

CMC QUATTRO

Standard version (4NT)

O P E R A T I N G M A N U A L

Table of contents

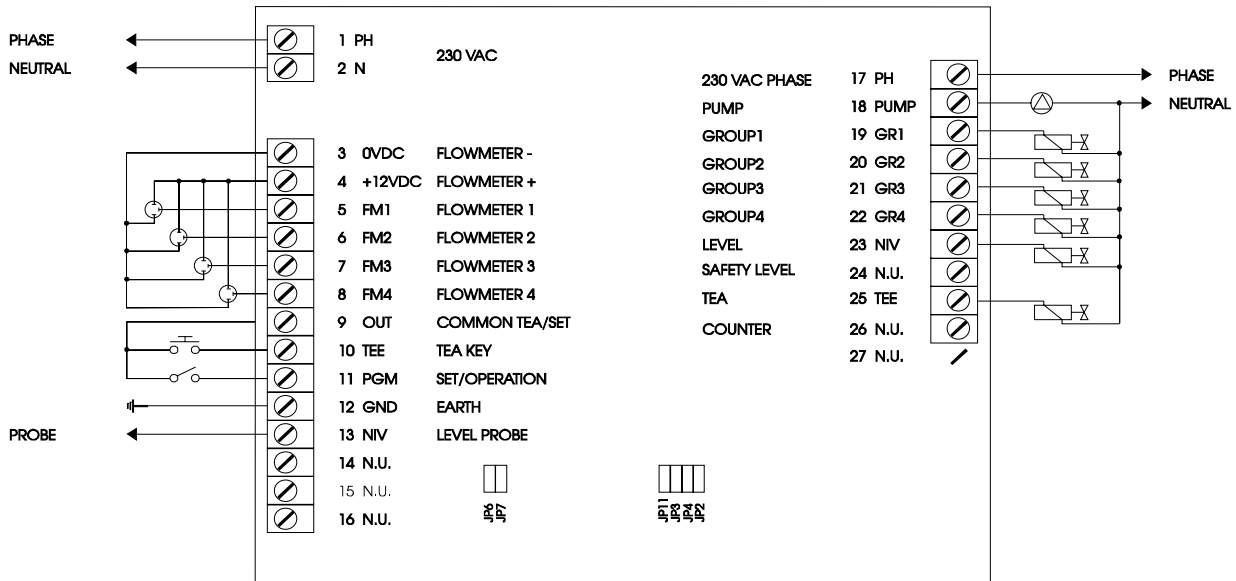
1 Terminal assignment and diagram	2
2 Earthen	4
3 Setting the supply voltage	4
4 Keyboards	4
5 Options	5
6 Maintenance	5
7 Commissioning	6
8 Machine specific programming	6
8.1 Programming the delay time	6
8.2 Programming the pump operation	7
8.3 Programming pre-infusion	8
9 Setting portions	9
9.1 Setting together	9
9.2 Setting separately	10
9.3 Setting the 5th portion	11
9.4 Setting the 5th portion to continuous flow	13
9.5 Setting the hot water timer for tea	14
10 Operation	14
11 Malfunctions	14
12 Technical data*	15

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CMC QUATTRO

Version standard



12-95 CB

1 Terminal assignment and diagram

- 1st mains voltage terminal.
The phase is usually connected here
- 2nd mains voltage terminal.
The neutral conductor is usually connected here
- Earth to all flowmeters (-).
Common terminal for earth lead (0V) to all flowmeters. The flowmeters can be wired either individually or in a loop
- + Supply to all flowmeters (+)
Common terminal for supply lead (+) to all flowmeters. The flowmeters can be wired either individually or in a loop. Warning: if the flowmeter polarity is reversed, the piece can be damaged.
- Pulse input flowmeter # 1.
The out terminal of the 1st flowmeter is connected directly
- Pulse input flowmeter # 2.
The out terminal of the 2nd flowmeter is connected directly
- Pulse input flowmeter # 3.
The out terminal of the 1st flowmeter is connected directly

