Filtration Group®
Industrial

Translation of the original instructions
FGFS-E900

Mat. No. of original instructions
72370026



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2 General safety instructions

2.1 Safety instructions for installation and operating personnel

This translation of the original instructions contains important safety information which must be heeded at all times during installation, normal operation and maintenance.

Non-observance can result in the following risks to persons and the environment as well as in damage to the machine or system:

⇨ Failure of critical functions of the machine or system or of its component parts.
⇨ Danger to persons from electrical or mechanical effects as well as from chemical reactions.
⇨ Danger to the environment owing to the leakage of hazardous substances.

Before installation / start-up:

- Read this translation of the original instructions carefully.
- Make sure that installation and operating personnel are adequately trained.
- Make sure the contents of the original instructions are fully understood by the responsible persons.
- Define areas of responsibility and competence.
- Prepare a maintenance schedule.

During operation of the system:

- Keep this translation of the original instructions handy at the place of use.
- Heed the safety instructions. Always operate the machine or system in accordance with its ratings.

If in doubt:

- Consult the manufacturer.

By keeping the following information handy, you can help us deal with any problems more efficiently:

- Material number of the control cabinet
- Software version
  (see sticker on the EEPROM of the micro-PLC)

2.2 Warning structure

Where possible, warnings are structured according to the following system:

Signal word	
Possibly with symbol	**Nature and source of the danger** ⇨ Potential consequences of non-observance • Action to avert the danger.

2.3 Warning symbols used

⚠ DANGER!
Immediate danger! ⇨ Non-observance will result in serious or fatal injury.

⚠ WARNING!
Potentially dangerous situation! ⇨ Non-observance can result in serious or fatal injury.

⚠ CAUTION!
Potentially dangerous situation! ⇨ Non-observance can result in minor or moderate injuries.

CAUTION! (without a symbol)
Potentially dangerous situation! ⇨ Non-observance can result in property damage.

2.4 Other symbols used

	Danger: High voltage!
	Danger information about explosion protection
☞	Hand symbol: Indicates general information and recommendations
•	Bullet: Indicates the order in which actions are to be carried out
⇨	Arrow: Indicates responses to actions

3 Glossary

Differential pressure (Δp):
Pressure difference between the dirty side and the clean side of the automatic filter.

4 General information

4.1 Manufacturer

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Schleifbachweg 45
74613 Öhringen
Phone 07941 6466-0
Fax 07941 6466-429
industrial@filtrationgroup.com
industrial.filtrationgroup.com

4.2 Information about the original instructions

FG Mat. No. 72370026
Date: 24.11.2021
Version: 06

5 Intended use

⚠ DANGER!
PROHIBITED: • Use for purposes other than described below without prior consultation with the manufacturer. • Use in hazardous areas.

⚠ CAUTION!
Potentially dangerous situation! This filter controller is only allowed to be used in accordance with the operating conditions specified in the contract documentation and in the original instructions. All forms of use which deviate from or exceed the limits of use described above are considered to be contrary to the intended purpose. The manufacturer is not liable for any damage resulting from such use.

The filter controller can be used to control the following automatic filters:

⇨ FRx-x
⇨ FKx-x
⇨ AF71 - AF179
⇨ FMAx

Use for other purposes is prohibited without prior consultation with the manufacturer!

To start a cleaning cycle

A cleaning cycle can be started in the following ways:

- Manually
- Based on the differential pressure
- By means of a time switch

6 Functional description

6.1 Operating principle

The filter controller monitors the pressure difference between the dirty side and the clean side of the automatic filter.

If the set differential pressure is exceeded, the signal for cleaning the automatic filter (“Flushes acc. to Δp”) is tripped.

6.2 Control elements

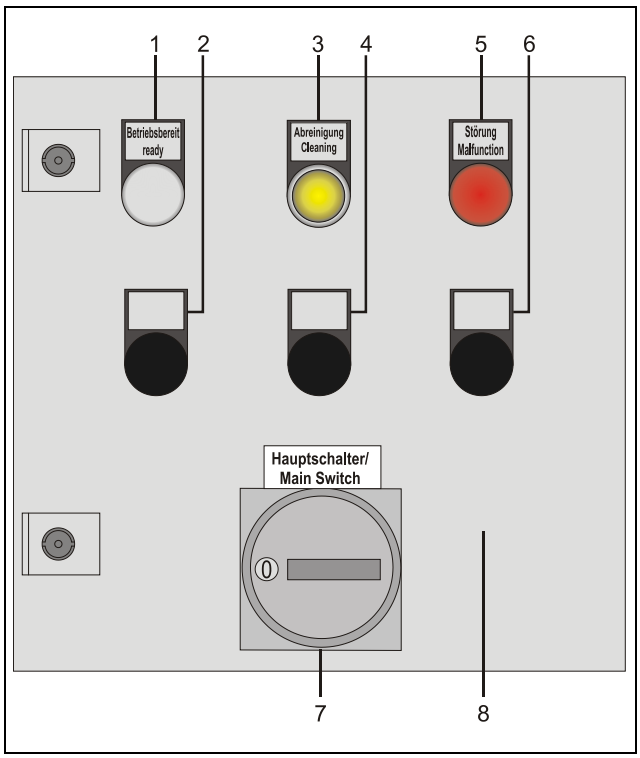


Fig. 1: Control elements of the E900

No.	Control elements
1	“Ready” lamp
2	Not assigned
3	Illuminated “Cleaning” button
4	Not assigned
5	“Malfunction” lamp
6	Not assigned
7	Main switch
8	Control cabinet

6.3 Components

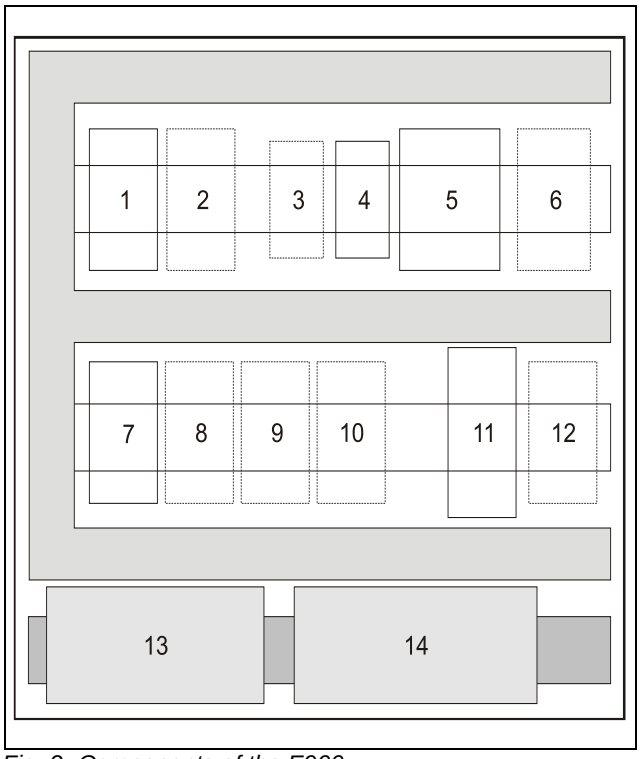


Fig. 2: Components of the E900

No.	Components
1	Motor circuit breaker Q1
2	Pump MS (optional)
3	Time relay (optional)
4	Relay K4
5	Siemens logo KF1
6	Expansion module
7	Filter motor contactor QA1
8	Mains contactor (optional) Pump control
9	Delta (optional) Pump control
10	Star (optional) Pump control
11	Power supply T1
12	F1 27 (optional) Fuse if backup fuse > 10 A
13	Terminal strip X1
14	Terminal strip X2

7 Technical data

Order-specific data

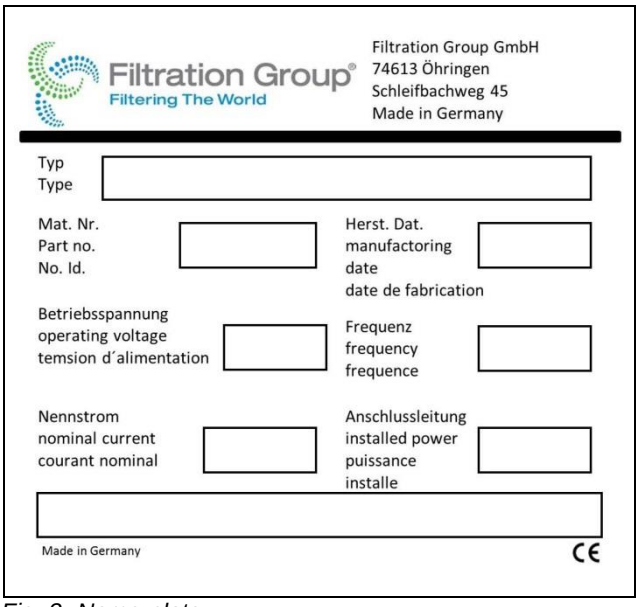


Fig. 3: Name-plate

The order-specific data can be taken from the name-plate.

