Operating instructions

fimotec – fischer
Montagetechnik

Sorting control AS-241

Art. no.: 90.0410.50

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In your own interest:
Please read these instructions and keep them in a safe place.
Please observe and follow the safety information.

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1 General

In this manual, you will find all important information regarding the mounting, connection, setting and operation of your AS-241 device.
In addition, you will find information as well as important warnings for your safety.
Please observe:
Devices of the AS-241 series are specially adapted sorting controls for 24V= loads.

1.1 The product

- Sorting control for 24V= loads
- Can be used for mains voltages from 95 - 253 V~ 50 or 60 Hz
- Integrated short-circuit protection for the load output
- Can be used for inductive loads
- Can be controlled via a PLC signal, a sensor or a potential-free contact
- Four control inputs are available

1.2 Guide for these instructions

Used signal words and symbols

Symbol	Signal word	Meaning
	**Danger**	Warning of potentially serious to fatal injuries The lightning symbol warns against dangers due to electrical current.
	**Warning**	Warning of potentially minor injuries or potential damage to property
	**Caution**	Warning of potential defects / destruction of the device
	**Important note** **Important tip**	Here, important information or a tip is given concerning the function.

1.3 Safety-related information for the user

These instructions contain the required information for the intended use of the device described herein. They are directed toward technically qualified personnel.

Qualified personnel are people who have been authorized by persons responsible for the safety of the system to execute the required activities and are able to recognize potential dangers and avoid them based on their training, experience and instruction, as well as their knowledge of relevant standards, regulations, accident prevention regulations and operating conditions (definition of skilled personnel according to IEC 364).

Caution:
Danger due to electric voltage.
Non-observance can lead to death, serious bodily injury or property damage.

The following safety information is for your protection, the protection of third parties as well as the protection of the device. You should therefore observe it under all circumstances.

- Disconnect the power supply before installation or dismantling work, as well as when changing a fuse or making changes to the setup.
- Observe the valid accident prevention and safety regulations for your specific application.
- Before commissioning, check whether the nominal voltage of the device agrees with the local mains voltage.
- Emergency Stop mechanisms must remain active in all operating modes. Unlocking the Emergency Stop mechanisms must not result in uncontrolled reactivation.
- The electrical connections must be covered.
- Protective conductor connections must be checked for perfect function after installation.

Operating environment

The device must not come into direct contact with water.
When changing from cold to warm environments, allow the device to temper for a few hours before putting it into operation; otherwise, damage could occur due to condensation water.
Do not install the control device near devices which generate strong electromagnetic fields. The function could be disturbed as a result.
Also avoid environments which are very hot, cold or wet.

Power supply

- Only connect the device to a grounded mains socket with a mains voltage of 95-253 V~/50 Hz or 95-253 V~/60 Hz.
- If you notice malfunctions, disconnect the device from the mains. Have the device checked by qualified, skilled personnel, and repaired if necessary.

The device

- For safety and licensing reasons (CE), it is not permitted to convert and/or modify the device without authorization.

- The device meets the valid low-voltage and EMC directive.

Operation

- The sorting control only functions correctly when it is correctly installed and operated. In the event of malfunctions or unclear operating states, you should check the device and remedy the malfunction (see "Error list" chapter) or have it remedied.
- To avoid the risk of injury, do not allow uninstructed personnel or other vulnerable/endangered persons to operate the device without supervision.

Warning:
If the sorting control is switched on, the device plug must never be plugged into or unplugged from the operated load.
The device could be damaged by doing this.

