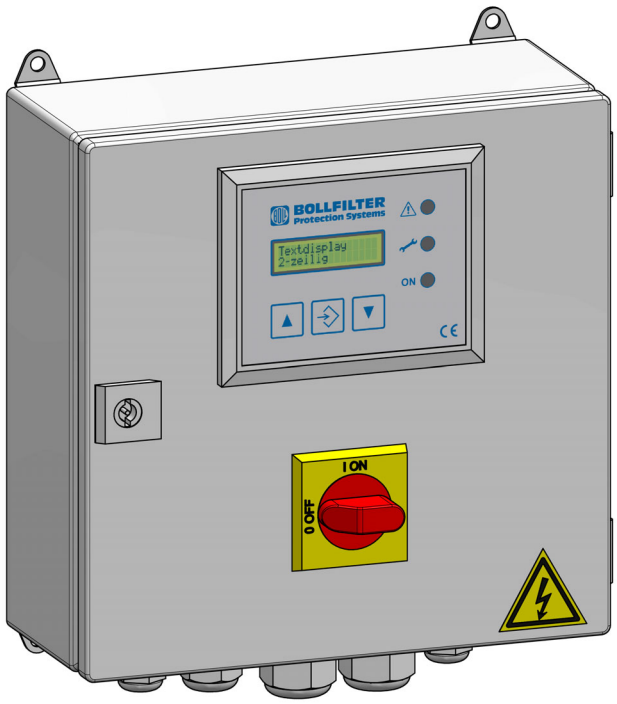
Operating and Installation Instructions

Electronic Control Box
Type: 2310



NOTE:
Print document on both sides

Translation of the original operating instructions

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Date	Version	Language	Order no.	Item No.
03.2020	001	en	-	-

Table of Contents

1 Preface

1.1 General information

These operating instructions are intended to assist you in familiarizing yourself with the control box from BOLL & KIRCH and in using it as intended.

These operating instructions provide important information about how to use the control box safely and correctly. Observance of these operating instructions will help avoid danger, reduce maintenance costs and downtimes and increase the reliability and service life of the control box. Read these operating instructions closely and carefully.

Provide supplements to these operating instructions in the form of instructions on the basis of national and international accident prevention regulations and environmental protection regulations. Ensure that the operating instructions are kept permanently available at the place of use of use of the control box. The operating instructions must be read and applied by every person instructed to carry out the following work:

- Installation
- Operation
- Maintenance
- Disposal

1.2 Warranty and liability

The “General Terms and Conditions of Delivery and Service” of Boll & Kirch Filterbau GmbH apply.

Boll & Kirch Filterbau GmbH shall not accept any warranty or liability claims in relation to personal and material damage if they are based on one or more of the following causes:

- improper use of the control box;
- non-observance of information and instructions, mandatory requirements and prohibitions included in the operating instructions;
- improper installation, operation and maintenance of the control box;
- unauthorized structural modifications to the filter;
- Emergencies caused by external influence or force majeure.

All information in these operating instructions is provided taking into account our current experience and findings, and is accurate to the best of our knowledge. Technical changes within the context of further development are reserved.

The text and diagrams do not necessarily correspond with the actual state as delivered. The diagrams are not to scale.

A spare parts list is included in the control cabinet diagrams to enable spare parts to be ordered.

1.3 Copyright

These operating instructions are an official document as defined by the law against unfair competition.

The copyright remains with

Boll & Kirch Filterbau GmbH

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These operating instructions are intended for the user of the control box and his employees. They contain texts, images and drawings that, without express approval by the manufacturer, may not be

- duplicated,
- distributed or
- otherwise disclosed, neither in full nor in part.

Any infringement will result in liability for damages.

2 Basic safety instructions

2.1 Warning signs and symbols

The following designations and symbols are used for particularly important information in the operating instructions:

DANGER!

Danger to life / Serious harm to health!

Indicates an imminently hazardous situation involving a high risk which, if not avoided, will result in death or severe (irreversible) injury.

ATTENTION

Material damage!

Indicates a situation which could lead to damage to the product itself or to objects in its vicinity.

NOTE

Indicates special user tips and other particularly useful or important information.

DISPOSAL

Indicates special measures relating to environmental protection.

2.2 Proper use

The control box has been constructed in accordance with the state-of-the-art in technology and generally recognized rules of safety. However, danger to the life and limb of the user or third parties and/or damage to the control box and other property can arise during use.

The control box may only be used for its intended purpose and if it is in perfect working order, and it must be used with regard to safety and dangers as stated in the operating instructions. Faults, especially those that could adversely affect safety, must be rectified immediately.

The control box is designed to be used for the control of the filter described in these operating instructions only. Any other use or use going beyond this shall be regarded as improper use. The manufacturer/supplier shall not be liable for damage resulting from improper use; the user shall bear the risk alone.

Usage for the intended purpose, i.e. proper use, also includes complying with the operating instructions for the control box and corresponding filter.

Safe and reliable operation can only be guaranteed if all the instructions, settings and performance limits for the control box (see control cabinet diagrams) and corresponding filter are complied with.

DANGER!

Risk of accidents due to improper installation

A failure of the device resulting from improper installation of the electronic control box or the connected equipment could cause severe personal injury or even fatal injury. Therefore, in addition to the general safety rules for equipment in industrial power installations, comply with the following points in particular:

- The installation of the control box should only be performed by qualified specialist staff in accordance with the conditions of IEC 364 and DIN VDE 0105 for electrical equipment.
- All applicable laws, conditions, regulations and instructions relating to the installation of electrical equipment must be observed in relation to the installation location.
- Settings for IP00 protection class devices (in the case of an opened control cabinet or where there are no covers) must only be made by authorized specialist staff, with the devices switched off and in compliance with the local safety and accident prevention regulations.
- The control box may only be operated in the permitted area of use.

