

# JUMO diratron 104/108/116/132

Compact controller



## Brief Instructions

70211000T97Z001K000  
V5.00/EN/00688809/2019-11-20

## 1 Introduction


### 1.1 Safety information


#### General


This manual contains information that must be observed in the interest of your own safety and to avoid material damage. This information is supported by symbols which are used in this manual as indicated. Please read this manual before starting up the device. Store this manual in a place that is accessible to all users at all times.


If difficulties occur during startup, please do not intervene in any way that could jeopardize your warranty right!

#### Warning symbols


 **WARNING!**  
This symbol in connection with the signal word indicates that **personal injury** may occur if the respective precautionary measures are not carried out.


 **CAUTION!**  
This symbol in connection with the signal word indicates that **material damage or data loss** will occur if the respective precautionary measures are not taken.


 **CAUTION!**  
This symbol indicates that **components could be destroyed** by electrostatic discharge (ESD = Electro Static Discharge) if the respective cautionary measures are not taken. Only use the ESD packages intended for this purpose to return device inserts, assembly groups, or assembly components.

 **READ THE DOCUMENTATION!**  
This symbol, which is attached to the device, indicates that the associated **documentation for the device** must be observed. This is necessary to identify the nature of the potential hazard, and to take measures to prevent it.

 **NOTE!**  
This symbol refers to **important information** about the product, its handling, or additional benefits.

 **REFERENCE!**  
This symbol refers to **additional information** in other sections, chapters, or other manuals.

 **FURTHER INFORMATION!**  
This symbol is used in tables and indicates that **further information** is provided after the table.

 **DISPOSAL!**  
At the end of its service life, the device and any batteries present do not belong in the trash! Please ensure that they are **disposed of properly** and in an **environmentally friendly** manner.

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## 1 Introduction

### 1.2 Intended use

The device is designed for use in an industrial environment as specified in the technical data. Other uses beyond those defined are not viewed as intended uses.

The device has been manufactured in compliance with applicable standards and directives as well as the applicable safety regulations. Nevertheless, improper use may lead to personal injury or material damage.

To avoid danger, only use the device:

- For the intended use
- When in good order and condition
- When taking the technical documentation provided into account

Risks resulting from the application may arise, e.g. as the result of missing safety provisions or wrong settings, even when the device is used properly and as intended.

### 1.3 Qualification of personnel

This document contains the necessary information for the intended use of the device to which it relates. It is intended for staff with technical qualifications who have been specially trained and have the appropriate knowledge in the field of automation technology.

The appropriate level of knowledge and the technically fault-free implementation of the safety information and warnings contained in the technical documentation provided are prerequisites for risk-free mounting, installation, and startup as well as for ensuring safety when operating the described modules. Only qualified personnel have the required specialist knowledge to correctly interpret and implement the safety information and warnings contained in this document in specific situations.

### 1.4 Acceptance of goods, storage, and transport

#### 1.4.1 Checking the delivery

- Check the delivery for completeness against the packing slip and order details
- Inform the supplier immediately if there is any damage
- Store damaged parts until clarification is received from the supplier

#### 1.4.2 Important information about storage and transport

- Store the device in a dry, clean environment. Observe the admissible ambient conditions (see "Technical data").
- Protect the device from shock during transport
- The original packaging provides optimum protection for storage and transport

#### 1.4.3 Returning goods

In the event of repair, return the complete device in clean condition. Use the original packaging to return goods.

#### Accompanying letter for repair

Please include the completed accompanying letter for repair when returning goods.

- Do not forget to state the following:
- Description of the application and
  - Description of the error that has occurred

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## 1 Introduction

The accompanying letter for repair (Supplementary sheet for product returns) can be downloaded online from the manufacturer's website:  
<http://productreturn.jumo.info>

### Protection against electrostatic discharge (ESD)

(ESD = electrostatic discharge)

To prevent damage due to ESD, electronic modules or components must be handled, packaged, and stored in an ESD-protected environment. Measures that protect against electrostatic discharge and electric fields are described in DIN EN 61340-5-1 and DIN EN 61340-5-2 "Protection of electronic devices from electrostatic phenomena".

- When returning electronic modules or components, please note the following:
- Pack sensitive components only in an environment providing protection against ESD. Workspaces such as this divert electrostatic charges to ground in a controlled manner and prevent static charges due to friction.
  - Use only packaging intended specifically for ESD-sensitive assemblies/components. These must consist of conductive plastics.

No liability can be assumed for damage caused by ESD.



**CAUTION!**  
Electrostatic discharges occur in non-ESD-protected environments.

- Electrostatic discharges can damage modules or components.
- For transport purposes, use only the ESD packaging provided.

### 1.4.4 Disposal

#### Disposing of the device

##### DISPOSAL!

Devices and/or replaced parts should not be placed in the refuse bin at the end of their service life as they consist of materials that can be recycled by specialist recycling plants. Dispose of the device and the packaging material in a proper and environmentally friendly manner. For this purpose, observe the country-specific laws and regulations for waste treatment and disposal.

