



Compact Controller ER2022 and ER2022A

INSTALLATION & USER MANUAL

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Clorius
CONTROLS

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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 always accessible to all users, If difficulties occur during startup, please do not intervene in any way that could jeopardize your warranty rights!

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 = ElectroStatic 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 symbols 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 Check the delivery

- Ensure that the packaging and its contents are undamaged
- 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 also Technical data section 9 – this manual)
- Protect the device from shock during transport
- The original packaging provides optimum protection for storage and transport

1.4.3 Return of Goods

In the event of repair, return the complete device in clean condition.

Use the original packaging to return goods.

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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

The accompanying letter for repair (Supplementary sheet for product returns) can be downloaded online from the manufacturer's website:

www.cloriuscontrols.com

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 charges 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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1.5 Identifying the device version

1.5.1 Nameplate

The nameplate is mounted on the housing.

Contents

The nameplate contains important information. This includes:

Description	Designation on the nameplate	Example
Controller type	Type ER 2022 or ER2022A	-
Part no.	Item no.	1-51440005
Serial number	F-Nr.	0070033801217480006
Voltage supply	20-30 V AC/DC and 110-240 VAC, 48 to 63 Hz	-

Controller (Type)

Compare the specifications on the nameplate with the order.

Identify the supplied device version using the order details (order code).

Part no. (TN)

Item 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. = 0070033801217480006

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.

1.5.2 Spare parts

Description	Part no.
Mounting Bracket for ER 2022 and ER2022A	1-0157263

1.6 Brief description

The ER 2022 controller is used for constant temperature control. It is suitable for all heating and cooling control systems. The controller is primarily intended for marine installations and other industrial applications - such as cooling water and lubricating oil installations, flow temperature control etc.

The device is characterized by a simple, clearly structured operation supported with texts. Process values and parameters are represented by two 18-segment LCD displays.

The ER 2022 type is additionally equipped with a pixel matrix LCD display for displaying text. In addition, the device has individual display elements for the switch positions of the outputs as well as for manual mode.

The device is operated using a membrane keyboard with four buttons and can be used under harsh environmental influences thanks to the high IP65 protection.

The temperature input comes via a Pt100 sensor with a single sensing element.

The measured value of the controlled variable is compared with the set point value and adjusted via a PI or a PID control structure.

The ER 2022 can act as either a heating controller, the actuator closes at rising temperature, or as a cooling controller, the actuator opens at rising temperature.

The ER 2022 permits direct reading of the actual temperature value and it is secured from failure in the measuring circuit, i.e. the controller can be set to give either a closing, an opening or remain in current position command in case of sensor short circuit or sensor break.

The error message ALARM appears in the LED display.

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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

⇒ [See Technical data section 7 on Page 34](#)

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 lye's, scouring agents, and cleaning with a pressure cleaner.

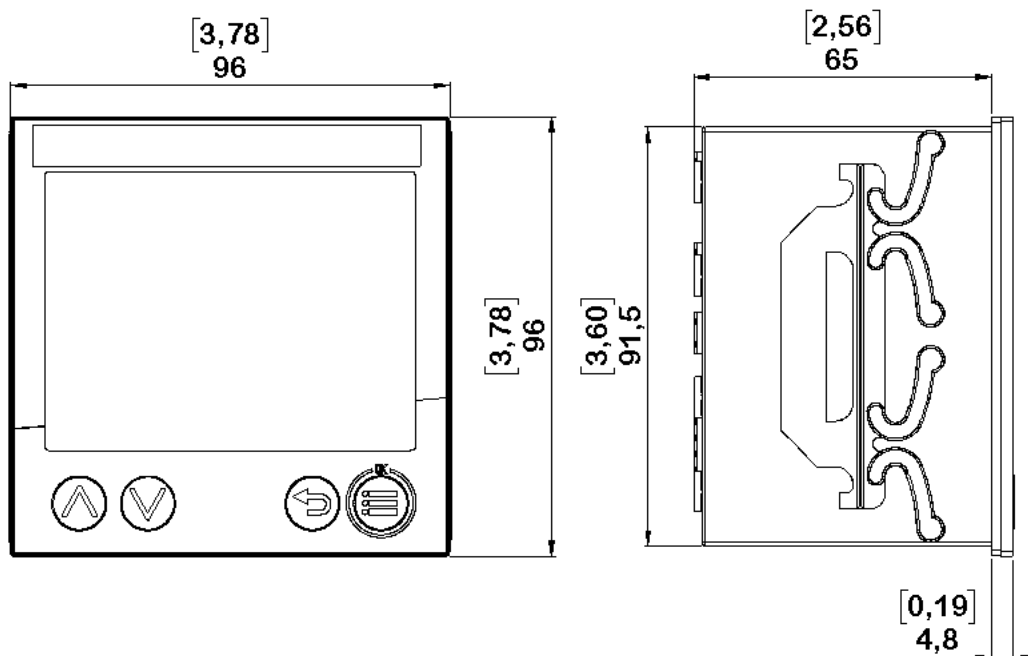
Use of these media can cause damage.

- ▶ Only clean the front of the device with suitable agents.
-

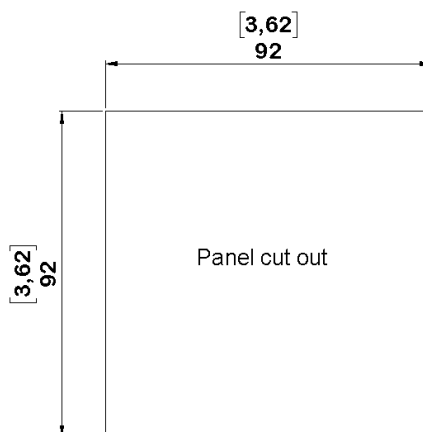
Compact Controller ER 2022 and ER 2022A

2. Mounting

2.3 Dimensions mm – [inch]



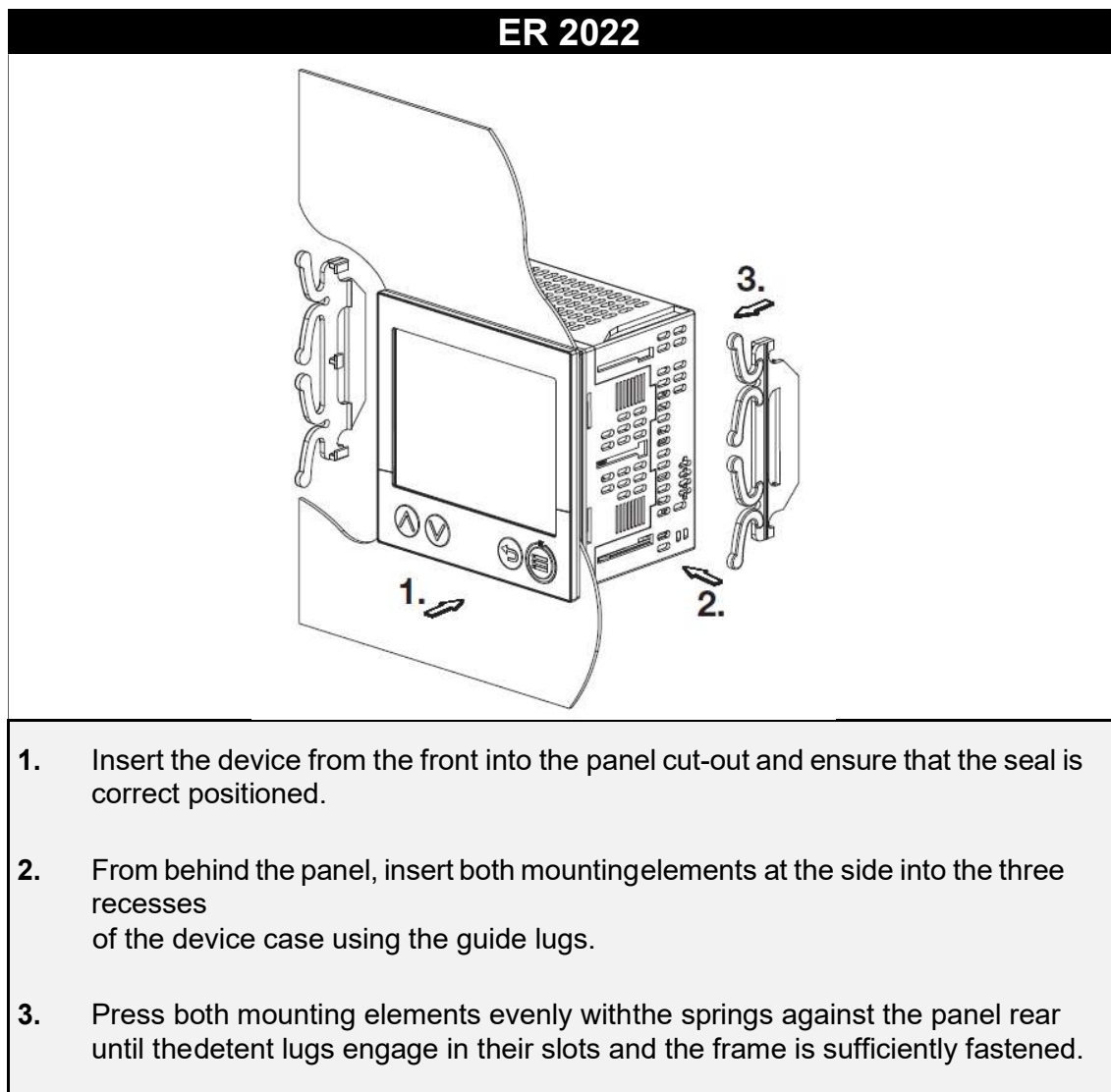
Panel cut-out according to DIN IEC 61554 [inch]



Controller	Panel cut-out (width x height)	Minimum spacing of panel cut- outs (for tightly packed installations)	
		Horizontal	Vertical
ER 2022 / A ER2022A	92 ^{+0.8} × 92 ^{+0.8} mm [3,62 x3,62 inch]	20 mm [0,79 inch]	30 mm [1,18 inch]

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2.3 Panel mounting



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 or both mounting elements as shown in the figure and ensure an even attachment

CAUTION!