2.3 Target group

These operating instructions are exclusively limited to use by trained specialist personnel.

2.4 Obligations of the user/operator

- Keep the operating instructions at hand at the place of use of the control box at all times.
- In addition to the operating instructions, observe and draw attention to generally applicable legal and other mandatory regulations relating to the prevention of accidents and environmental protection. Such obligations can include, for example, the provision/wearing of personal safety clothing and equipment.
- Provide supplements to the operating instructions in the form of instructions including supervision and reporting responsibilities to account for special operational considerations, e.g. with regard to the organization of work, work sequences and personnel employed.
- Only trained personnel who are familiar with the essential occupational health and safety regulations and have been provided with instruction in the handling of the control box are permitted to be deployed.
- Only personnel who have been specifically appointed by the user for the purpose are permitted to operate the control box or carry out any work of maintenance or repair on it.
- Observe all safety and hazard alerts on the control box (where provided).
- Make sure that all safety and hazard alerts on the control box are complete and legible at all times (where provided).
- Never make any modifications, additions or conversions to the control box which might adversely affect safety, without the manufacturer’s approval.
- The spare parts used must conform with the technical requirements specified by the manufacturer. This can be guaranteed by using original spare parts.

2.5 Selection of staff and qualification

- All tasks on the control box must be carried out only by reliable personnel. Personnel must not be under the influence of drugs or medication. Statutory minimum age limits must be observed.
- Employ only trained and instructed personnel and set out clearly the individual responsibilities of the personnel for installation, operation and maintenance.

In these operating instructions the following qualifications are stipulated for the different areas of activity:

- Instructed persons means persons who have been instructed during instruction provided by the user with regard to the work assigned to them and possible hazards arising from improper conduct and about required safety devices and precautions.
- Specialist staff means persons who have the training, knowledge and experience, as well as familiarity with applicable regulations, to be able to carry out the work delegated to them and to recognize and avoid potential dangers themselves.
- An electrician means a person who has the training, knowledge and experience, as well as familiarity with applicable standards and regulations, to be able to carry out work on electrical equipment and to recognize and avoid potential dangers themselves. The electrician is qualified to work at the specific place of use at which they work and is familiar with the relevant standards and regulations.

In-house instruction must be provided, having regard to the technical qualifications of the specific individual concerned.

In addition to the safety instructions set out in these operating instructions, the following rules and regulations must also be complied with:

- the applicable accident prevention regulations
- occupational medicine-related regulations
- generally recognized rules of safety
- country-specific regulations
- proper use

In addition, these rules and regulations can also be supplemented by in-house regulations specified by the plant or company itself.

2.6 Organizational measures

2.6.1 General information

- Always comply with all applicable national and international workplace accident prevention regulations.

2.7 Safety instructions for operating personnel

Refrain from any working practices which could

– pose a risk of danger to life and limb of the user or third parties,
– adversely affect the control box or other property,
– adversely affect the safety and operation of the control box,
– infringe the specified safety instructions.

2.7.1 Personal safety clothing and equipment

The safety clothing and equipment stipulated by the company for all work on the control box must be worn.

3 Technical data of the control box and control cabinet components

3.1 Power components

3.1.1 Supply

Supply L1-L2-L3 directly to the 4-pole main switch - Q1 (T1-T2-T3)

3.1.2 Motor actuation

Motor connection U-V-W direct at the motor contactor - Q2 (2-4-6)

3.1.3 Control of the electric actuator EPI2-063-BK

The electric actuator type EPI2-063-BK is controlled via the outputs VS, VE1 and VE2 (terminals 6, 8 and 10, see the control cabinet diagrams) of control circuit board A2.

3.1.4 Voltage supply

Primary voltages	0 - 208 V, 230 V, 380 V, 400 V, 440 V, 500 V, 550 V
Secondary voltages	
0 V AC - 230 V AC	Actuator control voltage 230 V AC
0 V AC - 20 V AC	Control circuit board A2 supply voltage

3.1.5 Fuses

Fuses in the control cabinet	
F1 to F4	Each 1 A

ATTENTION

For the primary transformer connection 208 V and 230 V, the provided F1, F2 and F3 fuses with 2 amps must be used.

Fuses on the control circuit board	
Fuse F1	0.8 A slow-blow
Fuse F2	2.0 A slow-blow

3.2 Control circuit board inputs/outputs

3.2.1 Optocoupler inputs (E1-E5), terminals 31 - 40

3.2.2 Analogue input 4-20 mA, terminals 41 -42

3.2.3 Live relay outputs

Outputs VE1 - VN1 to VE3 - VN3	Terminals 8 - 13

NOTE

The connections and designations are to be taken from the respective control cabinet diagrams.

3.2.4 Floating relay outputs

Outputs A1 - A5	Messages 1 - 5 (changeover contact)	Terminals 16 - 30

NOTE

The connections and designations are to be taken from the respective control cabinet diagrams.

