

# I/O-System — 750 and 753 Series — One System for Every Application

## General Product Information



### One System for Every Application

The WAGO 750/753 I/O-SYSTEM is characterized by its universal application scope and extensive product portfolio. With more than 500 different modules, the versatility and flexibility is so great that virtually every requirement in a wide range of industries is covered.

### Industrial Automation

The wide selection of I/O modules for various potential and signal types, as well as special functions, makes it possible to economically wire sensors/actuators — even in safety-related applications.

### Building automation

The broad portfolio allows for flexible, cellar-to-ceiling solutions with conventional I/O modules, standardized industry-specific fieldbus protocols and subsystems for typical applications in lighting, shading, heating, ventilating and air conditioning (HVAC) and much more.

### Marine and Onshore/Offshore Automation

International approvals coupled with industry-specific features permit use in shipbuilding and other harsh sectors. Addressing requirements specific to industry and operating environment has enabled use on marine diesels and in the EMC-sensitive area of a vessel's bridge. Because the requirements are significantly greater for immunity to interference or emission of interference and mechanical performance in these sensitive areas, the system can readily meet the needs of other industries.

### Process automation

Even under the harshest environmental conditions, use is possible with special approvals. Potential hazardous area applications include oil and gas production, the chemical industry and power generation. The I/O-System can be installed in Zone 2/22 with its intrinsically safe I/O modules, making it possible to connect sensors/actuators in Zones 1/21 and 0/20.

### Maximum Fieldbus Independence

The system's modularity is also reflected in its support for numerous fieldbus systems and ETHERNET standards. Depending on the application, it is possible to choose between fieldbus couplers and communication modules for different protocols.

### Easy to Use

A modular, DIN-rail-mount design permits easy installation, expansion and modification of the I/O module without tools. The streamlined design prevents installation errors. In addition, proven CAGE CLAMP® technology offers fast, vibration-proof and maintenance-free connections that are independent of operator skill. Depending on the I/O module's granularity, field peripherals can be directly wired using 1-, 2-, 3- or 4-wire technology.

### Worldwide Approvals

International approvals for building and industrial automation, as well as the process and marine industries, guarantee worldwide use, even under more rigorous operating conditions including ATEX, BR-Ex, IECEx, UL508, UL ANSI/ISA and ship construction.



### Extremely Compact

WAGO's patented mechanical design leads to extremely compact I/O nodes. In fact, select I/O modules can accommodate up to 16 channels in a 12 mm (1/2") wide housing.

- Finely granular I/O modules for node customization.
- Space-saving design permits high integration density and direct connection.

### Maximum Reliability and Ruggedness

The WAGO-I/O-SYSTEM is engineered and tested for use in the most demanding environments in accordance with the highest standards, e.g., those required in marine applications. The system is distinguished from other products that are solely intended for industrial use because of:

- Greatly increased vibration rating.
- Significantly greater immunity to interference (ESD).
- Lower emission of interference.
- Larger voltage fluctuation range.
- Greater strength for continuous operation in upper temperature ranges.

In addition, CAGE CLAMP® spring pressure connections ensure superior reliability.

Integrated QA measures in the production process and 100 % function testing ensure consistent quality.

### Clear Identification

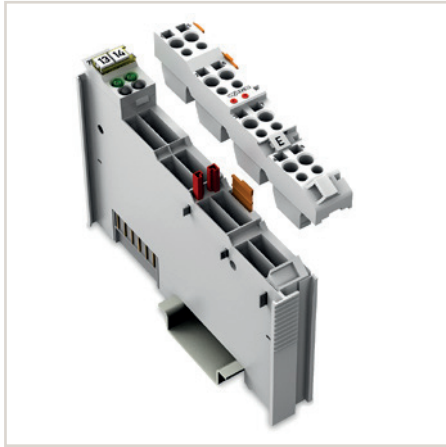
I/O module functionality is identified via marker carriers (integrated or as option). Terminal assignment and technical data are printed onto the side of the I/O module. The WAGO WSB marker system also allows module- and channel-related identification.

