

Device Description	Firmware*	Compiler	Visualization Profile
6.0.0.15	10.01.04(23)	3.5.17.30	CODESYS V3.5 SP17 Patch 3
6.1.0.16	13.02.04(24)	3.5.18.10	CODESYS Visualization 4.1.1.0
6.1.1.11	03.03.04 (25)	3.5.18.50	CODESYS Visualization 4.2.0.0
6.2.0.xx	04.04.xx (26)	3.5.19.20	CODESYS Visualization 4.4.0.0
x.x.x.xx	05.04.xx (27)	x.x.x.x	CODESYS Visualization x.x.x.x

*** Notes on firmware versions:**

- Not every new firmware contains a new version of the runtime environment, which is why the compiler version and visualization profile may remain unchanged.
- As a general rule, the compatibility also extends to hotfix and patch versions of the firmware, assuming only the bugfix point of the firmware version is different (example: “FW:01.02.xx(03)”).

6 Diagnostics

6.1 Diagnostics via Indicators

6.1.1 Diagnostics via LED Indicators – Power Supply

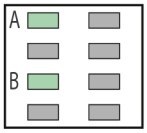


Figure 22: LED Indicators – Power Supply

The “A” (system power supply) LED indicates the following diagnostics:

Table 10: Diagnostics LED – System Power Supply

Status	Explanation	Remedy
Green	24 V system power supply present	--
Off	No 24 V system power supply present	1. Turn the power supply on. 2. Check the power supply.

The “B” (field supply) LED indicates the following diagnostics:

Table 11: Diagnostics LED – Field Supply

Status	Explanation	Remedy
Green	24 V field power supply present	--
Off	No 24 V field power supply present	1. Turn the power supply on. 2. Check the power supply.

6.1.2 Diagnostics via LED Indicators – System/Fieldbus



Figure 23: System/Fieldbus LED Indicators

The “SYS” LED indicates the following diagnostics:

Table 12: “Diagnostics LED “SYS” (e!RUNTIME)

Status	Explanation	Remedy
Green	Ready for operation; system start completed without errors	---
Orange	Device startup/boot process in progress and RST button not pressed	---
Orange, flashing	“Fix IP Address” mode; temporary setting until next reboot	1. Connect to the device via the default address (192.168.1.17). 2. Restart the device to restore the original value setting.

Status	Explanation	Remedy
Geen/red, flashing	Firmware update mode	---
Red, flashing	No license, evaluation period has expired	The libraries or device functions affected are shown in ***e!****COCKPIT*. 1. Activate the associated licenses immediately. 2. Alternatively, remove the libraries or device functions from your application.
Red/orange, flashing	No license, evaluation period not yet expired	The libraries or device functions affected are shown in ***e!****COCKPIT*. 1. Activate the associated licenses before the trial period expires. 2. Alternatively, remove the libraries or device functions from your application. The device has unrestricted functionality until the evaluation period ends. Once the evaluation period ends, it is no longer possible to start the device without activating the corresponding licenses.

The “RUN” LED displays the PLC program status with the following diagnostics:

Table 13: Diagnostics LED “RUN” (***e!****RUNTIME*)

Status	Explanation	Remedy
Green	Applications loaded and all have status “RUN”	---
Green, flashing	No application and no boot project loaded	• Load an application or boot project.
Red	Applications loaded and all have status “STOP”	• Set the mode selector switch to “RUN” to start the application.
Geen/red, flashing	At least one application with status “RUN” and status ”STOP”	• Start the stopped application.
Red, goes out briefly once	Warm start reset completed	---
Red, goes out longer once	Cold start reset completed	---
Red, flashing	At least one application has status “STOP” after exception (e.g., memory access error)	1. Restart the application by resetting via the mode selector switch or in the associated IDE. 2. If the application cannot be started, restart the controller. 3. Contact WAGO Support if the error occurs again.
Orange/green, flashing	Load above threshold value 1	• Try to reduce the load on the system: • Change the CODESYS program. • Terminate any fieldbus communication that is not essential or reconfigure the fieldbuses. • Remove any non-critical tasks from the RT area. • Select a longer cycle time for IEC tasks.

Status	Explanation	Remedy
Orange	Runtime system in debug state (breakpoint, step mode, individual cycle)	1. Resume the application in the associated IDE with step mode or start. If applicable, remove breakpoints. 2. If the connection has been interrupted, set the mode selector switch to “STOP” and then back to “RUN” to enable the application to continue.
Off	No runtime system loaded	• Activate a runtime system, e.g., via the WBM.

