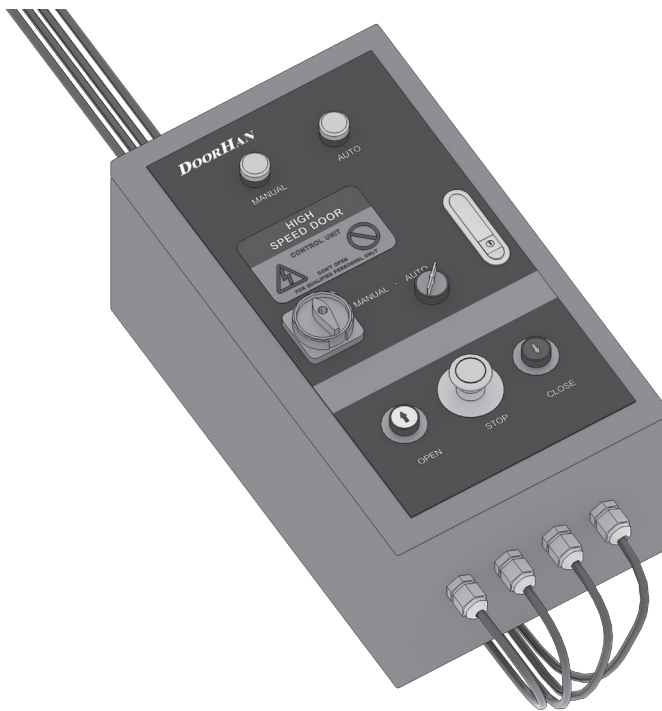


GENERAL INFORMATION	2
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SPEEDROLL/SPEEDFOLD CONTROL UNIT



Installation and Operation Instructions

MANUFACTURER'S DECLARATION OF CONFORMITY

Manufacturer: LLC StoreHan, 143002, Russia, Moskovskaya obl., Odintsovskij r-n, s. Akulovo, ul. Novaya, d. 120.

Trademark: DoorHan.

High speed door control unit for the doors series HSDC 181900, HSDC 18191, HSDC 18192, HSDC 18193, HSDC 18191 (N) fulfil the stipulations of the Directives 2006/95/EC Low-voltage, 2004/108/EC Electromagnetic compatibility to the following standarts EN ISO 12100:2010, EN 1398:2009, EN ISO 1570-1:2011+A1:2014, EN 60204-1:2006/A1:2009/Cor.Feb.:2010, EN61000-6-2:2005/Corr.Sep.:2005, EN 61000-6-4:2007/A1:2011.

This declaration of conformance is not applied if:

- the Product is operated in extreme climatic conditions, in magnetic fields, etc., and under special circumstances, e.g. explosion hazard.

1. GENERAL INFORMATION

HSDC 181900, HSDC 18191, HSDC 18192, HSDC 18193, HSDC 18191 (N) control units are designed to operate DoorHan high speed doors of SpeedRoll/SpeedFold series.

1.1. TECHNICAL DATA

Model	HSDC 181900	HSDC 18191	HSDC 18192	HSDC 18193	HSDC 18191 (N)
Power supply, V	220	380	220	380	380
Frequency converter, kW	1.5	1.5	2.2	2.2	1.5
Control voltage, V DC	24	24	24	24	24
Frequency, Hz	0–100	0–100	0–100	0–100	0–100
Working temperature range, °C	-20...+50	-20...+50	-20...+50	-20...+50	-20...+50

2. SAFETY RULES



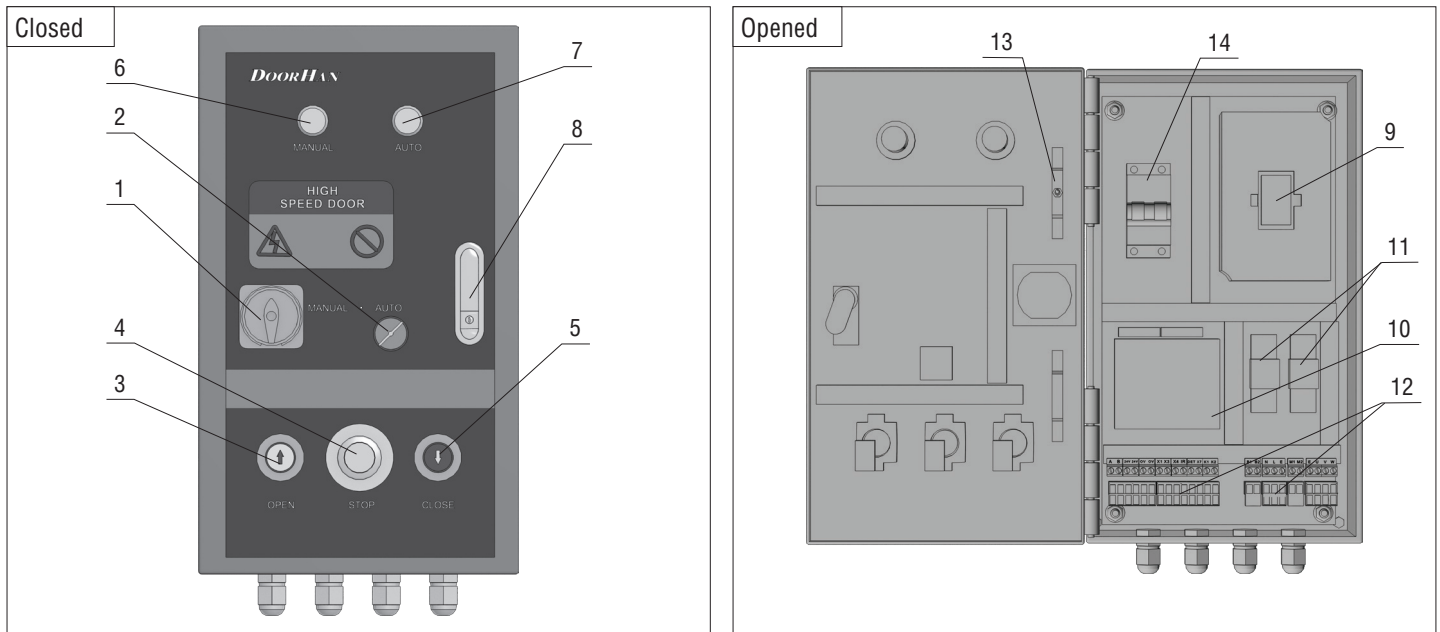
WARNING!

Follow all the instructions manual, since improper installation of equipment can lead to serious damage and injury.

- The improper use is not allowed.
- DoorHan s.r.o. shall not be responsible for property damage or injury, caused by Product misuse or failure to follow safety rules and owner's manual instructions.
- Installation, settings and maintenance of this equipment can only be performed by qualified personnel.
- The mains voltage must correspond to power supply of control unit.
- Before opener installation make sure speed door and door safety devices are in operating condition.
- Before operating the control unit, make sure that all electrical connections are properly secured and isolated.

3. CONTROL UNIT

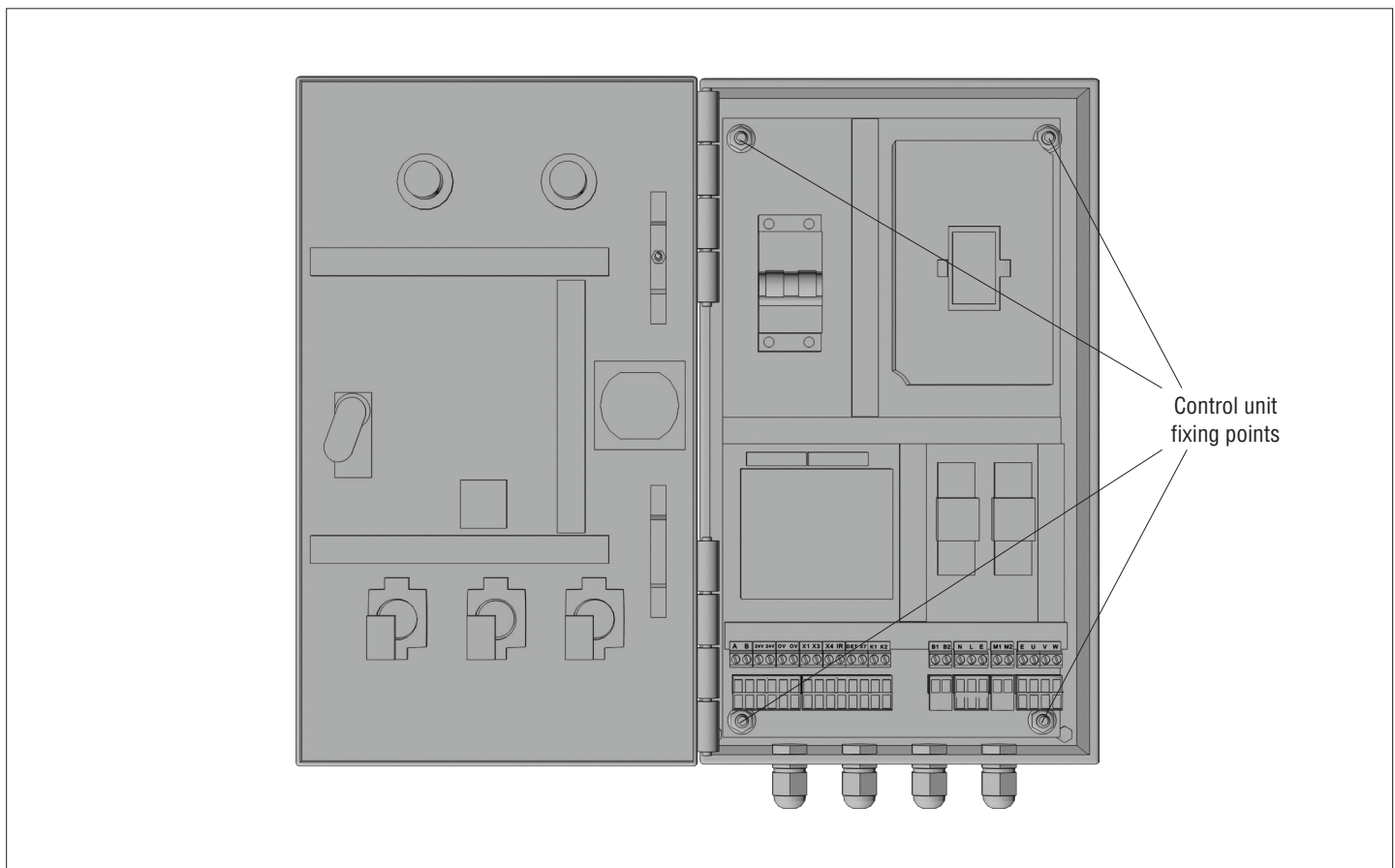
3.1. GENERAL VIEW



- | | | |
|--------------------------|--------------------------|------------------------|
| 1. Main switch | 6. Manual mode indicator | 11. Relay |
| 2. Manual/Auto switch | 7. Auto mode indicator | 12. PCB |
| 3. Open button | 8. Lock | 13. Programming switch |
| 4. Emergency stop button | 9. Frequency converter | 14. Circuit breaker |
| 5. Close button | 10. PLC | |

3.2. CONTROL UNIT INSTALLATION

Mount control unit to the wall 1.2...1.5 m from the floor level. Choose fasteners suitable to the wall type.



4. ELECTRICAL CONNECTIONS



WARNING!

Be sure power is not connected before installing control unit.

