Fresh Water Station
FWM 150/225

Manual

Table of content

1 Preface

Prior to operation, please read the instructions in chapter 1 to 5 for installing and initiating your new Fresh Water Station (FWM). Please pay particular attention to the warnings in chapter 1.3.
Instructions for the heating and electric professional are written down in chapter 2.

1.1 Usage

The Fresh Water Station (FWM) is used to heat up tap water in connection with a buffer tank. Another use or installation is not intended. Do not connect the Fresh Water Station directly to any heat generator.

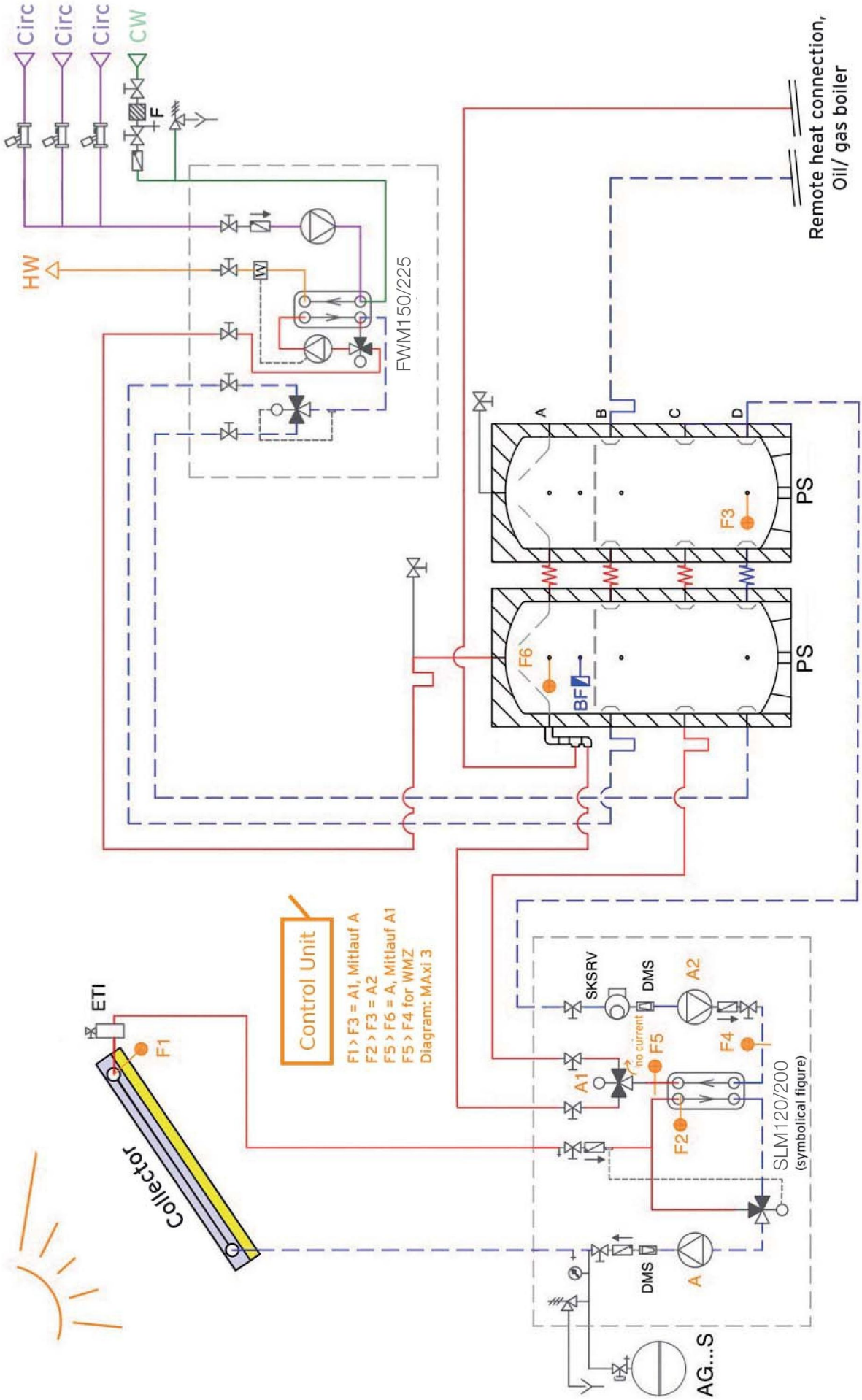
The Fresh Water Station includes a self-sufficient regulation. For operating the Fresh Water Station the following specific values have to be adhered:

Dissolved matter + specific values	unit	heat exchanger, copper brazed plates
pH-value		7-9 (considering Saturation index)
Saturation index (delta pH-value)		-0,2 < 0 < +0,2
Degree of hardness	°dH	6-15
conductivity	µS/cm	10...500
Filterable matter	mg/l	<30
Free chlorine	mg/l	<0,5
Hydrosulfide (H2S)	mg/l	<0,05
Ammoniac (NH3/NH4+)	mg/l	<2
Sulfate	mg/l	<100
Hydrocarbonate	mg/l	<300
Hydrocarbonate/Sulfate	mg/l	>1,0
Sulfide	mg/l	<1
Nitrate	mg/l	<100
Nitrite	mg/l	<0,1
Iron, solute	mg/l	<0,2
Manganese	mg/l	<0,1
Free aggressive carbonic acid	mg/l	<20

The above values are guideline values which can deviate under certain operating conditions.

Caution! Exceeding of this specific values leads to damages of the Fresh Water station and inevitably to loss of guarantee.

1.1.1 Usage example Fresh Water Station



1.2 Description

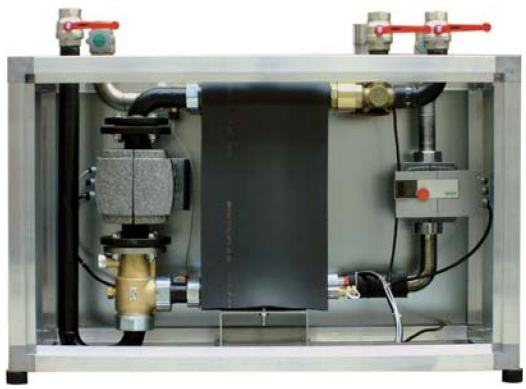
The Fresh Water Station is used to heat up tap water in connection with a buffer tank. Another use or installation is not intended. The manufacturer is not liable for damages due to inappropriate use and the operator bears the risk. Do not connect the Fresh Water Station directly to any heat generator.

