multicontrol cool MCC

WE SAY: PRESSURE MAINTENANCE! IS COOL!

eder

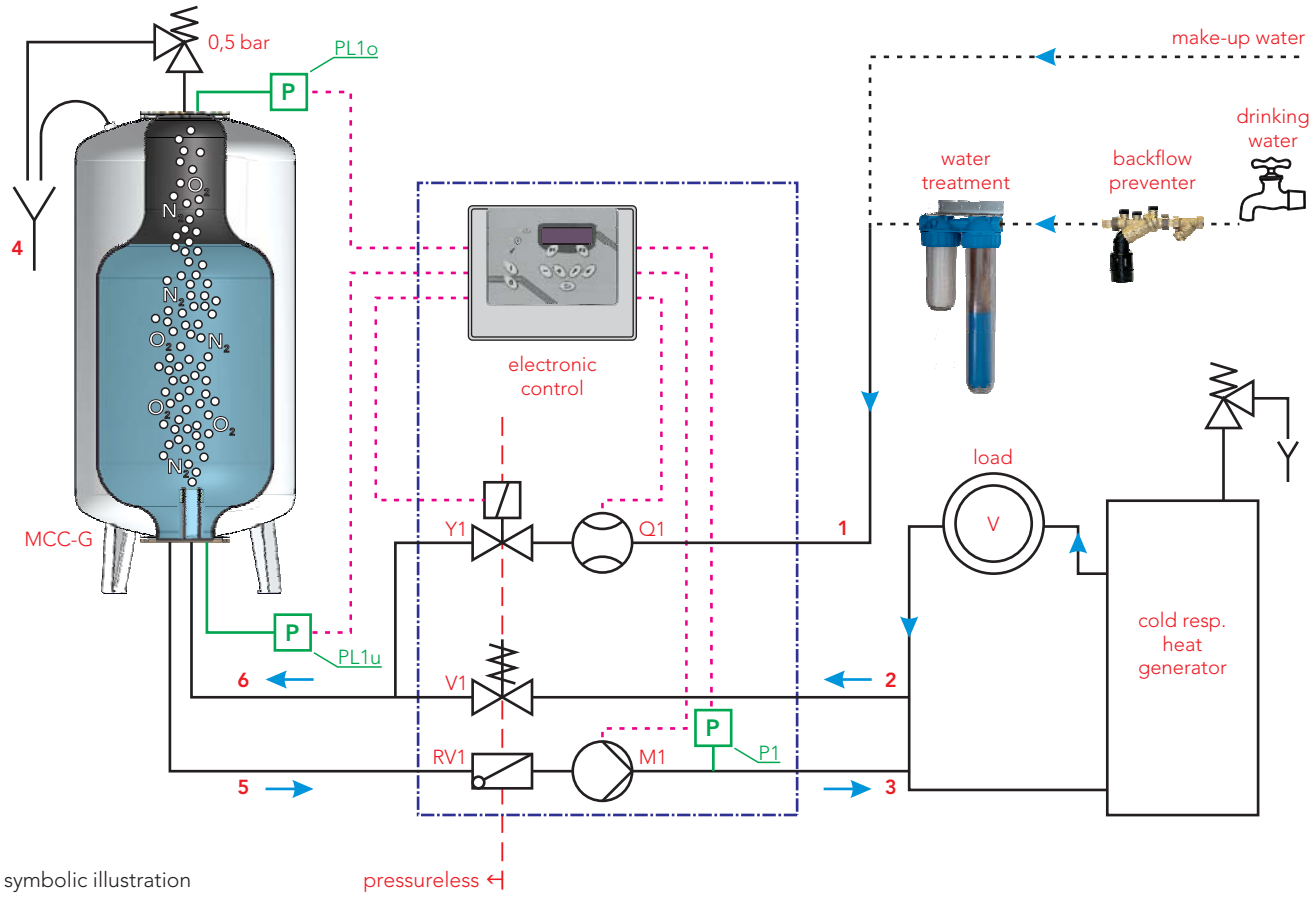
BETTER HEATING. SAFE BET.

