

Industrial PoE Injector

PoE++, 60 W, 10/100/1000 BASE

852-1731



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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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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 manual are generally protected by trademark or patent.

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1 Provisions

This document applies to the following product:

852-1731 (Industrial PoE Injector; PoE++ 60 Watt; 10/100/1000 Base)

Product Detail Page

<https://www.wago.com/852-1731>

The product must only be installed and operated in accordance with the operating instructions. Knowledge of the operating instructions is required for proper use. You can find all documents and information on the detailed product page.

1.1 Intended Use

This product is for setting up ETHERNET networks.

The product is an open type device and is designed for installation in an additional enclosure.

- This product is intended for installation in automation technology systems.
- Operation of the products in industrial area is permitted.
- The product is designed for use in dry indoor rooms.
- Operation of the product in other application areas is only permitted when corresponding approvals and labeling are present.

Improper Use

Improper use of the product is not permitted. Improper use occurs especially in the following cases:

- Non-observance of the intended use
- Use without protective measures in an environment in which moisture, salt water, salt spray mist, dust, corrosive fumes, gases, direct sunlight or ionizing radiation can occur
- Use of the product in areas with special risk that require continuous fault-free operation and in which failure of or operation of the product can result in an imminent risk to life, limb or health or cause serious damage to property or the environment (such as the operation of nuclear power plants, weapons systems, aircraft and motor vehicles)

Warranty and Liability

The provisions of the latest WAGO General Terms and Conditions of Deliveries and Services (GTC) apply as well as the Software License Terms for Standard Software (SW-License) applicable to software products und software embedded in WAGO hardware products, both available at: www.wago.com.

In particular, the warranty is void if:

- The product is improperly used.
- The deficiency (hardware and software configurations) is due to special instructions.
- Modifications to the hardware or software have been made by the user or third parties that are not described in this documentation and that has contributed to the fault.

Individual agreements always have priority.

Obligations of Installers/Operators

The installers and operators bear responsibility for the safety of an installation or a system assembled with the product. The installer/operator is responsible for the proper installation and safety of the system. All laws, standards, guidelines, local regulations and accepted technology standards and practices applicable at the time of installation, and the instructions in the the products' Instructions for Use, must be complied with. In addition, the installment requirements for licensing must be observed. In the event of non-compliance, the product may not be operated within the scope of the approval.

1.2 Typographical Conventions





Number Notation

100	Decimals: Normal notation
0x64	Hexadecimals: C-notation
'100'	Binary: In single quotation marks
'0110.0100'	Nibbles separated by a period

Text Formatting

<i>italic</i>	Names of paths or files
bold	Menu items, entry or selection fields, emphasis
Code	Sections of program code
>	Selection of a menu point from a menu
"Value"	Value entries
[F5]	Identification of buttons or keys

Cross References / Links

	Cross references/links to a topic in a document
	Cross references / links to a separate document
	Cross references / links to a website
	Cross references / links to an email address

Sequence of Action

- ✓ This symbol identifies a precondition.
- 1. Action step
- 2. Action step
 - ⇒ This symbol identifies an intermediate result.
- ➔ This symbol identifies the result of an action.
- Individual action step

Lists

- Lists, first level
 - Lists, second level

Figures

Figures in this documentation are for better understanding and may differ from the actual product design.

Warning Messages

DANGER

Type and source of hazard

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

- Action step to reduce risk

WARNING

Type and source of hazard

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

- Action step to reduce risk

CAUTION

Type and source of hazard

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

- Action step to reduce risk

NOTICE

Type and source of malfunction (property damage only)

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

- Action step to reduce risk

Information Notices

Note

Information


Indicates information, clarifications, recommendations, referrals, etc.

1.3 Legal Information

Intellectual property

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Third-party products are always mentioned without any reference to patent rights. WAGO GmbH & Co. KG, or the manufacturer of third-party products, retains all rights regarding patent, utility model or design registration.

Third-party trademarks are referred to in the product documentation. The “®” and “™” symbols are omitted hereinafter. The trademarks are listed in the Appendix:  **Protected Rights [▶ 26]**.