Before first use:

- check incoming power (maximum deviation should not exceed 10% of the nominal value),
- make sure the cross section of the supply wires is in accordance with the tables:

Aluminium wires	230V control unit, single phase
Distance from power source ($\leq m$)	Wire core diameter ($\geq mm^2$)
50	2
100	4
150	8
200	10
300	16
400	16
500	25

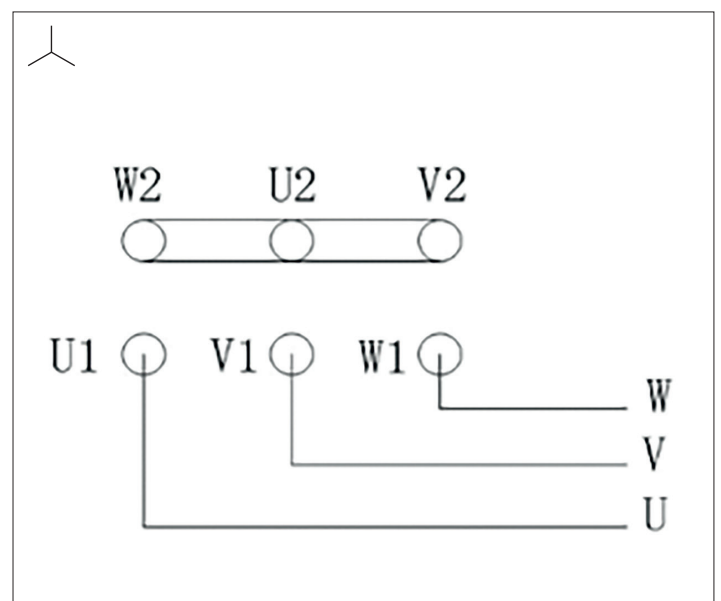
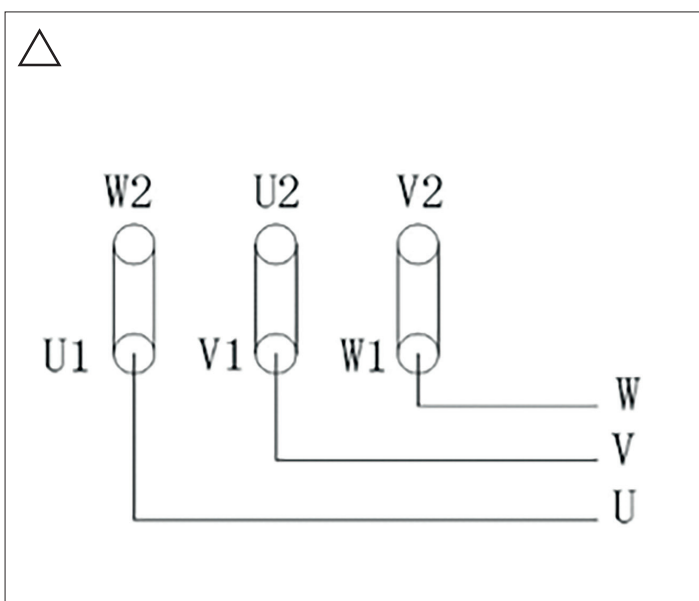
Aluminium wires	400V control unit, three phase
Distance from power source ($\leq m$)	Wire core diameter ($\geq mm^2$)
50	1.5
100	2.5
150	4
200	6
300	10
400	10
500	16

Copper wires	230V control unit, single phase
Distance from power source ($\leq m$)	Wire core diameter ($\geq mm^2$)
50	1.5
100	2.5
150	4
200	6
300	10
400	10
500	16

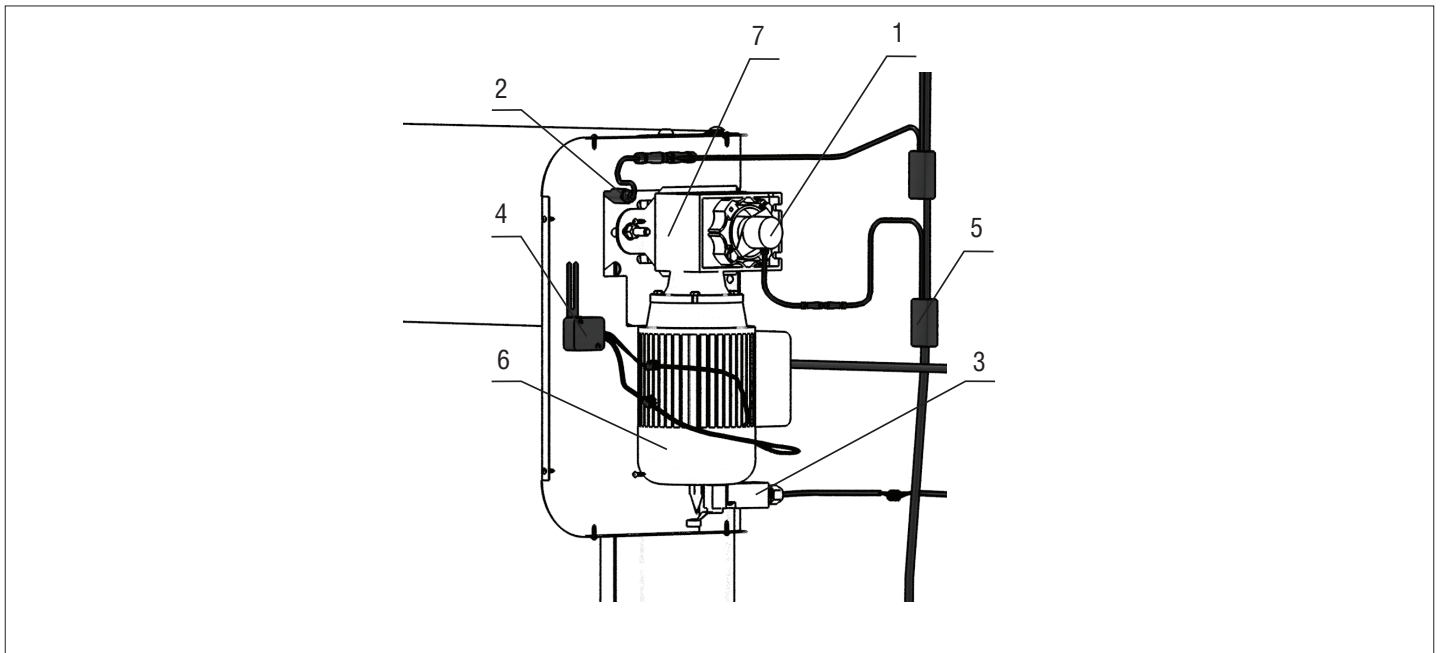
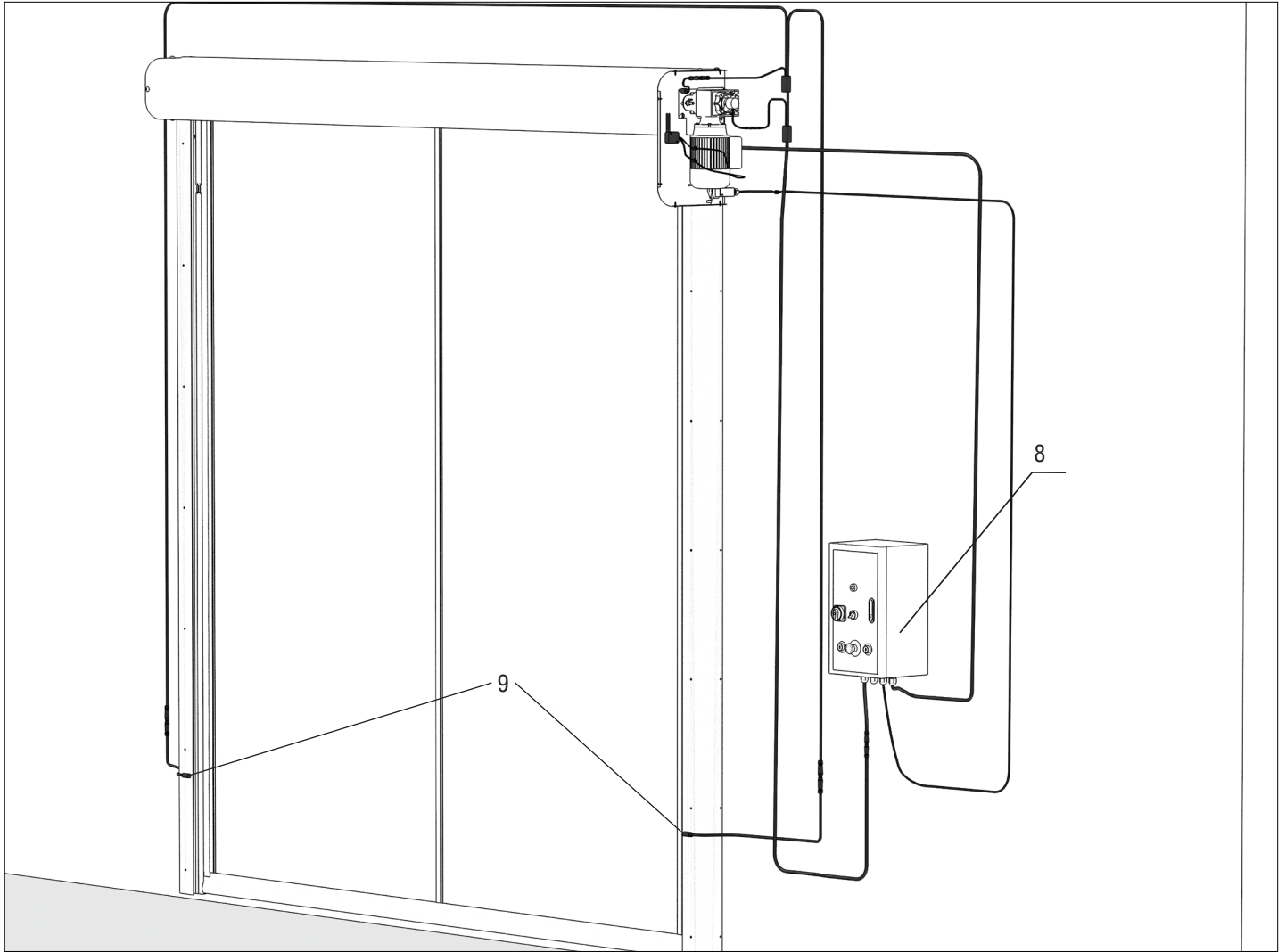
Copper wires	400V control unit, three phase
Distance from power source ($\leq m$)	Wire core diameter ($\geq mm^2$)
50	1.0
100	1.5
150	2.5
200	4
300	6
400	6
500	10

4.1. ELECTRICAL CONNECTIONS OF THE MOTOR

The motor windings are wired so that it is possible to operate the control unit on a $3 \times 400 V$ or $1 \times 230 V$ supply. The motor should be wired in delta (Δ) connection for a $1 \times 230 V$ mains. The motor should be in star (Y) connection for a $400 V$ mains. In order to change-over the voltage of the motor, the ends of the coils should be re-arranged, as shown below.



