

ANTON EDER GMBH

Weyerstraße 350

A-5733 Bramberg

www.eder-heizung.at



MULTICONTROL

MCK, MCM-_1 (-twin)

Instruction manual

eder

BETTER HEATING. SAFE BET.

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 NOTE!

Figures in this document can vary due to model and configuration of the delivered multicontrol device.

 INFORMATION!

This document refers to multicontrol series devices with software version V1.22. Design and operation can vary slightly due to the existing software version.

Disclaimer

We improve our products permanently and so we reserve the right to make modifications anytime and without previous announcements. We do not assume any guarantee for the correctness and completeness of this document.

Any claims, particularly claims for damages and loss of profit or financial losses must be excluded!

1. General

1.1 Tender text

multicontrol kompakt MCK resp. multicontrol modular MCM for lossless storage of the expansion volume and for pressure maintenance in closed heating, climate and cooling systems. Designed and manufactured acc. to regulations of EN 12828 and SWKI 93-1.

The control unit is built very compact with one resp. two low-noise pressure maintenance pump(s) (model Solo 1x100%, model Duo 2x50%, model Maxi 2x100%) which is/are executed as multistage centrifugal pump(s) with high quality floating-ring type shaft seal. Also the multicontrol hydraulics includes one resp. two continuously regulating, mechanically set overflow valve(s) (models Solo, Duo and Maxi 1x100% of the expansion flow, models Duo-twin and Maxi-twin 2x100%). High-precision measuring of the plant pressure. Hydraulic connections and necessary shutoff devices for on-site piping are factory-provided on the right side of the control unit (possibility for rebuilding to the left side of the control unit). Temperature monitoring of the media streaming into the vessel. Prepared connection point for mounting a make-up module for litre accurate measuring. Combinable with water softening for standardized make-up water.

All operations are controlled by the microprocessor electronics. The operator panel is situated ergonomically and contains a illuminated 4-line text display. The handling is thought-out and a lot of languages are supported. The measure- and control unit is executed in a closed electrical cabinet. Four potential-free signalling contacts (fault, warning, makeup in operation, device operation enabled).

For more signals two additional expansion modules can be installed easily in prepared mounting positions. Remote monitoring can be done also via multicontrol SMS-module or multicontrol bus module.

multicontrol series devices are equipped by default with integrated economic low-pressure degassing, based on the principle of pressure drop. External temperature monitoring via an optional temperature sensor at the connection point is prepared too.

multicontrol kompakt:

The multicontrol MCK device is a nicely shaped, self-contained unit with a pleasing design and a built-on expansion vessel (100% usable volume). High quality vessel membrane (exchangeable due to flanges on both sides) for best possible separation of plant media and atmosphere. Two vessel pressure transmitters for level measurement. The expansion vessel also contains a safety valve 0.5 bar for vessel safeguarding and an ex-works pre-assembled discharge hopper. A blow off and elutriation valve is situated at the lower vessel flange.

multicontrol modular:

The multicontrol MCM device is a nicely shaped, self-contained unit with a pleasing design. It is designed for a modular combination with external expansion vessels (max. 0.5 bar). The connections for suction pipe and overflow pipe are situated at the back of the device.

max. operation temperature of the plant: 110 °C (with EV cooling vessel)

max. temperature at the connection point: 70 °C

max. operating pressure (PN): 10 bar

2. Mounting

2.1 Installing the device

The multicontrol device must be installed on a horizontal and solid floor. The implementation into the system return must be executed acc. to the hydraulic diagrams in chapter 3 - "Hydraulic diagrams".

multicontrol kompakt MCK and multicontrol modular MCM devices can be used in plants with max. temperature of 70 °C at the connection point. If the max. temperature at the connection point exceeds 70 °C, EV cooling vessels must be installed! See chapter 2.6 - "Usage of EV cooling vessels".

The implementation into the system return must be done at a position where no external pressures can occur. External pressures could affect the trouble-free operation of the pressure maintenance device.

INFORMATION!

We recommend to install the multicontrol device with a dimension of at least DN 25.

The dimension of the expansion pipe is determined acc. to the standard ÖNORM H5151-1. See Appendix A

2.2 Makeup module multicontrol MCF-1

Ex works multicontrol kompakt MCK and multicontrol modular MCM series devices are delivered without makeup module MCF. The mounting of the module is done acc. to the assembly instruction which is delivered with the makeup module.

2.3 Changing the positions of the hydraulic connections

Ex works the connections from/to system return at multicontrol kompakt MCK and multicontrol modular MCM are situated at the right side of the device. If necessary, they can be built to the left side easily. Unused connections must be closed by using the delivered caps.

The connections from/to expansion vessel (only in MCM) are situated on the back of the control unit.

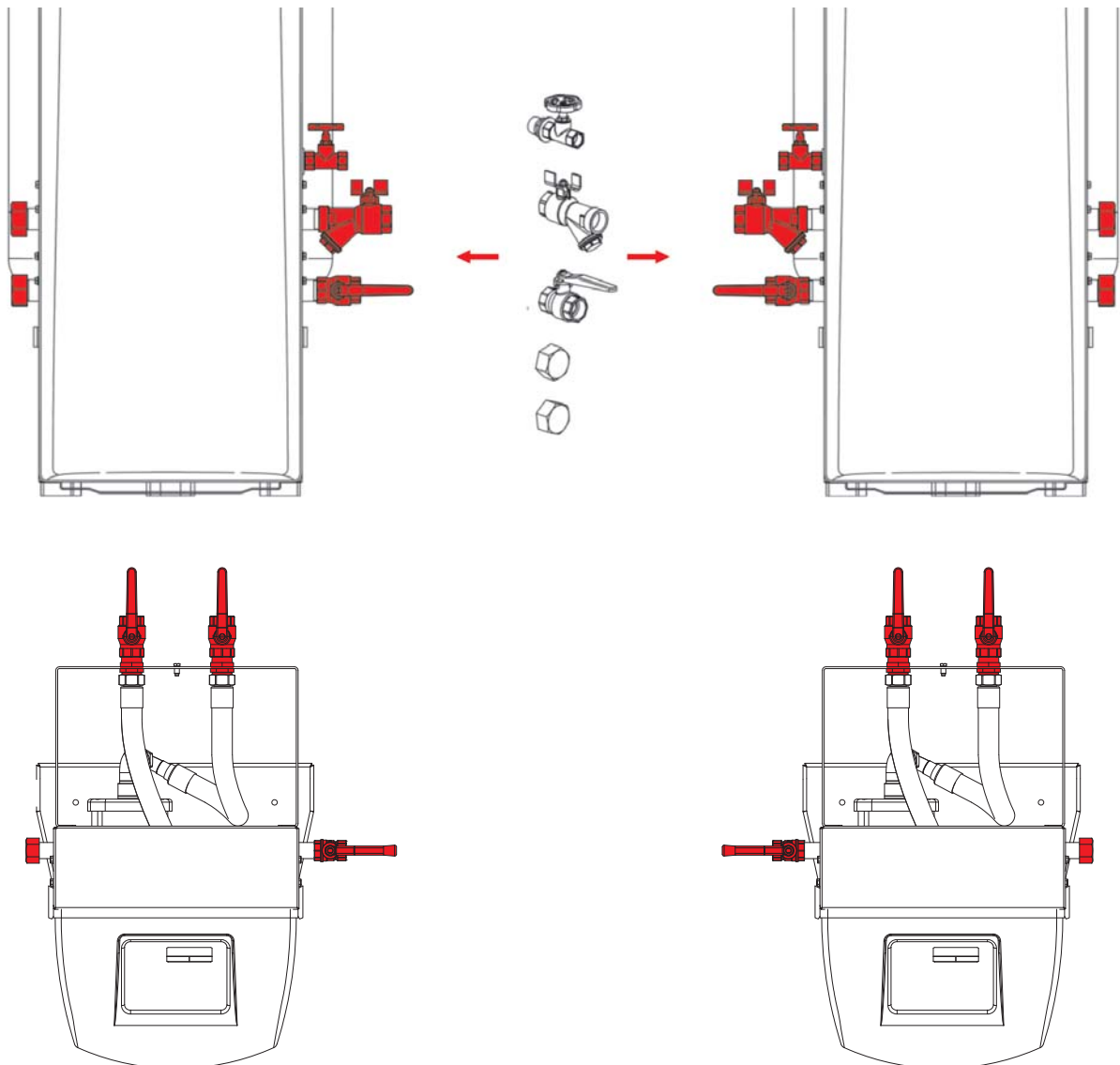


figure 1: Changing the positions of the hydraulic connections

The electric connections (pre-cut cable bushings in gland plate) are also situated at the right side of the device. If necessary they can also be built to the left side (figure 2a).

The opening on the other side must be closed by using the blank flange, which is at the left side of the electronic unit (figure 2b)!

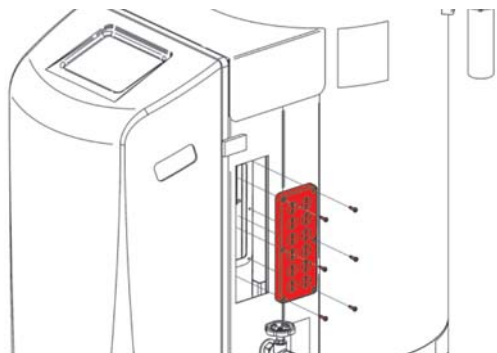


figure 2a: gland plate

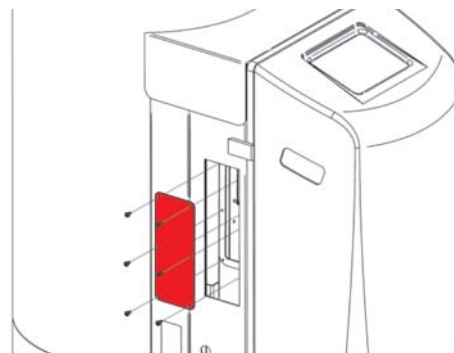


figure 2b: blank flange

2.4 Usage of MCB-Z additional vessels (multicontrol kompakt MCK only)

To enlarge the expansion volume of the multicontrol kompakt MCK, MCB-Z additional vessels can be connected to the main vessel of the MCK.

They must be connected at the lower vessel flange (water-side connection) and the upper vessel flange (gas-side connection). MCB-Z additional vessels and the built-on vessel must be arranged at the same level to ensure an equal level in all vessels.

i NOTE!

MCB-Z additional vessels must be executed in the same size as the built-on vessel to ensure a correct level measurement and function!

i INFORMATION!

multicontrol modular MCM series devices do not have a built-on vessel, the expansion volume must be stored in external EG-M series expansion vessels. To enlarge the expansion volume, EGZ-M additional vessels must be used.

With multicontrol modular all piping must be made on site according to the appropriate piping diagram (see chapter 3).

For detailed information about hydraulic connection of multicontrol modular and EG(Z)-M expansion vessels see appendix B.

To connect the expansion vessels we recommend to use the connection set MC_-Z. This set consists of flexible tubes and all necessary fittings for water-side and gas-side vessel connection.

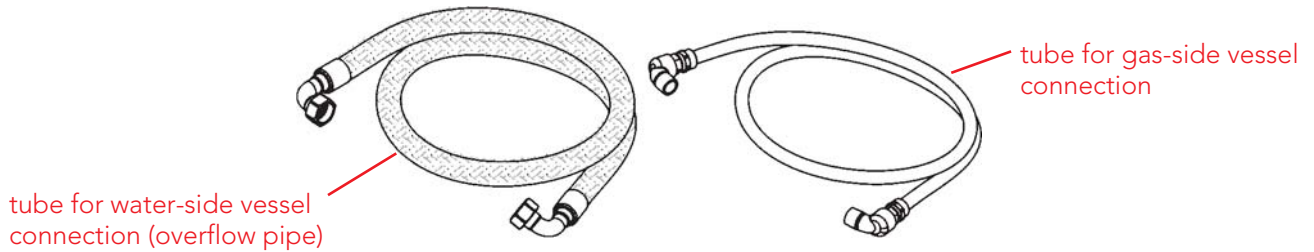


figure 3: connection set MC_-Z

If the connection set MC_-Z is not used, all connections must be executed equivalently on site! For more detailed information see chapter 3 "Hydraulic diagrams".

connection gas-side vessel connection (beneath hood):	Rp 1/2
dimension gas-side vessel connection:	min. DN15
connection water-side vessel connection (overflow pipe):	Rp 3/4
dimension water-side vessel connection (overflow pipe):	min. DN20

main vessel MCK-_45-300

additional vessel MCB-Z 45-300

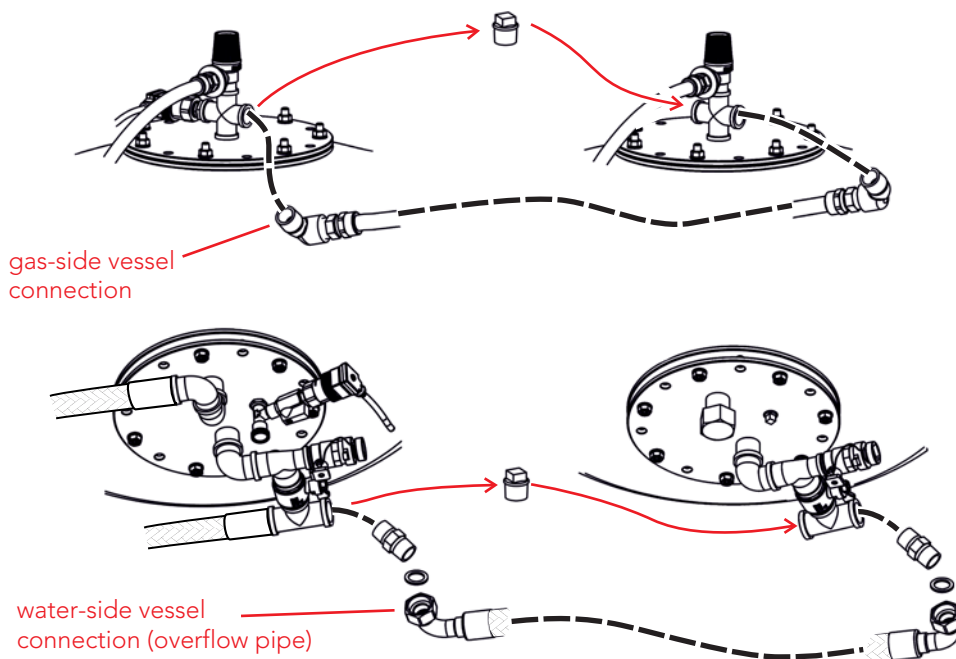


figure 4: connection from main vessel MCK-_45-300 to additional vessel MCB-Z 75-300

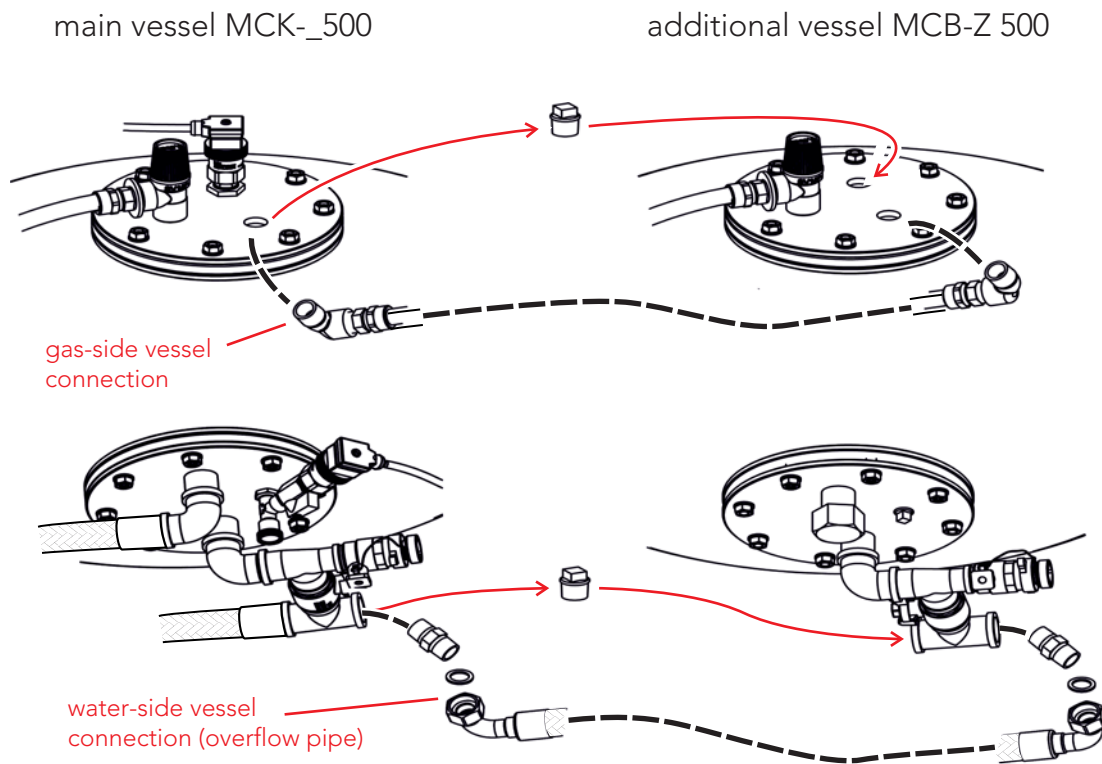


figure 5: connection from main vessel MCK-_500 to additional vessel MCB-Z 500

2.5 Usage of multicontrol devices without degassing

multicontrol kompakt and multicontrol modular series devices can be operated without degassing. For this purpose the unused connections have to be connected acc. to figure 6. This connection can be built via the optional accessory "multicontrol kompakt bypass set". The connection can also be executed on site (DN 25).



figure 6: connection via multicontrol kompakt bypass set and connection to the system return

To connect the multicontrol device to the system return you must use only one connection ("EXPANSION OVERFLOW PIPE").
see chapter 3- "Hydraulic diagrams"

i NOTE!

The automatic degassing feature will be inapplicable if a multicontrol kompakt bypass set is used!

The degassing function must be disabled using the "device set-up"-feature.

→ If not, unnecessary run-time of the pump but no fault.

2.6 Usage of EV cooling vessels

multicontrol kompakt and multicontrol modular series devices can be used in plants with a max. temperature of 70 °C at the point of implementation.

If the temperature at this point can exceed 70 °C, an EV cooling vessel must be used.

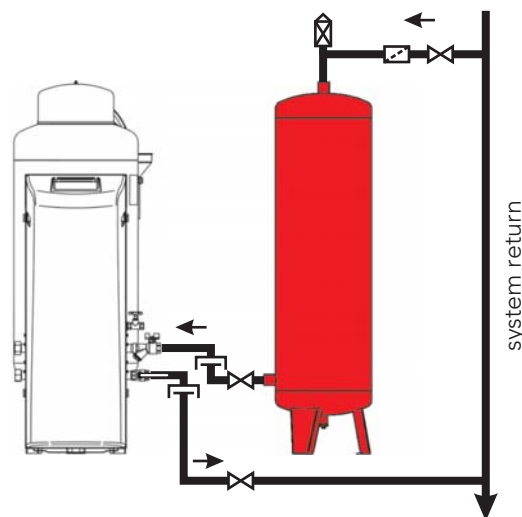


figure 7: Usage of an EV cooling vessel

Depending on the arrangement of the piping from system return to the EV cooling vessel, a vent valve must be set at the upper connection. This valve must be vented in course of commissioning.

i NOTE!

EV cooling vessels must not be insulated! The entire expansion overflow pipe from system return to the multicontrol device must not be insulated, too!

2.7 Temperature sensor T2

multicontrol kompakt and multicontrol modular series devices with an attached temperature sensor T2 (optional accessory) provide a monitoring of the temperature of the system return respective the expansion overflow pipe.

Due to this monitoring the degassing feature will be disabled in case of a too high temperature. Thus the membrane and the components can't be damaged by too hot plant media during the degassing. We recommend to use the temperature sensor T2 in systems with a max. operational temperature of 95 °C (set at the system safety temperature limiter).

The installation of the temperature sensor T2 into the system return must be executed on-site, the sensor must be mounted immediately in front of the connection to the pressure maintenance device (fig. 8a). If an EV cooling vessel is used, the sensor must be mounted into the expansion overflow pipe on top of the EV cooling vessel (fig. 8b).

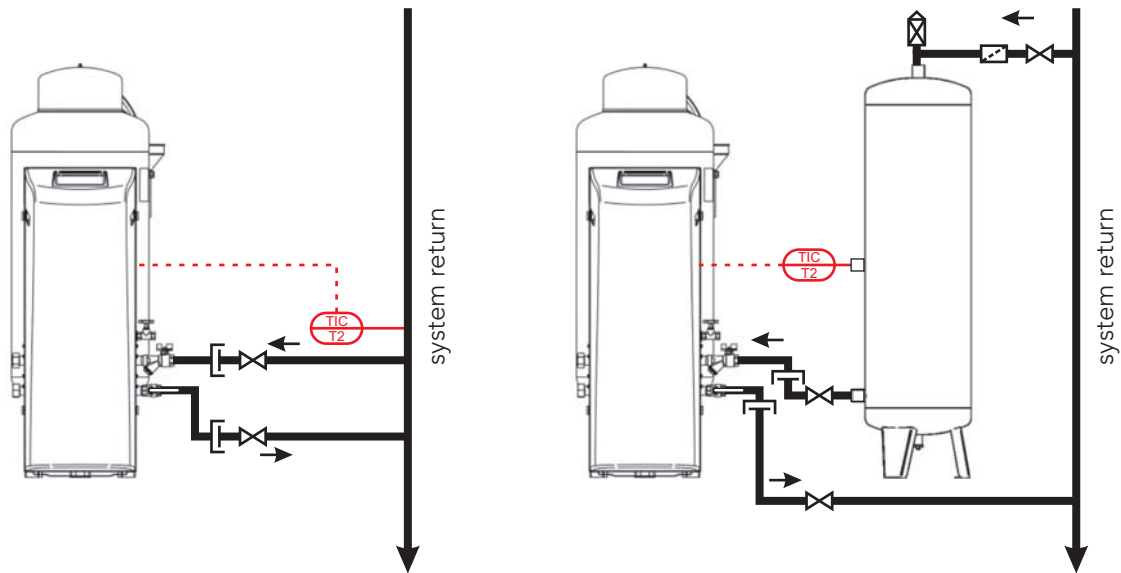


figure 8: Installation of the temperature sensor T2 without (a) and with (b) EV cooling vessel

2.8 Electric connection

The supply line is executed as a protective ground contact feeder. The electric connection should be done via a safety socket. This plug is designated for an entire disconnection to the power supply. No other separators are contained. If a direct connection to the power supply is desired, an appropriate separator must be installed on-site (e.g. two pole main switch).