Mechanical:

Width:	400 mm
Depth (incl. cover):	210 mm
Height:	500 mm
Weight:	3500 g
IP protection:	IP65

Electrical / pneumatic:

Supply voltage:	230 , 400… 500 V AC
	(190 … 250 V AC selectable)
Frequency:	50 to 60 Hz
Insulation:	Creepages and clearances
	acc. to VDE 0110, Gr. C
Output voltage:	24 V DC
Max. output current:	5 A per relay

Ambient conditions:

Ambient temperature:	-20°C to +60°C
Hazardous areas:	Refer to section 7.1,
	“Explosion protection”
Mounting position:	Any
Mounting location:	Free from vibration
Atmosphere:	Dust-free, non-corrosive

7.1 Explosion protection

⚠ DANGER!

Danger of explosion!

⇨ Risk of serious or fatal injury.

- The Filtration Group filter controller must not be installed or operated in potentially explosive atmosphere.

A special control cabinet must be used if automatic filters are operated in potentially explosive atmosphere.

- Please ask your Filtration Group contact for more information.

The E900 must be equipped with cut-off relays in order to control automatic filters in hazardous areas (see diagram below).

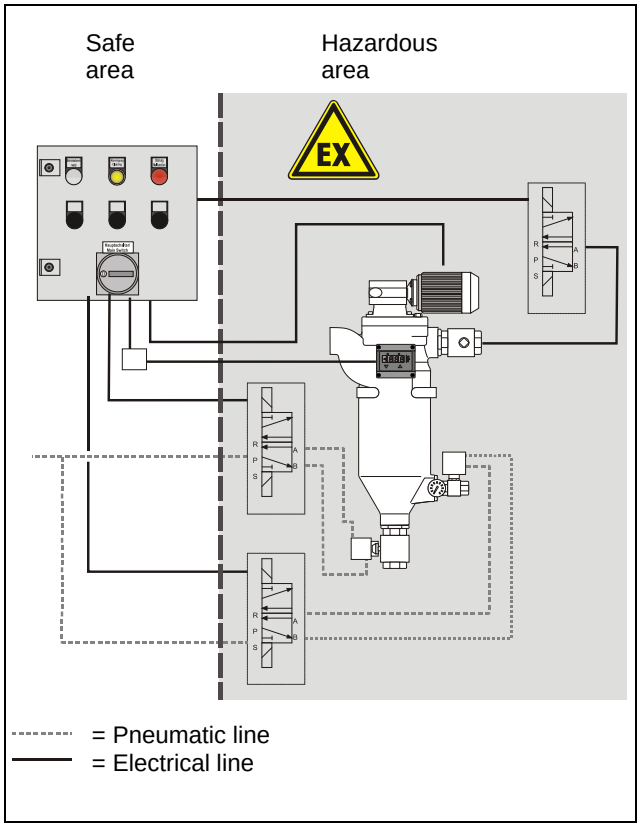


Fig. 4: Installation of the controller if filters are installed in a hazardous area

8 Transport and storage

Transport

- Always transport horizontally in the original packaging.
- Avoid vibration.

Storage

- Always store horizontally in the original packaging.
- Always store in a dry, frost-free room.



9 Electrical connections

⚠ DANGER!	
	**Danger of electric shock!** ⇨ Risk of serious or fatal injury in case of contact with electrical components. • All electrical installation work must be carried out by a qualified electrician!

- Do not install in the vicinity of devices that are susceptible to interference.
- Do not install in the vicinity of electromagnetic interference sources (power cables).
- Height in conformity with DIN EN 60204-1.
- The main switch, the customer's emergency stop buttons and all other control elements must be easily accessible.

9.1 Power supply

- Switch off the main switch.
- Feed the power supply and valve cables into the housing through the fitting.
- Connect the power supply and valve cables to the terminals provided for this purpose.

To select the input voltage

☞	To select the input voltage, detach the power supply from the mounting rail and set the switch (Input Select Voltage) to the required voltage.

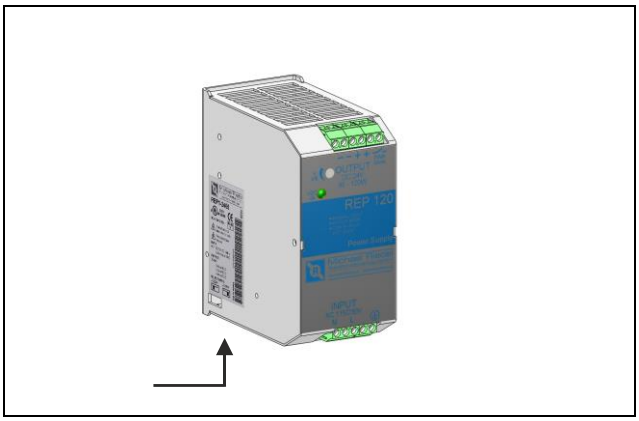


Fig. 5: Selecting the input voltage

9.2 Connecting the filter to the control cabinet

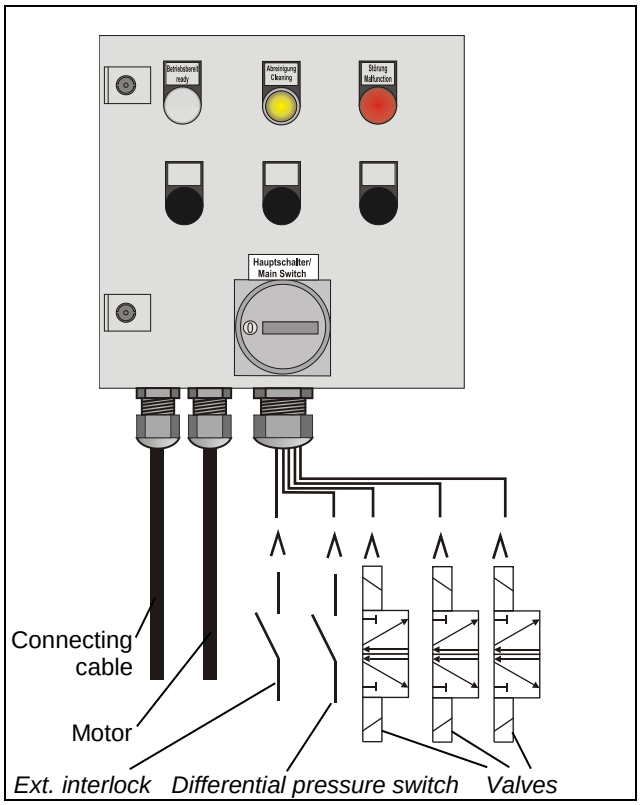


Fig. 6: Connecting a filter to the controller

- Open the cover of the control cabinet.

Terminal block X1:

- Feed line and motors.

Terminal block X2:

- Pressure sensors and (ball) valves.

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10 Manual mode

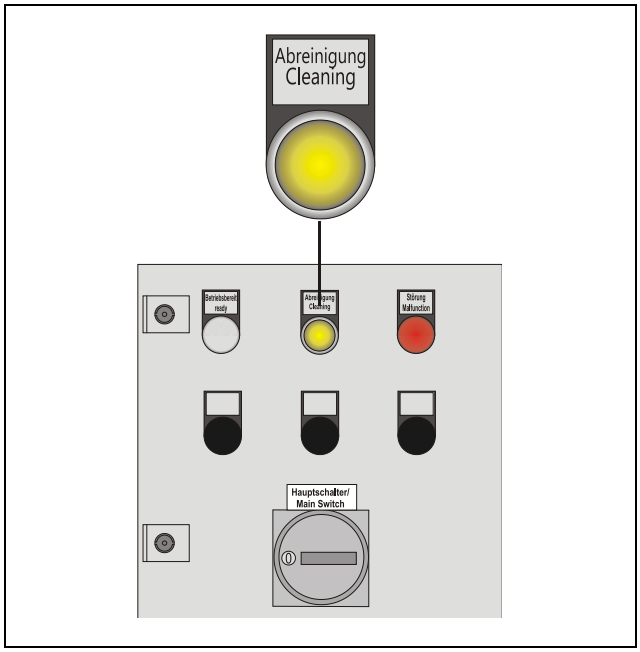


Fig. 7: Manual cleaning

10.1 Starting a manual cleaning cycle

- Press the illuminated “Cleaning” button

⇨ The button lights up.
⇨ The filter is cleaned.