1.3 Warning notices

- The FWM can heat up and burns are possible
- Power outages can lead to blocking of motor valves in open position such that burns due to contact with the FWM are possible.
- Operations on electrical parts must be conducted by a professional.
- The Station has to be connected to an external circuit breaker to allow a shutdown at any time.
- The water in the FWM can be very hot and under high pressure. The water has to be drained and the stop valves closed on both sides of the station prior to disassembly.
- Installation and operation must be performed according to regional regulations and common practice.
- At the occurrence of malfunctions – regardless of nature – please contact your installer for heating systems. Please do not perform any unauthorized repairing, it is forbidden and can lead to unexpected dangers.

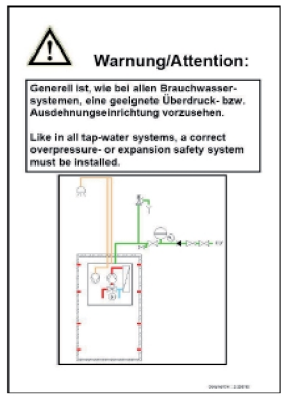
1.3 Design of the Fresh Water Station

The depicted picture is symbolic and can marginally differ from your FWM!



1.6 Scope of delivery

Description	Illustration
Manual Pump Wilo Stratos	
Manual Stratified Layer Valve	
Manual Hot Water Temperature - Control Unit	

Benennung	Abbildung
Test Certificate	
Safety precautions about expantion vessel	

1.7 Safety precautions

The installation and operation must be performed according to regional regulations and laws, common practice and according to the directives of the local water utility.

- **DIN 1988**
  Drinking water supply systems
- **DIN 4708**
  Central heat- water-installations; terms and calculation-basis
- **DIN EN 12828**
  Heating systems in buildings - design of water-based heating systems
- **DIN 4753**
  Water heaters and water heating installations for drinking water and service water
- **DIN 4757**
  Solar heating plants operating on organic heat transfer media; requirements relating to safe design and construction
- **DIN 18380**
  German construction contract procedures - Systems for heating and central water heating
- **DIN 18381**
  German construction contract procedures - Gas, water and sewage plumbing works inside of buildings
- **DIN 18382**
  Contract procedures for buildings works - low-voltage installation and medium-voltage installation with nominal voltages up to including 36 kV
- **DIN EN 12975**
  Thermal solar systems and their components
- **VDE 0100**
  Low-voltages electrical installations
- **VDE 0185**
  Lightning protection components (LPC)
- **VDE 0190**
  Main equipotential bonding of electrical systems
- **ÖNORM EN ISO 9488**
  Solar energy – vocabulary (ISO 9488:1999)
- **ÖNORM ENV 12977-1**
  Thermal solar systems and components - custom built systems - part 1: general requirements
- **ÖNORM M7700**
  Solar energy - therms with definitions
- **ÖNORM M7701**
  Solar energy installations; approximative calculation method for the dimensioning of flat collectors in domestic hot water systems
- **ÖNORM M7731**
  Solar heating systems for heating of water - requirements and tests

2 Installation and initiation

Before you install your new Fresh Water Station (FWM), please pay attention to the following points:

- Read chapter 1 and especially the warning notices in chapter 1.3.
- The FWM is used to heat up tap water in connection with a buffer tank. Another use or installation is not intended. Do not connect the FWM directly to any heat generator.
- The operation of this device is not allowed to persons with limited physical, sensory or intellectual abilities.
- Uninformed or unacquainted persons may operate the device only under the supervision or at the trained person's disposition.
- Replacements of electrical parts like the power cord must be conducted by a professional electrician.
- Installation and operation must be performed according to regional regulations and laws.

2.1 Installation

The setting up and installation must be carried out by an approved professional crafts enterprise. It is also responsible for a proper installation and initiation.
As a location for installation the device requires a frost-free room and the FWM needs to be installed splash-proof and may only be operated at room temperatures under 40°C.

To avoid thermal losses install the FWM close to the buffer tank. Before installation, make sure that the floor has an adequate bearing strength and is flat. Adjustable feet are mounted for leveling.

2.2 Hydraulic connection

Installation of the piping has to follow the instructions on the labeling or the figure in the manual, respectively. The piping to the buffer tanks ought to be as short as possible!

We suggest the use of steel, copper or suitable plastic piping on the tap water side and steel or copper piping on the buffer tank side. With all pipes and fittings, take care of the installation sequence to avoid electrochemical corrosion.

It is not allowed to install the device in gravitational heating systems!

Caution!

Tighten the flat-sealing connections only after sealing the piping. Avoid tightening torque and force effects on already installed parts and connections of the device at all costs!

Additionally, check the tightening torques of the flat-sealing swivel nuts (some loosening can happen during transport).

Make sure that the FWM is disconnected from the power supply before opening of the controller box!

According to DIN 4753, part 1, a safety relief valve set to 10 bar has to be incorporated into the cold water supply pipe. The relief valve should be sized in accordance with EN 764-7 (European standard based on pressure Equipment directive 97/23./EC).
At a pressure of 10 bar and above, a pressure-reducing device has to be installed in the cold mains water pipe. An isolation valve between the safety relief valve and the Fresh Water Station is not allowed. According to DIN 4753, the operation of the safety relief valve has to be tested regularly 1-2 times a month by bleeding the valve.
The exhaust opening must not be closed or constricted. A state-of-the-art water filter and a non-return valve has to be installed in the cold mains water pipe. Additionally, it is advisable to install a drinking water expansion vessel, sized depending on the number of outlets. The expansion vessel can be sized using the following formula:

Volume of water in the system (V) x 0.1 x 2 equals vessel.
Example: Vessel = (500L x 0.1) x 2 = 100L

Caution!

Avoid tightening torque and force effects on already installed parts and connections of the device at all costs!

2.3 Electric connection

The internal wiring of the electric parts is factory-provided. The connection to the electricity network (230 V/AC, 50Hz) happens with the connected power cord. Operations at the electrical parts of the device must be conducted according to regional regulations and laws.

Caution! Before working on the electrical parts of the Fresh Water Station make sure to disconnect it from the power supply!

2.4 Initiation

The filling and initiation must be carried out by an approved professional crafts enterprise. During the initiation process the unproblematic operation and leak-tightness of the whole installation, including the preinstalled connections, has to be tested.

Slow opening of the ball valves at the entries and exits of the Fresh Water Station avoids pressure blows during the rinsing process. The filling and rinsing of the system needs to be continued until it is sure that the system is completely de-aerated! Stream noises during operating the charge pump indicate that there is still air left in the system, which needs to be discharged over the pump.