#### Disposing of the packaging material

The entire packaging material (cardboard packaging, inserts, plastic film, and plastic bags) is fully recyclable.

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## 1 Introduction

### 1.5 Identifying the device version

#### 1.5.1 Nameplate

The nameplate is affixed to the housing.

#### Contents

The nameplate contains important information. This includes:

Description	Designation on the nameplate	Example
Device type	Typ	702114B1-4356-25/214
Part no.	TN	00123456
Serial number	F-Nr.	007033801217480006
Voltage supply	-	AC/DC 20 to 30 V, 48 to 63 Hz

#### Device type (Typ)

Compare the specifications on the nameplate with the order. Identify the supplied device version using the order details (order code).

#### Part no. (TN)

The part no. uniquely identifies an article in the catalog. It is important for communication between the customer and the sales department.

#### Serial number (F-Nr.)

The serial number indicates, among other things, the date of manufacture (year/week). Example: F-no. = 007033801217480006  
The characters in question are digits 12, 13, 14, and 15 (from the left).  
Thus the device was produced in calendar week 48 of 2017.

#### MAC address

For a device with Ethernet interface, the MAC address is indicated on the nameplate.

## 1 Introduction

### 1.5.2 Order details

(1) Basic type
<b>702110</b> Type 702110 (format 132: 48 x 24 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 1 relay (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function
<b>702111</b> Type 702111 (format 116: 48 x 48 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 2 relays (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function
<b>702112</b> Type 702112 (format 108H: 48 x 96 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 2 relays (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function
<b>702113</b> Type 702113 (format 108Q: 96 x 48 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 2 relays (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function
<b>702114</b> Type 702114 (format 104: 96 x 96 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 2 relays (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function

#### (2) Version

- 8 Standard with default settings\*
- 9 Customer-specific configuration (specifications in plain text)

#### (3) Option 1<sup>b</sup>

- 0 Not used
- 1 1 relay (N/O contact) (only for type 702111)
- 2 1 logic output 0/14 V (only for types 702111, 702112, 702113, 702114)
- 4 1 RS485 interface (Modbus-RTU)

#### (4) Option 2<sup>c</sup>

- 0 Not used
- 1 1 relay (N/O contact)
- 2 1 logic output 0/14 V
- 3 1 analog output
- 7 1 Ethernet interface (Modbus-TCP, Modbus-RTU/ASCII via TCP/IP; only for types 702112, 702113, 702114); **option 1 does not apply**

#### (5) Option 3<sup>d</sup> (only for types 702112, 702113, 702114)

- 0 Not used
- 1 1 relay (N/O contact)
- 2 1 logic output 0/14 V
- 5 1 PhotoMOS<sup>®</sup> relay<sup>e</sup>

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## 1 Introduction

(6) Option 4 <sup>f</sup> (only for types 702112, 702113, 702114)
0 Not used
1 1 relay (N/O contact)
2 1 logic output 0/14 V
5 1 PhotoMOS <sup>®</sup> relay <sup>e</sup>
6 1 relay (N/O contact) with longer contact life

#### (7) Voltage supply

- 23 AC 110 to 240 V / 10-15%<sup>g</sup>, 48 to 63 Hz
- 25 AC/DC 20 to 30 V, 48 to 63 Hz

#### (8) Extra codes

- 000 Without extra code
- 062 With DNV GL approval<sup>h</sup>
- 049 With DVI approval<sup>i</sup>
- 214 Math and logic module
- 221 Structured text

<sup>a</sup> The language of the device texts can be adjusted (German, English, French, Spanish).  
<sup>b</sup> The options cannot be retrofitted! Please consider options when ordering.  
<sup>c</sup> PhotoMOS is a registered trademark of Panasonic Corporation.  
<sup>d</sup> Can only be ordered for type 702111 with power supply AC/DC 20 to 30 V (approval only applies for operation with DC 20 to 30 V) and type 702114 with power supply AC 110 to 240 V; not in combination with Ethernet interface. The approval only applies to panel mounting.

#### Order code

702114 / 8 - 4 3 5 6 - 23 / 214 / ...  
<sup>k</sup> List extra codes in sequence, separated by commas.

### 1.5.3 Scope of delivery

- 1 device in the ordered version
- 1 quick start guide
- 1 mounting frame (only for types 702110 and 702111)
- 2 mounting elements (only for types 702112, 702113, and 702114)

### 1.5.4 Accessories

Description	Part no.
Setup program	00678822
USB cable, A connector to Micro-B connector, length 3 m	00616250
Activation for math and logic module (setup program required)	00689708
Activation for structured text (setup program required)	00689709
Mounting for DIN rail, for type 702110	00688236
Mounting for DIN rail, for type 702111	00688237

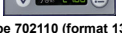
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## 1 Introduction

### 1.8 Device types



Type 702110 (format 132)



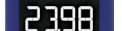
Type 702111 (format 116)



Type 702112 (format 108H)



Type 702113 (format 108Q)



Type 702114 (format 104)

### 1.9 Available technical documentation

In addition to this quick start guide, the following documents are available as PDF files and can be downloaded from the manufacturer's website:

- Operating manual
- Interface description (Modbus)
- ST editor manual

## 2 Mounting

### 2.1 Installation instructions



**WARNING!**  
The device is not designed for use in potentially explosive areas. Explosion hazard.  
▶ Only deploy the device outside of potentially explosive areas.