The “I/O” LED indicates the following diagnostics:

Table 14: “I/O” Diagnostic LED

Status	Explanation	Remedy
Green	Data cycle on the local bus, normal operating status.	---
Orange, flashing	Startup phase; the local bus is being initialized. The startup phase is indicated by rapid flashing for about 1 ... 2 seconds.	• Wait until initialization has completed.
Red	A hardware fault is present.	• Contact WAGO Support.
Red, flashing (2 Hz)	An error is present which it may be possible to eliminate.	1. First, try to eliminate the error by switching the device (power supply) off and then back on. 2. Check the entire node structure for any errors. 3. If you cannot eliminate the error, contact WAGO Support.
Red, flashing (flashing sequence)	There is a local bus error.	An explanation of the flashing sequence can be found in section “Diagnostics via Flashing Sequences.” • Follow the instructions described there.
Off	A library was not loaded, or a library function was not called.	• Restart the device. If you cannot eliminate the error, contact WAGO Support.

The “MS” LED indicates the following diagnostics:

Table 15: “MS” Diagnostic LED

Status	Explanation	Remedy
Off	No error	---
Red, flashing (flashing sequence)	There is a configuration error.	An explanation of the flashing sequence can be found in section “Diagnostics via Flashing Sequences.” • Follow the instructions described there.

The “CAN” LED displays the following diagnostics:

Table 16: “CAN” Diagnostic LED

Status	Explanation	Remedy
Off	The CAN interface has not been configured.	---

Status	Explanation	Remedy
Alternating red 50 ms / green 50 ms	Configuration in progress	---
Alternating red 200 ms / green 200 ms	Configuration invalid	• Check the configuration in the CODESYS Configurator.
Green 200 ms / off 800 ms	The CANopen interface has the status “Stop.”	---
Green 200 ms / off 200 ms	The CANopen interface has the status “Preoperational.”	---
Green	The CANopen interface has the status “Operational.”	---
Red	The CANopen interface has the status “Bus Off” (short circuit or other major fault).	• Check the bus connections and the baud rate.
Error in the status “Preoperational”		
1 × red flashing / 2 × green flashing	Bus Warning Level exceeded.	• Check the wiring for the CAN bus.
2 × red flashing / 2 × green flashing	Guarding error, slave incorrectly configured or not present.	• Check the slaves and the configuration.
3 × red flashing / 2 × green flashing	Sync Error	• Change the time interval for the synchronization message.
Error in the status “Operational”		
1 × red flashing / green 800 ms on	Bus Warning Level exceeded.	• Check the wiring for the CAN bus.
2 × red flashing / green 800 ms on	Guarding Error	• Check the slaves and the configuration.
3 × red flashing / green 800 ms ON	Sync Error	• Change the time interval for the synchronization message.

6.1.3 Diagnostics via LED Indicators – Network Connections

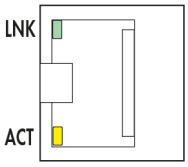


Figure 24: Network Connection LED Indicators

The “LNK” LED displays ETHERNET connection status with the following diagnostics:

Table 17: “LNK” Diagnostic LED

Status	Explanation	Remedy
Off	Data transmission rate: 10 Mbit/s	---
Green	Data transmission rate: 100 Mbit/s	---

The “ACT” LED displays ETHERNET communications status with the following diagnostics:

Table 18: “ACT” diagnostic LED

Status	Explanation	Remedy
OFF	There is no network communication.	• If necessary, check the network connections and network settings.
Yellow, flashing	There is network communication.	---

6.1.4 Diagnostics via LED Indicator – Memory Card Slot

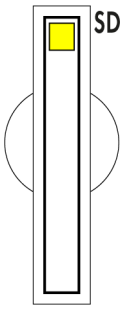


Figure 25: Memory Card Slot LED Indicator

The LED for the memory card slot displays the memory card status with the following diagnostics:

Table 19: Memory Card Slot Diagnostic LED

Status	Explanation	Remedy
Off	No read or write access to the memory card	---
Flashing yellow	Read or write access to the memory card	---
Yellow, steady	Read or write access to the memory card	---

7 Service

7.1 Inserting and Removing a Memory Card

Inserting a Memory Card

1. Use an operating tool or screwdriver to open the transparent cover flap by folding it upwards. An error indicates where to apply the tool.
2. Hold the memory card as depicted in the figure below, with the contacts visible on the right and the diagonal edge upwards.
3. Insert the memory card into the slot provided for it in this position.
4. Push the memory card all the way in. When you let go, the memory card will move back a little and then snap in place (a push-push mechanism).
5. Push the cover flap back in by folding it downwards until it snaps in.
6. You can seal the closed flap through the hole in the enclosure next to the flap.