Before taking the installation into operation, it makes sense to rinse the tap water and heating water circuits with completely opened valves to remove sludge and other contaminations. This should avoid clogging of valves, heat exchangers and other parts of the installations. Due to vibrations during transports and thermal expansion the tightening torques of the flat-sealing swivel nuts and piping have to be checked, after installation and initiation.

NOTE

Before filling the SLM or the FWM all pipe work connected to the associated appliance must be flushed and cleansed free of any debris using an appropriate non-corrosive chemical cleaning substance.

The buffer tanks and primary pipe work must be filled before the filling of the solar circuit. The tanks must be flushed and cleansed prior to filling. When filling, a suitable corrosion protection inhibitor must be added to the system in the correct dosage as stated by the manufacturer.

The buffer tank sealed circuit must be filled using a pressurisation unit if the heat input exceeds 45 kW, according to WRAS guidance G24.2.

2.5 Mode of operation

When hot fresh water is needed, hot water from the buffer tank is fed into the internal heat exchanger. The entry temperature into the heat exchanger is limited to avoid thermal furring. After flowing through the heat exchanger, the hot water from the buffer tank is cooled down as low as possible to ensure high efficiency. An energy saving circulation pump assures hot fresh water without latency.

The controller is freely programmable and boasts a clock timer with daily and weekly programs as well as impulse activation. If the FWM detects higher buffer return temperatures due to low hot fresh water output in circulation mode, it layers this buffer return automatically into a warm buffer tank zone.

The large scale Fresh Water Stations FWM 150 and FWM 225 guarantee fresh and hygienic hot water combined with very low standby losses and thermal furring. Due to a patented continuous-flow heating principle the hot water preparation is economic, safe and combines compact design with plug-in electric and hydraulic ready-for connection installation.

2.6 Adjustment of tap water temperature

The preset tap water temperature on the thermostatic temperature regulator is 55°C. Before changing the preset temperature consult the manufacturer to avoid problems (thermal furring). The maximum settable temperature is 60°C.

Buffer tank temperature recommendation:
The buffer tank temperature should be at least 7K above the desired tap water temperature.

2.7 Hygiene

With the factory-provided initial setting, the Fresh Water Station prepares fresh hot water (>55°C).

Advice! A hygienic system can only be guaranteed if all hygienic significant norms and directives are adhered to.

2.7 Circulation

The FWM is factory-provided with a circulation pump. A clock timer is in charge of circulating the tap water. The programming of the circulation times is written down in the controller-chapter 3.

It is essential for a hygienic and efficient operating mode of a circulation system to include thermostatic circulation valves (regulating valves) in every circulation line and have a properly adjusted circulation line network.

Advice!

A correct and germfree water preparation is only assured with a stable circulation and a circulation return temperature >52°C.

Like in all tap water circulation systems, sufficient expansion and overpressure safety devices have to be included. An annual service by a professional is recommended.

3 Controller

3.1 Controller handling

Button layout and operating systematic

OK change to next menu level, respectively select menu items and activate, change and save inputs.

ESC change to former menu level, respectively cancel inputs since the last **OK**.

▲ ▼ change item and/or change value
◄ ► change digit

At the start screen, the ◄ button also has the following functions:

1. Manually deactivate the circulation pump or
2. Control the circulation pump with timer clock

The buttons **DEL** and **ALT** are locked and do not have any function in normal use of the controller.

3.2 Adjustable features

After switch-on, a status screen appears and shows the various system status messages in a 4 second interval.

3.2.1 Circulation pump

After switch-on, the circulation pump is always controlled with the timer clock.

Pushing the ◄ button manually deactivates the circulation pump. Another push activates the standard setting again. At this, the circulation pump is controlled with the timer clock.

3.2.2 Timer clock

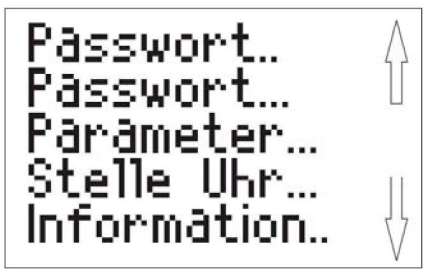
The controller has a 4-channel weekly timer clock which switches the circulation pump at the programmed times.

Advice!

Factory-preset all channels (A,B,C,D) are permanently activated (MO on 00:00, SO off 23:59). These settings should be adapted according to your needs to save energy.

Adjustment of timer clock

On the status screen, press (OK). The following menu appears:

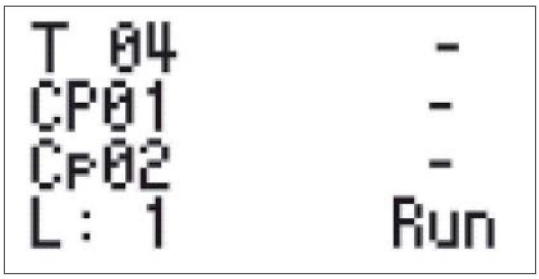


Choose with the ▲▼ buttons the menu item “Parameter…” and confirm with **OK**.

Advice!

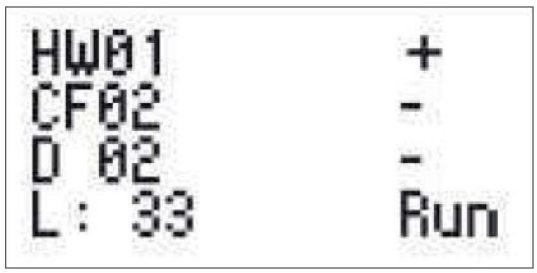
Adjustable parameters are marked on the right side with “+”, locked parameters with a “-“.

The following menu appears:



All parameters of the controller are listed in this menu. With the exception of the timer clock settings all parameters are locked by default.

L1 indicates the number of the parameter on which the cursor currently stands.

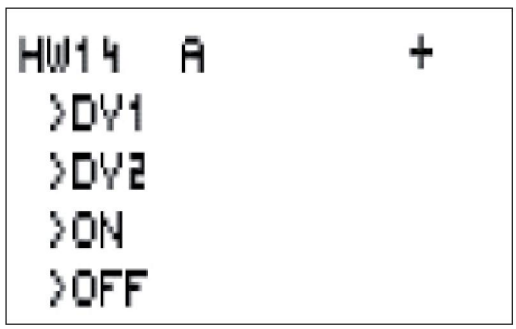


Choose the parameter HW01 (L: 33) with the ▼ button. By pushing **OK** the timer clock menu is reached.

