SPIROTECH

Maximising Performance for You

INSTRUCTION MANUAL

MULTICONTROL EMCK, EMCM-_1(TWIN) EXPANSION VALVES

SPIROEXPAND®

TABLE OF CONTENTS

1. PREFACE

1.1. About the device

These operating instructions cover the installation, commissioning and operation of the following MultiControl types:

TYPE	DESCRIPTION	COMPOSITION
EMCK-S_-__	MultiControl Compact Solo	Single pump 100%, single valve 100%
EMCK-D_-__	MultiControl Compact Duo	Double pump 2x50%, single valve 1x100%
EMCK-D_-__-twin	MultiControl Compact Duo Twin	Double pump 2x50%, single valve 2x100%
EMCK-M_-__	MultiControl Compact Maxi	Double pump 2x100%, single valve 1x100%
EMCK-M_-__-twin	MultiControl Compact Maxi Twin	Double pump 2x100%, single valve 2x100%
EMCM-S1-__	MultiControl Modular Solo	Single pump 100%, single valve 100%
EMCM-D1-__	MultiControl Modular Duo	Double pump 2x50%, single valve 1x100%
EMCM-D1-__-twin	MultiControl Modular Duo Twin	Double pump 2x50%, single valve 2x100%
EMCM-M1-__	MultiControl Modular Maxi	Double pump 2x100%, single valve 1x100%
EMCM-M1-__-twin	MultiControl Modular Maxi Twin	Double pump 2x100%, single valve 2x100%

1.2. About this document

Read this instruction manual before installation, commissioning and operation. Keep the instructions for future reference.

The original language of the document is German. All other available language versions are translations of the original instructions.

The illustrations in this document show a typical structure with relevant details and may differ from the model supplied depending on the type and equipment, but do not affect the comprehensibility of this document.

1.3. symbols

The following symbols are used in these operating instructions:

SYMBOLS		
	CAUTION	This symbol warns of a dangerous situation in which failure to observe the hazard warning may result in minor, reversible injuries.
	**WARNING**	This symbol warns of an extremely dangerous situation in which failure to observe the hazard warning may result in death or serious irreversible injury.
	**ELECTRICAL HAZARD**	This symbol warns of the risk of electric shock.
	**NOTE**	This symbol warns of situations in which failure to observe the instructions can lead to material damage.

2. SAFETY

2.1. Safety instructions

This safety information warns the user of risks and shows how the risks can be avoided.

Due to the design of the pressurisation unit, hardly any hazards are to be expected.

However, it should always be noted that hot system media (e.g. heating water) or even harmful media can leak out when handling these devices!

Since different devices each may have a special medium contained within, Spirotech cannot predict which medium the respective system will use. This also applies to harmful mixtures of media that may be used in the system.

It is the responsibility of the installer of the system and, after proper handover, the responsibility of the operator of the system to take appropriate safety-related measures if necessary.
Take precautions and, if necessary, attach warning signs to the device!

WARNING
The following areas of application are expressly excluded:
- Use in potentially explosive atmospheres
- Use outdoors
- Use in rooms with risk of water jets
- Use in areas with heavily polluted ambient air

If it is the case that the system medium is a hazardous, harmful substance, the following hazardous situations may arise:

- For maintenance purposes, a filling and emptying tap is installed in the pressuriser, which allows the hot and harmful system medium to escape by opening the tap.

WARNING
In this case there is a risk of scalding!

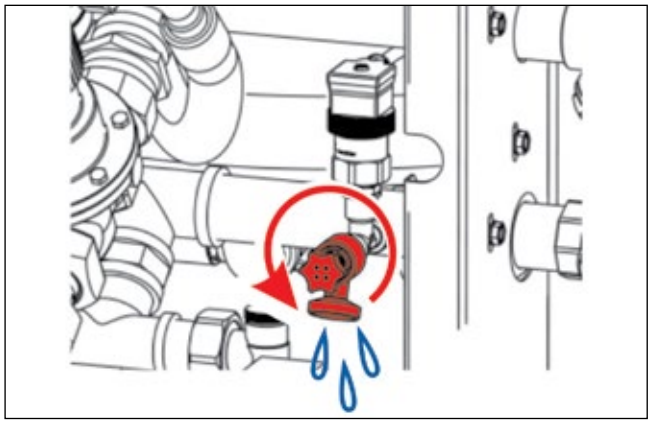


Figure 1: Filling and emptying tap of the pressuriser

Another filling and emptying tap is located on the lower flange of the container. This is also used for maintenance purposes, whereby harmful and hot system media can escape when the tap is opened.

WARNING
In this case there is a risk of scalding!

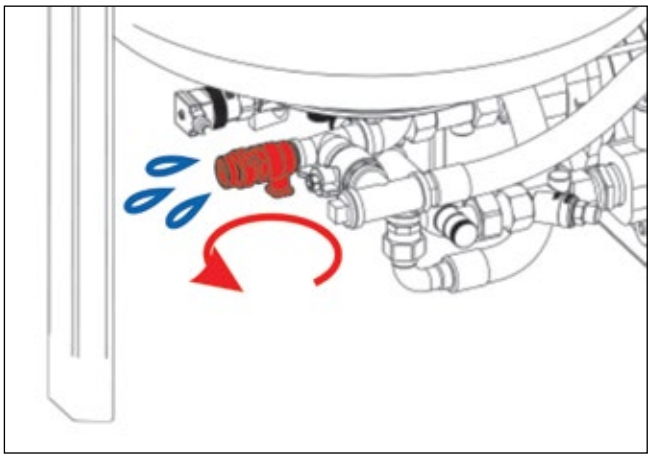


Figure 2: Filling and emptying tap of the container

There is a 0.5 bar safety valve on the top flange of the tank, which can be triggered by the following causes and thus allow hot and harmful system media to escape:

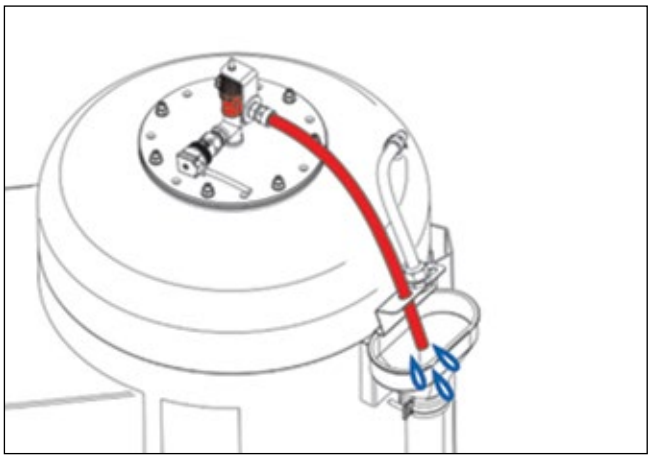


Figure 3: Safety valve of the container

- The expansion valve and the expansion tank have been sized incorrectly (too small) and the entire expansion volume cannot be accommodated in the tank.
- The content measurement may not work correctly due to defective pressure transmitters or a defective membrane, which can cause the container to overflow.
- The tank was filled to too high a level when cold (possibly by the "Fill once" function or uncontrolled if the EMCF backfeed module is not installed), whereby the expansion volume that occurs was not taken into account and can therefore no longer be fully absorbed in the tank.

WARNING
In this case there is a risk of scalding!

There is an emptying tap at the bottom of the container, which is not expected to pose any danger during normal operation. If the membrane installed in the tank is defective for any reason, hot and harmful system media can leak out through this tap.

WARNING
In this case there is a risk of scalding!

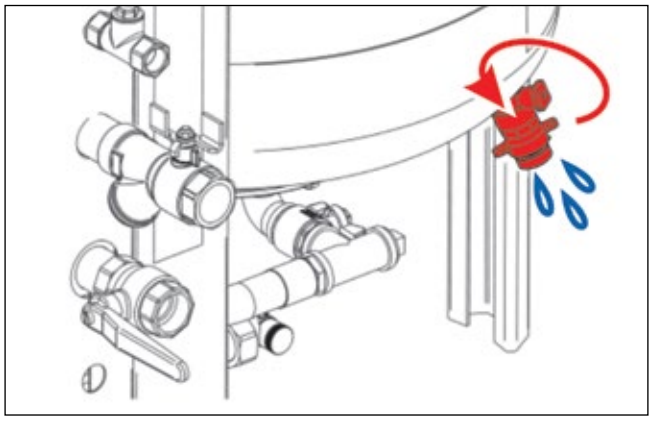


Figure 4: Emptying tap of the container

WARNING
Installation, commissioning and servicing may only be carried out by trained specialist personnel.

If the device is damaged, it must be taken out of operation and repaired by trained specialists.

The device must be de-energised before carrying out any electrical work!

No changes may be made to the product.

Operation is only permitted with the housing closed.

NOTE
Illustrations in this document may differ from the model supplied depending on the type and equipment.

CAUTION
Spirotech devices are subjected to a functional test at the factory before delivery and the device is filled with a frost-protected ready-mixed test water. Although the device is emptied as far as possible after the function test, small quantities of testing water (max. approx. 1.5 litres) may remain in the device, depending on the device type and design.

This test water is frost-protected down to -20°C and is produced on the basis of propylene glycol together with protective substances. Experience has shown that such small quantities of test water in the system do not cause any problems at the final destination when mixed with the system water there.

However, if there are concerns about the introduction of such a small amount of test water into the system at the destination, the pressurisation unit must also be flushed before connecting it to the system in the same way as is specified for the system itself (e.g. in ÖNORMH5195-1)

3. GENERAL

3.1. Description of the device

MultiControl Compact EMCK or MultiControl Modular EMCM for loss-free absorption of the expansion volume and for pressure stabilisation in closed heating, air-conditioning and cooling systems. Manufactured in accordance with the EN 12828 construction guidelines.

Control unit as compact hydraulics with one or two low-noise pressure maintenance pump(s) (Solo model 1x100%, Duo model 2x50%, Maxi model 2x100%) in the form of a multi-stage centrifugal pump with high-quality mechanical shaft seal, one or two pressure-proportionally continuously regulating, mechanically adjusted overflow valve(s) (Solo, Duo and Maxi models 1x100% of the expansion volume flow, Duo-Twin and Maxi-Twin models 2x100%). Precision system pressure measurement.

Hydraulic connections for on-site integration ex works on the right and with necessary shut-off valves (can be easily converted to the left). Temperature monitoring of the system medium entering the tank. Prepared connection point for easy assembly of the backfeed module for quantity-controlled, litre-precise backfeed, also available for retrofitting at any time. Water softening for standardised backfeed water can be combined with the backfeed module.

Electronic control unit in microprocessor design for controlling all processes, ergonomically arranged control panel with sophisticated operating concept in many national languages. Self-contained compact measuring and switching unit in closed switch cabinet design including connection cables. The basic version already includes four potential-free signalling contacts (fault, warning, backfeed running, device function enabled) as well as inputs for "ext. Enable contact device function" and "external message".

For extended signal exchange, prepared installation slots for additional expansion modules (also for retrofitting). Remote monitoring of the device is also possible using various multicontrol bus modules or multicontrol web module (also prepared for retrofitting). Additional external temperature monitoring provided by optional temperature sensor at the point of integration into the system.

Automatic, economical low-pressure degassing function based on the principle of depressurisation integrated as standard. Additional external temperature monitoring provided by optional temperature sensor at the point of integration into the system.

MultiControl Compact:
Elegant, self-contained unit in self-supporting, sound-insulating design with attached, unpressurised expansion tank (max. 0.5 bar), designed as a painted steel tank (100% of the volume can be used). High-quality, exchangeable tank membrane flanged on both sides for optimum separation of system medium and atmosphere. Vessel level measurement with two pressure transmitters on the tank flanges. Safety valve 0.5 bar for tank protection and factory-fitted drain funnel. Drain and blow-down valve on the lower tank flange.

MultiControl Modular:
Elegant, self-contained unit in self-supporting, sound-insulating construction for modular combination with unpressurised expansion tanks (max. 0.5 bar), connections for suction and overflow line at the rear including necessary shut-offs.

- max. safety temperature of the system: 110 °C (with cooling vessel)
- max. temperature at the connection point: 70°C
- max. operating pressure (PN): 10 bar

3.2. CE mark

The device is CE labelled. This means that the device has been developed, built and tested in accordance with the applicable health and safety regulations. Provided that the operating instructions are followed, the device can be used and maintained safely.

3.3. Type plate

The rating plate of the device is located on the side of the device and is shown in the illustration below.

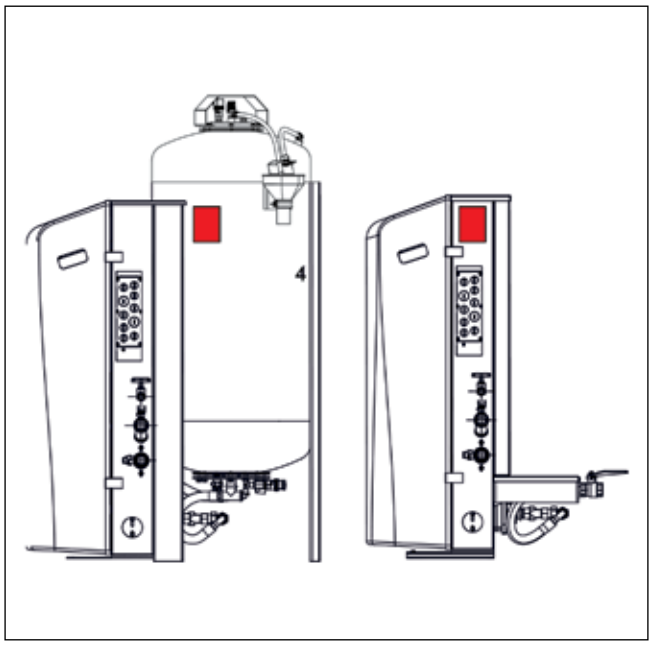


Figure 5: Type plate of the device

4. ASSEMBLY

4.1. Setting up the device

The device must be set up on a level, solid floor. Any unevenness must be levelled out. Setting the device up outdoors is not permitted. For devices with adjustable feet, it is also important to ensure that they are set up vertically.

The connection of all hydraulic lines from the device to the system must be as de-energised as possible.
The nozzle loads introduced into the device through connected piping must not impair the device in any operating phase. Piping must be designed and installed in such a way that impermissible forces are avoided (e.g: by installing expansion joints or setting fixed points immediately before the transition to the connection points on the device).

Storage:
Ambient temperature min./max: -18°C/40°C
Storage area must be protected from precipitation and direct sunlight.

Operation:
The device should only be installed in enclosed indoor areas of buildings. The ambient temperature in the installation room must be between +5°C and +40°C from the time the device is first filled with the system medium until it is taken out of service.

Sufficiently bright electrical lighting must be provided for the display and safety equipment, the operating devices and the access routes. Objects that are not intended for the operation or maintenance of the pressurisation system must not be stored in the immediate vicinity of the system (observe construction and safety regulations).

Integration into the system return is carried out according to the diagrams (in Chapter 6 - "Hydraulic connection diagrams").

Our pressurisation devices are suitable for systems where the maximum temperature at the connection point does not exceed 70 °C. If temperatures of more than +70 °C may occur at the point of integration into the system, a cooling vessel must be used (see chapter 5.6 "Use of cooling vessels"). The connection to the system return must be made at a point where there are no external hydraulic pressures that could influence the proper functioning of the pressurisation system.

The expansion line is sized in accordance with ÖNORM H5151-1. See Appendix 12.1.

NOTE
We recommend connecting the pressurisation unit with a minimum dimension of DN25.

NOTE
For details on the hydraulic connection of MultiControl Modular with EP-R(S) expansion vessels, see the appendix.

CAUTION
Danger of damage due to stray welding currents during installation with electric welding processes! If the welding current return cable is connected incorrectly to the part of the system to be welded, welding current may flow via the protective earth conductor. This can destroy protective conductors, damage devices and electrical equipment, overheat components and cause fires!

4.2. Backfeed module MultiControl EMCF

Devices in the MultiControl Compact and MultiControl Modular series are supplied ex works without an EMCF backfeed module. Retrofitting is possible at any time. This module is installed in accordance with the instructions supplied with the module.

4.3. Connection to the water supply system

Devices with a built-in backfeed module (EMCF) are equipped with a connection for fresh water supply.

If the fresh water connection is connected to the public water supply system, non-drinking water (heating water) must be prevented from being siphoned back into the water supply system. Appropriate devices that reliably prevent back siphoning are not built into the multicontrol device and must be provided externally (on site) (e.g. system separator).