8. Pulse input flowmeter # 4.
The out terminal of the 2nd flowmeter is connected directly
9. Common tea set/operation.
Common return line for the tea key and the Set/Operation switch
10. Hot water key Terminal.
Input of the tea key. The return line is connected to terminal 8
11. Set/Operation switch Terminal.
The return lead is connected to terminal 8. If the switch is closed, the coffee machine is in the setting mode.
12. Earth Terminal
Important: Please read the section "EARTHING" in this manual.
13. Level Probe Terminal
Input from the Level probe to control the water level into the boiler.
14. Not connected.
15. Not connected.
16. Not connected.
17. Common lead for contact assemblies.
This lead supplies the local mains voltage to the common terminal for the contact assemblies. For 230V~ / 110V~ solenoids and pumps, this lead has to be connected to the phase.
18. Pump Control Terminal
Relay contact to the pump.
19. Group 1 Control Terminal
Relay contact to the solenoid of group 1
20. Group 2 Control Terminal
Relay contact to the solenoid of group 2
21. Group 3 Control Terminal
Relay contact to the solenoid of group 3
22. Group 4 Control Terminal
Relay contact to the solenoid of group 4
23. Level probe Control Terminal
Relay contact to solenoid who controls the liquid level of the boiler.
24. Not connected.

25. Hot water Control Terminal
Relay contact to hot water solenoid.

26. Not connected.

2 Earthen

To ensure that the CMC quattro operates perfectly, the following specifications must be met:

- ◆ The earth terminal (No.11) must be connected to the housing of the coffee machine by means of a flexible lead
- ◆ The flexible lead must have a large cross-section, minimum 1.5mm²
- ◆ The flexible lead must be as short as possible and bolted to the housing by means of a serrated lock washer
- ◆ All of the components of the machines should be earthed at the same point

If these earthing specifications are met, the possibility of a malfunction resulting from electrostatic discharge is reduced to an absolute minimum.

3 Setting the supply voltage

The CMC quattro can be ordered in two voltage ranges, i.e. 230 V +/- 20 % and 115 V +/- 20 %.

4 Keyboards

The keyboards (max. 2) of the CMC quattro are connected to the control unit by only one cable (loop). As a result each keyboard has its own address. Therefore the keyboards within the system must not be interchanged, i.e. keyboard with designation "Group No. 1" always controls group No. 1 and therefore must be changed out accordingly.

If the keyboard address must be changed, e.g. during service/revision, this can be performed directly on site by means of a soldering bridge. To do this, unscrew the keyboard housing after it has been removed from the coffee machine. The desired address can then be programmed by soldering a thin cable to short-cut the pads or just using stain at the appropriate position, i.e. Group 1 = soldering bridge No. 1 soldered etc. (see illustration A1).

Note: Always ensure that only ONE soldering jumper is soldered and that the programmed address is only used once within the system. Otherwise this can result in a control unit malfunction.

5 Options

The two options available at present can be retrofitted. For this purpose two elements are required:

- An option type RS 232 or 6bit parallel
- Housing cover with plug opening

The CMC quattro is operated with option as follows:

- **Disconnect unit completely from the mains**
- Unscrew housing
- For operation and settings of the option see interface description
- Screw on housing cover with plug opening
- Insert CMC quattro in coffee machine and connect completely

6 Maintenance

The CMC quattro is basically maintenance-free. The unit displays system malfunctions (see operating instructions). Normally, the main unit is protected against short circuits. If the unit ceases to operate and no LEDs light up, you have to call the technical support.

7 Commissioning

The CMC quattro control unit must be connected according to our installation specifications. After the coffee machine has been fully wired, connect the keyboards to the control unit using the ribbon cable enclosed.

In the operating instructions the term "line" is used for the portion keys. The double function of the STOP key is designated "STOP/line 5". The keys and corresponding lines are shown in the diagram A2.

The following basic programming are performed at the factory:

Level probe delay		10s
Hot water		5s
Portions	Line 1 (one espresso portion)	50g
	Line 2 (two espresso portions)	100 g
	Line 3 (on normal portion)	60g
	Line 4 (two normal portions)	130g
	"STOP/line 5"	Continuous flow
Pre-infusion	no pre-infusion programmed or in accordance with the customer	

If the coffee machine has been wired in accordance with the installation specifications, it can now be switched on. Following this, the CMC quattro is initialized:

- 1 All LEDs light up for 2 seconds
- 2 The LEDs of the lines light up alternately on all groups for about ½s.