#### Mounting site

The device is designed for installation in a panel cut-out within a closed switch cabinet. The front of the device and housing have different protection types (see technical data).

#### Climatic conditions

The ambient temperature and the relative humidity at the mounting site must correspond to the technical data. Aggressive gases and vapors have a negative effect on the operating life of the device. The mounting site must be free from dust, powder, and other suspended solids.

#### Installation position

The device can be installed in any position. The maximum admissible ambient temperature only applies for the installation with the display in a vertical position.

#### Technical data

⇒ chapter 5 "Technical data", Page 25

### 2.2 Cleaning

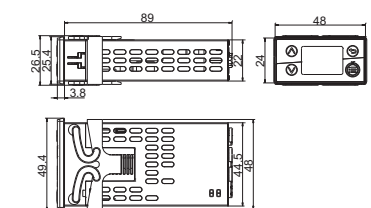
The front of the device (front foil) can be cleaned with standard detergents, rinsing and cleaning agents.  
**CAUTION!**  
The front of the device is not resistant to aggressive acids and lyes, scouring agents, and cleaning with a pressure cleaner.  
Use of these media can cause damage.  
▶ Only clean the front of the device with suitable agents.

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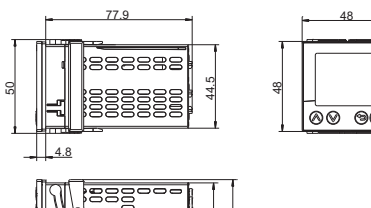
## 2 Mounting

### 2.3 Dimensions

Type 702110 (format 132: 48 mm x 24 mm)



Type 702111 (format 116: 48 mm x 48 mm)



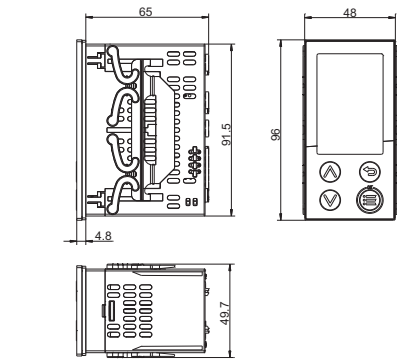
Type 702112 (format 108H: 48 mm x 96 mm)



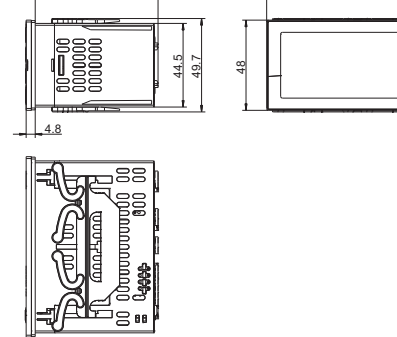
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## 2 Mounting

Type 702112 (format 108Q: 96 mm x 48 mm)



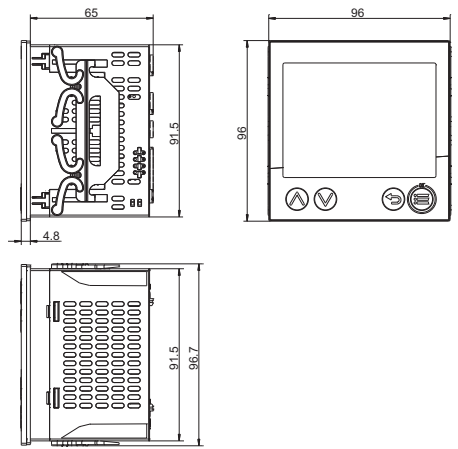
Type 702113 (format 108Q: 96 mm x 48 mm)



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## 2 Mounting

Type 702114 (format 104: 96 mm x 96 mm)