Subject to Change

The instructions, guidelines, standards, etc., in this manual correspond to state of the art at the time the documentation was created and are not subject to updating service. The installer and operator bear sole responsibility to ensure they are complied with in their currently applicable form. WAGO GmbH & Co. KG retains the right to carry out technical changes and improvements of the products and the data, specifications and illustrations of this manual. All claims for change or improvement of products that have already been delivered – excepting change or improvement performed under guarantee agreement – are excluded.

Licenses

The product contains open-source software. The requisite license information is saved in the product. This information is also available under  www.wago.com.

2 Safety



This section presents hazards that could occur if the product is used. Builders and operators must take all hazards into account when analyzing the risk of their installed systems.

Measures to reduce the risk of hazards that are foreseeable from the manufacturer's point of view (i.e., without knowledge of the specific system built) are explained in the respective sections of this documentation (e.g., in "Planning").

Builders and operators must implement explained risk reduction measures and also take their own measures depending on the residual risk.

2.1 General Safety Regulations

- This documentation is part of the product. Therefore, retain the documentation during the entire service life of the product. Pass on the documentation to any subsequent user of the product. In addition, ensure that any supplement to this documentation is included, if necessary.
- The product must only be installed and put into operation by qualified electrical specialists per EN 50110-1/-2 and IEC 60364.
- Changes to switch configurations in the network must always be performed by qualified personnel with sufficient skills.
- Set up permissions management for authorized persons.
 - Physical access may only be made by authorized persons.
 - Digital access may only be made by authorized persons.
- Comply with the laws, standards, guidelines, local regulations and accepted technology standards and practices applicable at the time of installation.

2.2 Electrical Safety

- Make sure the product does not carry any voltage before starting work.

Power Supply

- Connecting impermissible current or frequency values may destroy the product.
- Plan for voltage buffering if the requirement for voltage buffering according to EN 61131-2 is to be met.

Grounding/Protection/Fuses

- When handling the product, please ensure that environmental factors (personnel, work space and packaging) are properly equalized. Do not touch any conducting parts.

Cables

- To minimize interference (e.g., by electromagnetic interference), maintain a spatial separation between control, signal and data lines and the power supply lines.
- Always design the connection cables for the maximum anticipated current load.
- High currents and the inherent heat generated by the product can cause additional heat generation at the clamping point. Plan for a correspondingly higher temperature range for the connecting cables, or reduce inherent heat by selecting larger conductor cross-sections.
- Only one conductor may be connected to each connection point (e.g., CAGE CLAMP® connection).

2.3 Mechanical Safety

- Before startup, please check the product for any damage that may have occurred during shipping. Do not put the product into operation in the event of mechanical damage.
- Do not open the product housing.
- Avoid conductive contamination.

2.4 Thermal Safety

- The surface of the housing heats up during operation. Under special conditions (e.g., in the event of a fault or increased surrounding air temperature), touching the product may cause burns. Allow the product to cool down before touching it.
- If the surface temperature of the product can exceed 40 °C, wear protective gloves and attach protective covers and/or touch-proof protection.
- The temperature inside the additional enclosure must not exceed the ambient temperature permitted for the mounted product.
- Cooling of the product must not be impaired. Ensure air can flow freely and that the minimum clearances from adjacent products/areas are maintained.

2.5 Indirect Safety

- Do not use any contact spray for cleaning.
- Do not use hard objects that could cause scratches for cleaning.
- The product is not resistant to materials with seeping and insulating properties, such as aerosols, silicones or triglycerides (found in some hand creams). If these substances occur in the environment of the product, install the product in an additional housing that is resistant to these substances as well.
- Observe possible different technical specifications for mounting that does not correspond to the nominal mounting position.
- Only use accessories authorized by WAGO.

3 Overview

The product is an industrial PoE injector with two gigabit ETHERNET ports. An ETHERNET port (IEEE 802.3 af/at/bt/4PPoE) supplies power to PoE (powered devices) with power up to 51 W. The power supply from the PoE injector (power sourcing equipment) is up to 60 W. Additionally, automatic transmission rate detection (auto-negotiation) and automatic detection of the transmit and receive lines (Auto MDI-X) allow simple plug-and-play operation.