### Advantages:

- Fieldbus-independent — Support all standard fieldbus protocols & ETHERNET standards
- Flexible platform adapts to diverse applications and environments
- Tested and approved worldwide
- Wide range of accessories for marking system and connection technology
- Vibration-proof, fast and maintenance-free CAGE CLAMP® connections

## 750 and 753 I/O-System Versions

### Pluggable Connector



The pluggable connections of the WAGO 753 I/O-SYSTEM allow quick and safe replacement. Optional coding pins prevent inserting the pluggable connector in the wrong I/O module. Replacing and connecting the I/O module requires no further action and eliminates possible errors — permanent wiring.

Alternatively, field wiring is possible via interface modules that can be connected to the I/O-System using a ribbon cable (see "Types").

### Extended Temperature Range



Industrial automation technology is typically operated in temperatures ranging from 0 ... 55 °C. However, there are applications that require an extended temperature range.

For these applications, WAGO offers a line of WAGO 750 I/O-SYSTEM products for temperatures ranging from -20 ... +60 °C.

For extreme applications, where even this extended temperature range is not sufficient, the WAGO 750 XTR I/O-SYSTEM is available.

### Functional Safety



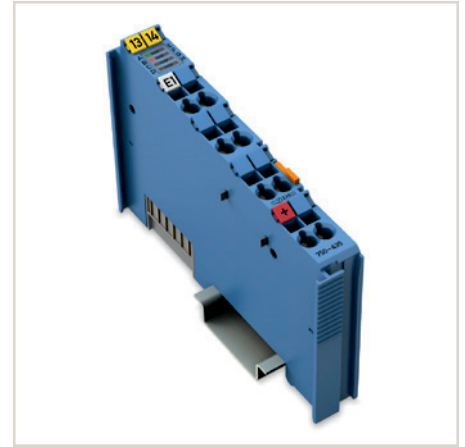
In the European Union, the machinery directive defines the requirements for machine and system safety. This ensures a uniform standard for the protection of "life and limb" for people within a machine's operating area.

The required risk assessment is based on harmonized standards (e.g., EN 13849) that identify existing risks and required risk reduction (SIL or PL quality). Based on the risk assessment, safety functionality can be implemented, e.g., by presence detection or protection zone violations using secure switches or light arrays to immediately shutdown the "risk". For this purpose, the safety signals are detected by the "yellow" safety modules and transmitted via "PROFIsafe" to the fail-safe PLC for further processing. The result is then executed via a safe actuator (output module, controller, etc.).

The unique safety characteristic values of the WAGO modules facilitate calculation of the final safety function up to Cat. 4/PLe according to EN 13849, or SIL3 according to EN 62061 or IEC 61511.

The mixed operation of safe and conventional I/O modules streamlines system configuration. For increased EMC immunity required according to the standard, WAGO offers compact filter modules for the power supply. Specific power supply features must be considered, which are described in detail in the corresponding manuals.

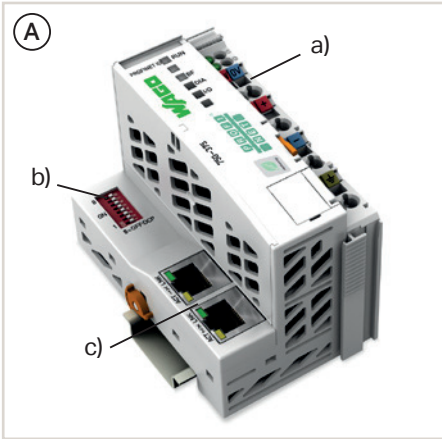
### Use in Hazardous Areas



In many plants across the chemical and petrochemical industries, as well as in the production and process automation sectors, installations are operated that process explosive gas- or dust-air mixtures. For this reason, electrical equipment must be explosion-proof in order to avoid injuries to personnel and equipment damages.

The modules within the WAGO 750 I/O-SYSTEM are designed for use in both non-hazardous and hazardous areas. The direct application of fieldbus technology in hazardous areas is typically resource-intensive. When used in hazardous areas of Zone 2/22, the WAGO-I/O-SYSTEM 750 offers a safe, easy and economical connection to the sensors and actuators of Zones 0/20 and 1/21. The "blue" Ex i I/O modules were specially developed for this purpose. They form an intrinsically safe section that can be integrated into a standard fieldbus node, offering all the advantages of a state-of-the-art fieldbus technology. The WAGO 750 I/O-SYSTEM is also approved for mining applications.

