Profactor Armaturen GmbH

EN

PROFACTOR®
DER DEUTSCHE QUALITÄTSSTANDARD

TECHNICAL DATA SHEET AND USER MANUAL

PRODUCT CODE

PF EA 652.ACC30

ROTARY ELECTRIC DRIVE WITH TEMPERATURE CONTROL

1. PURPOSE AND SCOPE

Rotary electric drive with temperature control PROFACTOR® PF EA 652. ACC30 is the modern designed microprocessor-driven device created with digital and SMT technology.

Purposed for the automatic control of rotary mixers and dividing valves also for the control and support of temperature in room. The common use is to control the return temperature of the boiler's contour.

2. TECHNICAL SPECIFICATIONS

Electric drive:
Torque: 6 Nm
Angle of movement: 90°
Time of the 90° movement: 120 sec
Power supply voltage: 230 B ~, 50 Hz
Consumption: max 1,5 VA
Degree of protection: Ip42 according to EN 60529
Safety class : I according to EN 60730-1
Permissible ambient temperature: +5°C to +40°C
Permissible relative humidity: max. 85% rH at 25°C
Storage temperature: –20°C to +65°C
Accuracy of the installed clock: ± 5 min/year
Programm class: A
Data storage without power supply: min. 10 years
Dimensions (W x H x D): 102 x 84 x 94 mm
Weight: 800 g

Sensor:
Temperature sensor type: Pt1000
Sensor resistance 1078 Ohm at 20°C
Temperature scope of use : –25°C to +150°C, IP32
Min. cross-sectional area of sensor cables: 0,3 mm^2
Max. length of sensor cables : max 10 m

Valve compatibility of producer :
PROFACTOR — RVM 389, RVM 390
ESBE — VRG (adapter ASCAVMSG), 3MG, 4MG, G, 3F, 4F, BIV, T, TM, H, HG
Sauter — M3R, M4R, MH32F, MH42F
Meibes — ELOMIX EM3, EM4
Barberi — 41D, Progress 460, 461, 450, 451, 475, 476, W28
MUT — VDM3, VM4, VMX
Seltron; Somatherm; Afriso, Acaso, IVAR, WIP, PAW, BRV, Hora, Olymp, Hoval.

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3. APPEARANCE OF THE DEVICE

1 – Graphic display.
2 – Clutch for manual / automatic operation.
3 – Button ↰ Return back.
4 – Button — Move to left, decreasing.
5 – Button ✓ Menu entry, confirmation of selection.
6 – Button + Move to right, increasing.
7 – Button ? Help.
8 – LED indication valve rotation right.
9 – LED indication red — fault, error
LED indication green — controller works normal.
10 – LED indication valve rotation left.

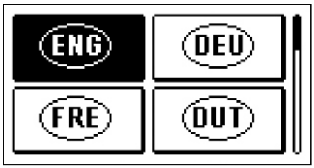
Housing — thermoplastic PC.

4. INITIAL ELECTRIC DRIVE SETUP

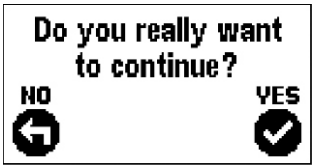
Constant temperature controllers are equipped with an innovative solution «Easy Start», which allows initial setup of the controller in only three steps.

When you connect the controller to the power supply for the first time, the software version is shown. Next, the first step — LANGUAGE SELECTION appears on the screen.

STEP 1 — LANGUAGE SELECTION.

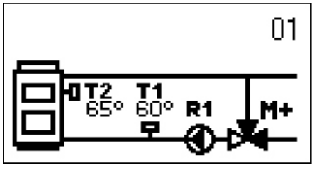


Using buttons — and + you select the required language.
Press the button ✓ to confirm the selected language.

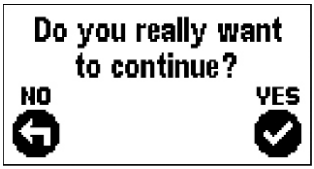


After selecting the language, the controller requires confirmation of the selection by pressing the button ✓.
If you accidentally selected the wrong language, go back to reset the language by pressing button ↩ .

STEP 2 — HYDRAULIC SCHEME SELECTION.

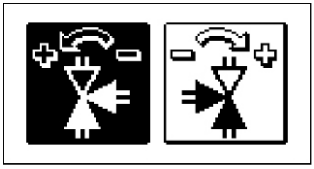


Next, you select a hydraulic scheme for the controller function. Move between schemes by means of buttons — and + .
Confirm the selected scheme by pressing the button ✓ .

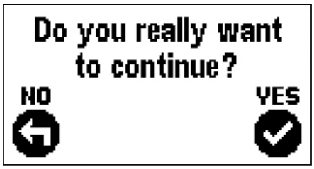


After you selected the scheme, the controller requires confirmation of the selection by pressing the button ✓.
If you accidentally selected the wrong scheme, go back to reset the scheme by pressing button ↩ .