MULTICONTROL COOL MCC

Ver.03/2017-en

Operating principle

elko-mat eder pressure maintenance systems operate according to the principle of pump-controlled pressure maintenance with closed expansion vessels.



symbolic illustration

Legend

1 ... fresh water supply
2 ... expansion overflow pipe (from system return)
3 ... expansion pressure pipe (to system return)

4 ... discharge hopper, vessel safety valve
5 ... suction pipe from expansion vessel
6 ... overflow pipe to expansion vessel

M1 ... pressure maintenance pump
RV1 ... check valve
V1 ... overflow valve
Y1 ... magnetic valve
Q1 ... water meter
MCC-G ... expansion vessel

PL1o ... vessel pressure transmitter top
PL1u ... vessel pressure transmitter bottom
P1 ... system pressure transmitter

Expansion and pressure maintenance

Going below the lower working pressure (e.g. caused by cooling down) is realised by the system pressure transmitter (P1) thereupon the electronic control turns on the pressure maintenance pump (M1). As soon as the lower working pressure is exceeded by one differential gap, the so called follow-up time starts. During this time the pressure maintenance pump (M1) still delivers medium into the system to stabilise the built-up system pressure. Possibly too much pumped medium will be returned to the expansion vessel (MCC-G) via the overflow valve (V1), latest if the upper working pressure is reached.

If the pressure in the system (e.g. expansion of the system medium by heating) increases the overflow valve (V1) will open pressure proportional continuously controlled and the expansion volume will be stored within the flexible membrane of the expansion vessel (MCC-G) so that is separated from atmosphere.
The area outside of this membrane is associated with the ambient air, whereby within the expansion vessel no significant negative pressure can arise (vessel is pressureless resp. max. 0.5 bar within the membrane).

Low pressure degassing

After first filling a closed system with the filling medium air inclusions are removed by venting. Often this not completely successful so that occasionally residual air inclusions remain.

The enclosed air mainly consists of oxygen and nitrogen that cause the following problems:

- Corrosion (by oxygen)
  Unique the oxygen of the enclosed air is consumed by reaction with the system materials quickly. However permanent oxygen input in the system must be avoided, to prevent corrosion damage.

- Malfunction (by nitrogen bubbles)
  Nitrogen does no react with other materials and stays as free gas in the system where it forms „cushion gas". Thus e.g. flow interruptions, dry running of pumps of flow noises arise ongoing operation.

Therefore a continuous degassing of the medium in the system makes sense. With low pressure degassing the gas content in the medium is reduced based on the principle that the solubility of gases in water decreases with falling pressure (Henry's absorption law).

Thus the pressure maintenance pump (M1) pumps low-gas medium out of the pressureless expansion vessel (MCC-G) into the system, so that the system pressure in increased on purpose and the overflow valve (V1) opens. Gas enriched medium below system pressure flows from the system into the expansion vessel, which causes pressure release. Solubility in the pressureless expansion vessel (MCC-G) is much lower, so that there the eliminiation of dissolved gases takes place. The gases rise in the vessel and the pressure within the membrane increases. Elimination of the gases is carried out by the vessel overflow valve as soon as 0.5 bar are exceeded.

Additional gas input into the system (e.g. make-up medium and therein dissolved gases) is just as little welcome, but mostly not completely avoidable. Make-up via the pressure maintenance system is carried out directly into the pressureless vessel. Already at the magnetic valve (Y1) the expansion (from the pressure of the make-up pipe to max. 0.5 bar of the vessel) takes place. Contrary to a make-up directly into the system the medium is degassed before it reaches the system (compare "make-up").

Make-up

Using a pump-controlled pressure maintenance system, losses in the system do no become directly noticeable, because they are compensated by the pressure maintenance system. Thereby the vessel level in the expansion vessel will decrease therefore make-up compensates the too low level in the expansion vessel.

Level measurement in the expansion vessel bases on pressure measurement inside the vessel membrane at the bottom and on top of the vessel by the pressure vessel transmitters Pl1o and Pl1u. Using both measurements the filling height (=vessel level) is calculated (also not by weight measurement of load cells at the vessel).

By undercutting the set minimum vessel level a controlled make-up is activated, the magnetic valve (Y1) opens. The make-up medium reaches the pressureless expansion vessel (MCC-G) with the inlet pressure of the fresh water supply, whereby it is already pre-degassed without having reached the system. The supplied water amount during make-up is measured by a water meter (Q1) and compared with the set maximum possible make-up amount. Is it exceeded, the make-up is stopped and make-up operation is locked. Only after verification and disengaging by the system support engineers the make-up can be reactivated. Beside the amount controlled operating mode also a time controlled operating mode is available, which is advantageous in case of known and regular necessary make-up amounts.