WARNING!

All relevant electric standards must be mind and observed.



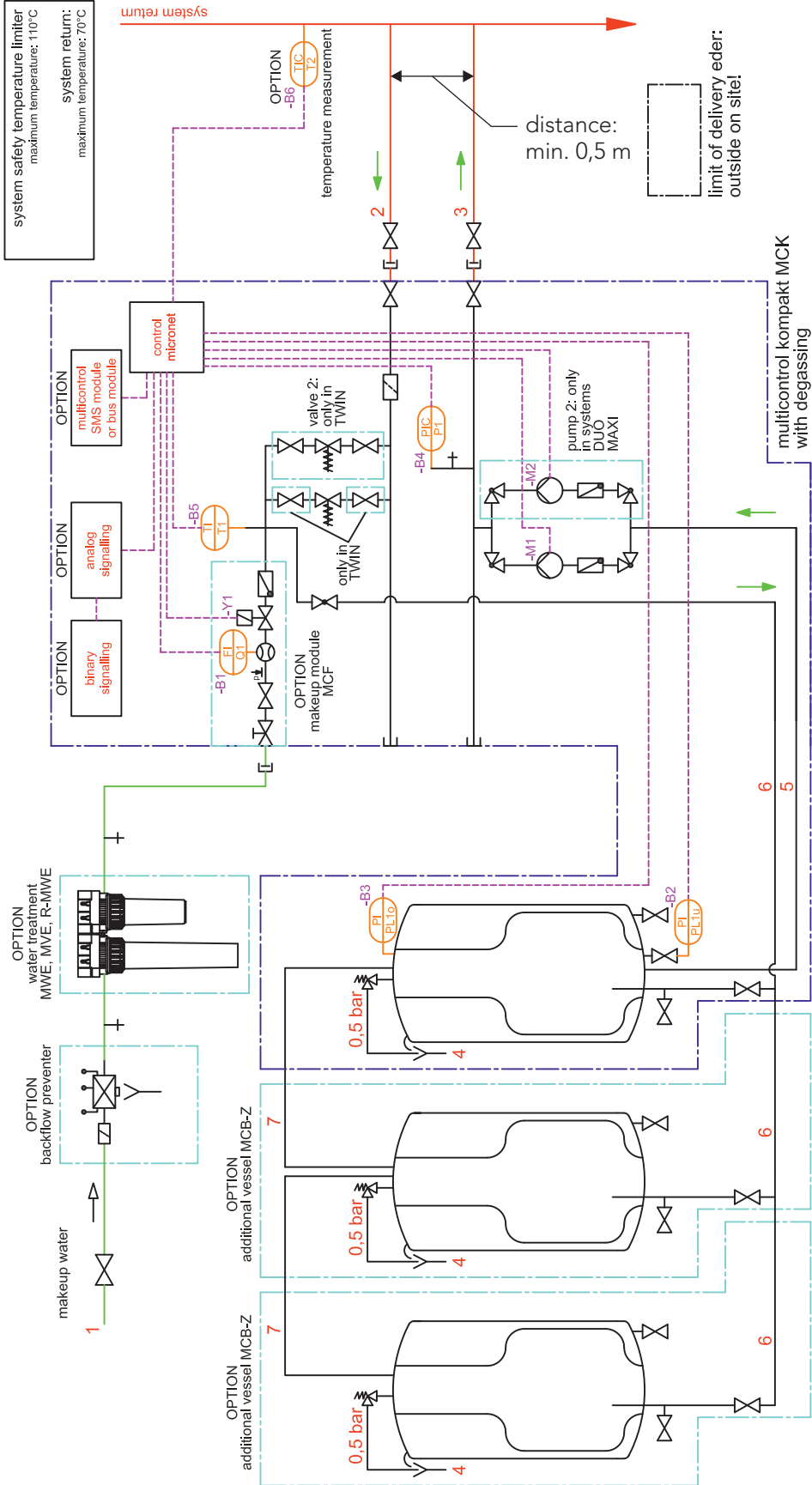
INFORMATION!

The connected load can be read at the type plate of the multicontrol device.

3. Hydraulic diagrams

multicontrol kompakt with degassing (standard diagram):

Options: additional vessels MCB-Z, expansion modules, makeup module MCF, water treatment, backflow preventer, sensor T2



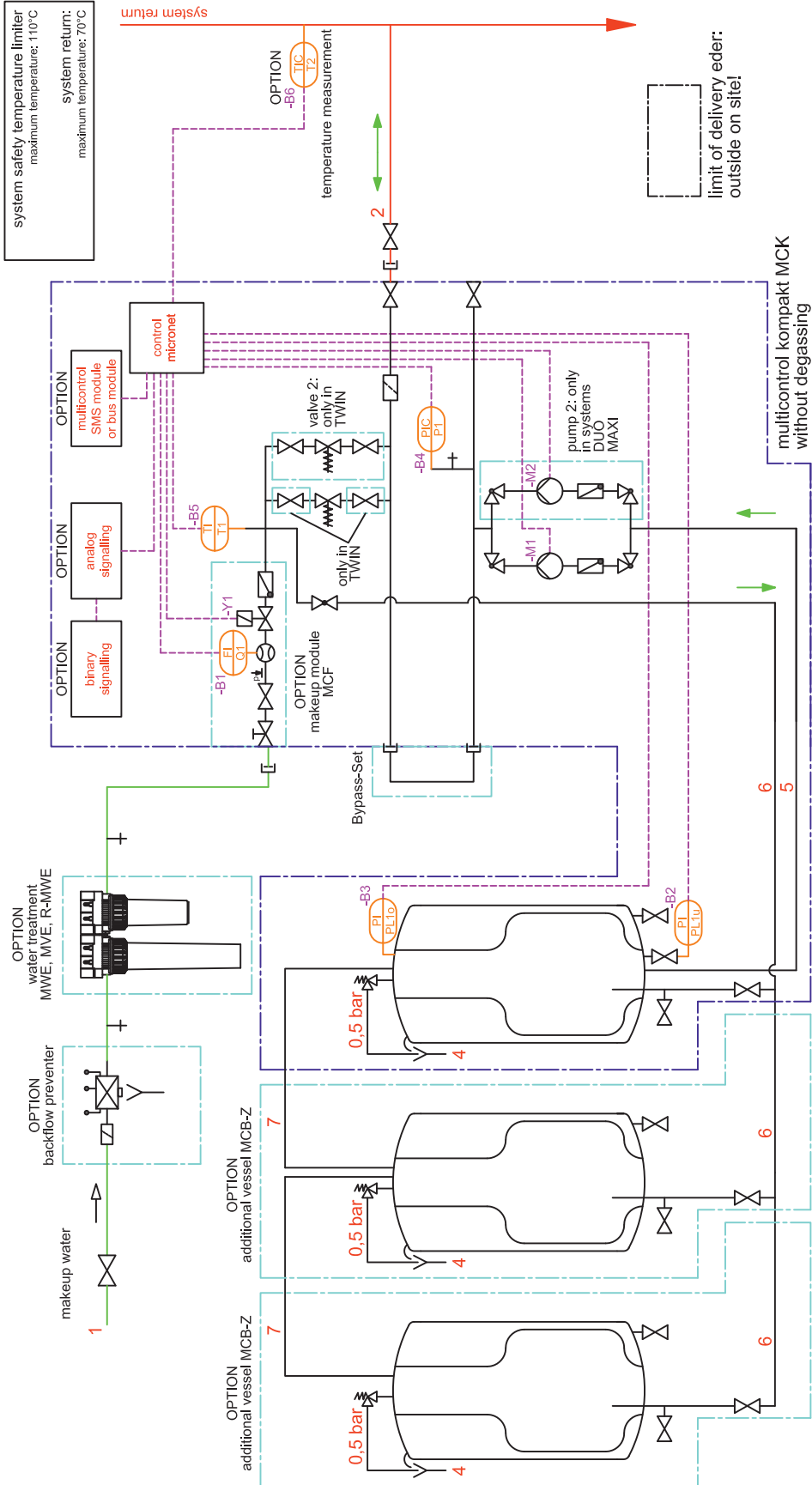
- 5 ... suction pipe from expansion vessel
- 6 ... overflow pipe to expansion vessel
- 7 ... gas-side vessel connection DN20

- 1 ... makeup water
- 2 ... expansion overflow pipe from system return min. DN25
- 3 ... expansion pressure pipe to system return min. DN25
- 4 ... discharge hopper for vessel safety valve

Version: V09-2016/01

multicontrol kompakt without degassing:

Options: Bypass set, additional vessels MCB-Z, expansion modules, makeup module MCF, water treatment, backflow preventer, sensor T2

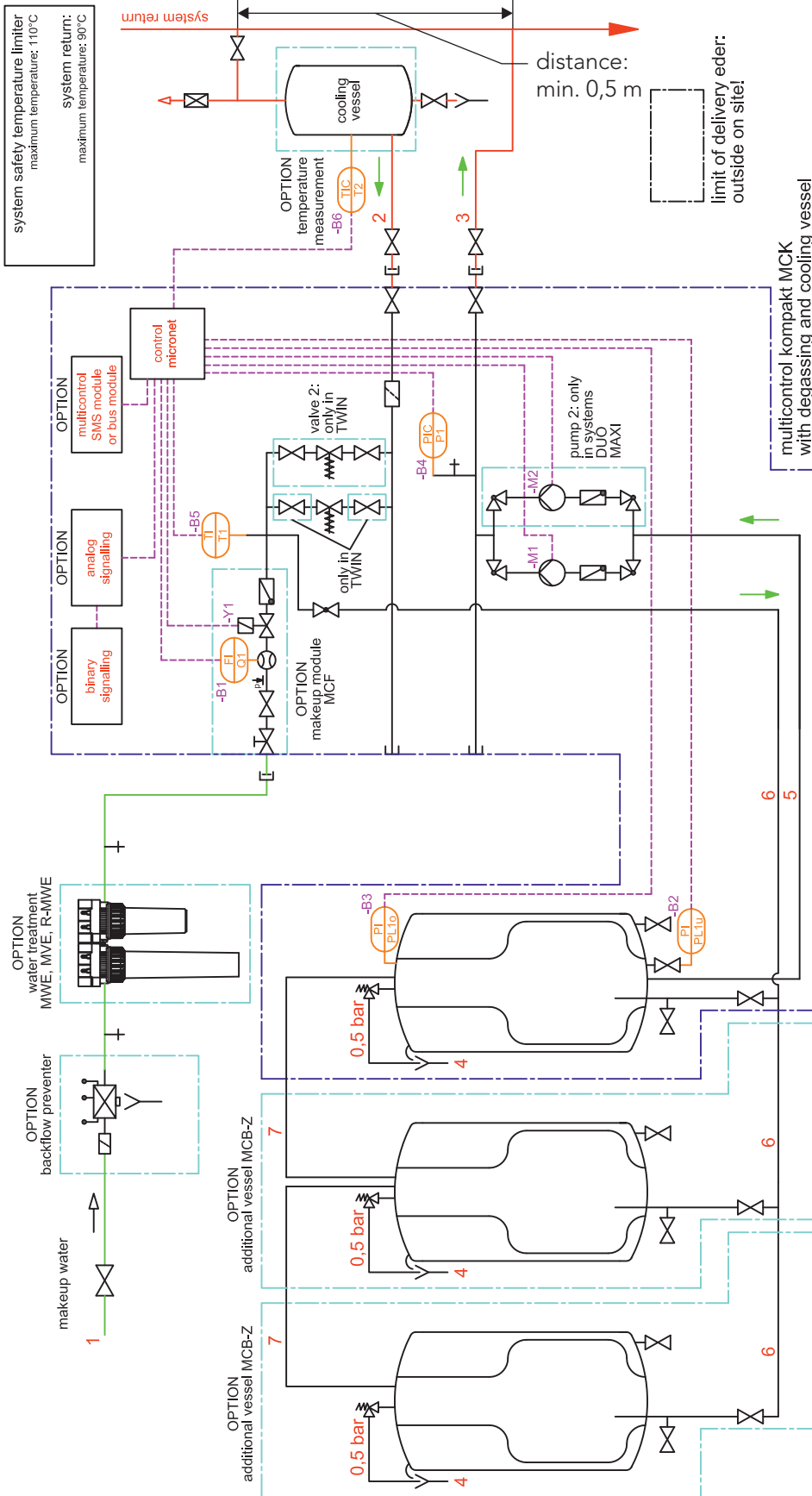


Version: V09-2016/01

- 1 ... makeup water
- 2 ... expansion overflow pipe from system return min. DN25
- 3 ... expansion pressure pipe to system return min. DN25
- 4 ... discharge hopper for vessel safety valve
- 5 ... suction pipe from expansion vessel
- 6 ... overflow pipe to expansion vessel
- 7 ... gas-side vessel connection DN20

multicontrol kompakt with degassing and EV cooling vessel:

Options: additional vessels MCB-Z, expansion modules, makeup module MCF, water treatment, EV cooling vessel, backflow preventer, sensor T2

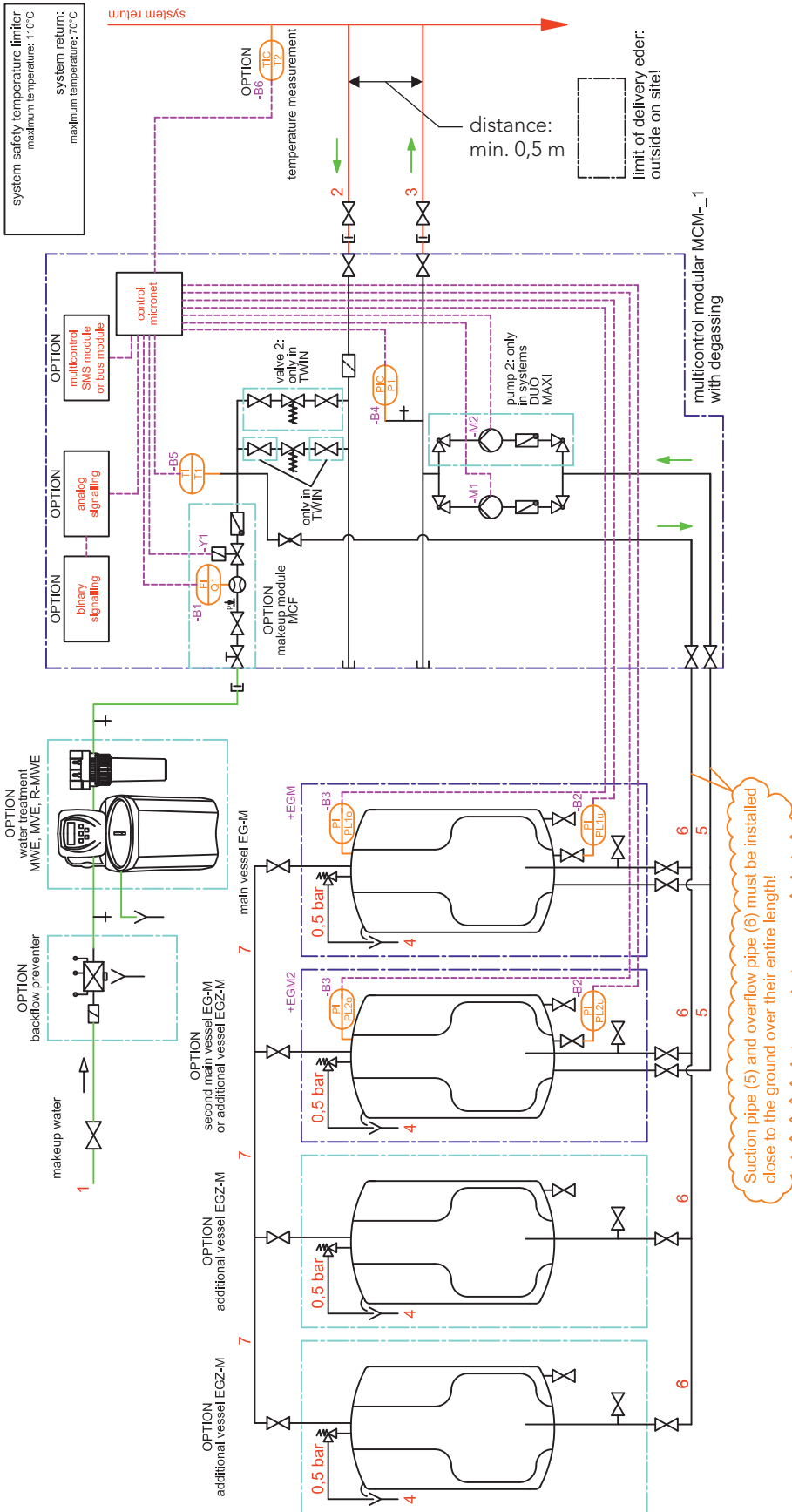


Version: V09-2016/01

- 1 ... makeup water
- 2 ... expansion overflow pipe from system return min. DN25
- 3 ... expansion pressure pipe to system return min. DN25
- 4 ... discharge hopper for vessel safety valve
- 5 ... suction pipe from expansion vessel
- 6 ... overflow pipe to expansion vessel
- 7 ... gas-side vessel connection DN20

multicontrol modular with degassing (standard diagram):

Options: 2 pcs. EG-M main vessels with level measurement, 2 pcs. EGZ-M additional vessels, expansion modules, makeup module MCF, water treatment, backflow preventer, sensor T2



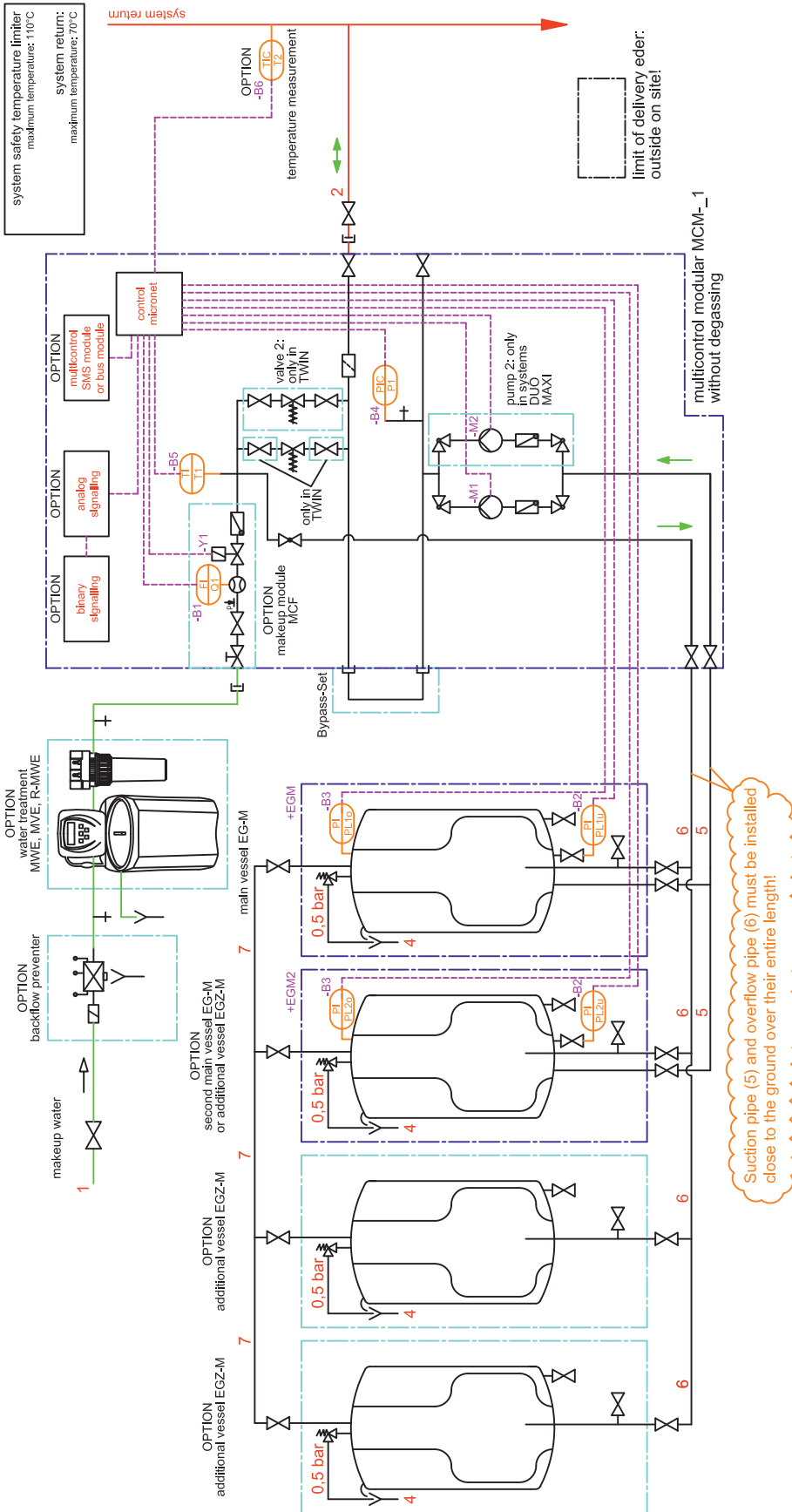
- 5 ... suction pipe from expansion vessel
- 6 ... overflow pipe to expansion vessel
- 7 ... gas-side vessel connection DN20

- 1 ... makeup water
- 2 ... expansion overflow pipe from system return min. DN25
- 3 ... expansion pressure pipe to system return min. DN25
- 4 ... discharge hopper for vessel safety valve

Version: V09-2016/01

multicontrol modular without degassing:

Options: Bypass set, 2 pcs. EG-M main vessels with level measurement, 2 pcs. EGZ-M additional vessels, expansion modules, makeup module MCF, water treatment, backflow preventer, sensor T2