## 750 and 753 I/O-System Interfaces and Types

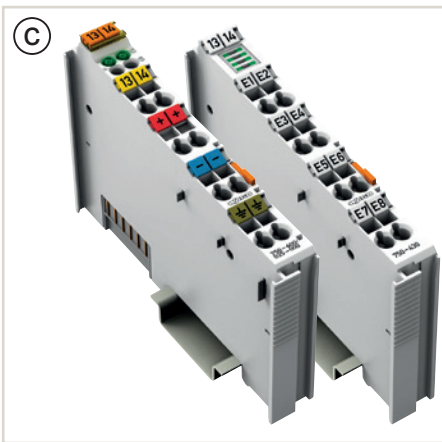
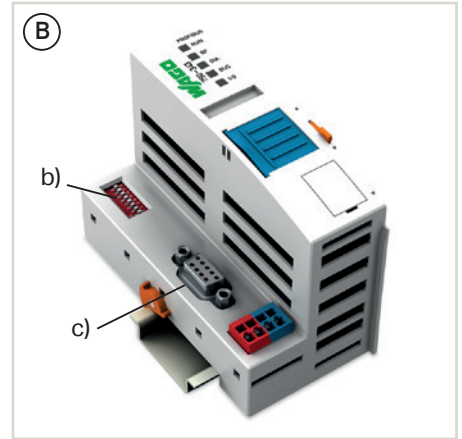


### Housing Design Fieldbus Coupler (A)

- Including supply module (a) to power downstream I/O modules
- Technical differences on the connection level.
- Optional address switch (b) and fieldbus interface (c)
- W x H x D (mm) 50.5 x 71.1 x 100 or
- W x H x D (mm) 61.5 x 71.9 x 100

### Housing Design Fieldbus Coupler ECO (B)

- Restriction on power supply and data width
- W x H x D (mm) 49.5 x 71.9 x 96.8

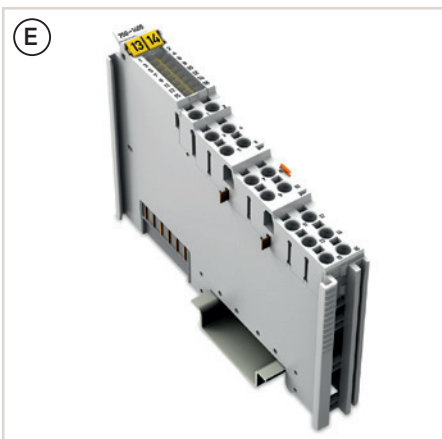
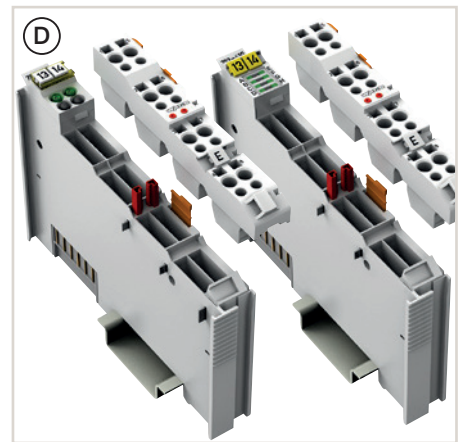


### Housing Design 750 (C)

- 8 connection points (CAGE CLAMP®)
- W x H x D (mm) 12 x 69.8 x 100 (4 LEDs)
- W x H x D (mm) 12 x 67.8 x 100 (8 LEDs)

### Housing Design 753 (D)

- Pluggable connector
- 8 connection points (CAGE CLAMP®)
- W x H x D (mm) 12 x 69.8 x 100 (4 LEDs)
- W x H x D (mm) 12 x 69 x 100 (8 LEDs)