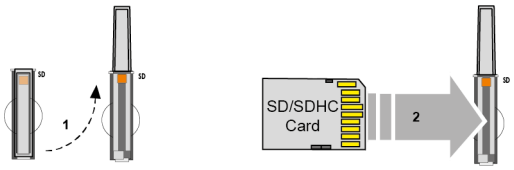


Figure 26: Inserting a Memory Card

Removing a Memory Card

1. Remove any seal.
2. Use an operating tool or screwdriver to open the transparent cover flap by folding it upwards. An error indicates where to apply the tool.
3. To remove the memory card, you must first push it slightly into the slot (a push-push mechanism). This releases the mechanical locking mechanism.
4. As soon as you let go of the memory card, the spring pushes the memory card out a bit.
5. Remove the memory card.
6. Push the cover flap back in by folding it downwards until it snaps in.

8 Appendix

8.1 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 750-8214 [▶ 31]

Data Sheet | Item Number: 750-8214

Controller PFC200; 2nd Generation; 2 x ETHERNET, RS-232/-485, CAN, CANopen

https://www.wago.com/750-8214

The PFC200 Controller is a compact PLC for the modular WAGO I/O System. Besides network and fieldbus interfaces, the controller supports all digital, analog and specialty modules found within the 750/753 Series.
Two ETHERNET interfaces and an integrated switch enable line topology wiring.
An integrated Webserver provides user configuration options, while displaying PFC200 status information.
Besides the processing industry and building automation, typical applications for the PFC200 include standard machinery and equipment control (e.g., packaging, bottling and manufacturing systems, as well as textile, metal and wood processing machines).
Programming per IEC 61131-3

- Programmable with CODESYS V3.5 from Firmware Release 23, WAGO-I/O-PRO V2.3 or ***e!****COCKPIT* up to Firmware Release 22
- Direct connection of WAGO's I/O modules
- 2 x ETHERNET (configurable), RS-232/-485, CAN, CANopen
- Linux operating system with RT-Preempt patch
- Configuration via CODESYS, ***e!****COCKPIT* or Web-Based Management user interface
- Maintenance-free

Technical data

Communications	CANopen Modbus TCP master/slave Modbus (UDP), WagoAppPlcModbus Library Modbus (RTU), WagoAppPlcModbus Library ETHERNET EtherNet/IP™ Adapter (slave) EtherNet/IP™ Scanner EtherCAT® Master OPC UA Server/Client OPC UA Pub/Sub (can be installed later) MQTT RS-232 serial interface RS-485 interface Telecontrol protocols, **requires an additional license**
ETHERNET protocols	DHCP DNS NTP FTP FTPS SNMP HTTP HTTPS SSH
Telecontrol protocols	IEC 60870 (additional license as slave or master) IEC 61850 (additional license as Client or Server) DNP3 (additional license as Slave or Master)
Visualization	Web-Visu
Operating system	Real-time Linux (with RT-Preempt patch)
CPU	Cortex A8; 1 GHz
Programming languages per IEC 61131-3	Instruction List (IL) Ladder Diagram (LD) Function Block Diagram (FBD) Continuous Function Chart (CFC) Structured Text (ST) Sequential Function Chart (SFC)
Programming environment	CODESYS V3.5, Firmware Release 23 or higher ***e!****COCKPIT* (based on CODESYS V3) up to Firmware Release 22 WAGO-I/O-*PRO* V2.3 (based on CODESYS V2.3), up to Firmware Release 22
Configuration options	CODESYS V3 ***e!****COCKPIT* WAGO-I/O-*CHECK* Web-Based Management ***e!****RUNTIME* library CODESYS Library
Baud rate (communication/fieldbus 1)	10/100 Mbit/s
Transmission rate	ETHERNET: 10/100 Mbit/s
Transmission medium (communication/fieldbus)	ETHERNET: Twisted pair S-UTP; 100 Ω; Cat. 5; 100 m maximum cable length
Main memory (RAM)	512 MB
Internal memory (flash)	4096 MB

Continued on next page

Technical data

Non-volatile hardware memory	128 KB
Program memory	CODESYS V2: 16 MB; CODESYS V3: 32 MB
Data memory	CODESYS V2: 64 MB; CODESYS V3: 128 MB
Non-volatile software memory	128 KB 128 KB
Type of memory card	SD and SDHC up to 32 GB (all guaranteed properties only valid with WAGO's memory card)
Memory Card Slot	Push-push mechanism; cover lid (sealable)
Number of modules per node (max.)	250
Number of modules without a bus extension (max.)	64
Input and output process image (internal) max.	1000 words/1000 words
Input and output process image (Modbus®) max.	CODESYS V2: 1000 words/1000 words; CODESYS V3: 32000 words/32000 words
Input and output process image (CAN) max.	2000 words/2000 words
Indicators	LED (SYS, RUN, I/O, CAN, U1 … U6) red/green/orange: Status system, program, internal data bus, CANopen, status programmable by user (can be used via CODESYS library); LED (A, B) green: Status system power supply, field supply
Supply voltage (system)	24 VDC (-25 … +30 %); via pluggable connector (CAGE CLAMP® connection)
Input current (typ.) at nominal load (24 V)	550 mA
Total current (system supply)	1700 mA
Supply voltage (field)	24 VDC (-25 … +30 %); via power jumper contacts
Current carrying capacity (power jumper contacts)	10 A
Number of outgoing power jumper contacts	3
Isolation	500 V system/field