FRESH WATER CONNECTION:
Highest inlet water pressure: 1.0 MPa = 10 bar
Lowest inlet water pressure: 0.2 MPa = 2 bar

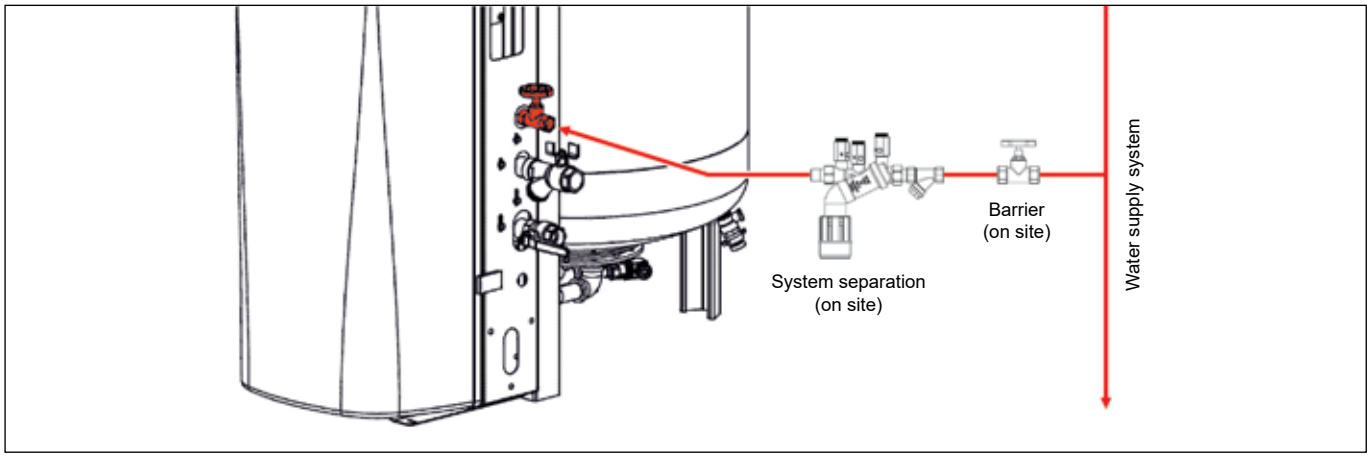


Figure 6: Connection for fresh water supply

CAUTION
Devices intended for connection to the water supply system must be fitted on site with devices that reliably prevent non-drinking water from being siphoned back into the water supply system.

4.4. Connection side right / left

On devices in the MultiControl Compact and MultiControl Modular series, the connections from/to the system return are located on the right-hand side ex works. These can be converted to the left-hand side if required. The other side must be closed with the caps supplied (Fig. 7).

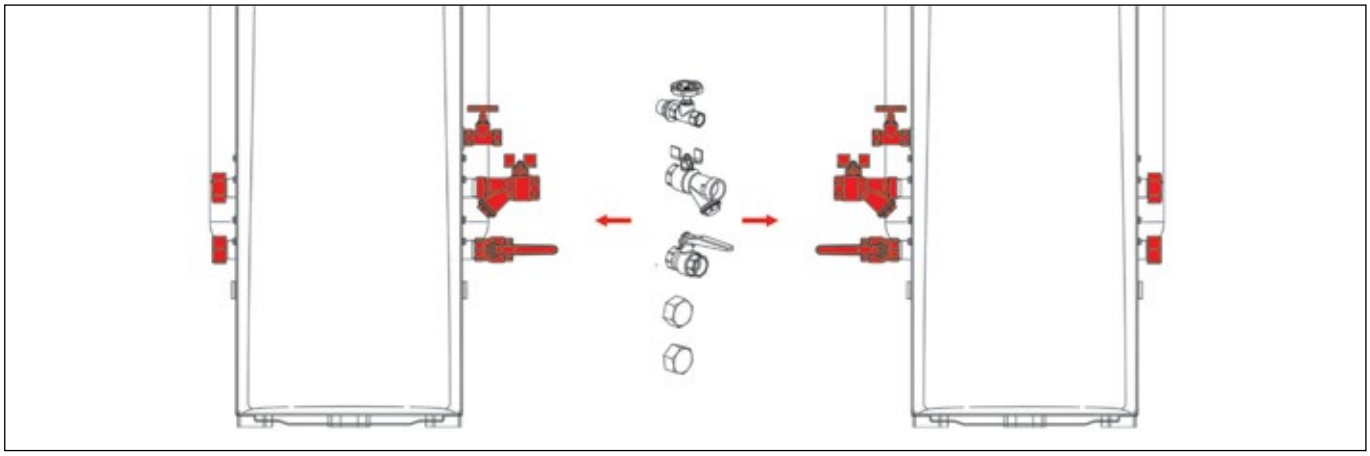


Figure 7: Conversion of connection side hydraulics MultiControl Compact

The connections from/to the expansion vessel (only for the MultiControl Modular series) are located on the rear of the device (Fig. 8).

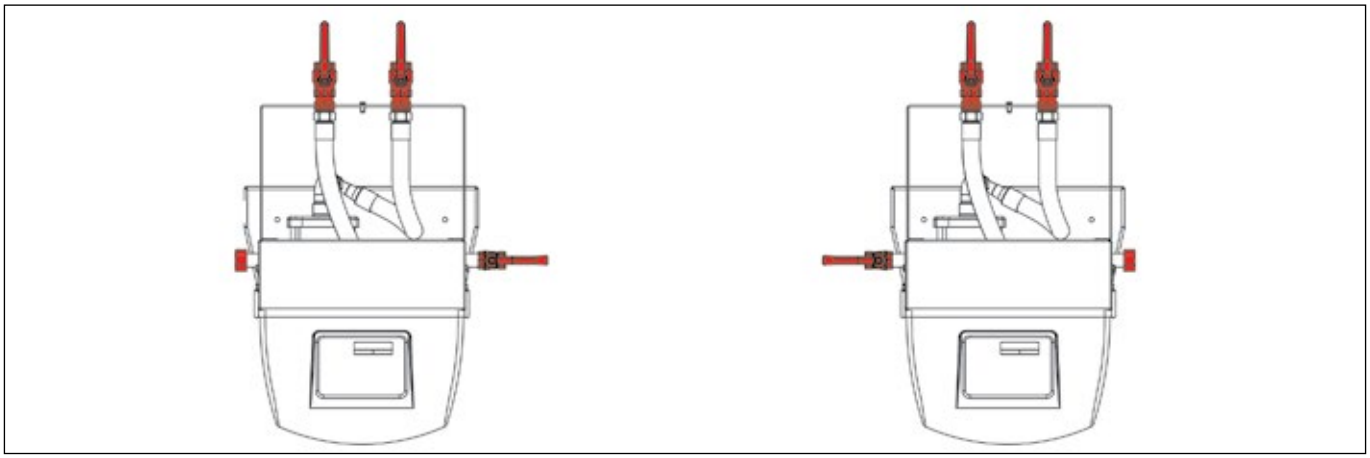


Figure 8: Conversion of connection side hydraulics MultiControl Compact

The electrical connections (cable flange plate with pre-punched cable glands) are also located on the right-hand side of the unit and can also be converted to the left-hand side if required (Fig. 9).

The opening on the other side must be closed with the blind flange (ex works on the left-hand side) (Fig. 10).

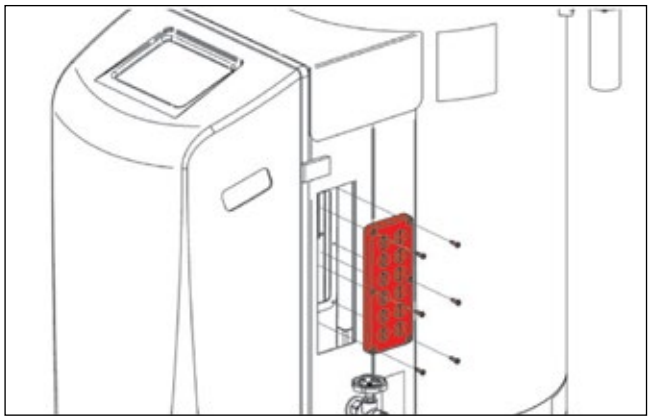


Figure 9: Cable flange plate

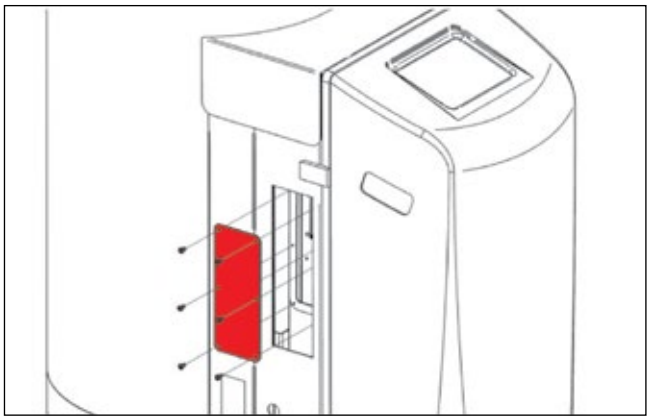


Figure 10: Blind flange

4.5. Use of EMCB-Z additional vessels (for MultiControl Compact)

If you want to expand the basic expansion volume of the MultiControl Compact EMCK, so-called EMCB-Z additional vessels can be connected to the attached main vessel of the EMCK.

These must be connected to the main vessel on the water side at the lower tank flange and on the gas side at the upper tank flange. The additional receptacles must be installed at the same level as the main receptacle. This ensures that the water level in all tanks is the same and that the expansion volume can be distributed evenly across all containers.

CAUTION
Additional vessels must be designed in the same size as the respective main vessel to ensure correct content measurement and function!

NOTE
Devices in the MultiControl Modular series do not have an attached expansion vessel. The expansion volume is stored in expansion vessels from the EP-R series, with the EP-RS expansion vessel serving as an extension. All piping must always be installed on site in accordance with the required hydraulic connection diagram (see chapter 6). For details on the hydraulic connection of MultiControl Modular with EP-RS expansion vessels, see Appendix 12.

The EMCB-Z additional vessel can be connected to EMCK using the optional EMCB-Z connection set. This consists of flexible hoses and all the fittings required to make the water and gas connections.

If the EMCB-Z connection set is not used, the connections between the containers must be made to an equivalent standard on site instead! See also chapter 6 "Hydraulic connection diagrams".

CONNECTION	DIMENSION
Gas-side container connection (below container cover)	Rp ½
Dimension gas-side container connection	min. DN15
Water-side connection of the overflow pipe	Rp ¾
Dimension of the water-side connection of the overflow pipe	min. DN20

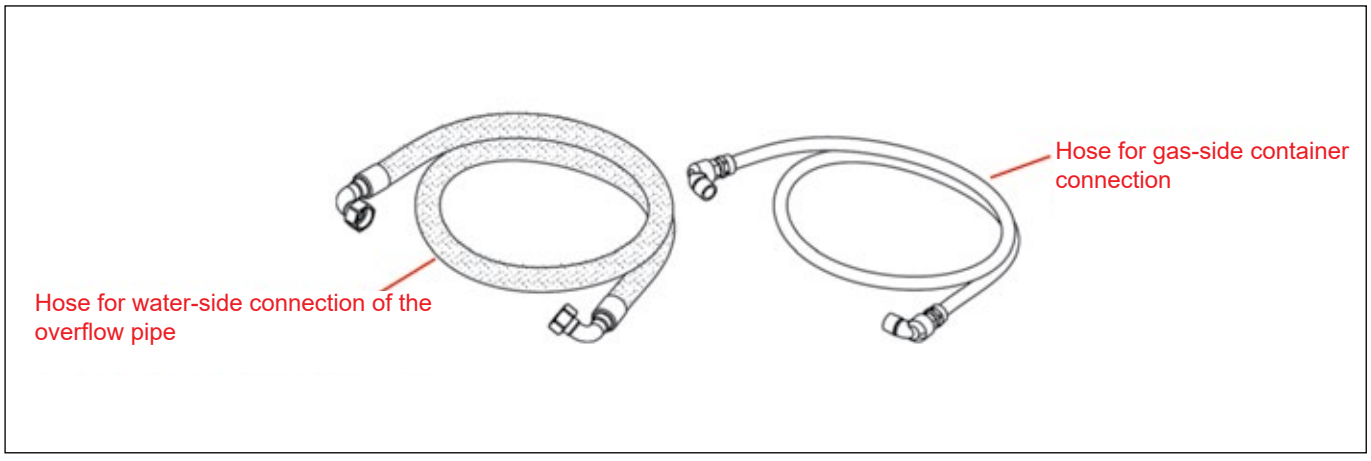


Figure 11: EMCB-Z connection set

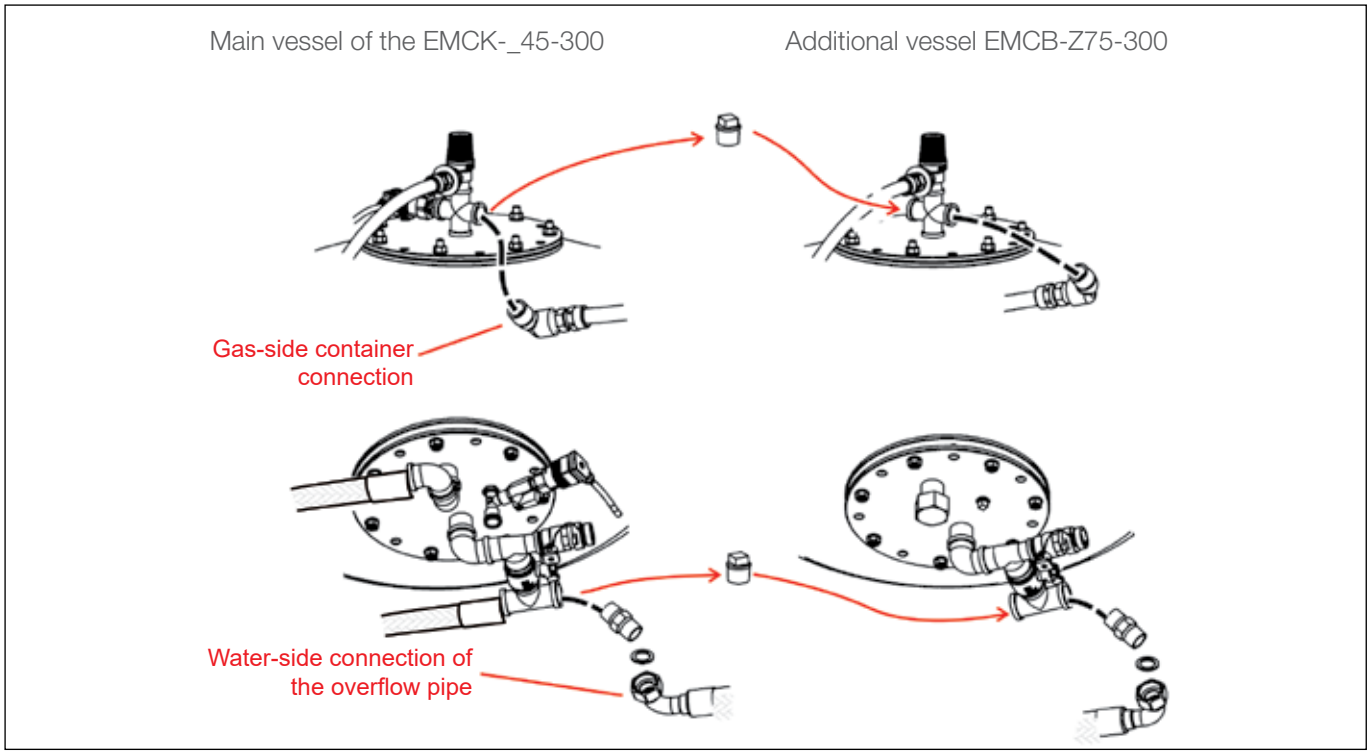


Figure 12: Connection main vessel of the EMCK-_45-300 with additional vessel EMCB-Z 75-300

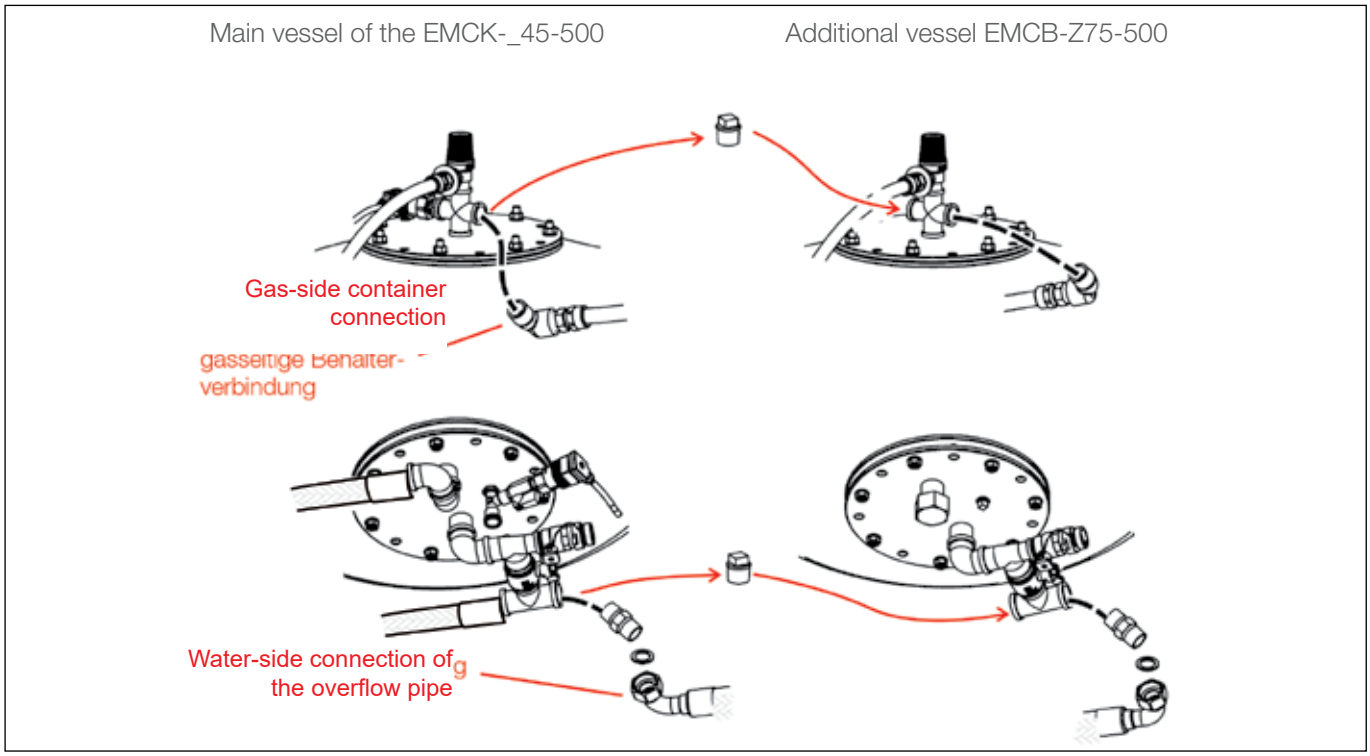


Figure 13: Connection of main vessel of the EMCK-_45-500 with additional vessel EMCB-Z 75-500

4.6. Use of MultiControl devices without degassing function

Devices from the MultiControl Compact and MultiControl Modular series can also be operated without the degassing function. The unused connections must be connected to each other as shown in the diagram below (Fig. 16).
This connection can be established with the MultiControl compact bypass set, which is available as an accessory. Optionally, this can also be realised on site (DN25).