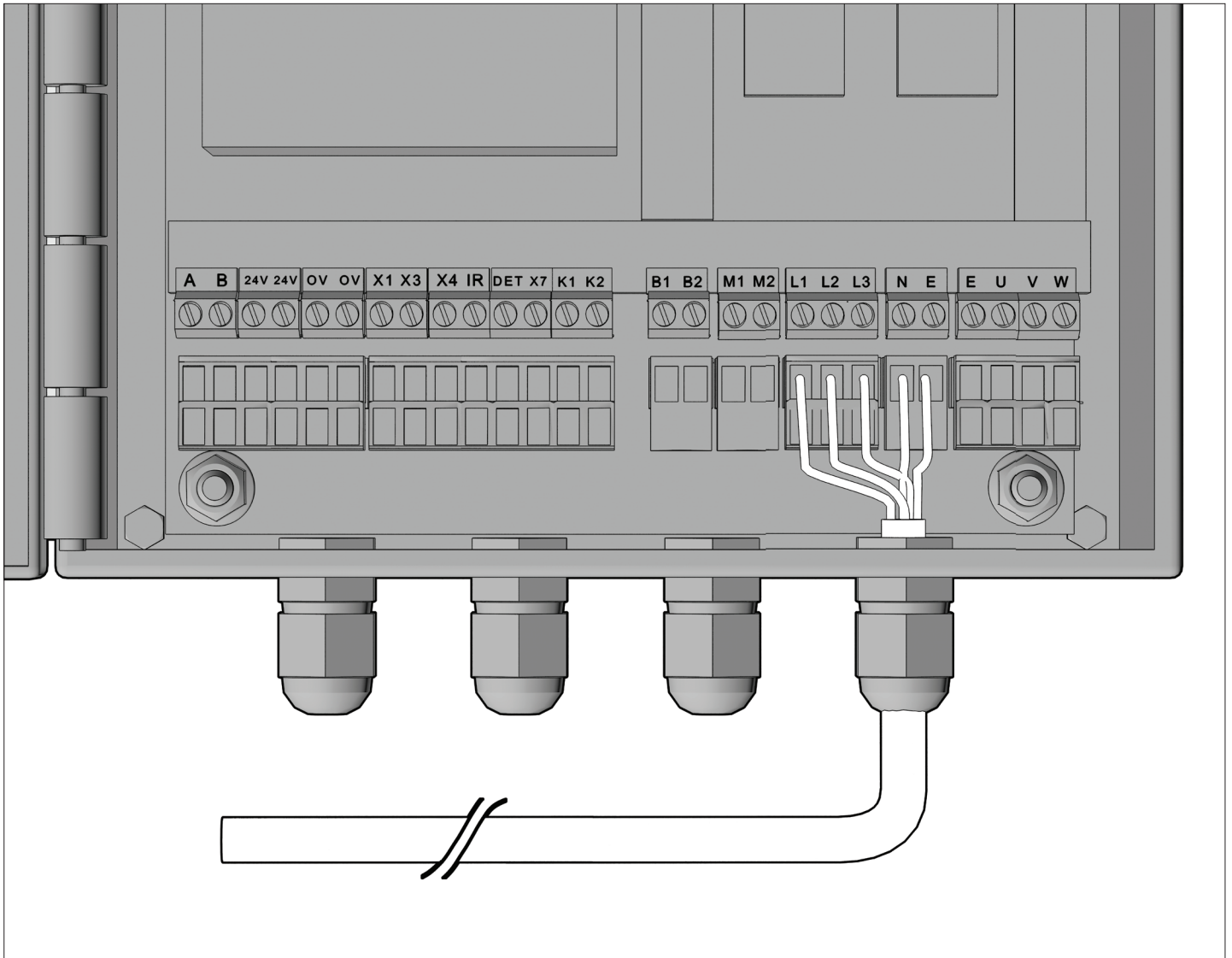
4.2. ELECTRICAL CONNECTIONS SCHEME



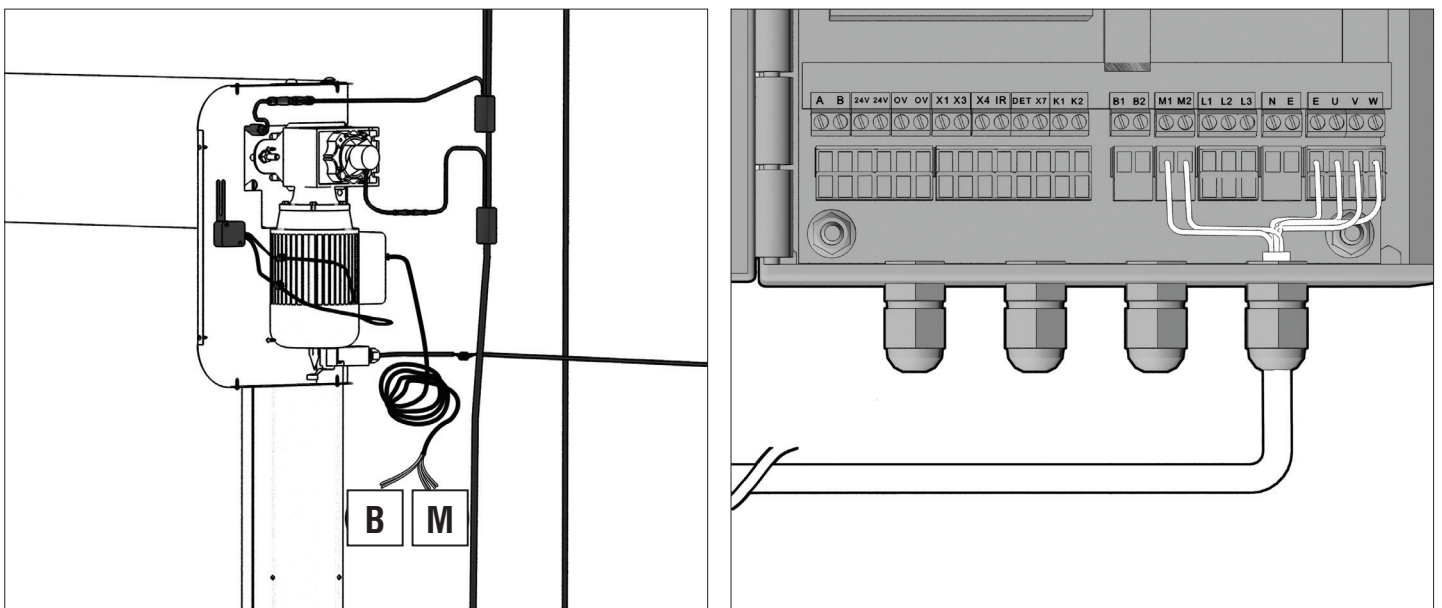
- | | | |
|-----------------------------|--------------------|-----------------|
| 1. Encoder | 4. Brake rectifier | 7. Reducer |
| 2. Anti-jamming sensor | 5. Spider cable | 8. Control unit |
| 3. Emergency opening switch | 6. Electric motor | 9. Photocells |

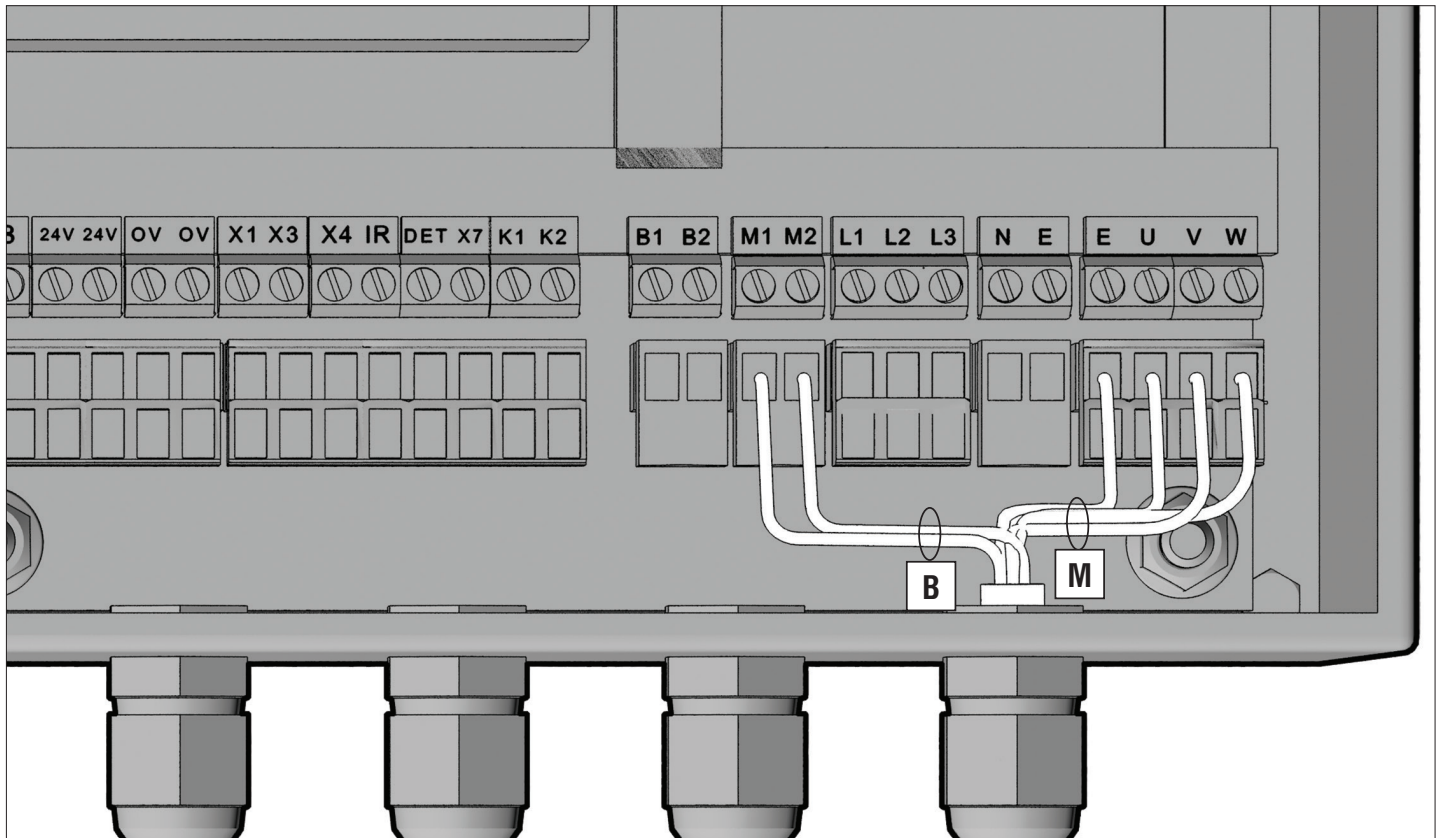
4.3. 400V CONTROL UNIT ELECTRICAL CONNECTIONS