1.4 Intended use

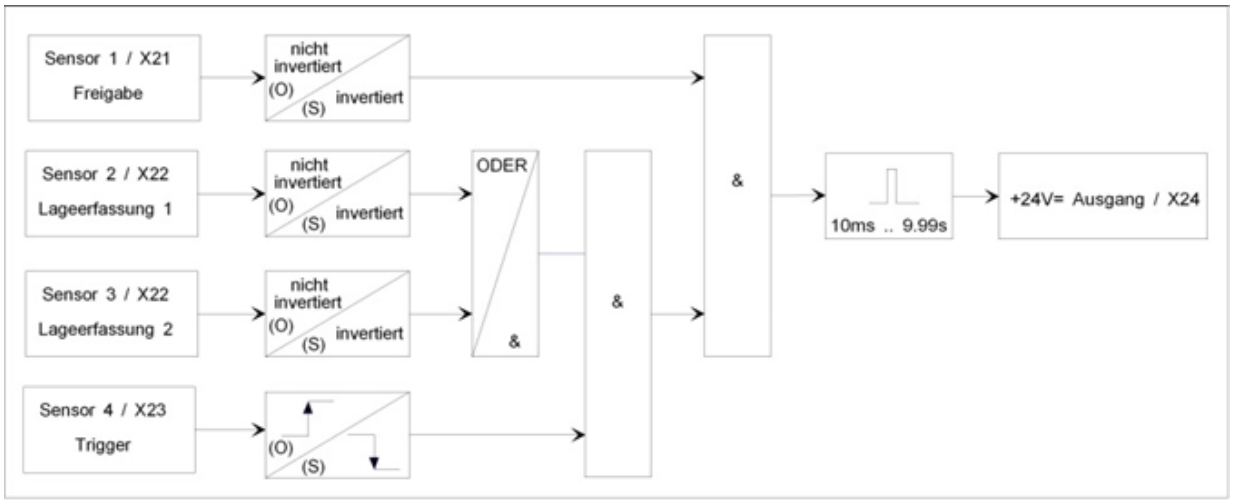
The device described here is an electrical piece of equipment for use in industrial automation systems and feeding equipment. It is designed to control 24V= loads.
A use other than the one described above is improper and can result in injuries as well as property damage.

(Further information about this topic can be found in the "Safety information" chapter).

2 Application

The sorting control AS 241 is used for the pulse control of 24V= loads.

The matched control inputs allow the load to be switched on/off in their programmed function. Systems, such as a PLC, initiator, sensors, etc. can be connected to the control inputs.



If the enable input is activated and the position sensors detect parts, the output for the set pulse time is activated with the (positive or negative) trigger edge.

3 Installation

A bore and elongated hole, externally accessible in the center of the device axis, are available for fastening the device. These are separated from the device interior.

Important note
Fasten to a vibration-free surface.

Caution:
Please make sure that the ribbon cable and control cable are not pinched against the housing in the interior. Pinching can cause short circuits and the destruction of the device.

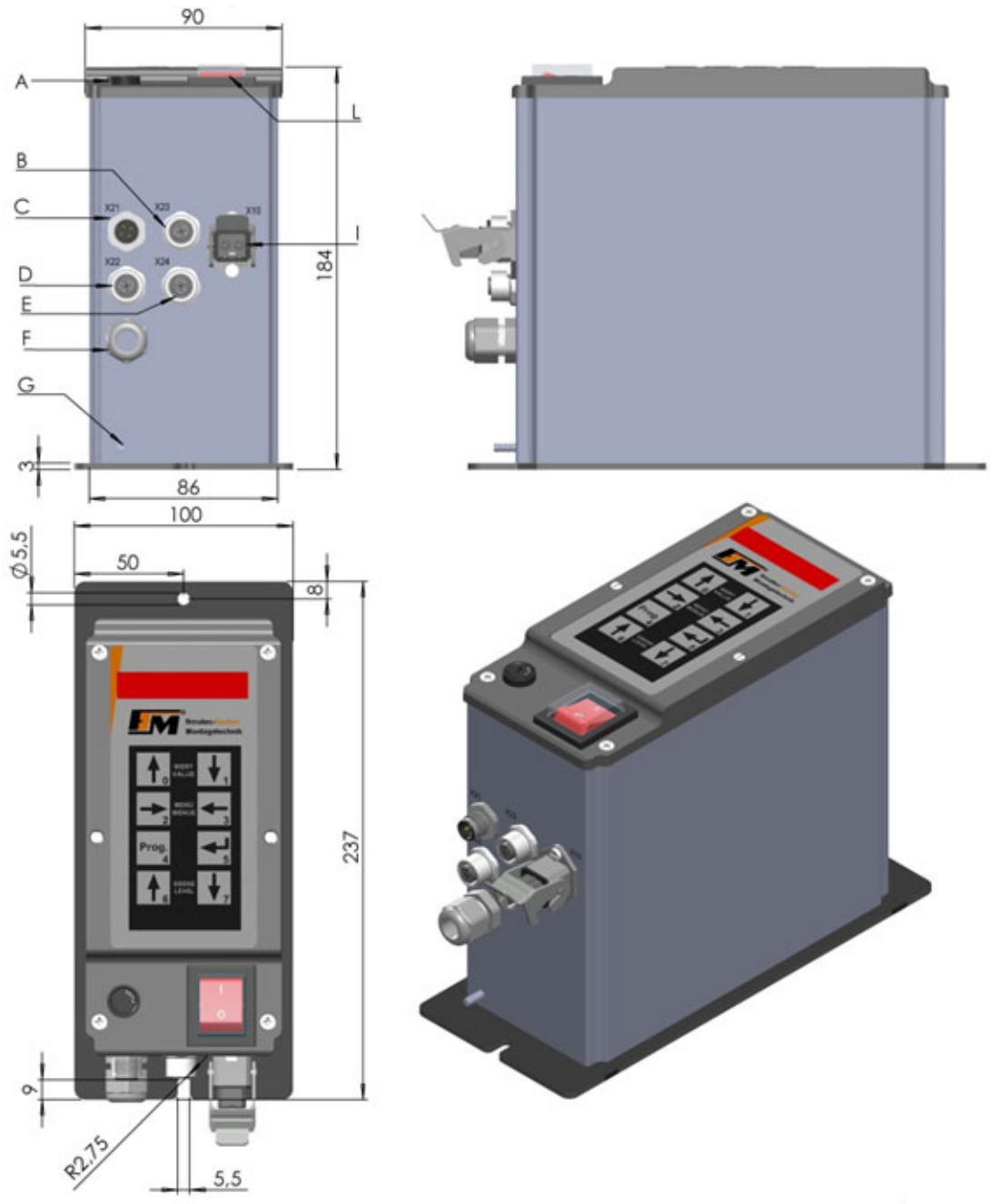
Warning:
Procedure for high voltage test:

- **L and N must be connected with each other.**
- **Test voltage may not be higher than 1000 V AC.**
- **Every device must be tested separately.**

If the above criteria are not complied with, the device could be damaged and the warranty will be void.

Caution:
The cover of the device is made of plastic. Screwing on the cover with the six countersunk screws must not be done with force, since otherwise there is a risk of the plastic cracking.
Screw in screws with a commercially available screwdriver by hand until the screw is flush with the recess and the cover lies on the profile.

3.1 Overview and dimensions



A - Mains fuse
B - M12 socket, 4-pin, for connection of trigger (E4) – X23
C - M12 plug, 4-pin, for enable input connection (E1) – X21
D - M12 socket, 4-pin, for connection of position sensors 1+2 (E2+3) – X22
S - M12 socket, 4-pin, for connection of load output (A0) – X24
F - Mains supply line
G - Grounding bolt
I - Connection of mains voltage - STAKEI2 X10
L - Mains switch

3.2 Connections and housing

 X10	Mains voltage connection Pin 1 - L Pin 2 - N PE - Protective conductor
X24 	Connection of load output A0 Pin 1 - Not Connected Pin 2 - Not Connected Pin 3 - GND Pin 4 - Load output (menu: A0)
 X21 X23   X22	Control input connection E1 Pin 1 - 24V= Pin 2 - Not Connected Pin 3 - GND Pin 4 - Enable input (menu: E1) Connection of trigger E4 Pin 1 - +24 V= Pin 2 - Not Connected Pin 3 - GND Pin 4 - Trigger input (menu: E4) Connection of position sensors E2+E3 Pin 1 - +24 V= Pin 2 – Position sensor input 2 (menu: E3) Pin 3 - GND Pin 4 – Position sensor input 1 (menu: E2) The +24V= supply is isolated from the mains voltage.

4 Commissioning

Before connecting the device, the mains voltage and frequency must be determined. The data must lie in the range of permissible values for the device.

- Connect the load and control cable to the device.
- Stick the mains plug of the device in the socket.
- Switch on the device
- Parameterize the required values via the keypad.

Operating note
Before switching on, check to make sure the plug connections are correct.
Switch on the device with the mains switch.

4.1 Control panel

The device is operated/set via 8 keys which are located on a control panel on the cover, together with a 6 x 7 -segment LED display.
All operating mode settings as well as the settable parameters can be made via this control panel.

