

Operating and Installation Instructions

Filter control system

RM-216 CB

EasyLine

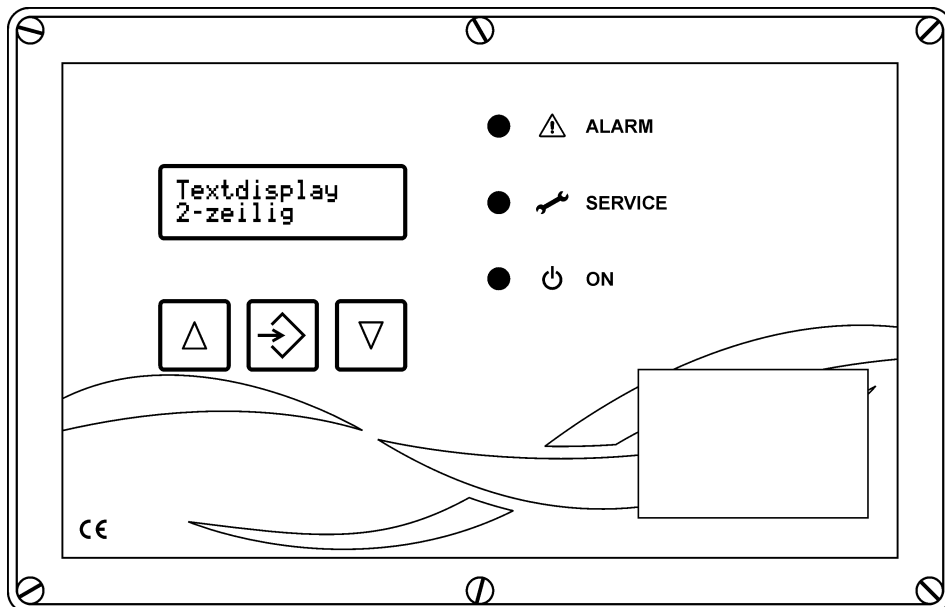


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Regulations

2014/30/EU

2014/35/EU

Legend



Important note



Important warning

1 Safety instructions

The filter control system RM-216 CB when connected to the mains poses an electrical hazard. Device failure, serious or even fatal injuries may occur as a result of improper installation of the connected equipment. Consequently, follow in particular the points set out below in addition to the general safety regulations for equipment in industrial electrical installations:

- Installation of the device may be carried out only by qualified experts, in accordance with the provisions of IEC 364, DIN VDE 0105 for electrical equipment.
- All applicable laws, conditions, orders and regulations governing the setting up of electrical equipment must be observed in respect of the installation site.
- Setting of equipment with degree of protection IP00 without covers, may only be performed by authorized expert staff, when disconnected, and whilst observing the local safety and accident prevention regulations.

The RM-216 CB may only be operated in the permitted operating area.