To get back to the status screen push the **ESC** button repeatedly.

Every timer clock is equipped with 4 channels, each switching one time on and off. The setting of the channels happens in the parameter-display. The internal time is buffered against power outage but the timeswitches do not switch anymore. In idle state the contacts stay open.

Parameter module and parameter set for the module weekly timer clock HW:



HW14	Function module weekly timer clock no. 14
A	Timer clock channel A
+	Appears in the parameter-display
> DV1	Day 1
> DV2	Day 2
> ON	Turn-on time
> OFF	Turn-off time

Channels
Every timer clock is equipped with 4 channels (channel A, B, C and D). These channels act together on the weekly timer clock contact.

Day 1 and Day 2

Either the period from day 1 until day 2 is valid (p.e. Monday until Friday) or only day 1.

MO	Monday
DI	Tuesday
MI	Wednesday
DO	Thursday
FR	Friday
SA	Saturday
SO	Sunday

Time

00:00 to 23:59

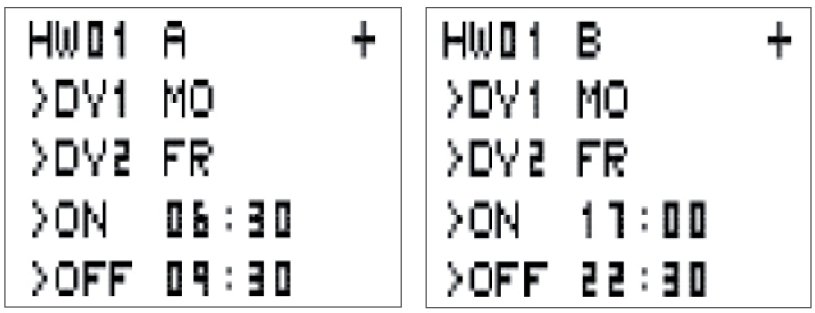
Mode of operation weekly timer clock

The switching points are defined according to the parameter settings.

MO until FR: on the weekdays Monday, Tuesday, Wednesday, Thursday, Friday.
ON 10:00, OFF 18:00

Switching points (on/off) for every single weekday

MO: every Monday
ON 10:00: turn-on time
SA: every Saturday
OFF 18:00: turn-off time

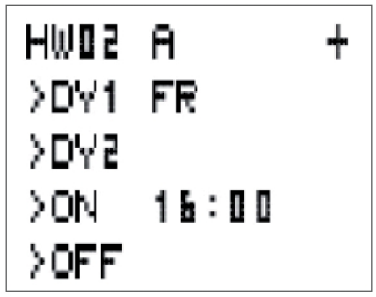


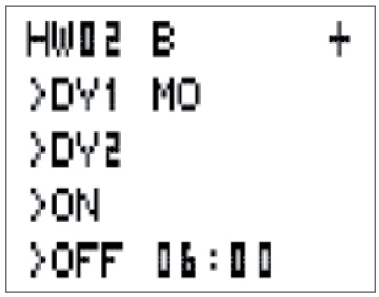
Switching workdays

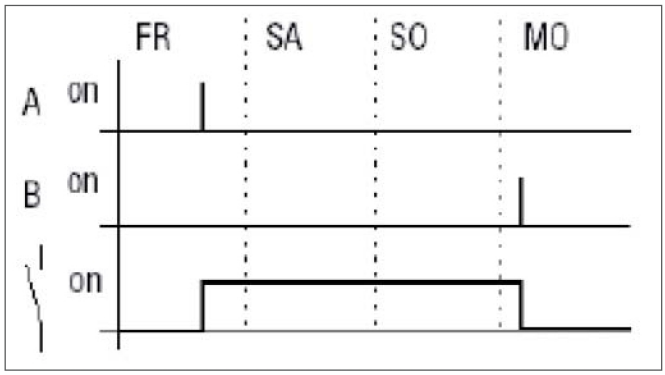
The timer clock HW01 switches Mondays until Fridays between 06:30 and 09:00 and between 17:00 and 22:30.

Switching weekends

The timer clock HW02 switches on Friday at 16:00 and off Monday at 06:00.

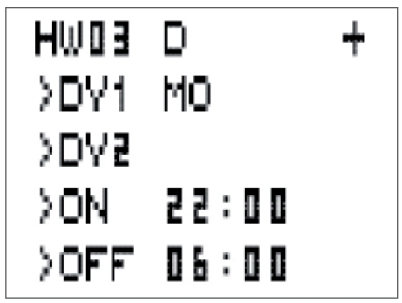


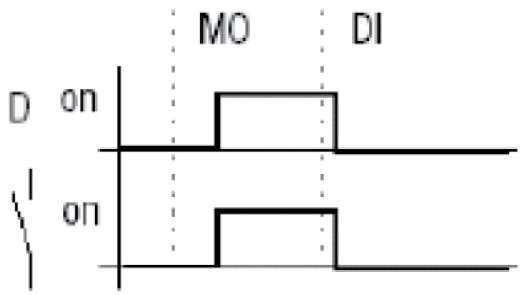




Switching over night

The timer clock HW03 switches on Monday at 22:00 and off Tuesday at 06:00.

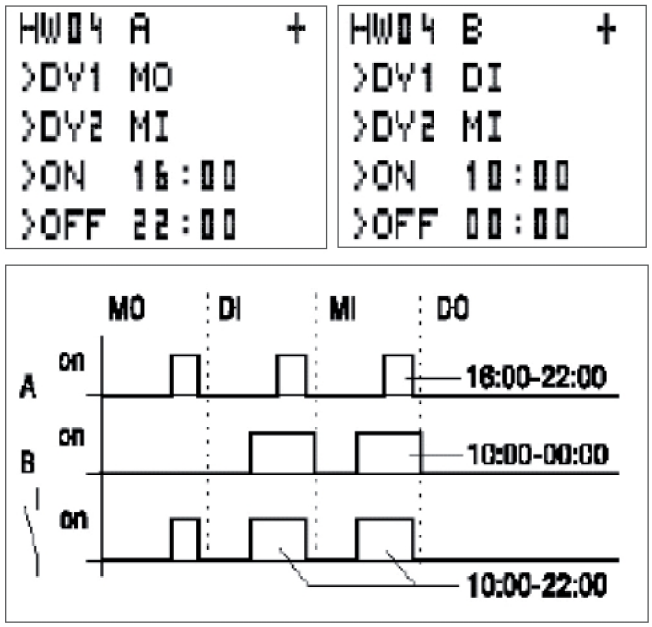




Advice! If the turn-off time is prior to the turn-on time, the timer clock switches off the next day.