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3. Electric 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 also the 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 loop throughs 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

- The device is intended to be installed in control cabinets or plants. Ensure that the customer's fuse protection does not exceed 20 A. Disconnect the device from the mains voltage on all poles prior to starting service or repair work.
The relay's load circuit can be operated with a hazardous electrical voltage (e.g. 230 V).
De-energize the load circuit during mounting/dismounting and electrical connection.
- To prevent the relay contacts being destroyed in the case of an external short-circuit in the load circuit, the latter must be fuse-protected as per the maximum admissible relay current (see the technical data section).
- The device is not suitable for installation in potentially explosive areas.
- In addition to a faulty installation, incorrectly set values on the device can also impair the correct function of the downstream process. Therefore, ensure that safety devices independent of the device, e.g., overpressure valves or temperature limiters/monitors, are present and that it is only possible for qualified personnel to define settings. Please observe the corresponding safety regulations in this context.

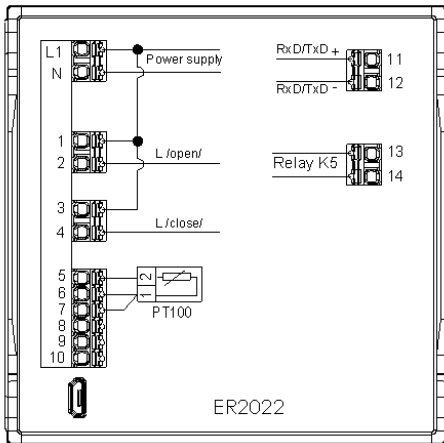
References to other information

- The electromagnetic compatibility conforms to the standards and regulations cited in the technical data section.
- In general, please observe the specifications regarding electrical isolation.

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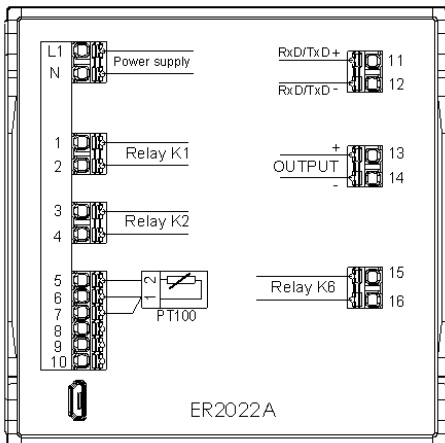
3.2 Connection elements

Controller ER2022 – 3-point



ER 2022 Terminals	CONNECTION
L 1 ; N	Voltage supply 24VAC/DC ; 110-240 VAC
1-2	Output 1 (relay)
3-4	Output 2 (relay)
5(+)-6-7	Input/PT100-three-wire/
5-7	Input/PT100-two-wire/
6(+); 7(-)	Input 0-20mA or 4-20mA
8(+); 7(-)	Input 0-10V or 2-10V
8-9-10	Set point SP-1-4 changeover
11(+); 12(-)	RS485
13-14	ALARM

Controller ER2022A – analog



ER 2022A Terminals	CONNECTION
L 1 ; N	Voltage supply 24VAC/DC ; 110-240 VAC
1-2	Relay K1
3-4	Relay K2
5(+)-6-7	Input/PT100-three-wire/
5-7	Input/PT100-two-wire/
6(+); 7(-)	Input 0-20mA or 4-20mA
8(+); 7(-)	Input 0-10V or 2-10V
8-9-10	Set point SP-1-4 changeover
11(+); 12(-)	RS485
13(+); 14(-)	Output analog signal
15-16	ALARM

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3.3 Connection diagram



CAUTION!

In unfavorable conditions, the temperature may exceed 60 °C/140°F 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/176°F

3.3.1 Analog input

Measuring probe/ standard signal	Symbol and terminal designation	Measuring probe/ standard signal	Symbol and terminal designation
Thermocouple		Current DC 0(4) ... 20 mA	
RTD temperature probe two-wire circuit		Resistance/potentiometer two-wire circuit	
RTD temperature probe three-wire circuit		Resistance/potentiometer three-wire circuit	
Voltage DC 0(2) ... 10 V (useable as alternative to digital input 2)		Resistance transmitter	

A = Start
E = End
S = Slider

3.3.2 Output 3- point signal

ER2022	Symbol and terminal designation
Relay (N/O contact)	
Relay (N/O contact)	

Analog signal

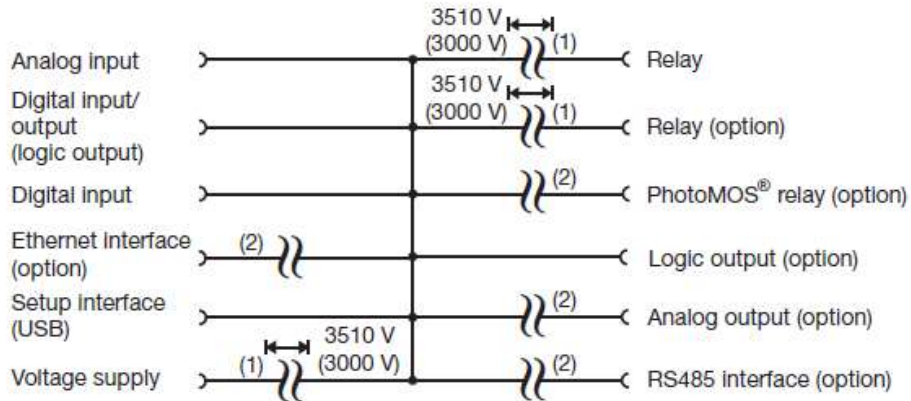
ER2022A	Symbol and terminal designation
Analog output	

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3.3.3 Voltage supply

Version (see nameplate)	Symbol and terminal designation	Version (see nameplate)	Symbol and terminal designation
AC 110 to 240 V	L1 ———○ L1/L+ N ———○ N/L-	AC/DC 20 to 30 V	L+ ———○ L1/L+ L- ———○ N/L-

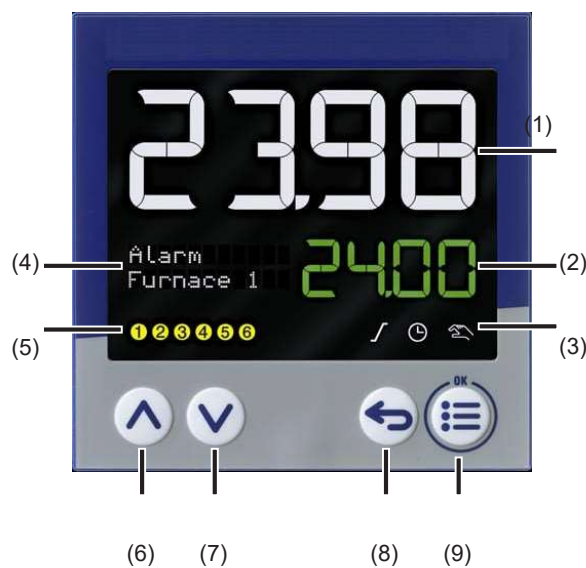
3.4 Galvanic isolation



The device is configured, parametrized, and operated using the four buttons on the front. The individual parameters for device setting are organized in different levels that can be inhibited. The level inhibit helps to prevent accidental or unauthorized operation.

4. Operation

4.1 Display and control elements



(1) 18-segment LCD display (e.g. actual value), 4-digit, white , also for displaying menu items, parameters and text) /PT100 sensor temperature.




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- (2) 18-segment LCD display (e.g. setpoint value), 8-digit, green, also for displaying menu items, parameters, values and text); / set point /
- (3) display "OK" when exiting editing mode (with change)
- (4) Activity display for ramp function/program, timer, manual mode
- (5) Pixel matrix LCD display for displaying menu items, parameters and values as well as customer-specific text
- (6) Switching of the digital outputs (yellow = active)
- (7) Up (in the menu: increase value, select previous menu item or parameter; in basic status: increasesetpoint value)

4.1 Display and Control elements

- (8) Down (in menu: reduce value, select next menu item or parameter; in basic status: reduce setpointvalue)
- (9) Back (in menu: back to previous menu level, exit editing mode without change; in basic status: configurable function)
- (10) Menu/OK (call up main menu, switch to submenu/level, switch to editing mode, exit editing modewith change)








Symbols (activity displays)

Symbol	Off	Lights up	Flashes
	Ramp function or program controller is not active and also not configured	Ramp function or program controller is configured but not active	Ramp function or program controller is active
	Timer is not active and also not configured	Timer is configured but not active	Timer is active (running)
	Manual mode is not active (= automatic mode)	Manual mode is active The outputs can be manually controlled using the "Up" and "Down" buttons: Increase/decrease output level (or three-step controller: Open/close actuator).	---

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4.1 Display and Control elements

Button function

Button or button combination (permanent)	Function		
	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
Down + Menu/OK very long (> 5 s)  + 	Call up menu for level inhibit	---	---

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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 Manual mode

For the three-step controller, the actuator gradually opens each time the "Up" button is pressed (display "Open"), and gradually closes each time the "Down" button is pressed (display "Close").