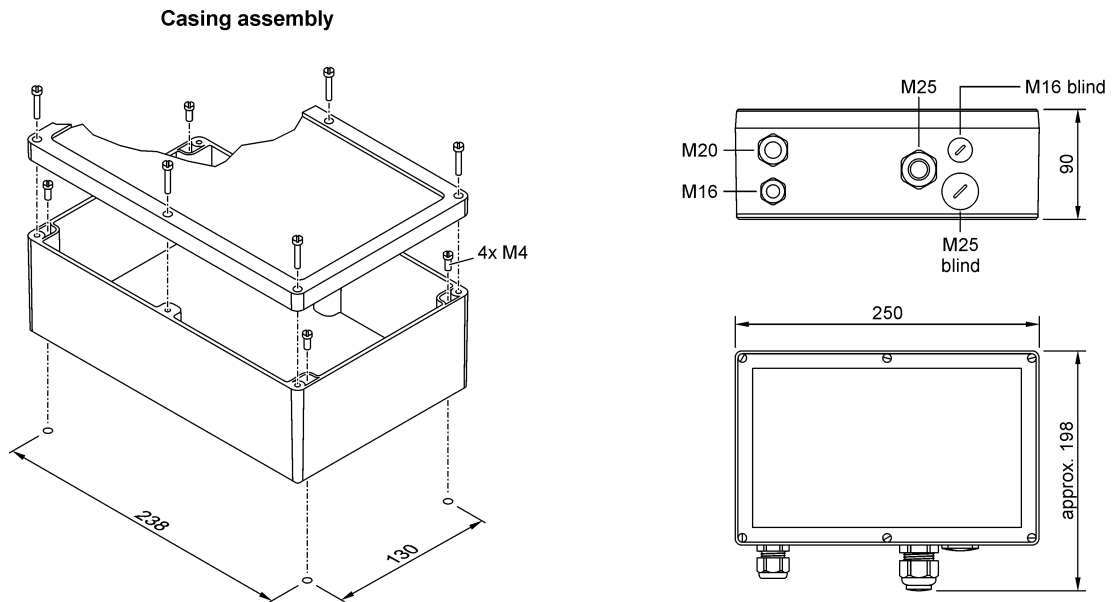


Switch off the mains supply before replacing the filter control or any components connected to it. Otherwise the equipment may be damaged.

2 Equipment specification

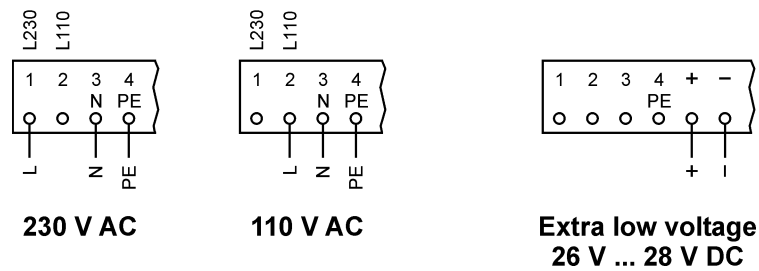
The RM-216 CB is used to control 24 V DC solenoid valves on filtering separators with compressed air pulse cleaning. After connecting the supply voltage, the filter control system functions fully automatically without further activation.