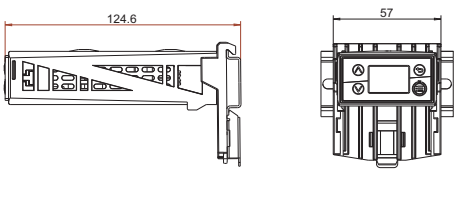


Panel cut-out according to DIN IEC 61554

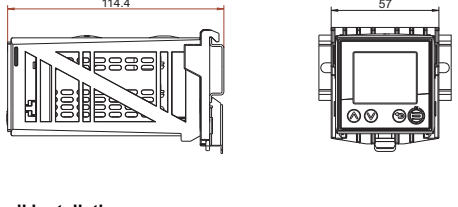
Type (format; front frame dimensions)	Panel cut-out (width x height)	Minimum spacing of panel cut-outs (for tightly packed installations)	
		Horizontal	Vertical
702110 (132; 48 mm x 24 mm)	45 <sup>+0.8</sup> mm x 22 <sup>+0.3</sup> mm	15 mm	30 mm
702111 (116; 48 mm x 48 mm)	45 <sup>+0.8</sup> mm x 45 <sup>+0.8</sup> mm	15 mm	30 mm
702112 (108H; 48 mm x 96 mm)	45 <sup>+0.8</sup> mm x 92 <sup>+0.8</sup> mm	20 mm	30 mm
702113 (108Q; 96 mm x 48 mm)	92 <sup>+0.8</sup> mm x 45 <sup>+0.8</sup> mm	20 mm	30 mm
702114 (104; 96 mm x 96 mm)	92 <sup>+0.8</sup> mm x 92 <sup>+0.8</sup> mm	20 mm	30 mm

## 2 Mounting

### Type 702110 (format 132) mounted on DIN rail (see accessories)



### Type 702111 (format 116) mounted on DIN rail (see accessories)



### 2.4 DIN rail installation

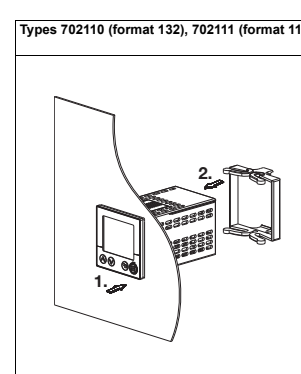
For devices in the formats 132 and 116, special mounting elements for mounting on a DIN rail (35 mm, according to DIN EN 60715) are available as accessories. This involves a base plate attached to the DIN rail and a device holder (see depictions in the section "Dimensions").

Process:

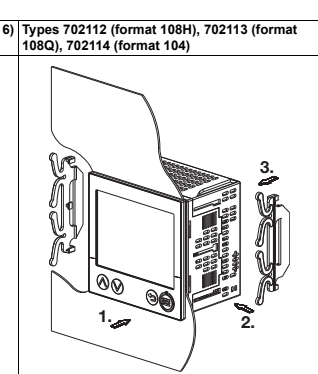
- 1 Mount the base plate on the DIN rail from above and press down until it engages.
- 2 Insert the mounting frame (included in the scope of delivery of the device, see Panel mounting) into the device holder from above (front).
- 3 Insert the device (without panel seal) into the device holder from the front and secure using the mounting frame. In doing so, ensure sufficient attachment (see Panel mounting).
- 4 Carry out electrical connection.
- 5 To facilitate the connection, the device holder can be mounted in the base plate from above with its underside positioned vertically (top connection terminals). It is also possible to mount the device holder with its front positioned horizontally so that the connection terminals can be accessed from the front. After connection, the device holder must be removed from the position!
- 6 Insert the device holder into the side recesses of the base plate with its rear detent lugs (format 132: top and center recesses) and press down until it engages.

## 2.5 Panel mounting

Types 702110 (format 132), 702111 (format 116)



Types 702112 (format 108H), 702113 (format 108Q), 702114 (format 104)



#### 1. Insert the device from the front into the panel cut-out and ensure that the seal is correctly positioned.

#### 2. Push the mounting frame from the panel rear onto the device body and press the springs against the panel rear until the detent lugs engage in their slots and the frame is sufficiently fastened.

#### 3. Insert the device from the front into the panel cut-out and ensure that the seal is correctly positioned.

#### 2. From behind the panel, insert both mounting elements at the side into the three recesses of the device case using the guide lugs.

#### 3. Press both mounting elements evenly with the springs against the panel rear until the detent lugs engage in their slots and the frame is sufficiently fastened.



**CAUTION!**  
The front of the device and housing have different protection types!

The protection type IP65 (front-side) is only guaranteed if the seal is flush and even.

▶ Use the mounting frame (and both mounting elements as shown in the figure and ensure an even attachment!

## 3 Electrical connection

### 3.1 Installation notes

#### Requirements for personnel

- Work on the device must only be carried out to the extent described and, like the electrical connection, only by qualified personnel.
- Before plugging and unplugging connecting cables, it must be ensured that the acting person is electrostatically discharged (by touching grounded metallic parts, for example).

#### Cables, shielding, and grounding

- When selecting the electrical wiring material as well as when installing and connecting the device electrically, comply with the requirements of DIN VDE 0100 "Low-voltage electrical installations" and the applicable country-specific regulations (for example, based on IEC 60364).
- It may be necessary to adhere to special notes relating to the heat resistance of cables (see connection diagram).
- Route input, output, and supply lines separately and not parallel to one another.
- Only use shielded and twisted probe and interface cables. Do not route the lines close to current-carrying components or cables.
- For temperature probes, ground the shielding on one side in the control cabinet.
- Do not perform lap-connections on the grounding cables, but instead route the cables individually to a shared grounding point in the control cabinet; in doing so, ensure that the cables are as short as possible.