Control Unit Connection to 3 × 400V Supply



Connection of Electric Motor to Control Unit





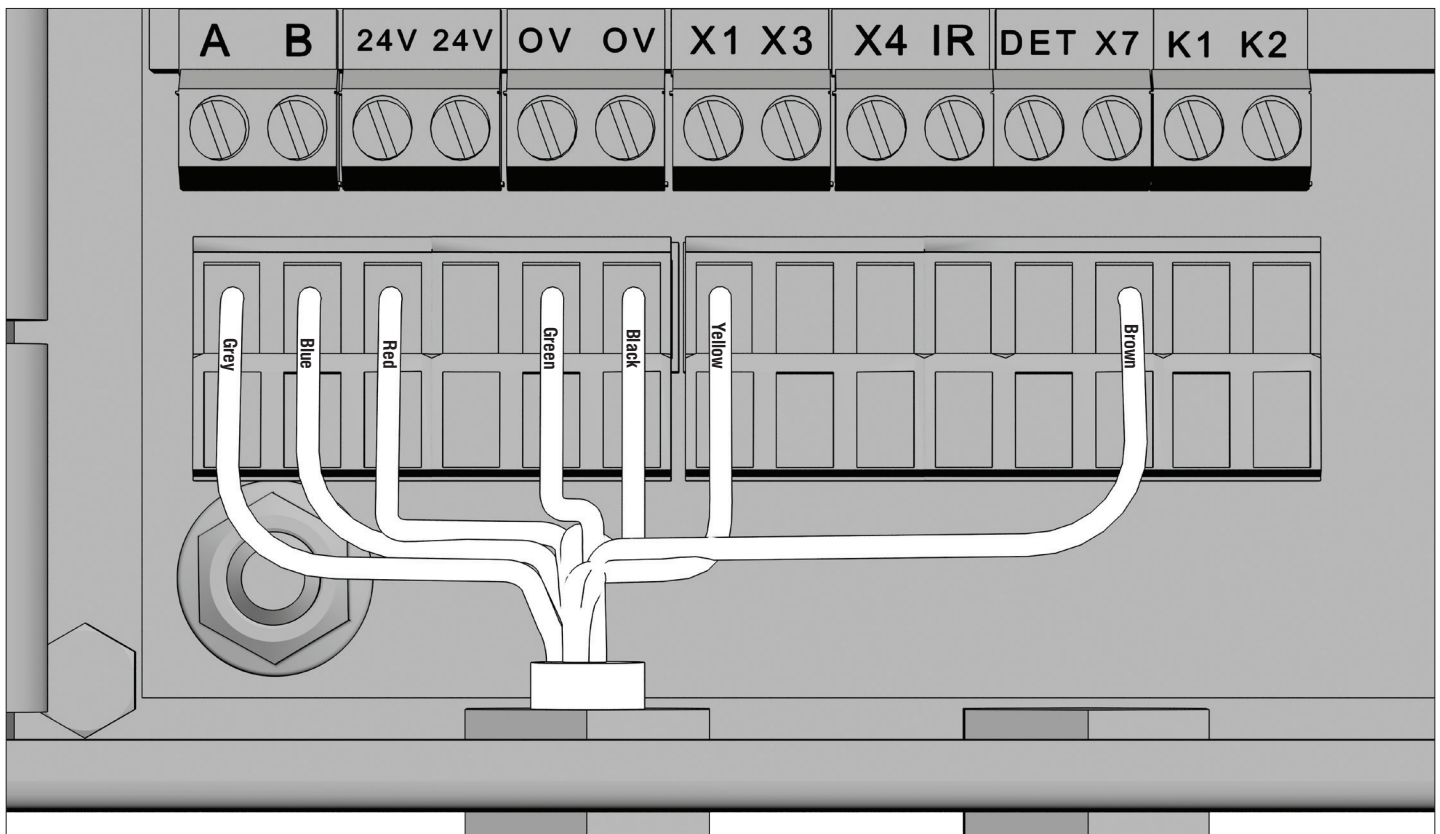
B — electromagnetic brake

M — electric motor

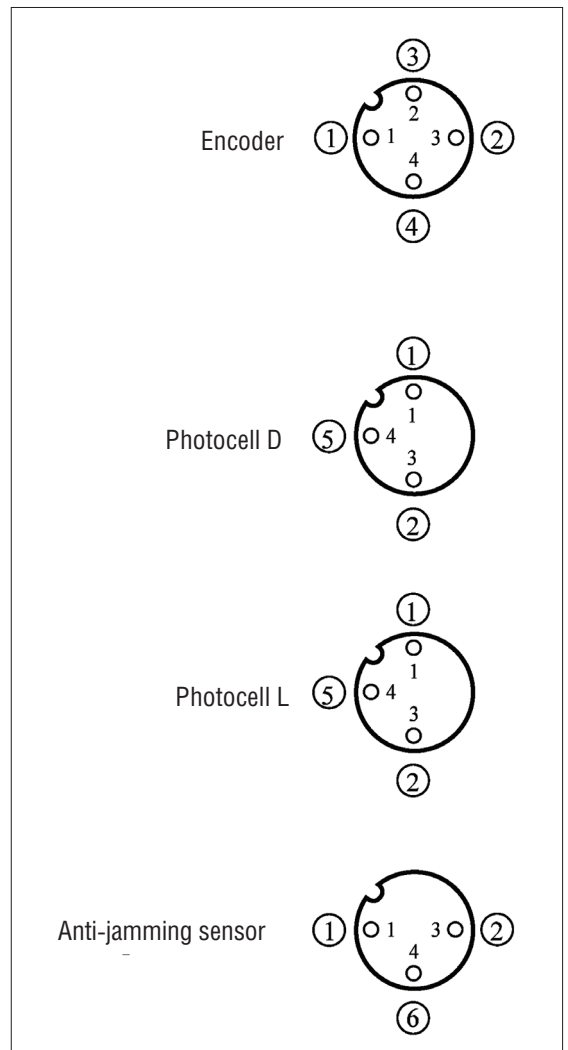
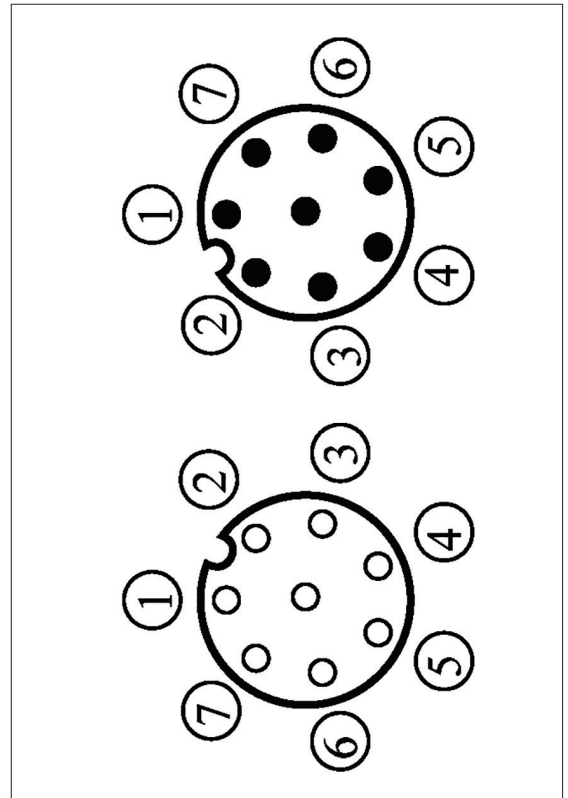
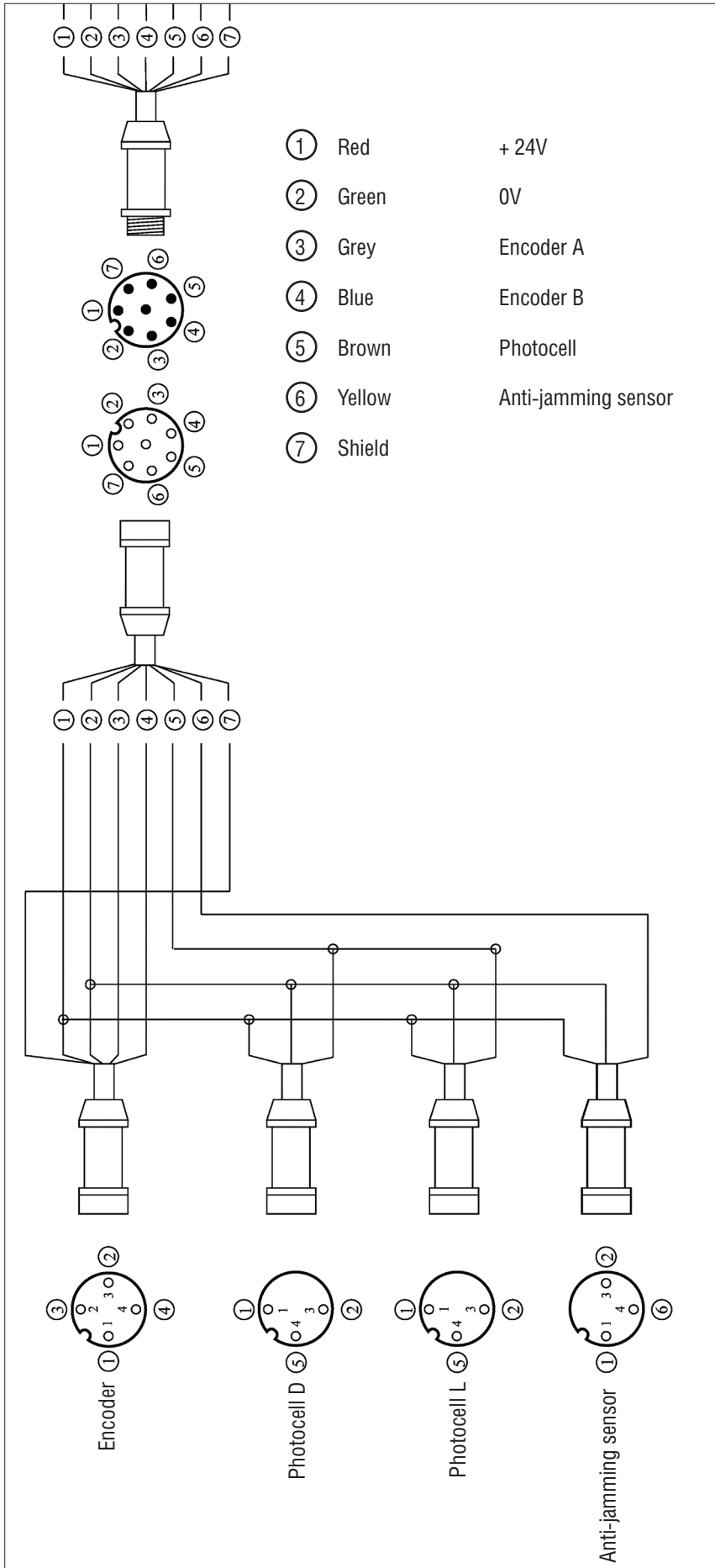
Connect electric motor to control unit with 6-wire cable as follows:

- connect 4 wires (1.5 mm²), marked with «M» tag, to U, V, W, E contacts (3 phases + ground);
- connect 2 wires (0.5 mm²), marked with «B» tag, to M1 and M2 terminals on main terminal block.

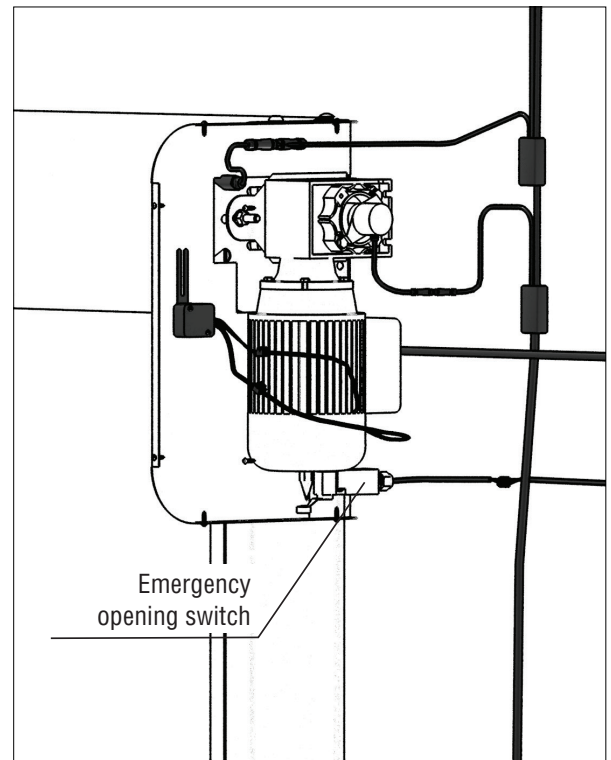
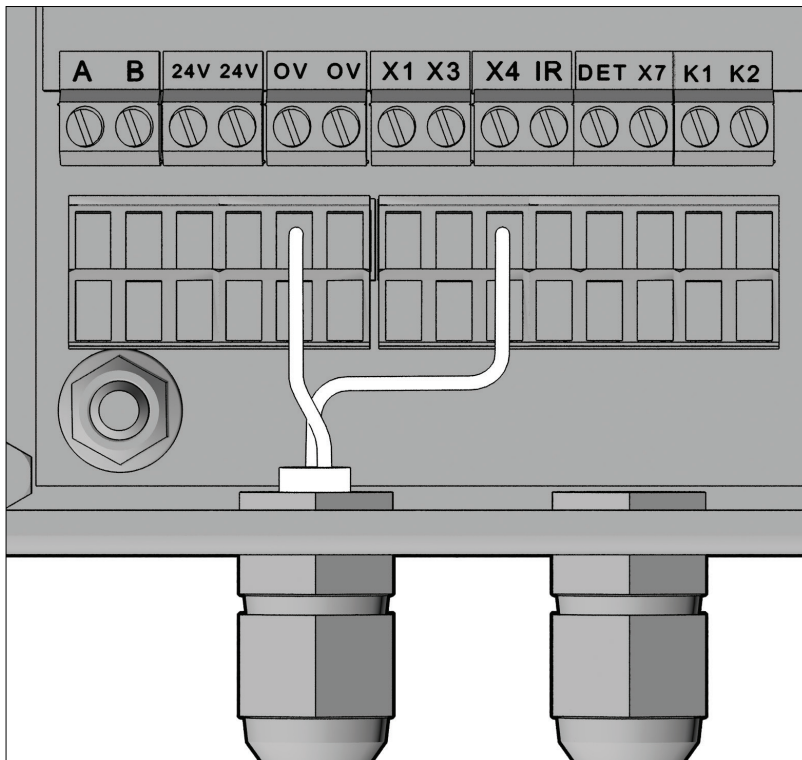
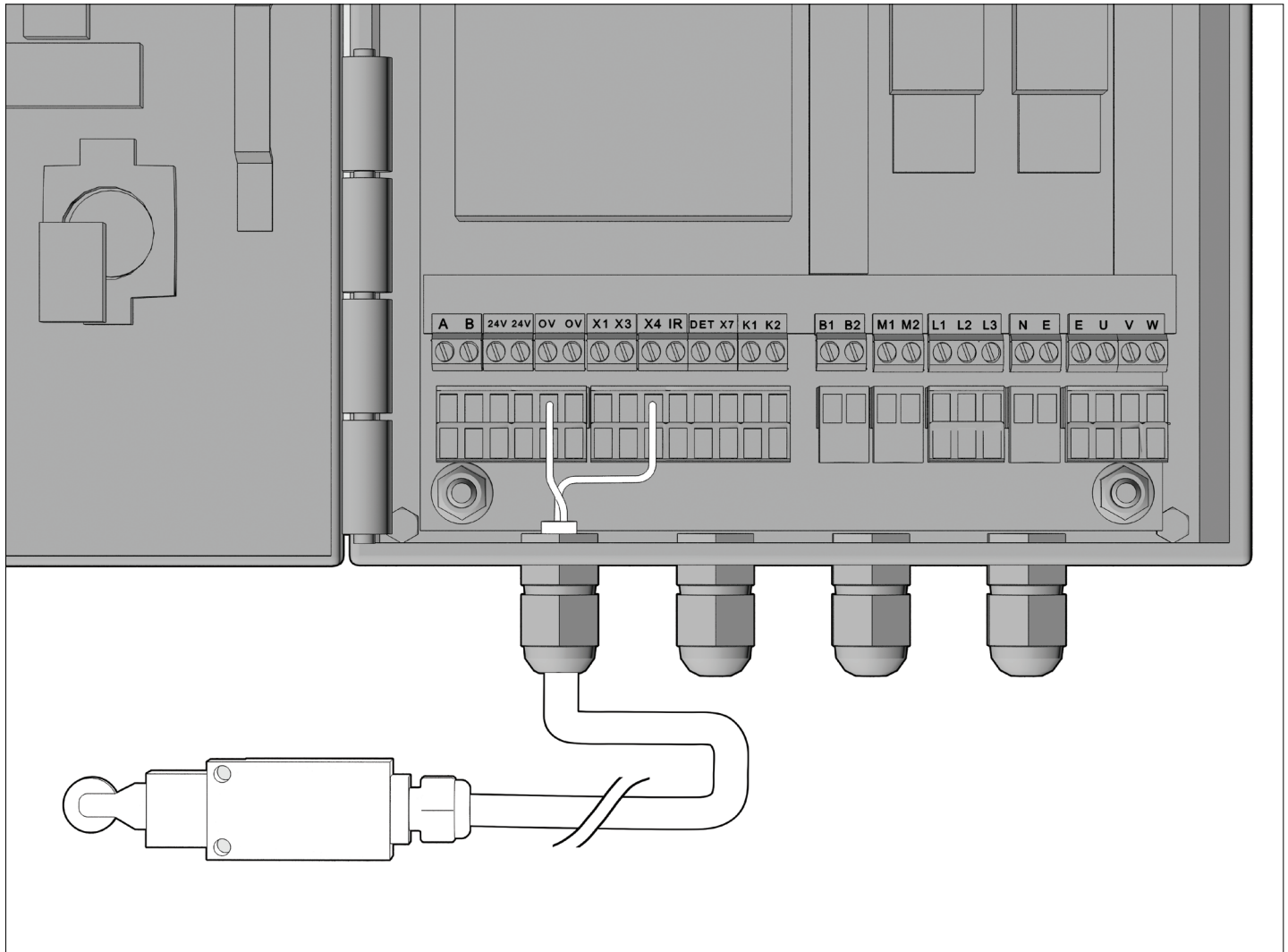
Connection of Spider Cable to Control Unit