3 Assembly



4 “Step by step” installation

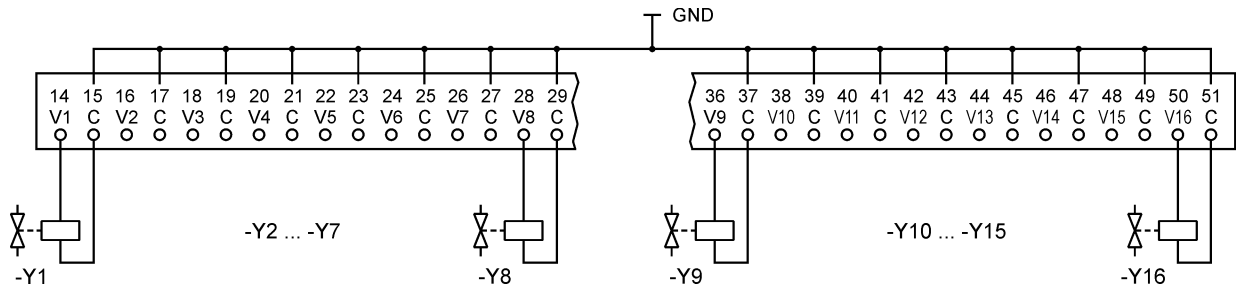
1 Supply voltage connection



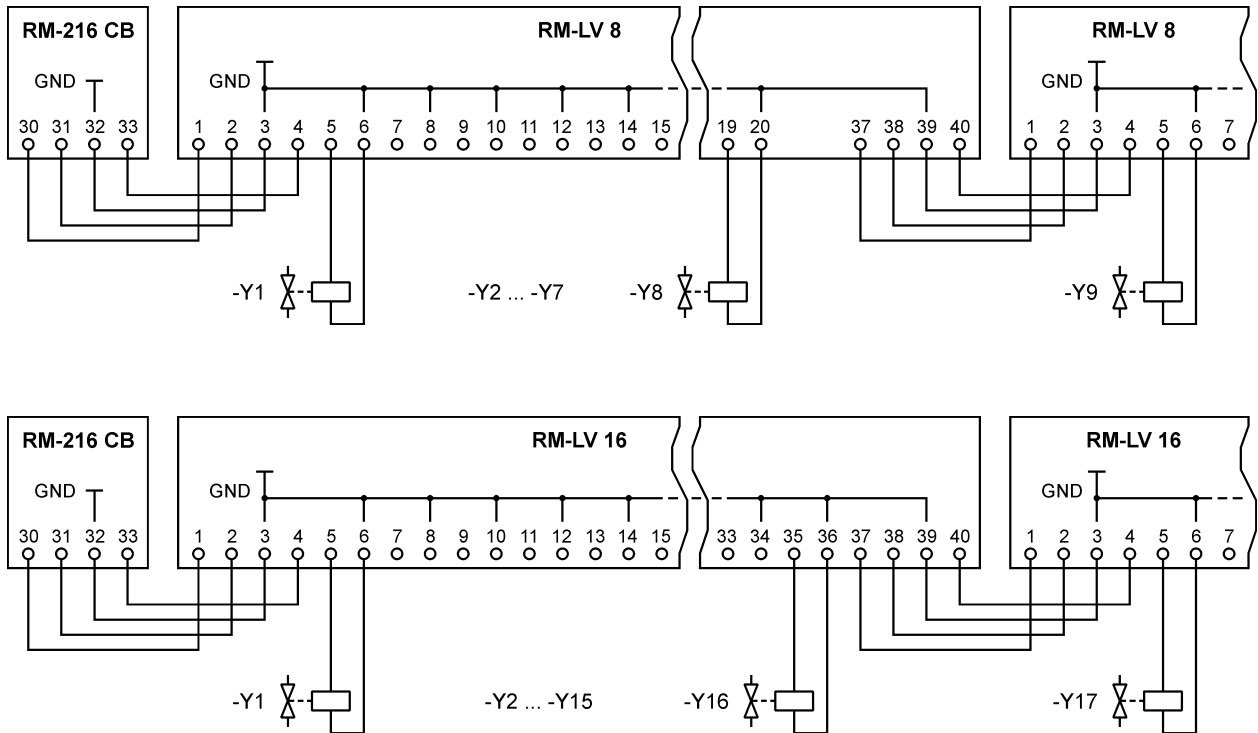
i A separate power supply unit is recommended for the operation of the filter controller with extra low voltage.

The unit can be operated with a supply voltage of 24 V DC, if no expansion modules are connected and if the electric cables to the solenoid valves are shorter than 3 meters long.

2 Solenoid valve connection



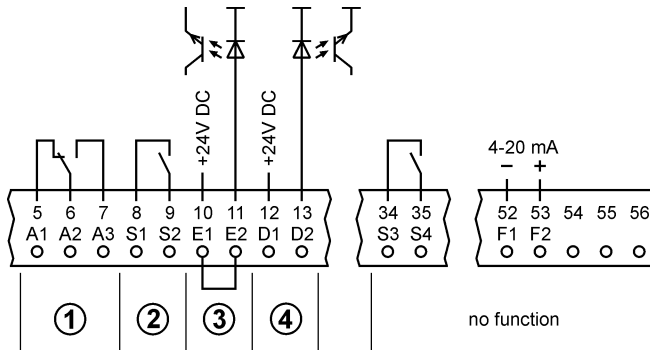
3 Connection of expansion modules RM-LV8 / RM-LV16



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- Use shielded cable for all bus lines! The shielding must be connected unilaterally to the protective earthing (PE).
- Signal cables must not be laid parallel to power cables.
- Tighten all cable glands in use so the cables are properly enclosed and water cannot penetrate.
- Cable glands that are not in use must be closed or replaced by blind plugs.

4 Other connections



- ① "Common alarm" relay output
- ② Output to control an extractor element contactor
- ③ Down-time cleaning input (factory bridged)
- ④ Start/stop input (external Δp -switch)

5 “Step by step” settings

5.1 Function when shipped

The down time cleaning input E1, E2 (terminals 10, 11) is bridged at the factory. Once the supply voltage is at RM-216 CB, the solenoid valves are controlled consecutively in sequence. The filter control system automatically detects how many valves are connected.