Especially in cold water systems, solar systems or similar usually special medium mixtures are used, so that simple make-up of fresh water is not possible. In this case a multicontrol autofill

MCA make-up unit can be employed. For details compare brochure "multicontrol autofill MCA".

If a possible prescribed system seperation does not exist across the system, it can be done with an additionally available backflow preventer (compare brochure "multicontrol original accessory").

Water treatment

If there is no water treatment across the system, in addition to the make-up module a water treatment may be combined. By means of the modules MWE (water softening), R-MWE (water softening, regenerating) and MVE (complete demineralisation) the make-up water is softened or completely demineralised by so called ion exchanger cartridges.

By using MWE resp. MVE the water meter (Q1) continuously monitors the make-up amount. Is the capacity of the ion exchagner resin running out further make-up is stopped and a cartridge exchange is requested.

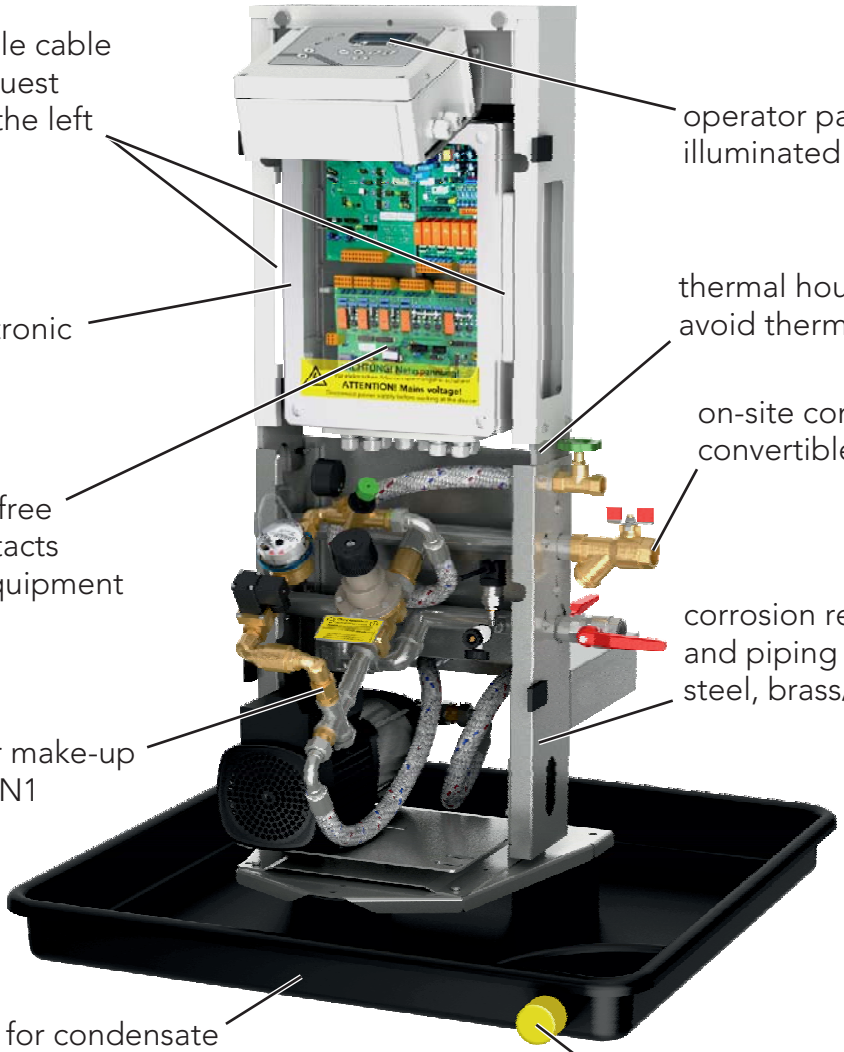
R-MWE 28 (module water softening, regenerating) is a fully automatic, microprocessor controlled water softening system, where the ion exchanger resin is regenerated autonomous depending on the actual water consumption.