Connection data

Connection technology: communication/fieldbus	CANopen: 1 x D-sub 9 plug; Modbus (TCP, UDP): 2 x RJ-45; Modbus RTU: 1 x D-sub 9 socket; RS-232 serial interface: 1 x D-sub 9 socket; RS-485 interface: 1 x D-sub 9 socket
Connection technology: system supply	2 x CAGE CLAMP®
Connection technology: field supply	6 x CAGE CLAMP®
Connection type 1	System/field supply
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
Connection technology: device configuration	1 x Male connector; 4-pole

Physical data

Width	112 mm / 4.409 inches
Height	100 mm / 3.937 inches
Depth	71.9 mm / 2.831 inches
Depth from upper-edge of DIN-rail	64.7 mm / 2.547 inches

Mechanical data

Weight	256.9 g
Color	light gray
Housing material	Polycarbonate; polyamide 6.6
Conformity marking	CE

Continued on next page

Environmental requirements

Ambient temperature (operation)	0 … +55 °C
Ambient temperature (storage)	-25 … +85 °C
Protection type	IP20
Pollution degree	2 per IEC 61131-2
Operating altitude	without temperature derating: 0 … 2000 m; with temperature derating: 2000 … 5000 m (0.5 K/100 m); 5000 m (max.)
Relative humidity (without condensation)	95 %
Mounting position	Horizontal left, horizontal right, horizontal up, horizontal down, vertical top and vertical bottom
Mounting type	DIN-35 rail
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 61000-6-3, marine applications
Exposure to pollutants	per IEC 60068-2-42 and IEC 60068-2-43
Fire load	2.911 MJ
Permissible H_2S contaminant concentration at a relative humidity 75 %	10 ppm
Permissible SO_2 contaminant concentration at a relative humidity 75 %	25 ppm

Environmental Product Compliance

CAS-No.	1303-86-2 1317-36-8 693-98-1 7439-92-1 79-94-7
REACH Candidate List Substance	2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol 2-methylimidazole Diboron trioxide Lead Lead monoxide Perfluorobutane sulfonic acid (PFBS) and its salts
RoHS Compliance Status	Compliant,With Exemption
RoHS Exemption	6(c) 7(a) 7(c)-I 7(c)-II
SCIP notification number (Austria)	d9aadd2f-b15f-4e94-8da8-2ed7a3021578
SCIP notification number (Belgium)	859989bc-2637-419c-8e32-a01ccb47ee12
SCIP notification number (Bulgaria)	33204001-767b-4079-a168-8802c4fa0269
SCIP notification number (Czech Republic)	3c9292d6-2615-4261-8465-f143b7638688
SCIP notification number (Denmark)	8317f84e-c65f-4805-8b79-c08a39de4f76
SCIP notification number (Finland)	d4b2388e-b609-4fcb-bfac-145688fbe1f1
SCIP notification number (France)	b8cf4f71-58fc-43c3-a366-bb3feafb3787
SCIP notification number (Germany)	e83469b5-3ba2-4366-b66d-6f902f06abb1
SCIP notification number (Hungary)	9fdebca9-ae2d-4ae6-af11-47ab714b3ca2
SCIP notification number (Italy)	76fca1bc-308c-4ede-b4ba-180817226836
SCIP notification number (Netherlands)	51dc0dd6-cb66-422f-85d6-89363a14eb03
SCIP notification number (Poland)	ca54f228-b993-4f07-a253-40c757faaed2
SCIP notification number (Romania)	e68fc98c-6936-44c6-a49a-30e7b1370e6b
SCIP notification number (Sweden)	dec7e2a4-4ab9-43d1-abb5-789a7157fdd8

Continued on next page

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-PFC750
UL Underwriters Laboratories Inc. (ORDINARY LOCATIONS)	-	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.	Rules for class. of Steel Ships	66711/A0
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)
IECEx TUEV Nord Cert GmbH	IEC 60079-0	IECEx TUN 14.0035 X (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

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