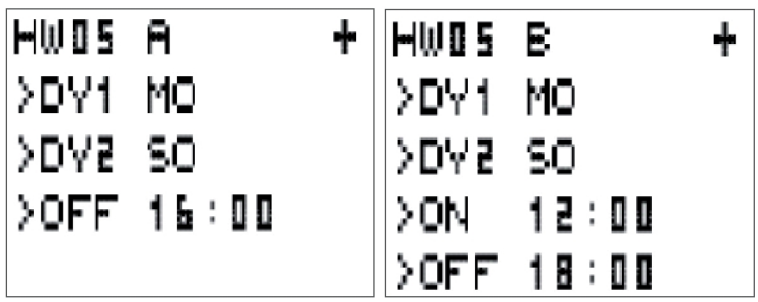
Time overlapping

The time settings of a timer clock overlap. The turn-on is Monday at 16:00, on Tuesday and Wednesday already at 10:00. The turn-off time is Monday until Wednesday at 22:00. Turn-on and turn-off times align according to the first switching channel.



Behavior in case of power outage

There is a power outage between 15:00 and 17:00. The relay deactivates and stays deactivated after the power outage because the first turn-off time already was at 16:00.

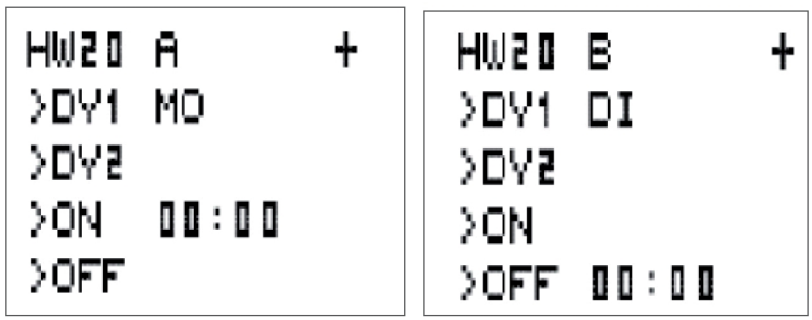


Advice!

The controller updates the switching status always from all available circuit times specifications after switch-on.

Switching 24 hours

The timer clock ought to switch 24 hours. Turn-on Monday at 00:00 and turn-off Tuesday at 00:00.



If turn-on and turn-off are at the same time, it is always switched off.

Adjustment of system time

Start at status screen. The following menu appears:

Choose “Stelle Uhr…” (Set time) with the ▲▼ buttons and confirm with (OK). Apply the desired changes in the submenu and return to the status screen by repeatedly pushing **OK**.

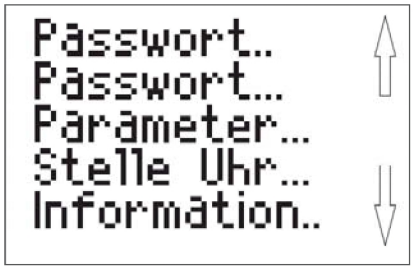
Adjusting the return layering

By default the temperature switching threshold between upper and middle buffer tank zone is set to 35°C and should not be changed by the user.

If this is necessary in an exceptional case, proceed as follows:

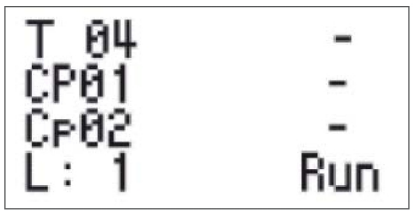
Start at status screen and push the **OK** button.

The following menu appears:



Choose with the ▲▼ buttons the menu item “Parameter…” and confirm with **OK**.

The following menu appears:



Select with the ▲▼ buttons the parameter A01 (L: 31) and confirm with **OK**. Select with the ▲▼ buttons the parameter I2 (standard value 35°C) and confirm with **OK**.

Adjust the parameter to the desired value with the ▲▼ button and confirm with **OK**.

Advice!

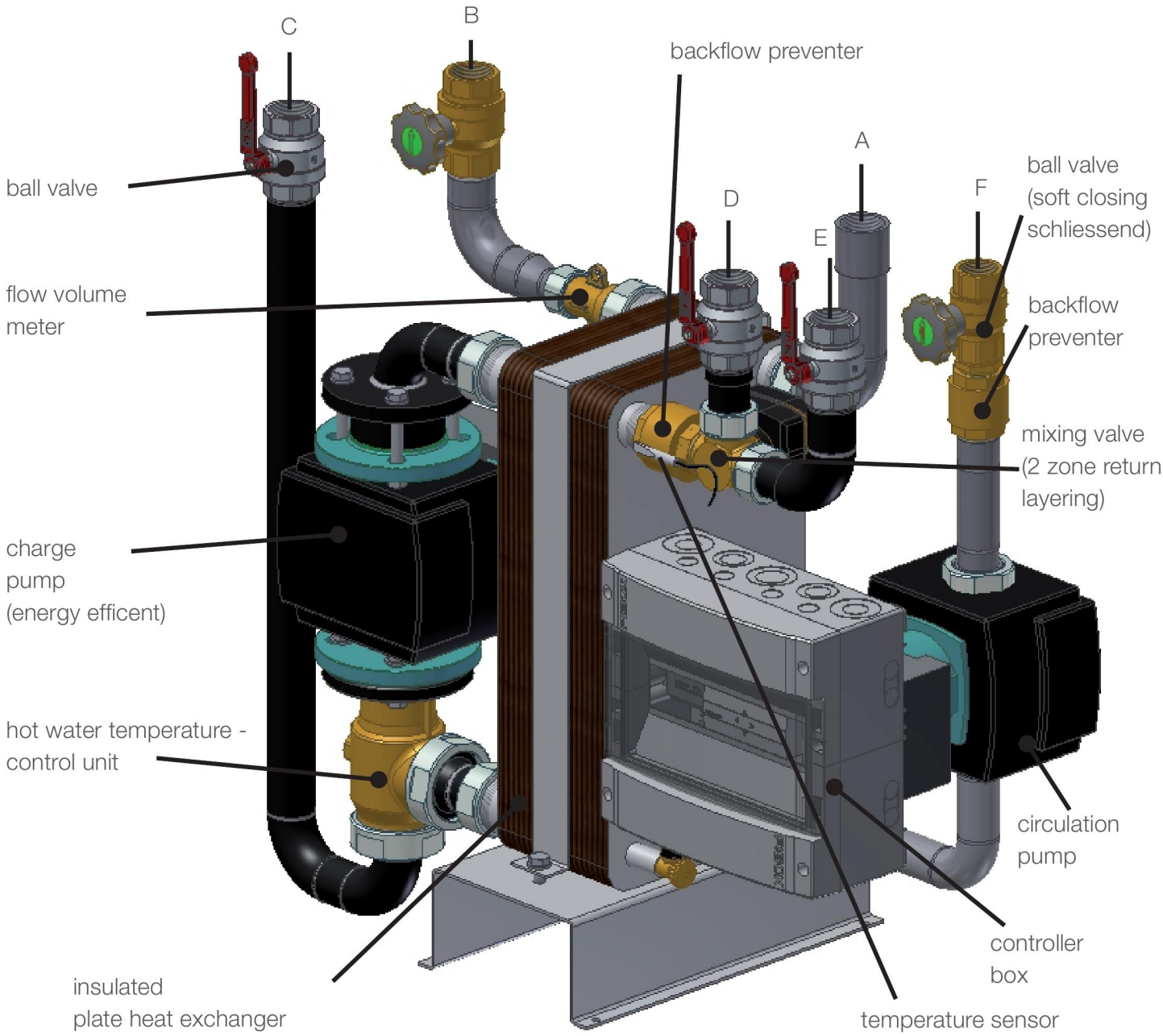
Check the correctness of the parameter, incorrect values will significantly decrease the efficiency of your system.