Its compact design with DIN rail adapter makes installation in the control cabinets with high temperatures, vibration and shock resistance easier. The integrated voltage transformer allows operation with the standard 24 VDC supply voltage in the control cabinet. Meaningful status LEDs, a redundant power supply and an alarm contact that can be configured via a dip switch increase the availability of the PoE injector in operation and also ensure easy handling.

Typical applications:

- Connecting vending machines or camera systems
- Connecting intelligent PoE-capable lighting systems
- Connecting decentralized control cabinets when using a PoE splitter

Features:

- Redundant DC power supply
- Supply voltage range: 24 ... 57 VDC
- DIP switch to set alarm functions
- Full compliance with IEEE 802.3, 802.3u and 802.3ab standards
- Autonegotiation at both 10/100/1000BASE-T ports
- Auto-MDI/MDIX (crossover) at both 10/100/1000BASE-TX ports

4 Properties

4.1 View

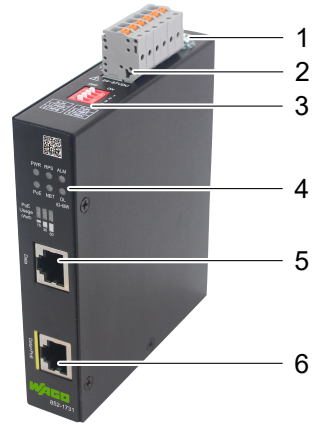







Figure 1: Front View





1	Grounding screw	Ground Conductor and Protective Ground [▶ 17]
2	Plug for power consumption	Supply Voltage [▶ 14]
3	DIP switch	Control Elements [▶ 15]
4	Indicators	Indicators [▶ 14]
5	10/100/1000BASE-T port	
6	PoE 10/100/1000BASE-T Port	

4.2 Type Plate



Figure 2: Type Plate (Example)

Pos.	Name	Description
1	 Hansastr. 27 D-32423 Minden	WAGO logo and address
2		QR code with link to product detail page <a href="http://www.wago.com/<item number>">www.wago.com/<item number>
3		Warning: Do not touch hot surfaces! The housing surface can become hot during operation. If the product has been used at high ambient temperatures, let it cool down before touching it.
		Note: Electrical and electronic equipment must not be disposed of with household waste! Electrical and electronic equipment contains materials and substances that can be harmful to the environment and health. Electrical and electronic equipment must be disposed of properly after use. For more information on this topic, see Disposal and Recycling [▶ 22] .
		Note: Observe the product documentation!
4	Item No.	Item Number
5	IN:	Indicates the supply voltage Technical Data, Approvals, Guidelines and Standards [▶ 23]

Pos.	Name	Description
6	Serial No.	Product serial number in text form: <Serial number> <Firmware version> (left sequence of digits; example: 02) <Hardware version> (right sequence of digits; example: 01)
7		Field for names
		With the CE mark, WAGO declares that the product meets the applicable requirements as set out in Community harmonization legislation per EC Regulation 765/2008, which allows the product to carry this mark.
		“Certification Mark for Safety” of UL-listed products for the North America and Canadian market
		With the FCC marking, WAGO declares conformity with the regulations of the US Federal Communications Commission.
		The UKCA (UK Conformity Assessed) mark declares that the conformity requirements for the UK market are met.

4.3 Connections

4.3.1 Supply Voltage

The female connector (Item No. 2231-106/026-000) can be connected to the 6-pole male connector located on the top. The male connector has the following pin assignment:

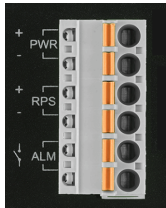


Figure 3: Power Supply Connection (Example)

Connection	Description
+ PWR	Primary DC input: Plus potential
- PWR	Primary DC input: Minus potential
+ RPS	Secondary DC input: Plus potential
- RPS	Secondary DC input: Minus potential
ALM	Switching contact for external alarm (24V, 1A)