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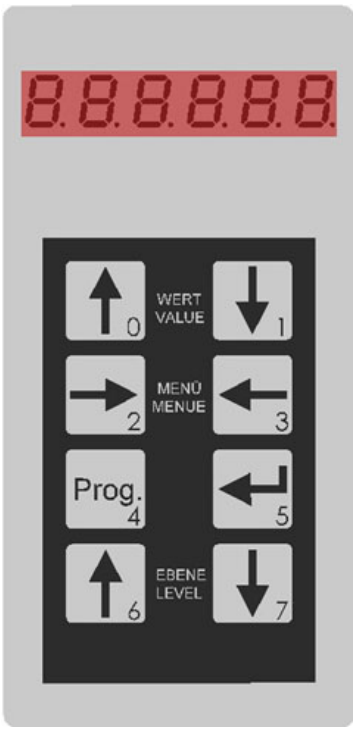


VALUE KEYS 0 and 1
MENU KEYS 2 and 3
PROGRAMMING KEY 4
SAVE KEY 5
LEVEL KEYS 6 and 7

Keypad explanation

The parameters are set by means of a menu structure and by entering an operator code.
In the "Setting instructions", the menu structure and the setting ranges of the parameters, as well as the function programming, will be explained.

By briefly pressing the arrow key 0 (increase/change) or 1 (decrease/change), the value in the selected parameter is increased/reduced or changed by one position (ones, tenths or mode). If the one or other key is kept pressed, it switches to fast mode, and after approx. 1 s to 2x fast mode.

If arrow keys 2 (clockwise rotation) and 3 (counterclockwise rotation) are briefly pressed, it switches from one parameter to the next. If the one or other key is kept pressed, the parameters are rolled through.

By briefly pressing the arrow keys 6 (increase) and 7 (decrease), the level structure is changed from one level to the other. If the one or other key is kept pressed, the levels are rolled through.

If the 4 key is pressed in all parameters, the entry of an operator code is expected. 

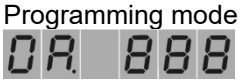
->  .

The code is accepted without acknowledgement if entered correctly. If the code is correct, programming mode is switched to.

After completing the changes, these must be stored with the 5 key.


appears briefly.

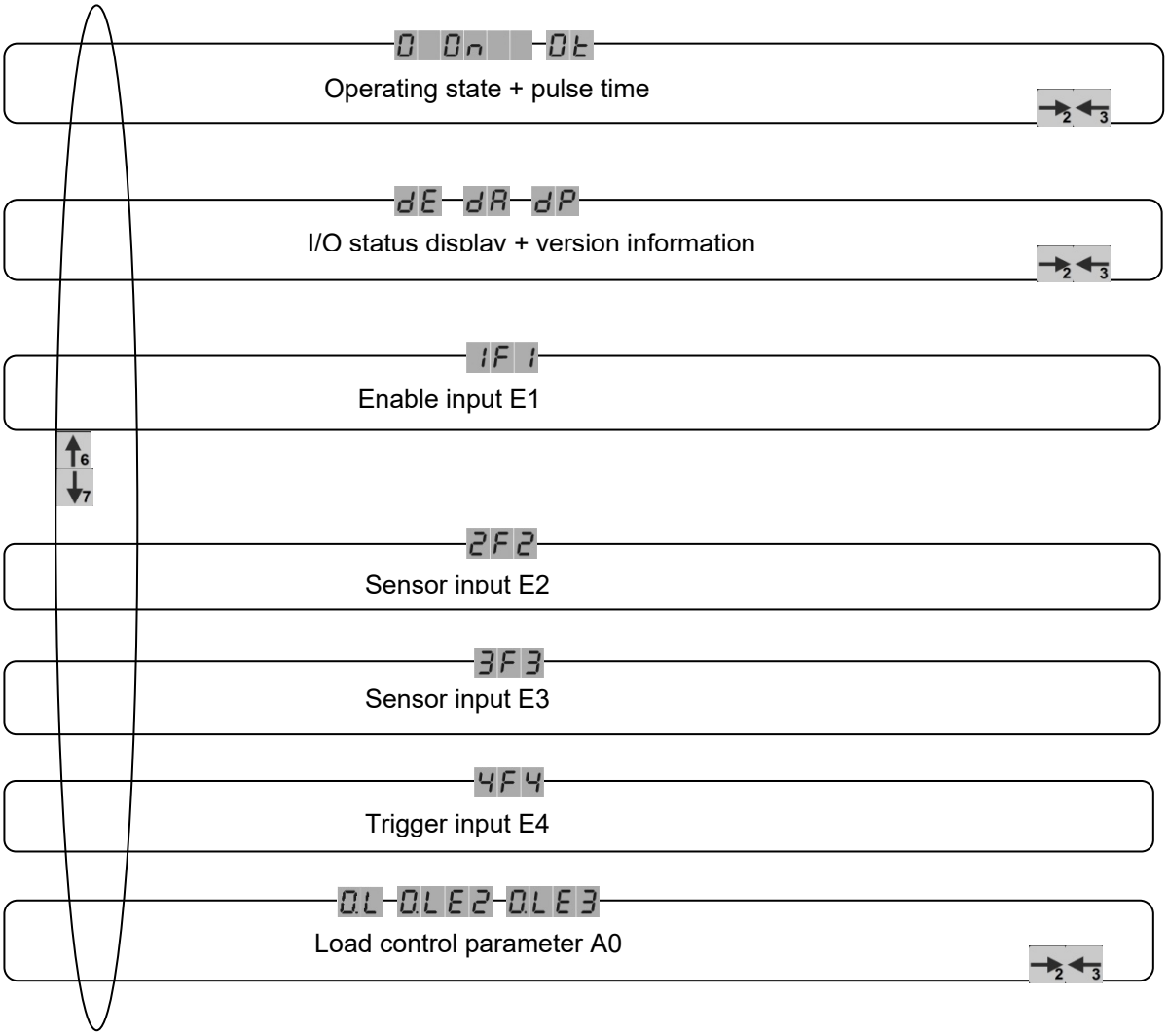
Changes are discarded 12 seconds (timeout) after the last key was pressed if the 5 key is not pressed; the values before the change in programming mode will be restored.