For connecting an external Δp switch, see section 6.3 “Cleaning via start / stop input (external Δp switch)”.

To activate the down time cleaning, see section 6.2 “Down time cleaning”.

If another function is required or if additional functions are to be activated, the parameter setting of the RM-216 CB must be changed. For more on this, see section 5.2 “Setting parameters”.

5.2 Setting parameters

To set or check the parameters, proceed as follows:

- 1 Use the parameter list in section 5.3 to search for the parameters you want to change or check. On the RM-216 CB, press buttons \blacktriangle and \blacktriangledown simultaneously, for at least 3 seconds. The program then changes from operation mode to parameter selection mode. The parameter P01 “Pulse time” is displayed on the text display at its set value.
- 2 Press the \blacktriangle button to call up all following parameters P02 ... P11 in sequence. The parameters already displayed can be accessed by repeatedly pressing the \blacktriangledown button.
- 3 To change the value of a displayed parameter, press the ENTER button for at least one second. The program then changes from parameter selection mode to parameter setting mode.
- 4 Press the \blacktriangle button to increase the parameter value displayed in increments. Press the \blacktriangledown button to decrease the parameter value displayed.
- 5 Press the ENTER button for at least 3 seconds. The new parameter value is stored. The text display will briefly display the message “Store”. The program automatically returns to the parameter selection mode. You can now call up other parameters and check or change their values.
- 6 So that the program changes from parameter selection mode to operation mode, press buttons \blacktriangle and \blacktriangledown simultaneously for at least 3 seconds.

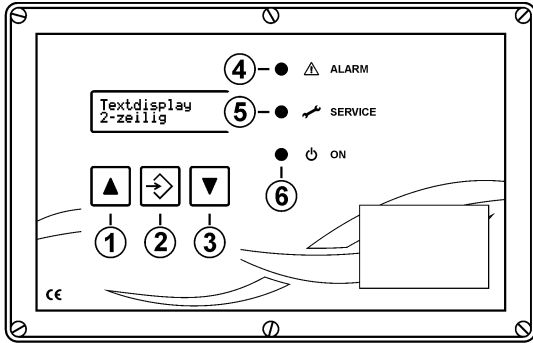
If the program is still in parameter setting mode, follow the instructions given under point 5.