4.4 Indicators

4.4.1 Status LED of the Supply Voltage

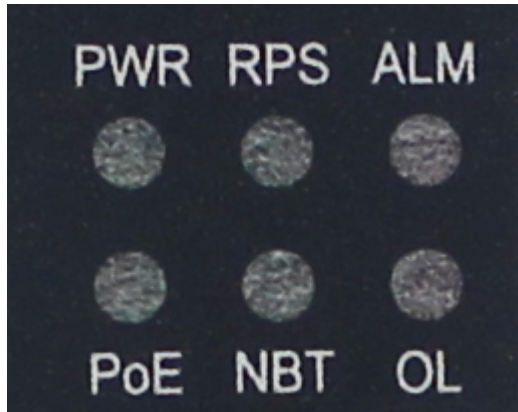


Figure 4: Status LEDs

LED	Name	Status	Description
PWR	Primary Power LED	Green	Primary power supply in use
		Off	Primary power supply switched OFF or error
RPS	Redundant power system LED	Green	Using the Secondary Power Supply
		Off	Secondary power supply switched off or error
ALM	Alarm LED	Red	Alarm for the following conditions (when the DIP switches are switched on) <ul style="list-style-type: none"> No primary power supply No secondary power supply PoE overload
		Off	No alarm reported
PoE	Power over ETHERNET	Green	Power over ETHERNET enabled
		Off	Power over ETHERNET disabled
NBT	Non 802.3bt	Green	2-pair power over ETHERNET enabled
		Off	4-pair power over ETHERNET (4PPoE) enabled
OL	Overload	Red, flashing	Power over ETHERNET between 63W and 66W)
		Off	<ul style="list-style-type: none"> Power over ETHERNET < 63W Power over ETHERNET > 66W (overload protection, the product switches off)

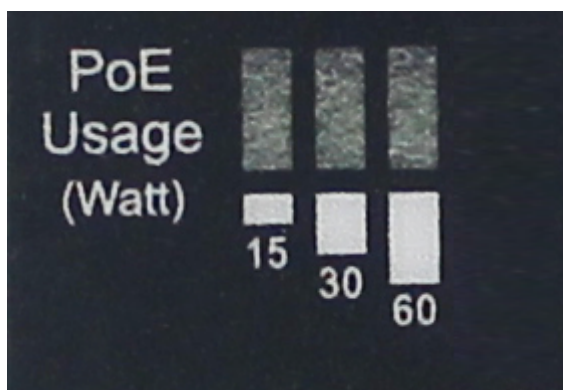


Figure 5: Status LEDs

LED	Name	Status	Description
15	PoE Utilization	Green	PoE power range: 15 W ~ < 30 W
30	PoE Utilization	Green	PoE power range: 30 W ~ < 60 W

LED	Name	Status	Description
60	PoE Utilization	Green	PoE power range: > 60 W

4.5 Control Elements

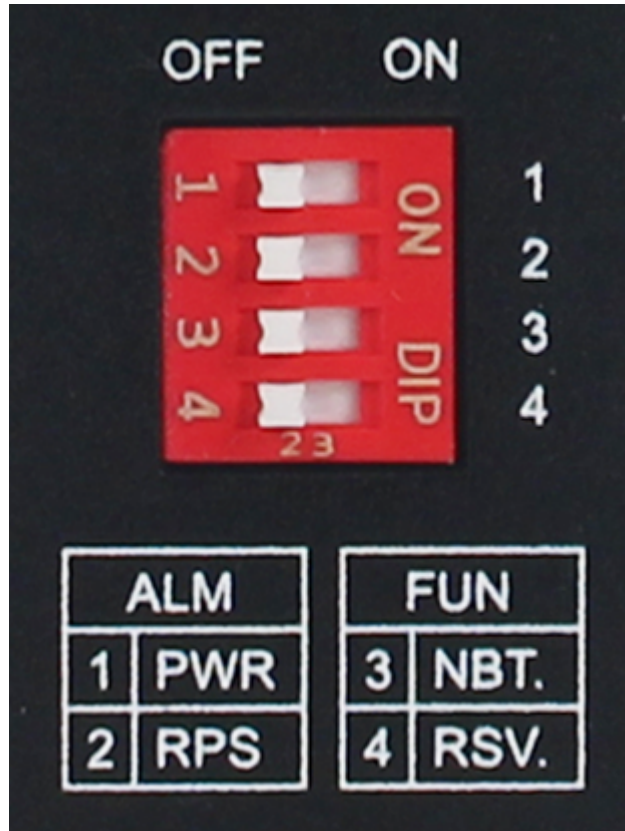


Figure 6: DIP switch

No.	Name	Status	Description
1	PWR	ON	Alarm function is enabled for the primary power supply.
		OFF	Alarm function is disabled for the primary power supply.
2	RPS	ON	Alarm function for the secondary power supply is enabled.
		OFF	Alarm function for the secondary power supply is disabled.
3	NBT.	ON	Legacy mode enabled, support for 2-pair detection
		OFF	802.3bt default mode, support for 4-pair detection
4	RSV		not assigned