Return to the status screen by repeatedly pushing **ESC**.

4 Technical data

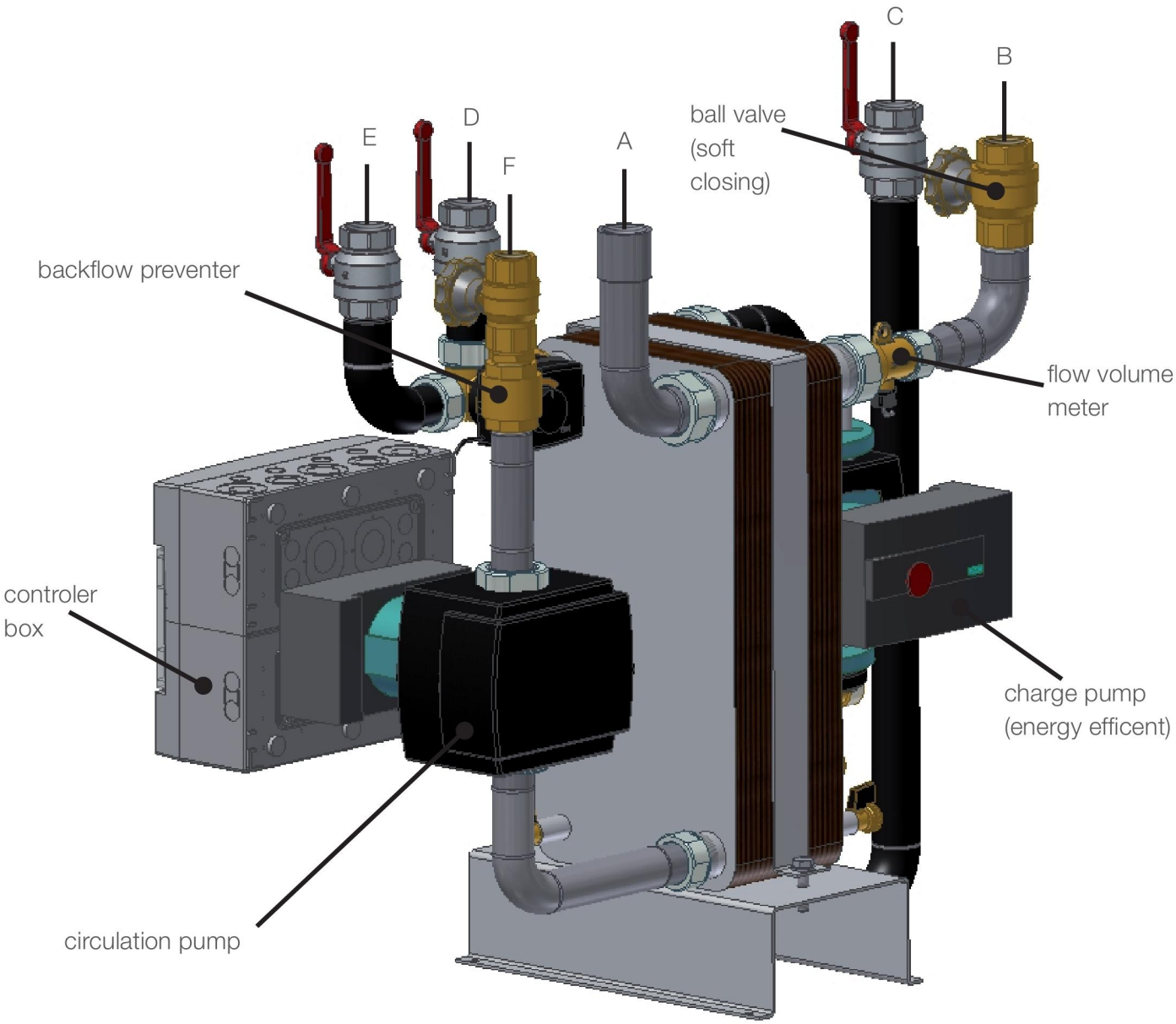
4.1 Design of Fresh Water Station FWM

Front view



The above depicted picture is symbolic and can marginally differ from your Fresh Water Station.

Back view



The above depicted picture is symbolic and can marginally differ from your Fresh Water Station.