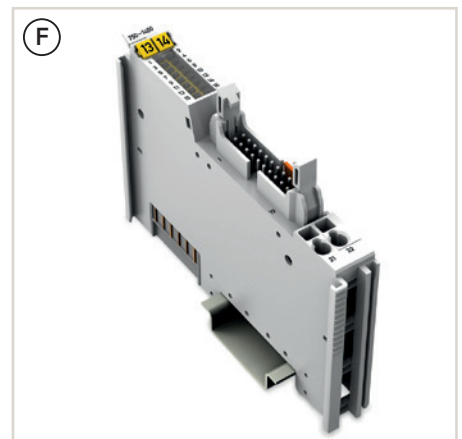


### Housing Design 750 (E)

- 16 connection points (push-in CAGE CLAMP®)
- W x H x D (mm) 12 x 69 x 100

### Housing Design (F)

- For time-saving wiring between I/O-System and interface modules
- Ribbon cable connector for connection to 289 Series Interface Modules and JUMPFLEX® Interface Adapter
- W x H x D (mm) 12 x 74.1 x 100

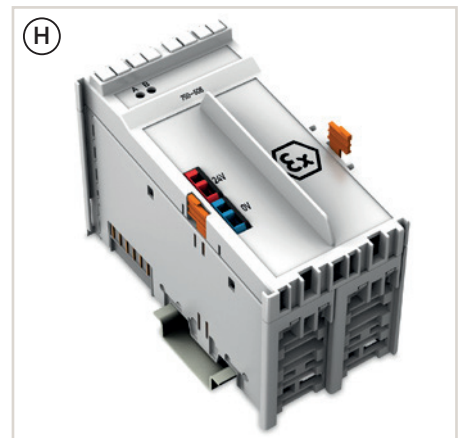


### Housing Design Double Width (G)

- Some modules are integrated into a double housing to address specific technological needs. Despite utilizing the same standardized housing, these modules are twice as wide.
- W x H x D (mm) 24 x 69.8 x 100

### Special Housing Design (H)

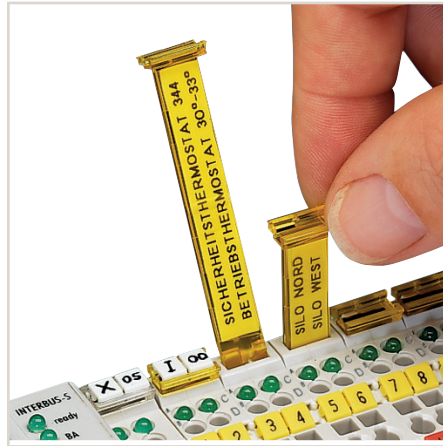
- Some modules are integrated into a specialized housing with a specific width and pluggable connectors. The dimensions are specified on the respective catalog page.



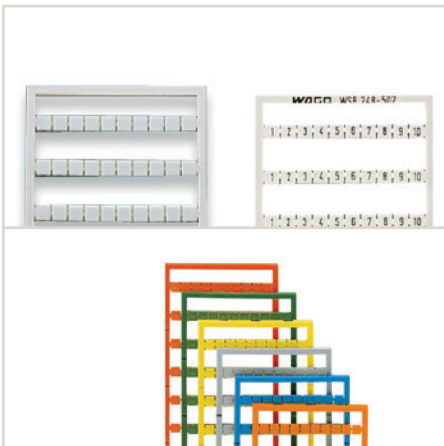
## 750 and 753 I/O-System Markings and Mounting Accessories



Transparent group marker carriers indicate module type by color.



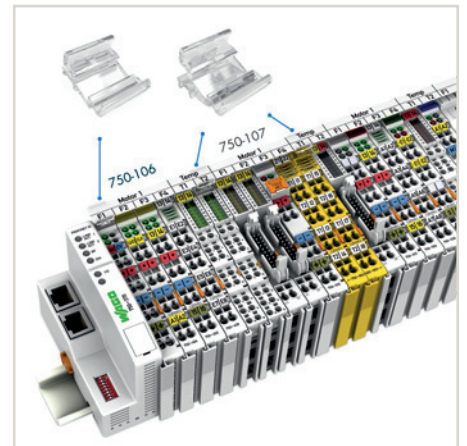
Removable group marker carriers are available for all 750 and 753 I/O modules with a maximum of four LEDs, as well as all fieldbus couplers with a supply module.