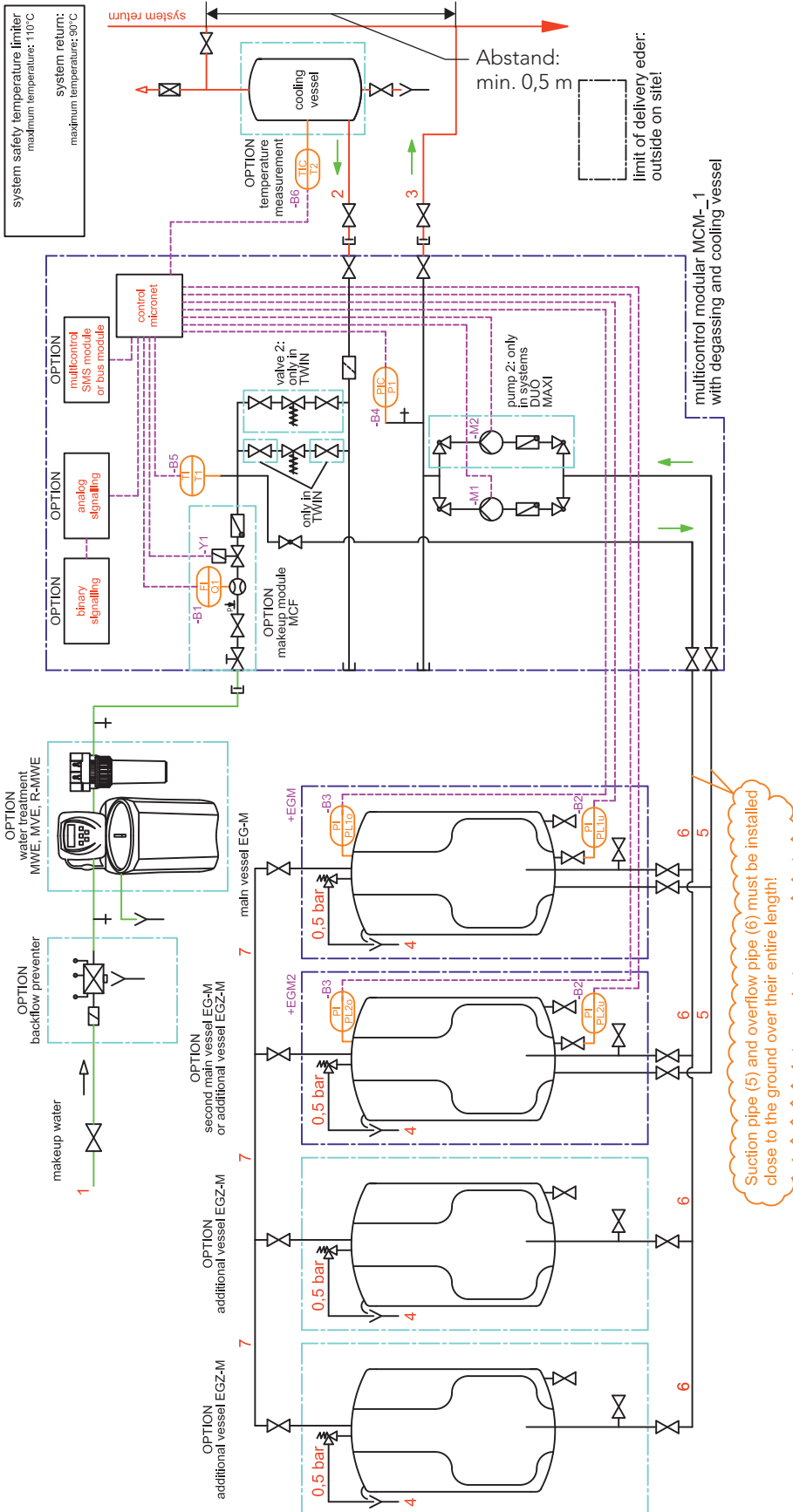


- 5 ... suction pipe from expansion vessel
- 6 ... overflow pipe to expansion vessel
- 7 ... gas-side vessel connection DN20

- 1 ... makeup water
- 2 ... expansion overflow pipe from system return min. DN25
- 3 ... expansion pressure pipe to system return min. DN25
- 4 ... discharge hopper for vessel safety valve

multicontrol modular with degassing and EV cooling vessel:

Options: 2 pcs. EG-M main vessels with level measurement, 2 pcs. EGZ-M additional vessels, expansion modules, EV cooling vessel, makeup module MCF, water treatment, backflow preventer, sensor T2



- 5 ... suction pipe from expansion vessel
- 6 ... overflow pipe to expansion vessel
- 7 ... gas-side vessel connection DN20

- 1 ... makeup water
- 2 ... expansion overflow pipe from system return min. DN25
- 3 ... expansion pressure pipe to system return min. DN25
- 4 ... discharge hopper for vessel safety valve

4. Wiring diagrams

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

-A1

eder
MN_IOMAS
200331

pump 2
only in systems
DUD (-D) and MAXI (-M)

eder
ABC010
030522

AGND

... protective earth (marking: PE)

... neutral conductor (marking: N)

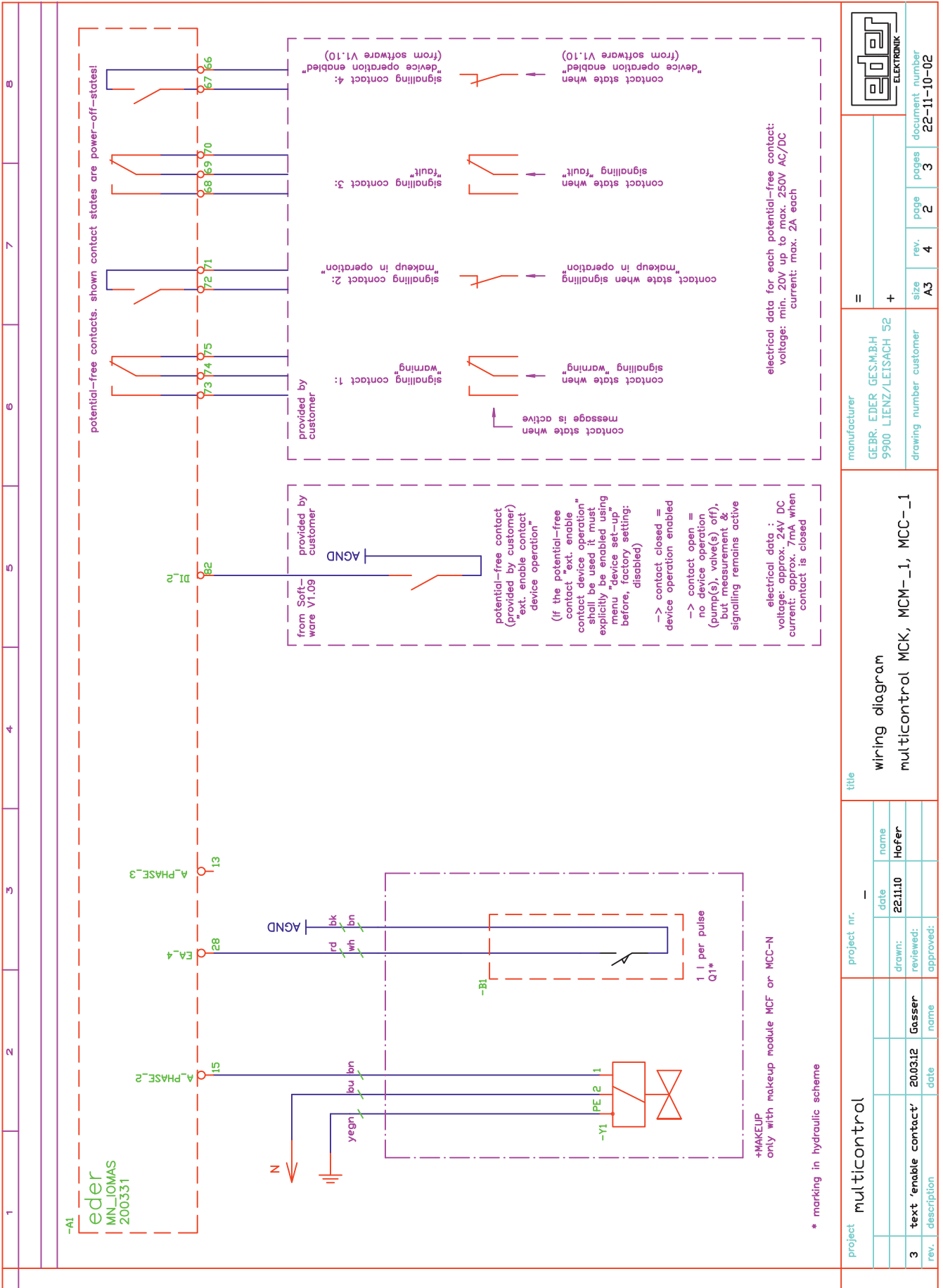
AGND

... ground conductor (marking: AGND)

* marking in hydraulic scheme

project	multicontrol		project nr.	-		title	wiring diagram multicontrol MCK, MCM_1, MCC_1		
rev.	-	-	drawn:	22.11.10	Hofer	manufacturer	GEBR. EDER GES.M.B.H 9900 LIENZ/LEISACH 52		
description	-	-	reviewed:	-	-	drawing number	A3	customer	+
date	-	-	approved:	-	-	size	A3	pages	3
name	-	-				rev.	5	document number	22-11-10-01

4. Wiring diagrams

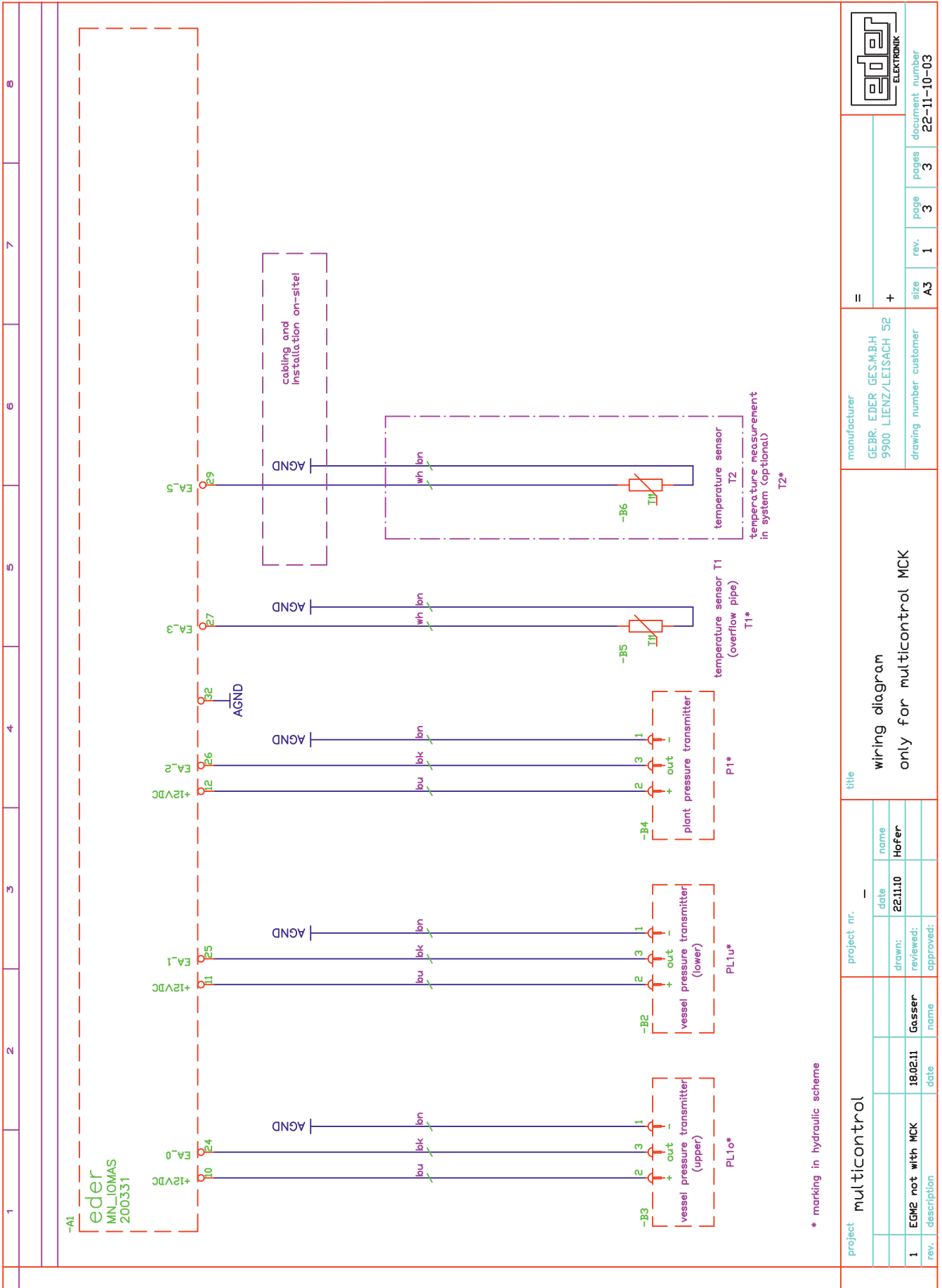


manufacturer	=		
	+		
GEBR. EDER GES.M.B.H	9900 LIENZ/LEISACH 52	size	A3
drawing number	customer	rev.	4
		page	2
		pages	3
		document number	22-11-10-02

wiring diagram
multicontrol MCC, MCM-1, MCC-1

project	multicontrol	project nr.	date	name
3	text 'enable contact'	2003.12	22.11.10	Hofer
rev. 1	description	date	name	name
			Gasser	
			reviewed:	
			approved:	

4. Wiring diagrams



manufacturer	=	
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GEBR. EDER GES.M.B.H 9900 LIENZ/LEISACH 52		
drawing number customer	size	pages
	A3	3
	rev.	1
	document number	22-11-10-03

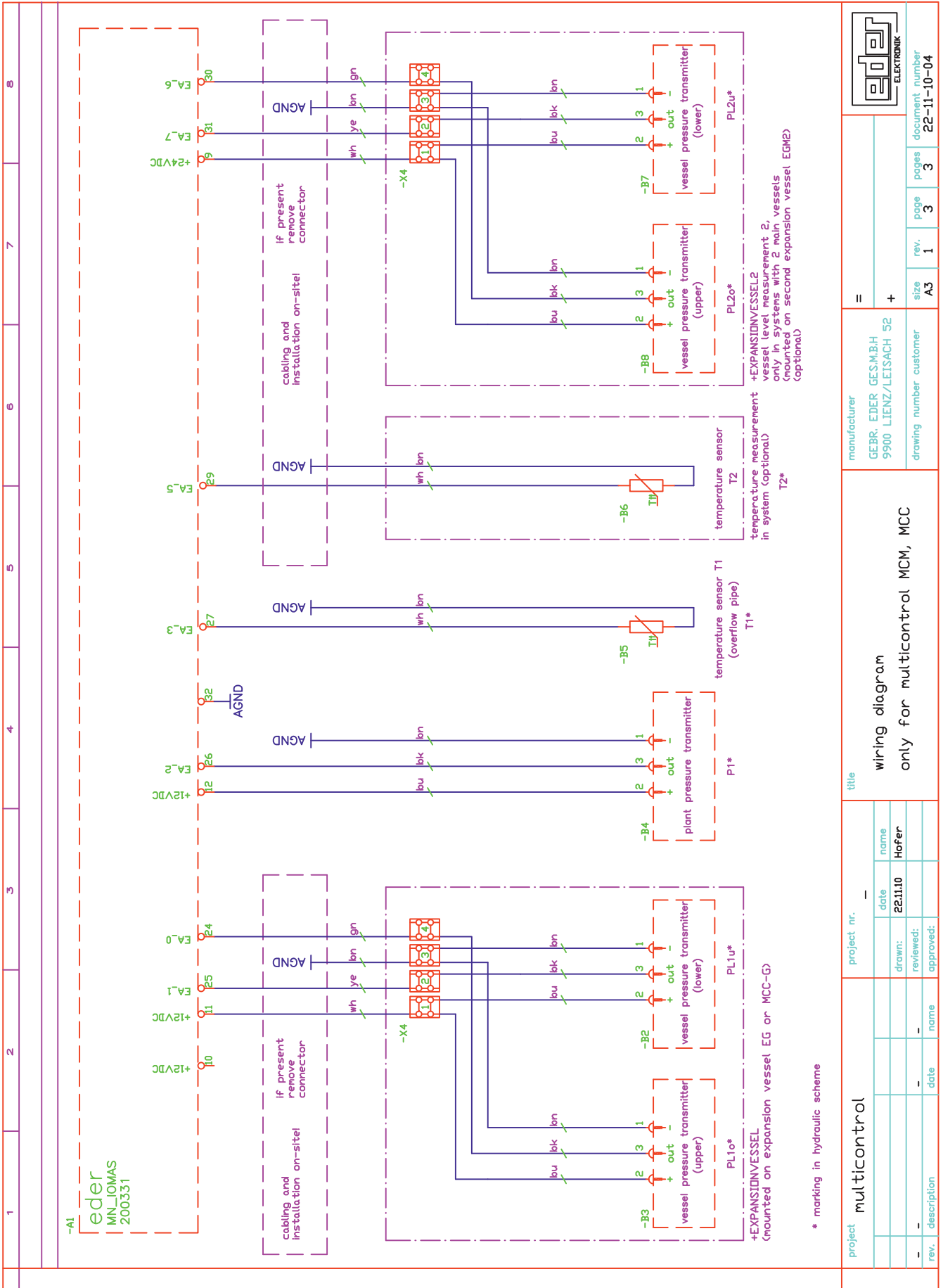
title	
wiring diagram only for multicontrol MCK	

project nr.	-
date	22.11.10
name	Hofer
drawn:	
reviewed:	Gasser
approved:	

project	multicontrol
rev.	1
description	EGM2 not with MCK
date	18.02.11
name	Gasser

* marking in hydraulic scheme

4. Wiring diagrams

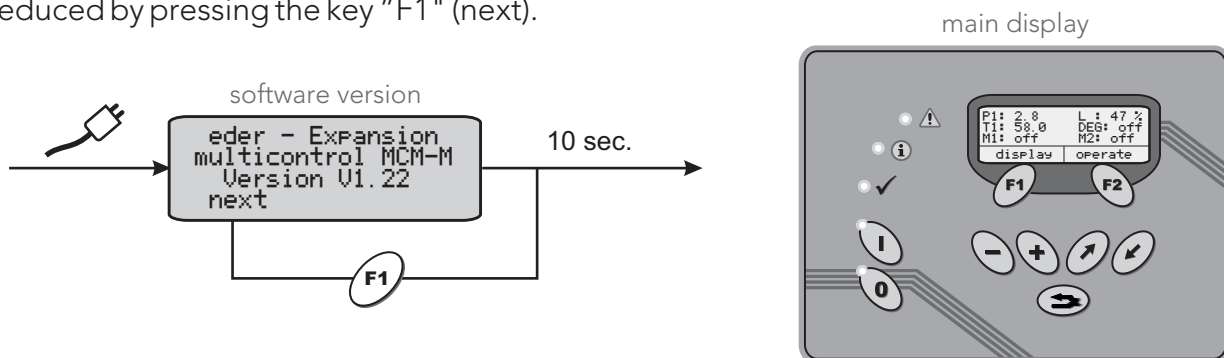


5. Operation and display

5.1. Switching on

After connecting power supply the expansion- and pressure maintenance device starts and the display shows the current software version.

Approx. 10 seconds later the main display appears automatically. This waiting time can be reduced by pressing the key "F1" (next).



5.2. User and display elements

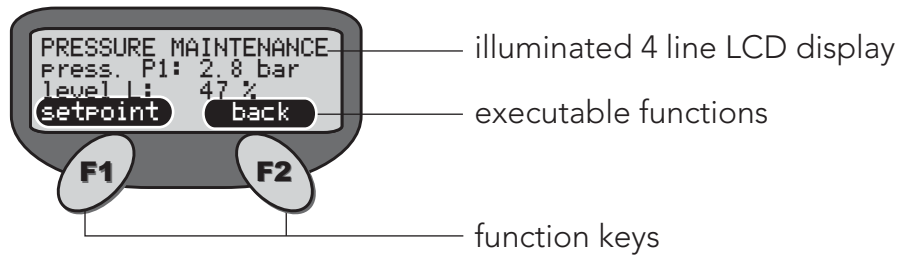
UE user element	Description	Notice
	device "ON"	Enable device (All actuators are controlled acc. to the internal control electronics.)
	device "OFF"	Disable device (All actuators are disabled. Only the sensor system remains active.) Caution: no pressure maintenance in this mode!
	execute function	The function displayed above the key is executed directly.
	change values	Keys to raise and reduce numerical values resp. to select the days in timer programs.
	scroll	Scroll through menus, displays and settings upwards and downwards.
	back to main display	By pressing this key the display jumps back to the main display directly.

DE display element	Description	Notice
	fault existing	An error exists so the device can't be operated correctly. Check and repair the cause of the error immediately!
	warning existing	Warnings are existing, the device is still in operation
	no warning	no warnings or errors

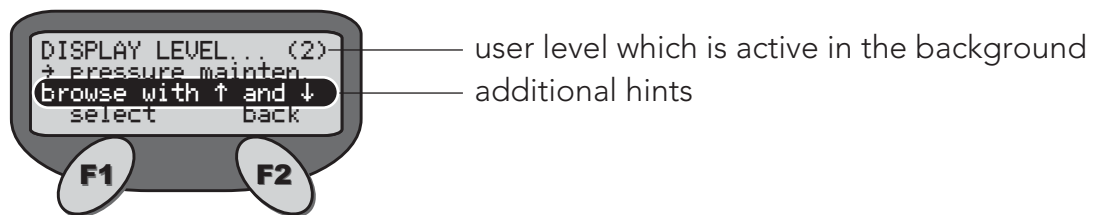
5.3. Display

The multicontrol microcomputer features an illuminated 4-line LCD display to show all data in a clear and well-arranged way.

Generally the executable functions are shown above the associated keys "F1" and "F2".

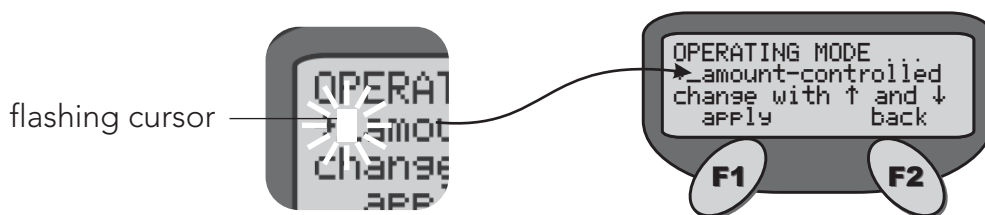


If there is enough space, additional hints are shown on demand.