4 Operation

4.1 Device functions and control flow

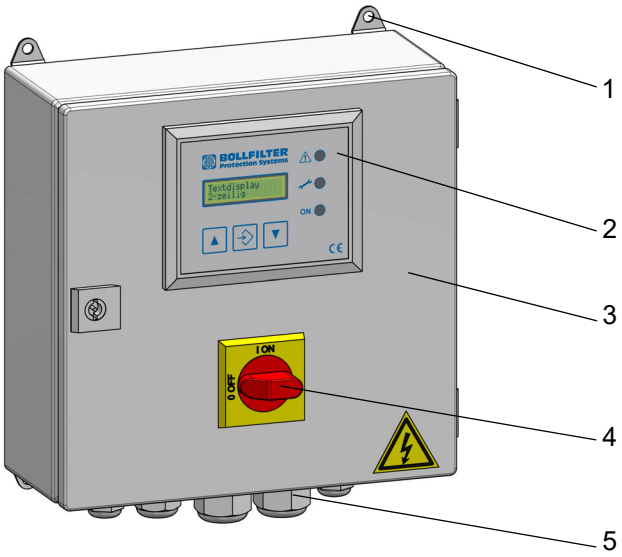

Fig. 4-1 Electrical control box type 2300

1	Fastening
2	Display and operating elements
3	Housing
4	Main switch
5	Connection

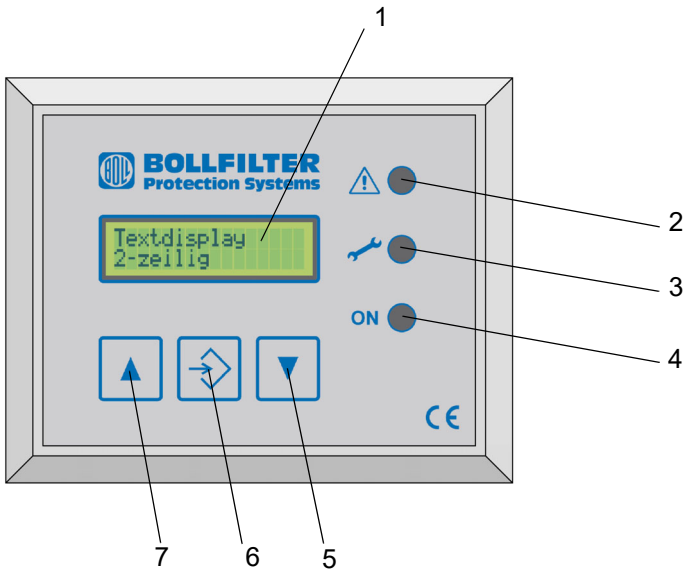

Fig. 4-2 Display and operating elements

1	Text output display, 2 lines of 16 characters
2	"Alarm" LED (red)
3	"Service" LED (yellow)
4	"Operation" LED (green)
5	Key Q - When pressed, acknowledges the alarm messages
6	Key F - When pressed, initiates a manual flush
7	Key C - When pressed, indicates the number of flushes

4.1.1 Software

The software for the type 2300 and type 2310 control boxes has been amalgamated compared to the preceding type 2200 and type 2210 control boxes in order to reduce the different versions, because the hardware of the control circuit board A2 used (see control cabinet diagrams) is identical.

4.1.2 Main switch operating feedback contact

If the main switch is set to position "On", the contact is closed.

4.1.3 Control voltage monitoring

As soon as the main switch is actuated, the mains voltage is applied and the control box is operating correctly, the "Operation" LED (green) comes on and the relay "control voltage monitoring" is actuated. In the event of loss of the operating voltage or a defective fuse on the control circuit board, no LED comes on and the "control voltage monitoring" relay is no longer actuated.

4.1.4 Motor fault

If the measured motor current exceeds the set setpoint of the P9 parameter, a message is output to the display and a floating signal is output to the relay outputs. The motor and backflushing are immediately switched off. After clearing of the fault, the user must acknowledge the alarm message by pressing the Q key.

4.1.5 Actuator fault

When the actuator signals a fault, the contact of input E3 (terminals 35 and 36, see control cabinet diagram) is opened. This is followed by a message on the display and a floating signal is output to relay output A2 (terminals 19-21, see control cabinet diagrams). Backflushing is stopped and the actuator is switched off. After clearing of the fault, the user must acknowledge the alarm message by pressing the Q key.

4.1.6 DP too high backflushing filter (ΔP100 %)

Signal encoder is a pressure switch contact that is connected to the optocoupler input "Differential pressure indicator DP too high backflushing filter". If the message exists for longer that 2 seconds, an alarm message is output to the display and the "Alarm" LED (red) comes on. After clearing of the fault, the user must acknowledge the alarm message by pressing the Q key.

4.1.7 Operating hours counter

The operating hours counter records the operating hours when the control box is switched on. The operating hours are displayed by multiple pressing of the C key (explanation - see section "C key").

4.1.8 Error memory

The internal error memory records all errors and events including specification of the operating hours. Reading out of the error memory is only allowed for authorised persons.

4.1.9 Differential pressure transmitter 4-20 mA

If a differential pressure transmitter (three-wire) is operated with 4-20 mA, the control box can be changed from a digital differential pressure measurement device (DPS = differential pressure switch) to an analogue differential pressure measurement device (DPT = differential pressure transmitter) (for a detailed setting explanation, see the section "P15 DP-Select").

4.1.10 DPT-Alarm

The alarm message "DPT-Alarm" is output to the display if a differential pressure transmitter (three-wire) is used with 4-20 mA, the parameter P15 "DPT" has been selected and the minimum current of 4 mA cannot be measured. In addition the "Alarm" LED (red) comes on and the alarm output and A2 "General Fault" is activated. After clearing of the fault, the user must acknowledge the alarm message by pressing the Q key.

4.1.11 C key (additional functions display)

If key C (additional functions display) is pressed once, the number of flushes that have been performed is output to the display for 3 seconds.