Integration into the system then takes place with just one pipe (connection "EXPANSION/OVERFLOW LINE from system return") in the system return, see also Chapter 6 - "Hydraulic connection diagrams".

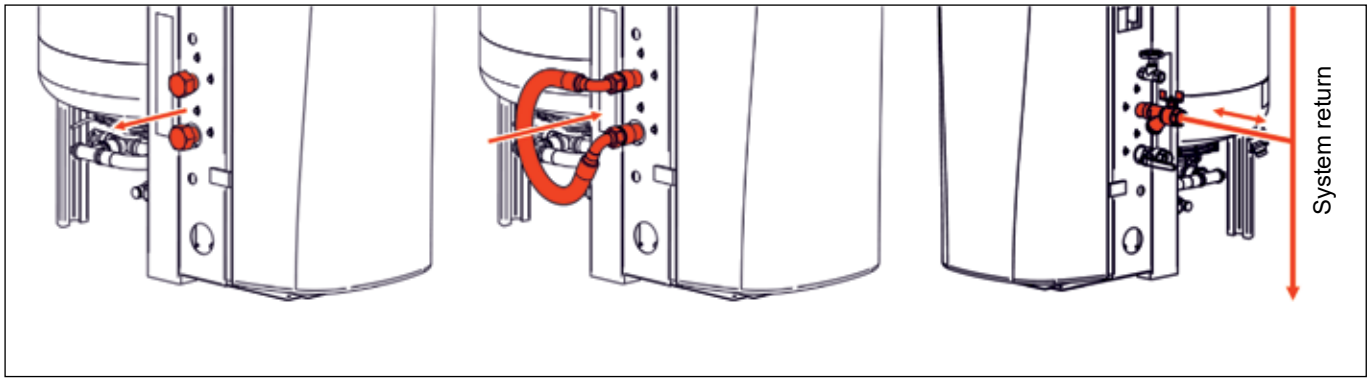


Figure 14: Connection of the connections to the bypass set and connection to the system return

CAUTION
When using the MultiControl compact bypass set, the automatic low-pressure degassing function is omitted!
The degassing function must be deactivated in the basic configuration.
If not, unnecessary pump runtime, but no fault!

4.7. Use of cooling vessels

Devices in the MultiControl Modular and MultiControl Compact series are suitable for systems where the maximum temperature at the connection point does not exceed 70 °C.

If temperatures of more than +70 °C (up to +110 °C) can occur at the point of integration into the system, an ET-T1 cooling vessel must be used.

Depending on the pipe routing from the system return to the EV cooling vessel, a vent valve must be installed on the upper connection. This must be vented once during commissioning.

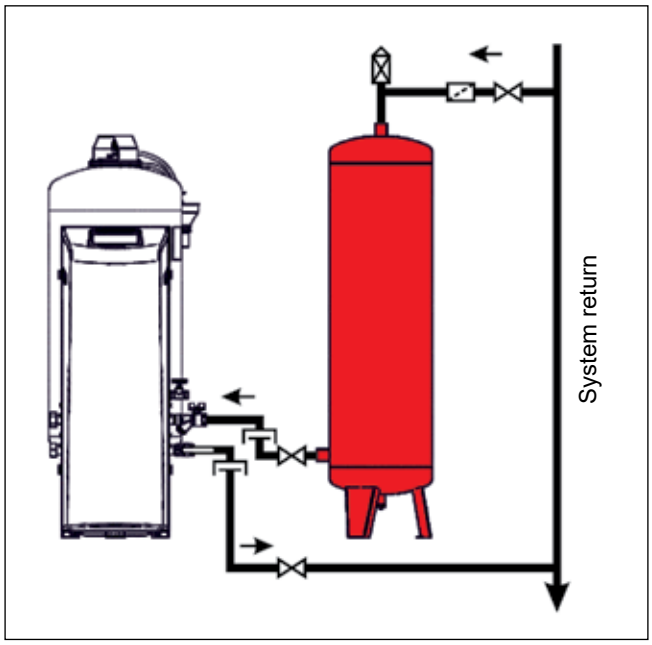


Figure 15: Use of an EV cooling vessel

NOTE
When using an ET-T1 cooling vessel, ensure that it is not thermally insulated under any circumstances. This also applies to the entire expansion line from the system return to the automatic expansion valve.

4.8. Temperature sensor T2

Devices from the MultiControl Compact and MultiControl Modular series, in conjunction with the T2 temperature sensor available as an accessory, offer the option of monitoring the temperature in the system return or in the expansion overflow pipe.

This monitoring function is used to protect the device by blocking the degassing function if the temperature is currently too high, so that the fittings and the diaphragm are not damaged during the degassing process by system medium that is too hot or has not yet cooled down. The installation of a T2 temperature sensor is highly recommended for systems with a protection temperature of more than 95 °C.
This temperature sensor is integrated on site in the system return immediately upstream of the connection point (Fig. 16). When using an cooling vessel, a sleeve is provided on the cooling vessel for this purpose (Fig. 17).

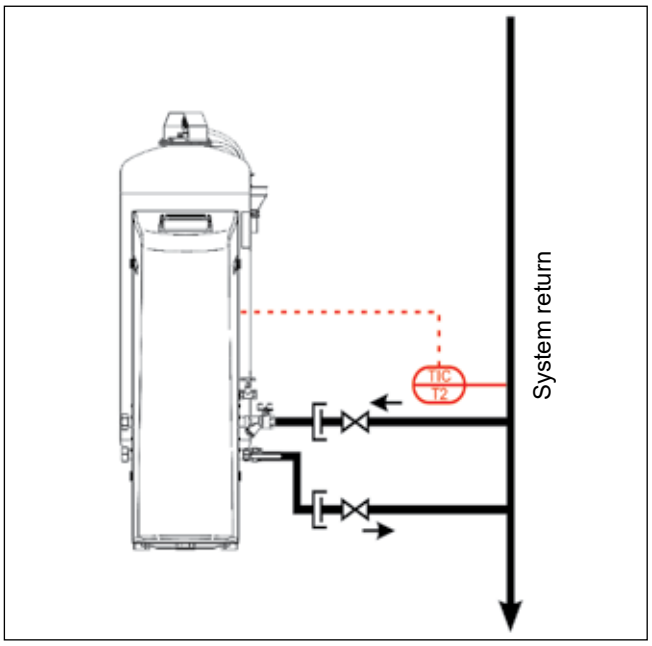


Figure 16: Integration of temperature sensor T2 without cooling vessel

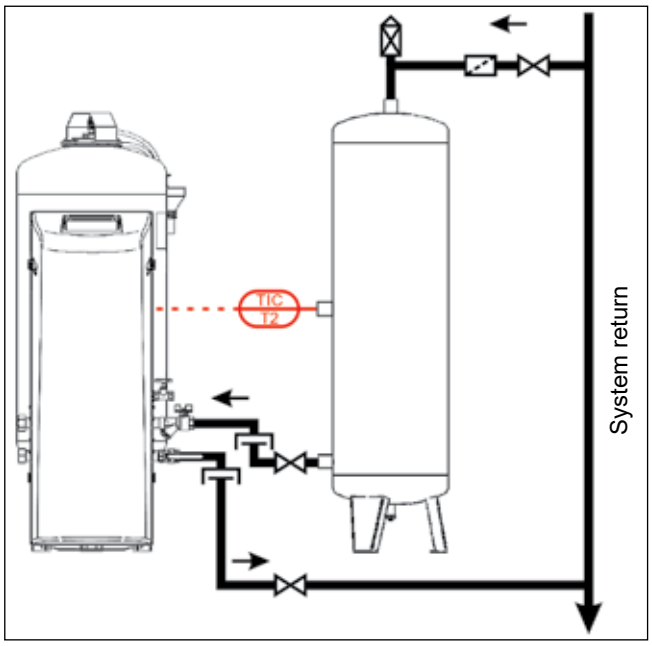


Figure 17: Integration of temperature sensor T2 with cooling vessel

4.9. Electrical connection

For single-phase devices, the mains supply cable is designed as a protective contact supply cable and should be connected by plugging it into a protective contact socket. This plug is intended for complete disconnection of the device from the mains; no other disconnecting devices are included.

If a direct connection to the mains is required, an appropriate device must be installed on site to enable complete disconnection from the mains (e.g. two-pole main switch).

The device must be secured on site and connected to an external all-pole mains switch.

Ensure that the electrical data specified on the rating plate matches the existing power supply.

The device must be connected to the equipotential bonding before commissioning. A corresponding connection point is provided on the device and labelled accordingly.

Phase, neutral conductor
Both when connecting to the earthed socket and when connecting directly to the mains, ensure that the phase and neutral conductors are not interchanged. A corresponding check must be carried out by a suitably trained electrician as part of the electrical installation.

The phase and neutral conductor are connected correctly if no voltage is measured between the earthing busbar and neutral conductor busbar when the power supply is connected (the earthing and neutral conductor busbars are located in the MultiControl device's switch cabinet).
If a voltage equal to the supply voltage (approx. 230V~) is measured during this check, the phase and neutral conductors must be connected reversed and the polarity reversed accordingly.

Important! The polarity of the phase and neutral conductors must always be reversed externally to the MultiControl device
(When connecting to an earthed socket, the phase and neutral conductors must be swapped in the socket).

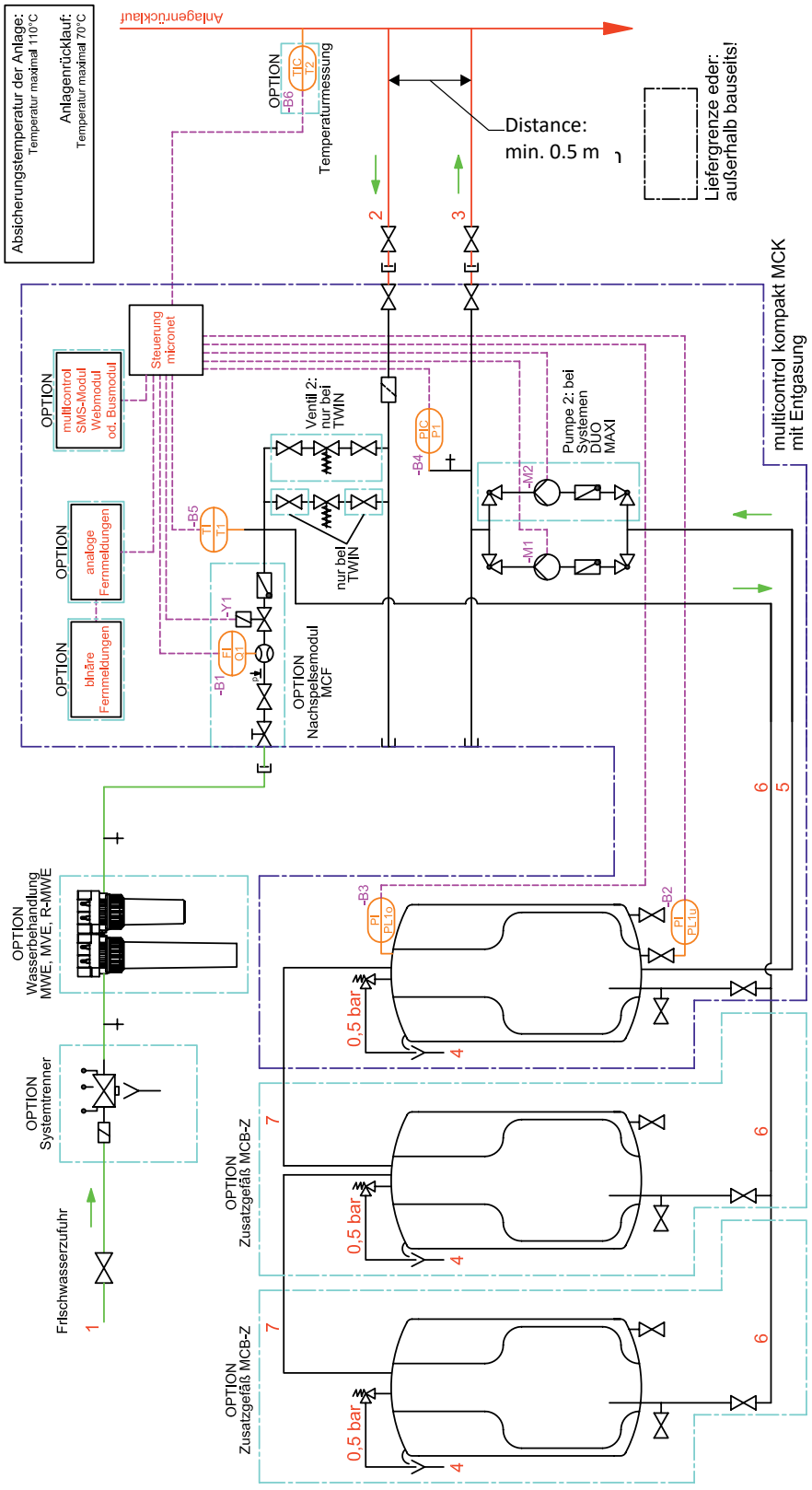
CAUTION
If the mains connection cable of this device is damaged, it must be replaced by the manufacturer or its customer service or a similarly qualified person in order to avoid hazards.

ELECTRICAL HAZARD
The applicable electrical regulations must be observed and complied with!

NOTE
The electrical connection values can be found on the type plate of the device.