5.4. Scroll and change values

If settings must be done, they are signaled at the LCD display via a flashing cursor.



UE user element	Description	Notice
	select / apply	Selecting a menu item resp. applying changed settings
	back	Back to previous menu resp. previous display without confirming any changes.
	change values	Keys to raise and reduce numerical values resp. to select the days in timer programs.
	scroll	Scroll through menus, displays and settings upwards and downwards.

5.5. Display level

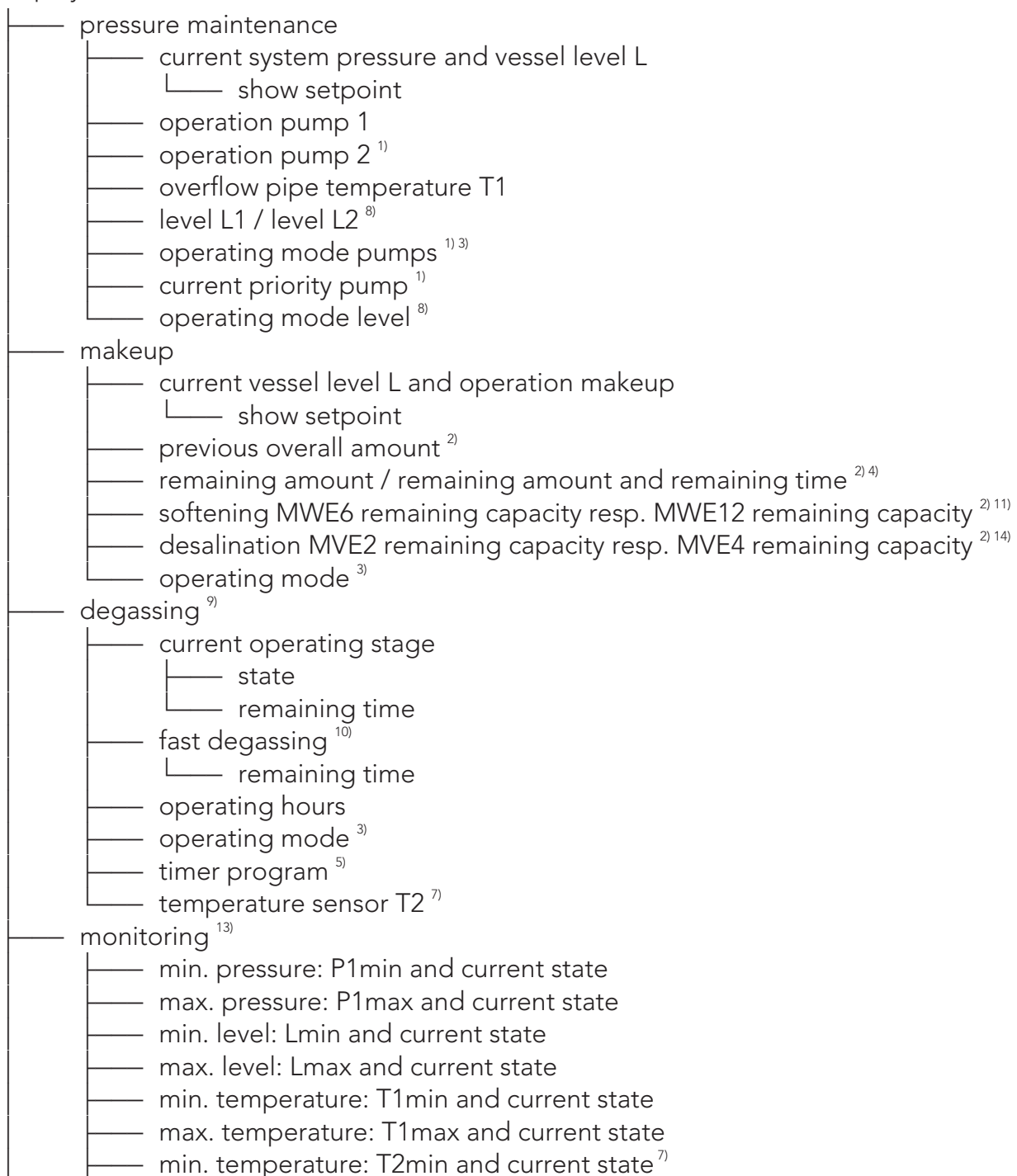
By pressing the key "F1" (display) the display level can be entered.

This level is used to show measured values and the current operation status.

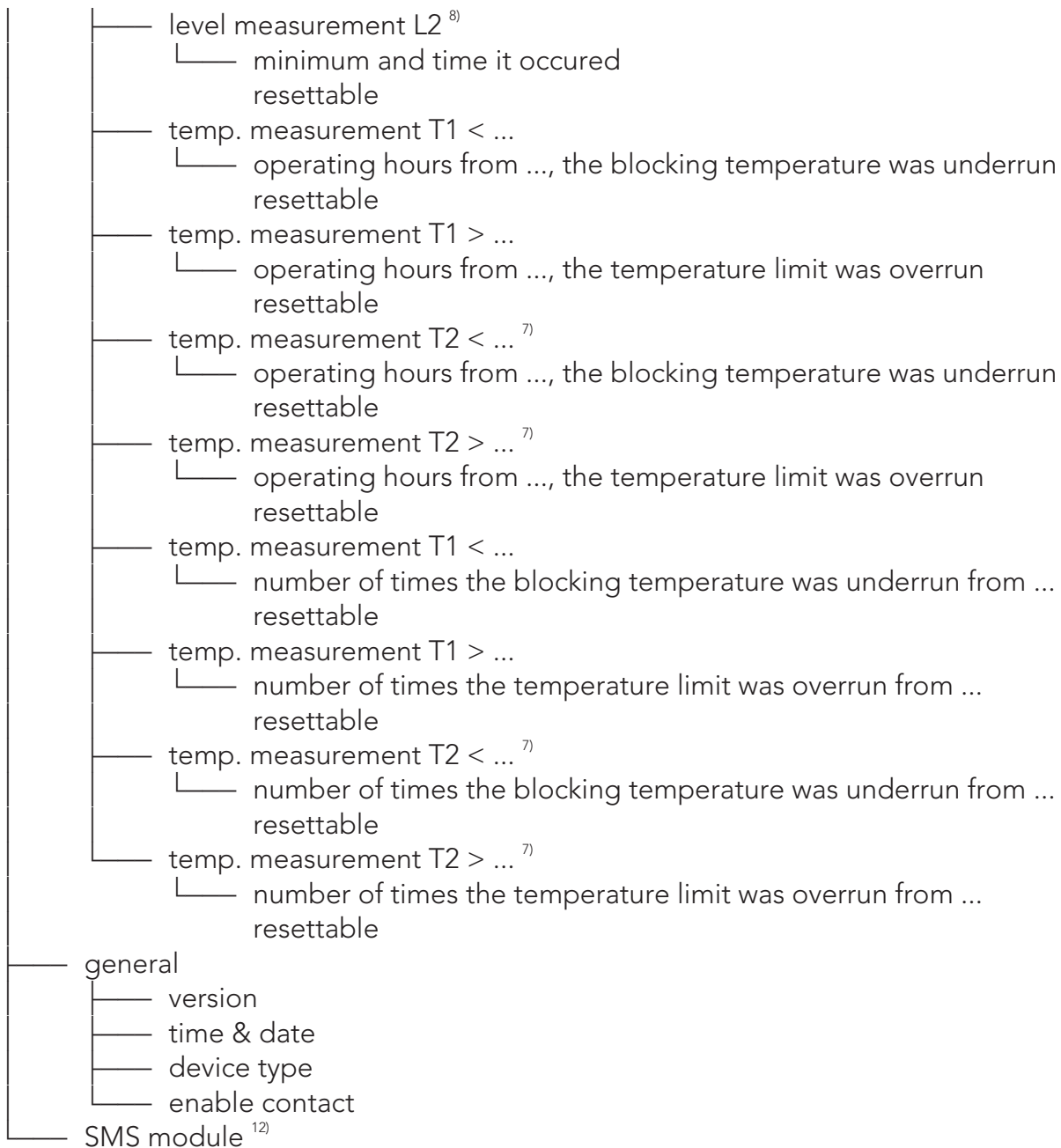
After accessing the display level, a number in brackets is shown. This number is the current active user level, which will also influence the display level's items.

display level - menu structure:

display level... (2)



└─	max. temperature: T2max and current state ⁷⁾
└─	statistics
└─	pump M1
└─	└─ operating hours from the displayed time
	resettable
└─	pump M2 ¹⁾
└─	└─ operating hours from the displayed time
	resettable
└─	degassing ⁹⁾
└─	└─ operating hours from the displayed time
	resettable
└─	temp. measurement T1
└─	└─ peak and time it occurred
	resettable
└─	temp. measurement T1
└─	└─ minimum and time it occurred
	resettable
└─	temp. measurement T2 ⁷⁾
└─	└─ peak and time it occurred
	resettable
└─	temp. measurement T2 ⁷⁾
└─	└─ minimum and time it occurred
	resettable
└─	press. measurement P1
└─	└─ peak and time it occurred
	resettable
└─	press. measurement P1
└─	└─ minimum and time it occurred
	resettable
└─	makeup ²⁾
└─	└─ amount from the displayed time
	resettable
└─	water treatment ²⁾¹¹⁾
└─	└─ cartridge changed on ...
	not resettable, entry happens when changing the cartridge
└─	press. maintenance
└─	└─ pressure set-up on ...
	not resettable, entry happens when setting the working pressure
└─	level measurement L1
└─	└─ peak and time it occurred
	resettable
└─	level measurement L1
└─	└─ minimum and time it occurred
	resettable
└─	level measurement L2 ⁸⁾
└─	└─ peak and time it occurred
	resettable



- | | |
|--|---|
| 1) only in systems Duo and Maxi | 2) only if MCF makeup module is enabled |
| 3) operating mode acc. to menu item settings | 4) depending on the selected operating mode |
| 5) only in operating mode "timer program" | 6) only in operating mode "time-controlled" |
| 7) only if sensor T2 is enabled | 8) only if level measurement L2 is enabled |
| 9) only if degassing is enabled (without bypass) | 10) only if fast degassing is activated |
| 11) only if softening MWE is enabled | 12) only if SMS module is enabled |
| 13) only if at least one value is monitored and user level 3 is active | 14) only if desalination MVE is enabled |

display level... (2) → pressure maintenance →

press. P1 / level L

current plant pressure and vessel level
lower and upper working pressure setpoint

operation pump 1	current operating mode of pump 1 ("On" or "Off") and elapsed hour counter for the entire run-time of the pump 1
operation pump 2	current operating mode of pump 2 ("On" or "Off") and elapsed hour counter for the entire run-time of the pump 2 only displayed at systems Duo and Maxi
sensor T1	current temperature in the overflow pipe inside the device
level L1	current level in vessel 1 (built-on main vessel at multicontrol kompakt resp. first EG-M at multicontrol modular) only displayed if level measurement L2 was activated in menu "settings"
level L2	current level in vessel 2 (additional EG-M at MCM) only displayed if level measurement L2 was activated in menu "settings"
operating mode pumps	current operating mode of the pumps acc. to menu "settings" only displayed at systems Duo and Maxi
curr. priority pump	current priority pump - the pump which starts at first if the lower working pressure is underrun only displayed at systems Duo or Maxi
operating mode level	operating mode of the level measurement acc. to menu „settings“ only displayed if level measurement L2 was activated in menu "settings"
display level... (2) → makeup →	
level L / state	current vessel level and operating mode of makeup ("On", "Off", "locked ___ s" or "1x ___ min") At operating modes "locked" and "1x (one-time)" the number in brackets shows the remaining time in seconds resp. in minutes.
prev. overall amount	entire makeup amount up to now
rem. amount	available amount since the last reset of the amount not displayed in operating mode "time-controlled"

rem.amount / rem.time	Display shows the remaining amount within the displayed remaining time. not displayed in operating mode "amount-controlled"
softening cartridge rem. capacity	Display shows the remaining capacity of the softener cartridge. only displayed if "softening MWE" was activated in menu "settings"
desalination cartridge rem. capacity	Display shows the remaining capacity of the desalination cartridge. only displayed if "desalination MVE" was activated in menu "settings"
operating mode	current operating mode of the makeup acc. to menu "settings" ("amount-controlled", "time-controlled" and "uncontrolled")
display level... (2) → degassing	→ menu item is displayed only if "degassing" was activated in menu "settings"
current operat. stage	display shows the current operating stage of the degassing ("Off", "locked (reason)", "pressure build-up", "degassing fast/normal", "break fast/normal") and the remaining time of the respective operation stage <ul style="list-style-type: none"> ... Off degassing disabled ... locked degassing is locked due to too high temperatures (T1 or T2) or too high pressure (P) ... pressure build-up pump builds up the necessary pressure for degassing ... degassing (fast) fast degassing active ... break (fast) shortened break because fast degassing is active ... degassing (normal) degassing cycle is active ... break (normal) normal break because fast degassing is not active
fast degassing rem. time	remaining time of the fast degassing (after this normal degassing) only displayed if "fast degassing" is active
operating hours	entire degassing time up to now

operating mode	current operating mode of the degassing acc. to menu "settings" ("as per timer prog.", "always enabled", "Off")
timer program	Display shows the enable times for degassing (3 different timer blocks possible for every day of the week) only displayed in operating mode "as per timer prog."
sensor T2	current temperature at sensor T2 only displayed if "sensor T2" was activated in menu "settings"

display level... (2) → monitoring

Display shows all monitored values. Monitoring is activated by entering limits (e.g. "min. press. P1min" or "max. temp. T1max") in user level 3
Also the current status is displayed: "OK" or "Status: Alert"
only displayed if at least one value is monitored and accessible from user level 3

display level... (2) → statistics

Display shows operating hours, maximum values, minimum values etc.
This function provides a possibility for systematic monitoring of decided operating states over defined periods (resettable).

display level... (2) → general

- current software version
- current time and date
- set type/model of the device
- current status of the enable contact
"On" or "Off"

display level... (2) → SMS module

For more information see instruction manual of the SMS module.

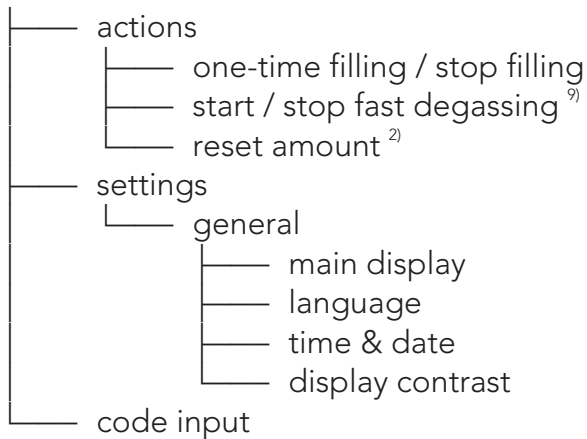
5.6. User level 2

By pressing the key "F2" (operate) the user level 2 can be entered.
This level is used to activate defined actions and to change settings.

→ Caution: no essential functions are accessible in this level.

(= protection against unrequested change of settings by non professional users without instruction manual)

user level 2



2) only if MCF makeup module is enabled
 9) only if degassing is enabled (without bypass)

included languages (in language pack a, b or c):

- German (default) (a,b,c)
- English (a,b,c)
- Swedish (a)
- French (a)
- Dutch (a)
- Finnish (a)
- Italian (a)
- Russian (only with special display CT) (b)
- Romanian (b)
- Polish (b)
- Czech (b)
- Latvian (b)
- Croatian (c)

user level 2 → actions →

one-time filling / stop filling

Vessel will be filled to a defined level one time only resp. filling will be stopped (factory default: 60 %).

start / stop fast degassing

Fast degassing with shortened breaks will be started resp. an active fast degassing will be stopped - thus normal degassing is activated.

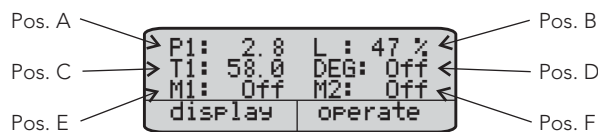
reset amount

The used makeup amount will be reset and the entire amount is available again.

user level 2 → settings → general →

main display

This setting allows users to customize the default main display individually to their requirements. Up to 6 values (out of a multiplicity of choices) can be displayed at the main display.



language

selection of the language for operation and display

time & date

Settings for time and date

display contrast | Possibility for adjustment of the display's luminosity

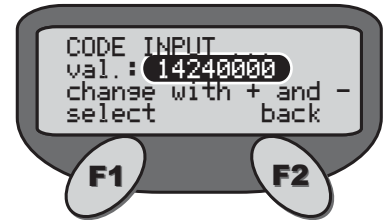
user level 2 → code input → change to higher rated user levels

5.7. User level 3

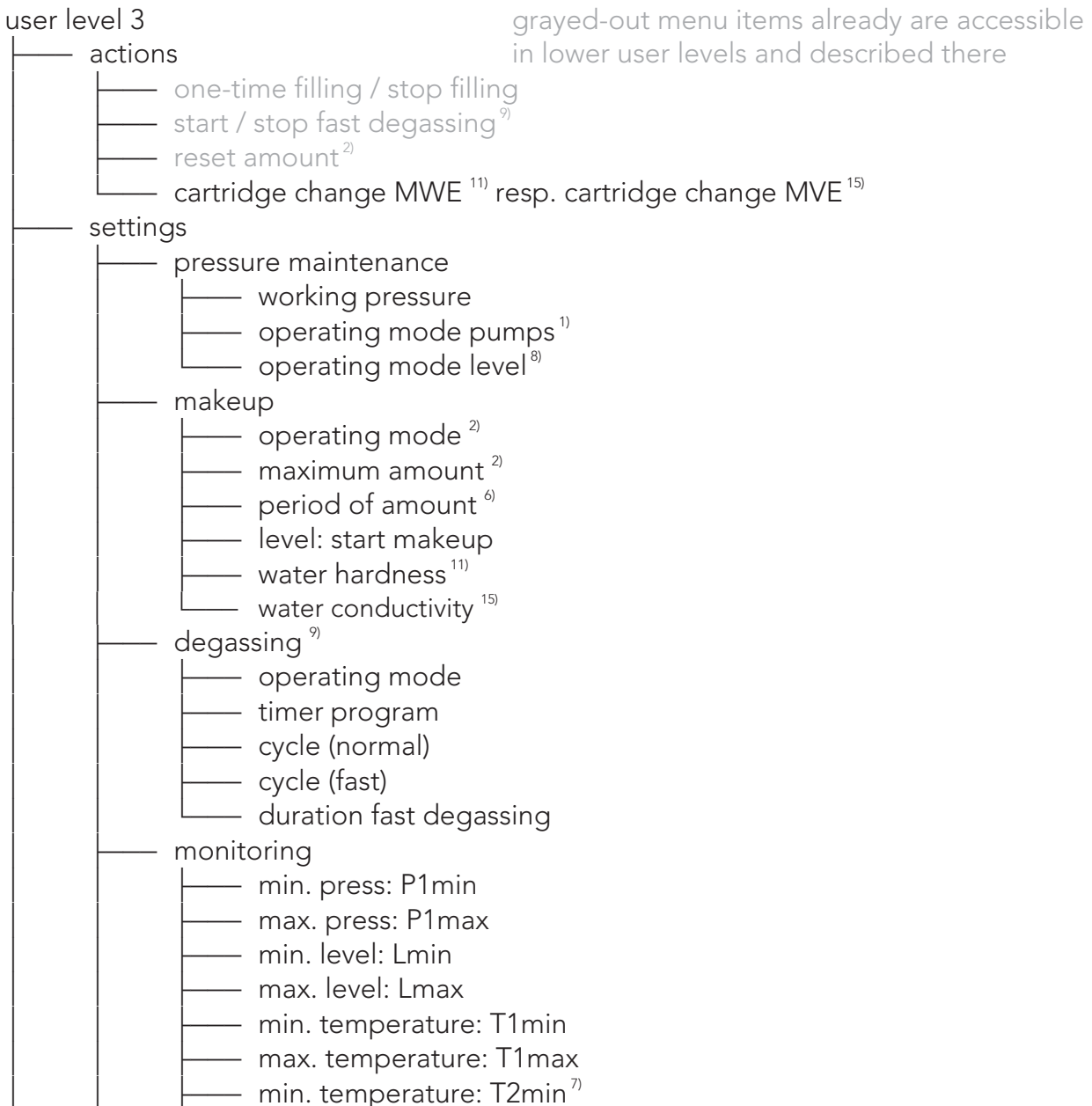
User level 3 can be unlocked in menu "settings" - "code input"