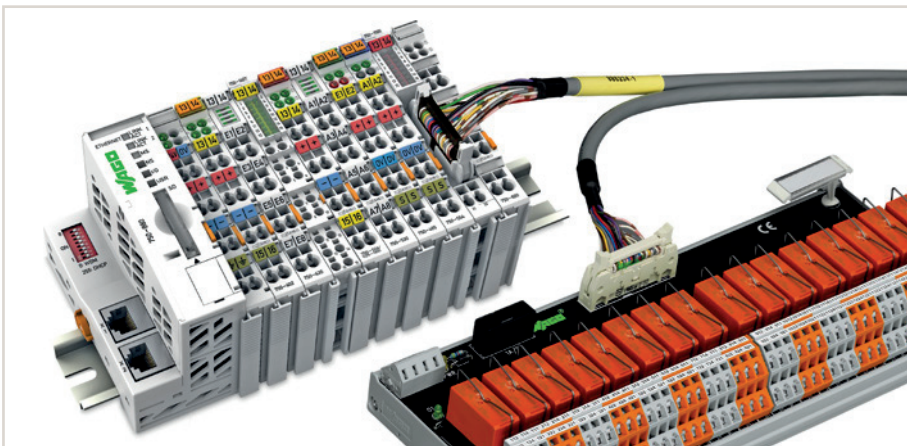
Mini-WSB quick marking system, blank, pre-marked and colored; suitable for all 750 and 753 I/O modules.



Marker carrier for one single I/O module, suitable for all 750 and 753 I/O modules; the marker carrier can be placed in the upper, Mini-WSB carrier plate.



Marker carrier for one I/O node; both versions (750-106 and 750-107) permit continuous marking regardless of the I/O module housing used.



Interface modules for system wiring



Interface cables

# 750 and 753 I/O-System Application and Installation Instructions

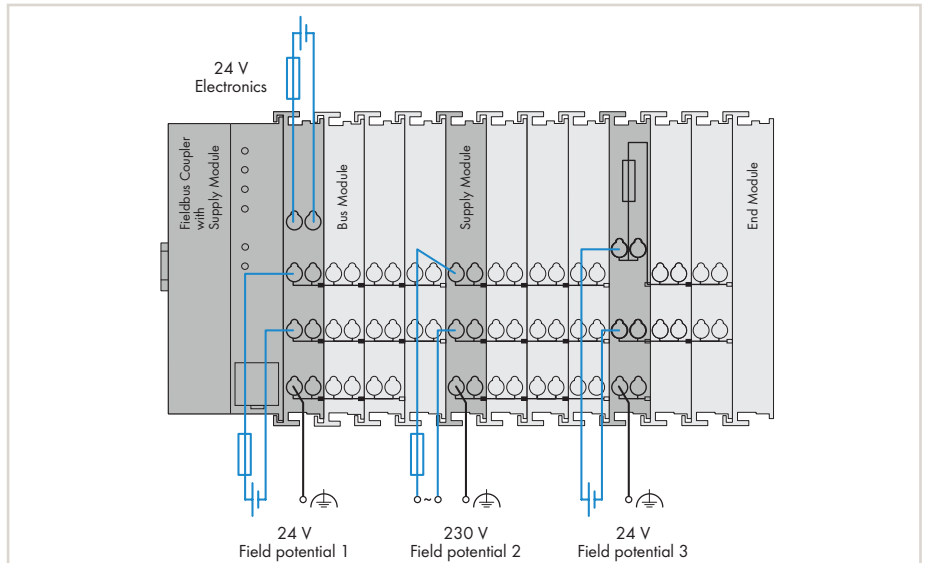
## Supply Modules

Power is normally channeled to the internal electronics power supply by the fieldbus coupler. The field-side power supply is electrically isolated via the bus supply module on the fieldbus coupler or a separate internal system supply module. The division enables a separate supply for sensors and actuators. Snapping the I/O modules together automatically routes the supply voltages (system power supply 5 VDC via the data contacts and field supply via the optional power jumper contacts). Bus supply modules with diagnostics enable additional monitoring of the power supply. This ensures a flexible, user-specific supply design for a station. The current supply to the electronics is limited by a maximum value. This value depends on the fieldbus coupler used. If the sum of the internal current demand of all the I/O modules should exceed this value, an additional bus supply module is necessary. Even in this case, power supply to the field-side supply of 10 A may not be exceeded. However, different bus supply modules allow a new power supply, formation of potential groups and realization of emergency stop concepts.