Programming mode is indicated by the dot in the second LED from the left.


Procedure example:

Select level via 6 and 7 keys.
Select parameter via 2 and 3 keys.
Press the 4 key to get into programming mode.
Input of operator code (only lines appear for each key pressed)
Change the parameter value with the 0 and 1 keys.
Save the value with the 5 key.

4.2 Menu structure



4.3 Level 0 – Operating state - Pulse time

After power ON, the display switches to the root display.

Output of operating state
Information On or OFF

Depending on this, the 2 and 3 keys can be used to roll to every individual parameter on this level. The following parameters are available:

Pulse time parameter for load output [s]
Settable value 0.01 - 9.99
Increment 0.01 s
Pulse time cannot be retriggered.

4.4 Level d – Information display (display only)

After power ON, the display switches to the root display.
From here, the 6 key can be used to change to level d.
The following status displays are available:

Status display of inputs E1 – E4.
The lower row of lines outputs the logical state,
i.e., the state after inversion processing.
E.g.: 0V at E2 + F2=S = line segment, bottom row, from the left, pos. 2

The upper row of lines outputs the physical status,
i.e. if voltage is applied at the corresponding input,
a line segment is displayed.
E.g.: 24VDC at E2 = line segment, upper row from the left, pos. 2

Status display of output A0.
The lower row of lines outputs the physical status,
i.e. if there is voltage applied at the output, a line segment is displayed.
E.g.: 24VDC at A0 = line segment, lower row from the left, pos. 1

Display of the program version

4.5 Level 1 – Enable input E1

After power ON, the display switches to the root display.
From here, the 6 key (press 2x) can be used to change to level 1.
The following parameters are available:

A logical 1 causes a reaction.
A logical 0 causes no reaction.

Code A and B

Parameter: F1 [function]
Value can be set to O, S
O – An applied HI signal is not inverted and is further processed as logical 1.
An applied LO signal is not inverted and is further processed as logical 0.

S – An applied HI signal is inverted and is further processed as logical 0.
An applied LO signal is inverted and is further processed as logical 1.

4.6 Level 2 – Position sensor 1 - E2

After power ON, the display switches to the "Amplitude" root display.
From here, the 6 key (press 3x) can be used to change to level 2.
The following parameters are available:

A logical 1 causes a reaction.
A logical 0 causes no reaction.

Code A and B

Parameter: F2 [function]
Value can be set to O, S
O – An applied HI signal is not inverted and is further processed as logical 1.
An applied LO signal is not inverted and is further processed as logical 0.

S – An applied HI signal is inverted and is further processed as logical 0.
An applied LO signal is inverted and is further processed as logical 1.

4.7 Level 3 – Position sensor 2 - E2

After power ON, the display switches to the "Amplitude" root display.
From here, the 6 key (press 4x) can be used to change to level 2.
The following parameters are available:

A logical 1 causes a reaction.
A logical 0 causes no reaction.