Initialization of the CMC quattro is then completed and programming of the machine-specific data can be begun. For this purpose, the housing of the CMC quattro must be opened.

8 Machine specific programming

8.1 Programming the delay time

The delay time between the time at which the level probe responds and the main valve of the boiler opens can be set to the following values ranging from 2s to 20s: 2s, 5s, 10s, 15s, 20s.

Programming can only be performed on group 1. The delay time is programmed as follows:

- 1 Insert the enclosed program plug (jumper) at position JP3 in accordance with the diagram on page 2: —> The LEDs for lines 1 to 4 then light up on the keyboard of group 1
- 2 If a delay time of 2s is desired, remove the program plug again to program the delay time.
- 3 If a delay time of more than 2s is desired, this can be programmed by pressing a line key in accordance with the following code:
Line 1 = 5s Line 2 = 10s Line 3 = 15s Line 4 = 20s
- 4 When a key is pressed the LED of the key begins to flash. The input can be corrected at any time by pressing another key. When the desired delay time has been selected, it is programmed by removing the program plug.

Note: Whenever the program plug is inserted the time which was programmed previously is cleared for safety reasons and a value of 2s is preset.

Example:

Programming a delay time of 15s

- 1 Shortcut the Jumper JP3 —> LEDs 1 to 4 light up
- 2 Select line 3 (15s) —> LED 3 flashes
- 3 Remove program plug —> LEDs 1 to 4 go out and the delay time is programmed.

8.2 Programming the pump operation

The CMC quattro control unit can also activate the pump when opening the main valve of the boiler to prevent the boiler from emptying if the pressure in the water circuit should become too low.

The pump is programmed as follows:

- Program plug JP2 inserted = pump is not activated when the main valve of the boiler is opened
- Program plug JP2 not inserted = pump is activated when the main valve of the boiler is opened

8.3 Programming pre-infusion

The pre-infusion feature of the CMC quattro permits to moisten the coffee powder before the portioning process. For this function, you have to know two delays: the first one is the moisten delay, the second one is the pause delay.

Each group of the CMC quattro have 2 single and 2 double portions (see section **3. Commissioning**). The quantity of powder for a single portion is different from the quantity for a double portion. In accordance with this, the moisten and the pause delays have to be different for a single portion and a double portion.

To program the pre-infusion you have to set 4 different values:

- one moisten and one pause delay for the single portions (means line 1 and 3)
- one moisten and one pause delay for the double portions (means line 2 and 4)

Programming can only be performed on group 1

- 1 insert the program plug at position JP4: ---> all the LEDs light up on the keyboard of group 1.
- 2 if you remove now the program plug, the pre-infusion feature will be disabled.
- 3 if you want to program several delays for the pre-infusion, each time that you press a key, 0.1s will be added to the designated delay value. The keys have the following code:
 - line 1 moisten delay for a single portion.
 - line 2 pause delay for a single portion.
 - line 3 moisten delay for a double portion.
 - line 4 pause delay for a double portion.
- 4 each time that you press on a key the LED will turn off until you release it.
- 5 if you are not sure of your programming, press the key of the line 5. It will clear the whole programming. To end the programming, remove the plug.

Example of programming pre-infusion:

single portions: 0.5s of moisten delay and 1.0s for pause.
double portions: 0.8s of moisten delay and 1.4s for pause.

- 1 insert the programming plug into JP4.
- 2 press five times the line 1 key.
- 3 press ten times the line 2 key.
- 4 press eight times the line 3 key.
- 5 press fourteen times the line 4 key.
- 6 remove the programming plug from JP3

9 Setting portions

The "setting" section is divided into five subsections:

9.1 Setting together

The CMC quattro can set the individual lines of several or all the groups in one operation. This is done as follows:

- 1 Switch the "Set/Operation" switch to the "Set" position. The machine is then in the setting mode
- 2 Press the "STOP/line 5" keys of all the groups to be set. All of the LEDs of lines 1 to 4 light up to acknowledge this input.
- 3 select a line of a chosen group. The LED of this key and the corresponding LED of the selected groups begin to flash. Coffee flows into the cup
- 4 When there is enough coffee in the cup, press the same key again. The LED of this key and the corresponding LEDs of the selected groups continue to flash and the flow of coffee is stopped. While the LED is flashing (15s) the coffee can be tasted.
- 5 If taste and quantity are alright, allow the 15s to elapse; and this line is then programmed for all the selected groups.
- 6 If you decide that the taste and quantity of the coffee are not good yet, more coffee can be added by selecting the line again. When the level of coffee in the cup is sufficient, the process is stopped by selecting the line again. This process can be repeated as often as necessary; the portion is only set when the 15s has expired, i.e. the LED stops flashing.
- 7 Switch the "Set/Operation" switch to the "Operation" position.

Example:

Setting line 3 of groups 1 and 2:

- 1 Switch the "Set/Operation" switch to "Set"
- 2 Press the "STOP/line 5" keys for groups 1 and 2 → LEDs of lines 1 to 4 on groups 1 and 2 light up
- 3 Select line 3 → LED of line 3 begins to flash on both groups Coffee flows into the cup
- 4 When there is enough coffee in the cup. Select line 3 again → LEDs of line 3 continue to flash. Flow of coffee stops
- 5 The coffee tastes good! Wait 15s until the LEDs are extinguished → Line 3 of groups 1 and 2 is programmed
- 6 The quantity and the taste are not alright, select line 3 again → LEDs of line 3 continue to flash and the coffee flows into the cup
- 7 When there is enough coffee in the cup, select line 3 again → LEDs of line 3 continue to flash and the flow of coffee stops
- 8 The coffee is now good, wait 15s until the LEDs are extinguished → Line 3 of groups 1 and 2 is programmed
- 9 Switch the "Set/Operation" switch to the "Operation" position

9.2 Setting separately

The CMC quattro also allows you to set all groups individually. This is done as follows:

- 1 Switch the "Set/Operation" switch to the "Set" position.
- 2 Then press the "STOP/line 5" key of the group to be set. All of the LEDs of lines 1 to 4 light up to acknowledge this input.
- 3 Select a line. The LED of this key begins to flash. The coffee begin to flow into the cup
- 4 When there is enough coffee in the cup press the same key again. The LED of this key continues to flash. The flow of coffee is stopped. While the LED is flashing (15s) the coffee can be tested.
- 5 If you decide that the aroma is okay, allow the 15s to expire; this line is then programmed.

- 6 If you decide that the taste and quantity of the coffee are not good yet, more coffee can be added by selecting the line again. If there is enough coffee in the cup, the process can be stopped by selecting the line again. This process can be repeated as often as necessary; the portion is only set when the 15s has expired, i.e. the LED is turned off.
- 7 Switch the "Set/Operation" switch to the "Operation" position.

Example:

Setting line 4 of group 2:

- 1 Switch the "Set/Operation" to "Set".
- 2 Press the "STOP/line 5" key for group 2 → LEDs of lines 1 to 4 on group 2 light up
- 3 Select line 4 → LED of line 4 begins to flash Coffee flows into the cup
- 4 When there is enough coffee in the cup, select line 4 again → LED of line 4 continues to flash. The flow of coffee stops
- 5 The taste and the quantity of coffee is alright. Wait 15s until the LEDs are extinguished → line 4 of group 2 is programmed
- 6 The coffee quantity is not enough. Select line 4 again → LED of line 4 continues to flash and the coffee flows again into the cup
- 7 When there is enough coffee in the cup, select line 4 again → LED of line 4 continues to flash and the flow stops
- 8 The coffee tastes good and the quantity is alright. Wait 15s until the LEDs are extinguished → Line 4 of group 2 is programmed
- 9 Switch the "Set/Operation" switch to the "Operation" position.

9.3 Setting the 5th portion

As mentioned earlier the CMC quattro can dispense a set portion by means of the "STOP/line 5" key. The procedure for programming the 5th portion is slightly different to that for the other lines. A detailed description shall therefore be given at this point.