It is also possible to switch to manual mode through a digital signal.

Manual mode can be generally inhibited in the configuration. It is also possible to inhibit manual mode through a digital signal.

Manual mode

With the corresponding configuration (Configuration > Display/operation), the "Back" button can be used to switch to manual mode (default setting: press key for more than 2 seconds).

The "Manual mode" symbol is illuminated during manual mode.

NOTE!

The controller automatically changes to manual mode in the event of over range or under range.



4.4 Operating level

Main menu

The "Menu/OK" button must be pressed to switch from the basic status to the main menu (menu). As well as the actual operating levels (user level, parameterization, configuration), the main menu contains the "Device information" menu for displaying device information (name, version number), checking the counter readings, and resetting to default settings. If the device has been configured as a program controller, the program editor is also part of the main menu.

Navigating through the menus

The individual sub-menus in the menu can be selected by pressing the "Up" and "Down" buttons. Pressing the "Menu/OK" button again takes you to the relevant sub-menu or parameter (editing mode). The "Back" button returns you to the next menu level up or takes you out of editing mode without changes.

To change a parameter, the desired value or setting must be selected in editing mode using the "Up" and "Down" buttons. The change is applied using the "Menu/OK" button and editing mode is closed (required if "Auto save = no"; if "Auto save = Yes", editing mode is automatically closed after a certain period and changes are applied).

If no further buttons are pressed, the device automatically switches to the basic status after 180 s (default setting for "Timeout operation" parameter; configurable from 30 to 180 seconds).

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Overview of the operating levels and sub-menus

The following overview shows the operating levels of the device and its sub-menus. The individual functions are configured or parameterized in the sub-menus (not shown here). Information about the functions can be found in the corresponding chapters of this manual. Beyond this, there are functions that can only be configured with the setup program; these functions are not listed here. Information about these functions can also be found in the corresponding chapters of this manual.

Operating level	Sub-menu 1	Sub-menu 2	
User level			
Program editor (only for program controller)	Section 1		
	...		
	Section 24		
Parameterization	Parameter block 1		
	Parameter block 2		
Configuration	System data		
	Display/operation		
	Analog input		
	Digital inputs		
	Analog output (if available)		
	Digital outputs		
	Controller		
			Controller input
			Autotuning
			Setpoint values
			Ramp function
	Program controller		
	Timer		
	Limit value monitoring functions		Limit value monitoring function 1
			...
			Limit value monitoring function 4
	Serial interface (if available)		
Device information	Versions		
	Service		

Example for changing a configuration parameter

Changing the linearization of the analog input

1. Press the "Menu/OK" button to move from the basic status to the main menu (menu).
2. Press the "Down" (or "Up") button repeatedly until the "Configuration" menu item appears.
3. Press the "Menu/OK" button to move to the "Configuration" sub-menu.
4. Press the "Down" (or "Up") button repeatedly until the "Analog input" menu item appears.
5. Press the "Menu/OK" button to move from to the analog input's configuration menu.
6. Press the "Down" (or "Up") button repeatedly until the "Linearization" menu item appears.

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Example for changing a configuration parameter

Changing the linearization of the analog input

7. Press the "Menu/OK" button to switch to editing mode.
The current value "Pt100" flashes (default setting for "RTD temperature probe" signal type).
8. Change the current value using the "Down" (or "Up") button until the new value "Pt100" flashes.
9. Press the "Menu/OK" button to apply the new value and to exit editing mode (if "Auto save" = No). Successful application of the new value is confirmed by "OK" being displayed.
10. Press the "Back" button several times to return to the basic status.

4.5 Inhibited level

Access to the individual levels can be inhibited. Press and hold the "Menu/OK" and "Down" buttons at the same time for longer than 5 seconds to set the level inhibit.

The corresponding degree of inhibition can be selected using the "Up" and "Down" buttons and confirmed using the "Menu/OK" button.

Inhibited levels
None (all levels free; default setting)
Configuration
Configuration and parameterization
Configuration, parameterization, and program editor
Complete (configuration, parameterization, program editor, and user level)

If the configuration is inhibited, resetting to default settings (Device Info > Service > Factory setting) is also not possible.

4.6 User level

The user level is only available on the device. Four setpoint values can be set here. The output level and the analog input's measured value are also displayed here (default setting).

The input limits of the setpoint values are dependent on the configuration of the respective setpoint value (Configuration > Controller > Setpoint values). The input range of -1999 to 9999 shown in the following table represents the maximum possible limits.

No.	Parameter	Selection/text/value	Description
1	Setpoint value 1	-1999 to 9999 (0)	Setpoint value 1
2	Setpoint value 2	-1999 to 9999 (0)	Setpoint value 2
3	Setpoint value 3	-1999 to 9999 (0)	Setpoint value 3
4	Setpoint value 4	-1999 to 9999 (0)	Setpoint value 4
5	Output level display	(Display only)	Current controller output level
6	Measured value	(Display only)	Current measured value of analog input

The selection of the maximum 16 parameters that appear in the user level can be changed or supplemented using the setup program (Setup only > User level).

The setpoint values can also be entered in the setup program in the scope of the controller configuration

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4.7 Error messages

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

^a Depends on the signal type (measuring probe); see also "Technical Data section 7".

In the event of an error, the controller switches to manual mode.

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5. Parameterization

5.1 Parameter blocks

The following table shows the parameters in a parameter block. The same parameters are also available for the second parameter block.

Depending on the controller type configured, certain parameters may be omitted or ineffective.

Parameter	Selection/text/value	Description
Control structure 1		These settings determine the control structure (transmission behavior) and relate to the first controller output.
	P	P controller
	I	I controller
	PI	PI controller
	PD	PD controller
	PID	PID controller
Control structure 2	(see: Control structure 1)	These settings apply to the second controller out-put for a three-state controller.
Xp1 proportional band	0 to 9999	Value for the proportional band The controller structure has no effect if $X_p = 0$ (behavior identical to limit value monitoring)! For a continuous controller, X_p must be $\neq 0$.
Xp2 proportional band	0 to 9999	
Tv1 derivative time	0 to 9999 (80)	The derivative time (in seconds) influences the differential component (D component) of the controller output signal. The effect of the D-term increases as the derivation time increases.
Tv2 derivative time	0 to 9999 (80)	
Tn1 reset time	0 to 9999 (350)	The reset time (in seconds) influences the integral component (I component) of the controller output signal. The greater the reset time, the less effect the I component has.
Tn2 reset time	0 to 9999 (350)	
Cy1 cycle time	0 to 9999 (20)	The cycle time (in seconds) should be chosen so that the energy supply to the process is as continuous as possible without overloading the switching elements.
Cy2 cycle time	0 to 9999 (20)	
Xsh contact spacing DEAD BAND	0 to 999	Spacing between the two control contacts of a three-state controller and three-step controller
Xd1 switching differential	0 to 999 (1)	Hysteresis for a switching controller with proportional band $X_p = 0$
Xd2 switching differential	0 to 999 (1)	
TT actuator time	5 to 3000 (60)	Control valve running time range (in seconds) used for a three-step controller
Y0 working point	-100 to +100 (0)	Working point correction (in percent) for a P or PD controller (correction value for the output level) If the actual value has reached the setpoint value, the output level corresponds to the working point Y0.

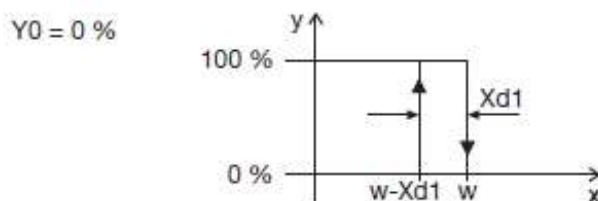
Compact Controller ER 2022 and ER 2022A

Parameter	Selection/text/value	Description
Y1 max. output level limit	0 to 100	Admissible maximum output level (in percent; only effective if $X_p \neq 0$)
Y2 min. output level limit	-100 to +100	Admissible minimum output level (in percent; only effective if $X_p \neq 0$) Three-state controller: For the second controller output to be active, a negative value must be set.
Tk1 min. relay-on time	0 to 9999	Minimum ON period (in seconds) to limit the switching frequency for switched outputs (digital outputs) Recommended setting when using a relay as controller output: ≥ 0.15 s
Tk2 min. relay-on time	0 to 9999	