5 Planning

5.1 Data Security

Professional planning and design is an important requirement for securing data confidentiality, availability and integrity.

Random Influences

Data transmission and processing can be disrupted by random influences, such as temporary electromagnetic disturbances. Proper setup can significantly reduce the likelihood of corruption or destruction of data.

For additional information see:  [EMC Installation \[▶ 17\]](#).

Deliberate Influences

Use in ETHERNET Areas

ETHERNET products are designed for use in local networks. Please note the following when using ETHERNET products in your system:

- Do not connect control components and control networks to an open network such as the Internet or an office network.
WAGO recommends putting control components and control networks behind a fire-wall.
- In the control components, close all ports and services not required by your application to minimize the risk of cyber attacks and to enhance cybersecurity.
Only open the ports and services for the duration of the commissioning/configuration.
- Limit physical and electronic access to all automation components to authorized personnel only.
- To reduce the risk of unauthorized access to your system, change the default passwords during initial commissioning.
- To reduce the risk of unauthorized access to your system, regularly change the passwords used.
- To verify that the measures taken meet your security requirements, regularly perform threat analyses.
- To restrict access to and control of individual products and networks, employ a “defense-in-depth” mechanism in your system’s security configuration.

Additional document

-  [White Paper Cybersecurity in Production Facilities](#)

All the documentation and information is available at:  www.wago.com.

5.2 Safety Measures at the Installation Location

Additional Enclosure

The product is an open type device. It must only be installed within appropriate enclosures, cabinets or electrical operation rooms that fulfill at least the following requirements:

- Offer adequate protection against direct or indirect contact.

- Offer adequate protection against UV irradiation.
- Restrict access to authorized personnel and may only be opened with tools.
- Ensure the required pollution degree in the vicinity of the system.
- Prevent fire from spreading outside of the enclosure.
- Guarantee mechanical stability.

5.3 Ground Conductor and Protective Ground

The product must be grounded. The following options are available for this:

- Grounding screw

Do not operate the product without an appropriate ground conductor installed.

5.4 Mounting Position

All specifications and handling steps refer to the nominal mounting position. Deviating mounting positions affect, for example:

- Air circulation

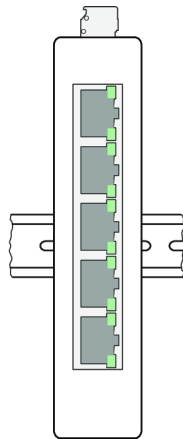


Figure 7: Nominal Mounting Position

5.5 EMC Installation

- **Ground DIN-rails.**
Ground the DIN-rails to divert electromagnetic interference.
- **Use shielded cables for data and signal lines.**
Electromagnetic interference is reduced and signal quality increased. Measurement errors, data transmission faults and interference due to excessive voltage can be prevented!
- **Keep data and signal lines separate from interference sources.**
Route data and signal lines separately from all power supply cables and other sources of high electromagnetic emissions (e.g., frequency converters or drives).
- **Connect the cable shielding with the ground potential.**
Integrated shielding is mandatory to meet technical specifications regarding measurement accuracy. Establish the connection between the cable shielding and ground potential at the inlet of the cabinet or housing. This grounding allows induced interferences to dissipate and be kept away from devices in the cabinet or housing.

- **Improve shielding performance with a large contact area.**

A low-impedance connection between shielding and ground achieves better shielding performance. For this purpose, connect the shielding over a large surface area, e.g., using the WAGO Series 790 Shield Connection System. This is especially recommended for large-scale systems where equalizing or high impulse currents may occur.

6 Transport and Storage

The original packaging offers optimal protection during transport and storage.