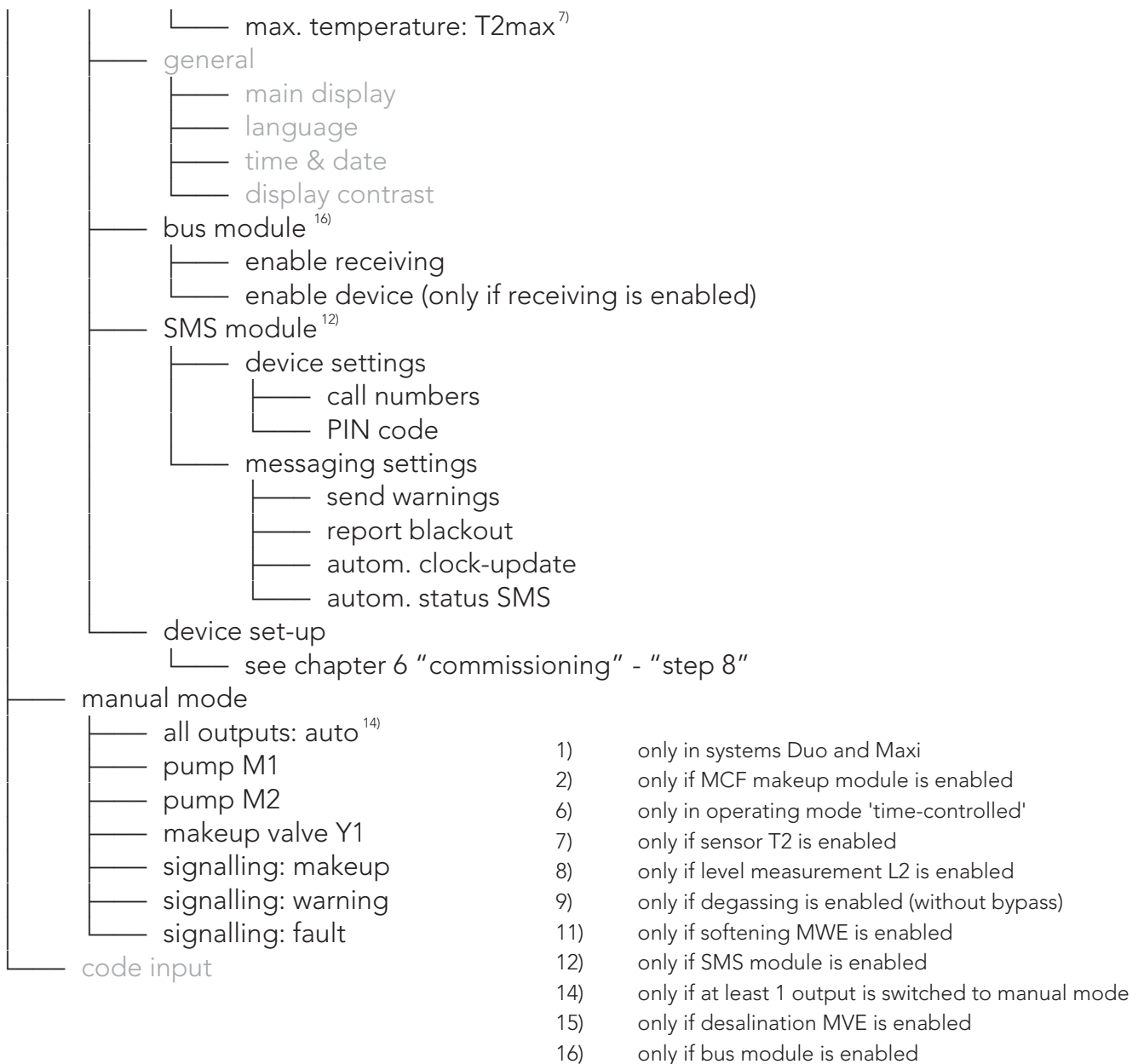
This level is intended for the commissioner of the plant (e.g. plumber,...).

code for user level 3:



user level 3 - menu structure:





user level 3 → actions →

**cart. change MWE
cart. change MVE**

After changing the softening cartridge resp. the desalination cartridge the change must be confirmed. Thus the remaining capacity will be set anew due to the set water hardness resp. water conductivity.

user level 3 → settings → pressure maintenance →

working pressure

To set the desired working pressure see chapter 6 "commissioning" - "step 11".

operat. mode pumps

At double-pump systems (systems Duo and Maxi) you can choose the following operating modes:

- "pump M1 only"
Pump M2 is deactivated permanently (e.g. for maintenance works).
- "pump M2 only"
Pump M1 is deactivated permanently (e.g. for maintenance works).
- "redundancy mode"
The actual priority pump starts pressure-dependent.
The additional pump starts only in case of an error of the priority pump.
- "staggered mode" (default setting at systems Duo and maxi)
The actual priority pump starts pressure-dependent.
The additional pump starts in case of an error of the priority pump, also it starts pressure-dependent.
- "parallel mode"
Priority pump and additional pump always run at the same time.

operating mode level

Selection of the used level measurement at devices with enabled second level measurement L2:

- "automatic change"
Automatic change to the second level measurement L2 in case of identified electric faults at level measurement L1 (at least one of the error messages E12, E13, E14, E15 must be released).
- "level L1 only"
Only L1 is used for level measurement
- "level L2 only"
Only L2 is used for level measurement

user level 3 → settings → makeup →**operating mode**

Selection of the operating mode of the enabled MCF makeup module

- "amount-controlled"
If the set available amount is used (see max. amount), error message E26 will be released and the makeup will be disabled.
- "time-controlled"
The set max. amount is available within the set period "period for amount". If more than this amount is used within this period, the error message E26 will be released and the makeup will be disabled.

	Otherwise the entire amount "max. amount" will be enabled for the next period.
max. amount	Set the max. amount in litres.
period for amount	Set the period of time for operating mode "time-controlled".
level: start makeup	Makeup starts below this level (hysteresis: +10%)
water hardness	measured hardness of the makeup water
water conductivity	measured conductivity of the makeup water

user level 3 → settings → degassing →

operating mode	<p>Selection of the operating mode of the enabled degassing</p> <ul style="list-style-type: none"> - "as per timer prog." <p>Degassing is only available in defined release times.</p> - "always enabled" <p>Degassing is always enabled, independent from time and timer program.</p> - "off" <p>Degassing is deactivated permanently.</p>
timer program	<p>Setting of the release times for operating mode "as per timer prog."</p> <p>see chapter 5.9 "timer programs"</p>
cycle (normal)	period of normal degassing in minutes
cycle (fast)	period of fast degassing in minutes
durat. fast degassing	duration of fast degassing (default setting: 48 h)

user level 3 → settings → monitoring →

In this settings you can define maximum and minimum values for the respective measurements. If these limits are over- resp. under-run, a warning will be released.
default setting: no monitoring

user level 3 → settings → bus module →

For more information see instruction manual of the bus module.

user level 3 → settings → SMS module →

For more information see instruction manual of the SMS module.

user level 3 → settings → device set-up →

Menu item to configurate the multicontrol device
see chapter 6 "commissioning" - "step 8"

user level 3 → manual mode →

For maintenance works each displayed output resp. signalling contact can be switched in manual mode.

- "on"
Output resp. signalling contact is switched on permanently
- "off"
Output resp. signalling contact is switched off permanently
- "test"
Output resp. signalling contact can be switched in tip operation:
pressing key "F1" = "On"
- "auto"
Default setting. Status of the output resp. signalling contact is set automatically by the multicontrol device due to it's current function.

user level 3 → code input →

change to higher rated user levels.

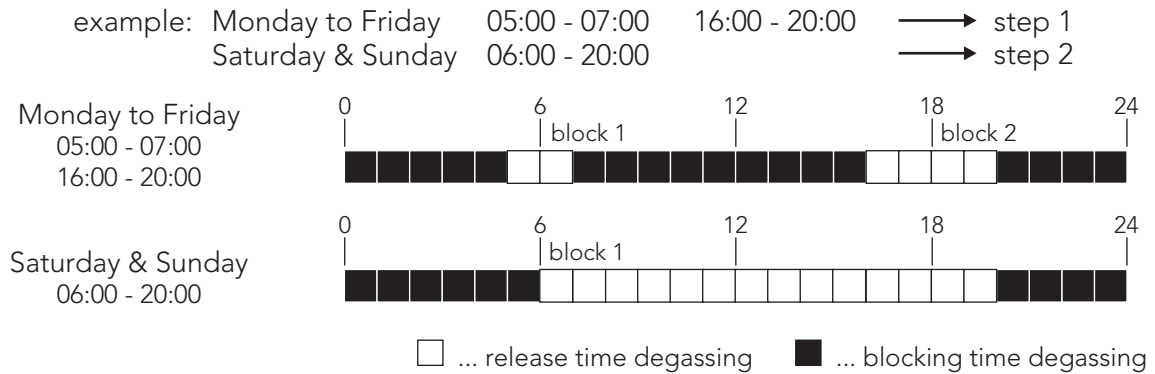
 INFORMATION!

If no key is pressed within 30 minutes, the control electronics quits the current user level and jumps to the main display.

To access user level 3 you have to enter the code again.

5.9. timer programs

If degassing is activated (operating mode: "as per timer prog.") you are able to define a timer program with 3 timer blocks in which every day of the week can be defined individually. To make the programming more easy, there are 3 settings to set more days at the same time: 'Monday to Friday' - 'Saturday & Sunday' - 'Monday to Sunday'



- step 1
- scroll to setting 'Monday to Friday'
 - select 'Monday to Friday'
 - select 'block 1'
 - set the times On: 05:00 → Off: 07:00 ^{1.)}
 - next
 - scroll to setting 'block 2'
 - select 'block 2'
 - set the times On: 16:00 → Off: 20:00 ^{1.)}
 - next
 - scroll to setting 'block 3'
 - select 'block 3'
 - set the times On: 24:00 → Off: 24:00 ^{1.) 2.)}
 - next
 - back

6. Commissioning

i INFORMATION!

For multicontrol modular MCM-_2...9 series devices see the instruction manual MCM-_2...9, chapter "Commissioning"

i NOTE!

Commissioning by the eder customer service resp. an authorized partner and training of the operating personell is recommended!

Commissioning procedure:

i NOTE!

Steps 1-3 must be completed on site in preparation for the commissioning.

- step 1** Determine the upper working pressure. This upper working pressure is also the set pressure of the overflow valve.

10 m Ws ~ 1 bar

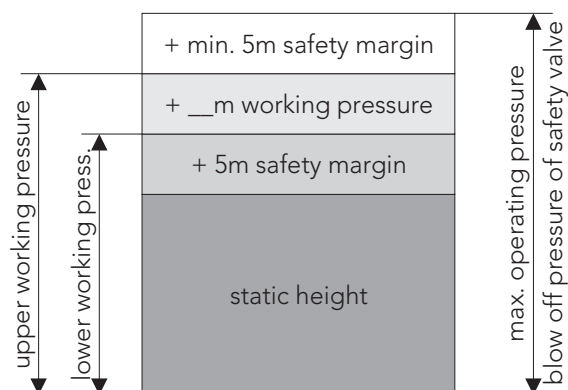


figure: determination of the upper and lower working pressure

- step 2** Shut all connections from/to system return (expansion overflow pipe, expansion pressure pipe, makeup water)
CAUTION: Do NOT shut suction pipe and overflow pipe at MCM series!
- step 3** Fill and ventilate the system to the upper working pressure as determined in step 1.
- step 4** Check the correctness of all hydraulic and electric connections, especially expansion pressure pipe, expansion overflow pipe and flow direction at the connection point in system return.

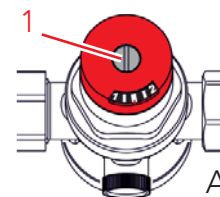
step 5

Open the makeup water connection to MCF makeup module and set the pressure reducing valve to 1,5 bar - max. 2,0 bar.

Version A:

Loosen the screw (1) at the pressure reducing valve and set the scale to 1,5 bar - max. 2,0 bar.

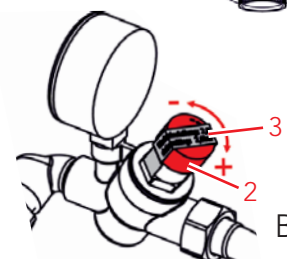
To fix the setting, the screw must be tightened again.



Version B:

Set the pressure at the setting knob (2).

If the MCF mounted ex factory, the pressure is already set, see sealing sticker at the valve (3).

**step 6**

Switch on power supply and check if the red control lamp beside the key "0" glows. If not, deactivate the device by pressing the key "0" and following confirmation by pressing the key "F1" (red control lamp beside the key "0" must glow!)

step 7

Fill and ventilate the pressure maintenance pumps and the piping.

- The shut off devices at the intake side of the pump(s) (1) must be opened completely (ex factory)
- Remove the plug at the filler hole (2)
- If a MCF makeup module is installed, go to manual mode (user level 3), see chapter 5.7, "user level 3".

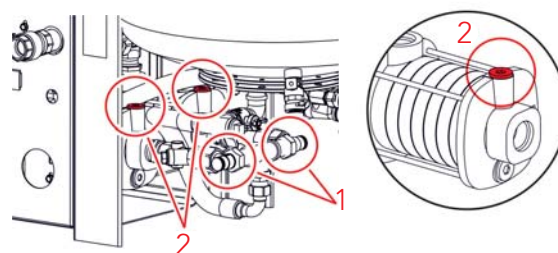


figure: pump filling and ventilation

- Switch on the output "makeup valve Y1" ("output: on") and fill the vessel until a continuous water jet leaks from the filler hole at the pressure maintenance pump. After this set the output "makeup valve Y1" to automatic mode ("output: auto"). The pump should be filled at a level (reference value) of ca. 30 - 40 %. During this filling the vessel level can be watched at the main display.

i INFORMATION!

Tip: Shut off all expansion vessels except the first main vessel (MCK resp. EG-M) previously to accelerate the filling.

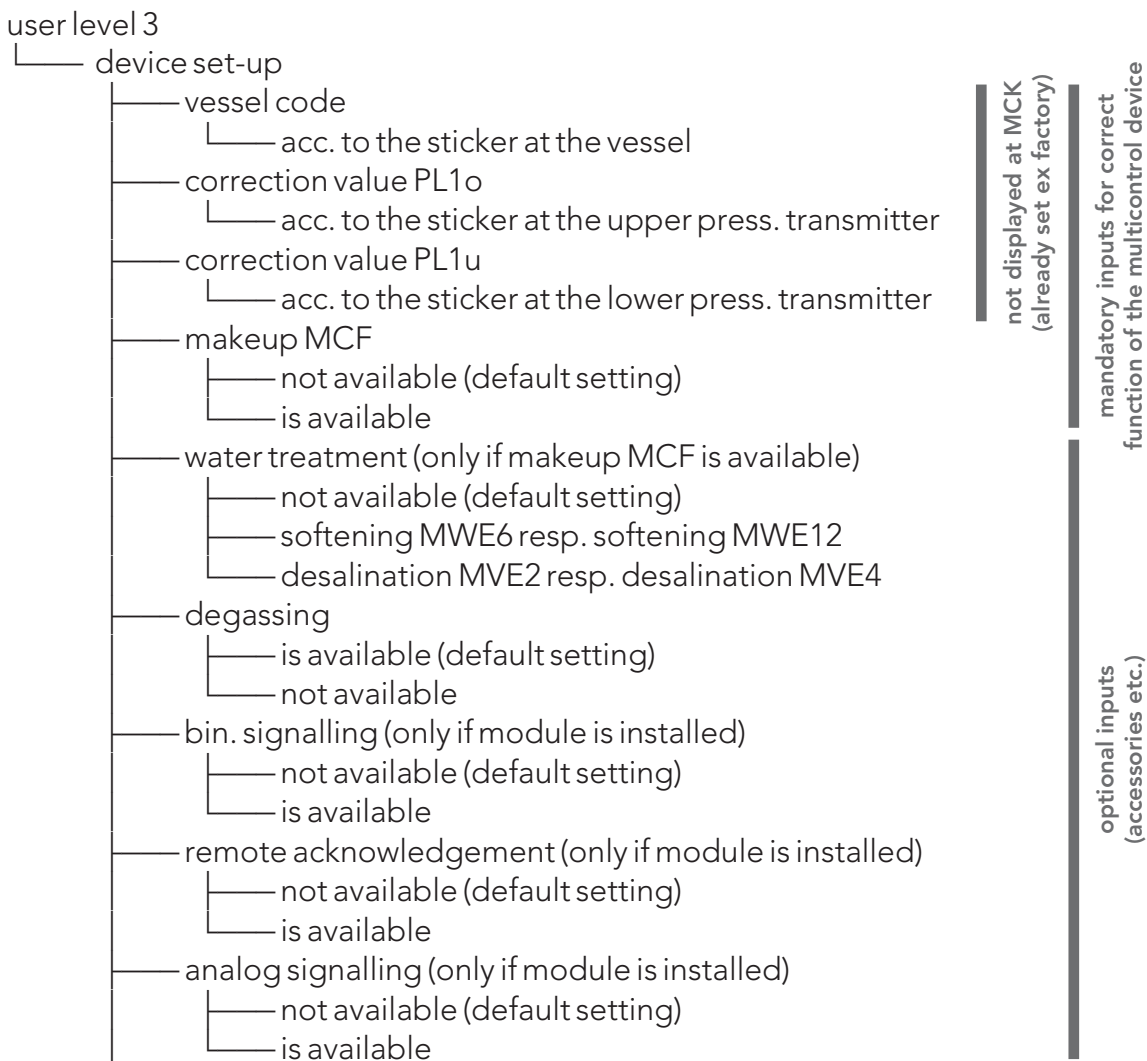
- If a makeup module is not installed, you have to fill the system until the vessel is filled via the overflow valve and a continuous water jet leaks from the filler hole of the pressure maintenance pump. If the system pressure rises too high, you could reduce the set upper working pressure at the overflow valve (see fig. 11).

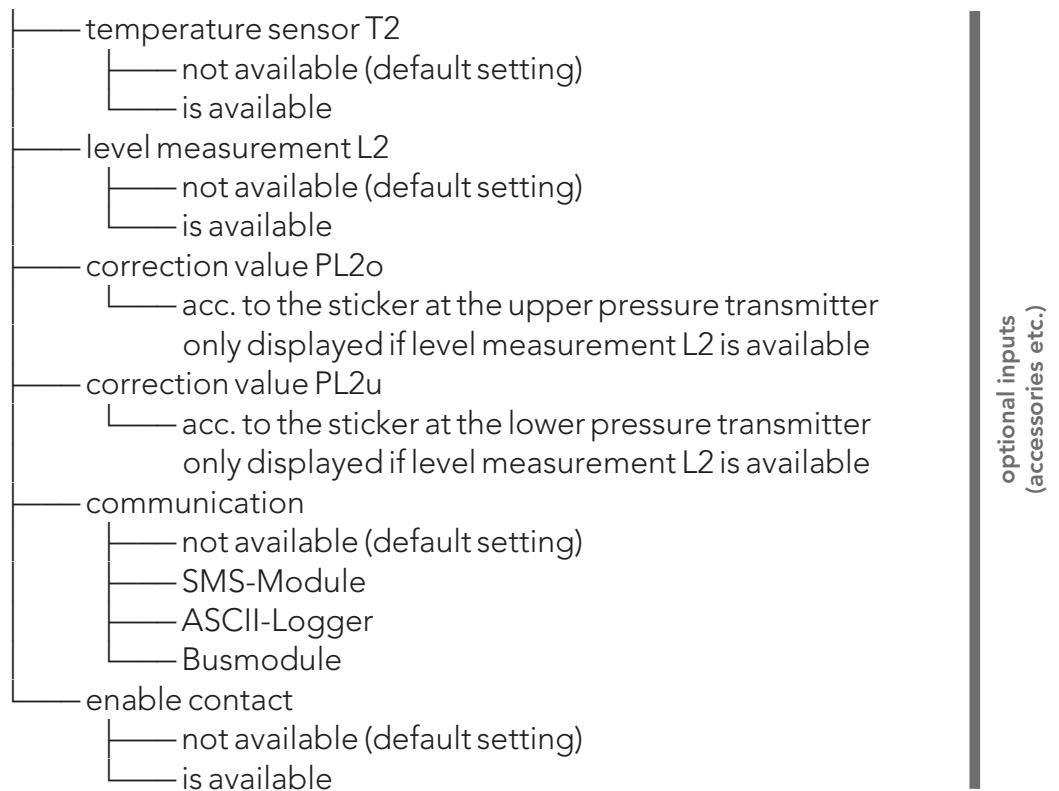
- To ensure a complete ventilation, start and stop the pump in manual mode ("output: Test", operate with "F1") several times.
- Reassemble the plug of the pumps filler hole.
- AT devices with two pressure maintenance pumps (systems Duo and Maxi) , repeat the above steps for the second pump (pump 1 = left side, pump 2 = right side)
- Open the emptying right beside the overflow valve and ventilate the piping completely by starting and stopping the pump(s) in manual mode several times. After this, shut the emptying.

step 8

Configuration of the multicontrol device

- Press key "F2" (operate) in main display
- Select menu item "code input"
- Enter the code (see chapter 5.7. "user level 3")
- user level 3 is unlocked
- Go to menu item "device set-up" in user level 3 (if already done: „settings“ → „device set-up“)





i INFORMATION!

If device set-up was completed successfully (only mandatory inputs necessary) this menu item is removed permanently. The device set-up always is available in "user level 3" → "settings"

step 9 Enable the device by pressing the key "I" in main display and confirm it by pressing the key "F1" (Yes) (green control lamp beside the key "I" must glow!)

step 10 Adjust the pressure maintenance pump(s)
Due to the necessary working pressure the pump(s) must be adjusted on the output side. This adjustment must be done because the delivery rate of the pump(s) (acc. to their characteristic curve) rises at lower pressures.

A hint for a necessary adjustment could be:

After pump stop the overflow valve doesn't close completely before approx. 0,5 bar under the upper working pressure.

i NOTE!

The adjustment of the pressure maintenance pump(s) must be done before the setting of the working pressure! After this neither the working pressure nor the adjustment must be changed! If the adjustment was done subsequently the working pressure must be set anew!

step 11

Set the working pressure

- Open the shut off devices from/to system return (expansion overflow pipe, expansion pressure pipe, makeup water).

Due to the size of the system the setting of the working pressure can take up a lot of time because the pressure has to extend into the entire connected system to be stable for the setting.

i NOTE!

To ensure a correct setting of the working pressure, the multicontrol device must be connected to the system return.

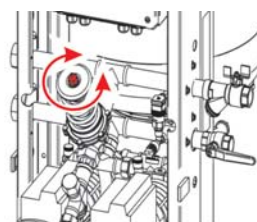
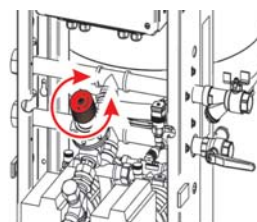
- Go to user level 3 (see step 9)
- Select "settings" → "pressure maintenance" → "working pressure"
- The display shows the current settings (complies with the last set working pressure, e.g. default value ex factory)

CAUTION: Independent to the displayed values the working pressure must be set again in the course of commissioning!

- Press the key "F1" (change) to start the pump.
- Set the overflow valve to the upper working pressure (determined in step 1), the current pressure is shown at the display.

The setting of the setpoint at the overflow valve happens at the black handwheel (systems Solo and Maxi) resp. at the hexagonal nut (wrench size 19 mm) at the spring cap (system Duo) in clockwise direction = higher pressure, resp. counterclockwise direction = lower pressure.