STEP 3 — OPENING OF THE MIXING VALVE.



Press icon which indicates the proper direction of mixing valve opening direction. Between icons you can move with buttons — and + .
Confirm the selection by pressing the button ✓ .



After you selected the correct direction, the controller requires confirmation of the selection by pressing the button ✓ .
If you accidentally selected the wrong mixing valve opening direction, go back to reset the the selection by pressing button ↩ .

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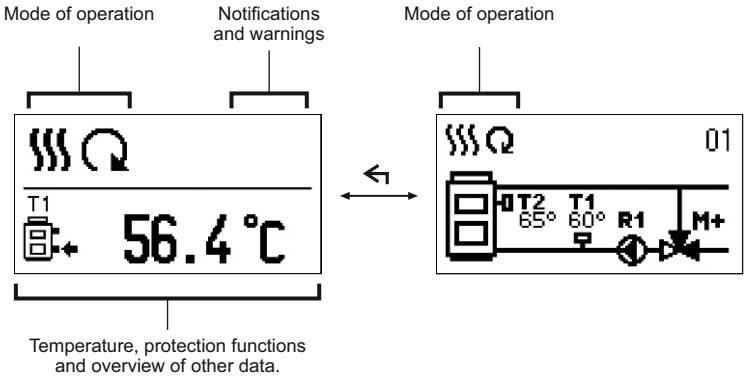
5. GRAPHIC LCD DISPLAY.

All needed data of the electric drive is shown on the graphic LCD display.

DESCRIPTION AND DESIGN OF THE MAIN DISPLAY.



Display of information on the screen:
The mode of operation, notifications and warnings are displayed in the upper third of the display. For switching between basic display and display of the hydraulic scheme use the button ↰ .

To check the temperature and other data, use buttons — and + . The number of sensors and other data, which can be listed on the display, depends on the selected hydraulic scheme and controller settings.

If you would like to have a specific data display to appear then select the desired data with buttons — and + . Confirm the selection by pressing the button ✓ and holding for 2 seconds.

When you press the button ↰ for 2 seconds, then the display of the temperature will change from one to two rows and vice versa. On the two line temperature display, the measured temperature is displayed in the first row and the required or calculated temperature in the second row.

DESCRIPTION OF SYMBOLS ON THE DISPLAY.

Operation mode symbols:

Symbol	Description
	Heating
	Cooling
	Automatic mode
	Stand by
	Manual mode

Temperature and other data symbols:

Symbol	Description
	Measured temperature
	Required or calculated temperature
	Supply temperature
	Stand-pipe temperature
	Boiler return temperature
T1	Temperature measured by sensor T1
T2	Temperature measured by sensor T2

Notices and warnings symbols:

Symbol	Description
	**Notification** In case of exceeding the maximum temperature or activation of protection function, the electric drive indicates the event with flashing symbol on the display. If the maximum temperature is no longer exceeded or if the protection function is turned off, a lighted symbol indicates a recent event. Press **?** to open the screen to check notifications.
	**Warning** In the case of sensor failure, the controller indicates the failure with flashing symbol on the display. If the issue is resolved or no longer presented, a lighted symbol indicates a recent event. Press **?** to open the screen to check warnings.

DISPLAY FOR HELP, NOTICES AND WARNINGS.

By pressing the button ? the screen for help, messages and warnings will be opened where the following icons are available:

Short manual
Short manual of using the electric drive.

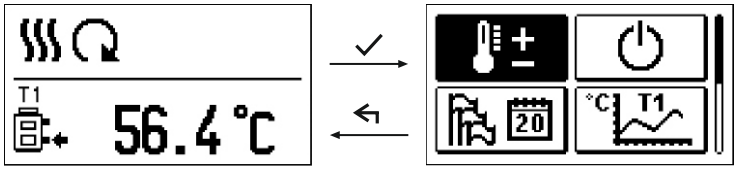
Firmware version
Overview of the type and firmware version.

Notifications
Log of exceeded maximum temperatures and activated protection functions. By pressing the buttons — and + move through the list of notifications. Press ↰ to exit the list.

Warnings
Log of temperature, pump or etc. sensor failures. By pressing the buttons — and + move through the list of warnings. Press ↰ to exit the list.

Delete warnings or notification logs
Pressing the button ↰ will erase notification and warning log. All sensors that are not connected will be deleted from the list of failures.
Note: Failures of sensors that are required for controller operation can not be deleted.