The "Stop/line 5" key is a multi-function key with the following functions:

- STOP (interrupt a dispensing process) - possible whenever the group is active
- Dispense a portion which has not been set (the procedure is activated by pressing the "STOP/line 5" key and is terminated by pressing the key again) or
- Dispense a set portion (the procedure is activated by pressing the "STOP/line 5" key and is terminated automatically when the set amount has been reached)

The setting procedure is:

- 1 Switch the "Set/Operation" to the "Operation" position
- 2 Press the "Stop/line 5" key of a group. The green LED of the group lights up and coffee flows out.
- 3 Now switch the "Set/Operation" to the "Set" position. The green LED of the group turns off, the flow of coffee stops and the machine is now in the setting mode for line 5
- 4 Prepare the filter holder with coffee powder and place a cup or a pot under the outlet.
- 5 Press the "STOP/line 5" key for this group again. The green LED begins to flash and coffee flows into the cup or the pot.
- 6 When there is enough coffee in the pot, press the "STOP/line 5" key again. The green LED continues to flash. The flow of coffee is stopped. While the LED is flashing (15s) the coffee can be tasted.
- 7 If you decide that the taste and the quantity of coffee is alright, allow the 15s to expire; this line is then programmed.
- 8 If you are not satisfied with the portion, more coffee can be added by selecting the line again. When there is enough coffee in the pot, the process is stopped by selecting the line again. This process can be repeated as often as necessary; the portion is only set when the 15s have expired, i.e. the flashing LED is extinguished.

Note: Several groups can be prepared simultaneously for setting line 5: press the "STOP/line 5" of the groups when the CMC quattro is in "Operating" mode. When the coffee flows on each groups turn the "Set/Operation" switch to "Set", then proceed the procedure explained above just on one group.

Example:

Setting line 5 of group 2:

- 1 Switch the "Set/Operation" to "Operation"
- 2 Press the "STOP/line 5" key of group 2 → Green LEDs of line 5 light up and the coffee flows.
- 3 Switch the "Set/Operation" to "Set" → Green LEDs of line 5 turns off. The flow of coffee stops.
- 4 Prepare the filter holder with coffee powder and place a cup or pot under the outlet.
- 5 Select line 5 → Green LED of line 5 begins to flash the pot is filled with coffee.
- 6 When there is enough coffee in the pot, select line 5 again → LED of line 5 continues to flash and the flow stops
- 7 If the quantity and the taste of the coffee is good, wait 15s until LEDs are extinguished → Line 5 of group 2 is programmed
- 8 If you are not satisfied, select line 5 again → LED of line 5 continues to flash and the coffee flows into the pot
- 9 When there is enough coffee in the pot, select line 5 again → LED of line 5 continues to flash and the flow of coffee stops
- 10 If the taste and the quantity are alright, wait 15s until LEDs are extinguished → Line 5 of group 2 is programmed

9.4 Setting the 5th portion to continuous flow

When line 5 of one or more groups are set as portion, the setting of continuous flow is:

- 1 Switch the "Set/Operation" to the "Operation" position.
- 2 Press the "STOP/line 5" key for one or more groups. The green LED of the group lights up and coffee flows out.
- 3 Now switch the "Set/Operation" to the "Set" position. The green LED of the group is extinguished and the flow of coffee is stopped.
- 4 The "STOP/line 5" key is then reprogrammed for dispensing an unlimited portion (continuous flow)

5 Switch the "Set/Operation" to the "Operation" position.

9.5 Setting the hot water timer for tea

The CMC quattro can also proportion hot water for tea using a timer. This timer is set as follows:

- 1 Switch the "Set/Operation" to the "Set" position.
- 2 Press the tea key Hot water flows out
- 3 When the cup is full, press the tea key again. The quantity of the hot water is set. The system does not have a correction facility for setting the hot water timer. If the setting must be corrected, the procedure must be repeated from the beginning.
- 4 Switch the "Set/Operation" to the "Operation" position.

10 Operation

In the "Operation" mode the "Set/Operation" switch is at the "Operation" position. In this mode any portion can be dispensed. Coffee is dispensed by selecting a line.

However, the following limitations apply:

- Only one line per group can be active at any time. All portion keys, with the exception of the STOP key, are disabled.
- If the "STOP/line 5" key is pressed for a group while a line of this group is active, it is interpreted as a STOP command. If no line is active a portion (depending on setting) or a continuous flow is dispensed.