5. HYDRAULIC CONNECTION DIAGRAMS

5.1. MultiControl Compact with degassing function (standard scheme)

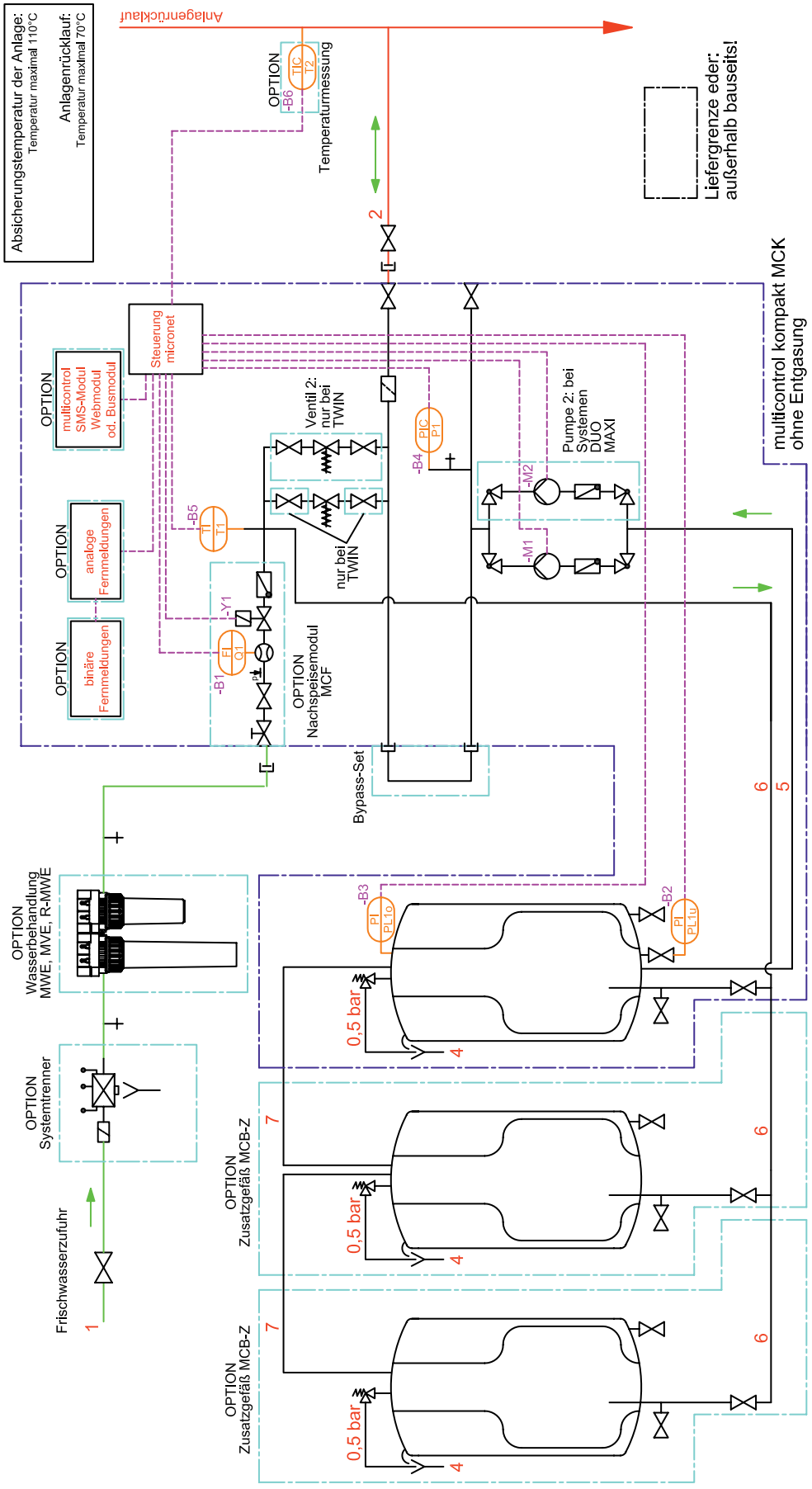


1. Fresh water supply
2. Expansion overflow line from the system return at least DN 25
3. Expansion pressure line to the system return at least DN25
4. Vessel safety valve drain pipe
5. Suction line from the expansion tank
6. Overflow line to the expansion tank
7. DN20 gas-side vessel connection

Options:

EMCB-Z additional vessels, expansion modules, EMCF backfeed module, water treatment, system separator, sensor T2.

5.2. MultiControl Compact without degassing function

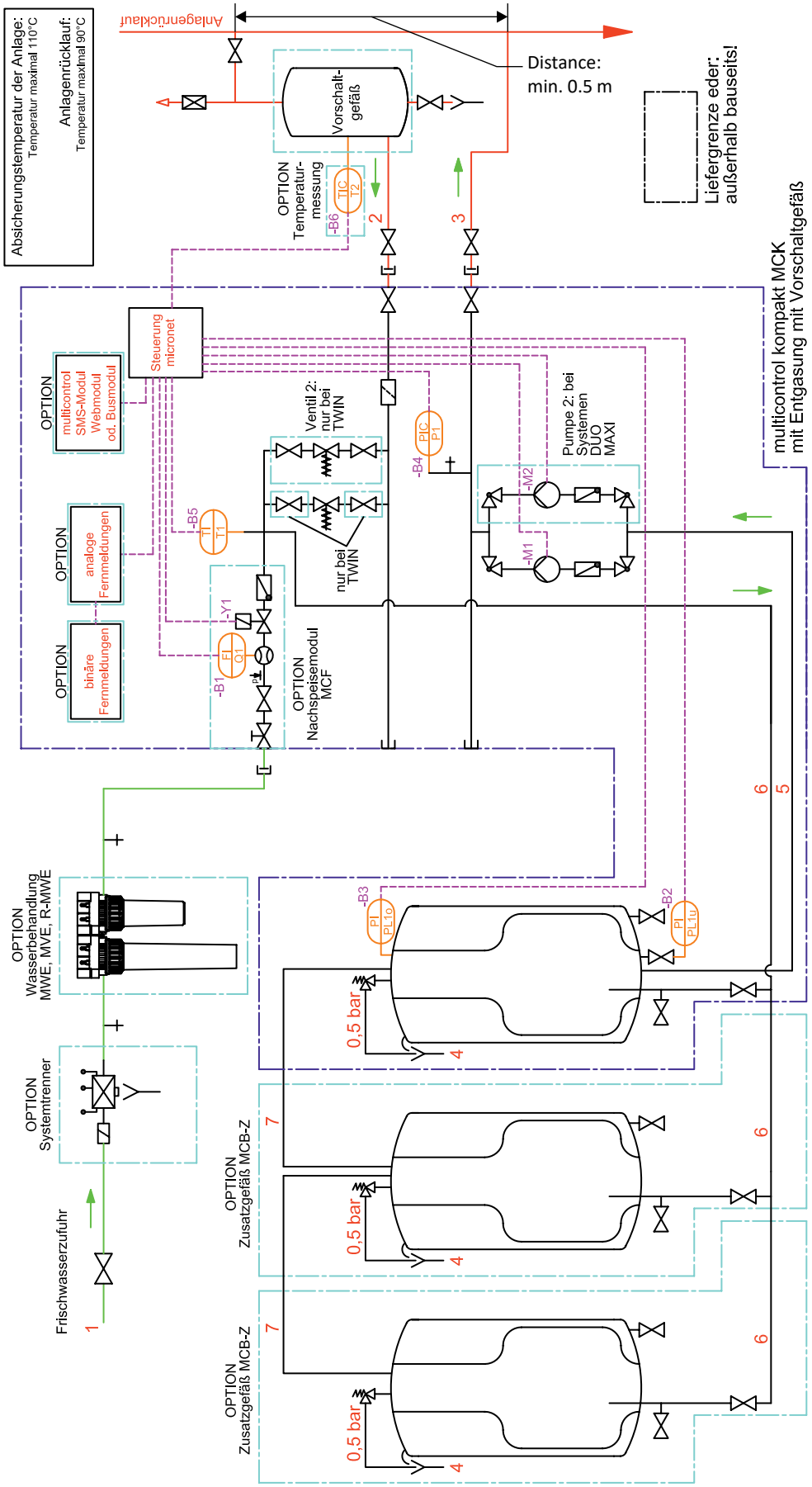


1. Fresh water supply
2. Expansion overflow line from the system return at least DN 25
3. Expansion pressure line to the system return at least DN25
4. Vessel safety valve drain pipe
5. Suction line from the expansion tank
6. Overflow line to the expansion tank
7. DN20 gas-side vessel connection

Options:

Bypass, EMCB-Z additional vessels, expansion modules, EMCF backfeed module, water treatment, system separator, sensor T2.

5.3. MultiControl Compact with degassing function and cooling vessel

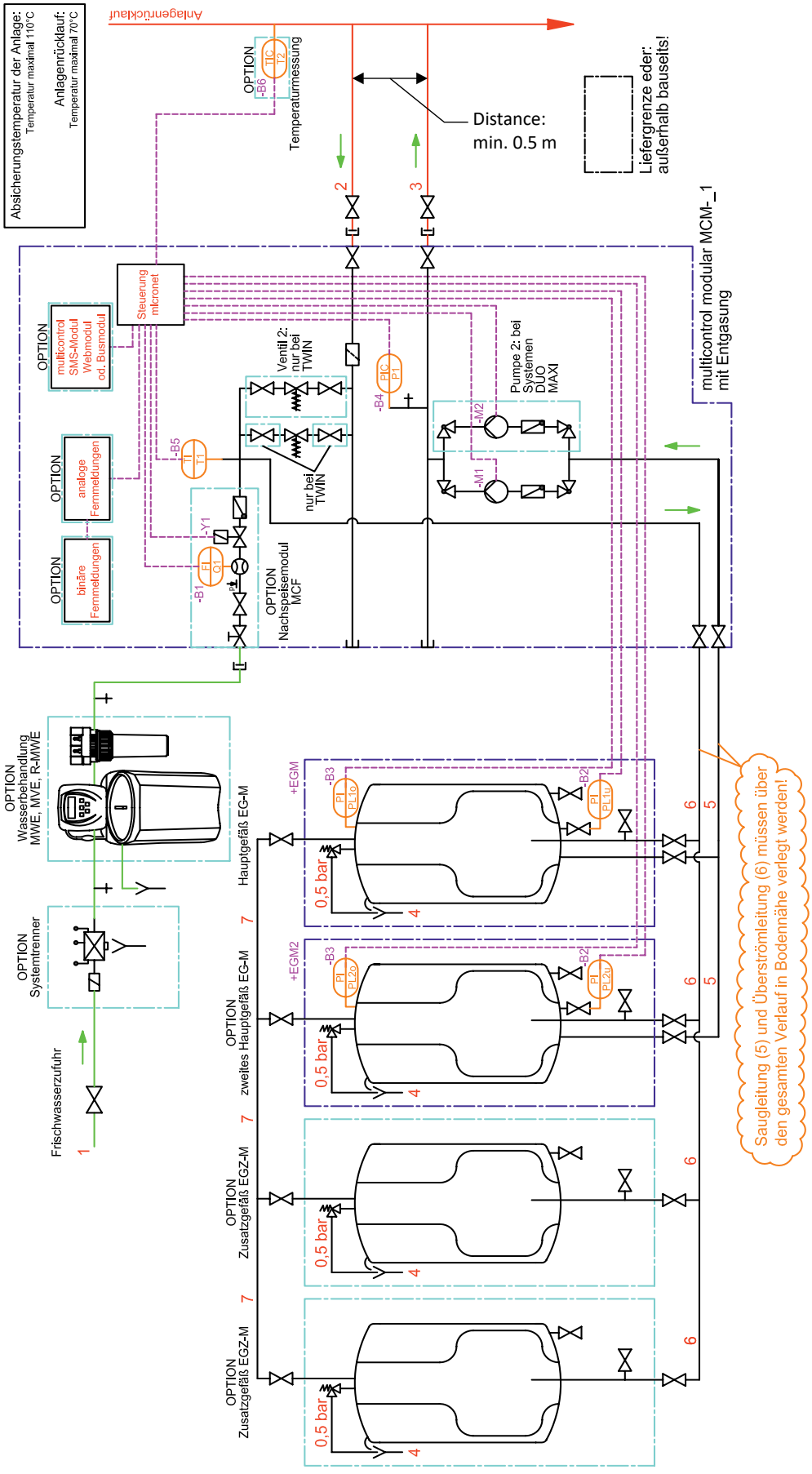


1. Fresh water supply
2. Expansion overflow line from the system return at least DN25
3. Expansion pressure line to the system return at least DN25
4. Vessel safety valve drain pipe
5. Suction line from the expansion tank
6. Overflow line to the expansion tank
7. DN20 gas-side vessel connection

Options:

EMCB-Z additional vessels, expansion modules, EMCF backfeed module, water treatment, ET-T1 cooling vessel, system separator, sensor T2

5.4. MultiControl Modular with degassing function (standard scheme)

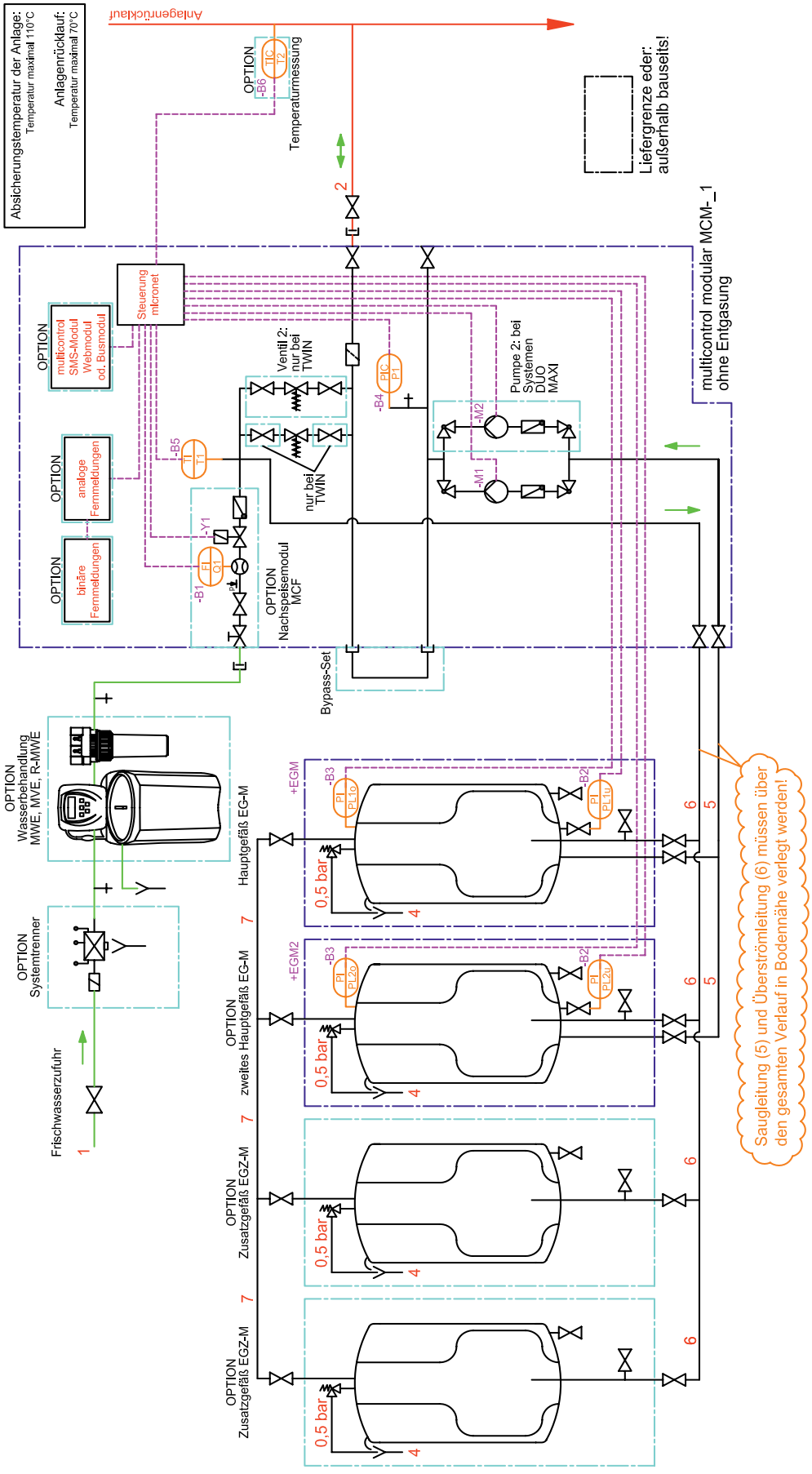


1. Fresh water supply
2. Expansion overflow line from the system return at least DN25
3. Expansion pressure line to the system return at least DN25
4. Vessel safety valve drain pipe
5. Suction line from the expansion tank
6. Overflow line to the expansion tank
7. DN20 gas-side vessel connection

Options:

2 pcs. EP-R main vessels with level measurement, 2 pcs. EP-RS additional vessels, expansion modules, EMCF backfeed module, water treatment, system separator, T2 sensor