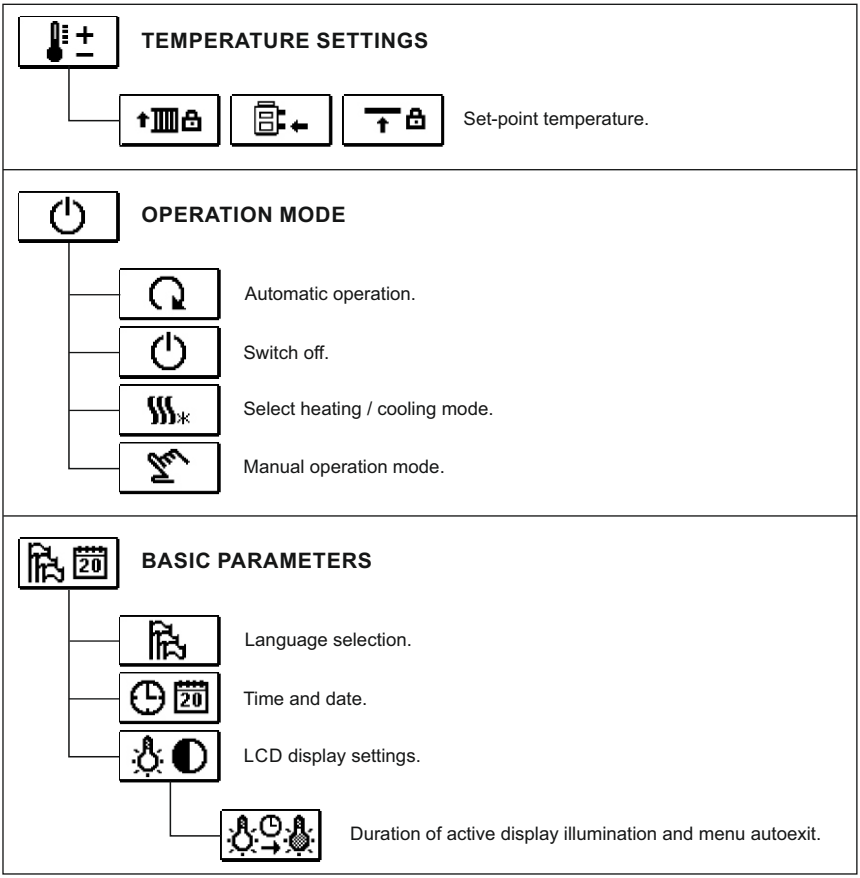
MENU ENTRY AND NAVIGATION.



To enter the menu press the button ✓ .
Move around the menu using the buttons — and + . Confirm the selection by pressing the ✓ button.
By pressing the button ↰ you return to the previous screen.

After the end of work with buttons the backlight turns off or is reduced automatically.

MENU STRUCTURE AND DESCRIPTION.



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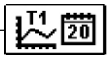
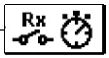
DATA OVERVIEW



Diagrams of measured temperatures by days for last week.

Diagrams of measured temperatures for current day.



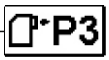
Output operation time counter.

Special service data.

CONTROLLER PARAMETERS

Basic settings.

Settings for the heating circuit.

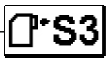


Settings for heat source.

SERVICE PARAMETERS

Basic service settings.

Service settings for the heating circuit.



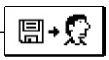
Service settings for heat source.

FACTORY SETTINGS

Reset of all controller parameters.

Reset of all controller settings and restart of the initial setup.

Save user settings.



Load user settings.

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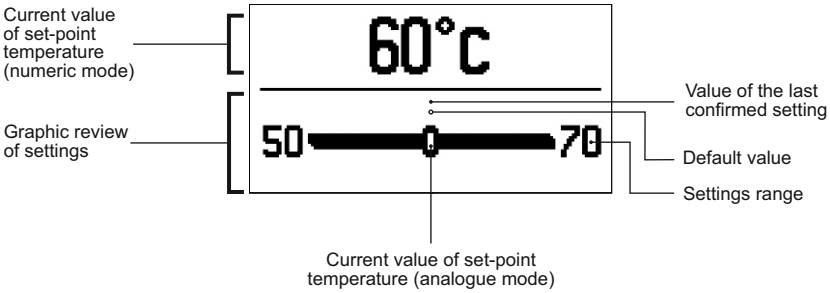
TEMPERATURE SETTINGS.

In the menu only the temperatures are displayed, which values were set according to the selected hydraulic scheme.

By pressing buttons − , + and ✓ you choose the required temperature, and a new window opens to install the required value.



Set the set-point temperature with buttons − and + . Confirm with the button ✓.
Exit the settings by pressing the button ↩ .

OPERATION MODE.

Select the operation mode with buttons − , + and confirm with button ✓ .

Exit the settings by pressing the button ↩ .

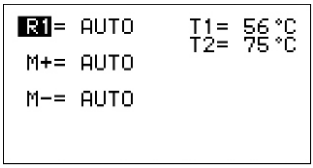
Automatic operation.

Controller switch-off.

Heating or cooling operation mode selector.

Manual mode.

MANUAL OPERATION MODE:



This mode is used for testing the system or in case of malfunction.
Every output R1, M- or M+ can be manually activated or deactivated, also automatic mode can be selected.
Move with the buttons − and + between the individual outputs R1, M- or M +. The output, status of which you want to change is selected by pressing the button ✓.
Value ON, OFF or AUTO starts flashing.
Now the output can be changed using the buttons − and + .
The setting is confirmed by pressing the button ✓.
Exit the setup menu with the ↩ button.