11 Control options

CAUTION!
⇨ This translation of the original instructions is only valid for the AK02 software. • Please refer to the separate instructions supplied with the software if any other software is used!

The E900 can be supplied in several different versions with different PLC programs. The PLC which is used here is a Siemens LOGO! controller.

Logosoft AK02 (standard software installed in the control cabinet)

⇨ Differential pressure-controlled cleaning with overriding time-controlled cleaning (Δp contact or programmed time, whichever occurs first); time-controlled cleaning is activated once an hour but can be deactivated with B22.
⇨ The drain valve opens after a preset time
⇨ Pump interrogation (external interlock)

11.1 Automatic differential pressure / time-controlled mode

⇨ Automatic mode is activated as standard.
⇨ A cleaning cycle is started according to the Δp or a selectable interval time.

- Set the switching point for the differential pressure indicator / switch or analogue sensors on the Siemens LOGO!.

⇨ The motor and the backflush valve are controlled by means of the Δp contact.

- Adapt the parameter settings to the actual operating conditions (refer to section 13.1).

⇨ The drain valve opens and closes according to the programmed time.
⇨ The drain valve is interlocked for cleaning.

☞	Refer to section 18 for a list of parameters and their default settings.

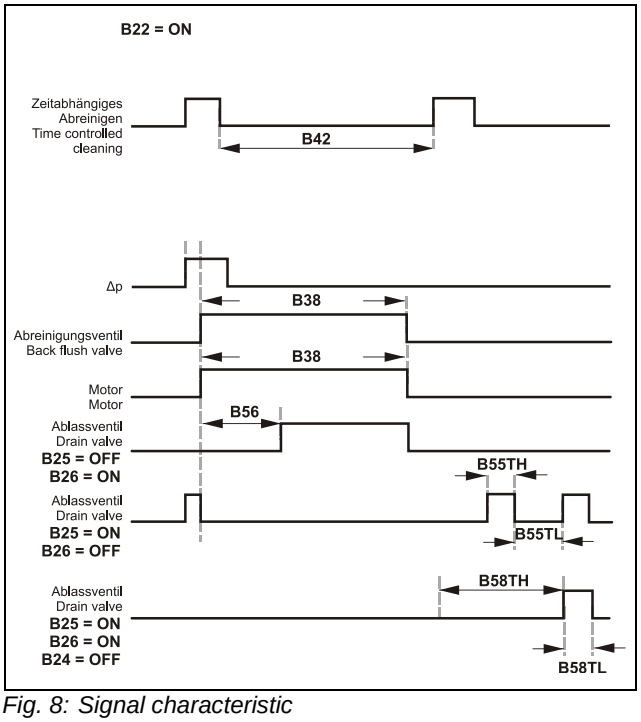


Fig. 8: Signal characteristic

12 Parameters for automatic cleaning

CAUTION!
If a cleaning cycle is interrupted: ⇨ Concentrate is drained in an uncontrolled way. • Set parameter B37 correctly. • Reduce parameter B37 to restrict the flow rate through the drain or backflush valve.

☞	The parameter settings should always be adapted to the application.

The end of a cleaning cycle is controlled by the Δp signal.

If the filter is still not clean at the end of a cleaning cycle, the Δp signal remains present to indicate severe fouling.

⇨ The drain or backflush valve remains open.
⇨ Concentrate is drained in an uncontrolled way.
⇨ The alarm time set with parameter B37 stops the cleaning cycle and closes the valves.

To change the cleaning threshold with analogue sensors

- Press ESC+▽ or △ .

⇨ The differential pressure threshold is changed.

Parameter	Description
B20/B21	OFF/OFF Pressure sensor 0 to 16 bar, 0 to 10 V ON/OFF Pressure sensor -1 to 15 bar, 0 to 10 V OFF/ON Pressure sensor 0 to 40 bar, 0 to 10 V ON/ON Pressure sensor 0 to 10 bar, 4 to 20 mA
B22	OFF = No time-controlled cleaning ON = Time-controlled cleaning, see also B42
B23	OFF = Analogue delta P measurement with 2 sensors ON = Digital delta P measurement with external differential pressure switch
B24	OFF = Without secondary filter ON = With secondary filter
Drain valve operating mode	
B25=OFF B26=OFF	No drain valve Throttle flap
B25=ON B26=OFF	Drain valve is time-controlled
B25=OFF B26=ON	Drain valve coupled to motor
B25=ON B26=ON	Drain valve coupled to cleaning
B27	Not assigned
B28	Not assigned
B37	Delta P signal present for too long. This parameter determines when an alarm should be output to indicate incomplete cleaning. The “ready” signal is simultaneously disabled.
B38	Cleaning period
B39	Interrogation time of secondary filter. Used if B24 = ON. If the pressure in the secondary filter does not fall below a defined value following the cleaning cycle, “secondary filter dirty” is indicated. Indication only, no switch-off.
B42	Interval time for time-controlled cleaning. Only relevant if B22 = ON.
B52	Counter for number of cleaning cycles.
B55	Drain valve pulse and interval times in ‘drain valve is time-controlled’ mode. B25 = ON; B26 = OFF ON = Set value OFF, CNT = Do not change
B58	Drain valve coupled to cleaning. TH = Period between end of cleaning and drain valve opening. TL = Drain valve opening time. B25 = ON; B26 = ON
B63	OFF = ON = Cleaning according to release counter. The counter counts the number of times the release contact is closed. If B63 = ON, a cleaning cycle starts when the number of release cycles is reached. Recommended for sporadic applications where a delta P increase is unlikely.
B64	ON = Save cleaning request if no release signal present. The cleaning cycle starts as soon as the release signal appears.
B65	ON = Save cleaning request. The cleaning cycle starts as soon as a new release signal appears. This causes the cleaning cycle to always start within 10 seconds of the release signal appearing.
B66	Counter for number of release cycles. Recommended for sporadic applications where a delta P increase is unlikely. ON = Set value OFF, CNT = Do not change
B68	Save cleaning release period in cleaning signal mode. B65 = ON.
B77	Suppress differential pressure If B25 and B26 = OFF B77 = Cleaning delayed until throttle flap closes.

☞	If an electric ball valve is used as the backflush or drain valve, a power failure could result in serious problems. There is a risk that the filter could run dry.

Translation of the original instructions FGFS-E900, Filtration Group GmbH, 24.11.21, Mat. No. 72370026, Version 06

13 Settings on the micro-PLC

☞	Observe the LOGO! controller instructions. A basic knowledge of how the LOGO! controller works is assumed.

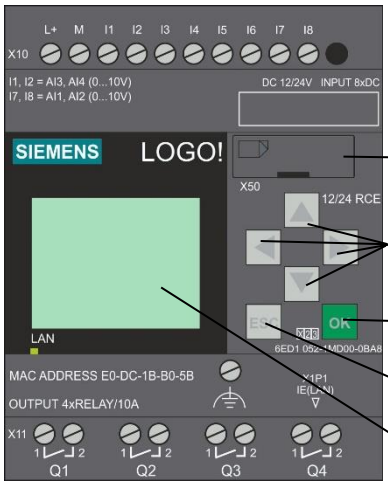


Fig. 9: LOGO! controller

13.1 Changing the parameter values

It may be necessary to change the parameter values in order to adapt the software to the actual operating conditions.

- Press ▽ repeatedly until the signal states (time, I, Q or M) are displayed.
- Press the ESC key.
- Press ▽ repeatedly until “Program” is marked.