- Store the product in suitable packaging, preferably the original packaging.
- Only transport the product in suitable containers/packaging.
- Make sure the product contacts are not contaminated or damaged during packing or unpacking.
- Observe the specified ambient climatic conditions for transport and storage.

Long-Term Storage

- For long-term storage, power must be applied to the product for five minutes at least every two years.

7 Installation and Removal

7.1 Mounting on the DIN-Rail

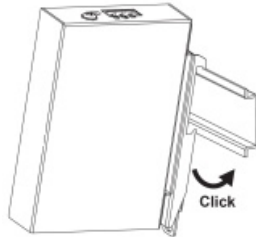


Figure 8: Mounting Product on DIN-Rail

1. Tilt the product slightly.
2. Place the product, with the DIN-rail guide, on the top edge of the DIN-rail.
3. Press the product onto the DIN-rail.
4. Push down until the product audibly snaps into place.

7.2 Removal from the DIN-Rail

CAUTION

Hot Surface!

The surface of the housing heats up during operation. Under special conditions (e.g., in the event of a fault or increased surrounding air temperature), touching the product may cause burns!

- Allow the product to cool down before touching it.

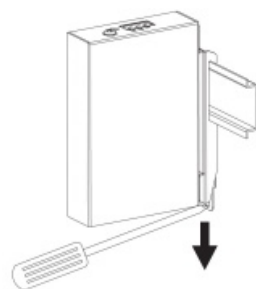


Figure 9: Removing the Product from the DIN-Rail

1. To remove the product, pull down the DIN-rail mount/removal latch. Use an operating tool for this purpose.
 - ⇒ The product is now unlocked.
2. Tilt the product forward and unhook it from the DIN-rail.

8 Connection

Solid conductors, as well as stranded and fine-stranded conductors with ferrules, are terminated by pushing them into Push-in CAGE CLAMP® Connectors. For all conductor types, an operating tool must be used to open the Push-in CAGE CLAMP®. Only one conductor may be connected to each clamping unit.

To connect a conductor, proceed as follows:

- ✓ You need an operating tool.
 - 1. Use the operating tool to press and hold the push-button next to the connection in question in order to open the Push-in CAGE CLAMP®.
 - 2. Insert the conductor into the corresponding connection opening (round housing opening).
 - 3. Release the push-button to close the Push-in CAGE CLAMP®.
- ➔ The conductor is now securely clamped.

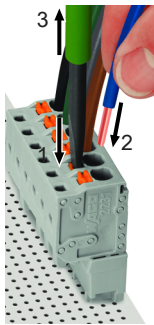


Figure 10: Connecting Conductor to Push-in CAGE CLAMP®

Removing Conductor

- ✓ You need an operating tool.
 - 1. Use the operating tool to press and hold the push-button next to the connection in question in order to open the Push-in CAGE CLAMP®.
 - 2. Remove the conductor.
 - 3. Release the push-button to close the Push-in CAGE CLAMP®.
- ➔ The conductor is now detached.

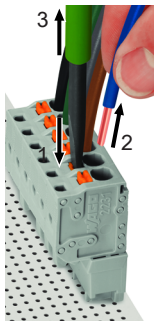
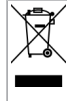


Figure 11: Removing Conductor from Push-in CAGE CLAMP®

9 Decommissioning

9.1 Disposal and Recycling



WEEE Mark

Electrical and electronic equipment may not be disposed of with household waste. This also applies to products without this mark.

Electrical and electronic equipment contain materials and substances that can be harmful to the environment and health. Electrical and electronic equipment must be disposed of properly after use. Environmentally friendly disposal benefits health, protects the environment from harmful substances in electrical and electronic equipment and enables sustainable and efficient use of resources.

- Observe the national and local regulations for the disposal of electrical and electronic equipment, lithium-ion batteries, lead–acid batteries and packaging.
- Clear any data stored on electrical and electronic equipment.
- Remove lithium-ion batteries, lead–acid batteries or memory cards that are added to the electrical and electronic equipment.
- Wear appropriate personal protective equipment when removing the lithium-ion batteries/lead–acid batteries.
- Dispose of the removed lithium-ion batteries/lead–acid batteries according to your local waste regulations (e. g. collection boxes at the retail or local collection points).
- Have electrical and electronic equipment sent to a local collection point.
- Dispose of all types of packaging to ensure a high level of recovery, reuse and recycling.
- Transport packages from the B2B area can be taken back free of charge via a return system in accordance with the Packaging Act. Please contact our service provider Interseroh directly. The corresponding certificate can be found at: [🌐 corporate-certificates](#).
- Throughout Europe, Directives 2006/66/EC, 94/62/EC and 2012/19/EU (WEEE) apply. National directives and laws may differ.