Spider Cable Wiring Diagramm

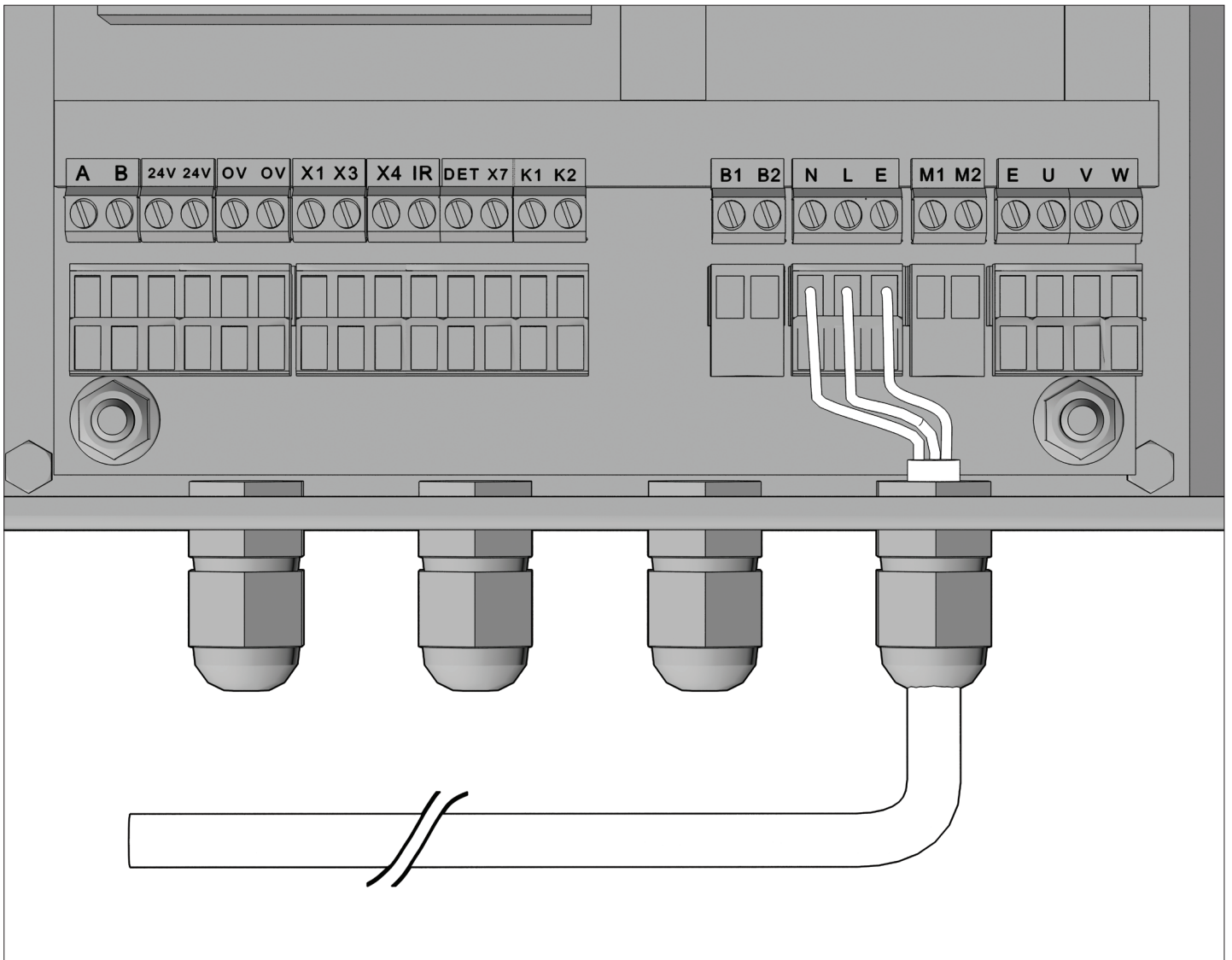


Emergency Opening Switch Connection (NO)

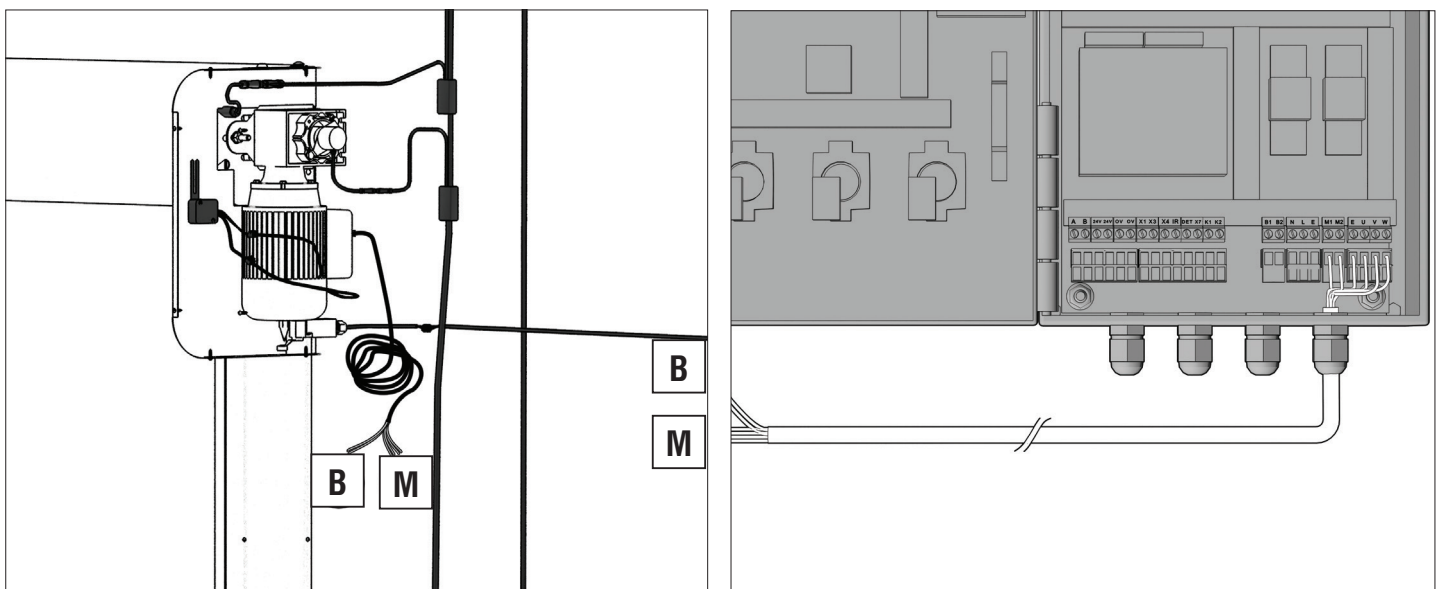


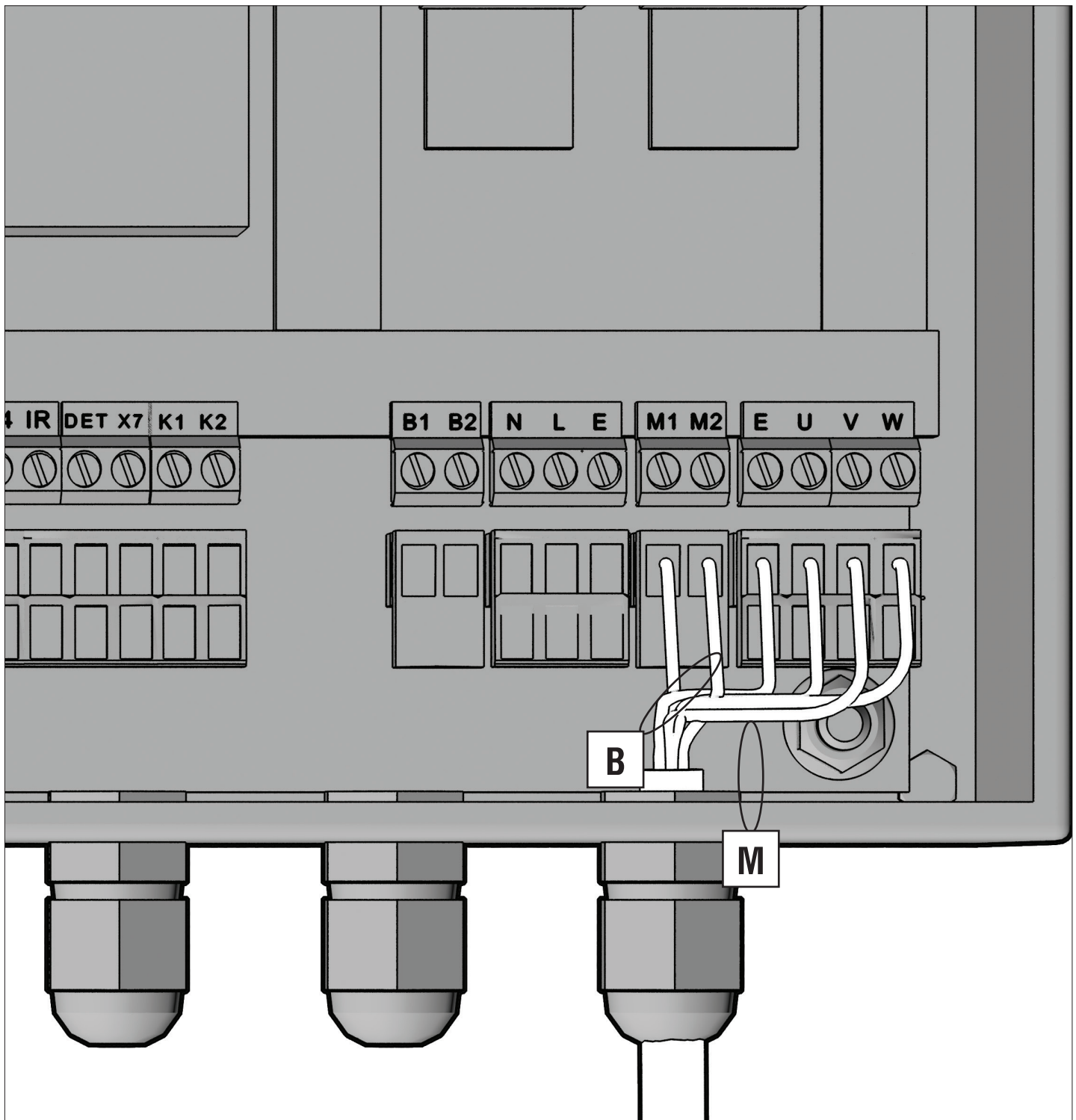
4.4. 230V CONTROL UNIT ELECTRICAL CONNECTIONS

Control Unit Connection to 1 × 230V Supply



Connection of Electric Motor to Control Unit





B — electromagnetic brake

M — electric motor

Connect electric motor to control unit with 6-wire cable as follows:

- connect 4 wires (1.5 mm²), marked with «M» tag, to U, V, W, E contacts (3 phases + ground);
- connect 2 wires (0.5 mm²), marked with «B» tag, to M1 and M2 terminals on main terminal block.