NOTE

If the C key is pressed repeatedly, each pressing causes the following additional information to be displayed in the specified sequence:

- Currently measured differential pressure provided a differential pressure transmitter is installed and the parameter P15 "DPT" Select has been set in the control box.
- Operating hours with the control box switched on.
- Currently measured motor current, provided a filter type with a gear motor is installed and has been set in the control box.
- DP-Alarm (flushing frequency monitoring) → on or off
- Actual remaining time "DP1 delayed", if a time delay has been set in the control box "Parameter P16 differential pressure delay time" and the contact of input E1 (terminals 39 + 40, see control cabinet wiring diagrams) has been closed for the flushing differential pressure ΔP75%.
- Actual remaining time "DP2 delayed", if a time delay has been set in the control box "Parameter P16 differential pressure delay time" and the contact of input E1 (terminals 37 + 38, see control cabinet wiring diagrams) has been closed for the flushing differential pressure ΔP100%.

4.1.12 DP-Alarm (flushing frequency monitoring)

If a "DP flushing" has been activated before the "Time-dependent backflush trigger" period elapses, the message "DP-Alarm" appears on the display and the "Service" LED (yellow) lights up (for a detailed setting explanation see the section "P8 DP-Alarm").

4.1.13 Message A4 "Flushing Active"

Output A4 "Flushing active" (terminals 25, 26 and 27, see control cabinet wiring diagrams) is activated as soon as a flushing has been triggered at the filter.

4.1.14 Time delay differential pressure ΔP75% and ΔP100%

The differential pressure signals "DP flushing [75%]" and "DP too high [100%] of the connected differential pressure measuring device (differential pressure switch [DPS] or differential pressure transmitter [DPT]) can be delayed dependent on the application (for a detailed setting explanation see the section "P16 DP delayed").

4.1.15 Function Remote On/Off (remote switching)

If the contact of input E4 ("Filter Blockage" (terminals 33 and 34, see control cabinet wiring diagrams) has been closed, outputs A5 (terminals 28, 29 and 30, see control cabinet diagrams) is activated and the control box switches to off condition. All outputs and control time meters (e.g. forced flushing time) are reset.

The remote function can only be activated once the message "Flushing active" is no longer present.

Typical representation on the display if remote control is activated:

"6.18/6.19/6.44"	Text display line 1
"Off"	Text display line 2

4.1.16 Initialisation incl. automatic control box type - setting

Software initialisation is a tool for avoiding errors during commissioning at the customer's site, which for control box types 0 (6.18/6.19/6.44) and 18 (aquaBoll) is started in that the gear motor is actuated for 20 seconds with the live relay outputs (terminals 8-13, see control cabinet diagrams) not activated. During this time a check is performed as to whether a signal of the electric actuator is active at input E3 (terminals 35 + 36, see control cabinet diagrams).

When it has been detected that input E3 is closed, the control box type 19 (6.18 electric actuator) or 20 (aquaBoll electric actuator) required in each case respectively is set automatically.

NOTE

Initialisation is not started if an operator has previously set the necessary control box type according to the operating instructions.

An error message "P0 filter type" is output if a signal of the electric actuator is active at input E3, initialisation has already been completed and the the wrong control box types 0 (6.18/6.19/6.44) or 18 (aquaBoll) have been set by the operator.

4.2 "Operation" mode display

The "Operation" LED (green) comes on after switching on of the mains voltage, if the control box is in the operating level ("Operation" mode).

4.3 Text messages

4.3.1 Text display after switching on

NOTE

The software of the preceding type 2200 and type 2210 control boxes have been amalgamated in order to reduce the different versions for type 2300 and type 2310.

The type 2310 control box can only be used for filter types 6.18 and aquaBoll with electric actuator type EPI2-063-BK (230 V version).

BOLL & KIRCH	Company name
xxxxxxxxxx	Program number

After a short time, the configured control box type is output to the second line of the display.

6.18 electric actuator	Control box type 19
aquaBoll electric actuator	Control box type 20 (*)

(*) Control box type 20 has the same function as control box type 19.

The following control box types are only intended to be used for control box type 2300.

6.18/6.19/6.44	Control box type 0
6.21/6.22/6.23/6.24	Control box type 1
6.60	Control box type 2
6.60.07/6.72.07	Control box type 4
6.61	Control box type 6
6.61.07	Control box type 8
6.62	Control box type 10
6.64	Control box type 12
6.64.07	Control box type 14
6.72	Control box type 16
aquaBoll®6.18.3	Control box type 18

ATTENTION

Control box types 0, 1, 2, 4, 6, 8, 10, 12, 14, 16 and 18 must not be used because of the difference in hardware between type 2300 and type 2310 (see control cabinet diagrams).

4.3.2 Text display in "operation" mode

Forced flushing 00:01	Remaining forced flushing trigger time 00 h 01 min
C - F - Q	Key tips

If a flushing process has been initiated, the following messages appear in the first line of the display, depending on the source:

Manual flushing	For flushing triggering via key F
Forced flushing	For flushing triggering via time-dependent backflush triggering
DP flushing	For flushing triggering via backflushing filter differential pressure

If a flushing process has been initiated, the following message appears in the second line of the display, depending on the source:

Flushing time 3S	Remaining flushing time

NOTE

3S Means the remaining flushing or after-blowing time equals 3 seconds.

Pressing key C causes the following message to appear in the display:

Flushing number
xxxxxx Pc Number of flushes

The number of flushes is saved and backed up for protection against mains failure.