For detailed information about the modules MWE, R-MWE and MVE compare the brochure "water treatment".

Your great benefit:

- From pioneer to number on: 45 years experience in pressure maintenance
- **Highly efficient degassing** according to Henry's absorption law
- **Stainless** - insensitive to condensation water
- Company owned costumer service for technical service of your system throughout the product's life
- **Lowest temperature** at connection point **-10°C** - solutions for higher requirements on request

Details



easily accessible cable glands, on request mountable at the left side

operator panel with four lines, illuminated plain text display

thermal housing separation to avoid thermal bridges

enclosed electronic unit, optimally protected

on-site connections, on request convertible to the left side

four potential free signalling contacts as standard equipment

corrosion resistance: housing and piping made of stainless steel, brass/red brass

connection for make-up module MCC-N1

collecting pan for condensate collection, produced of HDPE

sewer connection with siphon

connections for expansion vessel

corrosion resistance: housing and piping made of stainless steel, brass/red brass

mounting holes in the base plate for fixing the device

stainless steel vessel with enlarged connection distances to relieve possible insulating on site

vessel pressure transmitter for differential pressure measurement

discharge hopper with sewer connection for vessel overflow

removeable retaining plate to relieve insulating on site

vessel drainage for maintenance

vessel pressure transmitter for differential pressure measurement

Systems

solo

single pump system, pump and overflow valve for 100% of the expansion volume flow

maxi

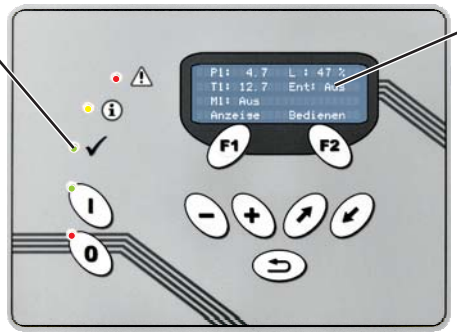
dual pump system, pump(s) and overflow valve for 100% of the expansion volume flow. Second pump provided as failure safety.

duo

dual pump system, pumps work parallel; this way a higher expansion volume flow si reached. The overflow valve is designed for this volume flow.

Operation

LEDs for status information at first sight



four lined, illuminated plain text display

- Basic display individually adaptable
  Out of plenty possibilities six display values can be chosen and shown at the basic display
- Display and operation eligible in many national languages *

* Status 03/2017: German, English, Swedish, French, Dutch, Finnish, Italien, Russian, Romanian, Polish, Czech, Latvian, Croatian, Estonian

Accessory

expansion vessels

multicontrol cool vessel MCC-G
expansion vessel

multicontrol cool additional vessel MCC-Z
only overflow pipe, without level measurement

make-up / degassing

multicontrol make-up module MCC-N1
amount-controlled make-up, 1/2"

multicontrol autofill solo MCA-S

water treatment

elko-mat eder MWE
module water softening make-up water

elko-mat eder R-MWE 28
module water softening, regenerating

elko-mat eder MVE
module demineralisation make-up water

connection accessory

EDER backflow preventer

multicontrol autofill connection set MC_

multicontrol cool connection set MCC-G

multicontrol cool connection set MCC-Z

expansion module / remote control

multicontrol expansion module
„analog signalling"

multicontrol expansion module
„binary signalling"

multicontrol expansion module
„binary signalling & remote reset"

multicontrol SMS module

multicontrol bus module Profibus

multicontrol bus module Modbus RTU

multicontrol bus module Profinet

general accessory

elko-mat eder EV
cooling vessel, PN10, 110 °C

multicontrol contact temperature sensor
incl. strap (diameter 15-40 mm)

multicontrol temperature sensor
cable 10m, incl. immersion sleeve G1/2", PN10

collecting pan, 3 spacer
discharge hopper 50 with siphon

For detailled information compare brochure „multicontrol original accessory".