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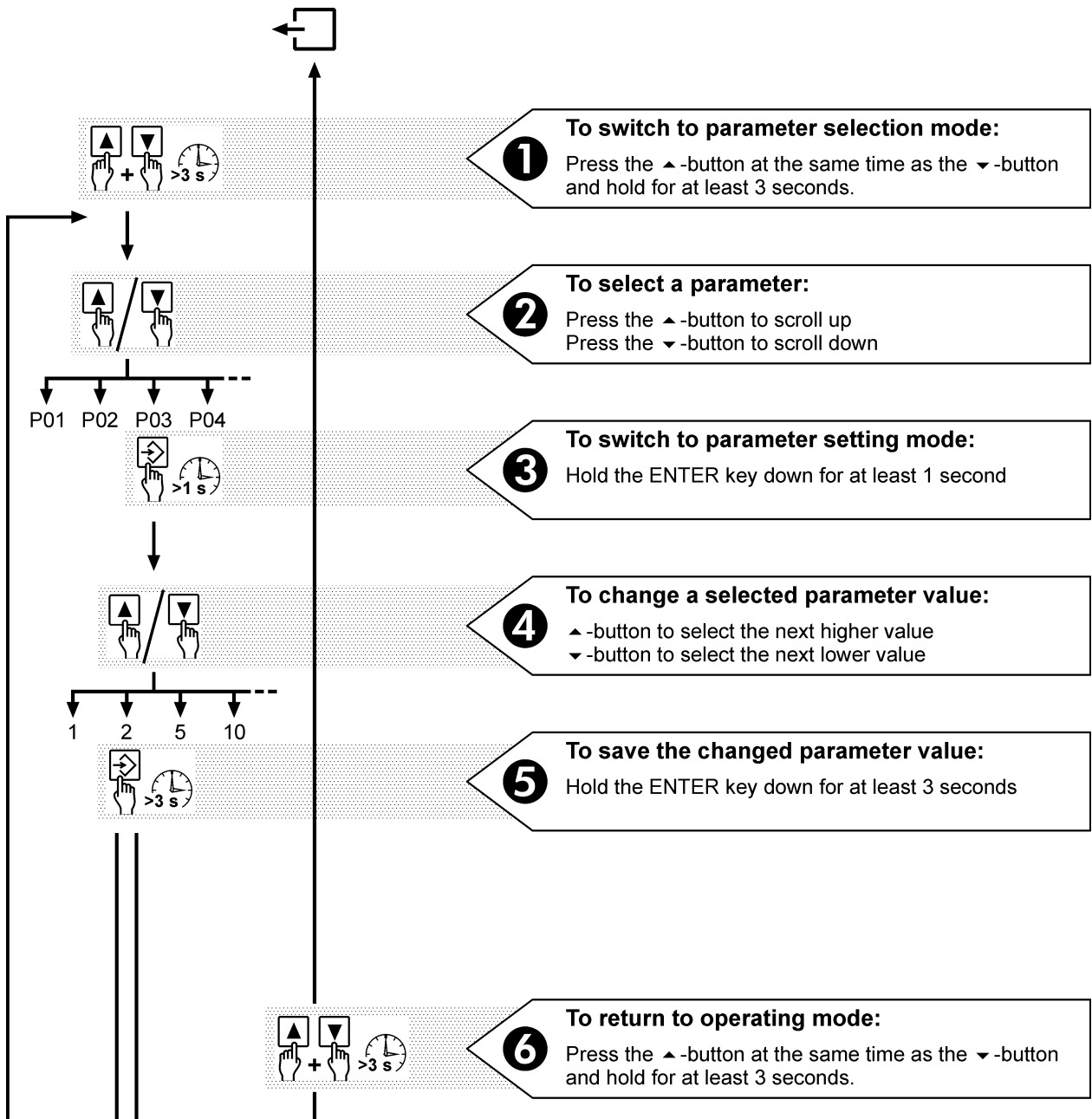
The symbols shown on the right will be shown in the lower left-hand corner of the text display. They indicate to the operator which mode the equipment is currently in.

+ - Operation mode
 +^ - Parameter selection mode
 +>- Parameter setting mode

If no buttons are pressed for 4 minutes, the RM-216 CB automatically returns from parameter selection mode or parameter setting mode to operation mode with the last values stored.



- ① ▲-button for selecting parameters or values (ascending)
- ② ENTER button for entering selected values
- ③ ▼-button for selecting parameters or values (descending)
- ④ LED "ALARM" is on when there is an alarm message (alarm relay pressed)
- ⑤ LED "SERVICE" is on when filter maintenance work is due
- ⑥ LED "ON" is on when the machine is in operation



5.3 Parameter list

Param. no.	Text on the display	Explanation	Factory settings	Setting range
P01	P01 Pulse time	Pulse time	60 ms	15 ... 2500 ms
P02	P02 Interval	Pause time	10 s	1 ... 500 s
P03	P03 DT interval	Down time interval time	6 s	1 ... 100 s
P04	P04 tot Valve no	Total no. of valves*	0	0 ... 128
P05	P05 DT cycles	Down time cleaning cycles	6	0, 2 ... 32
P06	P06 Operating h	Operating hours	–	0 ... 250000 h
P07	P07 Language	Language for the display text	D	D, GB, F, I, NL, DK, FIN, PL, E
P08	P08 Test Mode	0 = Test mode off 1 = Valve test 2 = Input test 3-5 = For manufacturer purposes only	Off (0)	0 ... 5
P09	P09 Ser.run hour	Service operating hours	–	–
P10	P10 Ser.run h.AL	Service operating hours alarm	0 h**	0 ... 25000 h**
P11	P11 Ser.r.h.Code	Service operating hours code	0	0 ... 250

* Number of all valves connected to the RM-216 CB and to the expansion modules. The parameter is used by the equipment for internal monitoring purposes and need only be set, if expansion modules are fitted. If the equipment detects that the total number of valves set is different from the actual number of valves controlled, an alarm message is issued.