4.3.3 Alarm messages

NOTE

- The "Alarm" LED (red) comes on for each alarm message.
- All alarm messages are saved an backed up to protect against mains failure.
- In alternation with the operating messages, the alarm message is output every 2 seconds to the second line of the display.
- Once the Q key is pressed, the alarm messages are deleted, however, only once the source of the alarm has been cleared. If the source of the alarm has not been cleared, the alarm message reappears.

Alarm messages in the display:

Motor fault	In the event of a "Motor fault" alarm
Actuator fault	In the event of an "Actuator fault" alarm
DP too high	If "High differential pressure Filter 100 %" exists

If flushing frequency monitoring is switched on:

DP-Alarm	DP-Alarm triggering of backflushing due to differential pressure 75 % (flushing frequency monitoring)

During differential pressure measurement using the differential pressure transmitter (DPT):

DPT-Alarm	In the event of an incorrect 4 mA input signal

4.4 Adjustment and operation

4.4.1 Setting level - parameter selection and view

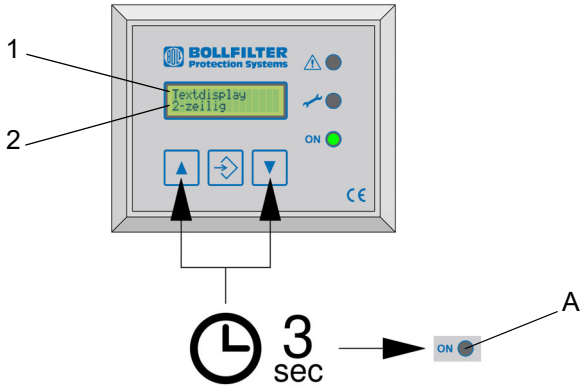

Fig. 4-3 Setting level - parameter selection and view

1	Parameter	A	Green LED goes off
2	Parameter value		

To access the setting level - Parameter selection and view - the keys ▲ and ▼ are pressed simultaneously until the "Operation" LED (green) goes out (approximately 3 seconds). The first line of the display shows the parameter, the second line the parameter value. Now all parameters can be displayed by repeated pressing of the ▲ or ▼ key.

4.4.2 Setting level - parameter change and storage

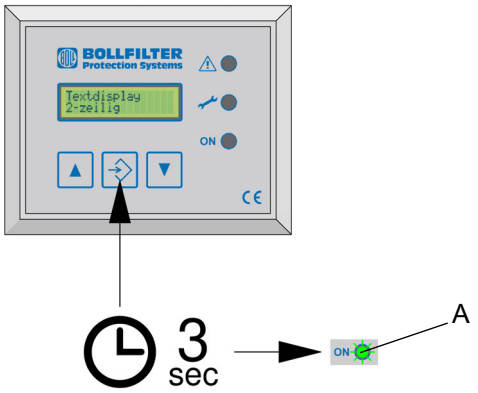

Fig. 4-4 Setting level - parameter selection and view

		A	Green LED flashes

To access the setting level - Parameter change and storage - the middle key is pressed until the "Operation" LED (green) flashes (approximately 3 seconds). Now the parameter can be changed by repeated pressing of the ▲ or ▼ key. To save the set value and return to the - Parameter selection and view - setting level, the middle key is pressed until the "Operation" LED (green) goes out (approximately 3 seconds).

4.4.3 Jump back to the operating level

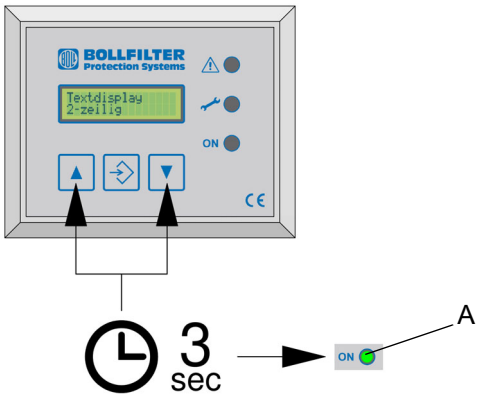

Fig. 4-5 Back to the operating level

A Green LED comes on

To access the operating level, the keys ▲ and ▼ are pressed simultaneously until the "Operation" LED (green) comes on (approximately 3 seconds).

NOTE

To save the newly set parameter, you must always return to the operating level.

4.5 Parameter list and description

4.5.1 P0 Filter type

Adjustable in single steps	Range 19 - 20
Factory setting	Basic value 19
Text display, line 1	**P0 Filter type**
Text display, line 2	**6.18 electric actuator**

4.5.2 P2 time-dependent backflush triggering

Adjustable in hour steps	Range 0 - 59 h
Factory setting	Basic value 2 h
Text display, line 1	**P2 Forced flushing**
Text display, line 2	**XXX hours**

4.5.3 P3 time-dependent backflush triggering

Adjustable in minute steps	Range 0 - 59 min
Factory setting	Basic value 0 min
Text display, line 1	**P3 Forced flushing**
Text display, line 2	**XXX minutes**

4.5.4 P4 Backflushing time

Adjustable in second steps	Range 5 - 100 s
Factory setting	Basic value 30 s
Text display, line 1	**P4 Backflushing time**
Text display, line 2	**XXX seconds**

4.5.5 P8 DP-Alarm (flushing frequency monitoring)

NOTE

This parameter can be set for all filter types (Factory setting: Off).
It is important to note that after activation this message is only shown on the display. If required, this message can be routed to a floating relay output (terminals 19-27, see control cabinet diagrams) by setting parameter P17 alarm relay A2, A3, A4 (configurable alarm outputs) accordingly.