## Interference-Free in Safety-Related Applications

To easily and safely perform cost-effective, centralized deactivation of complete actuator groups safely, the actuator's power supply can be switched off using a safety switching device. This can either be performed for each individual actuator or by turning off the power supply to a group of control outputs. In the event of failure, ensure that no interference from other current or power circuits occurs — even when the control voltage is switched off — so the defined safety function properties (logic and time response) remain unchanged.

Some modules are designed to provide interference-free safety functionality. These modules comply with safety requirements up to Category 4 of DIN EN ISO 13849-1:2007. Safety category and performance level depend solely on the safety components and their wiring.



### Notice:

Interference-free WAGO I/O modules are not a component of the safety function and do not replace the safety switching device! When using the components in safety functions, the corresponding notes must be observed in the relevant manual.

recommended when operating intrinsically safe Ex i modules for marine and onshore/offshore applications.

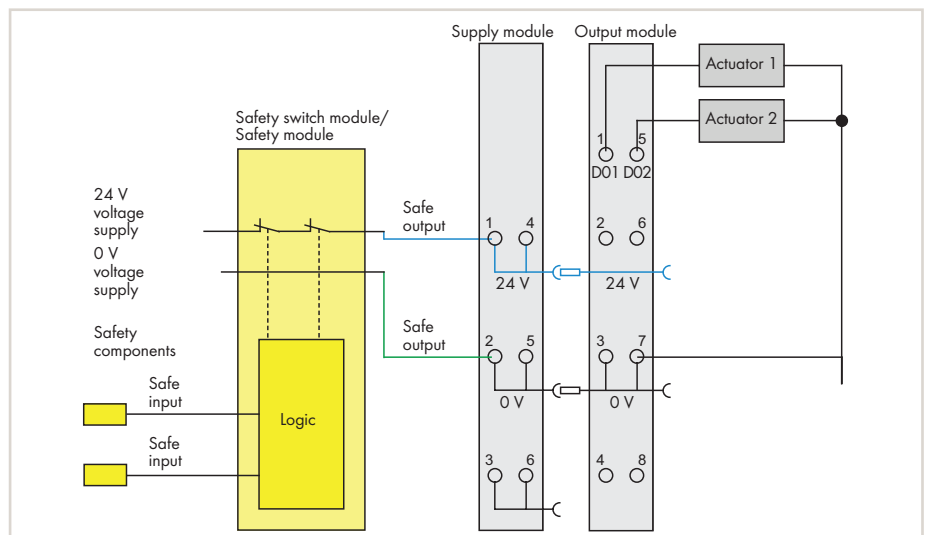
- For the 24 VDC power supply of electronics and field, PELV/SELV power supply units are recommended. As part of safety-related applications, they are mandatory. The mixed operation of safe and conventional I/O modules streamlines system configuration. For increased EMC immunity required according to the standard, WAGO offers compact filter modules for the power supply.

### Notes

Additional steps must be implemented specifically for the location the I/O-System is installed:

- Specific power and field-side power supply filters (750-624 or 750-626) are required for marine and onshore/offshore applications.
- A specific bus supply module (750-606) is required to operate intrinsically safe Ex i modules.
- Additionally, both a bus supply module and a field-side power supply filter are

Please refer to the manual for details about the power supply's design.