HEATING OR COOLING OPERATION MODE SELECTOR:

Heating operation mode is active.

Cooling operation mode is active.

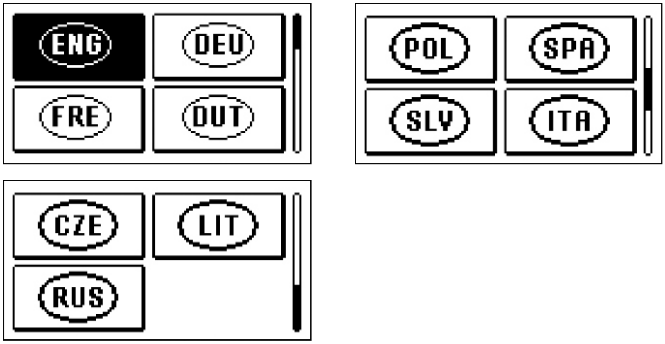
BASIC SETTINGS.

The menu is intended for language, time, date and display settings.

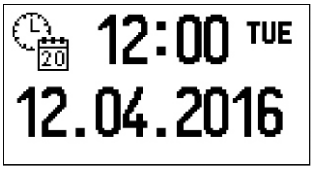
LANGUAGE SELECTION.

The required user language is selected by pressing buttons − , + and confirmed with button ✓.

Exit settings by pressing the button ↩ .



TIME AND DATE.



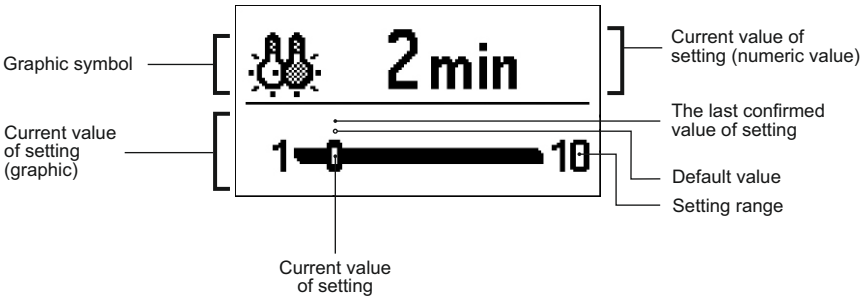
You set the exact time and date in the following way:
By pressing buttons — and + move among individual data. By pressing button ✓ you select data that you want to change. When data flashes, change it by pressing buttons — and + after confirm it with the button ✓ .
Exit the settings by pressing the button ↩ .

DISPLAY SETTINGS.

The following settings are available:

Time of the active screen illumination and autoexit from menu to the main screen. By pressing buttons — , + and ✓ you select and confirm required setting.

A new window opens:



You change settings by pressing buttons − and + and confirm by pressing the button ✓.
Exit the settings by pressing button ↩.

The change of settings is carried out only after the confirmation by pressing button ✓.

DATA OVERVIEW.

In this menu there are icons to access the following data of controller performance:

DIAGRAMS OF MEASURED TEMPERATURES BY DAYS FOR LAST WEEK.

The graphical representation of the temperature values in days, for each sensor.

DIAGRAMS OF MEASURED TEMPERATURES FOR CURRENT DAY.

Detailed graphic overview of temperature in a current day for each sensor. How often are temperatures logged is set with parameter P1.3.

OUTPUT'S OPERATION TIME COUNTERS.

Counters of controller's regulatory outputs operation time.

SPECIAL SERVICE DATA.

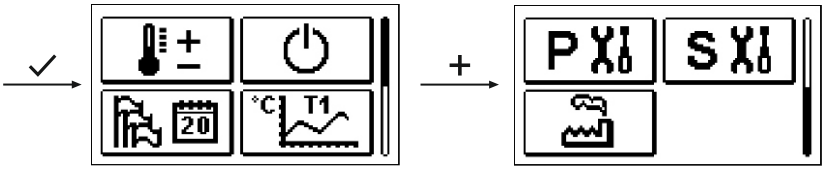
Intended for diagnostics and technical service.

Sensor-diagrams are viewed by the following way.
1. By pressing the buttons — and + move between sensors.
2. By pressing the button ✓ select the sensor which last period temperature you want to see.
3. By pressing the button — and + move between days.
4. By pressing the button ✓ select the day which temperature you want to see.
5. By pressing the button ? the range of the temperature displayed on the graph can be changed.
6. By pressing the button ↩ exit the diagram overview .