Adjustable	Off/on
Factory setting	Basic value
	Off
Text display, line 1	**P8 DP-Alarm**
Text display, line 2	**Off**
or	
Text display, line 2	**On**

4.5.6 P9 Motor fault

Adjustable in 0.01 A steps	Range 0.10 to 0.99 A
Factory setting	Basic value 0.4 A
Text display, line 1	**P9 Motor fault**
Text display, line 2	**0000 mA**

NOTE

The motor fault setting is dependent on the installed and approved standard gear motors 0.09 kW, 0.12 kW or 0.18 kW.

Star connection settings:

0.09 kW - Standard - Gear motor = 0.4 amp

0.12 kW - Standard - Gear motor = 0.65 amp

0.18 kW - Standard - Gear motor = 0.8 amp

4.5.7 P11 Language

German, English, French and Spanish are available as operating languages.

Adjustable	D German ES Spanish F French EN English
Factory setting	Basic value EN English
Text display, line 1	**P11 Language**
Text display, line 2	**EN English**

4.5.8 P12 Testcode

NOTE

This parameter is visible for all P0 filter types.

The testcode is divided into two areas:

- Advanced settings:
  In the first area, entry of a testcode grants access to an advanced setting level, in which additional parameters (such as P15, P16 and P17) can be set. (Detailed description see "P15 DP-Select", P16 DP Differential pressure delay time" and "P17 Alarm relay A2, A3, A4")
- Test mode:
  In the second area, entry of the testcode provides access to a test mode, which is only intended for authorised persons. Additionally, the internal error memory can be read out to a USB stick.

Adjustable in single steps	Range 0 to 9999
Factory setting	Basic value 0
Text display, line 1	**P12 Testcode**
Text display, line 2	**XXXX**

4.5.9 P15 DP-Select "Differential pressure switch or differential pressure transmitter"

NOTE

Entry of **Testcode 44** opens an advanced setting, which allows selection of the differential pressure evaluation between differential pressure switch (DPS = standard) and differential pressure transmitter (DPT = optional).
The advanced setting "P15 DP-Select" is only required if a differential pressure transmitter (output signal: 4-20 mA and electrical connection type: three-wire) is used to control the filter.
(Detailed explanation on setting and operation see Fig. 4.6)

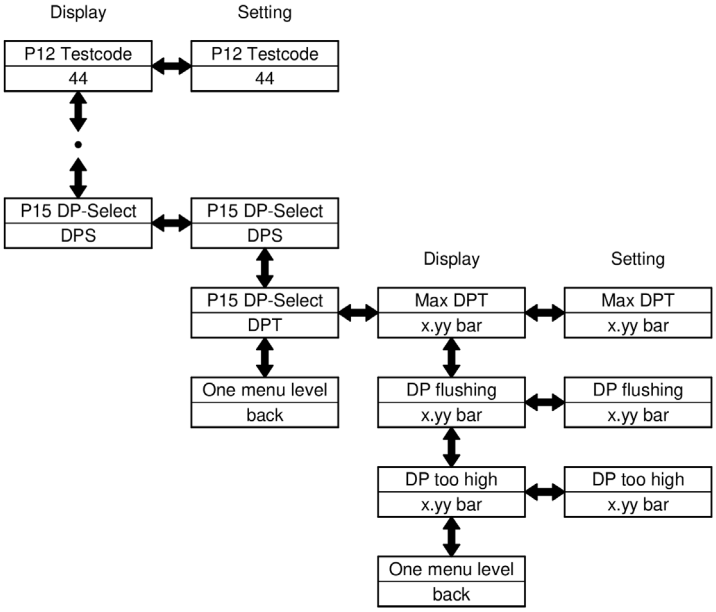

Fig. 4-6 Adjustment and operation

Adjustable	DPS / DPT
Factory setting	Basic value DPS
Text display, line 1	**P15 DP-Select**
Text display, line 2	DPS
or	
Text display, line 2	DPT

4.5.9.1 "MAX DPT" setting

NOTE

The maximum measurable differential pressure of the installed differential pressure transmitter must be set prior to commissioning.

Adjustable	Range 0.00 - 9.99 bar
Factory setting	Basic value 1.00 bar
Text display, line 1	MAX DPT
Text display, line 2	X.YY bar

4.5.9.2 Setting "DP flushing"

NOTE

The differential pressure signal "Differential pressure flushing ΔP 75%" must be set prior to commissioning.

Adjustable	Range 0.00 - 9.99 bar
Factory setting	Basic value 0.60 bar
Text display, line 1	DP flushing
Text display, line 2	X.YY bar

4.5.9.3 Setting "DP too high"

NOTE

The differential pressure signal "Differential pressure too high ΔP 100%" must be set prior to commissioning.