11 Malfunctions

During operation the CMC quattro performs continuous checks on the electrical connections to all the connected flowmeters and the flowmeter itself. During dispensing, if no pulses are registered from the flowmeter for 3s the CMC quattro switches over to the malfunction mode. A malfunction is displayed as follows:

- The LED of the selected line and the red LED of the "STOP/line 5" key flash alternately

This fault message has the following consequences for the user:

- The coffee portion must be manually interrupted (by pressing the "STOP" key)
- This portion cannot be recorded in conjunction with the calculating systems
- The pump is switched off after a maximum of 90s in order to protect it from being damaged.

Possible sources of faults:

- Water supply is interrupted.
- Coffee powder is ground too finely with the result that no more water can flow through.
- The flowmeter is blocked as a result of calcification and therefore emits no longer pulses.
- The input of the flowmeter to the CMC quattro is interrupted.

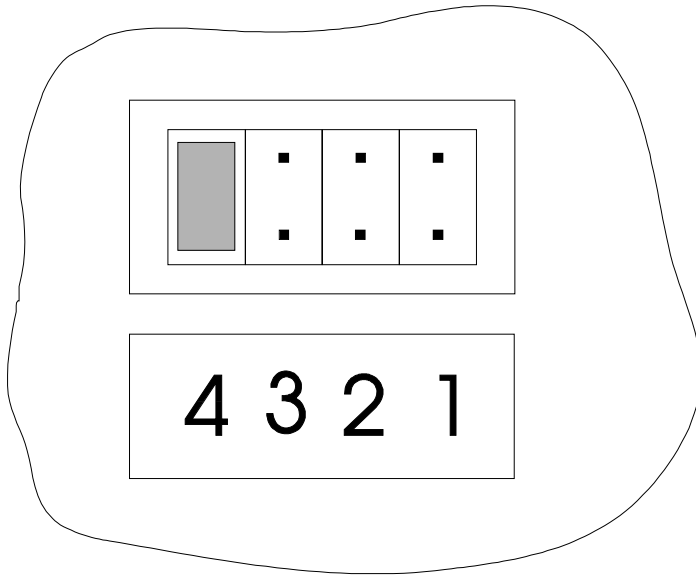
If the fault has not been remedied after these explanations, the CMC quattro must be replaced and sent to the technical support.

12 Technical data*

Primary mains voltage	230V \pm 20% also available 110V \pm 20%
Power input	max. 2.8VA (without relay load)
Secondary voltage	18V electrically isolated
Secondary Current	max. 145mA
Relay organization	1 Common max. 6 make contacts
Contact load	1 Pump Contact max. 250V/16A 7 Control Contacts max 250V/6A
General maximum design	4 groups, 2 level probes, 1 hot water timer, 1 temperature sensor or 1 safety level probe.
Group organization	4 lines 1 STOP key, STOP key also continuous flow or 5th portion.
Prozessor	Intel® 8052
Temperature range	0 - 70°C.
Dimensions	approx. 205 x 120 x 48 mm (LxWxH).
Weight	ca. 550g (4 Line)

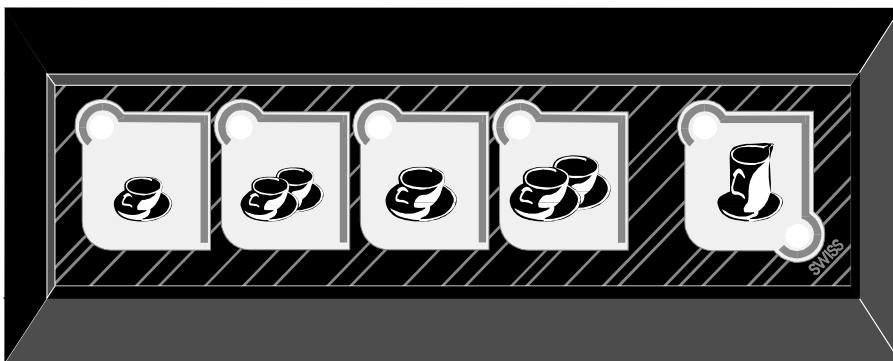
* Subject to change without prior notice

Setting of the keyboards



Schematic A1

Keyboards



Line 1

Line 2

Line 3

Line 4

STOP/Line 5

Schematic A2

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