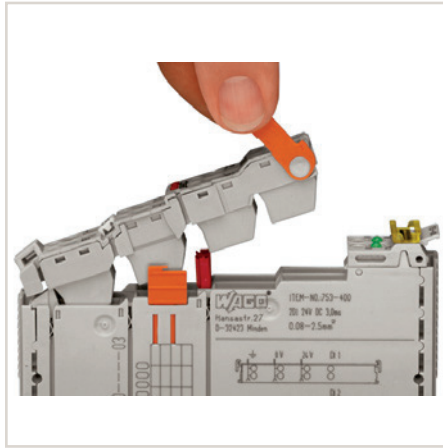
Example: Two-channel, double-pole power supply disconnection

# 750 and 753 I/O-System

## Application and Installation Instructions



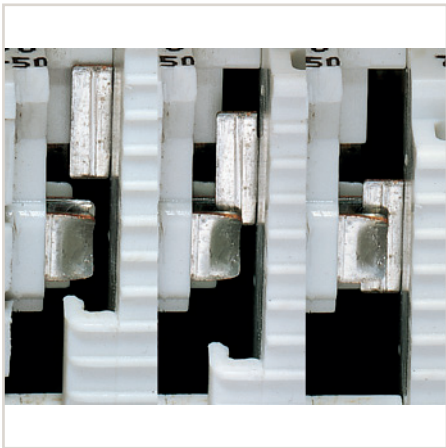
Attachment/release on the mounting rail



Releasing the pluggable connector



Optional protection against mismatching pluggable connectors via coding elements



Secure, automatic connection of the power supply by self-cleaning power jumper contacts

**Notice:**

For some I/O modules, not all power jumper contacts are made! An I/O module with three power jumper contacts (e.g., 2-channel digital input) cannot be snapped into place behind an I/O module in which not every contact is made.

To increase electromagnetic compatibility (EMC), some components are connected to the DIN-rail by a discharge contact. The DIN-rail must always have a low-resistance connection to the ground potential.



Wide range of accessories available for EMC-compliant installation, including shield connection



Secure, automatic connection of the data and electronics power supply by gold-plated pressure contacts