Adjustable	Range 0.00 - 9.99 bar
Factory setting	Basic value 0.80 bar
Text display, line 1	DP too high
Text display, line 2	X.YY bar

4.5.10 P16 Differential pressure delay time

NOTE

Entry of **Testcode 10** opens an advanced setting, which enables selection of a time delay for the differential pressure signals ΔP 75% and ΔP 100%.
(Detailed explanation on setting and operation see Fig. 4.7)

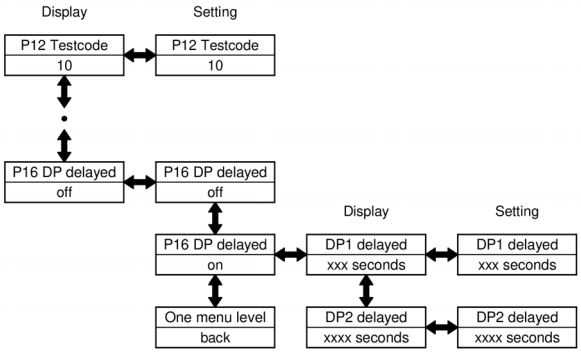

Fig. 4-7 Delay time differential pressure

4.5.10.1 Time delay setting "Differential pressure flushing ΔP75%"

Adjustable in second steps	Range 1 - 600 sec
Factory setting	Basic value 20 sec
Text display, line 1	DP1 delayed
Text display, line 2	XXX seconds

4.5.10.2 Time delay setting "Differential pressure too high ΔP100%"

Adjustable in second steps	Range 1 - 1800 sec
Factory setting	Basic value 1200 sec
Text display, line 1	DP2 delayed
Text display, line 2	XXX seconds

4.5.11 P17 Alarm relay A2, A3, A4 (configurable alarm outputs)

NOTE

Entry of **Testcode 75** opens an advanced setting that enables configuration of the alarm outputs A2, A3 and A4.
The advanced setting "P17 Alarm Relay A2, A3, A4" is necessary if the customer requires alarm outputs that differ from the standard at the system level (see standard control cabinet diagrams).
(See Fig. 4-8 for detailed explanation of Adjustment and operation)

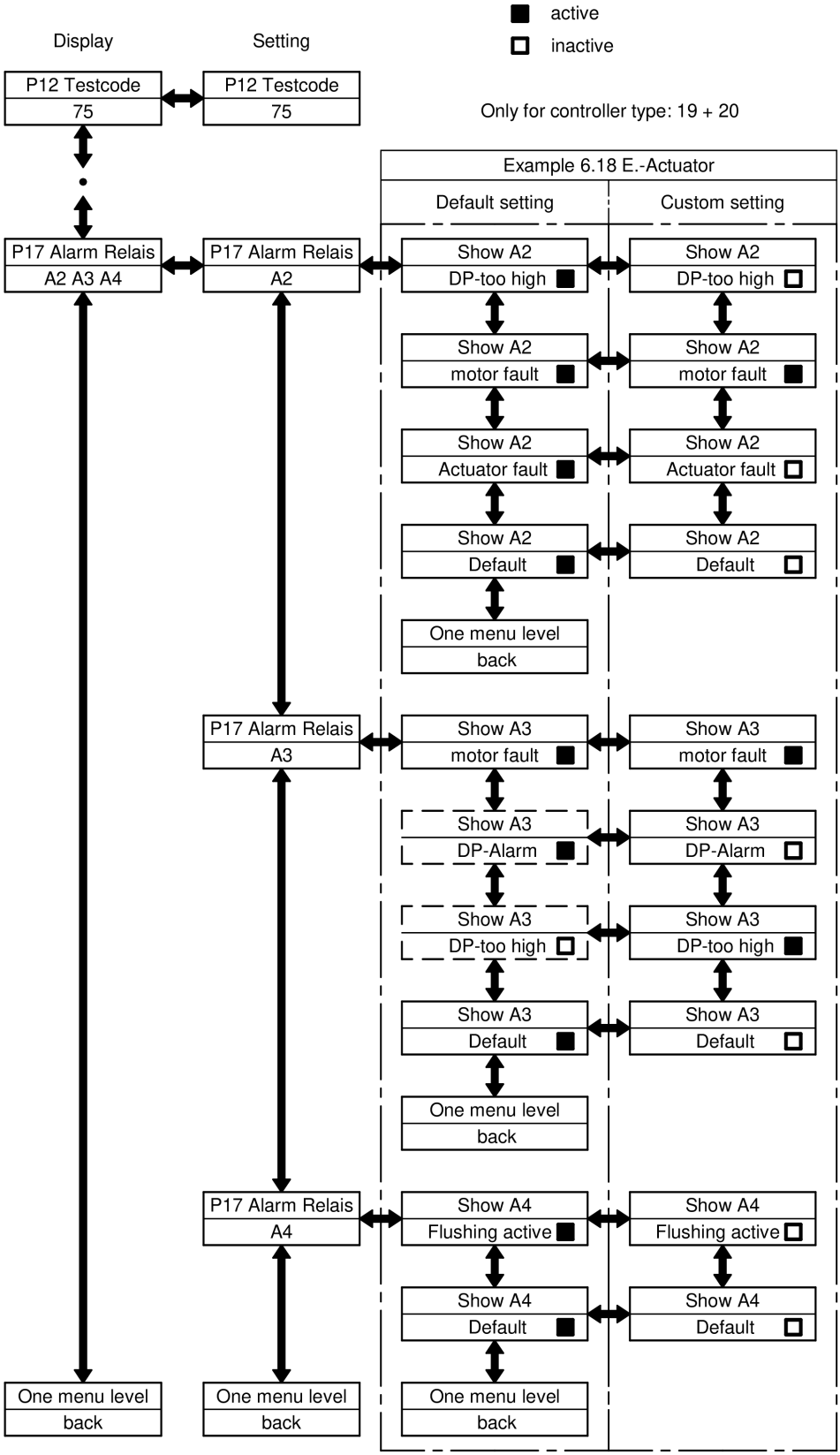

Fig. 4-8 P17 Alarm relay A2, A3, A4

5 Control box description, function and setting values

5.1 Control box of type 6.18 and aquaBoll with electric actuator

Inputs

Pressure switch "DP reached backflushing filter" → 75 %

Pressure switch "DP too high backflushing filter" → 100 %

Customer input → Filter blockage (Remote On/Off)

Outputs

Motor

Electric flushing valve

Floating contacts

1)	Alarm, "Control voltage monitoring"	Output A1
2)	General fault, comprising: - Alarm "Maximum differential pressure reached" and - Alarm "Motor fault": Actuator or gear motor“	Output A2
3)	Alarm "Motor fault"	Output A3
4)	Message "Flushing Active"	Output A4
5)	Message "Filter blockage (Remote On/Off)"	Output A5

Functional description of 6.18 and aquaBoll with electric actuator

See the operating instructions for details on filter functioning.