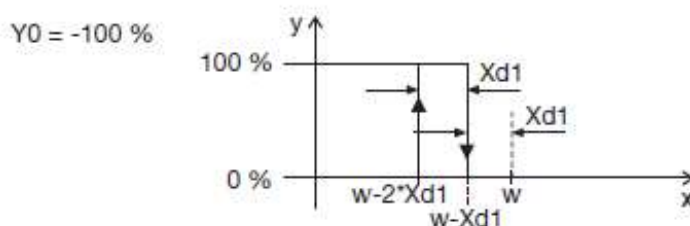
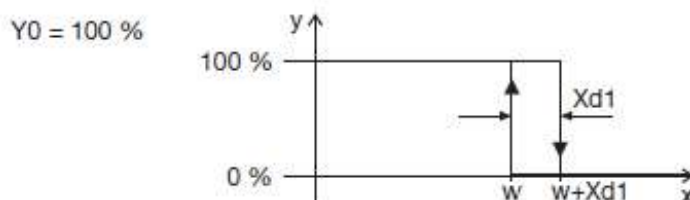
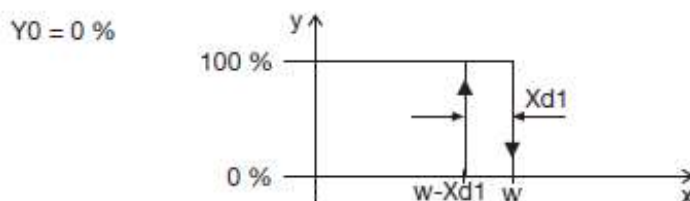
5.2 Controller types

Two-state controller

This controller has a switched output and can be parameterized with P, PI, PD, or PID transmission behavior. The proportional band X_p must be greater than 0 for the controller structure to take effect. If $X_p = 0$, the behavior corresponds to the function of limit value monitoring with switching differential X_{d1} (working point $Y_0 = 0\%$):



Influence of working point Y_0 on the switching behavior:

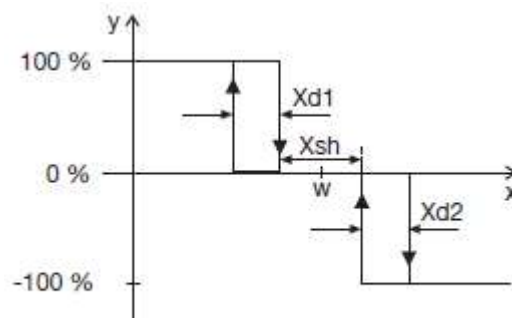


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Three-state controller

This controller has two outputs, which can be configured as continuous (analog output) or switched (digital output). In both cases, the controller can be parameterized with P, PI, PD, or PID transmission behavior. The proportional bands $Xp1$ and $Xp2$ must be greater than 0 for the controller structure to take effect.

If $Xp1 = 0$ and $Xp2 = 0$, the behavior corresponds to the function of limit value monitoring with switching differential $Xd1$ and $Xd2$, and contact spacing Xsh (working point $Y0 = 0\%$):



Three-step controller

This controller has two switched outputs and can be parameterized with PI or PID transmission behavior. The proportional band Xp must be greater than 0 for the controller structure to take effect.

The three-step controller is used for actuator drives with three switching statuses (actuator open, closed, hold).

Continuous controller

This controller has a continuous output (analog output) and can be parameterized with P, PI, PD, or PID transmission behavior. The proportional band Xp must be greater than 0 for the controller structure to take effect (the setting $Xp = 0$ is not normally used in practice).

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6. Configuration

6.1 Selectors

The selectors contain signals that are available for configuration on the device
These are device signals (e.g., analog and digital inputs or internal signals).

Analog selector

Category	Signal	Description
No selection		No signal selected
Analog input	Analog input	Analog input signal
Controller	Actual value	Actual value on the controller input
	Setpoint value	Active setpoint value on the controller input
	Sampling rate	Sampling rate (fixed value: 150 ms)
	Controller output 1 (ana-log)	Switched controller output 1 (0 to +100 %; e.g., for heating)
	Controller output 2 (ana-log)	Switched controller output 2 (-100 to 0 %; e.g., for cooling)
	Controller differential	Difference between setpoint value and actual value of the controller
Setpoint values	Output level display	Controller output level (-100 % to +100 %)
	Setpoint 1 to setpoint 4	Setpoint values that can be selected through the setpoint changeover.
	Current setpoint value	Setpoint value selected through the setpoint changeover

Digital Selector

Category	Signal	Description
No selection		No signal selected
Digital inputs	Digital input 1 digital input 2	Signals of digital inputs 1 and 2
Controller	Controller off	The signal corresponds to the controller-off signal (switch off controller).
	Autotuning	The signal is active during autotuning.
	Manual mode active	The signal is active during manual mode.
	Controller cycle alarm	Control loop monitoring alarm signal
	Output level alarm	Output level monitoring alarm signal
	Controller output 1 (digital)	Signal on controller output 1 (e.g., for heating with inverse control direction)
Controller output 2 (digital)	Signal on controller output 2 (e.g., for cooling with inverse control direction)	
Limit value monitoring functions	Limit value monitoring function 1 to limit value monitoring function 4	Alarm signals of limit value monitoring functions 1 to 4

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6.2 System data

The general system data is configured in this menu.

Parameter	Selection/text/value	Description
Device name (setup only)	Name (editable)	Device designation (in the "Device information" menu)
National language	German English French Spanish	National language of display texts
Language selection active	No Yes	Language selection after switching on the next time If "Yes", the user can select the national language for the device texts after the next time the device is switched on - following the change to the configuration. After applying the national language, this parameter is automatically set to "No", so that language selection is not necessary the next time the device is switched on.
Temperature unit	°C °F	Temperature unit for the display on the device and in the setup program (automatic conversion from °C to °F)

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6.3 Display/operation

Settings are implemented in this menu that affect the function of the displays and the device buttons.

Parameter	Selection/text/value	Description
Display 1	Analog selector Analog input	Analog signal that is shown in the first 18-segment display (top, white).
Display 2	Analog selector Current setpoint value	Analog signal that is shown in the second 18-segment display (bottom, green).
Display 3	Analog selector No selection	Analog signal that is shown in the top line of the pixel matrix display (only for formats 108H, 108Q, and 104).
Display 4	Analog selector No selection	Analog signal that is shown in the bottom line of the pixel matrix display (only for formats 108H, 108Q, and 104).
Timer start display change		Display change when starting the timer:
	Without function	No display change
	Timer remaining running time	Display of the remaining running time
	Timer runtime	Display of the runtime
Time-out operation	30 to 180 0 = Switched off	Time period (in seconds), after which the device automatically returns to the basic status if no key is pressed.
Contrast	1 to 10 (8)	Contrast of the displays
Running speed	1 to 3 (2)	Running speed of the display text
Short-press back button (< 2 s)	Without function Manual mode Start auto tuning Display timer value	Function of the "Back" button when short-pressing the button (less than two seconds). Additional functions of the button can be selected in the configuration of the individual device functions (digital selector).
Long-press back button (> 2 s)	Manual mode (See above for other functions)	Function of the "Back" button when long-pressing the button (more than two seconds)
Start delay time	0 to 300 s	Start delay time (in seconds) after Power ON. All functions of the device are only active after this time has elapsed.
Parameter	Selection/text/value	Description
Key lock	Digital selector No selection	Digital signal (high active) for inhibiting the buttons
Display off	Digital selector No selection	Digital signal (high active) for switching off all displays
Additional functions (setup only)	Expansion 1 to Expansion 5	Reserved functions for service purposes. Only activate when instructed to do so by service personnel! Click checkbox to activate the function.

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6.4 Analog input

The device has a universal analog input for connecting various measuring probes (sensors).

Parameter	Selection/text/value	Description
Signal type	No sensor	No sensor selected
	2L RTD temperatureprobe	RTD temperature probe in two-wire circuit
	3L RTD temperatureprobe	RTD temperature probe in three-wire circuit
	0...10 V	Voltage signal
	2...10 V	Voltage signal
	0...20 mA	Current signal
	4...20 mA	Current signal
Linearization	Pt 100	Only with RTD temperature probe
Decimal places		Number of pre-decimal and decimal places for the numerical display of the measured value
	Auto	Automatic
	XXXX.	No decimal place
	XXX.X	One decimal place
	XX.XX	Two decimal places
	X.XXX	Three decimal places

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6.4.1 Analog output

The device can optionally be equipped with an analog output.

Parameter	Selection/text/value	Description
	0...10 V	Voltage signal
	2...10 V	Voltage signal
	0...20 mA	Current signal
	4...20 mA	Current signal

6.5 Digital output

Parameter	Selection/text/value	Description
Source	Digital selector No selection	Signal that is issued at the digital output. Default setting for digital output 1: controller output 1 (digital) In the event of "No selection" the output signal does not correspond to the active status.
Inversion	No	Output signal not inverted.
	Yes	Output signal inverted.

Behavior after power on

The outputs are not active during the device's initialization phase (depending on the configuration). Once the initialization is complete, the output signal corresponds to the signal of the source (inverted if necessary).

6.6 Controller

6.6.1 Controller configuration

The general features of the controller are defined in this menu.

Parameter	Selection/text/value	Description
Controller type	Off	Controller disabled
	2-P controller	Two-state controller Controller with a switched output
	3-P controller	Three-state controller Controller with two switched outputs (for example, for heating/cooling) The combination of a continuous (e.g., for heating) and a switched output (e.g., for cooling) is also possible.