6. SERVICE MANUAL.

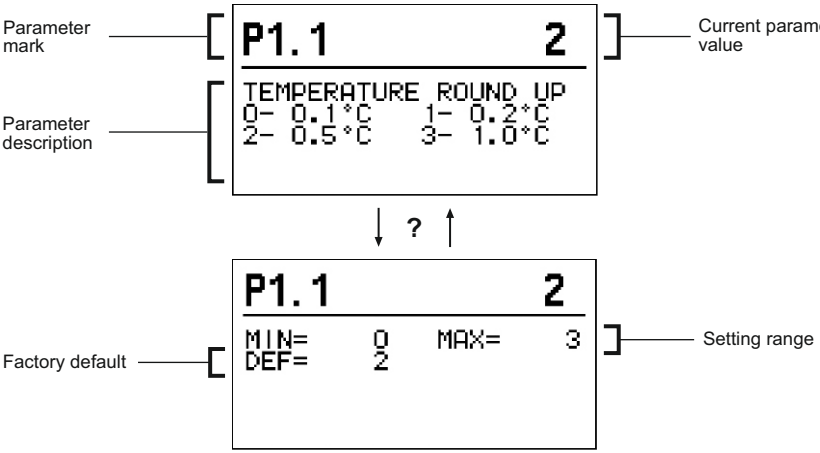
CONTROLLER PARAMETERS AND AUXILIARY TOOLS.

All additional settings and adjustments of controller performance are carried out by User- and Service- parameters. User-, Service- and Factory- parameters are found on the second menu screen.



USER PARAMETERS.

The basic parameters are listed in one group **P1** — basic parameters.
Content of basic parameters is displayed as follows:



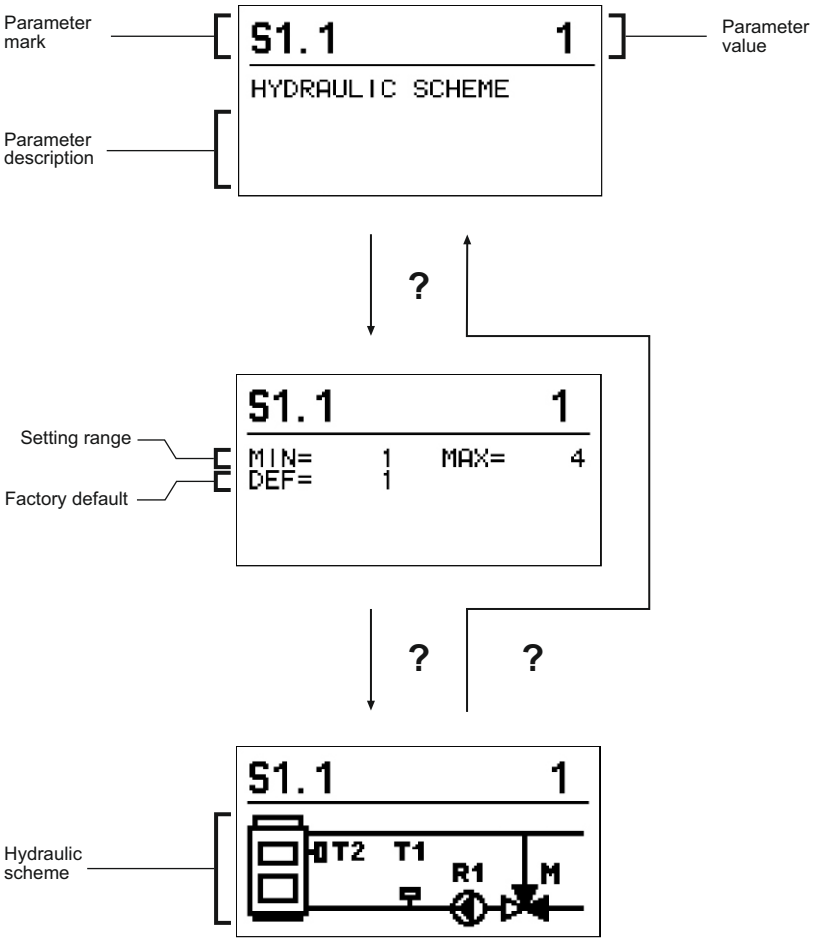
The setting is changed by pressing the button ✓ .
The value will start blinking and can be changed with the buttons — and + .
The setting is confirmed by pressing the button ✓ .
Move with buttons — and + to other parameters and repeat the procedure.
Exit the parameter settings by pressing the button ↩ .

P1 BASIC PARAMETERS:

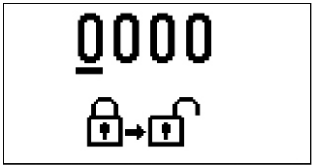
Para-meter	Function	Parameter description	Setting rage	Default value
P1.1	Temperature round up	You set the accuracy of displayed temperatures.	0 – 0.1°C 1 – 0.2°C 2 – 0.5°C 3 – 1°C	2
P1.2	Automatic shift of clock to summer / winter time	With the help of a calendar, the controller carries out the automatic changeover between summer and winter time.	0 – NO 1 – YES	1
P1.3	Period of temperature logging	By setting this field you define how often the measured temperatures are saved.	1 – 30 min.	5
P1.4	Tone signals	By setting this field you define sound signals of the controller.	0 – OFF 1 – KEYPAD 2 – ERRORS 3 – KEYPAD AND ERRORS	1
P1.5	Extended temperature display	Extended display means that we can see current, required or calculated temperature.	0 – NO 1 – YES	1

SXI SERVICE PARAMETERS.