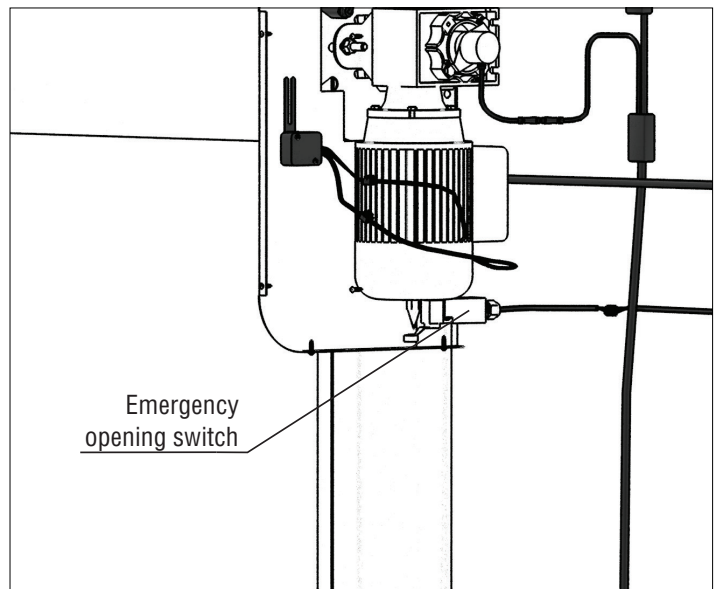
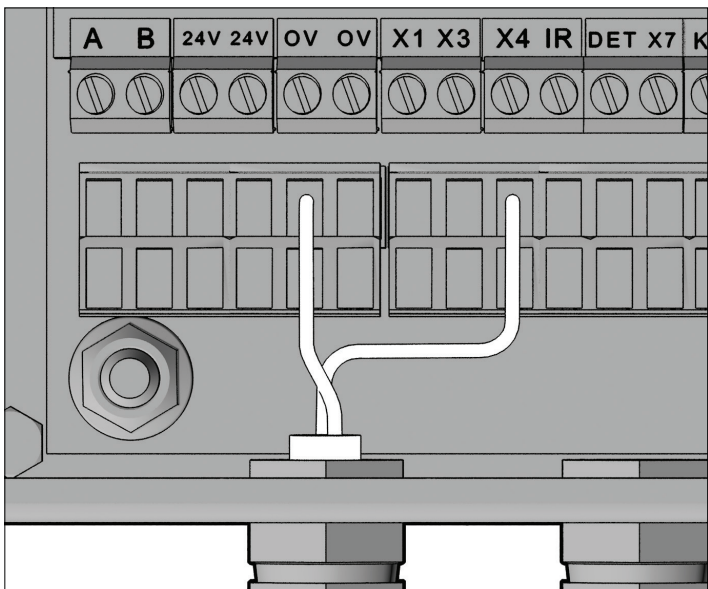
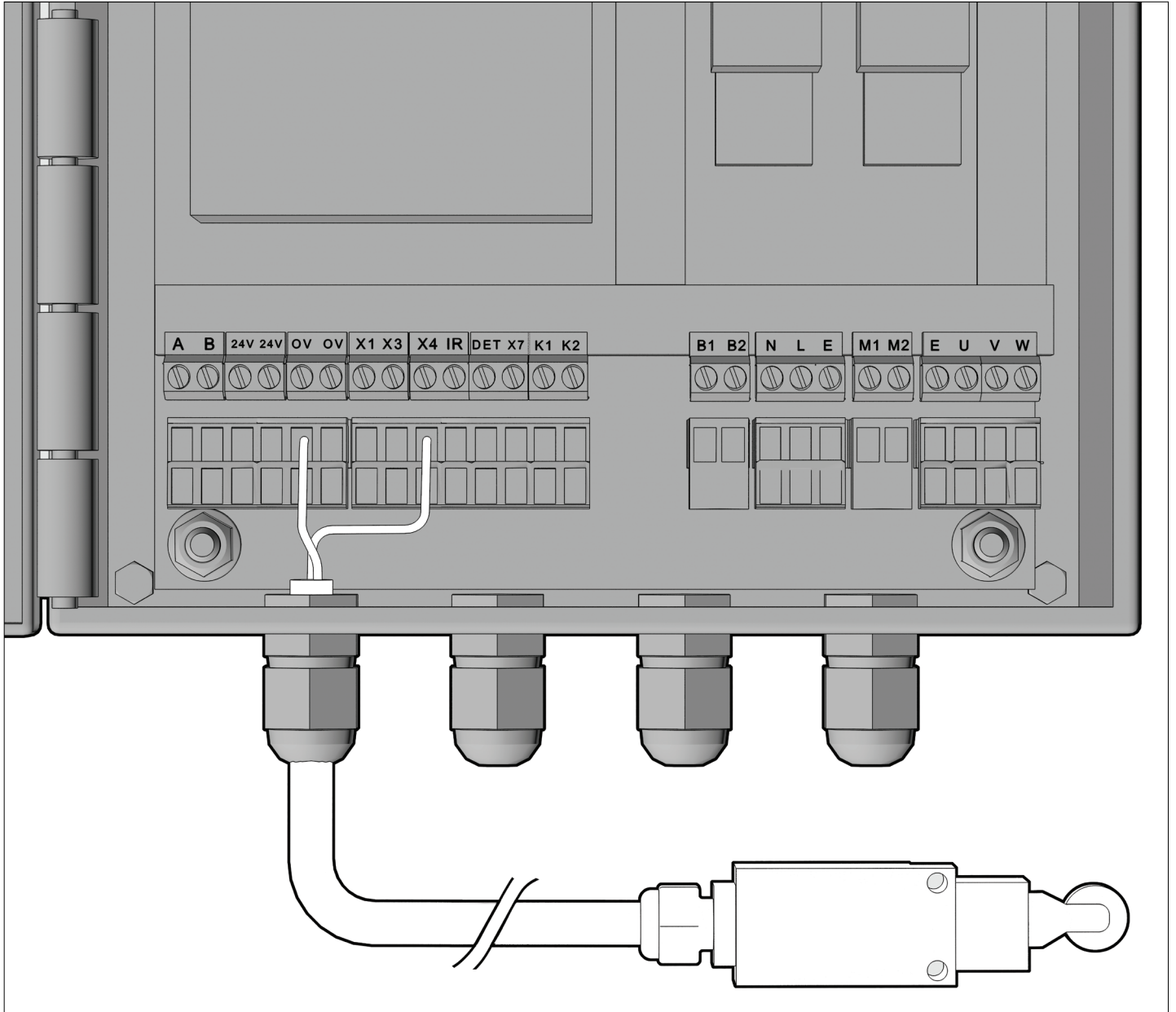
Connection of Spider Cable to Control Unit

Connection of spider cable to control unit see page 7.

Spider Cable Wiring Diagramm

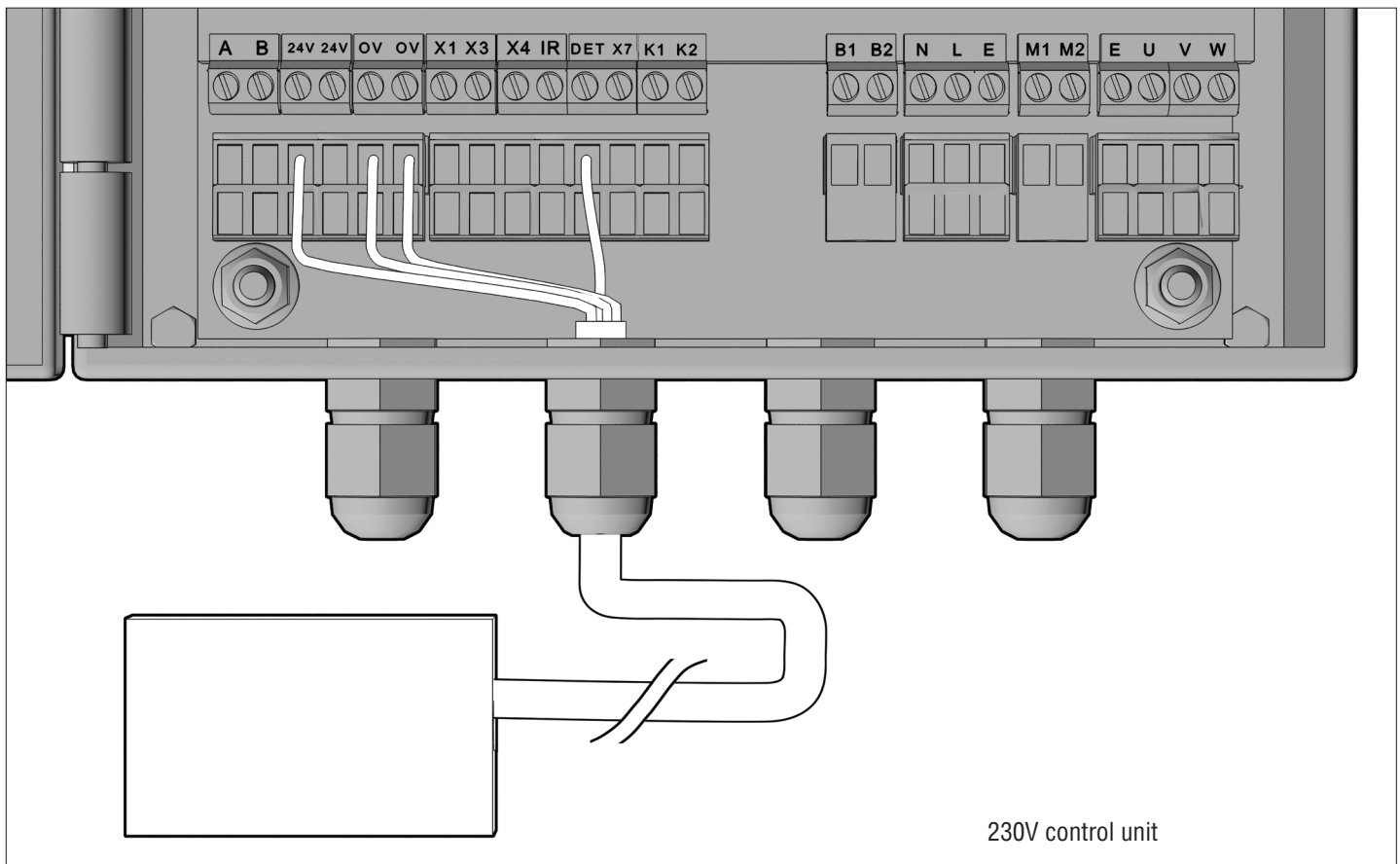
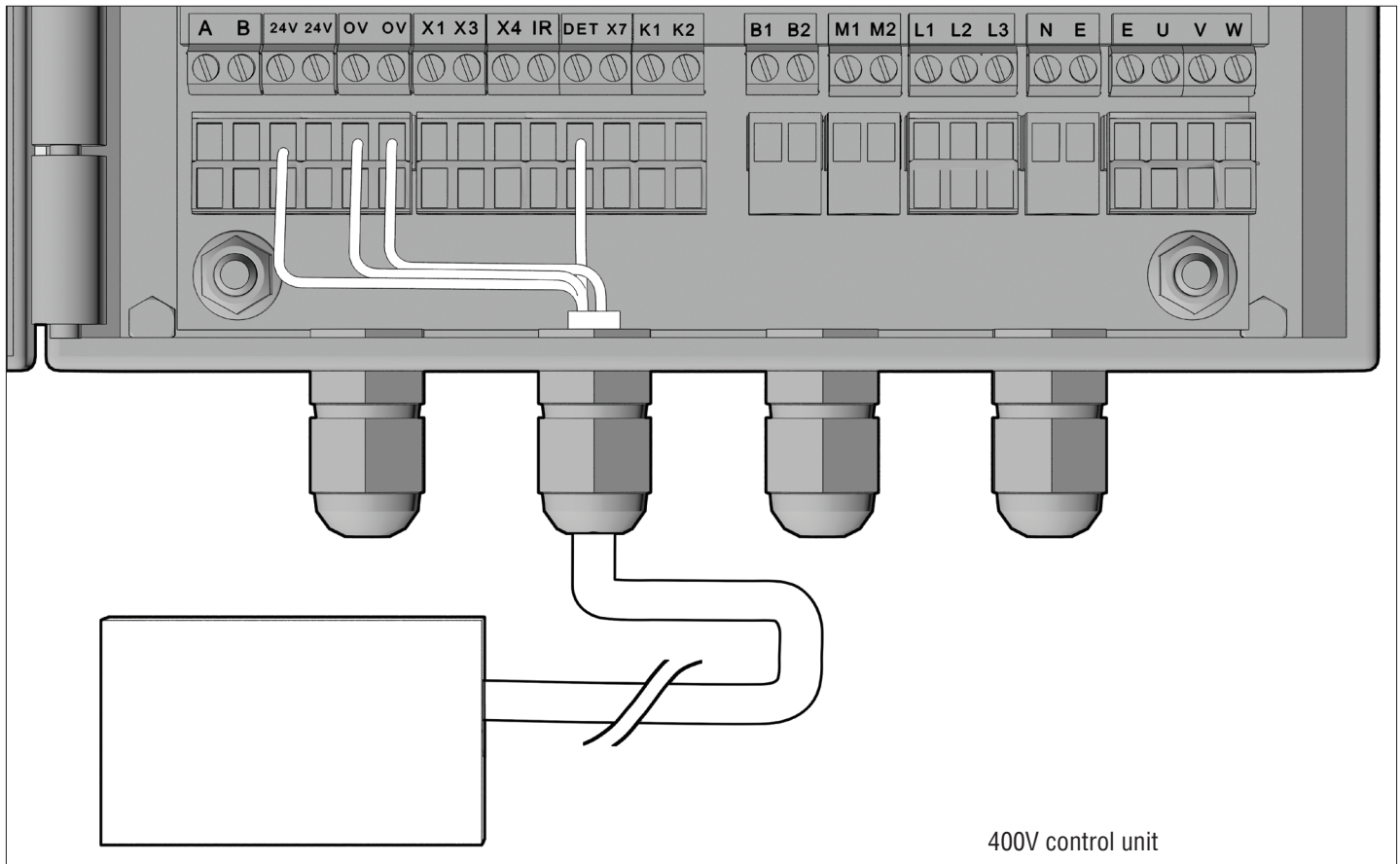
Spider cable wiring diagramm see page 8.