10 Appendix


10.1 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 852-1731.pdf [▶ 24]



The device is an industrial PoE injector with two Gigabit ETHERNET ports. One ETHERNET port (IEEE 802.3 af/at/bt/4PPoE) enables the power supply of PoE end devices (powered devices) with an energy of up to 51 watts. The feed-in power of the PoE injector (power sourcing equipment) is up to 60 watts. Automatic detection of the transmission rate (auto negotiation) and automatic determination of the transmission and reception lines (Auto MDI-X) enable simple "plug & play" operation.

The compact design with mounting rail adapter enables simple installation in the control cabinet with high resistance to temperature, vibration and shock. The integrated voltage converter enables operation with the usual supply voltage of DC 24 V in the control cabinet. Meaningful status LEDs, a redundant power supply and an alarm contact that can be configured via a DIP switch increase the PoE injector's availability during operation and ensure easy handling.

Typical fields of application:

- Connection of vending machines or camera systems
- Connection of intelligent PoE-capable lighting systems
- Connection of decentralized switch cabinets by using a PoE splitter

Features:

- Redundant DC power supply
- Supply voltage range: DC 24 ... 57 V
- DIP switch for enabling alarm functions
- Fully compatible with the IEEE802.3, 802.3u, 802.3ab standards
- Auto negotiation on both 10/100/1000BASE-T ports
- Auto-MDI/MDIX (crossover) on both 10/100/1000BASE-T ports

Technical data

Number of 1 Gbit/s ports	2
Communication standards	IEEE 802.3bt 4-pair PoE IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab 1000BASE-T IEEE 802.3af Power over Ethernet (PoE) IEEE 802.3at High Power over Ethernet (PoE+)
Supply voltage	24 ... 57 VDC
Power consumption (max.)	90 W
Baud rate	Copper cable: 100/1000 Mbit/s
Transmission medium (communication/fieldbus)	Copper cable: Cat. 5e or 6a, 100 m maximum cable length
Indicators	Device: LED (PWR, RPS, PoE, NBT) green: Power supply (primary), redundant power supply (secondary), Power over Ethernet, Mode; LED (ALM, OL 63-66 W) red: Alarm, Overload; LED (PoE Usage (Watt)) green: 15, 30, 60 Watt; pro Port: LED green: Status 1000 Mbps, LNK/ACT port

Connection data

Connection technology: communication/fieldbus	Copper cable: 2 x RJ-45
Connection technology: supply	1 x Built-in male connector: 231-436/001-000; included female connector (MCS Connectors): 2231-106/026-000

Physical data

Width	25 mm / 0.98 inches
Height	116 mm / 4.57 inches
Depth	100 mm / 3.93 inches

Mechanical data

Weight	242.8 g
Housing material	Aluminum
Conformity marking	CE

Environmental requirements

Ambient temperature (operation)	-40 ... +75 °C
Ambient temperature (storage)	-40 ... +80 °C
Protection type	IP30
Relative humidity (without condensation)	95 %
Mounting type	DIN-35 rail
Vibration resistance	per IEC 60068-2-6
Shock resistance	per IEC 60068-2-27
EMC immunity to interference	per EN IEC 61000-6-2
EMC emission of interference	per EN IEC 61000-6-4
Fire load	0 MJ

Commercial data

PU (SPU)	1 pcs
Country of origin	TW
GTIN	4066966512014
Customs tariff number	8517620000

Environmental Product Compliance

RoHS Compliance Status	Compliant, No Exemption
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Approvals / Certificates

General approvals



Approval	Standard	Certificate Name
UL Underwriters Laboratories Inc. (ORDINARY LOCATIONS)	UL 61010-2-201	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	-	-

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