4.2 Specifications

		FWM 150	FWM 225
Abmessungen	Width	1170 mm	
	Height	750 mm	
	Depth	420 mm	
Casing		galvanized sheet steel, incl. 20 mm insulation	
Piping fresh water		6/4", stainless steel, insulated	
Piping Circulation		5/4", stainless steel, insulated	
Piping buffer		6/4", steel lacquered, insulated	
Weight		153 kg	175 kg

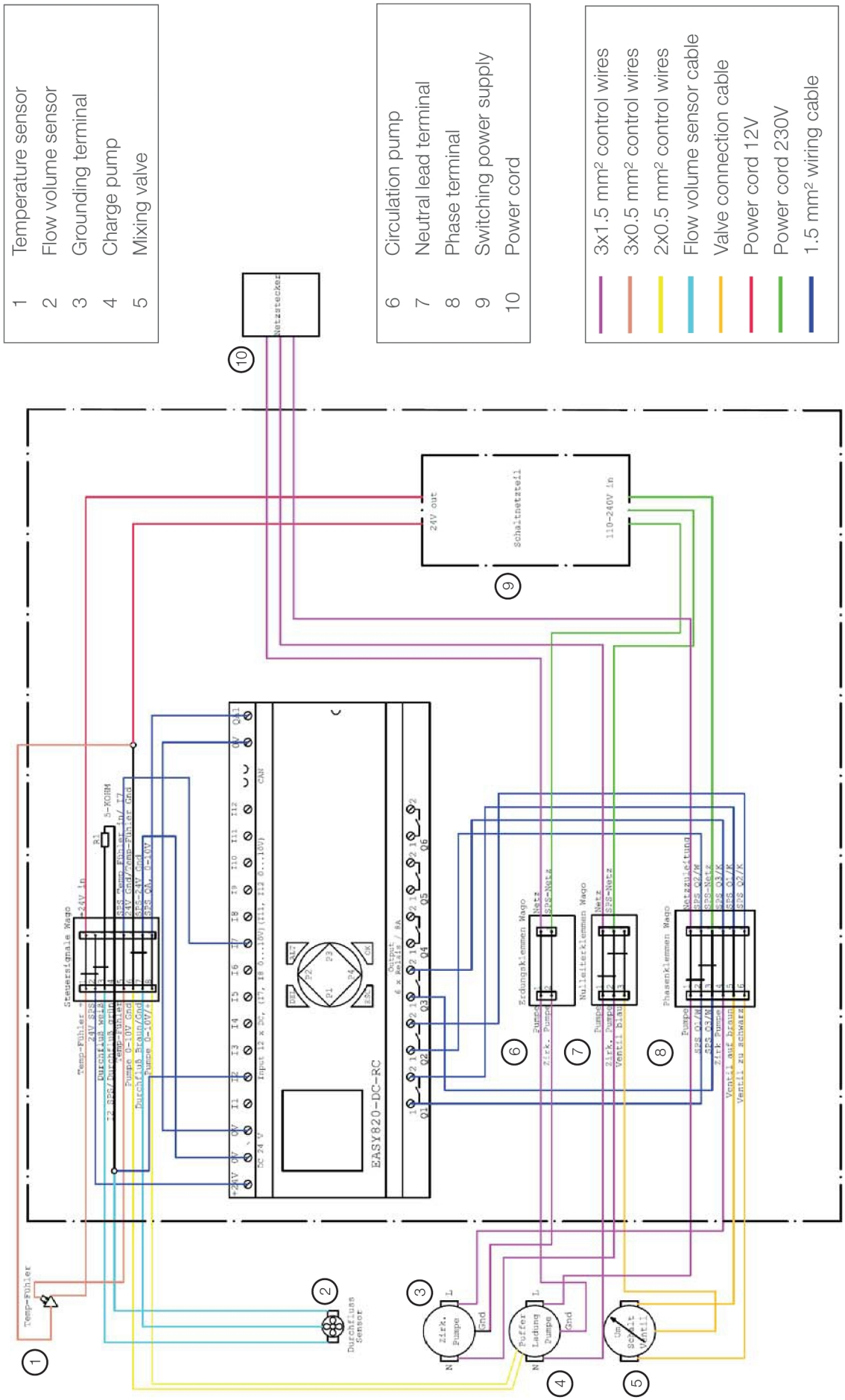
Connections	A	Fresh water IN, 6/4" IT
	B	Hot water OUT, 6/4" IT
	C	From buffer tank, 6/4" IT
	D	To buffer tank (cold), 6/4" IT
	E	To buffer tank (hot), 6/4" IT
	F	Circulation IN, 5/4" IT

Apartments according to ÖNORM	70	130
Output 40°C	150 l/min	225 l/min
Output 55°C	100 l/min	150 l/min
Heat exchanger (insulated)	315 kW	475 kW
Hot water temperature part load	58 - 60°C	
Hot water temperature full load	55°C	
Buffer temperature	60 - 100°C	
Buffer return	2-zone-return layering	

Charge pump	Nominal voltage	230 V / 50 Hz	230 V / 50 Hz
	Power input	0,2899 kW	0,6211 kW
	Max. current	1,32 A	2,7 A
	Rated speed	4800 RPM	4600 RPM
Circulation pump	Nominal voltage	230 V / 50 Hz	
	Power input	0,2899 kW	
	Max. current	1,32 A	
	Rated speed	4800 RPM	