Further products of our multicontrol series:

- pressure maintenance device **multicontrol kompakt MCK**
- pressure maintenance device **multicontrol modular MCM**
- pressure maintenance device **topcontrol modular TCM**
- make-up device **multicontrol autofill MCA**

Technical data

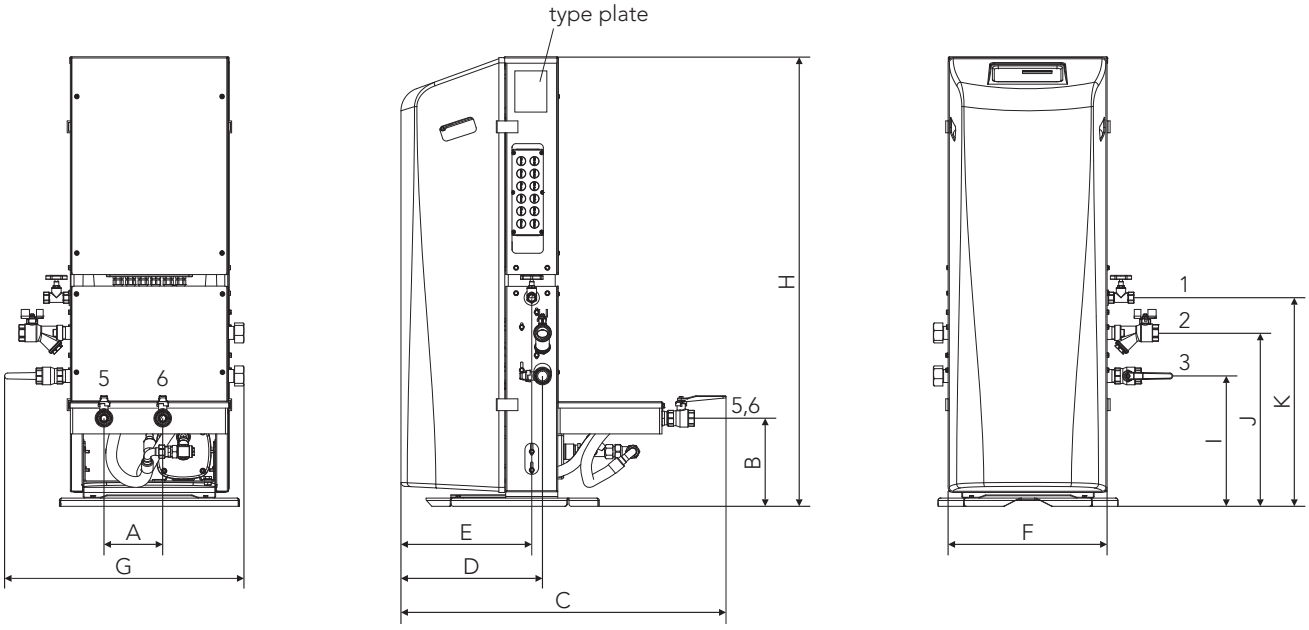
type			elko-mat eder multicontrol cool											
			MCC						expansion vessel MCC-G/Z					
			MCC-S1-4.0	MCC-S1-5.6	MCC-M1-4.0	MCC-M1-5.6	MCC-D1-4.0	MCC-D1-5.6	MCC-G 125 MCC-Z 125	MCC-G 200 MCC-Z 200	MCC-G 300 MCC-Z 300	MCC-G 500 MCC-Z 500
nominal content		Liter	-						125	200	300	500
max. operating pressure device (PN)		bar	10						-			
max. operating pressure vessel (PN)		bar	-						0,5			
max. temperature at plant connection		°C	70									
min. temperature at plant connection		°C	-10 *									
voltage		V/Hz	230/50						-			
max. electrical power		kW	0,8		1,5				-			
fuse protection		A	10		13				-			
dimensions	A	mm	150						642	642	745	745
	B	mm	225						1200	1430	1500	2150
	C	mm	830						-			
	D	mm	362						500	500	600	600
	E	mm	334						-			
	F	mm	406						-			
	G	mm	612						-			
	H	mm	1149						1167	1407	1475	2130
	I	mm	333						min. 500			
	J	mm	443						-			
	K	mm	533						-			
weight		kg	85		98		99		46	66	80	95
connections	1	"	Rp 1/2						-			
	2	"	Rp 1						-			
	3	"	Rp 1						-			
	4	mm	-						Geberit DN 50			
	5	"	Rp 1						Rp 3/4			
	6	"	Rp 1						Rp 3/4			
	7	"	-						Rp 1/2			