Service parameters are arranged in groups **S1** — Basic parameters, **S2** — Parameters for the heating circuit. With service parameters it is possible to activate or select many additional functions and adjustments of controller performance. When you select the required parameter group in the menu, a new screen opens:



The setting is changed by pressing the button ✓. Because the parameters are factory locked, a new screen appears. Here you have to enter the unlock code.



By pressing buttons + and — you mark the number which you want to modify and press the button ✓. When the number flashes you can modify it by pressing buttons +, — and confirm it by pressing button ✓.
When the correct code is inserted, the controller unlocks the parameters for editing and returns to the selected group of parameters.
Return back from unlocking by pressing button ↩.

Factory set code is «0001».

Modify the value of the unlocked parameter by pressing buttons + and —. The setting is confirmed by pressing the button ✓. By pressing buttons + and — you can move to another parameter and repeat the procedure. Exit parameter settings by pressing the button ↩.

Change of service and functional parameters must be carried out only by a properly qualified expert.

S1 BASIC SERVICE PARAMETERS:

Para-meter	Function	Parameter description	Setting range	Default value
S1.1	Hydraulic scheme	Selection of the hydraulic scheme.	01 – 04	01
S1.2	Code of unlocking the service settings	This setting enables the change of code which is necessary to unlock the service settings. WARNING! Keep new code in a safe place. Without this code is impossible to change service settings.	0000 – 9999	0001
S1.4	Actuator opening direction	Setting of actuator turning direction — valve opening.	0 – RIGHT 1 – LEFT	0

S1.5	Display orientation	Setting of display orientation.	0 – REGULAR 0° 1 – ROTATED 180°	0
S1.9	Anti-block function of pump and valve	All outputs that haven't been activated in the last week are activated on Friday at 20:00 for 60 seconds.	0 – OFF 1 – ON	0
S1.17	Sensor T1 calibration	Correction of displayed measured temperature of sensor T1.	–5°C – 5°C	0
S1.18	Sensor T2 calibration	Correction of displayed measured temperature of sensor T2.	–5°C – 5°C	0

S2 SERVICE SETTINGS OF HEATING CIRCUIT:

Para-meter	Function	Parameter description	Setting range	Default value
S2.1	Setting of minimal temperature in heating mode	Setting of a minimal allowed temperature in heating mode. Temperature cannot be adjusted lower than this parameter.	5°C – 70°C	50°C
S2.2	Setting of a maximum allowed temperature in heating mode.	Setting of a maximum allowed temperature in heating mode. Temperature cannot be adjusted higher than this parameter.	10°C – 95°C	70°C
S2.3	Setting of minimal temperature in cooling mode	Setting of a minimal allowed temperature in cooling mode. Temperature cannot be adjusted lower than this parameter.	10°C – 25°C	15°C
S2.4	Setting of a maximum allowed temperature in cooling mode.	Setting of a maximum allowed temperature in cooling mode. Temperature cannot be adjusted higher than this parameter.	15°C – 35°C	30°C

S2.7	Backlash of mixing valve	Setting of mixing valve running time to compensate the backlash of actuator and mixing valve assembly, which occurs by change of rotation direction.	0 – 5 sec.	1 sec.
S2.8	P-mixing valve constant	Setting of mixing valve position correction intensity. Smaller value means shorter movements, higher value means longer movements.	0,5 – 2,0	1
S2.9	I-mixing valve constant	Setting of mixing valve control frequency — how often mixing valve position is being controlled. Smaller value means low frequency, higher value means higher frequency.	0,4 – 2,5	1
S2.10	D-mixing valve constant	Sensitivity of mixing valve for stand-pipe temperature changes. Smaller value means low sensitivity, higher value means high sensitivity.	0,4 – 2,5	1
S2.13	Boiler circulation pump — time of boiler temperature increase (seconds)	This function is used in regulation of return in solid fuel boiler. In the set time, the regulator determines temperature increase of the boiler by 2°C. If an increase in the boiler is determined, the regulator activates the circular pump.	30 – 900 sec	300 sec
S2.14	Boiler circulation pump operation mode	The setting sets the operation mode of the circular pump of the boiler: 1 – STANDART: the pump is operating according to the minimum set temperature of the system, and when the difference between the boiler and return line is exceeded. 2 – PERMANENT means that the pump is operating continuously when boiler temperature is higher than the minimum set temperature of the boiler. This mode is used for pellet boilers when there is no sensor available in the thermal storage	1 – STANDART 2 – PERMANENT	1
S2.16	Boiler circulation pump — switch-off delay (seconds)	Setting of circulation pump switch-off delay when there is no requirement for heating.	30 – 900 sec	300 sec