** If the parameter is set to the value 0 h, the alarm is switched off.

i The parameters P09 and P10 are only displayed if the service operating hours code (parameter P11) has been entered.

6 Operating modes

6.1 Test mode

In test mode, the most important functions in the control sequence are checked and shown on the text display. To start test mode, call up parameter no. P08 "Test mode" (see section 5.2 for more information) and select one of the following test modes:

Test mode 1 (Valve test)

Each valve connected is activated in sequence and shown in the text display.

Test mode 2 (Input test)

The signal statuses of the inputs are displayed on the text display.

Test modes 3-5

For manufacturer purposes only

Test mode 0 (test mode off)

Test mode is switched off.

6.2 Down time cleaning

To activate down time cleaning, perform the following steps:

- Remove the factory-fitted wire jumper on input E1, E2 (terminals 10, 11).
- Connect a free auxiliary contact (make contact) of the fan contactor to terminals 10 and 11. The input should be operated in isolation.
- Set parameter P05 "Down time cleaning cycles" to the required number of cycles (see also section 5.2 "Setting parameters").

If the fan is switched on, the contact on E1, E2 closes and switches on the cleaning. When switching off the fan, the contact on E1, E2 opens and activates the down time cleaning. The down time cleaning cycles set are carried out. The RM-216 CB then shuts down.

6.3 Cleaning via start / stop input (external Δp switch)

If the cleaning is controlled via an external Δp switch, the isolated contact on the Δp switch must be connected to the start / stop input D1, D2 (terminals 12, 13).



During down-time cleaning, the start / stop input D1, D2 is inactive.

7 Troubleshooting

Error	Possible causes	Recommended action
The "ON" LED is not lit and input E1, E2 is bridged.	- No mains voltage	- Check power feed
	- Device fuse is defective	- Replace fuse
	- EMERGENCY STOP activated	- Check EMERGENCY STOP
No valve activity	- No control system release	- Bridge input E1, E2
	- Wiring to valves interrupted	- Check cables and electrical connections
	- Magnet coil faulty	- Replace coil
No down time cleaning	- Parameter P05 = 0 (down time cleaning cycles)	- Set parameter P05 "Down time cleaning cycles" to a different value
	- There is no signal from the fan control	- Activate signal to input I1, I2
Cleaning ineffective	- Interval time too long	- Set parameter P02 "Interval time" to a lower value
	- Pressure too low	- Set pressure to 6 ... 8 bar (min. 5 bar) - Set parameter P02 "Interval time" to a higher value
	- Valve faulty	- Check / replace valves
	- Pulse time too short	- Set parameter P01 "Pulse time" to a higher value
"Alarm" LED on	- The number of valves is set incorrectly	- Set parameter P04 "Total no. of valves" correctly

8 Text messages on the display

Display	Explanation
Reset RM204VXX	Reset status and text version The text message is displayed for approx. 1 second after the voltage is switched on.
Stand By + - Val.No	Controller is not enabled through inputs I1 and I2.
Cleaning Off + - Val.No	The control has been enabled via input E1, E2 and stopped via input D1, D2.
Cleaning On + - Val.No	The control has been enabled via input E1, E2 and started via input D1, D2.
DTC Cleaning ON + - 000 Pcs	Down time cleaning active
Call Service + - Val.No	The alarm switching point for the service hours counter has been exceeded.
RM-LVX Alarm + - Val.No	A connected O module RM-LV8 or RM-LV16 is out of order. or the total number of valves (parameter P04) is set incorrectly.

9 Details on the equipment function

Cleaning

Cleaning starts at the first valve. If the cleaning is interrupted via the starstop input D1, D2, the control sequence is continued at the next cleaning procedure. The cleaning then starts at the valve following the last valve activated.

If the control is reactivated following a mains voltage failure, a restart is carried out.