Emergency Opening Switch Connection (NO)

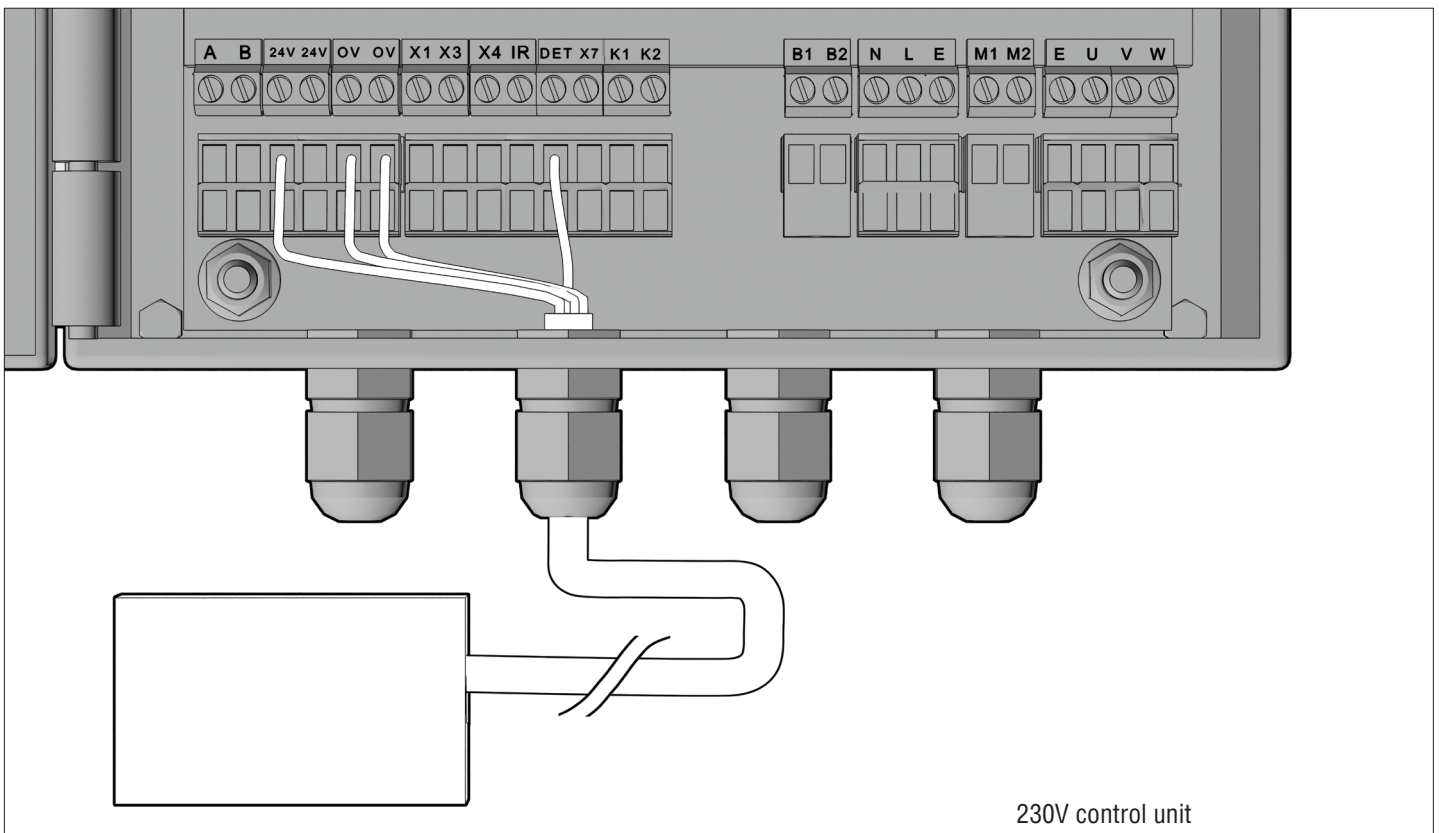
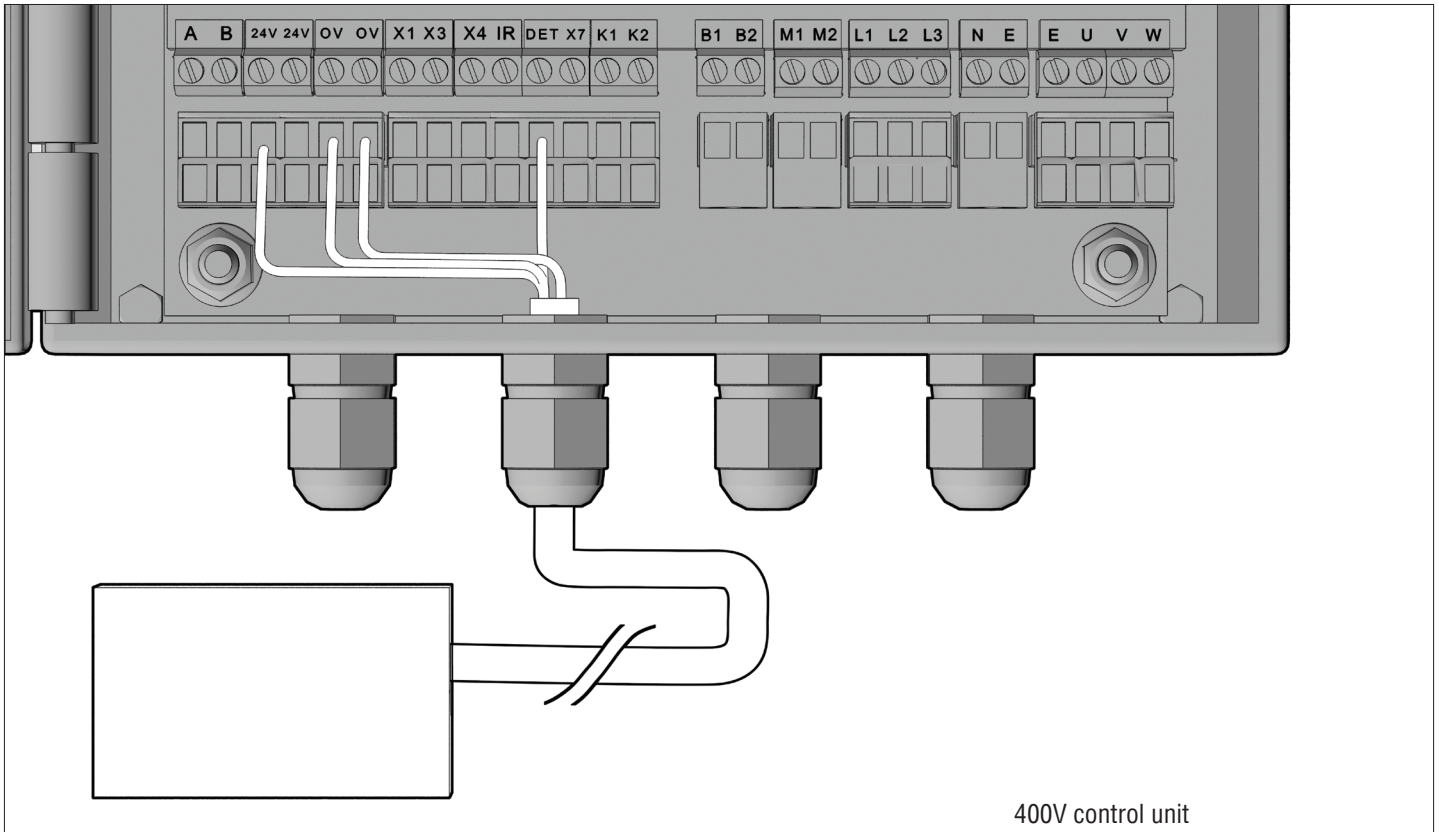


4.5. CONNECTION OF OPTIONAL DEVICES TO 400/230V CONTROL UNIT

Radar Connection (NO)



DHRE-1 (2) Receiver Connection

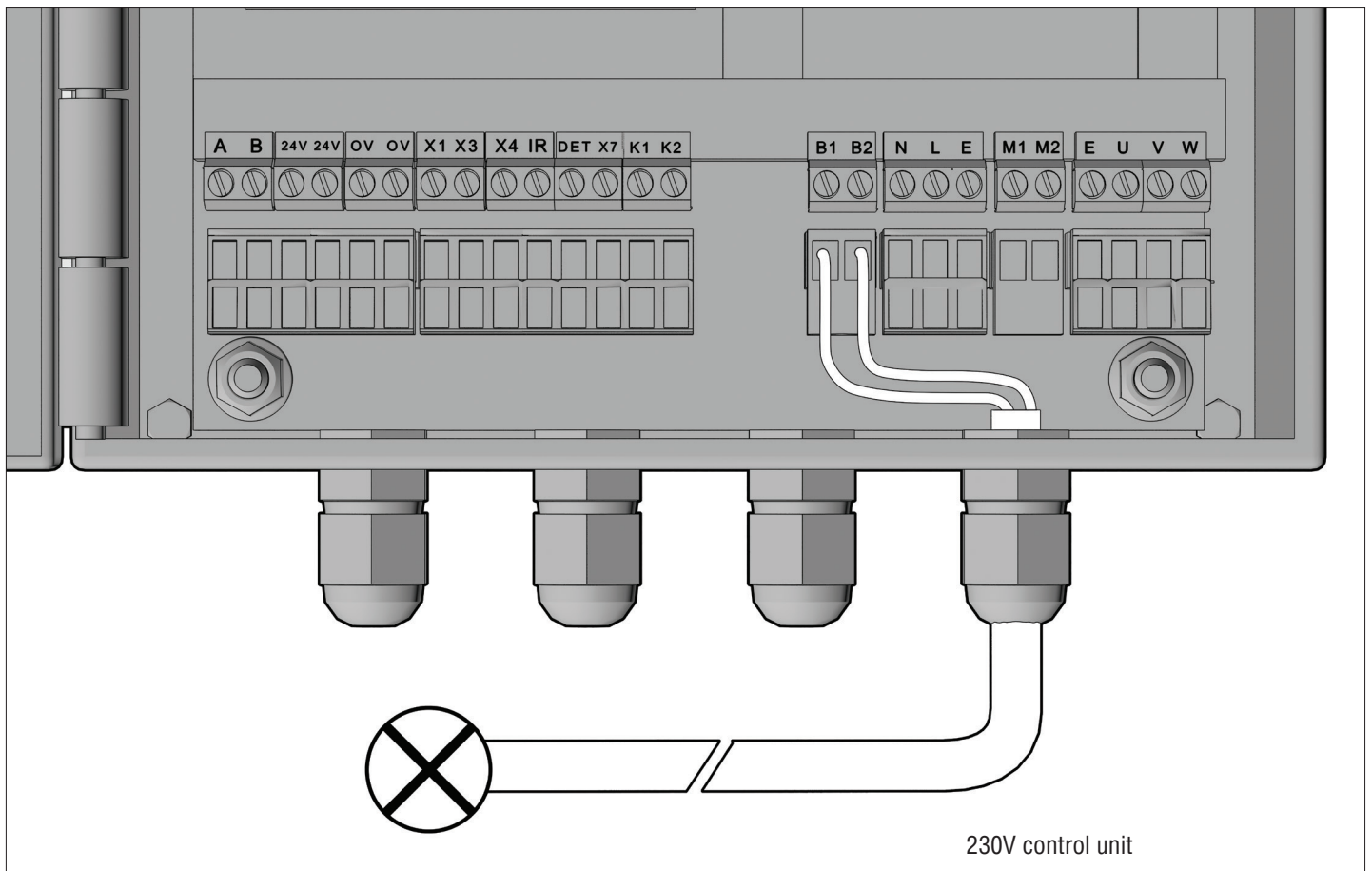
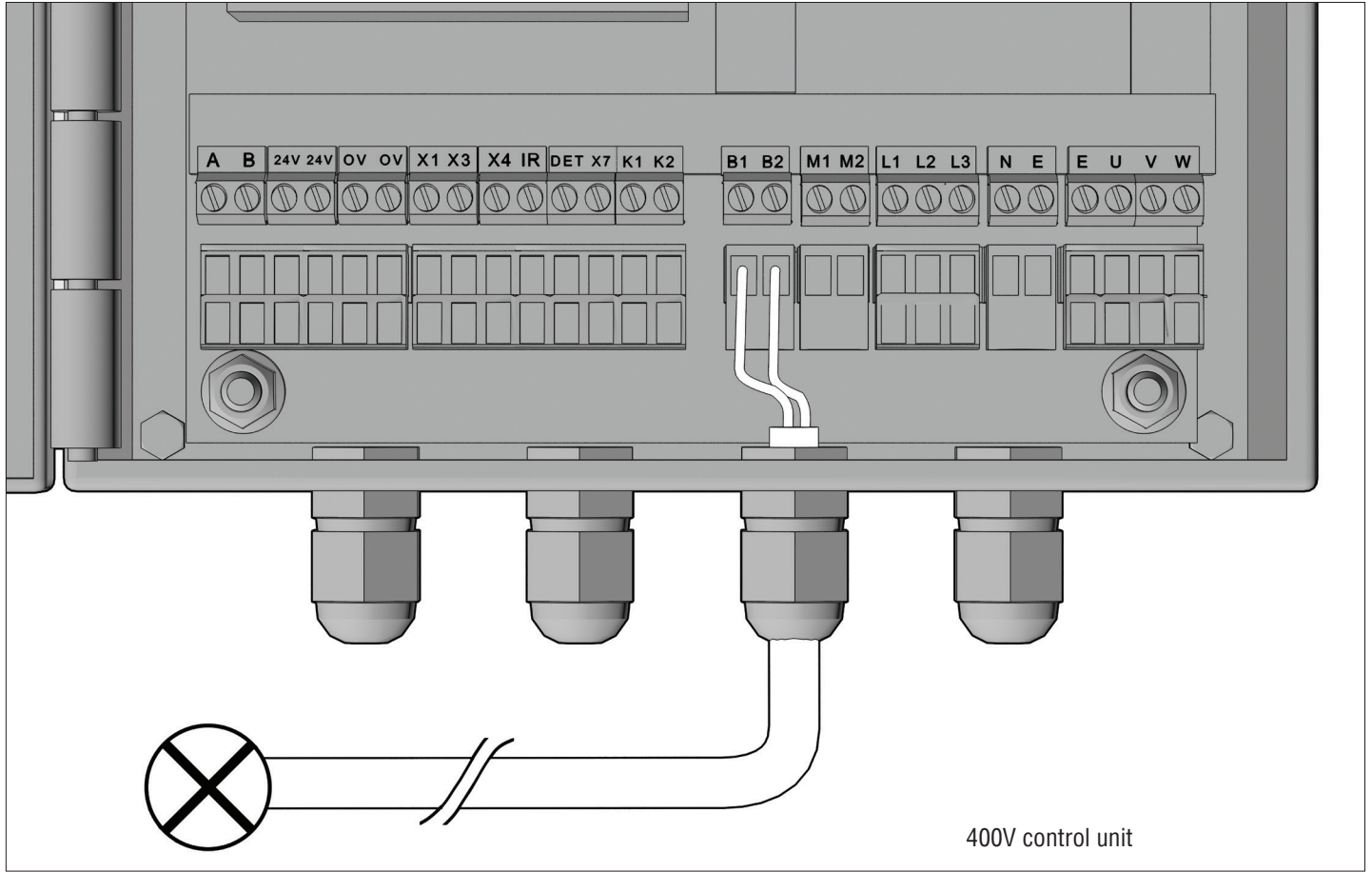