S2.16	Boiler circulation pump — shut-down differential	This setting determines the difference between sensors T2 and T1 which shuts downcircular pump of the boiler.	2,0°C – 8,0°C	3,0°C
S2.19	Initial valve movement from «open» position	Setting of initial valve movement duration when moving from open position. With this setting the valve is moved according to its control range and controller immediately respond at startup of system.	0 – 30 sec	15 sec
S2.20	Initial valve movement from «closed» position	Setting of initial valve movement duration when moving from closed position. With this setting the valve is moved according to its control range and controller immediately respond at startup of system.	0 – 30 sec	15 sec

S3 SERVICE CONFIGURATION OF HEAT FLOW:

Para-meter	Function	Parameter description	Setting range	Default value
S3.1	Protection of the heating system — sensor T2	Controller response is set in case of sensor T2 presence. If T2 temperature is lower than S3.2 the actuator completely closes the mixing valve.If T2 temperature is higher than S3.3 the actuator completely opens the mixing valve. 0 – Controller ignores T2 sensor. 1 – To protect the system only the minimal temperature is considered (parameter S3.2) 2 – To protect the system only the maximum temperature is considered (parameter S3.3) 3 – To protect the system both minimal and maximum temperatures are considered. (parameters S3.2 S3.3)	0 – WITHOUT 1 – TMIN 2 – TMAX 3 – TMIN and TMAX	0
S3.2	The lowest temperature of the system in the heating operation mode	The lowest temperature is set at which the actuator completely closes the mixing valve.	10°C – 70°C	55°C

S3.3	The maximum allowed temperature of the system in the heating operation mode	The maximum temperature is set at which the actuator completely opens the mixing valve.	30°C – 95°C	90°C
S3.4	Protection of the cooling system — sensor T2	Controller response is set in case of sensor T2 presence. If T2 temperature is lower than S3.5 the actuator completely closes the mixing valve. If T2 temperature is higher than S3.6 the actuator completely opens the mixing valve. 0 – Controller ignores T2 sensor. 1– Only the minimum temperature is considered (parameter S3.5). 2 – Only the maximum temperature is considered (parameter S3.6). 3 – Both minimal and maximum temperatures are considered. (parameters S3.5 S3.6)	0 – WITHOUT 1 – TMIN 2 – TMAX 3 – TMIN and TMAX	0
S3.5	The lowest temperature of the system in the cooling operation mode	The lowest temperature is set at which the actuator completely closes the mixing valve.	10°C – 30°C	15°C
S3.6	The maximum temperature of the system in the cooling operation mode	The maximum temperature is set at which the actuator completely opens the mixing valve.	20°C – 40°C	30°C

FACTORY SETTINGS.

In the menu there are software tools to help with setting the controller. Restoring the controller settings are made through the selection of:

RESET OF ALL CONTROLLER PARAMETERS.

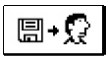
Restores all the settings of parameters P1, S1 (except S1.1) and S2. to factory values.

RESET OF ALL CONTROLLER SETTINGS AND RESTART THE INITIAL SETUP.

Restores all parameters to default values and starts the initial setup as at the first start.

SAVE USER'S SETTINGS.

Save current parameter values as user's settings.



LOAD USER'S SETTINGS.

Load previously saved user's settings. If there are no saved settings to load the command will not be implemented.

Before performing of the commands stated above, the controller requires a confirmation of the selected command.

OPERATION MODE BY SENSOR FAILURE.

Stand pipe temperature sensor isn't connected or has a malfunction.
Mixing valve opens.

Resistance values of temperature sensors type Pt 1000.

Temp. (°C)	Resist (Ω)	Temp. (°C)	Resist (Ω)	Temp. (°C)	Resist (Ω)	Temp. (°C)	Resist (Ω)
–20	922	35	1136	90	1347	145	1555
–15	941	40	1155	95	1366	150	1573
–10	961	45	1175	100	1385	155	1592
–5	980	50	1194	105	1404	160	1611
0	1000	55	1213	110	1423	165	1629
5	1020	60	1232	115	1442	170	1648
10	1039	65	1252	120	1461	175	1666
15	1058	70	1271	125	1480	180	1685
20	1078	75	1290	130	1498	185	1703
25	1097	80	1309	135	1515	190	1722
30	1117	85	1328	140	1536	195	1740

7. INSTALLATION MANUAL.

Install the regulator in a dry room, where it is not exposed to any strong electromagnetic fields.

ELECTRIC CONNECTION.

The performance of the PROFACTOR® EA 652.ACC30 electric drive depends on the calculations and the correct assembly of the entire system. If there is a mistake, the device may not work.

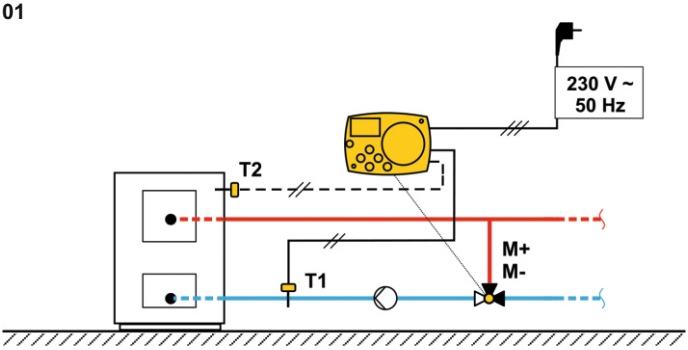
Installation the the controlling devices must be done by an expert with suitable qualifications or authorised organisation. Before you deal with the main wiring, make sure that the main switch is switched off. Follow the guidelines for low voltage installations IEC 60364 and VDE 0100.