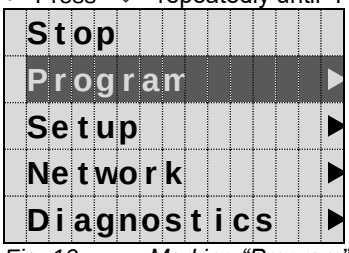


Fig. 10: Marking “Program”

- Press the ▷ key.

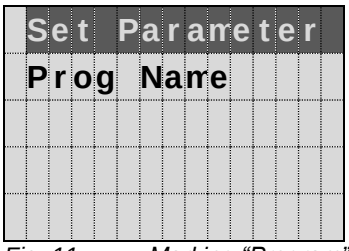


Fig. 11: Marking “Program”

- Press the OK key.
- Mark the required parameter with ▽ and △ (e.g. in this case B55).

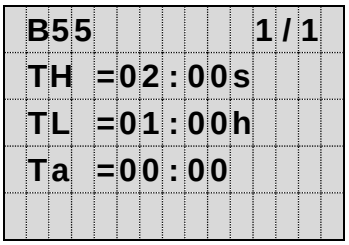


Fig. 12: Parameter B55

Ta = Actual time value

- Confirm with OK.

⇨ The cursor jumps to the first editable value.

- Mark the value you want to edit with ▷ and ◁.
- Enter the required value with ▽ and △.
- Press the OK key.

⇨ The new value is now stored.

- Press ESC repeatedly until the signal states (time, I, Q or M) are displayed.
- Press the △ key.

⇨ The controller shows the normal operating mode again.

13.2 Displaying signal states

- Press ▽ repeatedly until the signal states (time, I, Q or M) are displayed.
- Mark the required parameter with ▷ and ◁.

⇨ The signal state of the required parameter (time, I, Q or M) is displayed.

- Press the △ key.

⇨ The controller shows the normal operating mode again.

13.3 Displaying the program name

- Press ▽ repeatedly until the signal states (time, I, Q or M) are displayed.
- Press the ESC key.
- Press ▽ repeatedly until “Program” is marked.

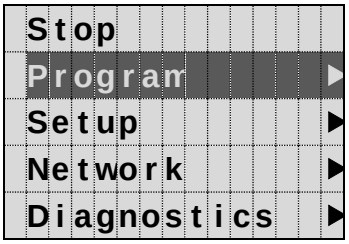


Fig. 13: Marking “Program”

- Press the ▷ key.
- Press the ▽ key.

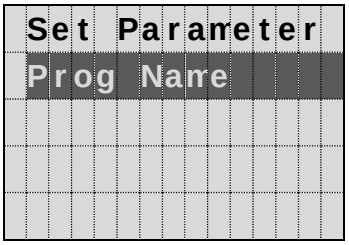


Fig. 14: Marking “Program”

- Press the OK key.

⇨ The program name is displayed.

- Press ESC twice.
- Press the △ key.

⇨ The controller shows the normal operating mode again.

13.4 Replacing the program module

⚠ CAUTION!
Do not attempt to remove the program module while the unit is operating! ⇨ Risk of damage to the system or injury to persons as a result of malfunctions. • Always switch off the E900 prior to replacing the program module!

☞	Refer to the original Siemens instructions for a description of how to replace the program module.

13.5 Displays

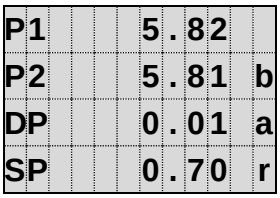


Fig. 15: Status displays P1, P2

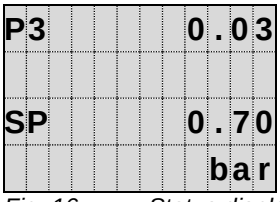
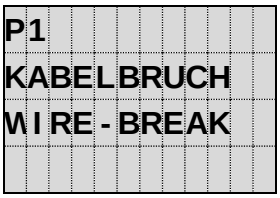
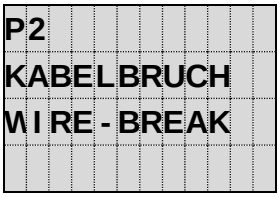
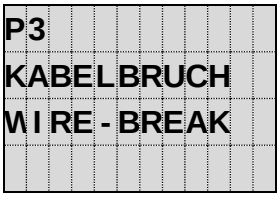


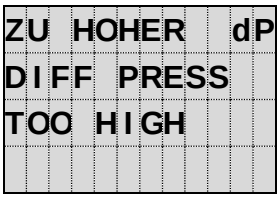
Fig. 16: Status display P3

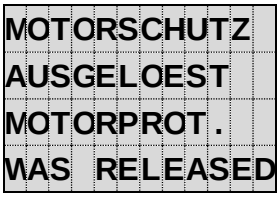
- Press ESC + ▽ or ESC + △ to change the switching point.
- Press ESC+ ◁ to change the pressure display (condition: B24 = ON, i.e. with secondary filter).











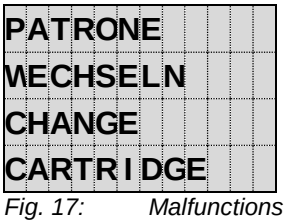


Fig. 17: Malfunctions

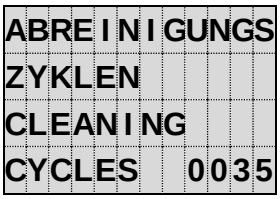


Fig. 18: Cleaning cycles

- Press ESC + right arrow to display the cleaning cycles for 10 seconds.

14 Start-up

⚠ DANGER!
The filter controller must not be put into service until the relevant machinery into which it has been incorporated has been declared in conformity with the applicable EC directives, harmonised standards, European standards or equivalent national standards.

⚠ WARNING!
If the parameter settings are incorrect: ⇨ Risk of injury to persons or damage to the system. • Always check the parameter settings **before** starting up the system and correct them if necessary!

☞	Before starting up the system, make sure the E900 parameters are suitable for the intended automatic filter type (refer to section 18).

14.1 Functional test

- Switch on the customer's power switch.
- Test the connections for the motor and all valves using the manual function.
- Check the direction of rotation of the motor and correct it if necessary (AF filters).
- Make sure the controller parameters are correct (refer to section 18).
- Adjust the differential pressure switch so that it sends a signal to the controller (AF filters).

☞	Set the SP1 Function parameter briefly (2 s) to NC if you are using a PiS 3170 / 3175. This causes a signal to be sent to the controller and starts a cleaning cycle (refer to the information in the PiS 3170 / 3175 instructions).

- Change the parameter settings on the controller if necessary (refer to sections 10 and 12).

14.2 Starting up the filter system

CAUTION!
Be careful not to exceed the maximum permissible volume flow when the unit is started up (refer to the contract documentation and the offer / order confirmation)!

- Connect the customer's compressed air supply.
- Switch on the main switch.

15 Normal operation

- The E900 works automatically during normal operation.

Conditions for trouble-free operation:

⇨ The external release signal must be enabled whenever fluid is pumped through the filter.

⇨ If the system is susceptible to failure in case of pressure loss, the release signal must be enabled each time the workpiece is changed, for example.

⇨ One cleaning cycle takes approximately 10 s in normal operation.

⇨ In systems with external pressure cleaning by means of compressed air, remember that this air must be supplied separately.

16 Troubleshooting

Fault	Possible cause	Remedy
Complete controller without power	Fuse defective	Replace the fuse
		Compare the actual voltage with the rated voltage
	Input voltage between 190 V and 250 V	Set the power supply to the required voltage (refer to section 9.1)
Motor does not start	Motor circuit-breaker tripped	Reset the motor circuit breaker
	No release signal	
Incorrect program sequence	Wrong program	Set the correct parameters
No automatic function	No program module or wrong program module installed	Install the correct program module
Relay indicates malfunction	Motor circuit-breaker tripped	Reset the motor circuit breaker
	Δp signal present for too long	Check parameter B37 and Δp
	Wire break at pressure sensors (analogue sensors only)	Replace the faulty cable Check the plug contact
Drain valve of AF 13x, 15x, 17x does not open	Air breaks down	Open the drain valve before the external pressure valve
Motor turns continuously	Differential pressure not reduced	Check the differential pressure
	Continuous motor operation selected (only recommended for AF 7x and AF 9x)	Select another operating mode B27=OFF
Error message: "Δp too high"	Differential pressure too high	Make sure SP2 Function is set to NC on the PiS 3170 / 3175

☞	**All errors not mentioned in this list:** • Please contact Filtration Group!