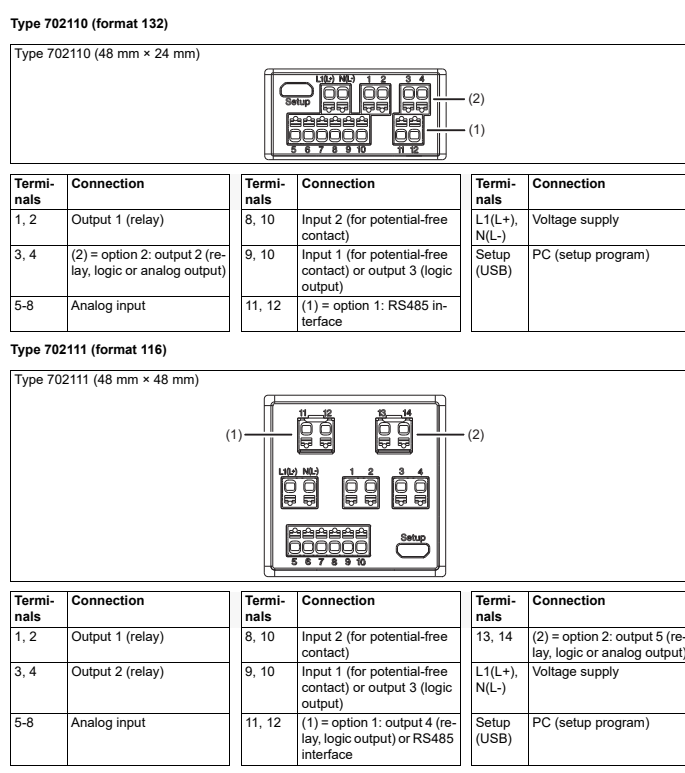
Ensure that the potential equalization is correct.