HYDRAULIC SCHEMES:

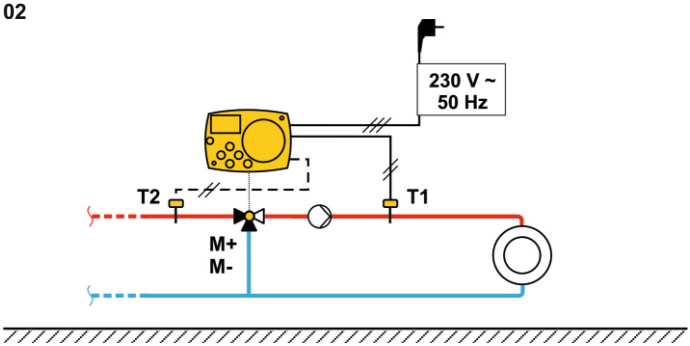
IMPORTANT

WARNING! Wiring diagrams show the principle of operation and do not include all auxiliary and protective elements! When installing, you must comply with current regulations!

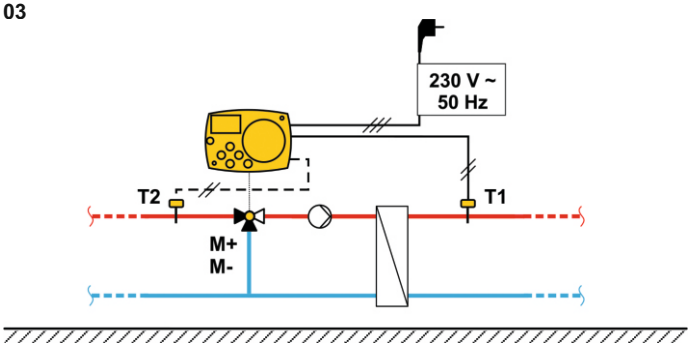
01



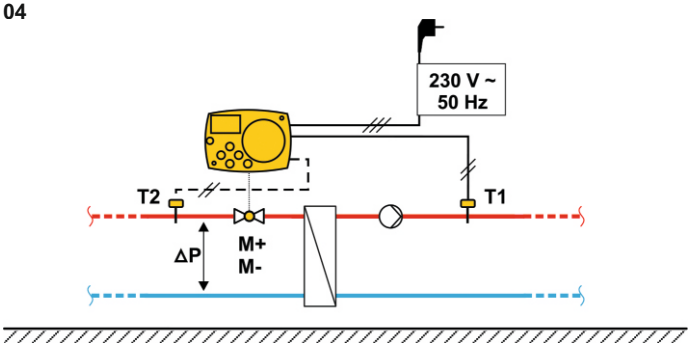
02



03



04



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8. WARRANTY OBLIGATIONS

The warranty period is 24 months from the date of sale to the end consumer. Throughout the entire warranty period, the manufacturer guarantees the proper functioning of the product and its compliance with safety requirements, provided that the consumer follows the rules for storage, transportation, installation, operation, and maintenance of the product. The warranty covers all defects arising through the manufacturer's fault.

The warranty does not cover defects resulting from:

— Violation of storage, transportation, installation, operation, or maintenance conditions;
— Exposure to substances aggressive to the materials of the product;
— Signs of mechanical damage;
— Damage caused by fire, natural disasters, or other force majeure circumstances;
— Damage caused by improper actions of the user;
— Evidence of unauthorized interference with the product design.

The product described in this technical manual is a technically complex device that must be installed by a qualified specialist with appropriate experience working with this type of equipment.

Installation and commissioning must be carried out by an authorized and certified company.

Profactor Armaturen GmbH reserves the right to make changes to the product design that do not affect its technical characteristics or functional features.

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INTERNATIONAL WARRANTY CARD

NAME OF THE PRODUCT _____

PRODUCT CODE, SIZE _____ **QUANTITY** _____

SELLER NAME AND ADDRESS _____

DATE OF PURCHASE _____

SELLER STAMP

SELLER SIGNATURE _____

For the warranty term refer to the Warranty obligation clause in the technical manual

FOLD LINE FOLD LINE

In case of any claims to the product quality the following documents should be submitted:

1. Application with customer and product detailes:
- Name of the customer, actual address and phone number
- Article of the product
- Reason for the claim and photo
- Plumbing system where installed (name, address, phone number)

2. Invoice copy and receipt

3. Warranty card

RETURN/EXCHANGE COMMENTS _____

DATE _____ **SIGNATURE** _____

Profactor Armaturen GmbH

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