5.5. MultiControl Modular without degassing function

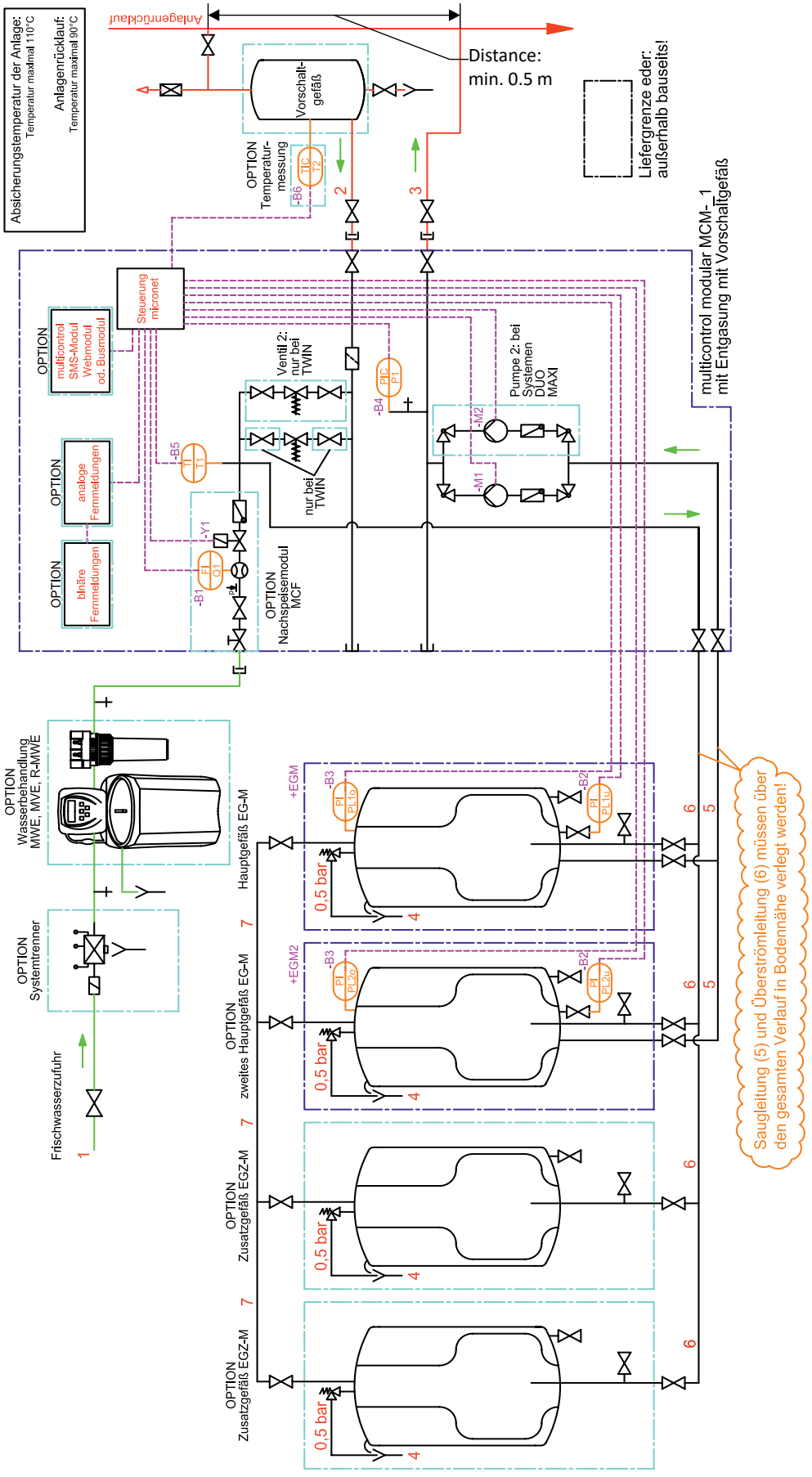


1. Fresh water supply
2. Expansion overflow line from the system return at least DN25
3. Expansion pressure line to the system return at least DN25
4. Vessel safety valve drain pipe
5. Suction line from the expansion tank
6. Overflow line to the expansion tank
7. DN20 gas-side vessel connection

Options:

Bypass, 2 pcs. EP-R main vessels with level measurement, 2 pcs. EP-RS additional vessels, expansion modules, EMCF backfeed module, water treatment, system separator, T2 sensor

5.6. MultiControl Modular with degassing function and with cooling vessel



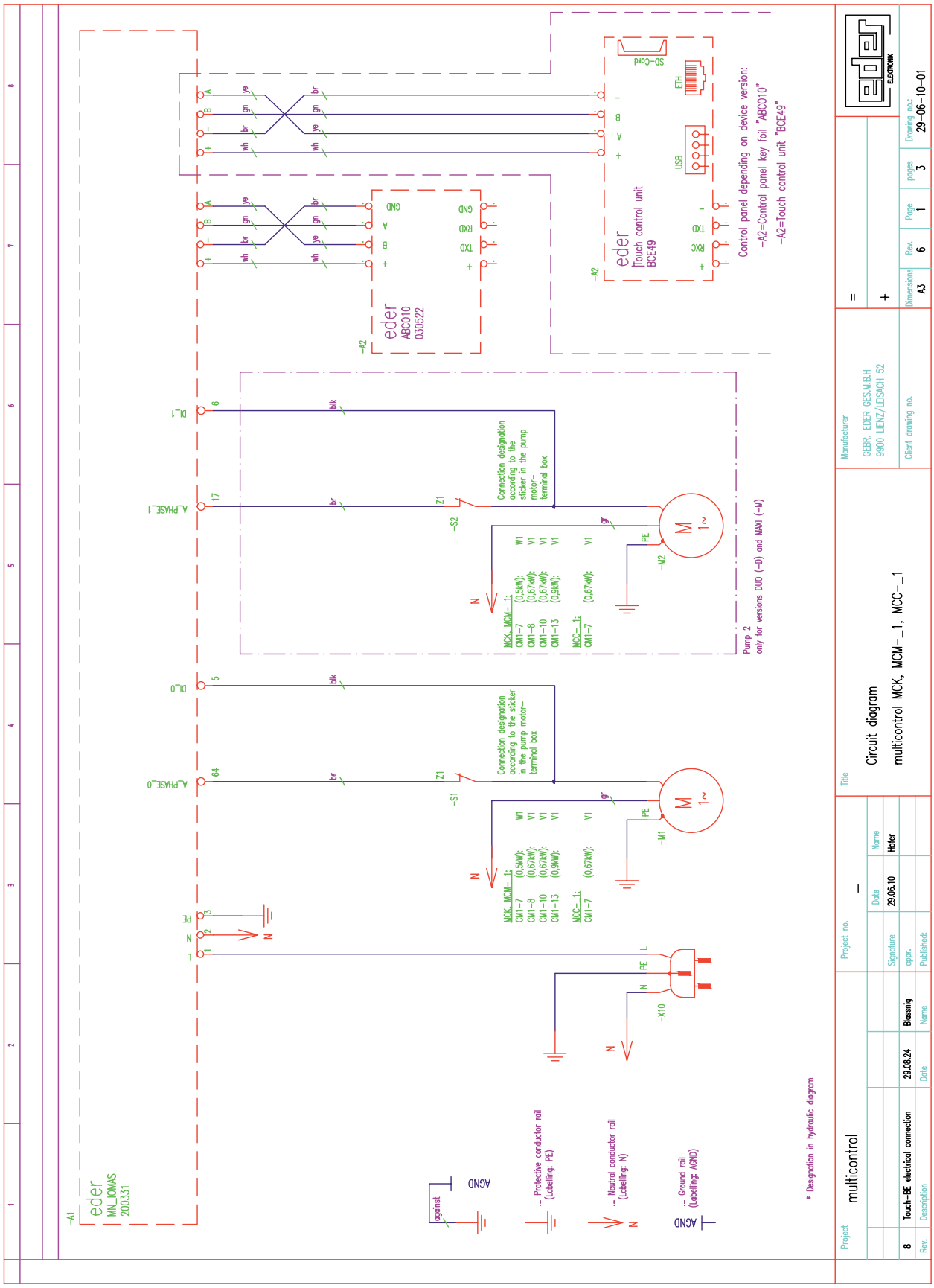
1. Fresh water supply
2. Expansion overflow line from the system return at least DN25
3. Expansion pressure line to the system return at least DN25
4. Vessel safety valve drain pipe
5. Suction line from the expansion tank
6. Overflow line to the expansion tank
7. DN20 gas-side vessel connection

Options:

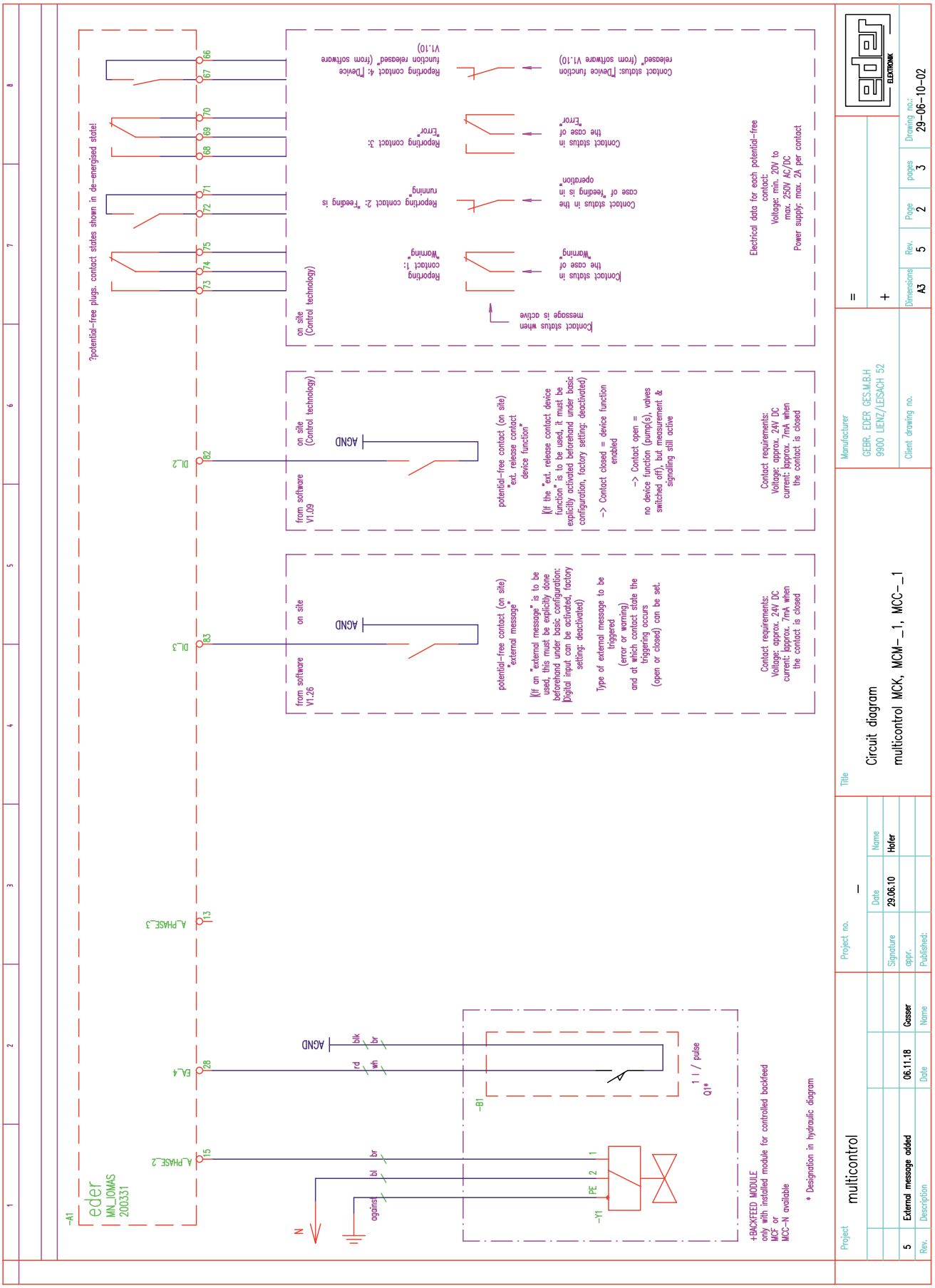
2 pcs. EP-R main vessels with level measurement, 2 pcs. EP-RS additional vessels, expansion modules, ET-T1 cooling vessel, EMCF backfeed module, water treatment, system separator, T2 sensor

6. CIRCUIT DIAGRAMS

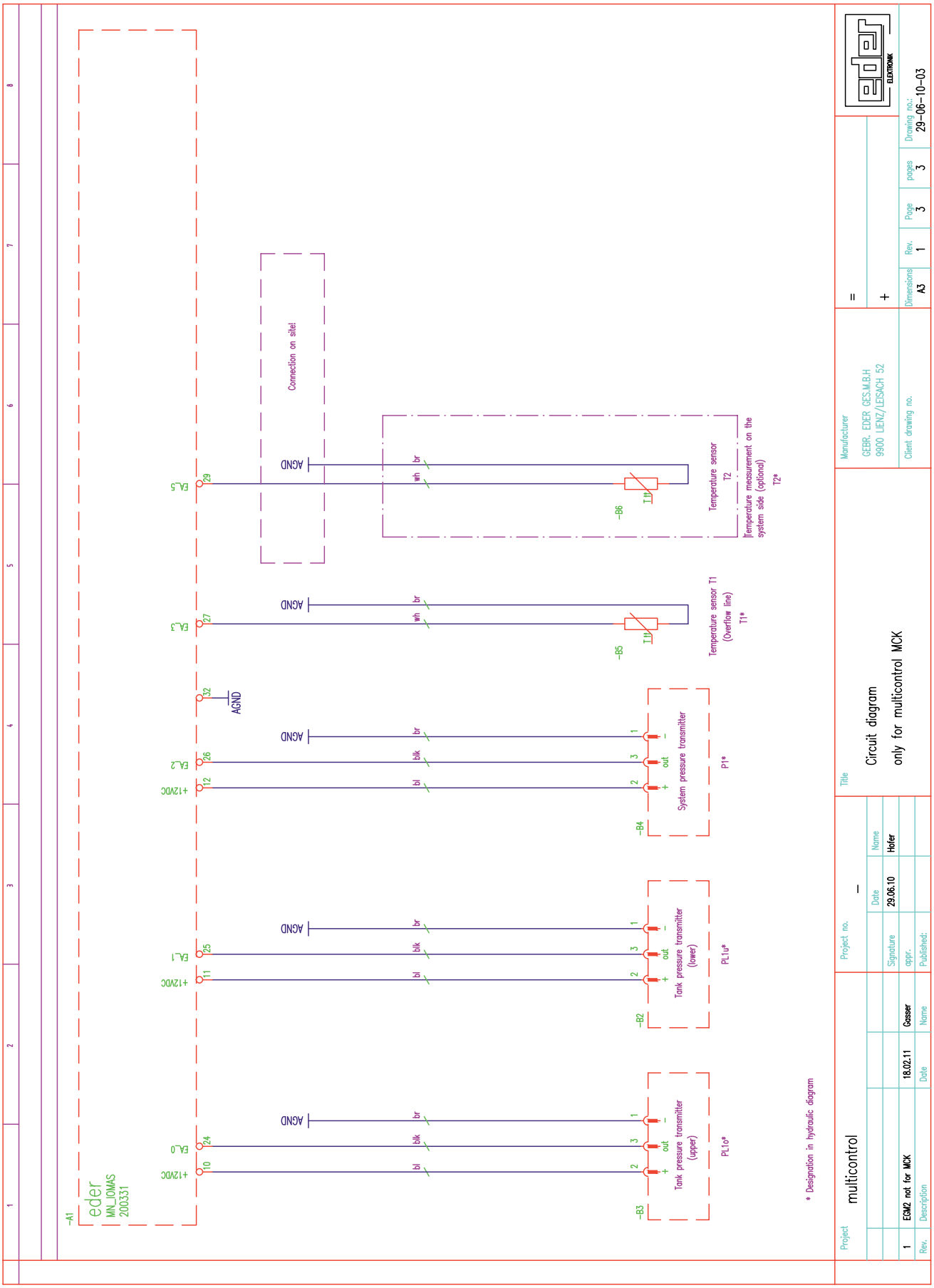
6.1. MultiControl EMCK, EMCM-_1



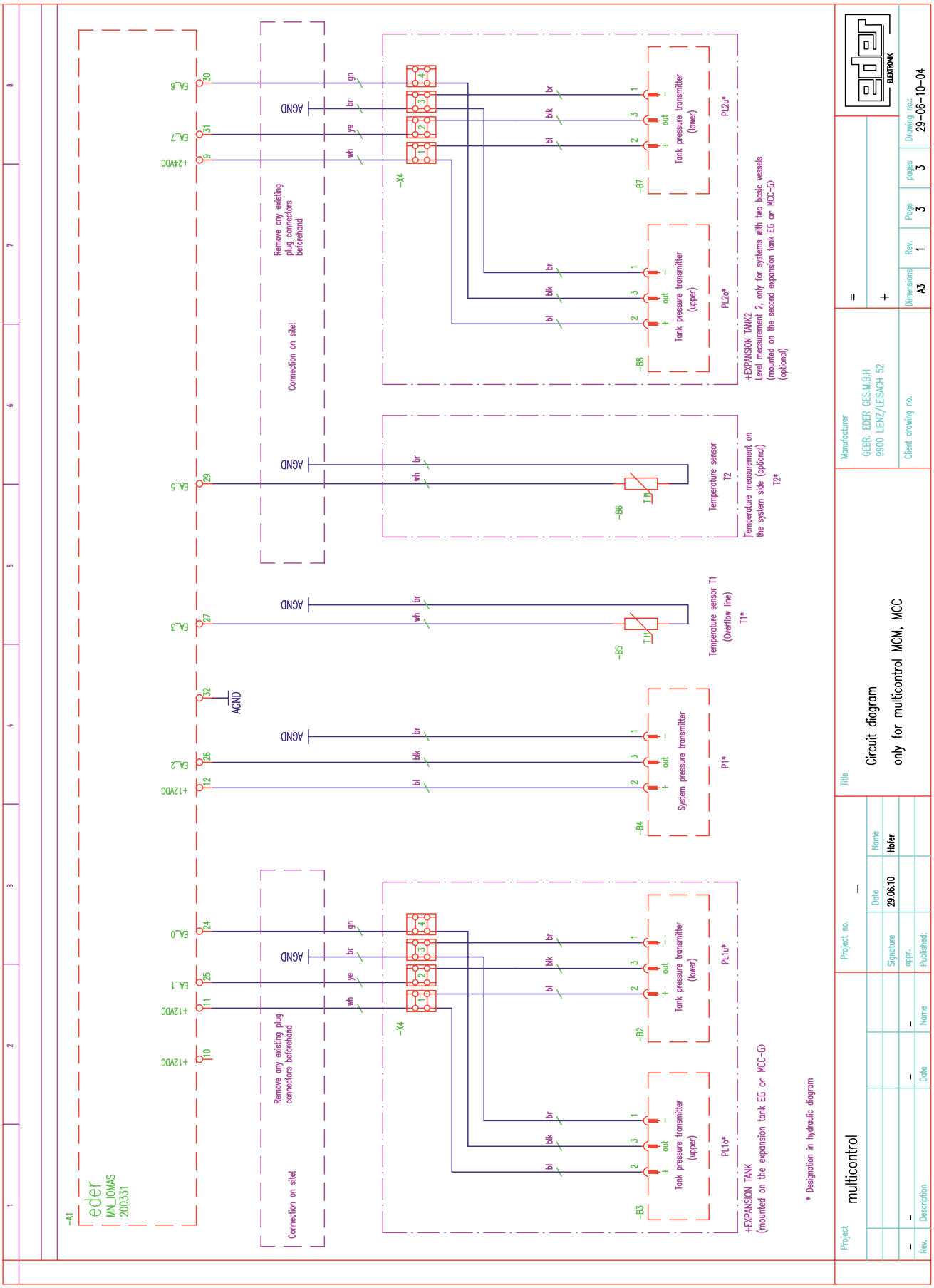
6.2. MultiControl EMCK, EMCM-_1



6.3. MultiControl EMCK



6.4. MultiControl EMCM



6.5. Legend - MultiControl EMCK and EMCM-_1

DESIGNATION	DESCRIPTION
-A1	Control electronics: MultiControl motherboard, type 200331
-A2	Depending on the device version: Control electronics: Processor board MULTICONTROL, type ABCO10 Control electronics: Touchscreen operating unit, type BCE49
-S1	Motor pump 1: Thermal protection (integrated in the motor)
-S2	Motor pump 2: Thermal protection (integrated in the motor) (option)
-M1	Motor pump 1
-M2	Motor pump 2 (option)
-Y1	EMCF backfeed module: Solenoid valve (option)
-B1	EMCF backfeed module: Water meter pulse output (option)
-B2	Vessel pressure transmitter bottom (PL1u*)
-B3	Vessel pressure transmitter top (PL1o*)
-B4	System pressure transmitter (P1*)
-B5	Temperature sensor (T1*), sensor element KTY10-6 or compatible
-B6	Temperature sensor (T2*), sensor element KTY10-6 or compatible
-B7	Vessel pressure transmitter bottom (PL2u*) (option)
-B8	Vessel pressure transmitter top (PL2o*) (option)
-X4	Connection clamp

* Designation in hydraulic diagram

7. COMMISSIONING

7.1. Putting the device into operation

CAUTION
Commissioning of the device by the Spirotech factory customer service or an authorised partner, including training of the operating personnel of the system, is mandatory!