Code A and B

Parameter: F3 [function]
Value can be set to O, S
O – An applied HI signal is not inverted and is further processed as logical 1.
An applied LO signal is not inverted and is further processed as logical 0.

S – An applied HI signal is inverted and is further processed as logical 0.
An applied LO signal is inverted and is further processed as logical 1.

4.8 Level 4 – Trigger sensor – E4

After power ON, the display switches to the "Amplitude" root display.
From here, the 6 key (press 5x) can be used to change to level 2.
The following parameters are available:

A logical 1 causes a reaction.
A logical 0 causes no reaction.

Code A and B

Parameter: F3 [function]
Value can be set to O, S
O – An applied HI signal is not inverted and is further processed as logical 1.
An applied LO signal is not inverted and is further processed as logical 0.

S – An applied HI signal is inverted and is further processed as logical 0.
An applied LO signal is inverted and is further processed as logical 1.

4.9 Level 0 – Logic for vibratory conveyor drive

After power ON, the display switches to the root display.
From here, the 6 key (press 6x) can be used to change to level 0.

On level 0, the control of the load output is set (physically).

The following parameters are available:

A logical 1 causes a reaction.
A logical 0 causes no reaction.

Code A and B

Parameter: Logic [function]
Value can be set O, U
Result = physical state of the vibratory conveyor before the function F1
O - OR operation of all available
and active inputs (value entry 0.LEX=1)

U - AND operation of all available
and active inputs (value entry 0.LEX=1)

Code A and B

Parameter: Input E2 [function]
Value can be set to 0 or 1
0 - Input switched to inactive (not considered in the logic)
1 - Input switched to active (considered in the logic)

Code A and B

Parameter: Input E3 [function]
Value can be set to 0 or 1
0 - Input switched to inactive (not considered in the logic)
1 - Input switched to active (considered in the logic)

4.10 Setting up enable/sensor/trigger input

Connect the enable/sensor/trigger input directly to the socket on the housing;
Use a matching mating connector for this.

X21

X23

X22

<u>Control input connection E1</u>
Pin 1 - 24V=
Pin 2 - Not Connected
Pin 3 - GND
Pin 4 - Enable input (menu: E1)

<u>Connection of trigger input E4</u>
Pin 1 - +24 V=
Pin 2 - Not Connected
Pin 3 - GND
Pin 4 - Trigger input (menu: E4)

<u>Connection of position sensor inputs E2+E3</u>
Pin 1 - +24 V=
Pin 2 – Position sensor input 2 (menu: E3)
Pin 3 - GND
Pin 4 - Position sensor input 1 (menu: E2)

The +24V= supply is isolated from the mains voltage.

Via the control panel, parameterize the menu item F1, F2, F3, F4 on levels 1 – 4 with the desired function value by first changing to programming mode (see the control panel and operator code):

Start in "Amplitude" root display

Parameter: F1 [function]
Value can be set to O, S
O – An applied HI signal is not inverted and is
further processed as logical 1.
An applied LO signal is not inverted and is
further processed as logical 0.

S – An applied HI signal is inverted and is
further processed as logical 0.
An applied LO signal is inverted and is
further processed as logical 1.

5 Technical data

Mains connection, wide range	95 - 250 V~
Output voltage	24 V=
Mains frequency	50Hz / 60 Hz
Output current	500 mA
Protection class	**IP 54 for suspended mounting** (screw connections point to the floor)
Fuse	6.3 A F
Mains connection, mechanical	2 m with moulded Schuko angle plug
Mains connection, loop	STAKEI2 (active independent of power switch)
Connection, load	M12 socket, 4-pin
Input E1	M12 plug, 4-pin +24V= / max. 50 mA / PNP Switching level HI: 6 - 24V=- Switching level LO: 0 - 4 V=
Inputs E2+E3+E4	M12 socket, 4-pin +24V= / max. 50 mA / PNP Switching level HI: 6 - 24V=- Switching level LO: 0 - 4 V=
Housing	Aluminium base plate + aluminum extruded section + plastic cover
Dimensions	237 x 100 x 184mm
Operating temperature	0...40° C
Storage temperature	-10...+80° C
Installation height	1000 m, 0.5% nominal current reduction per additional 100 m