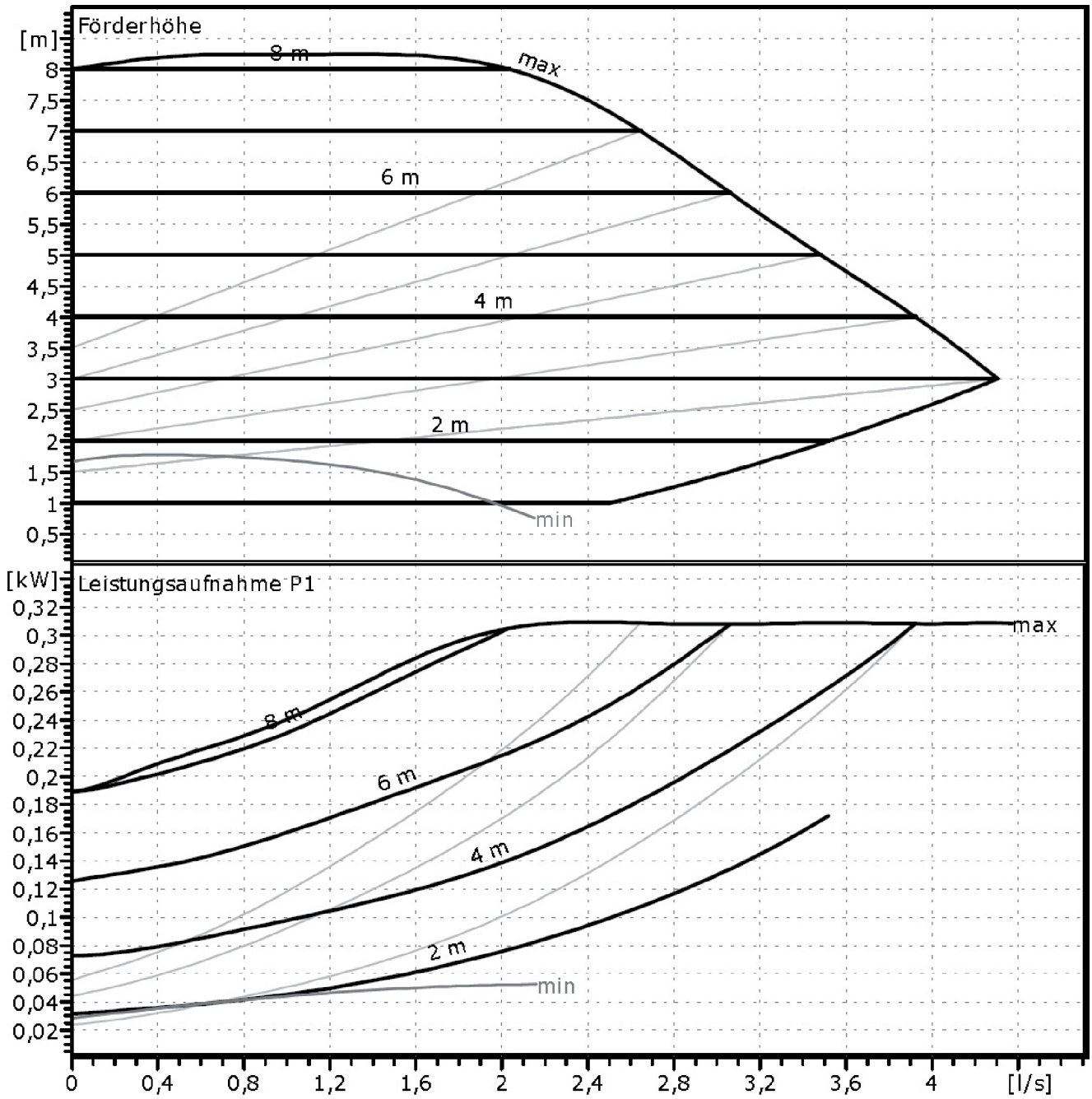
Min. operating temperature	2° C
Max. operating temperature	95° C
Max. operatingpressure fresh water	10 bar
Max. pressure buffer	3 bar

4.3 Connection scheme

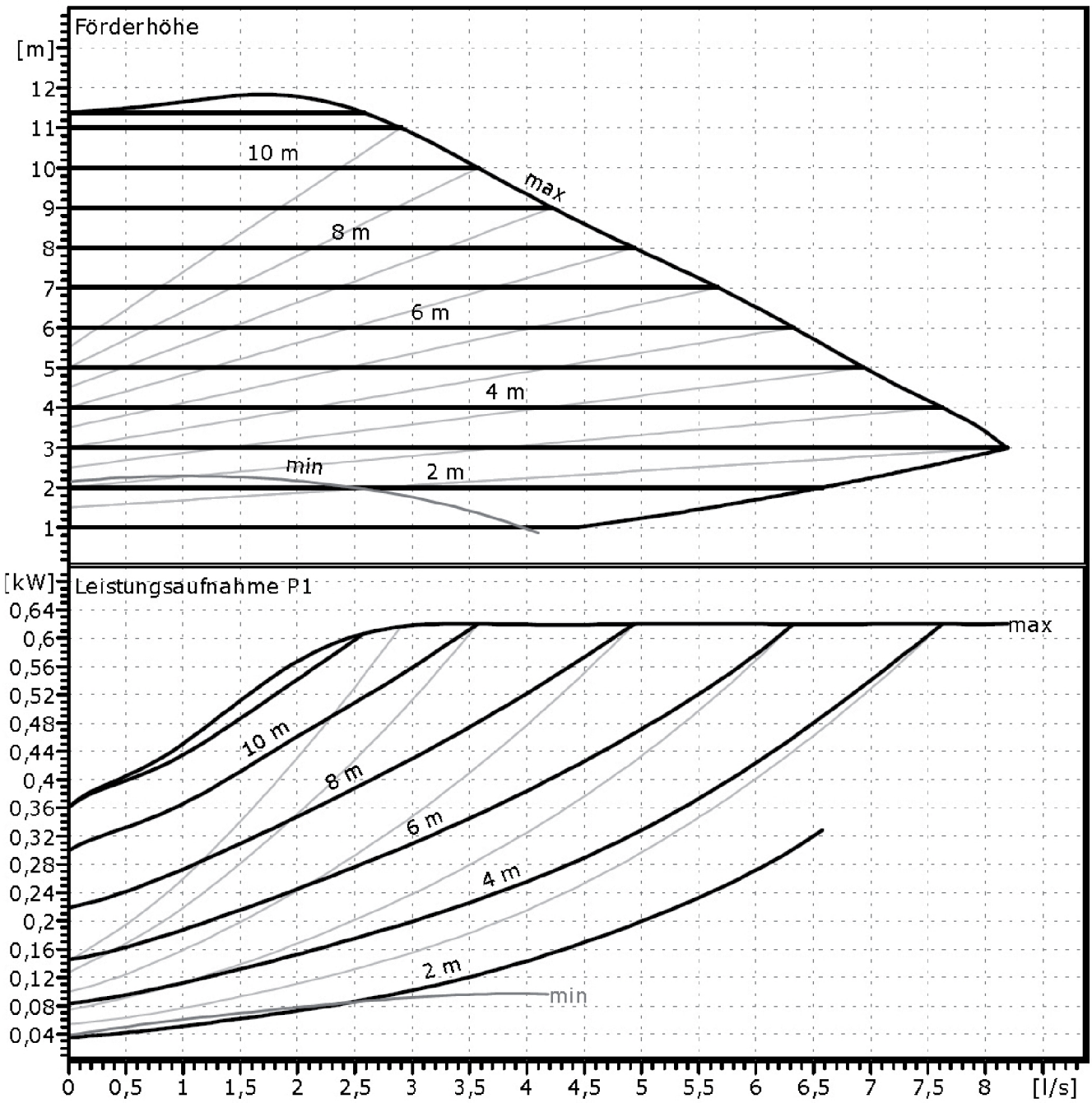


4.4 Pump characteristic lines

4.3.1 Stratos 50 / 1-8 for water (FWM 150)



4.3.2 Stratos 50 / 1-12 for water (FWM 225)



5. Terms of guarantee

The manufacturer issues a guarantee of 2 years from the invoice date on the device and its constituent parts. Without proper installation and use of the device the guarantee is void.

Any unauthorized alteration or change is forbidden due to security reasons and inevitably leads to the loss of any guarantee.

Notes

Contact

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