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	3-P step controller	Three-step controller Controller with two switched outputs (for motor actuator)
	Continuous controller	Continuous controller Controller with a continuous output (analog signal)
Control direction	Direct	The controller output level is positive if the actual value is greater than the setpoint value (cooling).
	Inverse	The controller output level is positive if the actual value is smaller than the setpoint value (heating).
Y in manual mode	Current value	Current output level before changeover
	Y manual mode	Configurable value (see "Y manual mode" parameter)
Y with error	Current value	Current output level before fault occurs
	Y replacement value	Configurable value (see "Y replacement value" parameter)
Y replacement value	-100 to +100 (0)	Output level (in percent) in the event of a fault

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6.6.1 Controller configuration

Parameter	Selection/text/value	Description
Control direction	Direct	The controller output level is positive if the actual value is greater than the setpoint value (cooling).
	Inverse	The controller output level is positive if the actual value is smaller than the setpoint value (heating).
Y in manual mode		Output level after changeover to manual mode
	Current value	Current output level before changeover
	Y manual mode	Configurable value (see "Y manual mode" parameter)
Y manual mode	-100 to +100 (0)	Output level (in percent) in manual mode
Y with error		Output level in the event of a fault (outside of the measuring range)
	Current value	Current output level before fault occurs
	Y replacement value	Configurable value (see "Y replacement value" parameter)
Y replacement value	-100 to +100 (0)	Output level (in percent) in the event of a fault

Behavior after power on

The controller outputs are inactive during the initialization phase (output level 0 %, relay in standby mode).

6.6.2 Controller input

The controller input signals are assigned in this menu.

Parameter	Selection/text/value	Description
Controller actual value	Analog selector Analog input	Analog signal as actual value of the controller
Controller setpoint value	Analog selector Current setpoint value	Analog signal as controller setpoint value
Signal 1 setpoint changeover	Digital selector No selection	Signal (bit 0) for controlling setpoint changeover
Signal 2 setpoint changeover	Digital selector No selection	Signal (bit 1) for controlling setpoint changeover
Manual/auto change-over signal	Digital selector No selection	Signal (high-active) for changeover to manualmode
Manual mode signal inhibition	Digital selector No selection	Signal (high active) for inhibiting manual mode

Setpoint changeover

Signal 2 (bit 1)	Signal 1 (bit 0)	Active setpoint value
0	0	Setpoint value 1
0	1	Setpoint value 2
1	0	Setpoint value 3
1	1	Setpoint value 4

Compact Controller ER 2022 and ER 2022A

6.6.2 Controller input

Parameter	Selection/text/value	Description
Parameter block changeover signal	Digital selector No selection	Signal (high-active) for changeover from parameter block 1 to parameter block 2
Controller signal on	Digital selector No selection	Signal (high-active) for switching on the controller
Controller signal off	Digital selector No selection	Signal (high-active) for switching off the controller

Setpoint changeover

Signal 2 (bit 1)	Signal 1 (bit 0)	Active setpoint value
0	0	Setpoint value 1
0	1	Setpoint value 2
1	0	Setpoint value 3
1	1	Setpoint value 4

6.6.3 Setpoint values

One of four (switchable) setpoint values is used as a controller setpoint value. For each of these setpoints, certain specifications can be made here that are of importance, for example, when entering the setpoint value. The setpoint itself can also be set here.

Parameter	Selection/text/value	Description
Min. limit	-1999 to 9999	Minimum admissible setpoint value (lower input limit)
Max. limit	-1999 to 9999	Maximum admissible setpoint value (upper input limit)
Setpoint value	-1999 to 9999 (0)	Fixed setpoint value (input limits dependent on min. limit and max. limit)

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6.7 Limit value monitoring functions

The device is equipped with four limit value monitoring functions that can be individually configured. The following configuration parameters are available for each of the four limit value monitoring functions.

Parameter	Selection/text/value	Description
Function	Without function	
	AF1	Limit value above and below the setpoint value
	AF2	As for AF1, output signal inverted
	AF3	Limit value below the setpoint value
	AF4	As for AF3, output signal inverted
	AF5	Limit value above the setpoint value
	AF6	As for AF5, output signal inverted
	AF7	Fixed limit value (independent of the setpoint value)
	AF8	As for AF7, output signal inverted
Actual value input	Analog selector No selection	Analog signal as actual value (signal to be monitored)
Setpoint value input	Analog selector No selection	Analog signal as setpoint value (reference signal for AF1 to AF6)
Limit value	-1999 to 9999 (0)	Admissible deviation (AL) of the actual value
Limit value 2	-1999 to 9999 (0)	For non-standard limit value function: second limitvalue (AL2) to implement an asymmetrical monitoring band; only for AF1 and AF2 The limit value (AL) is below the setpoint value; thesecond limit value (AL2) is above the setpoint value.
Switching differential	0 to 9999 (1)	Switching thresholds of the output signal (difference from limit value)
Startup alarm suppression		Alarm suppression during start-up phase
	Off	Limit value monitoring always operates according to its alarm function.
	On	Alarm suppression after power on or if limit value or setpoint value is changed
Response in case of a fault		Output signal in the event of a fault (e.g., in the event of over range or under range)
	Off	Output signal inactive
	On	Output signal active

Function

For the AF1 to AF6 alarm functions, the final limit value depends on the setpoint value – the entered limit value is added to or subtracted from the setpoint value. The AF7 and AF8 alarm functions work with a fixed limit value which corresponds to the limit value entered.

See also *chapter 6.7.1 "Alarm functions and switching behavior"*,

Startup alarm suppression

Function of the startup alarm suppression:

- After power on, the alarm signals for the limit value monitoring function remains inactive, even if the actual value is in the alarm range.
- If the limit value or setpoint value is changed so that the actual value is then within the alarm range, while the actual value is outside of the alarm range, the alarm signal remains inactive.
- The limit value monitoring only starts to operate according to its alarm function again once the actual value has left the alarm range. This means that the alarm signal remains inactive until the actual value returns to the alarm range.

Behavior after power on

The output signal status is not saved via power off. Limit value monitoring starts after completion of initialization according to its configuration.

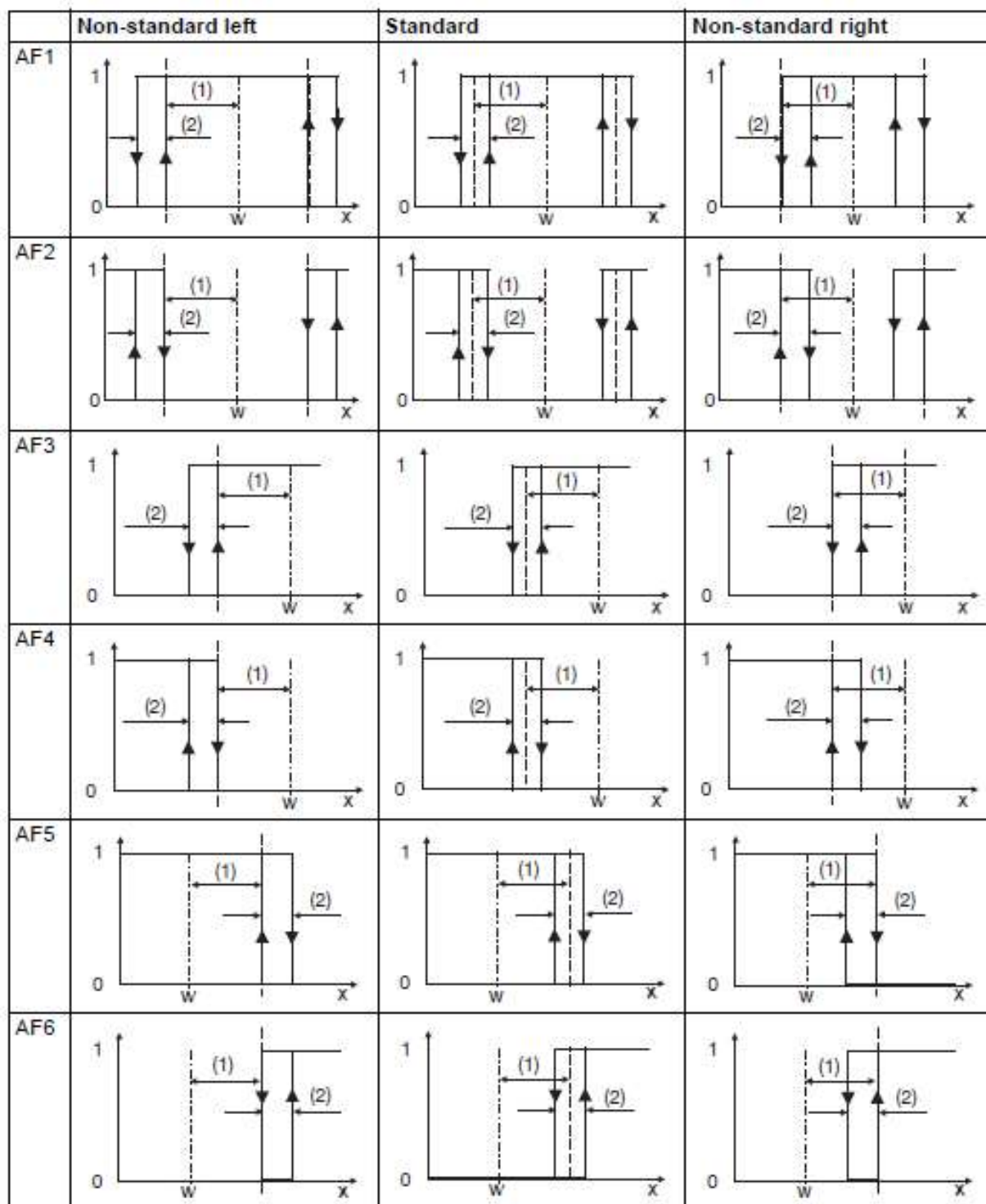
6.7.1 Functions and switching behavior

This section describes the alarm function AF1 to AF8 and the switching behavior (non-standard left, standard, non-standard right)

Factory setting AF6 alarm type.