#### Electrical safety

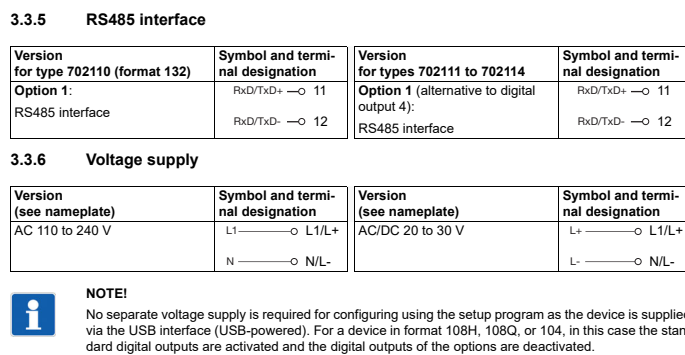


### 3 Electrical connection

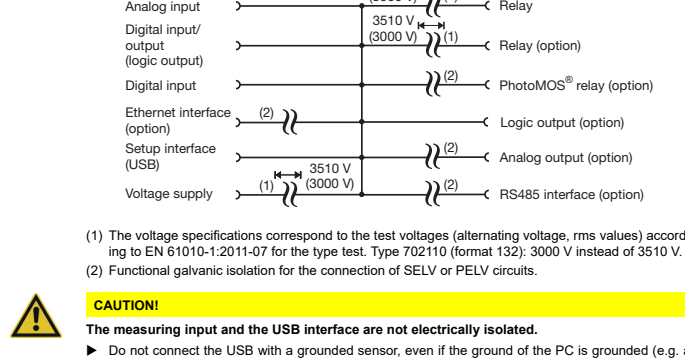
#### 3.2 Connection elements



### 3 Electrical connection



### 3 Electrical connection



### 5 Technical data

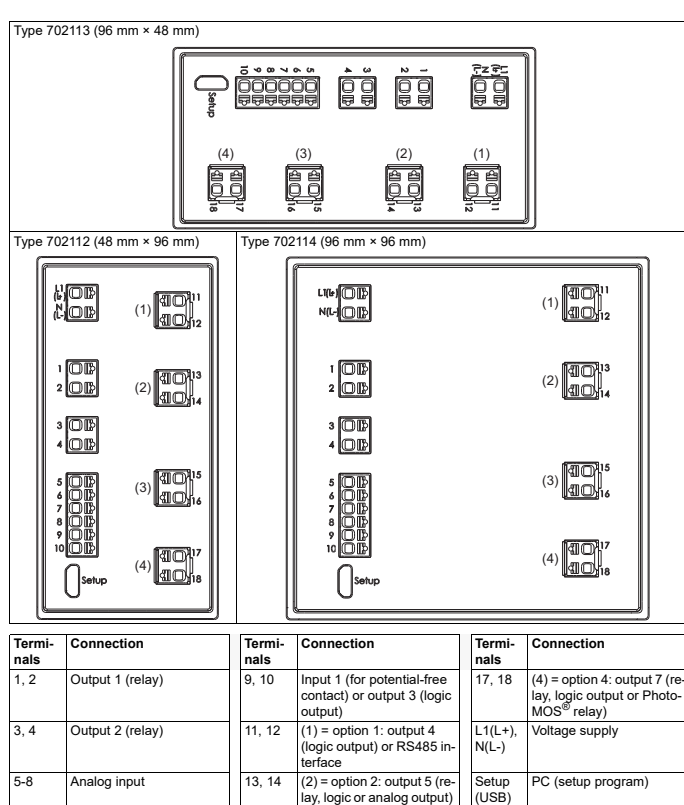
Designation	Type	Standard	ITS	Measuring range	Accuracy <sup>a</sup>
Fe-CuNi	"L"	DIN EN 43710 (1985)	IP7S-68	-200 to +900 °C	≤ 0.25 %
Fe-CuNi	"J"	DIN EN 60584-1:2014 IEC 60584-1:2013	ITS-90	-210 to +1200 °C	≤ 0.25 % from -100 °C
Cu-CuNi	"U"	DIN EN 43710 (1985)	IP7S-68	-200 to +600 °C	≤ 0.25 % from -100 °C
Cu-CuNi	"D"	DIN EN 60584-1:2014 IEC 60584-1:2013	ITS-90	-270 to +400 °C	≤ 0.25 % from -150 °C
NiCr-Ni	"K"	DIN EN 60584-1:2014 IEC 60584-1:2013	ITS-90	-270 to +1300 °C	≤ 0.25 % from -80 °C
NiCr-CuNi	"E"	DIN EN 60584-1:2014 IEC 60584-1:2013	ITS-90	-270 to +1000 °C	≤ 0.25 % from -80 °C
NiCr-Si-NiSi	"N"	DIN EN 60584-1:2014 IEC 60584-1:2013	ITS-90	-270 to +1300 °C	≤ 0.25 % from -80 °C
Pl10Rh-Pt	"S"	DIN EN 60584-1:2014 IEC 60584-1:2013	ITS-90	-50 to +1768 °C	≤ 0.25 % from 20 °C
Pl13Rh-Pt	"R"	DIN EN 60584-1:2014 IEC 60584-1:2013	ITS-90	-50 to +1768 °C	≤ 0.25 % from 20 °C
Pl30Rh-Pt6Rh	"B"	DIN EN 60584-1:2014 IEC 60584-1:2013	ITS-90	-50 to +1820 °C	≤ 0.25 % from 400 °C
WRe-W26Re	"C"	DIN EN 60584-1:2014 IEC 60584-1:2013	ITS-90	0 to 2315 °C	≤ 0.25 % from 500 °C
WRe-W25Re	"D"	ASTM E175184-15	ITS-90	0 to 2315 °C	≤ 0.25 % from 500 °C
WRe-W26Re	"A1"	GOST R 8.585-2001	ITS-90	0 to 2500 °C	≤ 0.25 % from 500 °C
Chromel-Copel	"L"	GOST R 8.585-2001	ITS-90	-200 to +800 °C	≤ 0.25 % from -80 °C
Chromel-Alumel	"K"	GOST R 8.585-2001	ITS-90	-270 to +1300 °C	≤ 0.25 % from -80 °C

### 5 Technical data

Designation	Measuring range	Accuracy <sup>a</sup>	Input resistance or burden voltage
Voltage	0 to 10 V	≤ 0.1 %	> 500 kΩ
Current	4 to 20 mA	≤ 0.1 %	< 2.5 V
	0 to 20 mA	≤ 0.1 %	< 2.5 V

### 5.8 Environmental influences

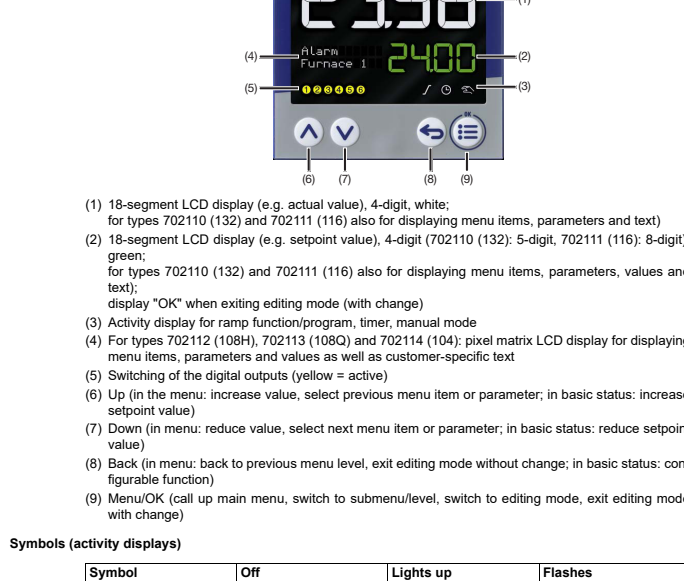
Ambient temperature range	-30 to +70 °C
Storage	-10 to +55 °C
Operation	Max. 2000 m above sea level
Site altitude	Max. 2000 m above sea level
Climate environmental influences	According to DIN EN 60721-3 with extended temperature range ≤ 90 % rel. humidity without condensation
Resistance to climatic conditions	Storage: According to class 1K2 Operation: According to class 3K3
Mechanical environmental influences	Storage: According to class 1M2 Transport: According to class 2M2 Operation: According to class 3M3