1…make-up 2…expansion overflow pipe 3…expansion pressure pipe 4…discharge hopper for vessel safety valve 5…suction pipe 6…overflow pipe 7 … gas-side vessel connection

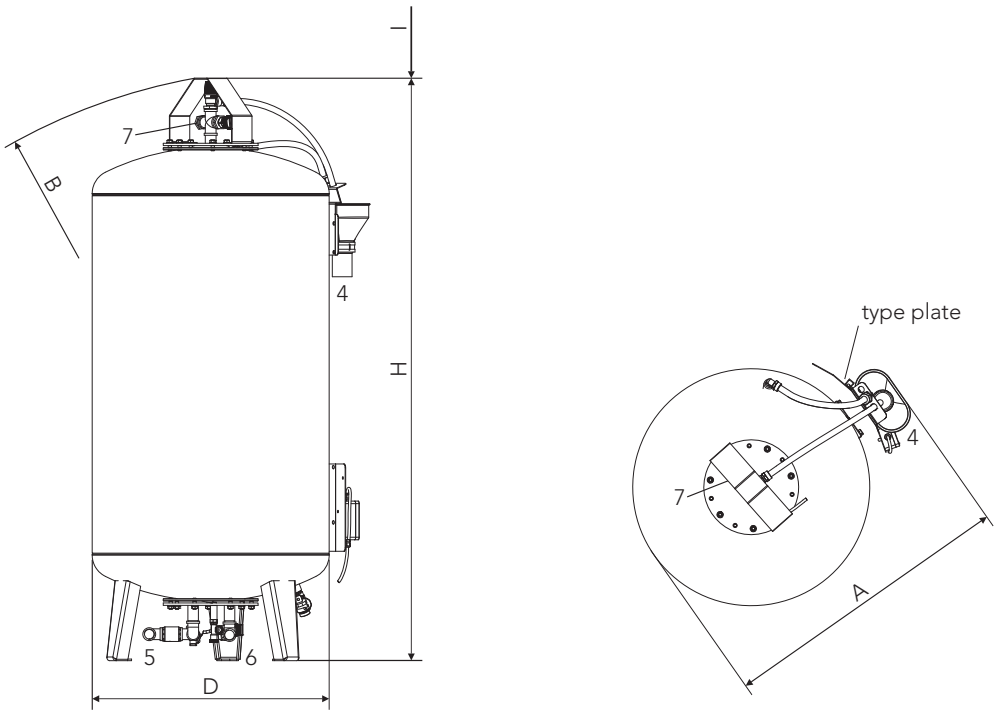
technical changes reserved!

* solutions for higher requirements on request

multicontrol cool solo MCC-S



multicontrol cool vessel MCC-G / additional vessel MCC-Z



technical changes reserved!

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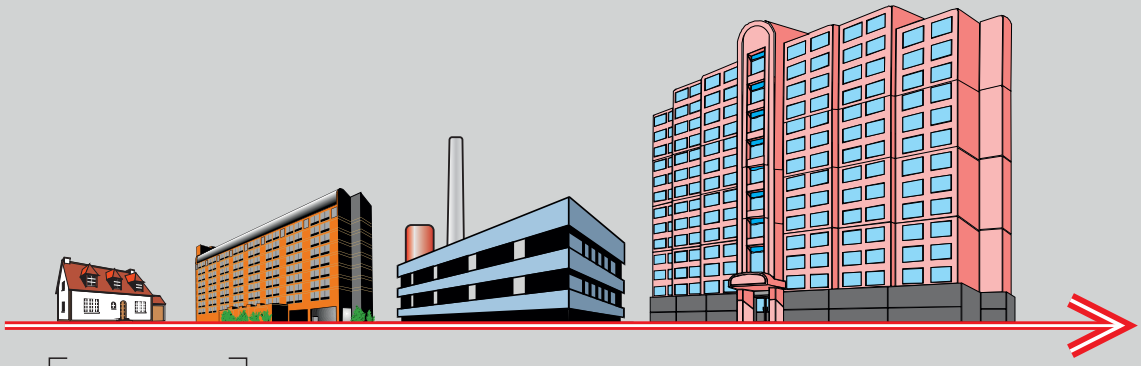

plant complexity
(generating capacity,
static height,
total content,
working pressure)

elko-flex eder

elko-mat eder multicontrol cool MCC

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