Compact Controller ER 2022 and ER 2022A

Limit value in relation to the setpoint value



0 = output signal not active

1 = output signal active

x = actual value

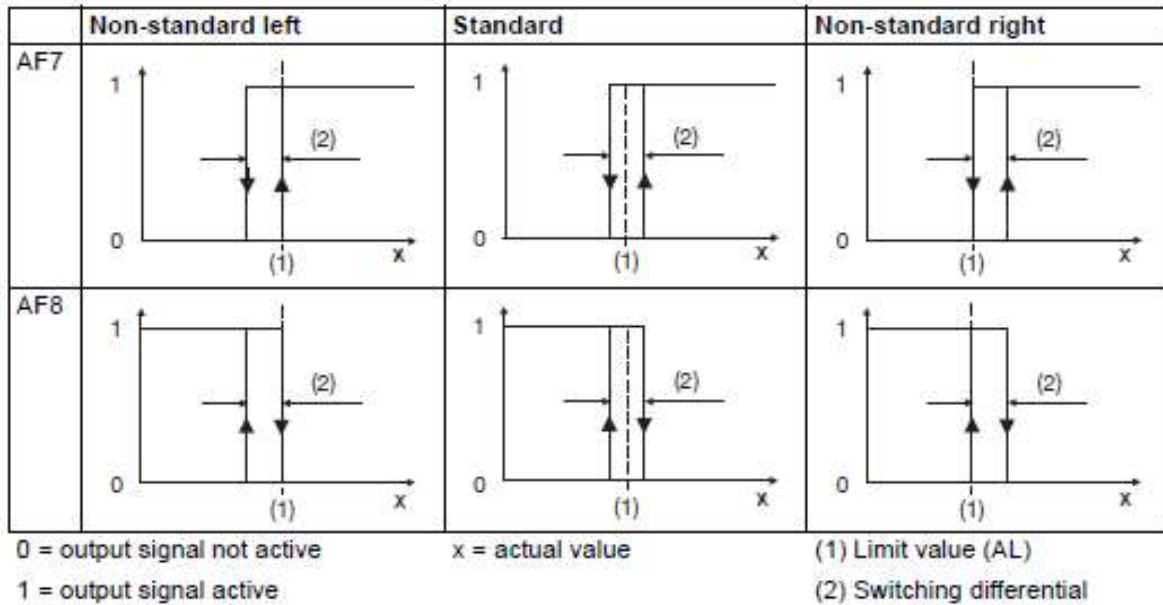
w = setpoint value

(1) Limit value (AL)

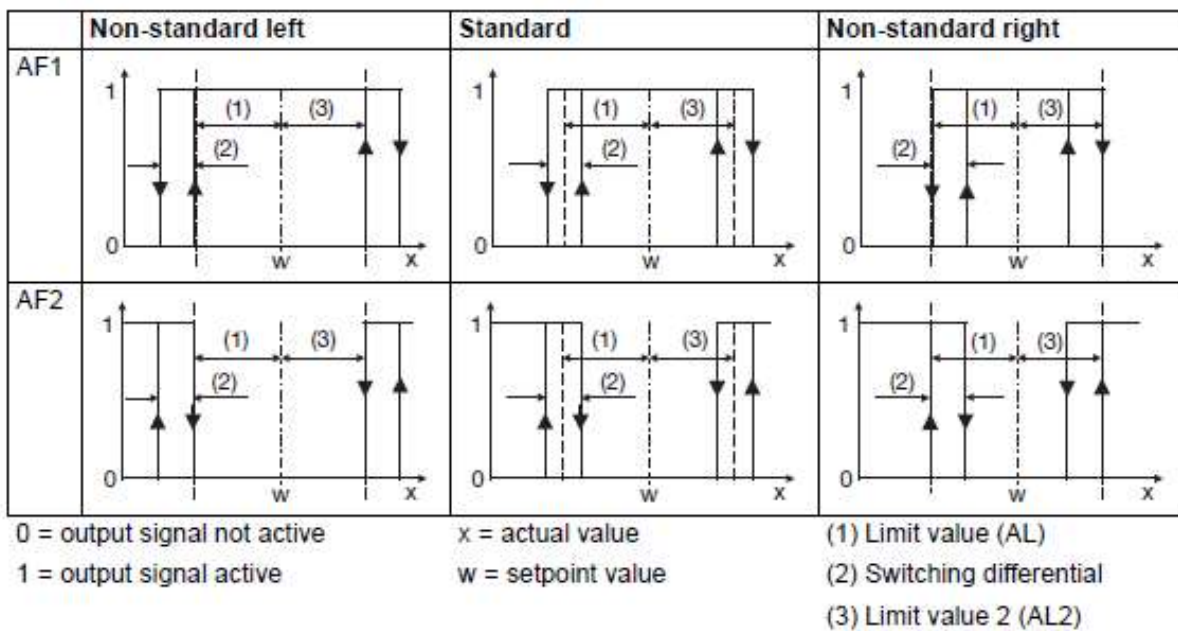
(2) Switching differential

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Fixed limit value



Limit value in relation to the setpoint – non-standard monitoring brand



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6.7.2 Serial interface

The device can be optionally equipped with a RS485 interface that is provided for connecting to a Modbus master and is operated as a Modbus slave (Modbus RTU protocol).

Parameter	Selection/text/value	Description
Device address	1 to 254	Modbus device address
Baud rate	9600	9600 baud
	19200	19200 baud
	38400	38400 baud
	115200	115200 baud
Data format	8-1 no parity	8 data bits, 1 stop bit, no parity
	8-1 odd parity	8 data bits, 1 stop bit, odd parity
	8-1 even parity	8 data bits, 1 stop bit, even parity
	8-2 no parity	8 data bits, 2 stop bits, no parity
Min. response time (setup only)	0 to 500 (40)	The minimum response time (in milliseconds) is adhered to by the device (Modbus slave) before a response is sent following a data request.

NOTE!



There is a separate interface description available with further information. Amongst other things, this includes the Modbus addresses of all device data, process value, and configuration parameters available via Modbus

Behavior after power on

The inputs are set to 0 (binary) or "NOINPUT" (analog) during the device's initialization phase. Once the initialization is complete, the values transferred via Modbus are applied.

Description of the RS485 controller data:



RS485 Interface Description of ER2022 and ER2022A Controllers – See also manual no. 99.224.01

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7. Technical data

7.1 Analog input

RTD temperature probe

Designation	Standard	ITS	Connection type	Measuring range	Accuracy ^a	Measuring current
Pt100	DIN EN 60751:2009 IEC 60751:2008	ITS-90	Two/three-wire	-50 to +260 °C -58 to +500 °F	≤ 0.1 %	500 μA

^a The accuracy value refers to the measuring range.

Ambient temperature influence	≤ 50 ppm/K
Sensor line resistance	Max. 30 Ω per line
Sampling rate	150 ms
Input filter	Digital filter, 2nd order; filter constant can be set from 0 to 100.0 s

Voltage, current (standard signals)

Designation	Measuring range	Accuracy ^a	Input resistance or burden voltage
Voltage	0 to 10 V	≤ 0.1 %	> 500 kΩ
	2 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

^a The accuracy value refers to the maximum measuring range. Small measuring spans lead to reduced linearization accuracy.

Ambient temperature influence	≤ 100 ppm/K
Deviation below/above the measuring range	According to NAMUR recommendation NE 43 (only current input 4 to 20 mA)
Sampling rate	150 ms
Input filter	Digital filter, 2nd order; filter constant can be set from 0 to 100.0 s

Measuring circuit monitoring

The device behavior in the event of a fault is configurable.

Measuring probe	Measuring range underflow	Measuring range overflow	Short-circuit (probe/line)	Break (probe/line)	Polarity
RTD temperature probe	++	++	++	++	---
++ = is detected		--- = is not detected		(+) = is detected in certain conditions	

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7.2 Analog input

Voltage	
Output signal	DC 0(2) to 10 V
Load resistance	> 500 Ω
Current	
Output signal	DC 0(4) to 20 mA
Load resistance	< 450 Ω
Accuracy	$\leq 0.5 \%$
Ambient temperature influence	≤ 150 ppm/K

7.2.1 Digital outputs

Relay (N/O contact)	
Switching capacity	Max. 3 A at AC 230 V or DC 30 V, resistive load
Contact life	150,000 operations at rated load 350,000 operations at 1 A
Relay (N/O contact) with longer contact life	
Switching capacity	Max. 3 A at AC 230 V, resistive load
Contact life	300,000 operations at rated load 1,500,000 operations at 1 A
Logic output	
Output signal	DC 0/14 V $\pm 15 \%$
Current	Max. 20 mA per output (at nominal voltage 14 V)
Switching time when used as a controller output	Min. 10 ms
PhotoMOS [®] relay ^a	
Switching capacity	Max. 200 mA at AC 30 V or DC 45 V; not short-circuit proof

7.2.2 Interface

RS485	
Baud rate	9600, 19200, 38400, 115200
Data format	8/1n, 8/1e, 8/1o, 8/2n
Protocol	Modbus-RTU as slave