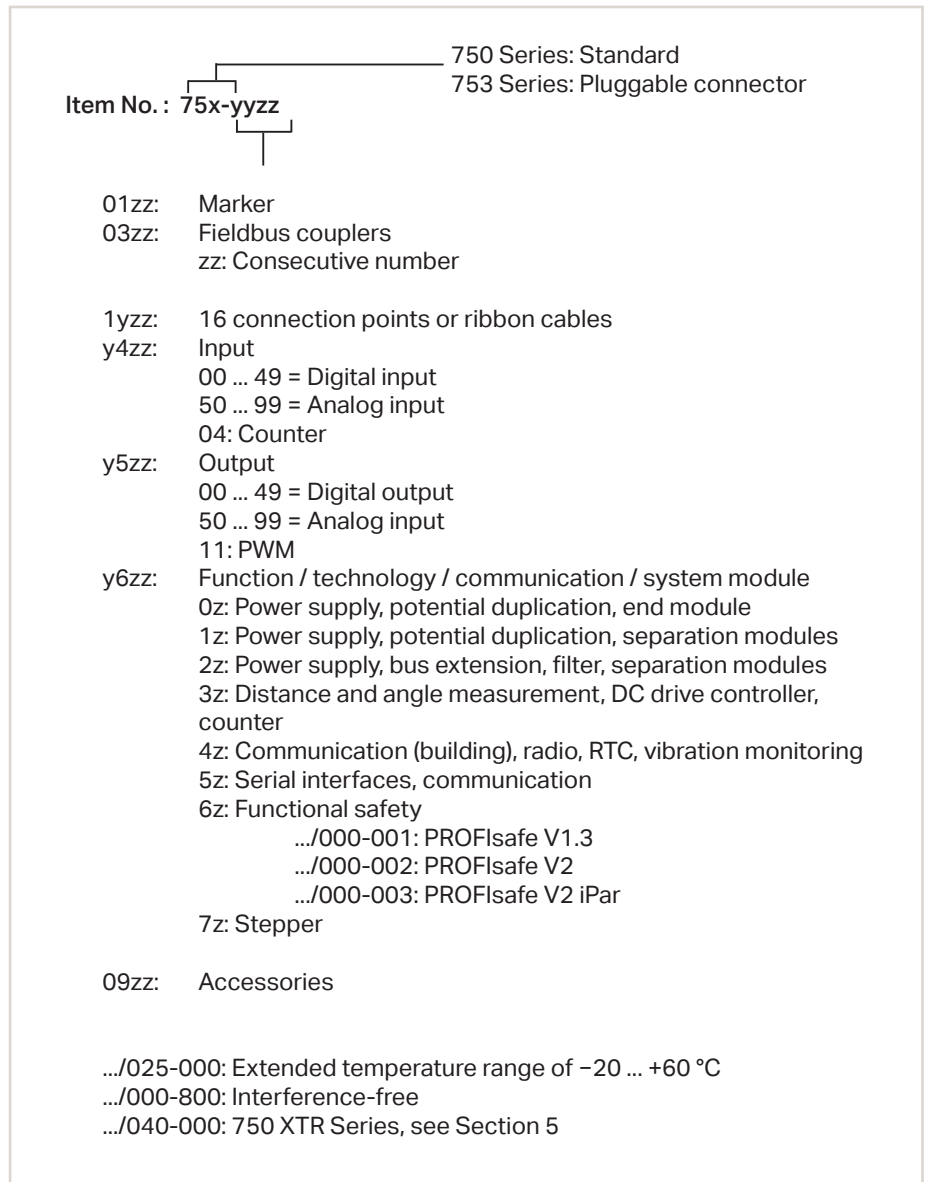
Securing the cable to the connector



Service interface for configuring the fieldbus coupler; connectivity via configuration cable or radio adapter

## 750 and 753 I/O-System Item Number Key

Explanation of the components of an item number key



# 750 and 753 I/O-System

## Standards and Rated Conditions

General Specifications	
System supply voltage	24 VDC (–25 ... +30 %)*; * For all marine-certified fieldbus couplers and I/O modules
Isolation	500 V system/supply
Ambient temperature (operation)	0 ... +55 °C
Ambient temperature (operation) for versions with an extended temperature range	–20 ... +60 °C
Ambient temperature (storage)	–25 ... +85 °C
Ambient temperature (storage) for versions with an extended temperature range	–40 ... +85 °C
Relative humidity	95 % non-condensing
Relative humidity for versions with an extended temperature range	Max. 95 %, short-term condensation per Class 3K6 / IEC EN 60721-3-3 and E DIN 40046-721-3, taking a temperature range of –20 ... +60 °C into consideration (except wind-driven precipitation, water and ice formation) %
Operating altitude	Without temperature derating: 0 ... 2000 m; with temperature derating: 2000 ... 5000 m (0.5 K/100 m); max.: 5000 m
Pollution degree	2 per IEC 61131-2
Vibration resistance	0.5 g (4 g for all shipbuilding-certified fieldbus couplers and I/O modules) per IEC 60068-2-6
Shock resistance	15 g per IEC 60068-2-27
EMC immunity to interference	Per EN 61000-6-2 / shipbuilding applications
EMC emission of interference	Per EN 61000-6-3, EN 61000-6-4, marine applications
Protection type	IP20
Mounting position	Any
Mounting type	On 35 mm DIN-rail
Housing material	Polycarbonate, polyamide 6.6
Exposure to pollutants	Per IEC 60068-2-42 and IEC 60068-2-43
Permissible SO <sub>2</sub> contaminant concentration at a relative humidity < 75 %	25 ppm
Permissible H <sub>2</sub> S contaminant concentration at a relative humidity < 75 %	10 ppm
Wire connection	CAGE CLAMP® Termination
Conductor size; strip length for standard I/O modules and couplers 753 I/O modules: ECO Fieldbus Couplers:	0.08–2.5 mm <sup>2</sup> / 28–14 AWG; 8–9 mm / 0.31–0.35 inch 0.08–2.5 mm <sup>2</sup> / 28–14 AWG; 9–10 mm / 0.35–0.39 inch 0.08–1.5 mm <sup>2</sup> / 28–16 AWG; 5–6 mm / 0.2–0.24 inch
Wire connection	Push-in CAGE CLAMP®
Conductor size; strip length for I/O modules with 16 connection points:	Solid: 0.08–1.5 mm <sup>2</sup> / 28–16 AWG, Fine-stranded: 0.25–1.5 mm <sup>2</sup> / 22–16 AWG; 8–9 mm / 0.31–0.35 inch
Current carrying capacity of the power jumper contacts	10 A

## Approvals

Overview of the approvals in the article comparison in Section 12, Technical Appendix, or online under [www.wago.com](http://www.wago.com)