☞	If an electric ball valve is used as the backflush or drain valve, a power failure could result in serious problems. There is a risk that the filter could run dry.

17 Shutting down the system

17.1 Temporary shut-down

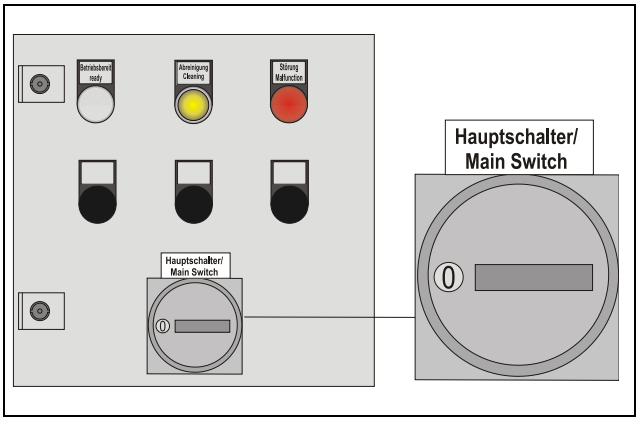


Fig. 19: Shutting down the system temporarily

- Switch off the main switch on the control cabinet.

17.2 Prolonged shut-down

- Switch off the main switch on the control cabinet.
- Disconnect the compressed air supply.

18 Overview of automatic filters

18.1 AF 4x, AF 7x, AF 9x

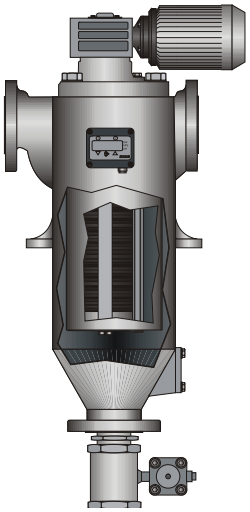


Fig. 20: AF 4x, 7x, 9x – Automatic backflush filter with external pressure cleaning and radial scraper cleaning

Parameter	As-delivered condition	Recommended value	Actual value
B20	ON	ON	
B21	OFF	OFF	
B22	ON	ON	
B23	OFF	**ON**	
B24	OFF	OFF	
B25	OFF	**ON**	
B26	OFF	OFF	
B27	OFF	OFF	
B28	OFF	OFF	
B37	T = 02:00 m	02:00 m	
B38	TH = 15:00 s TL = 00:00 s	**07:00 s** TL = 00:00 s	
B42	T = 01:00 h	01:00 h	
B55	TH = 02:00 s TL = 01:00 h	02:00 s 01:00 h	
B56	T = 01:00 s	01:00 s	
B58	TH = 05:00 s TL = 02:00 s	05:00 s 02:00 s	
B59	0000 0000	0000 0000	
B63	OFF	OFF	
B64	OFF	OFF	
B65	OFF	OFF	
B66	000 0000	0000 0000	
B68	TH = 15:00 s TL = 00:00 s	15:00 s 00:00 s	
B77	T = 01:00 s	01:00 s	

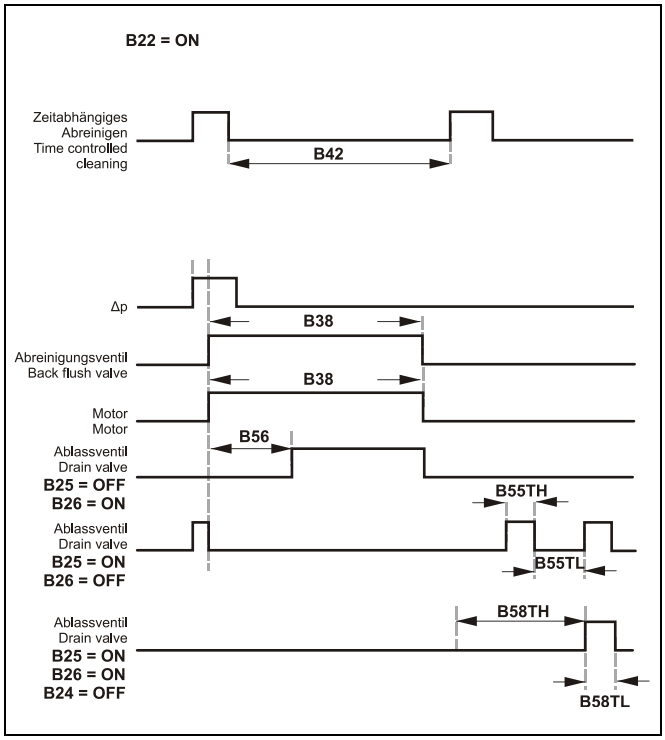


Fig. 21: Signal characteristic of the AF 4x, 7x, 9x

Parameter	Description
B20/B21	OFF/OFF Pressure sensor 0 to 16 bar, 0 to 10 V ON/OFF Pressure sensor -1 to 15 bar, 0 to 10 V OFF/ON Pressure sensor 0 to 40 bar, 0 to 10 V ON/ON Pressure sensor 0 to 10 bar, 4 to 20 mA
B22	OFF = No time-controlled cleaning ON = Time-controlled cleaning (B42 = time between cleaning cycles)
B23	OFF = dP measurement with 2 sensors ON = dP evaluation with external differential pressure switch
B24	OFF = Without secondary filter ON = With secondary filter
B25/B26	OFF/OFF No drain valve, throttle flap ON/OFF Drain valve is time-controlled OFF/ON Drain valve coupled to motor ON/ON Drain valve coupled to cleaning
B27	ON = Continuous motor operation The motor stops if a malfunction occurs or the release signal is interrupted
B28	Not assigned
B37	dP signal present for too long Determines when an alarm should be output. The “ready” signal is simultaneously disabled.
B38	TH: Cleaning period TL: Do not change
B42	Time until new time-controlled cleaning cycle. This time starts again if a dP-controlled cleaning cycle takes place in the meantime.
B55	**Only active in ‘drain valve is time-controlled’ mode. B25/B26 ON/OFF** TH: Drain valve pulse time TL: Drain valve interval time ON = Set value OFF, CNT = Do not change
B56	**Only active in ‘drain valve coupled to motor’ mode. B25/B26 OFF/ON** Delay time until drain valve opens.
B58	**Only active in ‘drain valve coupled to cleaning’ mode. B25/B26/B24 ON/ON/OFF** TH: Period between end of cleaning and drain valve opening TL: Drain valve opening time
B58	**Only active if a secondary filter is used. B24 ON** TH: Time until secondary filter is pressurised TL: Pressurisation period
B59	Counter for drain valve Example: The value 2 means the valve is activated by every second increase in differential pressure. (B25 and B26 = OFF) ON = Set value OFF, CNT = Do not change
B63	Cleaning according to release counter Number of times the release contact is closed For sporadic applications where a dP increase is unlikely.
B64	Save cleaning request if no release signal present. Cleaning as soon as release signal appears.
B65	Save cleaning request if a release signal present. Cleaning cycle starts as soon as new release signal appears. Cleaning cycle always starts within 10 seconds of the release signal appearing.
B66	Number of release cycles ON = Set value OFF, CNT = Do not change
B68	TH: Save cleaning release period in cleaning signal mode.
B77	*Suppress differential pressure peaks* *With throttle flap: Cleaning is delayed*

18.2 AF 11x

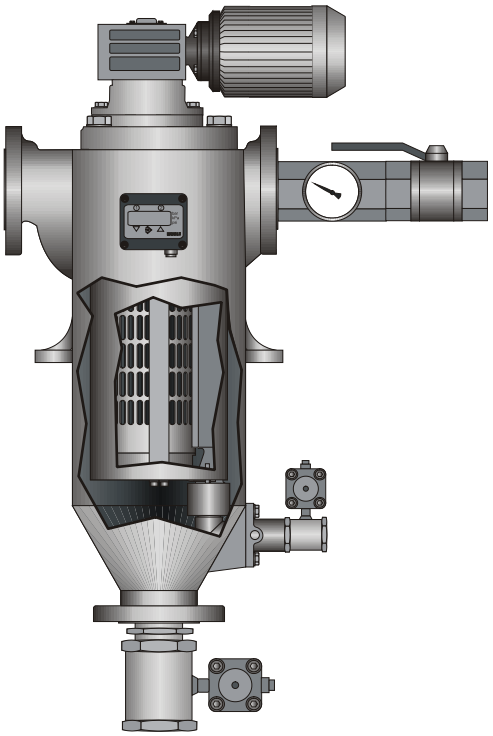


Fig. 22: AF 11x – Automatic backflush filter with internal pressure cleaning and integrated cyclone effect