Proceed as follows when commissioning the MultiControl Compact and MultiControl Modular:

CAUTION
Steps 1-3 represent work to be carried out on site in preparation for commissioning.

Step 1:
Determination of the upper and lower working pressure. The upper working pressure is also the set pressure at the overflow valve.

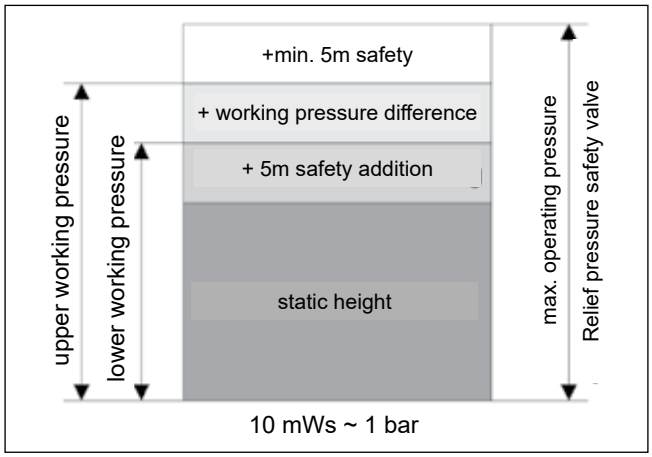


Figure 18: Determination of upper and lower working pressure

Step 2:
Shut off the lines from/to the system (expansion overflow line, expansion pressure line, fresh water supply).

CAUTION
But DO NOT shut off the suction line and overflow line at EMCM-_1!

Step 3:
Fill and ventilate the system to the upper working pressure determined in step 1.

Step 4:
Check the hydraulic and electrical connections for correctness, especially the expansion pressure and expansion overflow line and flow direction at the point of integration.

Step 5:
Open the fresh water supply to the MultiControl on the EMCF backfeed module and set the pressure reducer to 1.5 bar to max. 2.0 bar.

Version A: Loosen the fixing screw (1) and set the pressure reducer to 1.5 bar - max. 2.0 bar. Then tighten the screw again to fix the setting of the pressure reducer.

Version B: The setting is made using the adjusting dial (2). If the EMCF backfeed module is installed at the factory, this is already set, see sealing strip on the valve (3).

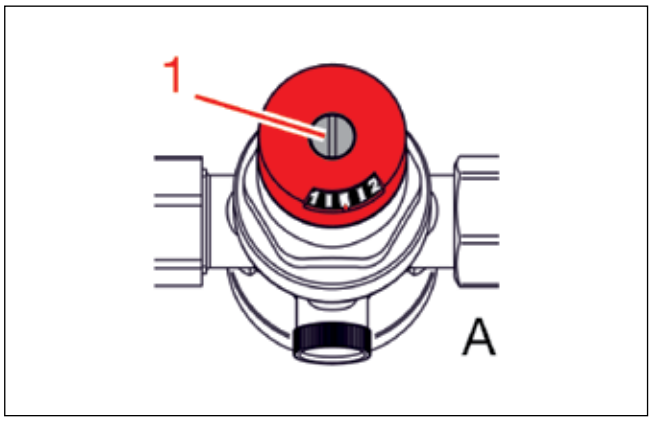


Figure 19: Pressure reducer on MCF version A

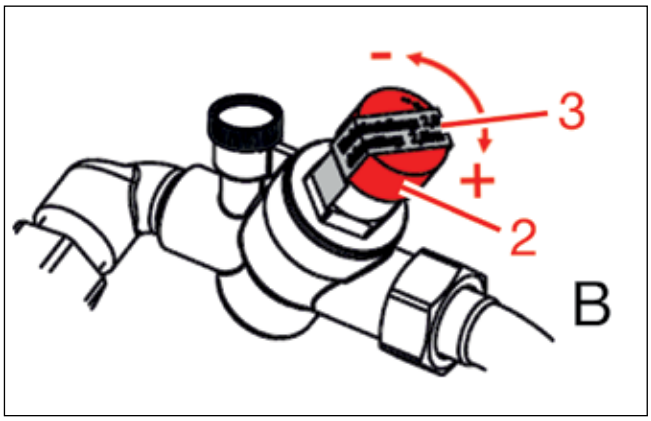


Figure 20: Pressure reducer on MCF version B

Step 6:
Switch on the power supply and check whether the device function is deactivated. If necessary, switch off the device function using the activate device function button (system ON/OFF).

Step 7:
Settings in the device setup allow the touchscreen operating unit to be customised to the components in the device and its range of functions. Some of the settings possible in the device setup have already been preconfigured in the factory. Further settings are made during commissioning or, if necessary, in the course of a component extension or component replacement (service/maintenance). Device setup: see touchscreen operating unit operating instructions, menu "Settings" "Device set-up".

NOTE
For device set-up, see "Touchscreen operating unit operating instructions".

Step 8:
Filling and venting the pressurising pump(s) and the piping
- Fully open the shut-off valves on the pump suction side (1) (are open ex works).
- Remove the filler hole plug (2).

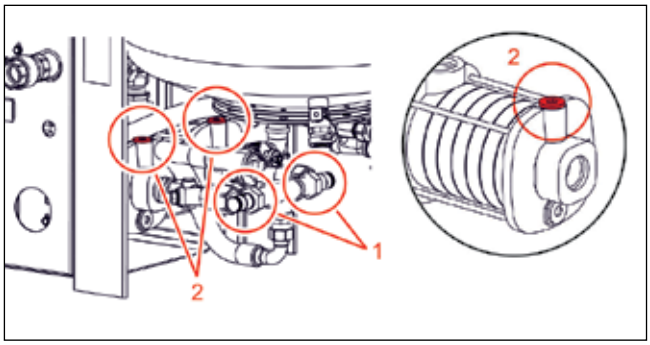


Figure 21: Venting the pressure maintenance pumps

- With the EMCF backfeed module installed, switch to manual mode (operating level 3: Manual mode -> Outputs). Switch on the "backfeed valve" output and fill the tank with it until a continuous jet of the system medium emerges from the pump's vent valve, then set the "backfeed valve" output back to automatic mode (Auto "1"). As a guideline, a vessel level of approx. 30-40% can be assumed here, at which the pump should be filled. During this filling process, the vessel level can be monitored in the basic display.
-

NOTE
Shut off all expansion tanks except the first main vessel beforehand to speed up the filling process.

- For devices without a built-in backfeed module, the system must be filled until the container is filled via the overflow valve and a continuous jet of the system medium emerges from the filling hole of the pump. If necessary, reduce the factory-set upper working pressure at the pressure stabilising valve beforehand if the pressure in the system would otherwise rise too high (higher than the desired upper working pressure).
- Then switch the pressure maintenance pump on and off a few times in manual mode to achieve complete venting of the pump chambers ("Test" pump 1).
- Reinsert and tighten the plug in the filler hole of the pump (2).
- For devices with 2 pressure maintenance pumps (Duo and Maxi models), repeat the above steps for the second pump (pump 1 = left, pump 2 = right).
- Then open the emptying tap in the pipework (to the right of the overflow valve) and switch the pumps on and off manually a few times to ensure that the pipework is completely vented. Then close the vent tap again.

Step 9:
Once the basic configuration has been completed and the pump(s) have been vented, switch on the device function using the activate device function button (system ON/OFF).

Step 10:
Depending on the working pressure to be set, it may be necessary to adjust the pressure maintenance pump(s) on the pressure side (characteristic curve-dependent increase in delivery rate with decreasing pressure). An indication that adjustment is necessary may be, for example, if the overflow valve only closes completely at more than approx. 0.5 bar below the upper working pressure after the pump(s) have been switched off.

CAUTION
The pressurising pump(s) must always be adjusted before the working pressure is set. After this, neither the working pressure nor the adjustment may be changed! If the pump(s) are subsequently adjusted, the working pressure must be set again.

Step 11:
Set the working pressure:
- Open the shut-off valves from/to the system (expansion overflow pipe, expansion pressure line, fresh water). Depending on the size of the system, the pressure setting can take a long time, as the pressure must be propagated throughout the entire connected system in order to be sufficiently stable for the setting.
- Switch to operating level 3.

CAUTION
The connection from/to the system must be guaranteed for adjustment!

- Select "Settings" -> "Pressure maintenance" -> "Working pressure".
- The current setting is displayed; it corresponds to the last set working pressure (e.g. factory-set default values).

CAUTION
Depending on the values displayed, the working pressure must always be set again during commissioning!

- After pressing the "CHANGE" button and confirming with "YES", the pump starts and the working pressure setting is active.
- Set the overflow valve to the upper working pressure determined in step 1. The currently measured pressure is displayed on the touchscreen of the Touchscreen operating unit.
  Target value adjustment on the valve with black handwheel (Solo and Maxi) or with hexagon nut (SW 19) on the spring disc (Duo) clockwise = higher pressure, anti-clockwise = lower pressure.

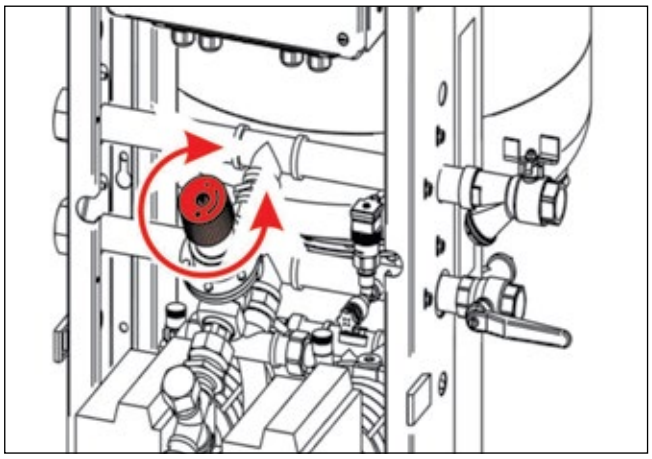


Figure 22: Target value adjustment for Solo and Maxi devices

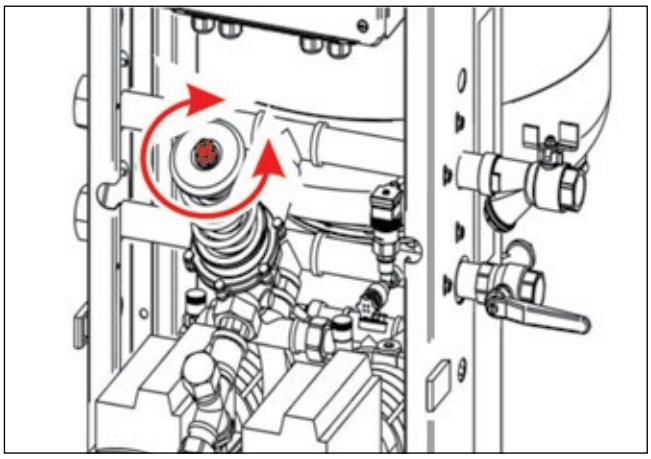


Figure 23: Target value adjustment Duo devices

- For devices with two overflow valves (twin), the valves must be set individually one after the other. To do this, shut off one valve with the respective shut-off valves and set the pressure on the other valve. Then shut off the valve that has already been set, open the second valve and repeat the above steps (set both valves to the same pressure!).
- Once the working pressure has been adjusted to the desired value and has stabilised, set the switching differential and accept the pressure setting using the OK button.

CAUTION
With twin devices, only one overflow valve may be in operation at any one time; the other must be shut off on the inlet side. If both overflow valves are operated at the same time, the control behaviour of the valves can be negatively influenced by each other (e.g. working pressure difference too large); this must therefore be avoided!

Step 12:
If the EMCF backfeed module is installed, the operating mode of the backfeed module must be selected. This operating mode depends on various factors, such as the size of the system, the age of the system, any known leaks, etc.

In the case of known regular leaks (e.g. if it is known that a certain quantity needs to be refilled within a certain time), we recommend the "Time-controlled" operating mode.

The description of the possible EMCF operating modes can be found in the operating instructions for the touchscreen operating unit.

Step 13:
The device is ready for operation.

The shut-off valves in the pipes from/to the system must be secured against unintentional closing (e.g. remove handles...).

Further settings (e.g. softening EMWE, operating modes, etc.) can be made in the "Settings" menu of the touchscreen operating unit.

NOTE
A detailed description of the function, operation, menu structures and display of the touchscreen operating unit can be found in the separate operating instructions.

8. CLEANING AND MAINTENANCE

8.1. Cleaning

During operation, dirt particles are separated from the system at the built-in strainer. These impurities are gathered in the strainer and are consequently lead to the reduced passage of the strainer. This may cause problems with the function of the device.

CAUTION
If problems with contamination occur frequently or constantly, further measures should be considered for the system (e.g. replacement and flushing of the system contents, installation of additional filters or sludge separators, etc.). These measures have a positive effect on all installed devices with direct contact with the medium, not just the pressurisation system.

The dirt particles separated by the strainer must therefore be removed at regular intervals by removing and cleaning the strainer screen. This inspection and cleaning of the strainer must be carried out at least twice a year! However, if there are any problems with the function of the device, the strainer must be cleaned first of all!

Problems and malfunctions caused by failure to clean the strainer as prescribed are excluded from any warranty claims.

8.2. Maintenance

The device must undergo maintenance at least once a year or when a warning "W03" is displayed! Carrying out this maintenance is the responsibility of the operator.

CAUTION
If the operator of the system is unable or unwilling to carry out this annual maintenance, appropriate specialist personnel or the Spirotech factory customer service must be commissioned to do so.

NOTE
It is recommended that maintenance is carried out by the Spirotech customer service centre. The conclusion of a maintenance contract is highly recommended.

Problems or malfunctions caused by non-compliance with the prescribed maintenance intervals or lack of maintenance are excluded from any warranty.

Work to be carried out in the course of maintenance:

- Check and document whether the regular cleaning according to 9.1 is carried out and document when this was last done; Carry out cleaning in any case!
- Ask the operator and document whether any abnormalities or problems have occurred since the last maintenance. These must be rectified if necessary!
- Check the check valve(s) for correct closure.
- Check the overflow valve for correct function and correct closing.
- Desludging: Connection (1) on the lower container flange or in the overflow pipe on the container.
- Open the drain (2) outside the membrane and drain any medium present. If fluid is constantly leaking, the diaphragm may be defective: check!
- Flush the connection (3) of the vessel pressure transmitter; Open the black plastic stopper and rinse out of the container until any impurities have been rinsed out. Then close the plug again.