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7.3 Display

18-segment LCD displays		
Digit height ER2022 and ER2022A	Upper display: 24.8 mm / 0,976 inch	Lower display: 12 mm / 0,472 inch
Color	Upper display: white; lower display: green	
Places, including decimal places	Upper display: 4; lower display:	
Decimal places	0, 1, 2, 3 or automatic (configurable)	
	Pixel matrix LCD display	
Pixel fields		
ER2022 and ER2022A	2 rows each with 11 pixel fields	
Number of pixels per field	8 x 5	
Color	White	

7.4 Electric data

Voltage supply	AC 110 to 240 V +10/-15 %, 48 to 63 Hz AC/DC 20 to 30V, 48 to 63Hz	
Electrical safety	According to EN 61010, part 1; overvoltage category II to 300 V mains voltage, pollution degree 2	
Protection rating	I with internal isolation from SELV	
Power consumption	For AC 110 to 240 V: Max. 6.6 W	For AC/DC 20 to 30 V: Max. 6.7 W
Electrical connection	On the back via spring-cage terminals (Push-In technology)	
Conductor cross section Wire or stranded wire without ferrule Stranded wire with ferrule Stripping length	Min. 0.2 mm ² , max. 1.5 mm ² Without plastic collar: min. 0.2 mm ² , max. 1.5 mm ² With plastic collar: min. 0.2 mm ² , max. .75mm ² 8 mm / 0,314 inch	

7.5 Environmental influence

Ambient temperature range Storage Operation	-30 /-22 to +70 °C / 158 °F -10/14 to +55 °C/ 131 °F
Site altitude	Max. 2000 m above sea level
Climatic environmental influences	According to DIN EN 60721-3 with extended temperature range
Resistance to climatic conditions	≤ 90 % rel. humidity without condensation
Storage	According to class 1K2
Operation	According to class 3K3
Mechanical environmental influences	According to DIN EN 60721-3
Storage	According to class 1M2
Transport	According to class 2M2
Operation	According to class 3M3
Electromagnetic compatibility	According to DIN EN 61326-1

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(EMC)	
Interference emission	Class A – only for industrial use –
Interference immunity	Industrial requirements

7.6 Case

Case type	Plastic housing for panel mounting according to DIN IEC 61554 (indoor use)
Case front	Made of plastic with membrane keyboard
Panel thickness	1 to 10 mm / 0,039 to 0,393 inch
Case fastening	In panel using the supplied mounting frame or both mounting elements
Operating position	Any ^a
Protection type	According to DIN EN 60529, IP65 on the front, IP20 on the back
Weight	Max. 220 g 7,760 oz

^a The maximum admissible ambient temperature only applies for the installation with the display in a vertical position.

7.7 Approvals and approvals marks

Approval mark	Test facility	Certificate/certification numbers	Inspection basis	Valid for
c UL us	Underwriters Laboratories	E201387	UL 61010-1 (3. Ed.), CAN/CSA-22.2 No. 61010-1 (3. Ed.)	
DNV GL	DNV GL	TAA00001B3	Class Guideline DNVGL-CG-0339	On request

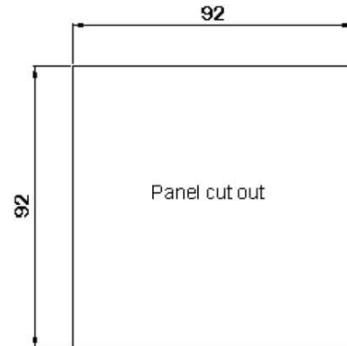
The device is approved if the relevant approval mark is shown on the device.

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8. Replacing the ER 2000 -6490B by new type ER 2022

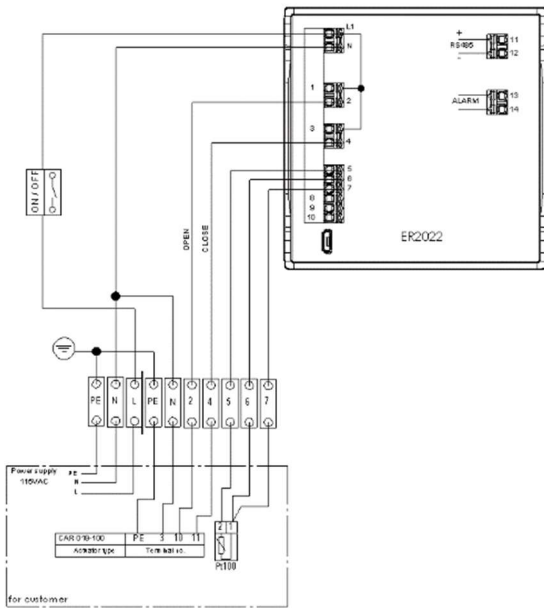
Before starting the replacement of ER 2000 by ER 2022 or ER2022A check dimension of controller hole made on front of the panel /or cabinet cover
 If dimension of panel hole is too small rework the hole manually for bigger one as such below sketch.

Panel cut-up $92+0.5 \times 92+0.5$ mm [3,62 x3,62 inch]

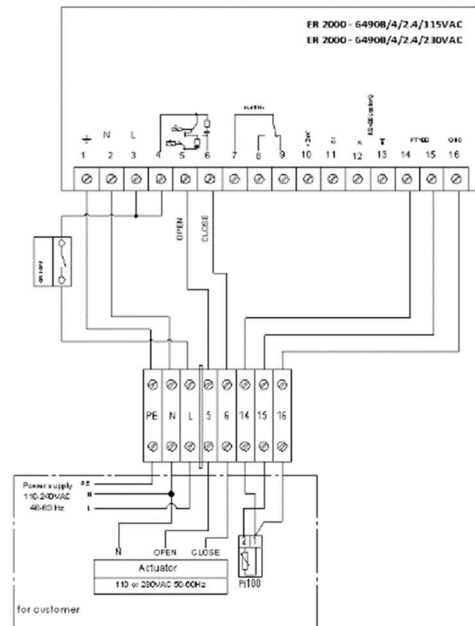


Wiring diagram of ER Controllers /3-point/ 110-240VAC old and new type - mounted in the cabinet

ER 2022



ER 2000 - 6490

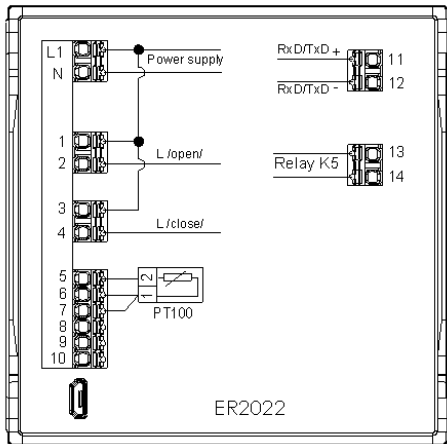


Description	ER 2022 Terminals	ER 2000 Terminals
Voltage supply	L 1	L
	N	N
Output 1 - open	2	5
Output 2 - close	4	6
Pt 100 - 3 wire	5	15
	6	14
	7	16

**Shielded cables should be used.
 It is recommended to use the cable end clamps when installing the wire.**

Compact Controller ER 2022 and ER 2022A

ELECTRICAL CONNECTIONS POWERED 24V AC/DC and 110-240VAC OPTIONAL EXTERNAL UNITS / 3- point /



ER 2022 Terminals	CONNECTION
L 1 ; N	Voltage supply 24VAC/DC ; 110-240 VAC
1-2	Output 1 (relay)
3-4	Output 2 (relay)
5(+)-6-7	Input/PT100-three-wire/
5-7	Input/PT100-two-wire/
6(+); 7(-)	Input 0-20mA or 4-20mA
8(+); 7(-)	Input 0-10V or 2-10V
8-9-10	Set point SP-1-4 changeover
11(+); 12(-)	RS485
13-14	ALARM

Clorius Electric actuator types – 110-230VAC – connection diagram

Unit	ER Terminal	Unit	Terminal
ER2022	Voltage supply	L	no connected
		N	3
	Output 1	2	10
	Output 2	4	11

Unit	ER Terminal	Unit	Terminal
ER2022	Voltage supply	L	no connected
		N	MM/N
	Output 1	2	.01
	Output 2	4	.02

Unit	ER Terminal	Unit	Terminal
ER2022	Voltage supply	L	no connected
		N	3
	Output 1	2	4
	Output 2	4	5

Unit	ER Terminal	Unit	Terminal
ER2022	Voltage supply	L	no connected
		N	N
	Output 1	2	2a
	Output 2	4	2b

Unit	ER Terminal	Unit	Terminal
ER2022	Voltage supply	L	no connected
		N	5
	Output 1	2	11
	Output 2	4	12

Unit	ER Terminal	Unit	Terminal
ER2022	Voltage supply	L	21
		N	N
	Output 1	2	2a
	Output 2	4	2b