Parameter	As-delivered condition	Recommended value	Actual value
B20	ON	ON	
B21	OFF	OFF	
B22	ON	ON	
B23	OFF	**ON**	
B24	OFF	OFF	
B25	OFF	**ON**	
B26	OFF	OFF	
B27	OFF	OFF	
B28	OFF	OFF	
B37	T = 02:00 m	02:00 m	
B38	TH = 15:00 s TL = 00:00 s	**04:00 s (AF112)** **07:00 s (AF113)** **18:00 s (AF119)** TL = 00:00 s	
B42	T = 01:00 h	01:00 h	
B55	TH = 02:00 s TL = 01:00 h	02:00 s 01:00 h	
B56	T = 01:00 s	01:00 s	
B58	TH = 05:00 s TL = 02:00 s	05:00 s 02:00 s	
B59	0000 0000	0000 0000	
B63	OFF	OFF	
B64	OFF	OFF	
B65	OFF	OFF	
B66	000 0000	0000 0000	
B68	TH = 15:00 s TL = 00:00 s	15:00 s 00:00 s	
B77	T = 01:00 s	01:00 s	

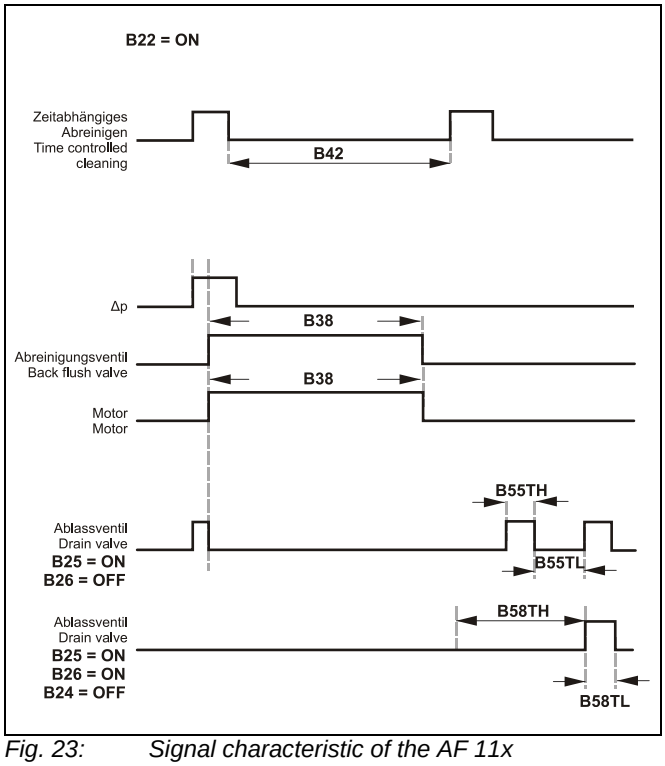


Fig. 23: Signal characteristic of the AF 11x

Parameter	Description
B20/B21	OFF/OFF Pressure sensor 0 to 16 bar, 0 to 10 V ON/OFF Pressure sensor -1 to 15 bar, 0 to 10 V OFF/ON Pressure sensor 0 to 40 bar, 0 to 10 V ON/ON Pressure sensor 0 to 10 bar, 4 to 20 mA
B22	OFF = No time-controlled cleaning ON = Time-controlled cleaning (B42 = time between cleaning cycles)
B23	OFF = dP measurement with 2 sensors ON = dP evaluation with external differential pressure switch
B24	OFF = Without secondary filter ON = With secondary filter
B25/B26	OFF/OFF No drain valve, throttle flap ON/OFF Drain valve is time-controlled OFF/ON Drain valve coupled to motor ON/ON Drain valve coupled to cleaning
B27	ON = Continuous motor operation The motor stops if a malfunction occurs or the release signal is interrupted
B28	Not assigned
B37	dP signal present for too long Determines when an alarm should be output. The “ready” signal is simultaneously disabled.
B38	TH: Cleaning period TL: Do not change
B42	Time until new time-controlled cleaning cycle. This time starts again if a dP-controlled cleaning cycle takes place in the meantime.
B55	**Only active in ‘drain valve is time-controlled’ mode. B25/B26 ON/OFF** TH: Drain valve pulse time TL: Drain valve interval time ON = Set value OFF, CNT = Do not change
B56	**Only active in ‘drain valve coupled to motor’ mode. B25/B26 OFF/ON** Delay time until drain valve opens.
B58	**Only active in ‘drain valve coupled to cleaning’ mode. B25/B26/B24 ON/ON/OFF** TH: Period between end of cleaning and drain valve opening TL: Drain valve opening time
B58	**Only active if a secondary filter is used. B24 ON** TH: Time until secondary filter is pressurised TL: Pressurisation period
B59	Counter for drain valve Example: The value 2 means the valve is activated by every second increase in differential pressure. (B25 and B26 = OFF) ON = Set value OFF, CNT = Do not change
B63	Cleaning according to release counter Number of times the release contact is closed For sporadic applications where a dP increase is unlikely.
B64	Save cleaning request if no release signal present. Cleaning as soon as release signal appears.
B65	Save cleaning request if a release signal present. Cleaning cycle starts as soon as new release signal appears. Cleaning cycle always starts within 10 seconds of the release signal appearing.
B66	Number of release cycles ON = Set value OFF, CNT = Do not change
B68	TH: Save cleaning release period in cleaning signal mode.
B77	Suppress differential pressure peaks With throttle flap: Cleaning is delayed

18.3 AF 13x, AF 15x

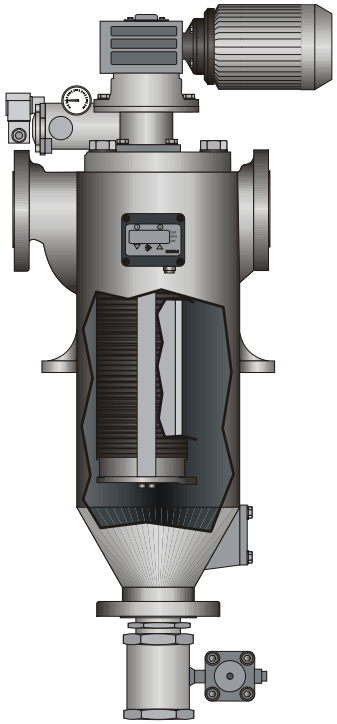


Fig. 24: AF 13x – Automatic backflush filter with external pressure cleaning

Parameter	As-delivered condition	Recommended value	Actual value
B20	ON	ON	
B21	OFF	OFF	
B22	ON	ON	
B23	OFF	**ON**	
B24	OFF	OFF	
B25	OFF	OFF	
B26	OFF	**ON**	
B27	OFF	OFF	
B28	OFF	OFF	
B37	T = 02:00 m	02:00 m	
B38	TH = 15:00 s TL = 00:00 s	**07:00 s (AF133/153)** **04:00 s (AF132)** TL = 00:00 s	
B42	T = 01:00 h	01:00 h	
B55	TH = 02:00 s TL = 01:00 h	02:00 s 01:00 h	
B56	T = 01:00 s	01:00 s	
B58	TH = 05:00 s TL = 02:00 s	05:00 s 02:00 s	
B59	0000 0000	0000 0000	
B63	OFF	OFF	
B64	OFF	OFF	
B65	OFF	OFF	
B66	000 0000	0000 0000	
B68	TH = 15:00 s TL = 00:00 s	15:00 s 00:00 s	
B77	T = 01:00 s	01:00 s	