5.1 Setting values via keypad

Parameter			Delivery state
Pulse time	0t	0.01...9.99s	1 s

Control level 1			
Invert input	1F1	PNP (O) PNP inverted (S)	S
Control level 2			
Invert input	2F2	PNP (O) PNP inverted (S)	O

Control level 3			
Invert input	3F3	PNP (O) PNP inverted (S)	S
Control level 4			
Invert input	4F4	PNP (O) PNP inverted (S)	S
Logic level 0.			
Logic operation	0.L	O - OR U - AND	O
For input which can be activated with logic	0.LE2	Inactive (0) / active (1)	1
For input which can be activated with logic	0.LE3	Inactive (0) / active (1)	0

6 Error list

Danger:
Life-threatening danger due to electric current! Have repairs to the 230 V power network performed only by a qualified professional.

Problem/error	Possible cause(s)	Remedy
Device does not work	- Power failure or defective fuse - The 230V mains socket is defective. - The device is defective. - Control input inverted	➢ Check the fuses. ➢ Have the mains socket repaired by qualified, skilled personnel. ➢ Have the device checked by qualified, skilled personnel. ➢ Check whether the control input is correctly set.
Control input does not work	- Control voltage is not in correct range Control input deactivated	➢ Have the voltage checked by qualified, skilled personnel. ➢ Check the settings
Important: Malfunctions might occur in an unfavourable electromagnetic environment.		

Caution:
Danger due to improper interventions. Do not manipulate the device. Otherwise, this can result in function failures and device defects.

7 Maintenance and cleaning

The control device works maintenance-free.
The safety inspection in acc. with DIN VDE 0701-0702 is to be performed annually.

Pull out the mains plug before cleaning the housing of the device with liquids.

8 Disposal

The device must not be disposed of in the normal household waste.

Users are obligated to bring old devices to a disposal point for old electrical and electronic devices. The separate collection and proper disposal of your old devices helps to conserve natural resources and ensures recycling, which protects human health and the environment. Information about where you can find disposal points for your old devices can be obtained from your city administration or local waste disposal facility.

9 CE conformity

The sorting control AS-241 is marked with the CE marking and therefore meets the relevant European directives.
The company fimotec-fischer GmbH & Co. KG herewith confirms that this device complies with the following directives:

- Low-voltage directive 2014/35/EU
- EMC directive 2014/30/EU
- Standards EN 61000-6-4 and EN 61000-6-2

The declaration of conformity is archived at the manufacturer.

10 Service

If you have any questions or problems, please contact the supplier directly.
Manufacturer: fimotec-fischer GmbH & Co.KG: Tel.: 0049-7424-884-0

Note:

Please keep the following information ready, since otherwise service cannot be provided:

- **Your company with address**
- **Your name and contact data, such as telephone number and e-mail address**
- **Complete designation of the device**
- **Serial number (FBxx-xxxx-xx or HW20xxxx)**
- **The direct supplier of your device or machine in which the device is integrated.**

10.1 Operator codes

The following codes are available:

It is up to the system supplier to pass on the operator code or to reserve it for his service personnel.

Via the operator code, parameters are enabled, which may only be changed by skilled, trained personnel, since the function is influenced with these settings.

11 Accessories (not included in the scope of delivery)

Designation	Use	Article number
Cable plug	for X10, 230V output	91.3300.20
Cable socket M12A	for X21, disable/enable input	91.3211.01
Power plug M12A	for X22, filling level sensor input	91.3311.01
Power plug M12A	for X24, 24V sorting air valve	91.3311.01
Connection cable	Filling level M8-3p, 3m straight St. M12	91.4214.00
Connection cable	Filling level M8-3p, 3m angled St. M12	91.4214.01
Connection cable	Filling level M8-3p, 5m straight St. M12	91.4214.02
Connection cable	Filling level M8-3p, 5m angled St. M12	91.4214.03
Connection cable	Filling level M8-4p, 3m straight St. M12	91.4214.04
Connection cable	Filling level M8-4p, 3m angled St. M12	91.4214.05
Connection cable	Filling level M8-4p, 5m straight St. M12	91.4214.06
Connection cable	Filling level M8-4p, 5m angled St. M12	91.4214.07
Connection cable	Filling level M12, 3m straight St. M12	91.4214.08
Connection cable	Filling level M12, 3m angled St. M12	91.4214.09
Connection cable	Filling level M12, 5m straight St. M12	91.4214.10
Connection cable	Filling level M12, 5m angled St. M12	91.4214.11