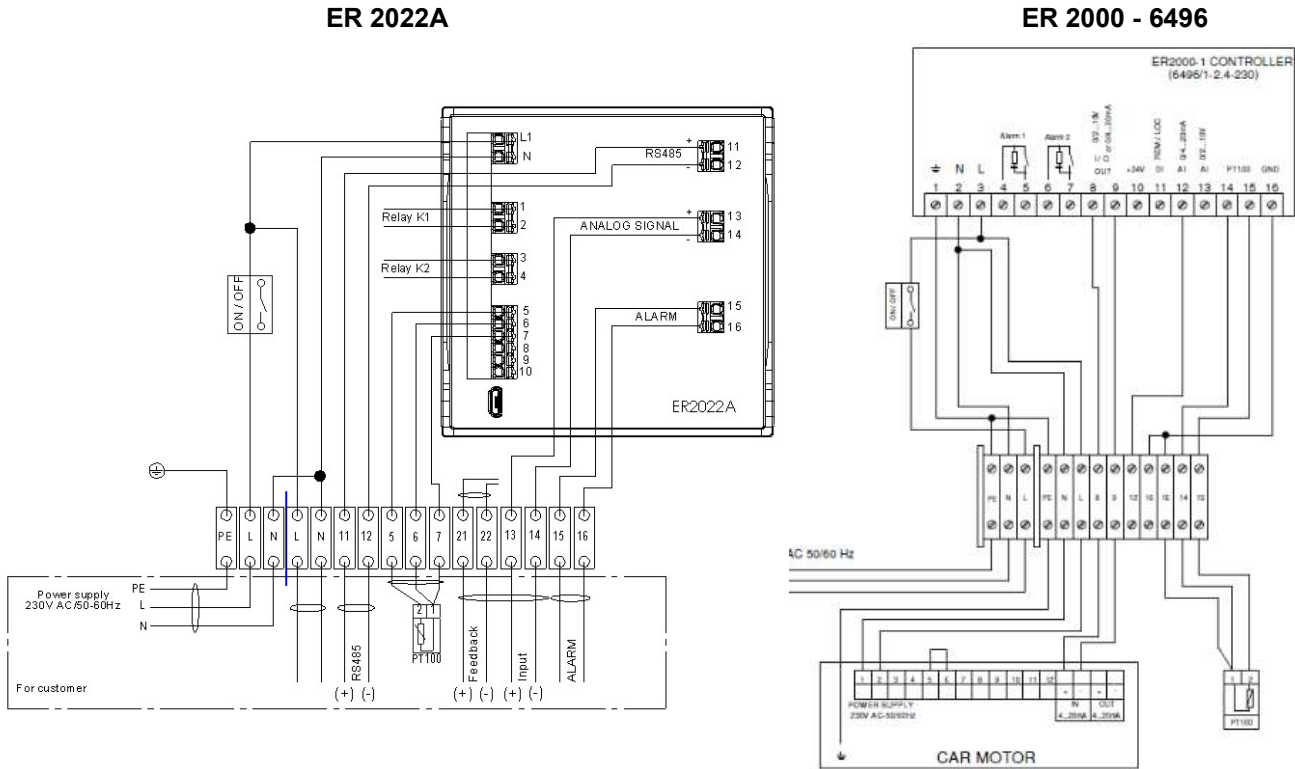
Unit	ER Terminal	Unit	Terminal
ER2022	Voltage supply	L	X5-2
		N	X5-1 and X1-2
	Output 1	2	X1-1
	Output 2	4	X1-3

* AVM321/322 and AVM234 & AVF234SK:
Please refer to instruction depending on the type

Compact Controller ER 2022 and ER 2022A

9. Replacing the ER 2000 6496 by new type ER 2022A

Wiring diagram of ER Controllers /analog / 110-240VAC old and new type - mounted in the cabinet

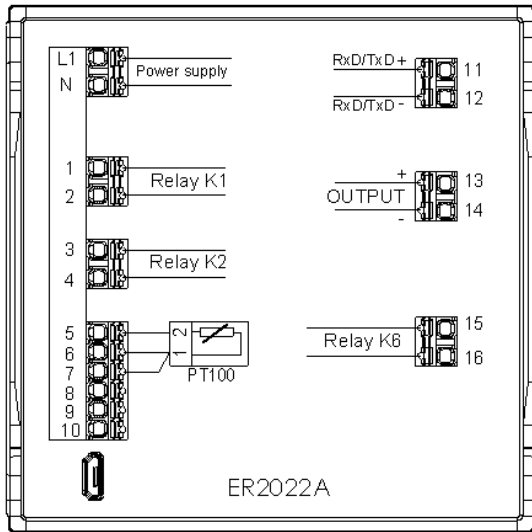


Description	ER 2022 Terminals	ER 2000 Terminals
Voltage supply	L 1	L
	N	N
Output 4-20mA (+)	13	8
Output 4-20mA (-)	14	9
Pt 100 - 3 wire	5	15
	6	14
	7	16

Shielded cables should be used.
It is recommended to use the cable end clamps when installing the wire.

Compact Controller ER 2022 and ER 2022A

ELECTRICAL CONNECTIONS POWERED 24V AC/DC and 110-240VAC OPTIONAL EXTERNAL UNITS ANALOG



ER 2022A Terminals	CONNECTION
L 1 ; N	Voltage supply 24VAC/DC ; 110-240 VAC
1-2	Relay K1
3-4	Relay K2
5(+)-6-7	Input/PT100-three-wire/
5-7	Input/PT100-two-wire/
6(+); 7(-)	Input 0-20mA or 4-20mA
8(+); 7(-)	Input 0-10V or 2-10V
8-9-10	Set point SP-1-4 changeover
11(+); 12(-)	RS485
13(+); 14(-)	Output analog signal
15-16	ALARM

ELECTRICAL CONNECTIONS POWERED 110-240VAC – OPTIONAL EXTERNAL UNITS - analog output

Unit	ER Terminal	Unit	Terminal
ER2022A	Voltage supply	L	1
		N	2
	Control signal 4-20mA	13	5-6 (bridge) INPUT (+)
		14	INPUT (-)

Unit	ER Terminal	Unit	Terminal
ER2022A	Voltage supply	L	L
		N	N
	Control signal 4-20mA	13	AVM321SK / 322SK
		14	MM

Unit	ER Terminal	Unit	Terminal
ER2022A	Voltage supply	L	2
		N	1
	Control signal 4-20mA	13	CAR-H MOTOR 006-010
		14	14

Unit	ER Terminal	Unit	Terminal
ER2022A	Voltage supply	L	21 and 2a or 2b
		N	N
	Control signal 4-20mA	13	AVF234SK
		14	1

Unit	ER Terminal	Unit	Terminal
ER2022A	Voltage supply	L	13
		N	5
	Control signal 4-20mA	13	CAR-H MOTOR 016-S250
		14	13-14 (bridge)
			19

Unit	ER Terminal	Unit	Terminal
ER2022A	Voltage supply	L	2a or 2b
		N	N
	Control signal 4-20mA	13	AVM234SK
		14	3i

Unit	ER Terminal	Unit	Terminal
ER2022A	Voltage supply	L	X5-2
		N	X5-1
	Control signal 4-20mA	13	CAL M301/302
		14	X3-1

* AVM321/322 and AVM234 & AVF234SK:
Please refer to instruction depending on the type

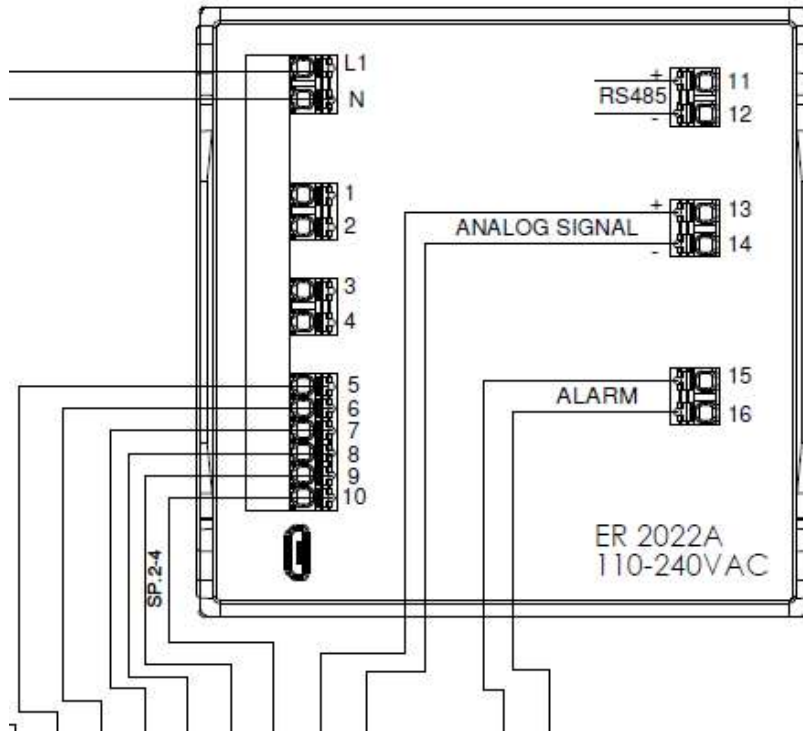
Compact Controller ER 2022 and ER 2022A

SETPOINTS /Setpoint changeover/

The Controller ER 2022 and ER 2022A can be set with 4 set point values
Below sample of SP1-4 settings with different temperature value

Terminals 8,9,10 must be connected acc. to the diagram to choose the correct selected temperature.

This controller can be set before shipment acc. to customer SP temperature requirements



SET POINT	Factory setting [°C]	Terminal SP-8	Terminal SP-9	Terminal SP-10
SP-1	30			
SP-2	65		x	x
SP-3	75	x		x
SP-4	85	x	x	x

Set point value can be set manually on the ER2022 panel

Compact Controller ER 2022 and ER 2022A

CONTACT

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See also www.cloriuscontrols.com for further information