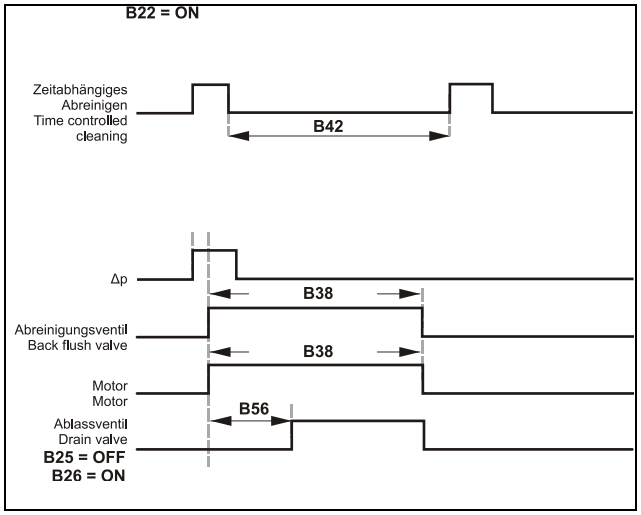


Fig. 25: Signal characteristic of the AF 13x

Parameter	Description
B20/B21	OFF/OFF Pressure sensor 0 to 16 bar, 0 to 10 V ON/OFF Pressure sensor -1 to 15 bar, 0 to 10 V OFF/ON Pressure sensor 0 to 40 bar, 0 to 10 V ON/ON Pressure sensor 0 to 10 bar, 4 to 20 mA
B22	OFF = No time-controlled cleaning ON = Time-controlled cleaning (B42 = time between cleaning cycles)
B23	OFF = dP measurement with 2 sensors ON = dP evaluation with external differential pressure switch
B24	OFF = Without secondary filter ON = With secondary filter
B25/B26	OFF/OFF No drain valve, throttle flap ON/OFF Drain valve is time-controlled OFF/ON Drain valve coupled to motor ON/ON Drain valve coupled to cleaning
B27	ON = Continuous motor operation The motor stops if a malfunction occurs or the release signal is interrupted
B28	Not assigned
B37	dP signal present for too long Determines when an alarm should be output. The “ready” signal is simultaneously disabled.
B38	TH: Cleaning period TL: Do not change
B42	Time until new time-controlled cleaning cycle. This time starts again if a dP-controlled cleaning cycle takes place in the meantime.
B55	**Only active in ‘drain valve is time-controlled’ mode. B25/B26 ON/OFF** TH: Drain valve pulse time TL: Drain valve interval time
B56	**Only active in ‘drain valve coupled to motor’ mode. B25/B26 OFF/ON** Delay time until drain valve opens.
B58	**Only active in ‘drain valve coupled to cleaning’ mode. B25/B26/B24 ON/ON/OFF** TH: Period between end of cleaning and drain valve opening TL: Drain valve opening time
B58	**Only active if a secondary filter is used. B24 ON** TH: Time until secondary filter is pressurised TL: Pressurisation period
B59	Counter for drain valve Example: The value 2 means the valve is activated by every second increase in differential pressure. (B25 and B26 = OFF)
B63	Cleaning according to release counter Number of times the release contact is closed For sporadic applications where a dP increase is unlikely.
B64	Save cleaning request if no release signal present. Cleaning as soon as release signal appears.
B65	Save cleaning request if a release signal present. Cleaning cycle starts as soon as new release signal appears. Cleaning cycle always starts within 10 seconds of the release signal appearing.
B66	Number of release cycles
B68	TH: Save cleaning release period in cleaning signal mode.
B77	Suppress differential pressure peaks With throttle flap: Cleaning is delayed

18.4 AF 17x

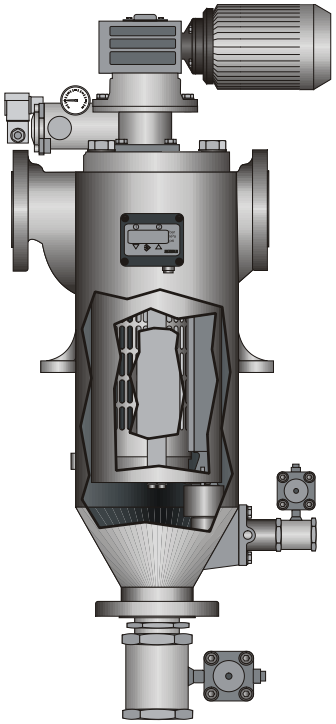


Fig. 26: AF 17x – Automatic backflush filter with external pressure cleaning and integrated cyclone effect

Parameter	As-delivered condition	Recommended value	Actual value
B20	ON	ON	
B21	OFF	OFF	
B22	ON	ON	
B23	OFF	**ON**	
B24	OFF	OFF	
B25	OFF	**ON**	
B26	OFF	OFF	
B27	OFF	OFF	
B28	OFF	OFF	
B37	T = 02:00 m	02:00 m	
B38	TH = 15:00 s TL = 00:00 s	**04:00 s (AF172)** **07:00 s (AF173)** **17:00 s (AF179)** TL = 00:00 s	
B42	T = 01:00 h	01:00 h	
B55	TH = 02:00 s TL = 01:00 h	02:00 s 01:00 h	
B56	T = 01:00 s	01:00 s	
B58	TH = 05:00 s TL = 02:00 s	05:00 s 02:00 s	
B59	0000 0000	0000 0000	
B63	OFF	OFF	
B64	OFF	OFF	
B65	OFF	OFF	
B66	000 0000	0000 0000	
B68	TH = 15:00 s TL = 00:00 s	15:00 s 00:00 s	
B77	T = 01:00 s	01:00 s	

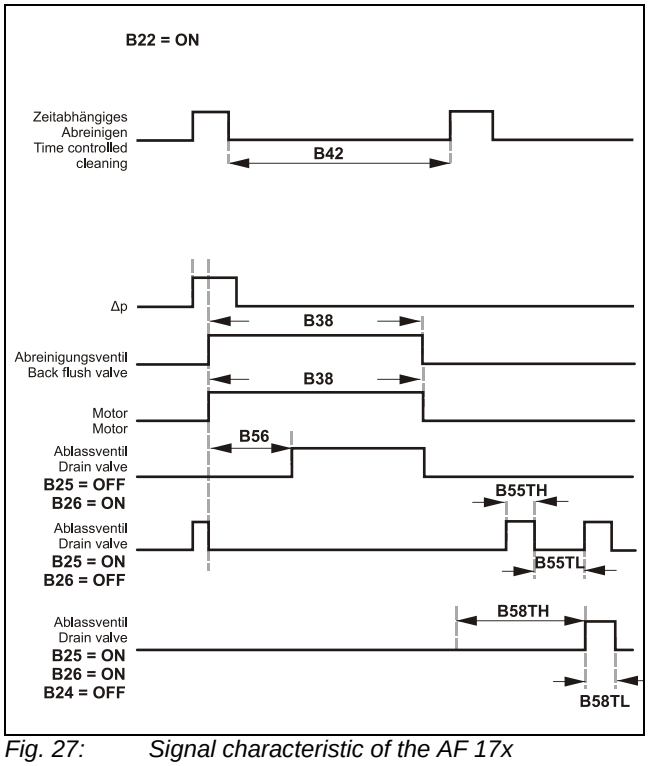


Fig. 27: Signal characteristic of the AF 17x

Parameter	Description
B20/B21	OFF/OFF Pressure sensor 0 to 16 bar, 0 to 10 V ON/OFF Pressure sensor -1 to 15 bar, 0 to 10 V OFF/ON Pressure sensor 0 to 40 bar, 0 to 10 V ON/ON Pressure sensor 0 to 10 bar, 4 to 20 mA
B22	OFF = No time-controlled cleaning ON = Time-controlled cleaning (B42 = time between cleaning cycles)
B23	OFF = dP measurement with 2 sensors ON = dP evaluation with external differential pressure switch
B24	OFF = Without secondary filter ON = With secondary filter
B25/B26	OFF/OFF No drain valve, throttle flap ON/OFF Drain valve is time-controlled OFF/ON Drain valve coupled to motor ON/ON Drain valve coupled to cleaning
B27	ON = Continuous motor operation The motor stops if a malfunction occurs or the release signal is interrupted
B28	Not assigned
B37	dP signal present for too long (dP = 0.5) Determines when an alarm should be output. The “ready” signal is simultaneously disabled.
B38	TH: Cleaning period TL: Do not change
B42	Time until new time-controlled cleaning cycle. This time starts again if a dP-controlled cleaning cycle takes place in the meantime.
B55	**Only active in ‘drain valve is time-controlled’ mode. B25/B26 ON/OFF** TH: Drain valve pulse time TL: Drain valve interval time
B56	**Only active in ‘drain valve coupled to motor’ mode. B25/B26 OFF/ON** Delay time until drain valve opens.
B58	**Only active in ‘drain valve coupled to cleaning’ mode. B25/B26/B24 ON/ON/OFF** TH: Period between end of cleaning and drain valve opening TL: Drain valve opening time
B58	**Only active if a secondary filter is used. B24 ON** TH: Time until secondary filter is pressurised TL: Pressurisation period
B59	Counter for drain valve Example: The value 2 means the valve is activated by every second increase in differential pressure. (B25 and B26 = OFF)
B63	Cleaning according to release counter Number of times the release contact is closed For sporadic applications where a dP increase is unlikely.
B64	Save cleaning request if no release signal present. Cleaning as soon as release signal appears.
B65	Save cleaning request if a release signal present. Cleaning cycle starts as soon as new release signal appears. Cleaning cycle always starts within 10 seconds of the release signal appearing.
B66	Number of release cycles
B68	TH: Save cleaning release period in cleaning signal mode.
B77	Suppress differential pressure peaks With throttle flap: Cleaning is delayed