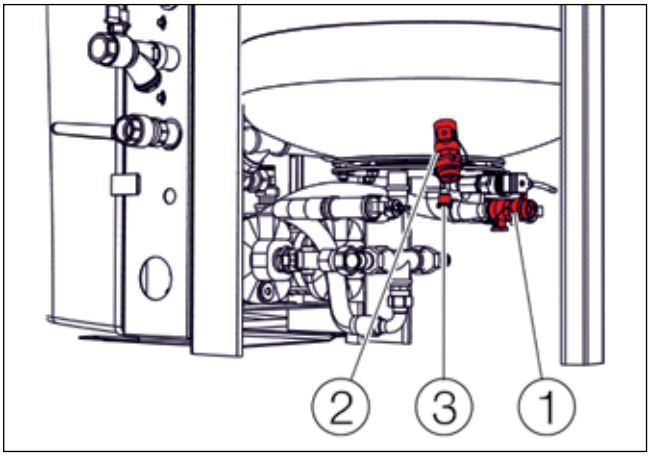


Figure 24: Maintenance of the containers

9. SPARE PARTS LIST

9.1. Bonnet and expansion vessel

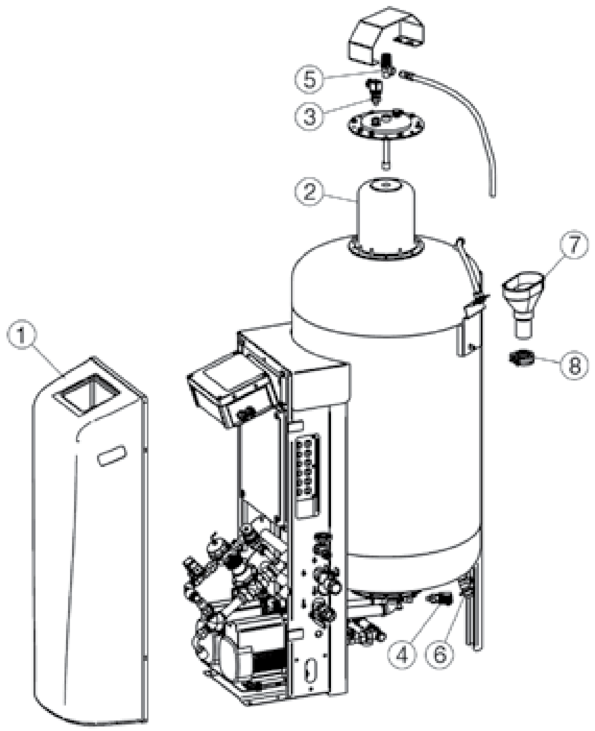


Figure 25: Spare parts hood and expansion vessel

POS.	DESIGNATION	SPARE PART ART. NO.						
		EMCK-S45-__ EMCK-D45-__ EMCK-M45-__	EMCK-S75-__ EMCK-D75-__ EMCK-M75-__	EMCK-S125-__ EMCK-D125-__ EMCK-M125-__	EMCK-S200-__ EMCK-D200-__ EMCK-M200-__	EMCK-S300-__ EMCK-D300-__ EMCK-M300-__	EMCK-S500-__ EMCK-D500-__ EMCK-M500-__	EMCM-S1-__ EMCM-D1-__ EMCM-M1-__
1	MultiControl plastic hood, incl. 4 snap fasteners (2 pieces each)	E90918						
2	Membrane	E90429	E90430		E90480	E90481	E90450	-
3	Vessel pressure transmitter top	E90141						-
4	Vessel pressure transmitter bottom	E90141						-
5	Safety valve 0.5 bar	E90596						-
6	Emptying tap ½" - ¾"	E90915						-
7	Drain funnel 50	E90916						-
8	Fixing clamp for drain funnel 50	E90917						-

9.2. Piping

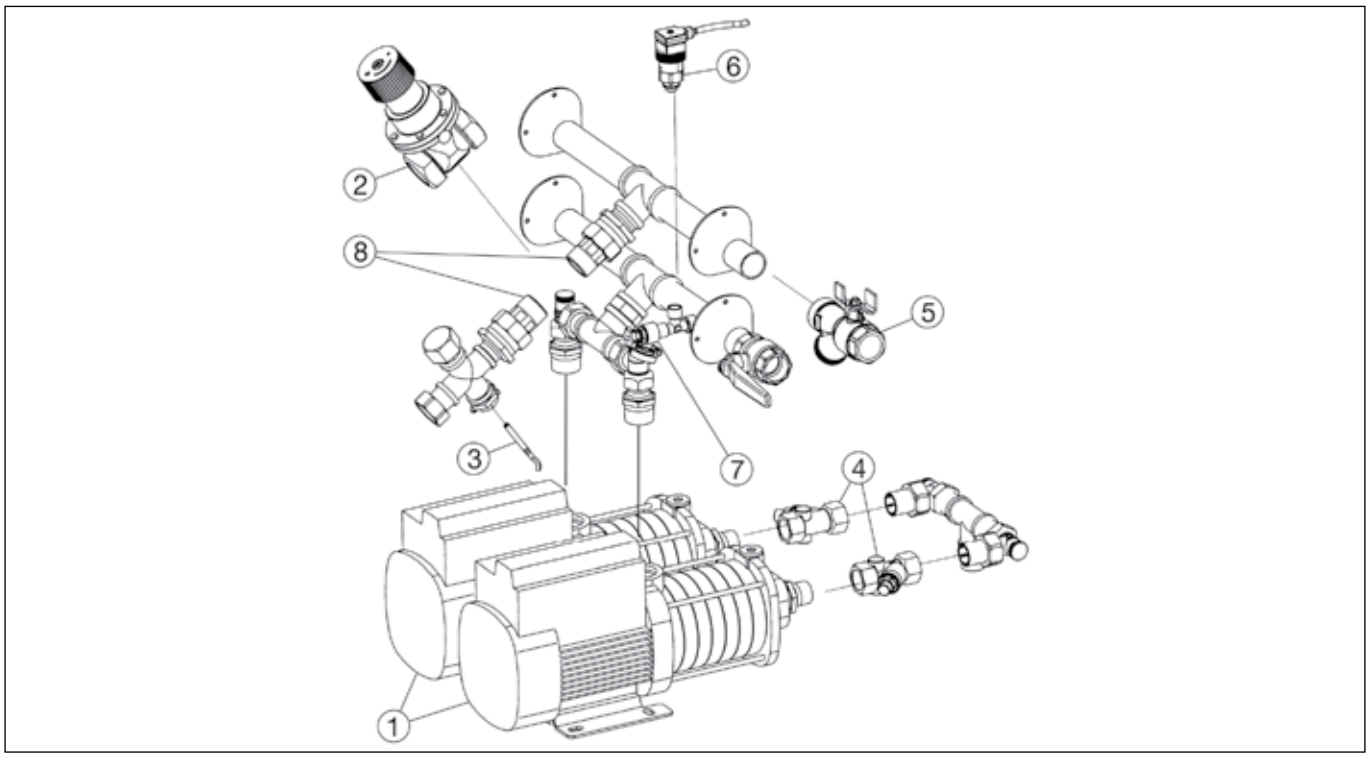


Figure 26: Spare parts piping

POS.	DESIGNATION	SPARE PART ART. NO.									
		EMCK-S __-4.0 EMCM-S1-4.0	EMCK-S __-5.6 EMCM-S1-5.6	EMCK-S __-8.1 EMCM-S1-8.1	EMCK-D __-4.0 EMCM-D1-4.0	EMCK-D __-5.6 EMCM-D1-5.6	EMCK-D __-6.6 EMCM-D1-6.6	EMCK-D __-8.1 EMCM-D1-8.1	EMCK-M __-4.0 EMCM-M1-4.0	EMCK-M __-5.6 EMCM-M1-5.6	EMCK-M __-8.1 EMCM-M1-8.1
1	Pump - CM 1-7 (-4.0 + -5.6)	E90909		-	E90909		-	-	E90909		-
1	Pump - CM 1-8 (-6.6)	-		-	-		E90910	-	-		-
1	Pump- CM 1-10 (-8.1)	-		E90957	-		-	E90957	-		E90957
2	Overflow valve	E90011	E90603	E90604	E90650	E90121	E90121	E90115	E90011	E90603	E90604
3	Temperature sensor for MC	E90911									
4	Angle seat check valve	E90547									
5	Strainer, 1", can be shut off	E90912									
6	System pressure transmitter	E90140									
7	Emptying ¼" - ¾"	E90914									
8	Overflow valve - screw connection 1" AG - 5⁄4" IG, flat sealing	E90913									

9.3. Electronics

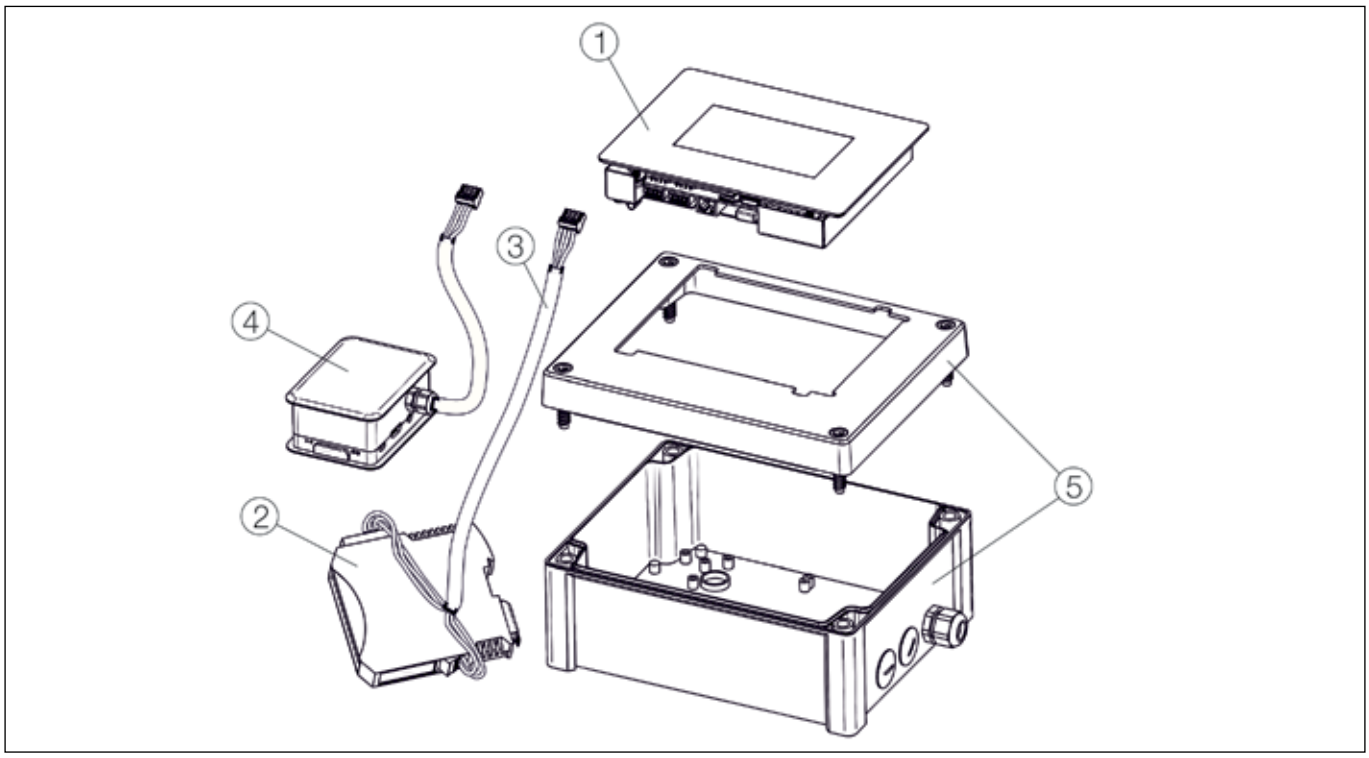


Figure 27: Spare parts operating housing

POS.	DESIGNATION	SPARE PART ART. NO.
		EMCK-_ __-__ EMCM-_ 1-__
1	Touchscreen operating unit, type BCE49, incl. shielding plate	E90996
2	MultiControl Bus Module Profibus	(optionally available as an accessory)
2	MultiControl Bus Module Modbus RTU RS485	(optionally available as an accessory)
2	MultiControl Profinet Bus Module	(optionally available as an accessory)
2	MultiControl Bus Module Modbus TCP	(optionally available as an accessory)
3	Connection cabling for bus module	(included in the scope of delivery of the bus module)
4	MultiControl web module	(optionally available as an accessory)
5	Touchscreen operating unit - MultiControl operating housing (base + cover), machined, empty	E90997

CAUTION
Simultaneous use of bus module and web module is not possible!

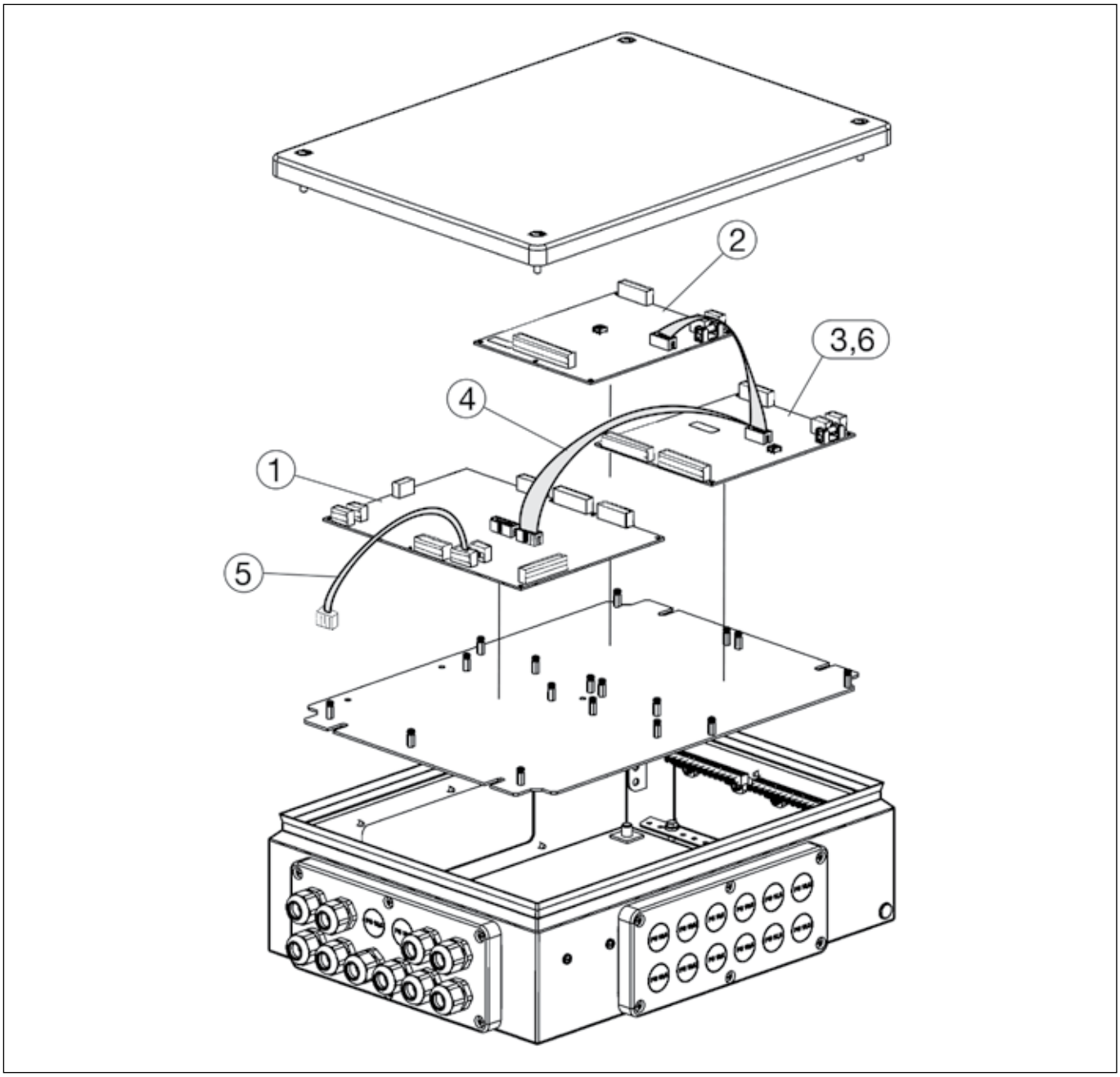


Figure 28: Spare parts switch cabinet

POS.	DESIGNATION	SPARE PART ART. NO.
		EMCK-_ _-_ _ EMCM-_ 1-_ _
1	Print - MultiControl motherboard, type 200331	E90903
2	Print - "Analogue remote signalling" expansion module	E90624
3	Print - "Binary remote signalling" expansion module	E90625
4	Connection cable motherboard-expansion board, 10-pole, 3 connectors	E90965
5	Connection cable 4-pole, shielded Motherboard operating unit, without plug	E90994
6	Print - Expansion module "Binary remote signalling & remote acknowledgement"	E90626