### 4 Operation

The device is configured, parameterized, and operated using the four buttons on the front. A setup program is also available for convenient configuration of the device using a PC. Some functions can only be configured with the setup program. The individual parameters for device settings are organized in different levels that can be inhibited. The level inhibits help to prevent accidental or unauthorized operation.

#### 4.1 Display and control elements



#### Symbols (activity displays)

Symbol	Off	Lights up	Flashes
Ramp function/program	Ramp function or program controller is not active and also not configured	Ramp function or program controller is active but not active	Ramp function or program controller is active
Timer	Timer is not active and also not configured	Timer is configured but not active	Timer is active (running)

### 5 Technical data

Designation	Standard	ITS	Connection type	Measuring range	Accuracy <sup>a</sup>	Measuring current
PH100	DIN EN 60751:2009 IEC 60751:2008	ITS-90	Two/three-wire	-200 to +850 °C	≤ 0.1 %	500 µA
PH1000	DIN EN 60751:2009 IEC 60751:2008	ITS-90	Two/three-wire	-200 to +850 °C	≤ 0.1 %	50 µA
PH100	GOST 6651:2009 A.2	ITS-90	Two/three-wire	-200 to +850 °C	≤ 0.1 %	50 µA
KTY			Two-wire	-53 to +153 °C	≤ 2.0 %	50 µA

### 5 Technical data

Designation	Measuring range	Accuracy <sup>a</sup>	Input resistance or burden voltage
Voltage	0 to 10 V	≤ 0.1 %	> 500 kΩ
Current	4 to 20 mA	≤ 0.1 %	< 2.5 V
	0 to 20 mA	≤ 0.1 %	< 2.5 V

### 5.10 Approvals and approval marks

Approval mark	Test facility	Certificate/certification numbers	Inspection basis	Valid for
cUL us	Underwriters Laboratories	E201387	UL 1010-1 (3. Ed.), CAN/CSA-22.2 No. 61010-1 (3. Ed.)	All types
DNV GL	DNV GL	TAA00001B3	Class Guideline DNVGL-CG-0339	Type 702111 (DC 20 to 30 V) and type 702114 (AC 110 to 240 V), without Ethernet interface, panel mounting
BUREAU VERITAS	Bureau Veritas	53627/AV 09	Bureau Veritas Rules for the Classification of Steel Ships	

#### 3.3 Connection diagram

**CAUTION!**  
In unfavorable conditions, the temperature may exceed 60 °C at the terminals. As a result, the insulation of the cables connected at the terminals may be damaged. The affected cables must be heat-resistant up to at least 80 °C.

**NOTE!**  
There is an individual connection diagram on the housing that corresponds to the ordered device version.

#### 3.3.1 Analog input

Measuring probe/standard signal	Symbol and terminal designation	Measuring probe/standard signal	Symbol and terminal designation
Thermocouple	7	Resistance/potentiometer two-wire circuit	7
RTD temperature probe two-wire circuit	7	Resistance/potentiometer three-wire circuit	5
RTD temperature probe three-wire circuit	6	Resistance transmitter	5

#### 3.3.2 Digital inputs

Input	Version	Symbol and terminal designation	Input	Version	Symbol and terminal designation
1	Digital input for potential-free contact (usable as alternative to digital output 3)	9	2	Digital input for potential-free contact (only usable if the analog input is not configured as DC 0/2) ... 10 V)	8
8, 10	Input 2 (for potential-free contact)	10			10

### 4 Operation

Symbol	Off	Lights up	Flashes
Manual mode	Manual mode is not active (F = automatic mode)	Manual mode is active	

#### Button functions

Button or button combination (permanent)	In basic status	When navigating	When editing
Up	Increase setpoint value in manual mode. Increase output level (or open actuator in the case of the three-step controller).	Select previous menu item or parameter.	Increase value or go up in picklist.
Down	Decrease setpoint value in manual mode. Decrease output level (or close actuator in the case of the three-step controller).	Select next menu item or parameter.	Decrease value or go down in picklist.
Back short (< 2 s)	Function configurable (default setting: without function).	Move to menu level above.	Leave editing mode without changes.
Back long (> 2 s)	Function configurable (default setting: switch to manual mode / end manual mode).		
Menu/OK short (< 2 s)	Call up main menu.	Call up sub-menu or switch to editing mode.	Leave editing mode with changes.
Up + Down long (> 2 s)	Start/stop autotuning.		
Down + Menu/OK very long (> 5 s)	Call up menu for level inhibit.		