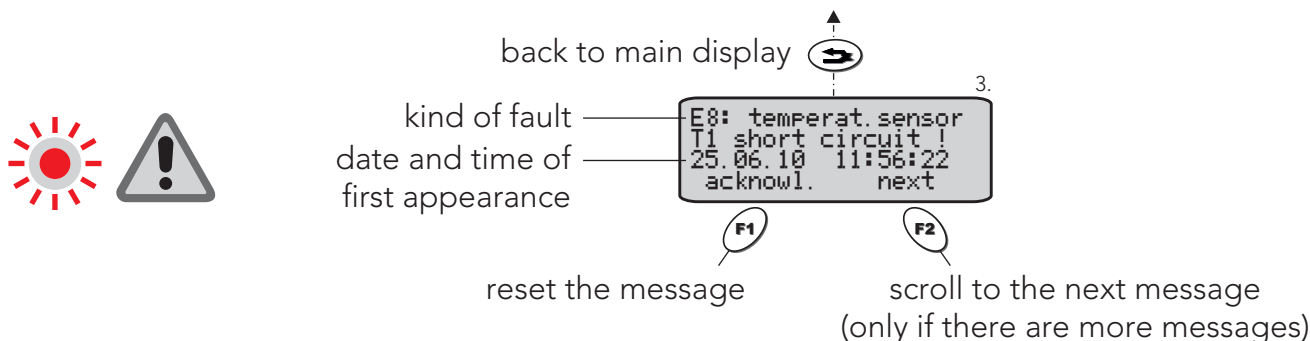
- In devices with 2 overflow valves (system Twin), both valves must be set one by one. One of the valves must be shut off, at the other one the upper working pressure can be set. Then the set valve must be shut off and the other one can be set - repeat the above steps (set both valves to the same pressure!)



i NOTE!

In Twin devices only one overflow valve must be in operation, the other one must be shut off at its intake side. If both valves are in operation at the same time, the control behaviour can be influenced negatively (e.g. too big hysteresis). Therefore this must be avoided!

Example: fault message "E8: temperat.sensor T1 short circuit !"



Warnings (device is still in operation)



No.	Message	Description	Check / Repair	Necessary device options for this message
W2	W2: manual mode at least 1 output	At least one output is set to "manual mode".	Message resets itself after setting all outputs to "automatic mode". To set several outputs, use "user level" - "manual mode".	no (contained in every configuration)
W3	W3: accomplish Periodic maintenance	This message is displayed after 2500 operating hours of the pressure maintenance pump. It signals a necessary maintenance.	Arrange a maintenance acc. to instruction manual and after this reset the message.	no (contained in every configuration)
W4	W4: temperat. limit sensor T1 exceeded!	Maximum temperature at sensor T1 has been exceeded. Degassing is deactivated as long as the temperature is too high. After this it will be enabled again.	Exceeding temperature at T1 again and again signifies too high temperatures at the point of implementation! On site tasks could be necessary (EV cooling vessels etc.) to avoid damages of the device (defective components, membrane,...)	no (contained in every configuration)
W5	W5: monitorins: Lmax over-run !	Built-in monitoring has been activated: The set maximum level has been exceeded	Message is only an advice. It doesn't affect the function of the device. Check set limit value eventually	no (contained in every configuration)
W6	W6: monitorins: Lmin under-run !	Built-in monitoring has been activated: The set minimum level has been under-run	Message is only an advice. It doesn't affect the function of the device. Check set limit value eventually	no (contained in every configuration)
W7	W7: monitorins: P1max over-run !	Built-in monitoring has been activated: The set maximum plant pressure has been exceeded	Message is only an advice. It doesn't affect the function of the device. Check set limit value eventually	no (contained in every configuration)
W8	W8: monitorins: P1min under-run !	Built-in monitoring has been activated: The set minimum plant pressure has been under-run	Message is only an advice. It doesn't affect the function of the device. Check set limit value eventually	no (contained in every configuration)
W9	W9: monitorins: T1max over-run !	Built-in monitoring has been activated: the set maximum temperature at sensor T1 has been exceeded	Message is only an advice. It doesn't affect the function of the device. Check set limit value eventually	no (contained in every configuration)

7. Warnings and fault messages

No.	Message	Description	Check / Repair	Necessary device options for this message
W10	W10: monitoring: T1min under-run !	Built-in monitoring has been activated: the set minimum temperature at sensor T1 has been under-run	Message is only an advice. It doesn't affect the function of the device. Check set limit value eventually	no (contained in every configuration)
W11	W11: time changed due to daylight-saving !	The time has been changed due to daylight-saving.	Check time and date before resetting this message.	no (contained in every configuration)
W12	W12: underpressure in vessel 1 (PL1o) !	Low-pressure has been detected in vessel 1 (upper transmitter of level measurement L1). Thus pumps have been disabled.	Pumps get enabled again, if pressure is in allowed range and the message is reset. First check if the hose from the outside of the membrane is clear.	no (contained in every configuration)
W13	W13: temperat. limit sensor T2 exceeded!	Maximum temperature at sensor T2 has been exceeded. Degassing is deactivated as long as the temperature is too high. After this it will be enabled again.	Message is only an advice. The Sensor T2 is decided to disable degassing in such situations with too high temperatures.	sensor T2
W14	W14: monitoring: T2max over-run !	Built-in monitoring has been activated: the set maximum temperature at sensor T2 has been exceeded	Message is only an advice. It doesn't affect the function of the device. Check set limit value eventually	sensor T2
W15	W15: monitoring: T2min under-run !	Built-in monitoring has been activated: the set minimum temperature at sensor T2 has been under-run	Message is only an advice. It doesn't affect the function of the device. Check set limit value eventually	sensor T2
W16	W16: makeup MCF remaining amount < 20%	The remaining amount for the makeup is less than 20% of the set maximum amount.	Message is only an advice. It doesn't affect the function of the device. Check if consumption is in line with the usual consumption of the plant, reset the amount so the full amount is available again.	makeup module MCF
W17	W17: softening MWE remain. capacity < 20%	The remaining amount of the softening cartridge from MWE is less than 20%. If the amount is completely used makeup can't be used anymore.	Provide spare cartridge in time and change it at latest if the old capacity is completely used.	makeup module MCF and softening MWE
W18	W18: underpressure in vessel 2 (PL2o) !	Low-pressure has been detected in vessel 1 (upper transmitter of level measurement L2). Thus pumps have been disabled.	Pumps get enabled again, if pressure is in allowed range and the message is reset. First check if the hose from the outside of the membrane is clear.	level measurement 2
W20	W17: demineral. MVE remain. capacity < 20%	The remaining amount of the demineralisation cartridge from MVE is less than 20%. If the amount is completely used makeup can't be used anymore.	Provide spare cartridge in time and change it at latest if the old capacity is completely used.	makeup module MCF and demineralisation MVE
W21	W21: blocking temp. T1 sensor T1 below !	The minimum temperature at sensor T1 has been undercut. Degassing is deactivated as long as the temperature is too low. After this it will be enabled again.	Recurring undercuts of the minimum temperature at sensor T1 mean too low temperatures at the connection point! On-site steps (e.g. EV vessel etc.) are necessary to avoid damage of the device (e.g. armatures, bubble etc.)	no (contained in every configuration)

No.	Message	Description	Check / Repair	Necessary device options for this message
W22	W22: blocking temp. T2 sensor T2 below !	The minimum temperature at sensor T2 has been undercut. Degassing is deactivated as long as the temperature is too low. After this it will be enabled again.	Message is only an advice. The sensor T2 is decided to disable degassing in such situations with too low temperatures.	sensor T2

Fault messages (the device can't be operated correctly, check and repair the cause of the fault immediately!)



associated control lamp

No.	Message	Description	Check / Repair	Necessary device options for this message
E0	E0: device is disabled!	Device has been deactivated by pressing key 0 and confirming the request.	Message resets itself after enabling the device by pressing key 1. First check the reason for the deactivation and if an enabling is possible again.	no (contained in every configuration)
E1	E1: data link error to basic circ. Board	At the communication between the central processing board and the basic circuit board occurred a fault.	Basic circuit board: the middle LED has to flash permanently. The green one shows the data transfer and must flash at least every second. Check connections and if ok the central processing board or the basic circuit board is damaged	no (contained in every configuration)
E2	E2: PUMP M1 start failed !	Device control enabled the output (A_PHASE_0) for pump M1 but the checkback signal for the pump motor (DI_0) did not arrive in time.	<ul style="list-style-type: none"> - integrated motor temperature switch Z1/Z2 has been activated (after cooling down pump can restart if necessary) - break - incorrect contact - defect output A_PHASE_0 - defect input DI_0 	no (contained in every configuration)
E3	E3: PUMP M1 stop failed !	Device control disabled the output (A_PHASE_0) for pump M1 but after this at least one checkback signal of the pump motor (DI_0) was received.	<ul style="list-style-type: none"> - incorrect contact - defect output A_PHASE_0 - defect input DI_0 	no (contained in every configuration)
E4	E4: read error I2C basic circuit board	The internal communication at the I2C-bus on the basic circuit board failed	- confirm message. If the message appears anew the basic circuit board obviously is defective	no (contained in every configuration)
E5	E5: max. run-time PUMP M1 exceeded !	By starting pump M1 a monitoring time checks if the pump is able to raise the pressure and turn off in a defined time. If not, an error message appears. Pump disabled.	<ul style="list-style-type: none"> - check if a permanent decrease of plant pressure occurs - configuration of the upper working pressure has been changed without using the pressure settings function of the control electronics. Check pressure settings and confirm message.	no (contained in every configuration)

7. Warnings and fault messages

No.	Message	Description	Check / Repair	Necessary device options for this message
E6	E6: too many PUMP requests per period!	If the lower working pressure falls below a set value a pump request occurs and a pump starts. The quantity of pump requests per interval is monitored. By exceeding of the upper limit this message appears. Pumps disabled.	<ul style="list-style-type: none"> - check if a permanent decrease of plant pressure occurs - check valve pump is defective - configuration of the upper working pressure has been changed without using the pressure settings function (insufficient working pressure difference) 	no (contained in every configuration)
E7	E7: write error I2C basic circuit board	The internal communication at the I2C-bus on the basic circuit board failed	<ul style="list-style-type: none"> - confirm message. If the message appears anew the basic circuit board obviously is defective 	no (contained in every configuration)
E8	E8: temperat. sensor T1 short circuit !	The resistance of the sensor is too low and falls below the valid range.	<ul style="list-style-type: none"> - sensor connection shows a short circuit or is damaged - sensor element is defective 	no (contained in every configuration)
E9	E9: temperat. sensor T1 break !	The resistance of the sensor is too high and exceeds the valid range.	<ul style="list-style-type: none"> - incorrect connection of the sensor at the control electronics - sensor connection is broken or damaged - sensor element defective 	no (contained in every configuration)
E10	E10: transmitter P1 meas. signal too high	Measurement signal of pressure transmitter P1 (plant pressure) is above the normal valid range.	<ul style="list-style-type: none"> - connection of pressure transmitter P1 is incorrect or damaged - pressure transmitter is defective - measure input of basic circuit board is defective 	no (contained in every configuration)
E11	E11: transmitter P1 meas. signal too low!	Measurement signal of pressure transmitter P1 (plant pressure) is below the normal valid range.	<ul style="list-style-type: none"> - pressure transmitter P1 is disconnected - connection of pressure transmitter is incorrect or damaged - pressure transmitter is defective - measure input of basic circuit board is defective 	no (contained in every configuration)
E12	E12: transmitter PL1o meas. signal too high	Measurement signal of pressure transmitter PL1o (vessel pressure top) is above the normal valid range.	<ul style="list-style-type: none"> - connection from pressure transmitter PL1o incorrect or damaged - pressure transmitter defect - measure input of basic circuit board defect 	no (contained in every configuration)
E13	E13: transmitter PL1o meas. signal too low!	Measurement signal of pressure transmitter PL1o (vessel pressure top) is below the normal valid range.	<ul style="list-style-type: none"> - pressure transmitter PL1o is disconnected - connection from pressure transmitter is incorrect or damaged - pressure transmitter is defective - measure input of basic circuit board is defective 	no (contained in every configuration)
E14	E14: transmitter PL1u meas. signal too high	Measurement signal of pressure transmitter PL1u (vessel pressure bottom) is above the normal valid range.	<ul style="list-style-type: none"> - connection of pressure transmitter PL1u is incorrect or damaged - pressure transmitter is defective - measure input of basic circuit board is defective 	no (contained in every configuration)
E15	E15: transmitter PL1u meas. signal too low!	Measurement signal of pressure transmitter PL1u (vessel pressure bottom) is below the normal valid range.	<ul style="list-style-type: none"> - pressure transmitter PL1u is disconnected - connection from pressure transmitter is incorrect or damaged - pressure transmitter is defective - measure input of basic circuit board is defective 	no (contained in every configuration)

7. Warnings and fault messages

No.	Message	Description	Check / Repair	Necessary device options for this message
E16	E16: dry run protec. has been activated !	Dry run protection for pressure maintenance pump has been activated for at least one time.	This message could appear if fresh water supply is closed, backfeed modul is defect, makeup amount is exceeded, etc. After reaching the minimum level the function of the device will be enabled automatically. The message must be reset manually	no (contained in every configuration)
E17	E17: read error I2C module: analog sign.	The internal communication between the basic circuit board and the expansion module "analogue signalling" at the I2C-bus failed	<ul style="list-style-type: none"> - expansion module "analogue signalling" is activated while it is actually not installed: correct configuration - cable connection is disconnected or damaged - expansion module: power supply is disconnected - expansion module is defective 	expansion module "analogue signalling"
E18	E18: write error I2C module: analog sign.	The internal communication between the basic circuit board and the expansion module "analogue signalling" at the I2C-bus failed	<ul style="list-style-type: none"> - expansion module "analogue signalling" is activated while it is actually not installed: correct configuration - cable connection is disconnected or damaged - expansion module: power supply is disconnected - expansion module is defective 	expansion module "analogue signalling"
E19	E19: read error I2C module: binary sign.	The internal communication between the basic circuit board and the expansion module "binary signalling" at the I2C-bus failed	<ul style="list-style-type: none"> - expansion module "binary signalling" is activated while it is actually not installed: correct configuration - cable connection is disconnected or damaged - expansion module: power supply is disconnected - expansion module is defective 	expansion module "binary signalling"
E20	E20: write error I2C module: binary sign.	The internal communication between the basic circuit board and the expansion module "binary signalling" at the I2C-bus failed	<ul style="list-style-type: none"> - expansion module "binary signalling" is activated while it is actually not installed: correct configuration - cable connection is disconnected or damaged - expansion module: power supply is disconnected - expansion module is defective 	expansion module "binary signalling"
E21	E21:temperat. sensor T2 short circuit !	The resistance of the sensor is too low and falls below the valid range.	<ul style="list-style-type: none"> - incorrect connection of the sensor - sensor connection is damaged - sensor element defective 	sensor T2
E22	E22:temperat. sensor T2 break !	The resistance of the sensor is too high and exceeds the valid range.	<ul style="list-style-type: none"> - incorrect connection of the sensor at the control electronics - sensor connection is broken or damaged - sensor element defective - sensor T2 has been activated while it is not installed 	sensor T2

7. Warnings and fault messages

No.	Message	Description	Check / Repair	Necessary device options for this message
E23	E23: PUMP M2 start failed !	Device control enabled the output (A_PHASE_1) for pump M2 but the checkback signal for the pump motor (DI_1) did not arrive in time.	<ul style="list-style-type: none"> - integrated motor temperature switch Z1/Z2 has been activated (after cooling down pump can restart if necessary) - break - incorrect contact - defect output A_PHASE_1 - defect input DI_1 	system duo or maxi (pump 2)
E24	E24: PUMP M2 stop failed !	Device control disabled the output (A_PHASE_1) for pump M2 but after this at least one checkback signal of the pump motor (DI_1) was received.	<ul style="list-style-type: none"> - incorrect contact - defect output A_PHASE_1 - defect input DI_1 	system duo or maxi (pump 2)
E25	E25: max. run-time PUMP M2 exceeded !	By starting pump M2 a monitoring time checks if the pump is able to raise the pressure and turn off in a defined time. If not, an error message appears. Pump disabled.	<ul style="list-style-type: none"> - check plant if a permanent decrease of pressure happens - configuration of the upper working pressure had been changed without using the pressure setting function. Check pressure setting and confirm message. 	system duo or maxi (pump 2)
E26	E26: makeup MCF amount exceeded !	The set maximum makeup amount has been used and so makeup is disabled.	Check if consumption is in line with the usual consumption of the plant or if an extraordinary event happened (leakage,...). Only if consumption is ok, reset the amount so that the full amount is available again and makeup is possible.	makeup module MCF
E27	E27: makeup: maximum run-time exceeded !	By starting makeup a monitoring time checks if the makeup is able to raise the level and turn off in a defined time. If not, this error message appears.	<ul style="list-style-type: none"> - no or too little makeup water supply pressure - shutoff device of MCF is closed - makeup valve doesn't open: damaged or disconnected - basic circuit board damaged - level measurement doesn't work correctly 	makeup module MCF
E28	E28: softening MWE change cartridge !	The capacity of the MWE's softening cartridge is depleted, a correct softening is not ensured anymore. Thus the MCF makeup module is disabled too.	change cartridge and confirm it in the control electronics "actions" menu, so makeup is enabled again.	makeup module MCF and softening MWE
E29	E29: transmitter PL2o meas.signal too high	Measurement signal of pressure transmitter PL2o (vessel pressure top) is above the normal valid range.	<ul style="list-style-type: none"> - connection from pressure transmitter PL2o incorrect or damaged - pressure transmitter defect - measure input of basic circuit board defect 	level measurement 2
E30	E30: transmitter PL2o meas.signal too low!	Measurement signal of pressure transmitter PL2o (vessel pressure top) is below the normal valid range.	<ul style="list-style-type: none"> - pressure transmitter PL2o is disconnected - connection from pressure transmitter is incorrect or damaged - pressure transmitter is defective - measure input of basic circuit board is defective 	level measurement 2

No.	Message	Description	Check / Repair	Necessary device options for this message
E31	E31: transmitter PL2u meas.signal too high	Measurement signal of pressure transmitter PL2u (vessel pressure bottom) is above the normal valid range.	<ul style="list-style-type: none"> - connection of pressure transmitter PL2u is incorrect or damaged - pressure transmitter is defective - measure input of basic circuit board is defective 	level measurement 2
E32	E32: transmitter PL2u meas.signal too low!	Measurement signal of pressure transmitter PL2u (vessel pressure bottom) is below the normal valid range.	<ul style="list-style-type: none"> - pressure transmitter PL2u is disconnected - connection from pressure transmitter is incorrect or damaged - pressure transmitter is defective - measure input of basic circuit board is defective 	level measurement 2
E42	E42: demineral. MVE change cartridge !	The capacity of the MVE's demineralisation cartridge is depleted, a correct demineralisation is not ensured anymore. Thus the MCF makeup module is disabled too.	change cartridge and confirm it in the control electronics "actions" menu, so makeup is enabled again.	makeup module MCF and demineralisation MVE

8. Cleaning and maintenance

8.1. Cleaning

During operation, mud particles will be caught inside the filter of the mud flap which is mounted at the connection of the expansion overflow pipe. Due to these impurities the flow rate through the mud flap decreases. This decrease could lead to malfunctions of the device.

So the mud particles must be removed in periodic intervals by dismantling and cleaning of the filter of the mud flap. This check and cleaning of the mud flap must be done at least two times a year! If any problems appear at the pressure maintenance device, you should clean the mud flap at first.

Any problems or malfunctions caused by missing this cleaning are excluded from any warranty.

RECOMMENDATION!

If problems with impurities appear frequently, further tasks must be considered (e.g. changing and flushing of the plant media, installation of additional filters or mud separators,...)

These measures affect positively to the entire plant, not only to the pressure maintenance device.

8.2. Maintenance

Maintenance is required at least once a year or if the warning W3 is displayed! The operator has to take care that this maintenance will be done effectively.

i NOTE!

If this maintenance can't be done resp. isn't intended to be done by the operator himself, an adequate expert or the EDER customer service must be assigned to do it.

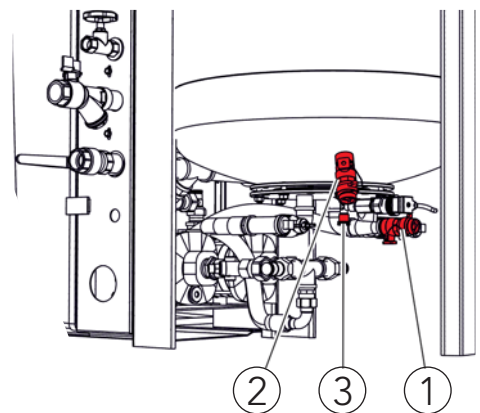
i INFORMATION!

We recommend that the maintenance is executed by the EDER customer service. In this case a conclusion of a maintenance contract is highly recommended.

Any problems caused by missing the required maintenance or maintenance intervals are excluded from any warranty.

Works that must be done in the course of a maintenance:

- Check and record, if the periodic cleaning acc. to 8.1 has been done, record the last cleaning. Clean the device acc. to 8.1 in every case.
- Ask the operator and record, if there occurred any abnormalities or problems since the last maintenance. If possible, resolve these problems.
- Look for the correct closure of the check valve(s).
- Look for the correct function and closure of the overflow valve.
- Elutriate the vessel via the tap at the lower vessel flange (1) resp. in the overflow pipe at the vessel.
- Open the drain tap (2) and discharge eventually existing medium. If medium discharges permanently, the membrane could be damaged → Check the membrane!
- Flush the connection of the vessel pressure transmitter (3). Open the black plastic plug and flush out of the vessel until any impurities are removed. Then close the plug.