Relay output S1, S2 to control extractor elements (terminals 8, 9)

If automatic components for dust removal (extractor elements) are fitted, these need to be in operation during cleaning and during down time cleaning. Connect the cut-out for controlling these drive units to the isolated output S1, S2.

“Alarm” relay output A1, A2, A3 (terminals 5, 6, 7)

As soon as the supply voltage is present on the RM-216 CB, relay contact A1, A2 closes (terminals 5, 6) and contact A2, A3 opens (terminals 6, 7). In the following situations, relay contact A1, A2 opens and contact A2, A3 closes:

- Supply voltage failure
- Failure of a voltage internal to the equipment
- Fault in a connected O module
- Total number of valves is set incorrectly (parameter P04)

10 Glossary

Term	Explanation
Cleaning	Cleaning the filter elements using compressed air pulses.
Compressed air pulse cleaning	Cleaning of the filter elements using compressed air pulses
Down time cleaning	Cleaning the filter elements after the system is shut down for a set duration or number of cycles.
Down time cleaning cycles	The number of cleaning cycles performed in the down time cleaning.
Down time cleaning input	Input on the RM-216 CB for starting the down time cleaning.
Down time interval time	Pause time during the down time cleaning.
Expansion module	If the filter has more than 16 valves, expansion modules of type RM-LV8 (for 8 valves) or RM-LV16 (for 16 valves) are required. A maximum of 7 type RM-LV16 expansion modules can be connected to the main RM-216 CB equipment. With the outputs on the main equipment, this makes a maximum of 128 valve outputs available.
Extractor element	Device for extracting the filter casing from the dust deposited. E.g. cellular wheel sluice, trough conveyor worm.
Extractor element contactor	Contacting which switches the drive unit for an extractor element on and off.
I/O module	Input/output module (module for the input and output of control signals)
Operation mode	Status of the RM-216 CB in which the equipment is ready for operation.
Parameter selection mode	Status of the RM-216 CB in which the equipment operator can select a parameter.
Parameter setting mode	Status of the RM-216 CB in which the equipment operator can set a parameter.
Pause time (also Interval time)	Time period between two consecutive control pulses from the valve outputs when the cleaning is running.
Pulse time	Duration of a control pulse on the valve outputs
Service operating hours alarm	Alarm issued when the operating hours set for the maintenance interval has elapsed.
Service operating hours code	Code which needs to be entered to change the set value for the service operating hours.
Solenoid valve	(also relay valve) electromagnetically operated valve for the pneumatic triggering of the filter membrane valves. The membrane valves in turn release the compressed air strokes for filter cleaning.
Starstop input	Input on the RM-216 CB for starting and stopping the cleaning via an external Δp switch.
Total no. of valves	Number of all valves connected to the RM-216 CB and to the expansion modules.
Δp switch	Switch which is triggered by a differential pressure value set and which activates the filter cleaning.

11 Technical specifications

Application	Data
Supply voltages	230 V AC $\pm 10\%$ 110 V ... 120 V AC $\pm 10\%$ 26 V ... 28 V DC*
Signal inputs	24 V DC, operate ensuring isolation
Signal output	Relay outputs, max. 2 A, 250 V or 1 A, 30 V DC
Control outputs for valves	For valves with a rated voltage of 24 V DC, can be expanded to 128 outputs, Output power in pulse mode 42 Watt
Outputs for expansion modules	Supply voltage and pulse wires to the expansion modules
Fuses	230 V: T 0.4 A, 250 V, 5 x 20 mm 110 V: T 0.8 A, 250 V, 5 x 20 mm Extra low voltage: Fusing via PTC resistor
Temperature range	-20°C to +60°C
Degree of protection	Casing IP-66 / NEMA 4
Dimensions	See chapter 3 "Assembly"
Weight	approx. 0.8 kg
Installation height	max. 3000 m above M.S.L.

* The unit can be operated with a supply voltage of 24 V DC, if no expansion modules are connected and if the electric cables to the solenoid valves are shorter than 3 meters long.

Disclaimer

The contents of this documentation has been verified for correctness and completeness. Nevertheless, errors can not be excluded so that we cannot guarantee the correctness of this information. Subject to alterations at any time.