### 5 Technical data

Measuring range underflow	Measuring range overflow	Short-circuit (probe/line)	Break (probe/line)	Polarity
RTD temperature probe	++	++	++	---
Resistance/potentiometer	---	++	---	++
Resistance transmitter	---	(+) <sup>b</sup>	---	---
Thermocouple	++	++	++	(+) <sup>b</sup>
Current	---	++	---	---
DC 0 to 20 mA	---	---	---	---
Current 4 to 20 mA	++	---	++	++
Voltage 0 to 10 V	---	++	---	++
Voltage 2 to 10 V	++	++	++	++

### 6 China ROHS

Component Name	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)	铅 (Pb)	汞 (Hg)	镉 (Cd)	镍 (Ni)	钎剂 (Solder)
外壳 (Housing)	○	○	○	○	○	○	○	○
连接器 (Connector)	○	○	○	○	○	○	○	○
螺母 (Nut)	○	○	○	○	○	○	○	○
螺钉 (Screw)	○	○	○	○	○	○	○	○

#### 3.3.3 Analog output

Output	Version	Symbol and terminal designation	Output	Version	Symbol and terminal designation
2	Option 2 (alternative to digital output 2): DC 0/2 ... 10 V or DC 0/4 ... 20 mA (configurable)	3	5	Option 2 (alternative to digital output 5): DC 0/2 ... 10 V or DC 0/4 ... 20 mA (configurable)	14

#### 3.3.4 Digital outputs

Output	Version	Symbol and terminal designation	Output	Version	Symbol and terminal designation
1	Relay (N/O contact)	1	5	Option 2 for types 702111 (116), 702112 (108H), 702113 (108Q) and 702114 (104) (alternative to analog output): Relay (N/O contact) logic output 0/14 V	13
2	Relay (N/O contact), (for type 702110 as option 2, see below)	2	6	Option 3 for types 702112 (108H), 702113 (108Q) and 702114 (104): Relay (N/O contact) logic output 0/14 V or PhotoMOS <sup>®</sup> relay	14
3	Logic output 0/14 V (usable as alternative to digital input 1)	9	7	Option 4 for types 702111 (116), 702112 (108H), 702113 (108Q) and 702114 (104): Relay (N/O contact; only with longer contact life) or logic output 0/14 V PhotoMOS <sup>®</sup> relay	15
4	Option 1 for types 702111 (116), 702112 (108H), 702113 (108Q) and 702114 (104) (alternative to RS485 interface): Relay (N/O contact); only for type 702111 (116) or logic output 0/14 V	11			16
		12			17
		12			17

### 4 Operation

**4.2 Language selection**  
After switching on the device for the first time, the user can either confirm the flashing displayed language with "OK" or select another language using the "Up"/"Down" buttons and then confirm this with "OK". If, at a later point, another user is to also have the option of selecting a language, the configuration parameter "Language selection active" must be set to "Yes" (Configuration > System data). After applying the language, this parameter is automatically set to "No", so that language selection is not necessary the next time the device is switched on. The language of the device texts can be changed at any time in the configuration settings (regardless of language selection after switch-on).

#### 4.3 Error messages

Display	Possible cause <sup>a</sup>	Measures
<<<<	Measuring range underflow Short-circuit (probe/line) Break (probe/line) Polarity	Check sensor and line (break, short-circuit, polarity) Check connection terminals Check configuration (signal type, linearization, resistance measuring range, scaling)
>>>>	Measuring range overflow Break (probe/line) Polarity	Check configuration (signal type, linearization, resistance measuring range, scaling)

#### 4.4 Further information

For further information regarding the operation and configuration of the device, see the operating manual, as well as the interface description (Modbus) and the ST editor manual, if necessary.  
→ chapter 1.9 "Available technical documents", Page 9

#### Ethernet interface (option)

The settings of the Ethernet interface must be made with the Lantronix CPR Manager PC software from the manufacturer Lantronix, Inc. Configuration on the device or with the setup program is not necessary. Further information can be found in the interface description (Modbus).

### 5 Technical data

Designation	Measuring range	Accuracy <sup>a</sup>	Measuring current
Resistance transmitter	0 to 4000 Ω	≤ 0.1 %	50 µA
Resistance/potentiometer	0 to 4000 Ω	≤ 0.1 %	500 µA
	0 to 4000 Ω	≤ 0.1 %	50 µA

### 5.4 Digital outputs

Relay (N/O contact)	Switching capacity	Contact life
Relay (N/O contact) with longer contact life	Max. 3 A at AC 230 V or DC 30 V, resistive load 350,000 operations at 1 A	
Relay (N/O contact) with shorter contact life	Max. 3 A at AC 230 V, resistive load 300,000 operations at rated load 1,500,000 operations at 1 A	

### 5.5 Interfaces

USB device	Connector type	Standard	Max. cable length
Micro-B (socket)	Low-Speed, Full-Speed	5 m	