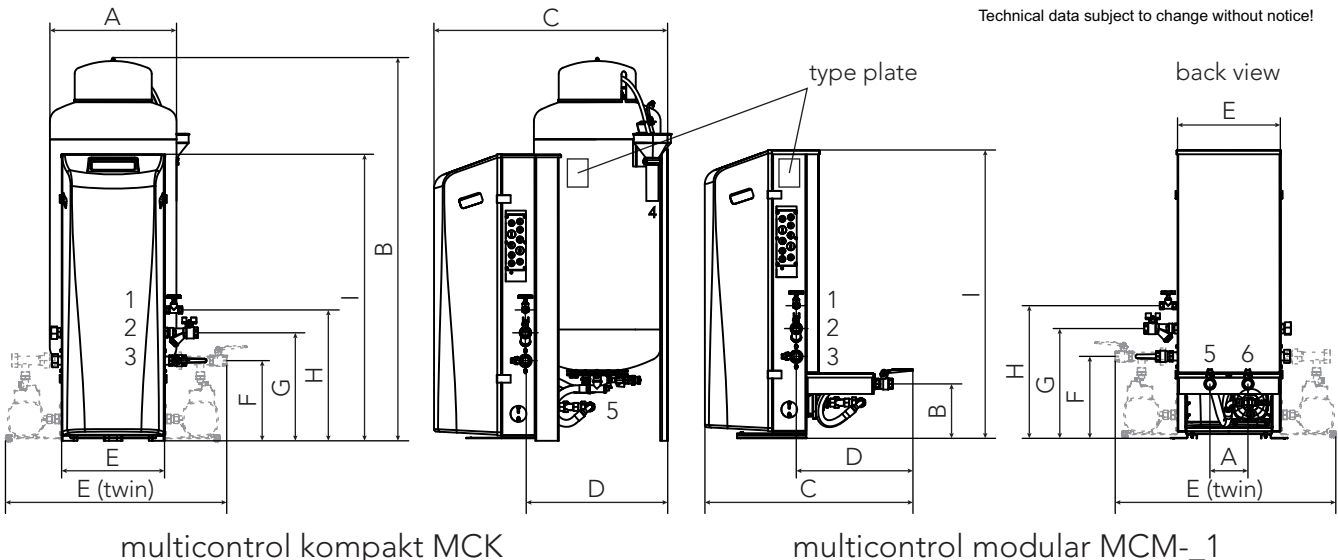
9. Technical data

9.1. multicontrol kompakt MCK and multicontrol modular MCM

type	elko-mat eder multicontrol																						
	kompakt MCK							additional vessels MCB-Z															
system Solo	MCK-S45	MCK-D45(-twin)	MCK-M45(-twin)	MCK-S75	MCK-D75(-twin)	MCK-M75(-twin)	MCK-S125	MCK-D125(-twin)	MCK-M125(-twin)	MCK-S200	MCK-D200(-twin)	MCK-M200(-twin)	MCK-S300	MCK-D300(-twin)	MCK-M300(-twin)	MCK-S500	MCK-D500(-twin)	MCK-M500(-twin)	MCB-Z75	MCB-Z125	MCB-Z200	MCB-Z300	MCB-Z500
nominal content	liter	45	75	125	200	300	500	75	125	200	300	500											
nominal pressure device (PN)	bar	10																					
nominal pressure vessel (PN)	bar	0,5																					
max. temperature at plant connection	°C	70																					
insertion: tip dimension	mm	1500	1500	1500	1630	1700	2250	1500	1500	1630	1700	2250											
voltage	V/Hz	230/50																					
max. electrical power	kW	type Solo Duo Maxi																					
		MCK-__-4.0 + 5.6 : 0,6 1,1 1,1 kW																					
		MCK-__-6.6 + 8.1 : 0,8 1,5 1,5 kW																					
fuse protection	A	Solo: 10 Duo + Maxi: 13																					
dimensions	A mm	400	400	500	500	600	600	400	500	500	600	600	400	500	500	600	600						
	B mm	1375	1375	1405	1515	1577	2130	1375	1405	1515	1577	2130	1375	1405	1515	1577	2130						
	C mm	725	800	940	925	1026	1030	430	535	530	630	640											
	D mm	365	440	570	560	665	670																
	E mm	Solo, Duo, Maxi: 406 Duo-twin, Maxi-twin: 850																					
	F mm	317																					
	G mm	427																					
	H mm	517																					
	I mm	1130																					
	J mm	340	340	345	205	205	120	340	345	205	205	120	340	345	205	205	120						
weight	Solo (4.0+5.6 / 8.1)	kg	88 / 93	91 / 96	95 / 100	115 / 120	129 / 134	144 / 149															
	Duo (4.0+5.6)	kg	102	105	109	129	143	158															
	(6.6 / 8.1)	kg	106 / 112	109 / 115	113 / 119	133 / 139	147 / 153	162 / 168															
	Duo-twin (4.0+5.6)	kg	110	113	117	137	151	166	42	46	67	80	96										
	(6.6 / 8.1)	kg	114 / 117	117 / 120	121 / 124	141 / 144	155 / 158	170 / 173															
	Maxi (4.0+5.6 / 8.1)	kg	101 / 111	104 / 114	108 / 118	128 / 138	142 / 152	157 / 167															
	Maxi-twin (4.0+5.6 / 8.1)	kg	108 / 115	111 / 118	115 / 122	135 / 142	149 / 156	164 / 171															
connections	1 "	Rp1/2																					
	2 "	Rp1																					
	3 "	Rp1																					
	4 mm	Geberit DN50																					
	5 "	Rp3/4																					
	6 "	Rp3/4																					

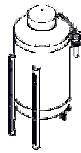
1...makeup 2...expansion overflow pipe 3...expansion pressure pipe 4...discharge hopper 5...suction pipe 6...overflow pipe

Technical data subject to change without notice!



9.2. MCB-Z additional vessels for combination with MCK EG(Z)-M (additional) expansion vessels for combination with MCM

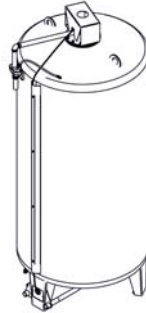
Design of elko-mat eder expansion vessels:



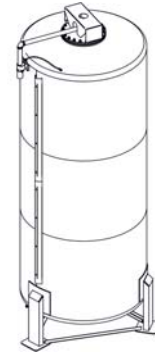
MCB-Z 75-500
EG(Z) 200-500 M



EG(Z) 800-1.500 M



EG(Z) 2.000-5.000 M



EG(Z) 10.000 M

type usage	elko-mat eder MCB-Z / elko-mat eder EG(Z)-M												
	multicontrol kompakt					multicontrol modular							
	MCB-Z 75	MCB-Z 125	MCB-Z 200	MCB-Z 300	MCB-Z 500	EG 200 M	EGZ 200 M	EG 300 M	EGZ 300 M	EG 500 M	EGZ 500 M	EG 800 M	EGZ 800 M
nominal content	litre	75	125	200	300	500	200	300	500	500	500	800	800
nominal pressure vessel (PN)	bar	0,5											
max. temperature at plant connection	°C	70											
insertion tip dimension	mm	1500	1500	1600	1700	2300	1600	1700	2300	2300	2300	2300	2300
dimensions	diameter D	400	500	500	600	600	500	600	600	600	600	800	800
	total height H	1375	1405	1510	1570	2150	1510	1570	2150	2150	2150	2110	2110
	clear height above vessel L	500											
weight	kg	42	46	66	80	95	66	80	95	95	95	210	210
connections	1	Rp 1"											
	2	Rp 1"											
	3 "	Rp 1/2"				Rp 3/8"		Rp 1/2"		Rp 3/8"			
	4 mm	Geberit DN 50											

type usage	elko-mat eder EG(Z)-M															
	multicontrol modular															
	EG 1.000 M	EGZ 1.000 M	EG 1.500 M	EGZ 1.500 M	EG 2.000 M	EGZ 2.000 M	EG 2.500 M	EGZ 2.500 M	EG 3.000 M	EGZ 3.000 M	EG 4.000 M	EGZ 4.000 M	EG 5.000 M	EGZ 5.000 M	EG 10.000 M	EGZ 10.000 M
nominal content	litre	1.000	1.500	2.000	2.500	3.000	4.000	5.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000	10.000
nominal pressure vessel (PN)	bar	0,5														
max. temperature at plant connection	°C	70														
insertion tip dimension	mm	2300	2500	2600	3400	3500	3800	3900	5600	5600	5600	5600	5600	5600	5600	5600
dimensions	diameter D	900	1050	1200	1050	1200	1400	1500	1700	1700	1700	1700	1700	1700	1700	1700
	total height H	2100	2220	2265	3200	3275	3500	3550	5310	5310	5310	5310	5310	5310	5310	5310
	clear height above vessel L	500			700			1000								
weight	kg	250	350	500	550	575	675	775	1500	1500	1500	1500	1500	1500	1500	1500
connections	1	Rp 1"		Rp 5/4"				Rp 6/4"				DN 50				
	2	Rp 1"		Rp 5/4"				Rp 6/4"				DN 50				
	3 "	Rp 3/8"		Rp 1/2"		Rp 3/4"										
	4 mm	Geberit DN 50												Geberit DN 75		

1...overflow pipe from device

2...suction pipe to device

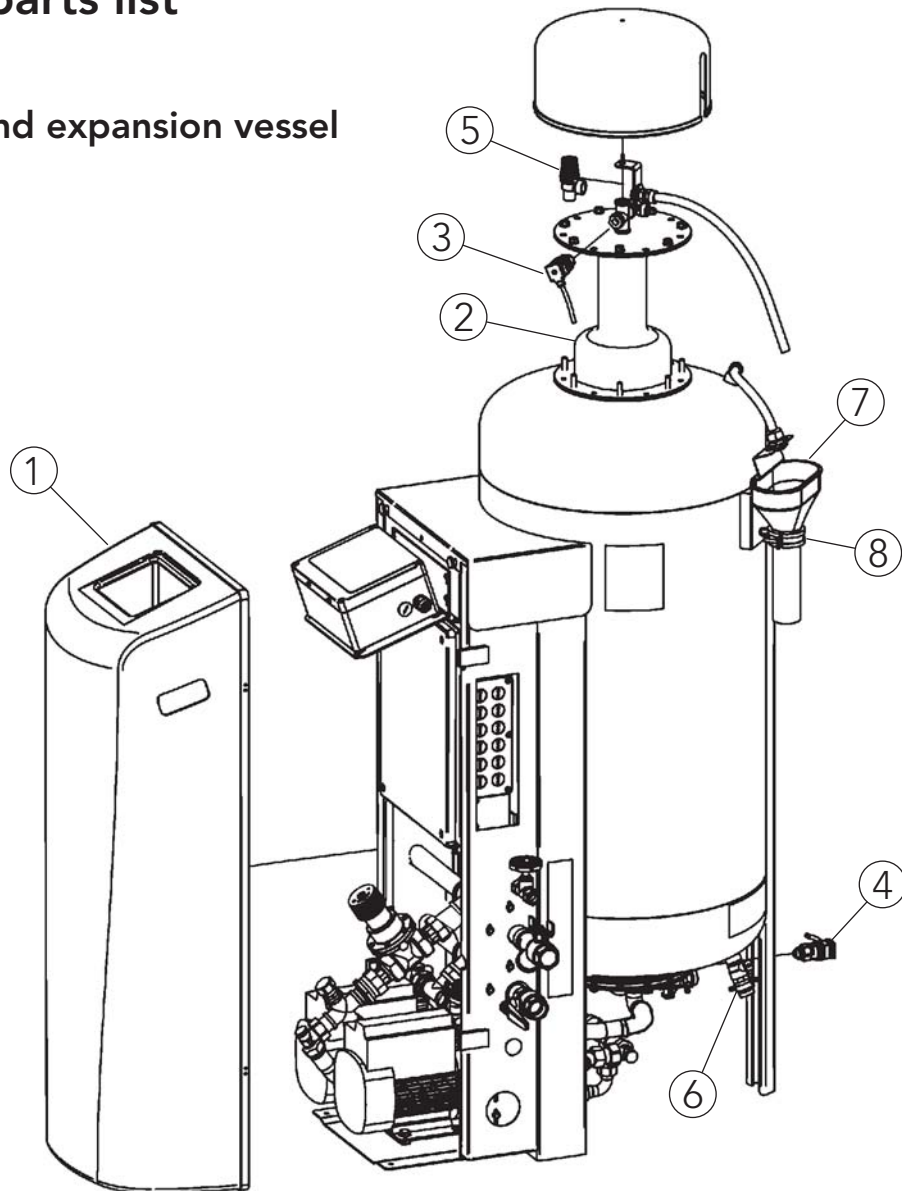
3...gas side vessel connection (beneath cover)

4...discharge hopper

technical data subject to change without notice!

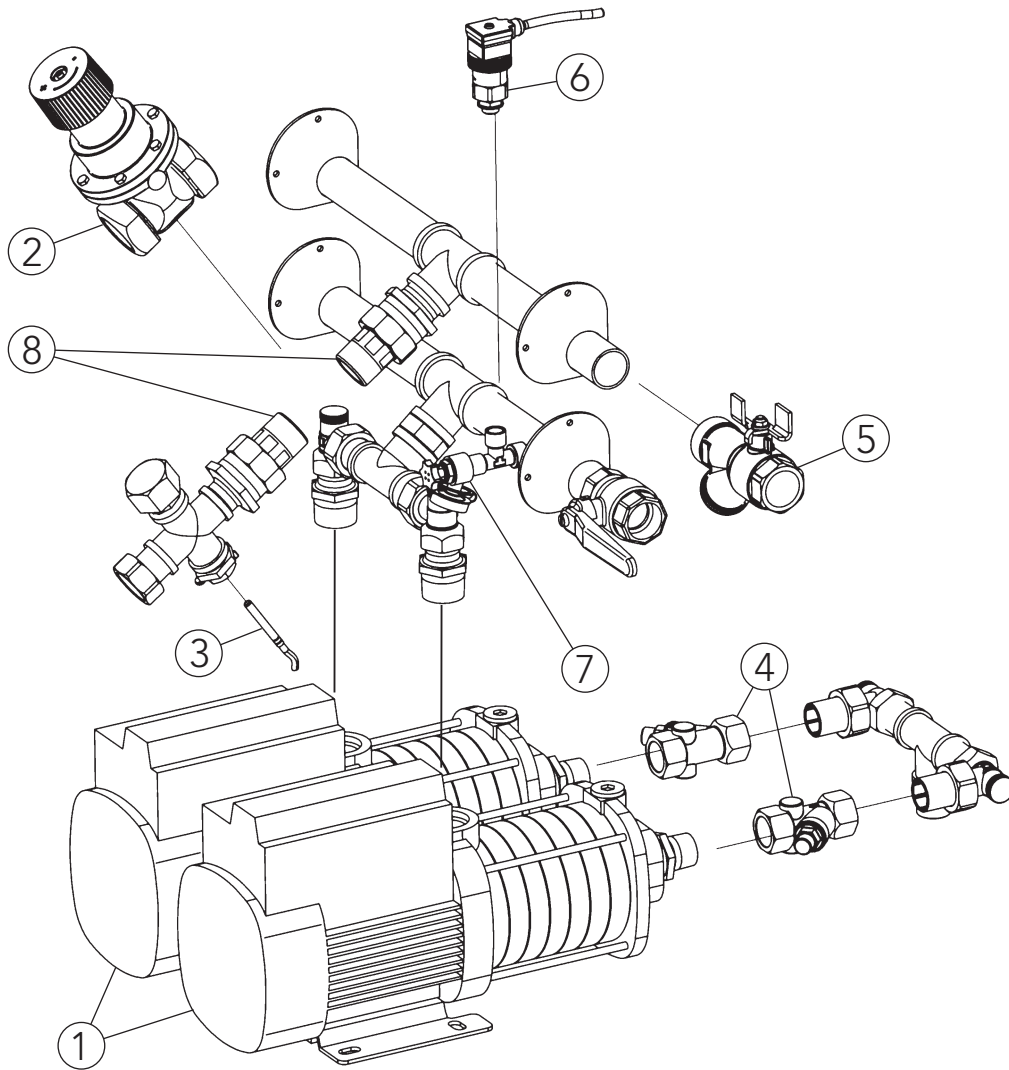
10. Spare parts list

10.1. hood and expansion vessel



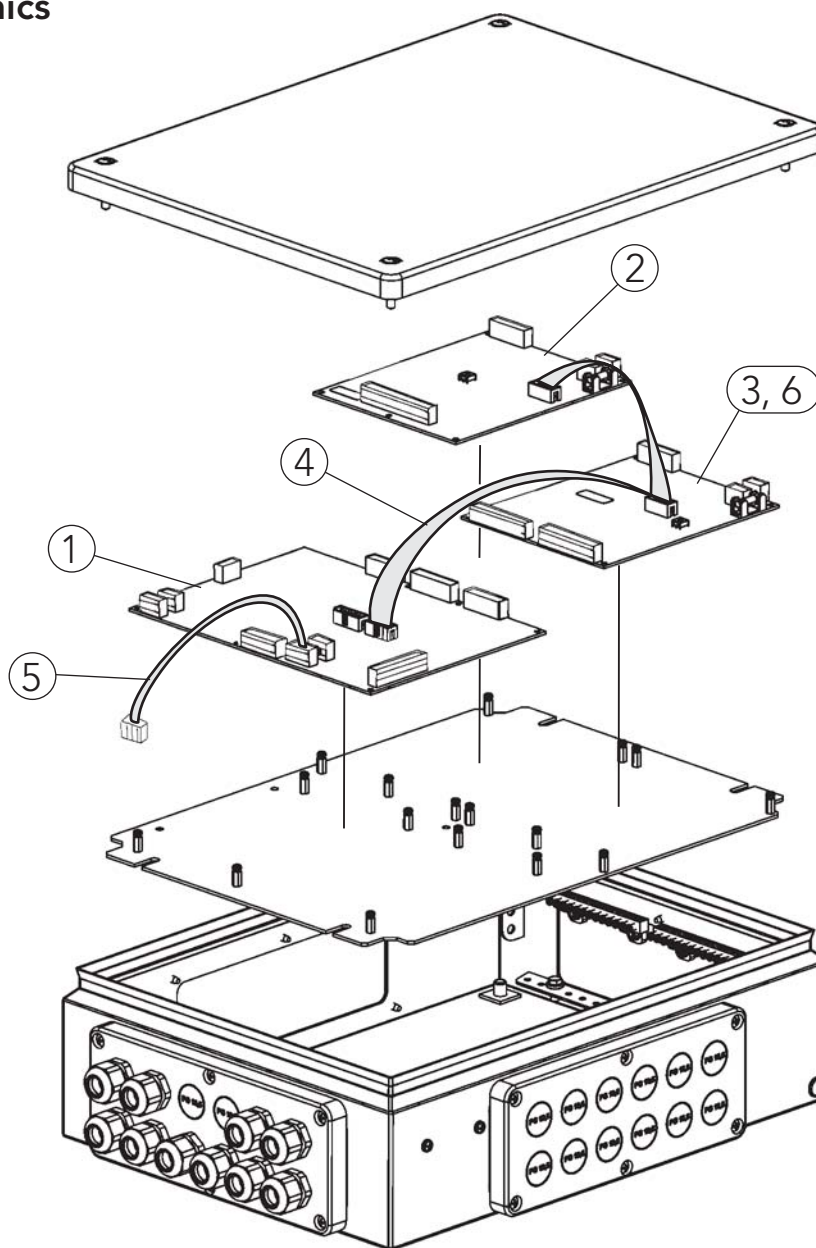
item	description	spare part no.						
		MCK-S45- MCK-D45- MCK-M45- MCK-S75- MCK-D75- MCK-M75- MCK-S125- MCK-D125- MCK-M125- MCK-S200- MCK-D200- MCK-M200- MCK-S300- MCK-D300- MCK-M300- MCK-S500- MCK-D500- MCK-M500- MCM-S1- MCM-D1- MCM-M1-						
1	plastic hood multicontrol, incl. 4 fasteners (two-parts)	90918						
2	membrane	90429	90430	90480	90481	90450	-	
3	upper vessel pressure transmitter	90141						-
4	lower vessel pressure transmitter	90141						-
5	safety valve 0,5 bar	90596				90079		-
6	drain tap 1/2" - 3/4"	90915						-
7	discharge hopper 50	90916						-
8	clamp for discharge hopper 50	90917						-

10.2. piping

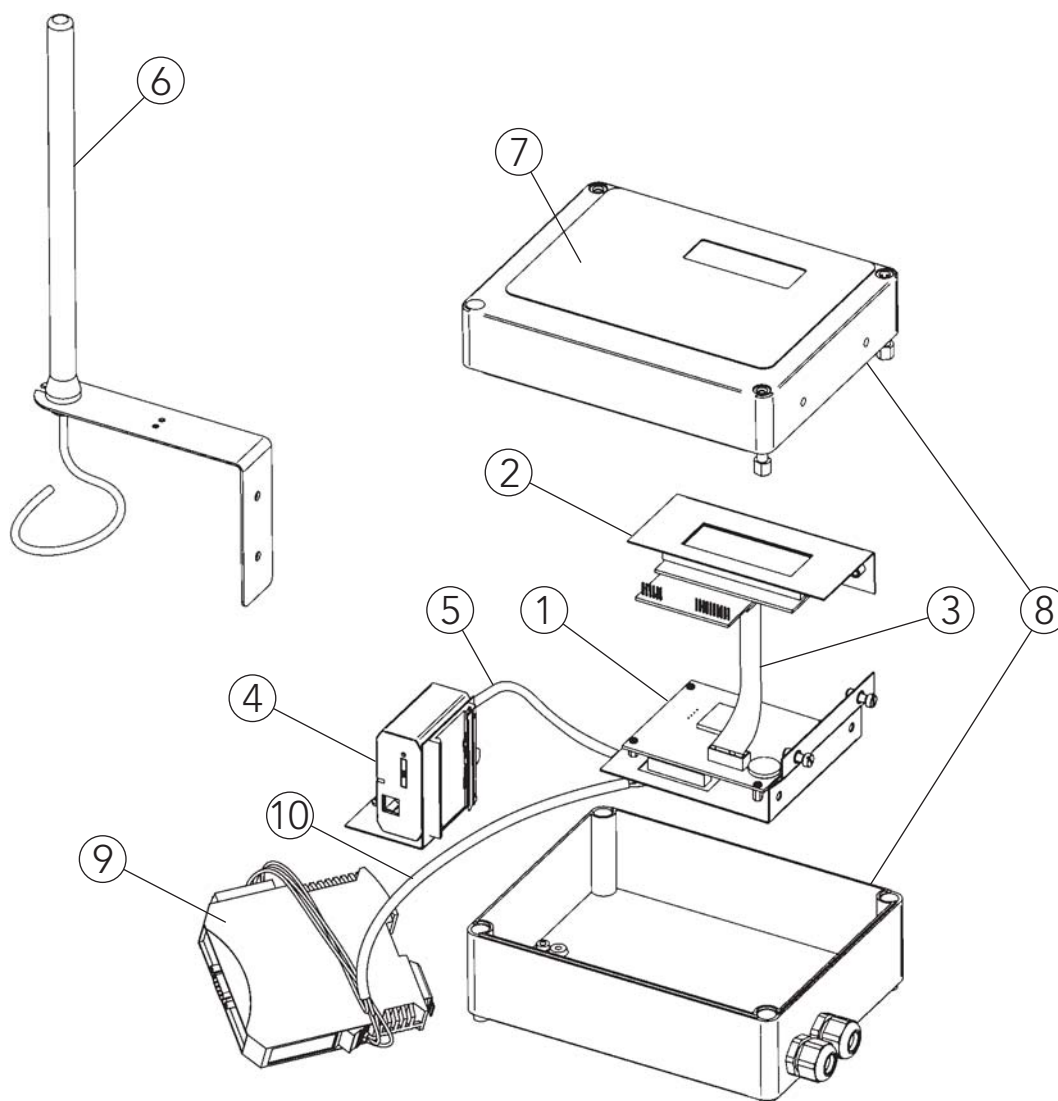


item	description	spare part no.								
		MCK-S__-4.0 MCM-S1-4.0	MCK-S__-5.6 MCM-S1-5.6	MCK-S__-8.1 MCM-S1-8.1	MCK-D__-4.0 MCM-D1-4.0	MCK-D__-5.6 MCM-D1-5.6	MCK-D__-6.6 MCM-D1-6.6	MCK-D__-8.1 MCM-D1-8.1	MCK-M__-4.0 MCM-M1-4.0	MCK-M__-5.6 MCM-M1-5.6
1	pump - CM 1-7 (-4.0 + -5.6)	90909	-	-	90909	-	-	-	90909	-
1	pump - CM 1-8 (-6.6)	-	-	-	-	90910	-	-	-	-
1	pump - CM 1-10(-8.1)	-	-	90957	-	-	-	90957	-	90957
2	overflow valve	90011	90603	90604	90650	90121	90121	90115	90011	90603
3	temperature sensor for multicontrol	90911								
4	Y-type check valve	90547								
5	mud flap, 1", lockable	90912								
6	plant pressure transmitter	90140								
7	drain tap 1/4" - 3/4"	90914								
8	overflow valve - screw connection R1" - Rp5/4", flat sealing	90913								