18.5 FMAx-x or FRx-x without secondary filter

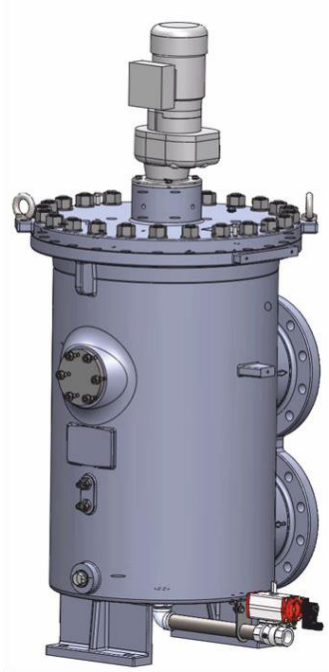


Fig. 28: FRx-x – Automatic backflush filter with internal medium backflushing

The filter requires at least one turn of the motor in order to clean the element. Please change the parameter (B38 TH) accordingly.

Parameter	As-delivered condition	Recommended value	Actual value
B20	ON	ON	
B21	OFF	OFF	
B22	ON	ON	
B23	OFF	OFF	
B24	OFF	OFF	
B25	OFF	OFF	
B26	OFF	OFF	
B27	OFF	OFF	
B28	OFF	OFF	
B37	T = 02:00 m	02:00 m	
B38	TH = 15:00 s TL = 00:00 s	15:00 s 00:00 s	
B42	T = 01:00 h	01:00 h	
B55	TH = 02:00 s TL = 01:00 h	02:00 s 01:00 h	
B56	T = 01:00 s	01:00 s	
B58	TH = 05:00 s TL = 02:00 s	05:00 s 02:00 s	
B59	0000 0000	0000 0000	
B63	OFF	OFF	
B64	OFF	OFF	
B65	OFF	OFF	
B66	000 0000	0000 0000	
B68	TH = 15:00 s TL = 00:00 s	15:00 s 00:00 s	
B77	T = 01:00 s	01:00 s	

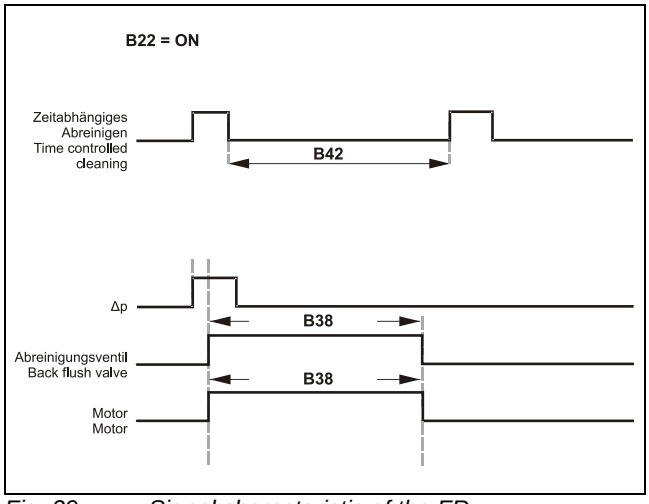


Fig. 29: Signal characteristic of the FRx-x

Parameter	Description
B20/B21	OFF/OFF Pressure sensor 0 to 16 bar, 0 to 10 V ON/OFF Pressure sensor -1 to 15 bar, 0 to 10 V OFF/ON Pressure sensor 0 to 40 bar, 0 to 10 V ON/ON Pressure sensor 0 to 10 bar, 4 to 20 mA
B22	OFF = No time-controlled cleaning ON = Time-controlled cleaning (B42 = time between cleaning cycles)
B23	OFF = dP measurement with 2 sensors ON = dP evaluation with external differential pressure switch
B24	OFF = Without secondary filter ON = With secondary filter
B25/B26	OFF/OFF No drain valve, throttle flap ON/OFF Drain valve is time-controlled OFF/ON Drain valve coupled to motor ON/ON Drain valve coupled to cleaning
B27	ON = Continuous motor operation The motor stops if a malfunction occurs or the release signal is interrupted
B28	Not assigned
B37	dP signal present for too long (dP = 0.5) Determines when an alarm should be output. The “ready” signal is simultaneously disabled.
B38	TH: Cleaning period TL: Do not change
B42	Time until new time-controlled cleaning cycle. This time starts again if a dP-controlled cleaning cycle takes place in the meantime.
B55	**Only active in ‘drain valve is time-controlled’ mode. B25/B26 ON/OFF** TH: Drain valve pulse time TL: Drain valve interval time
B56	**Only active in ‘drain valve coupled to motor’ mode. B25/B26 OFF/ON** Delay time until drain valve opens.
B58	**Only active in ‘drain valve coupled to cleaning’ mode. B25/B26/B24 ON/ON/OFF** TH: Period between end of cleaning and drain valve opening TL: Drain valve opening time
B58	**Only active if a secondary filter is used. B24 ON** TH: Time until secondary filter is pressurised TL: Pressurisation period
B59	Counter for drain valve Example: The value 2 means the valve is activated by every second increase in differential pressure. (B25 and B26 = OFF)
B63	Cleaning according to release counter Number of times the release contact is closed For sporadic applications where a dP increase is unlikely.
B64	Save cleaning request if no release signal present. Cleaning as soon as release signal appears.
B65	Save cleaning request if a release signal present. Cleaning cycle starts as soon as new release signal appears. Cleaning cycle always starts within 10 seconds of the release signal appearing.
B66	Number of release cycles
B68	TH: Save cleaning release period in cleaning signal mode.
B77	Suppress differential pressure peaks With throttle flap: Cleaning is delayed

19 Declaration of conformity

EU – Konformitätserklärung
EU declaration of conformity
Déclaration de conformité UE

Filtration Group®
Industrial

Der Hersteller
The manufacturer
Le producteur

Filtration Group GmbH
Schleifbachweg 45
74613 Öhringen
Tel.: +49 7941 6466-0
industrial.filtrationgroup.com

erklärt hiermit, dass das folgende Produkt
hereby declares that the following product
déclare par la présente que le produit suivant

Produktbezeichnung:
Product designation:
Désignation du produit :

Steuerschrank Automatikfilter

Das Produkt entspricht allen Bestimmungen der Richtlinie 2014/30/EU über elektromagnetische Verträglichkeit und der Niederspannungsrichtlinie 2014/35/EU.
The product conforms to all provisions of the Electromagnetic Compatibility Directive 2014/30/EU and low voltage directive 2014/35/EU.
Le produit répond à toutes les dispositions de la directive 2014/30/UE relative à la compatibilité électromagnétique et lignes directrices basse tension 2014/35/UE.

Folgende harmonisierten Normen wurden angewandt:
The following harmonised standards have been used:
Les normes harmonisées ci-dessous ont été appliquées :

DIN EN 60204-1, DIN EN 61000-6-3

Unterzeichner:
Signatory:
Signataire :

Wolfram Zuck
Dipl.-Ing. (FH) Industrial Engineering
Managing Director, Plant Manager Öhringen

Öhringen,
03.11.2020
Datum/Date/Date

Unterschrift/Signature/Signataire

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Safety instructions 2

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