Flushing is triggered via:

1) Key F
2) The elapsed forced flushing time
3) Pressure switch "DP reached backflushing filter"

Additional functions in the DP-Alarm is switched on (flushing frequency monitoring)

If, before the forced flushing time elapses, flushing is triggered via the "DP reached backflushing filter", a DP-Alarm is signalled (flushing frequency alarm) (setting See Section "P8 DP-Alarm").

Parametrisation of the alarm outputs is performed in section "P17 Alarm Relay A2, A3, A4".

Peculiarities

- All alarms are displayed, signalled over floating contacts and saved.
- If the control box is in configuration mode, manual triggering of flushing is not possible.
- If the "Control box type" parameter is changed, the functions are restarted.

5.1.1 Setting values for filter type 6.18 and aquaBoll with electric actuator

Terminal plan (Standard) Z46621		6.18Electric electric actuator	aquaBoll electric actuator
P0	Filter type	19	20
P2	Forced flushing	2h	2h
P3	Forced flushing	0min	0min
P4	Flushing time	30s	30s
P8	DP-Alarm	Off	Off
P9	Motor fault	0.4A	0.4A
P11	Language	D	D
P12	Testcode	/	/

NOTE

Setting values can be matched to the respective requirements as necessary.

6 Service

6.1 Contact for spare parts and service

Please always quote our order no. when ordering spare parts. You will find the order number on the nameplate of the filter. Please contact our spare parts sales department at spare-parts@bollfilter.com.

Should you require service, please contact our service team at +49 2273/562-222 or service@bollfilter.com.

6.2 Special safety instructions

DANGER!

Risk of accidents due to improper maintenance

A failure of the device resulting from improper maintenance (replacement of electric components) of the control box could cause the failure of the device, severe personal injury or even fatal injury. Therefore, in addition to the general safety rules for equipment in industrial power installations, comply with the following points in particular:

- The maintenance of the control box should only be performed by qualified specialist staff in accordance with the conditions of IEC 364 and DIN VDE 0105 for electrical equipment.

NOTE

Refer to the control cabinet diagrams for the spare parts for the control box.

DISPOSAL

Observe the regulations for environmental protection. Make sure that the removed components are disposed of properly and in an environmentally friendly manner.

7 Remedying faults

NOTE

For any faults or maintenance work which are not listed here, please contact for BOLL & KIRCH customer service.

7.1 Trouble shooting

Fault	Possible cause	Rectification
Actuation of the automatic filter does not occur	Faulty wiring	Check the wiring, power supply and transformer configuration according to the control box diagram
	Incorrect control box type set	Set the control box type according to the operating instructions
Display keys do not operate	Key membrane damaged	Change Display -A1
	Connecting cable between PCB and the display is loose	Remake the plug connection
	Connecting cable between PCB and display defective	Change connecting cable
Display does not work	Power supply faulty	Check power supply and in particular check for the correct setting of the primary voltage at the transformer - T1
	Connecting cable between PCB and the display is loose	Remake the plug connection
	Connecting cable between PCB and display defective	Change connecting cable
	Display -A1 defective	Change Display -A1
	Transformer -T1 defective	Change transformer -T1
	PCB -A2 defective	Change PCB -A2
	Fuse(s) F1 and/or F3 (1 amp) defective	Change fuse(s)
Gear motor does not turn + alarm message "Motor fault"	Incorrect control box type set	Please set the control box type according to the operating instructions
	Fuse F2 (1 amp) defective	Change fuse
	Filter operating fault (gear motor etc.)	See automatic filter operating instructions
	Faulty wiring	Check the wiring of the gear motor
Actuator does not work + alarm message "Actuator fault"	Active fault message from actuator. (Terminals 35+36, see control cabinet diagrams	See operating instructions for actuator EPI2-063-BK

Fault	Possible cause	Rectification
Alarm message "P0 filter type"	The wrong control box types 0 (6.18/6.19/6.44) or 18 (aquaBoll) have been set by the operator.	Set control box types 19 (6.18 electric actuator) or 20 (aquaBoll) according to the operating instructions
Differential pressure is not processed	Differential pressure indicator defective	Check/change differential pressure indicator
	Parameter P16 differential pressure delay time set	See explanations about the differential pressure time delay, P16 parameter setting and additional functions display (C key) in the operating instructions
Differential pressure transmitter is not processed	Differential pressure transmitter defective	Check/change differential pressure transmitter
	Differential pressure transmitter is not processed by the control box because a differential pressure switch is pre-set.	Set the differential pressure transmitter (DPT) according to the operating instructions (see the section P15 DP-Select "Differential pressure switch or differential pressure transmitter")
DPT-Alarm	Input signal 4 mA from differential pressure transmitter faulty	Check the differential pressure transmitter incl. wiring
Display "off"	Remote On/Off function (remote switching) has been activated by closing the E4 input (terminals 33+34, see control cabinet wiring diagrams)	This function can be deactivated by opening the contact of the input E4