10.3. electronics



item	description	spare part no. MCK-1-1 MCM-1-1
1	board - basic circuit board multicontrol, type 200331	90903
2	board - expansion module "analogue signalling"	90624
3	board - expansion module "binary signalling"	90625
4	cable - connection cable basic circuit board - expansion module, 10 pole	70082
5	cable - connection cable basic circuit board - central processing board, 4 pole	70083
6	board - expansion module "binary signalling & remote reset"	90626

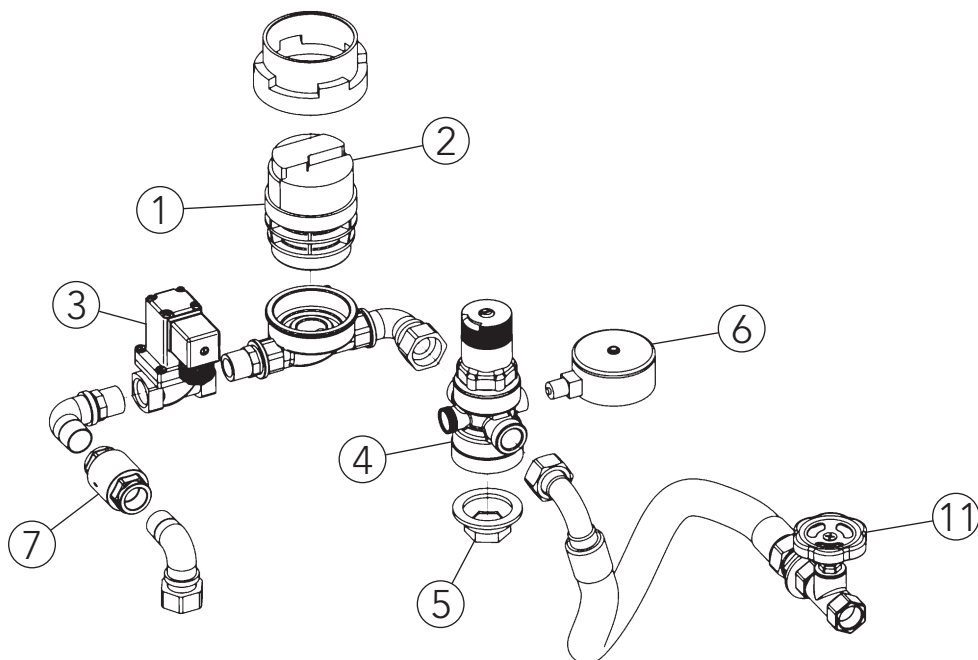


CAUTION! The simultaneous use of the SMS module and the bus modules is not possible!

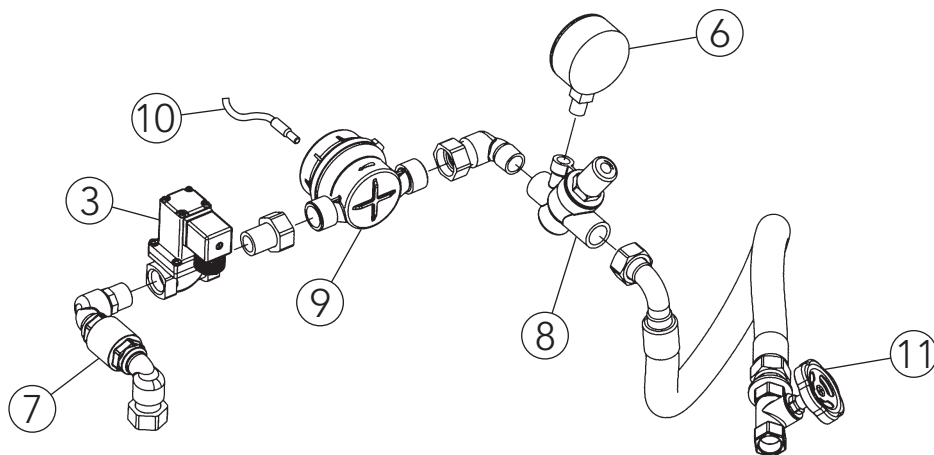
item	description	spare part no. MCK- MCM-1-
1	board - central processing board, without mounting plate	90904
2	display - multicontrol, incl. Mounting plate, without ribbon cable	90901
3	cable - connection central processing board - display, 14 pole	90905
4	SMS-module	(optional accessory)
5	data cable central processing board - SMS-module	(delivered with SMS-module)
6	GSM-antenna	(delivered with SMS-module)
7	display - keypad multicontrol with 2 connection cables	90900
8	display - operation panel multicontrol, (lower part and cover), machined, empty	90902
9	multicontrol bus module Profibus	(optional accessory)
9	multicontrol bus module Modbus RTU RS485	(optional accessory)
9	multicontrol bus module Profinet	(optional accessory)
10	connection cable for bus module	(delivered with bus module)

10.4. makeup module

version A



version B



item	description	spare part no.
		MCF-1
1	water meter 1,5 m ³ /h, type A	90906
2	water meter pulse output module 1 liter/puls snap-on, for water meter type A	90907
3	magnetic valve	90575
4	pressure reducing valve	90015
5	filter bowl	90530
6	manometer - for MCF (option according to respective version)	90908
7	check valve	90620
8	pressure reducing valve, 1/2", Typ D05 type B	90952
9	water meter 1,5 m ³ /h, type B	90950
10	water meter pulse output module 1 liter/puls plug-in, for water meter type B	90949
11	stop valve with handwheel, 1/2"	90694

11. EC declarations of conformity



EG-Konformitätserklärung EC declaration of conformity



im Sinne der EG-Richtlinie(n):

- 2006/42/EG Maschinen
- 2004/108/EG elektromagnetische Verträglichkeit
- 2006/95/EG Niederspannung
- 2011/65/EU Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS 2)

in accordance with the directive(s):

- 2006/42/EC machinery
- 2004/108/EC electromagnetic compatibility
- 2006/95/EC low voltage
- 2011/65/EU use of certain hazardous substances in electrical and electronic equipment (RoHS 2)

Der Hersteller

The manufacturer

Anton EDER GmbH
Weyerstraße 350
A - 5733 Bramberg

erklärt hiermit, dass das Produkt

declares hereby, that the product

multicontrol kompakt solo MCK-S___-__
multicontrol kompakt duo MCK-D___-__
multicontrol kompakt maxi MCK-D___-__-twin
multicontrol kompakt maxi MCK-M___-__
multicontrol kompakt maxi MCK-M___-__-twin

entwickelt, konstruiert und gefertigt wurde in
Übereinstimmung mit der/den oben genannten EG-
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:**

- EN 61000-6-1:2007
- EN 61000-6-3:2007
- EN 12828

Bramberg, 01.04.2016
Ort, Datum


Johann Eder sen.
Unterschrift



EG-Konformitätserklärung
EC declaration of conformity



im Sinne der EG-Richtlinie(n):

- 2006/42/EG Maschinen
- 2004/108/EG elektromagnetische Verträglichkeit
- 2006/95/EG Niederspannung
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erklärt hiermit, dass das Produkt

declares hereby, that the product

multicontrol modular solo MCM-S__-__
multicontrol modular duo MCM-D__-__
multicontrol modular duo MCM-D__-__-twin
multicontrol modular maxi MCM-M__-__
multicontrol modular maxi MCM-M__-__-twin

entwickelt, konstruiert und gefertigt wurde in
Übereinstimmung mit der/den oben genannten EG-
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:**

- EN 61000-6-1:2007
- EN 61000-6-3:2007
- EN 12828

Bramberg, 01.08.2015
Ort, Datum

Johann Eder sen.
Unterschrift



EG-Konformitätserklärung
EC declaration of conformity



im Sinne der EG-Richtlinie(n):

- 2004/108/EG elektromagnetische Verträglichkeit
- 2006/95/EG Niederspannung
- 2011/65/EU Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS 2)

in accordance with the directive(s):

- 2004/108/EC electromagnetic compatibility
- 2006/95/EC low voltage
- 2011/65/EU use of certain hazardous substances in electrical and electronic equipment (RoHS 2)

Der Hersteller

The manufacturer

Anton EDER GmbH
Weyerstraße 350
A - 5733 Bramberg

erklärt hiermit, dass das Produkt

declares hereby, that the product

Nachspeisemodul	multicontrol MCF-1	makeup module
Nachspeisemodul	multicontrol MCF-3	makeup module
Nachspeisemodul	multicontrol MCF-__	makeup module
Nachspeisemodul	multicontrol cool MCC-N1	makeup module
Entgasungsmodul	multicontrol MAE	degassing module

entwickelt, konstruiert und gefertigt wurde in Übereinstimmung mit der/den oben genannten EG-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:

- EN 61000-6-1:2007
- EN 61000-6-3:2007
- EN 12828

Bramberg, 01.08.2015
Ort, Datum

Johann Eder sen.
Unterschrift



EG-Konformitätserklärung
EC declaration of conformity



im Sinne der EG-Richtlinie(n):

- 2004/108/EG elektromagnetische Verträglichkeit
- 2011/65/EU Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS 2)

in accordance with the directive(s):

- 2004/108/EC electromagnetic compatibility
- 2011/65/EU use of certain hazardous substances in electrical and electronic equipment (RoHS 2)

Der Hersteller

The manufacturer

Anton EDER GmbH
Weyerstraße 350
A - 5733 Bramberg

erklärt hiermit, dass das Produkt

declares hereby, that the product

elko-mat eder EG 200M - EG 10.000M
multicontrol cool MCC-G 125 - MCC-G 500

entwickelt, konstruiert und gefertigt wurde in
Übereinstimmung mit der/den oben genannten EG-
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:**

- EN 61000-6-1:2007
- EN 61000-6-3:2007
- EN 12828

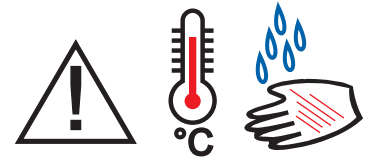
Bramberg, 01.08.2015
Ort, Datum


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Unterschrift

12. Hazard notes

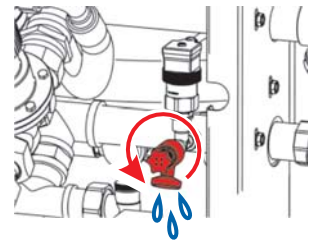
Due to the design of the multicontrol pressure maintenance device there are only marginal hazards.

Generally you have to keep in mind, that **hot plant media** (e.g. heating water) could leak due to handling at these devices!



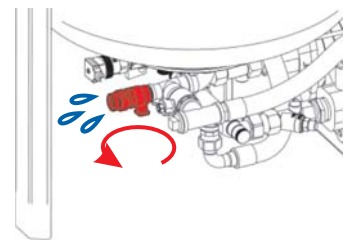
For service and maintenance purposes a fill and drain tap is provided at multicontrol kompakt MCK and multicontrol modular MCM series devices. Hot plant media could leak from this tap too.

Scalding risk exists in case of leakage!



Another fill and drain tap is installed at the lower vessel flange (only at multicontrol kompakt MCK series) of the built-on vessel. This tap is for service and maintenance purposes. If this tap is opened, hot plant media could leak too.

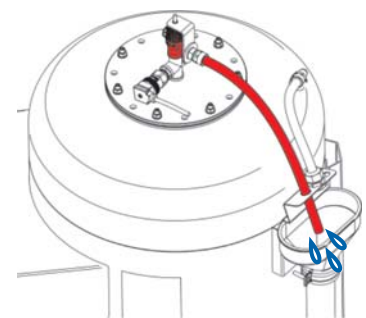
Scalding risk exists in case of leakage!



A safety valve 0,5 bar is installed at the upper vessel flange. This valve could open and discharge hot plant media due to the following reasons:

- The device resp. the expansion vessel was dimensioned wrong (too small) and the entire expansion volume can't be stored in the expansion vessel.
- The level measurement doesn't work correctly due to defective vessel pressure transmitters or a defective vessel membrane. So the vessel could get overfilled.
- The vessel has been filled to a too high level in cold situation (eventually because of the function "one-time filling" or uncontrolled if no makeup module MCF is installed) without taking care of the occurring expansion volume. So this expansion volume can't be stored completely in the expansion vessel.

Scalding risk exists in case of leakage!



13. Appendix

Appendix A Dimensioning of expansion pipes

Expansion pipes connect the plant with the expansion and pressure maintenance device.

i INFORMATION!

To calculate the expansion pipe you need to know the nominal power to be dissipated, the max. operating temperature and the flow speed acc. to ÖNORM H 5151-1:2010 12 15.

Part out of ÖNORM H 5151-1:2010 12 15:

11.2.3.2 Dimensioning of the expansion pipe

When dimensioning the expansion pipe the following points must be observed:

- The dimensioning of the expansion pipe is based on the nominal power of the heat generator.
- In plants with a nominal power smaller than 500 kW the minimum nominal diameters can be taken from table 6.

Table 6 - Minimum nominal diameters of expansion pipes

DN	nominal power
	in kW
20	up to 120
25	from 120 to 500

- The max. flow rate within the expansion pipe must not exceed 0,15 m/s.

NOTE If the system is divided between heat supply and heat distribution a lower water volume could exist within the heat supply system. Therefore the dimensioning of the expansion pipe based on the max. flow rate can be necessary.

The calculation of the flow rate within the expansion pipe is based on the percentage temperature-dependent increase in volume V_e from the filling temperature (10°C) to the safety temperature Θ_{Tz} and the total content V_A of the system.

The heating time t_A which is necessary for reaching the safety temperature Θ_{TZ} of the total content of the system V_A is calculated acc. to equation (22):

$$t_A = \frac{(V_A \cdot \Delta\theta_{TZ} \cdot c_W \cdot \rho_W)}{\Phi_N} \quad (22)$$

The expansion flow \dot{V}_e is calculated acc. to equation (23):

$$\dot{V}_e = \frac{V_e}{t_A \cdot 1000} \quad (23)$$

The inside diameter of the expansion pipe is calculated acc. to equation (24):

$$d_{AI} = \sqrt{\frac{4 \cdot \dot{V}_e}{\pi \cdot v}} \cdot 1000 \quad (24)$$

The next pipe dimension must be selected. The max. pressure drop within the expansion pipe must not be bigger than 1 kPa.

i NOTE!

At the inside of the pressure maintenance device (overflow pipe, suction pipe) the manufacturer defines the flow rates which ensure a trouble-free function of the pressure maintenance device. According to this, the max. flow rates are 0,75 m/s in the overflow pipe and 0,50 m/s in the suction pipe.

notes

Appendix B Hydraulic connection between MCM and EG(Z)-M

multicontrol modular MCM series devices do not have a built-on vessel. The expansion volume must be stored in external EG-M series expansion vessels. To enlarge the expansion volume, EGZ-M series additional expansion vessels must be used.

Generally the connection of the particular devices must be installed on-site according to the appropriate piping diagram in chapter 3.

i NOTE!

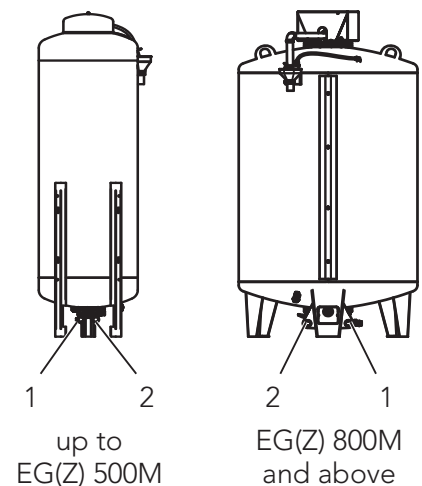
To ensure a correct function of the pressure maintenance unit you have to consider the following instructions for the connection between MCM and EG(Z)-M!

1. Pay attention to the right connection of the particular devices.

EG(Z)-M expansion vessels use built-in components (at the lower vessel flange) for a correct degassing.

Therefore it is necessary to connect the overflow pipe of the MCM device with the overflow pipe of the EG-M expansion vessel and the suction pipe of the MCM with the suction pipe of the EG-M expansion vessel!

- 1 ... overflow pipe
- 2 ... suction pipe



i NOTE!

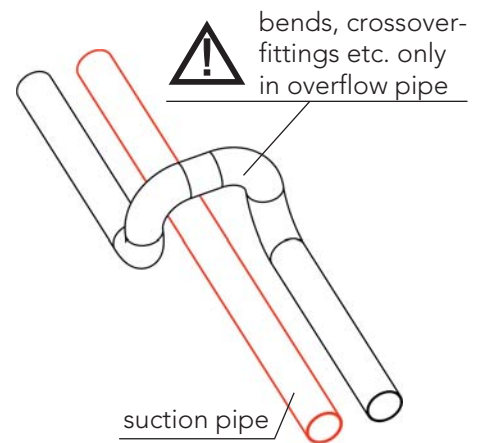
overflow pipe MCM = overflow pipe EG-M
suction pipe MCM = suction pipe EG-M

2. Installation of the suction pipe

Sometimes it is necessary to cross the overflow pipe and the suction pipe to connect MCM and EG(Z)-M correctly.

Please note that the suction pipe is installed without any differences in level. Try to avoid these differences as much as possible.

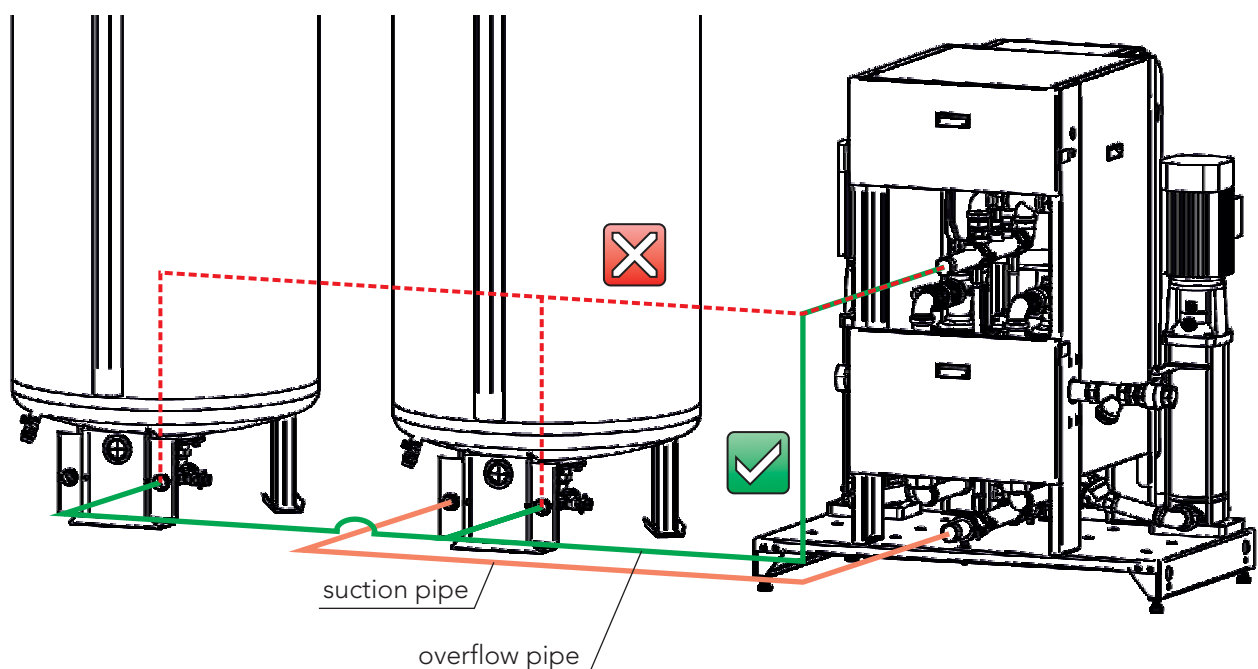
If these differences between MCM and EG(Z)-M can not be avoided, the suction pipe must be installed rising from MCM to EG(Z)-M.



i NOTE!

Bends, crossover-fittings etc. which are necessary for crossing may only be installed at the overflow pipe.

To ensure a trouble-free level compensation between the single vessels, suction pipe and overflow pipe must be installed at ground level over the entire length.



notes

Anton Eder GmbH

main plant / headquarters

Weyerstraße 350, A 5733 Bramberg
Tel. 06566 / 7366 Fax. 06566 / 8127
E-mail: info@eder-heizung.at

branch office / representation / service center

Leisach 52, A 9909 Leisach
Tel. 04852 / 64477 Fax. 04852 / 64477-20
E-mail: lienz@eder-heizung.at

representation / service center

Gabelsbergerstraße 31, A 5020 Salzburg
Tel. 0662 / 87 99 20 Fax. 0662 / 87 99 20-4
E-mail: salzburg@eder-heizung.at

representation / service Center

Gorskistraße 15, A 1230 Wien
Tel. 01 / 98 53 730 Fax. 01 / 98 53 732
E-mail: wien@eder-heizung.at



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