9.4. EMCF-1 backfeed module

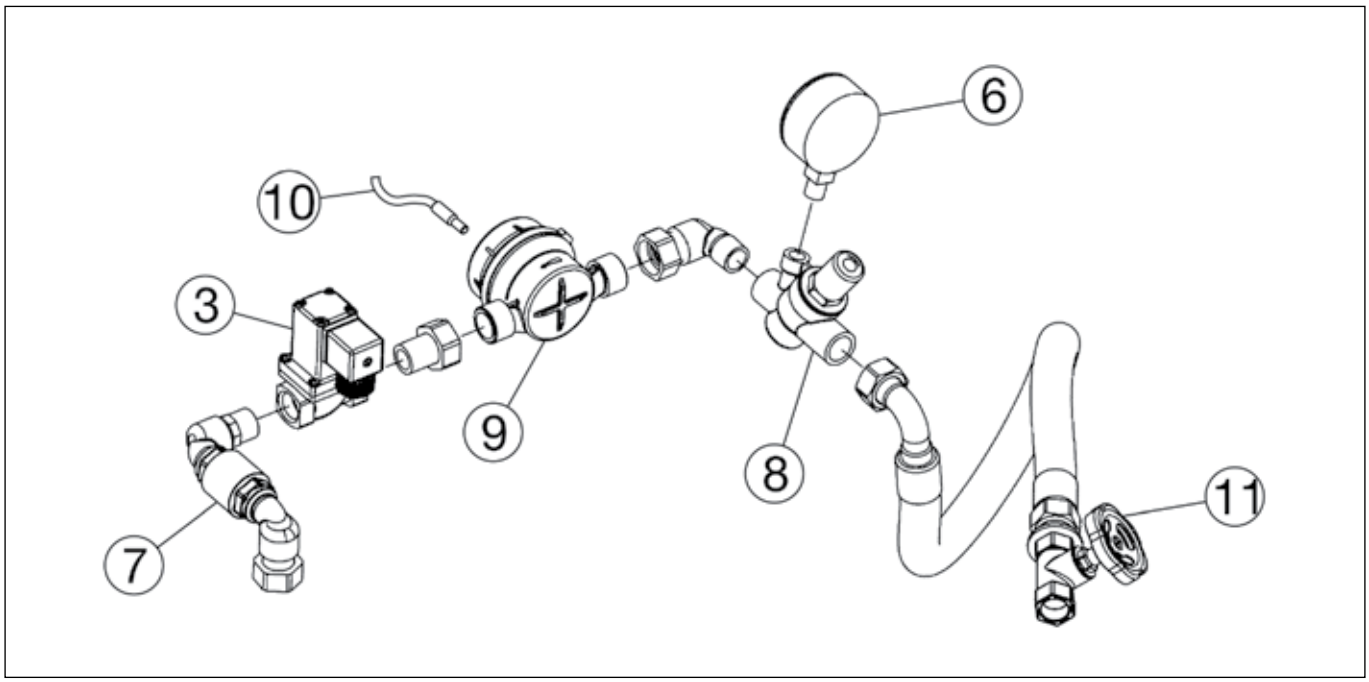


Figure 29: Spare parts backfeed module EMCF-1

POS.	DESIGNATION	SPARE PART ART. NO.
		EMCF-1
3	Solenoid valve	E90575
6	Pressure gauge - for EMCF (optional depending on version)	E90908
7	Check valve	E90620
8	Pressure reduction valve, ½", type D05 version B	E90952
9	Water meter 1.5 m^3/h, version B	E90950
10	Water meter contact module 1 litre/pulse plug-in, for meter version B	E90949
11	Flow valve with handwheel, ½"	E90694

10. CERTIFICATES

10.1. CE declarations of conformity

CE

EG-Konformitätserklärung
EC Declaration of Conformity

EDER

im Sinne der Richtlinie(n):	**in accordance with the directive(s):**
- 2006/42/EG über Maschinen	- 2006/42/EC on machinery
- 2014/30/EU über die elektromagnetische Verträglichkeit	- 2014/30/EU relating to electromagnetic compatibility
- 2014/35/EU über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt	- 2014/35/EU relating to the making available on the market of electrical equipment designed for use within certain voltage limits
- 2011/65/EU Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS 2) gemäß Anhang II (gültig ab 22.07.2019) nach Änderungen der Richtlinie (EU) 2015/863	- 2011/65/EU use of certain hazardous substances in electrical and electronic equipment (RoHS 2) as per Annex II (valid from 22 July 2019) acc. to the amendments of the directive (EU) 2015/863

Der Hersteller	**The manufacturer**

Eder Spirotech GmbH
Leisach 52
A - 9909 Leisach

erklärt hiermit, dass das Produkt	**declares hereby, that the product**

multicontrol kompakt MCK

mit dem (optionalen) Zubehör		**with the (optional) accessories**
Nachspeisemodul	multicontrol MCF	makeup module

entwickelt, konstruiert und gefertigt wurde in Übereinstimmung mit der/den oben genannten Richtlinie(n).	**has been developed, designed and manufactured in compliance with the above listed directive(s).**

Folgende harmonisierten und nationalen Normen und Spezifikationen sind angewandt:	**The following harmonised and national standards and specifications have been applied:**

- ÖNORM EN ISO 12100:2013
- ÖVE EN 60204-1:2019
- EN 61000-6-2:2005
- EN 61000-6-3:2007 +A1:2011 +AC:2012
EN 61326-1:2013
EN 61000-3-2:2014
EN 61000-3-3:2013
ÖNORM EN 60335-1:2012 + AC:2014
ÖVE ÖNORM EN 60730-1:2012

Leisach, 03.02.2022
Ort, Datum

Ing. Hans Jacobs, Geschäftsführer
Unterschrift

EG-Konformitätserklärung
EC Declaration of Conformity

im Sinne der Richtlinie(n):

- 2006/42/EG über Maschinen

- 2014/30/EU über die elektromagnetische Verträglichkeit

- 2014/35/EU über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt

- 2011/65/EU Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS 2) gemäß Anhang II (gültig ab 22.07.2019) nach Änderungen der Richtlinie (EU) 2015/863

in accordance with the directive(s):

- 2006/42/EC on machinery

- 2014/30/EU relating to electromagnetic compatibility

- 2014/35/EU relating to the making available on the market of electrical equipment designed for use within certain voltage limits

- 2011/65/EU use of certain hazardous substances in electrical and electronic equipment (RoHS 2) as per Annex II (valid from 22 July 2019) acc. to the amendments of the directive (EU) 2015/863

Der Hersteller / **The manufacturer**

Eder Spirotech GmbH
Leisach 52
A - 9909 Leisach

erklärt hiermit, dass das Produkt / **declares hereby, that the product**

multicontrol modular MCM

mit dem (optionalen) Zubehör / **with the (optional) accessories**

Expansionsgefäß	elko-mat eder EG-M	expansion vessel
Nachspeisemodul	multicontrol MCF	makeup module
Entgasungsmodul	multicontrol MAE	degassing module

entwickelt, konstruiert und gefertigt wurde in Uber-einstimmung mit der/den oben genannten Richtlinie(n).

has been developed, designed and manufactured in compliance with the above listed directive(s).

Folgende harmonisierten und nationalen Normen und Spezifikationen sind angewandt:

The following harmonised and national standards and specifications have been applied:

- ÖNORM EN ISO 12100:2013
- ÖVE EN 60204-1:2019
- EN 61000-6-2:2005
- EN 61000-6-3:2007 +A1:2011 +AC:2012
EN 61326-1:2013
EN 61000-3-2:2014
EN 61000-3-3:2013
ÖNORM EN 60335-1:2012 + AC:2014
ÖVE ÖNORM EN 60730-1:2012

Leisach, 03.02.2022
Ort, Datum

Ing. Hans Jacobs, Geschäftsführer
Unterschrift

11. APPENDIX

11.1. Sizing the expansion line

Expansion lines are pipes that connect the system to the expansion and pressure maintenance system.

NOTE
The design criterion is the nominal heat output to be dissipated, the maximum operating temperature and the flow velocity according to ÖNORM H 5151-1:2010 12 15.

Extract from ÖNORM H 5151-1:2010 12 15:

11.2.3.2 Sizing the expansion line (expansion line).

The following points must be observed when sizing the expansion line:

- The nominal heat output of the heat supply system applies to the sizing of the expansion line.
- For systems with a nominal heat output of less than 500 kW, the minimum nominal diameters can be retrieved from the adjacent table.

DN	NOMINAL HEAT OUTPUT IN KW
20	up to 120
25	over 120 to 500

Minimum nominal diameter of expansion lines

The maximum flow velocity in the expansion line must not exceed 0.15 m/s.

NOTE
If the heat supply and heat distribution systems are separated, there may be a small volume of water in the heat supply system. It may therefore be necessary to size the expansion line using the maximum flow velocity.

The calculation of the flow velocity in the expansion line must be based on the percentage temperature-dependent increase in volume V_e from the filling water temperature (10°C) to the protection temperature θ_{TZ} and the total content of the system V_A.

The heating time t_A, which is required to reach the safety temperature θ_{TZ} and the total volume of the system V_A, is calculated according to equation A:

$$t_A = \frac{(V_A \cdot \Delta\theta_{TZ} \cdot c_W \cdot \rho_W)}{\Phi_N}$$

c_w	spec. heat capacity of heating water at θ_{TZ}	[kJ/(kg . K)]
ΦN	Nominal heat output	[kW]
ρ_w	Density of the heating water at θ_{TZ}	[kg/m³]

Equation A

The expansion volume flow V_e is calculated according to equation B:

$$\dot{V}_e = \frac{V_e}{t_A \cdot 1000}$$

Equation B

The calculation inner diameter of the expansion line is calculated according to equation C:

$$d_{AI} = \sqrt{\frac{4 \cdot \dot{V}_e}{\pi \cdot v}} \cdot 1000$$

Equation C

The next larger nominal pipe diameter must be selected. The maximum pressure loss in the expansion line must not exceed 1 kPa.

CAUTION
Within the pressure maintenance system (overflow line, suction line), the manufacturer decides which flow velocities ensure problem-free functioning of the pressure maintenance system.
The maximum flow velocities are therefore 0.75 m/s in the overflow line and 0.50 m/s in the suction line.

11.2. Details on connecting EMCM with EP-R(S)

Devices in the MultiControl Modular series do not have an attached expansion vessel; the expansion volume is stored in expansion vessels from the EP-R series, with the EP-RS expansion vessel serving as a possible extension.

The individual devices must always be connected in accordance with the required hydraulic connection diagram in chapter 5.

To ensure proper functioning of the pressurisation system, the following instructions must be observed when connecting the EMCM to the EP-R(S)!

Ensure that the respective connections are connected correctly!
EP-R(S) expansion vessels have internals on the lower vessel flange that are required for proper degassing function.

Therefore, the overflow line of the EMCM control unit must always be connected to the overflow line on the expansion vessel. This must also be observed for the suction line!

NOTE
- EMCM overflow line = EP-R overflow line
- Suction line EMCM = Suction line EP-R

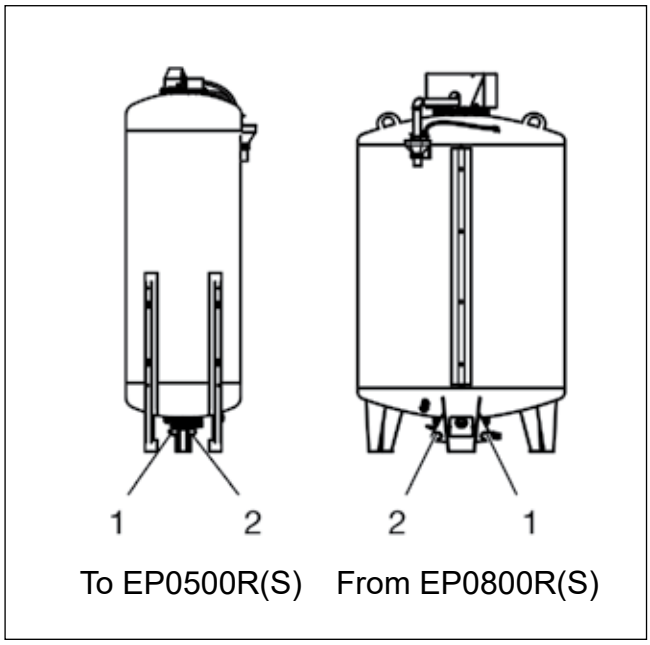


Figure 30: Overflow line (1) and suction line (2) from EG(Z)-M

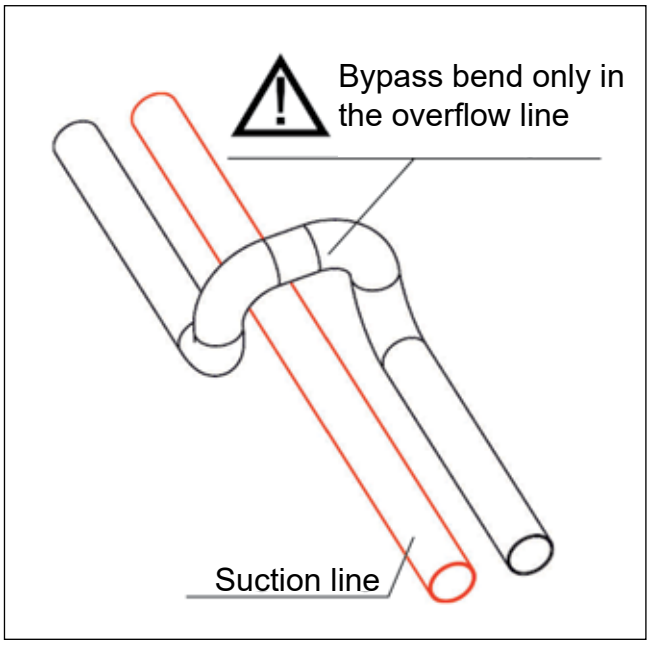


Figure 31: Laying the suction line

Laying the suction line

In some cases, it may be necessary to cross the overflow line and the suction line in order to connect the EMCM and EP-R(S) correctly. It is important to ensure that the suction line is laid without constant differences in level.

If level differences between the EMCM and EP-R(S) cannot be avoided, it must at least be ensured that the suction line from the EMCM to the EP-R(S) is routed upwards.

CAUTION

Avoidance bends, jump bends etc. required for the crossing may only be implemented in the overflow line. To ensure problem-free level compensation between the individual vessels, the suction line and overflow line must be laid close to the floor along their entire length!

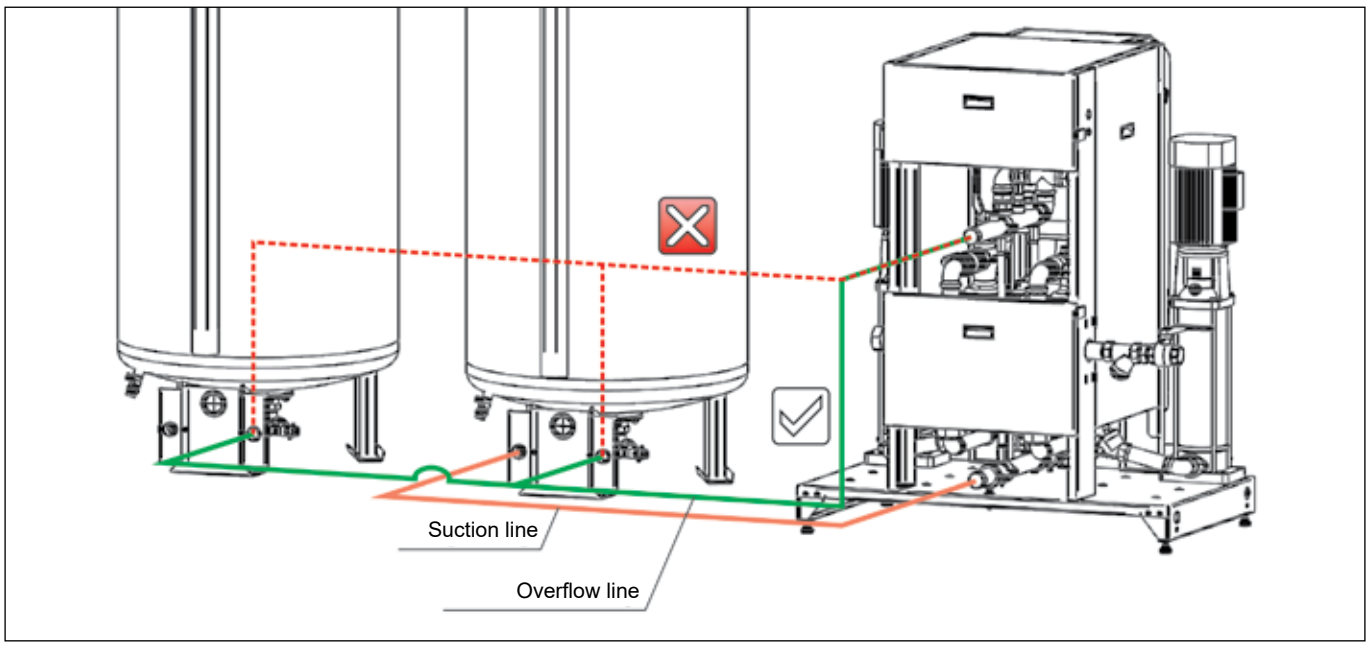


Figure 32: Laying the suction line and overflow line

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