WARNING!



When DHRE-1(2) receiver is connected opening of the door is performed with a remote control transmitter. Press CLOSE button once to close the door in MANUAL mode or wait for the door to close automatically in AUTO mode (see p. 19 for auto-close setting).

Signal Lamp Connection

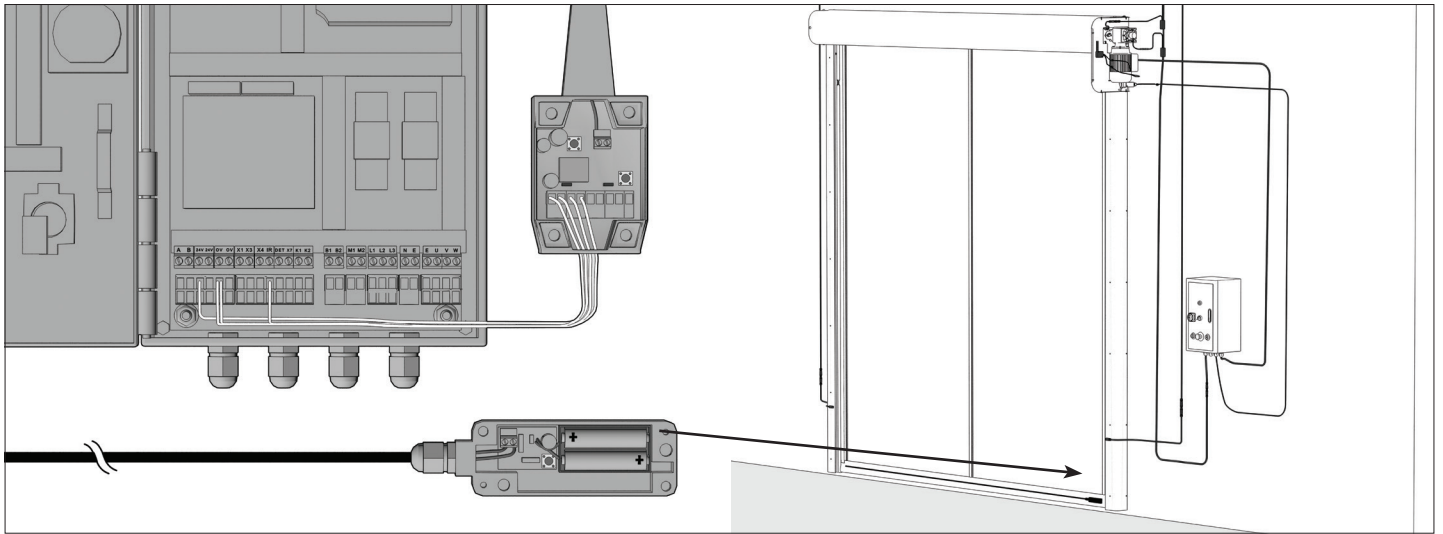


Safety Edge Connection (NO)

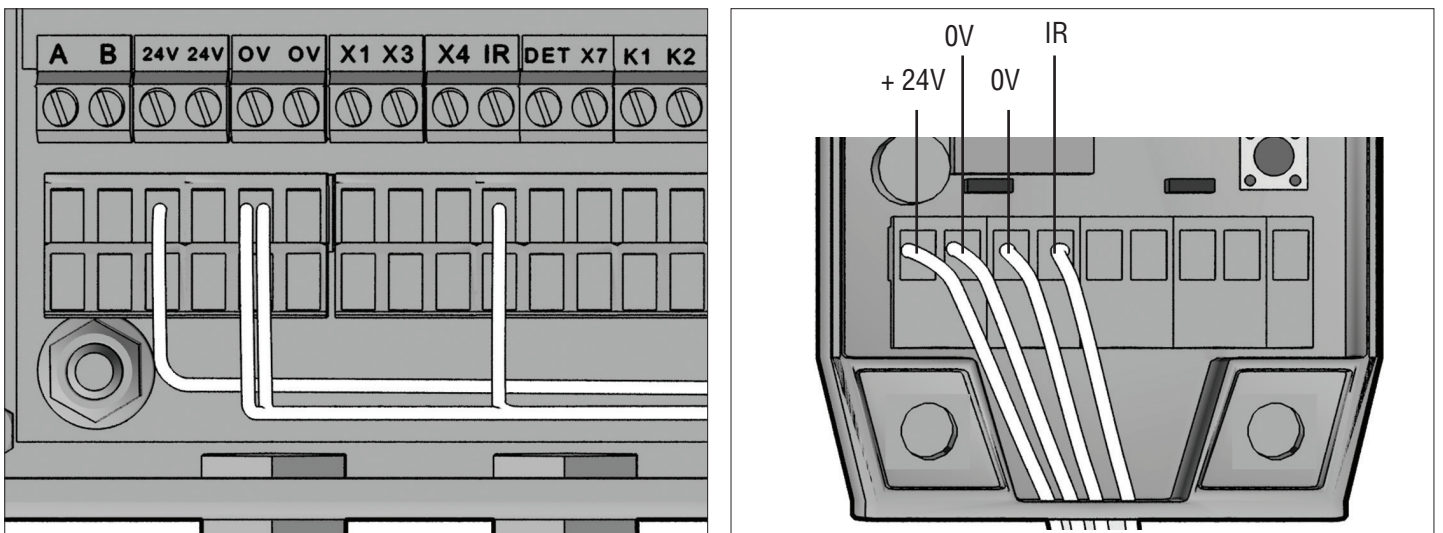
JCM Safety Edge

TR_BAND — Transmitter

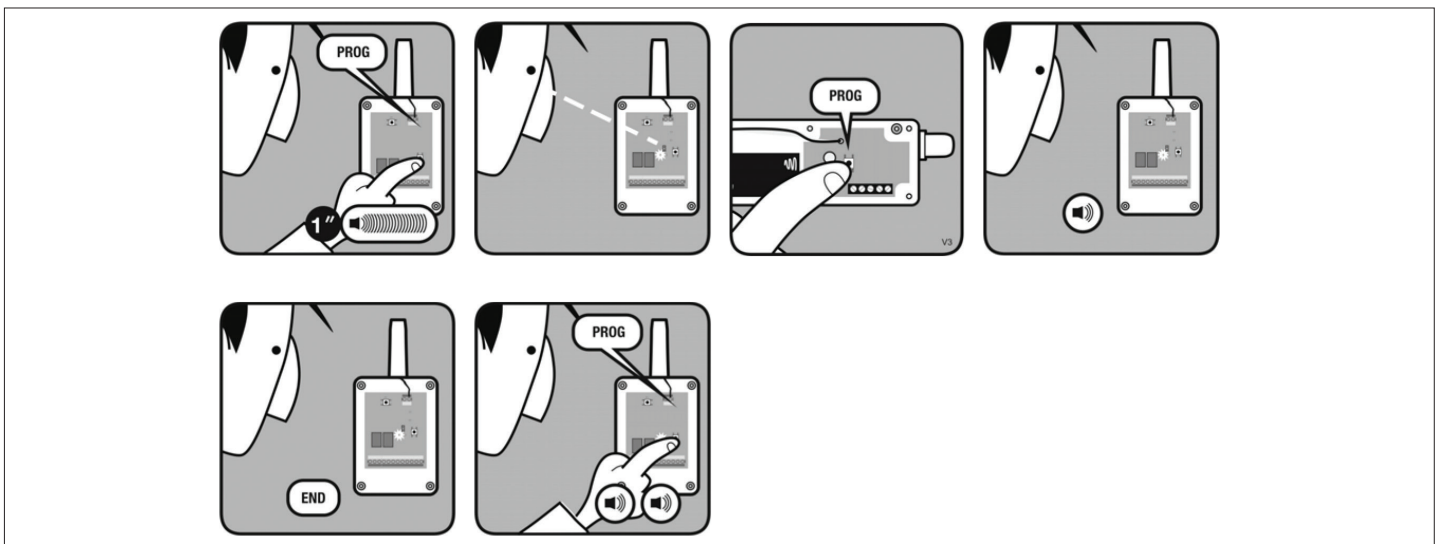
REC_BAND — Receiver



Connection diagram



Programming



Safety Edge

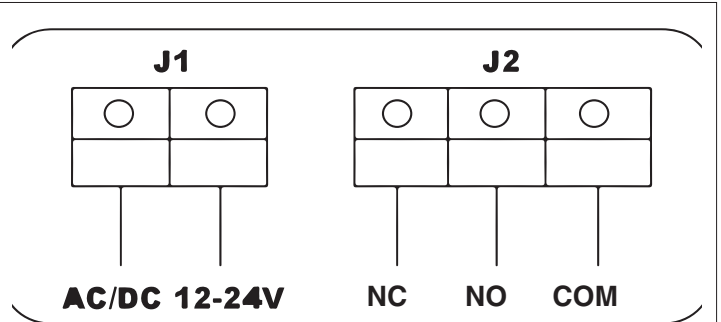
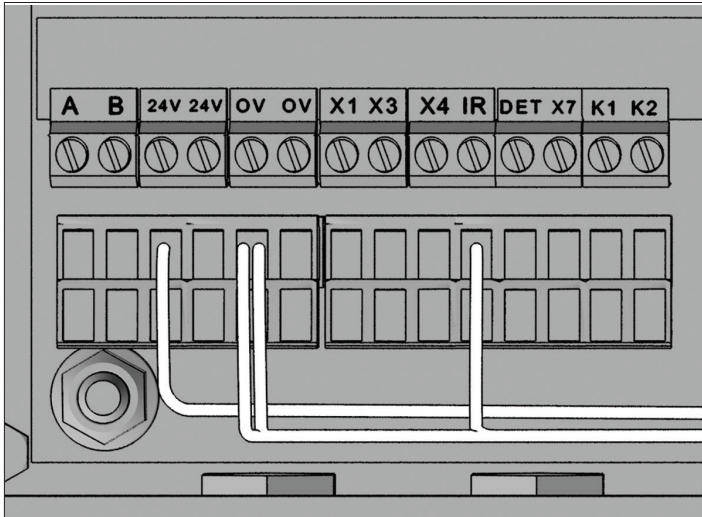
B211-R — Transmitter

B211-M — Receiver

J1 — Power connector

J2 — Control connector

Connection diagram



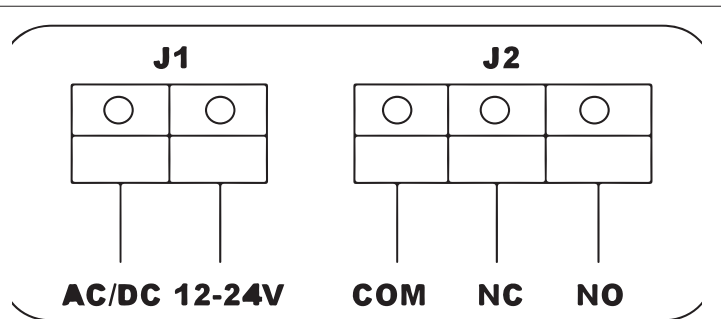
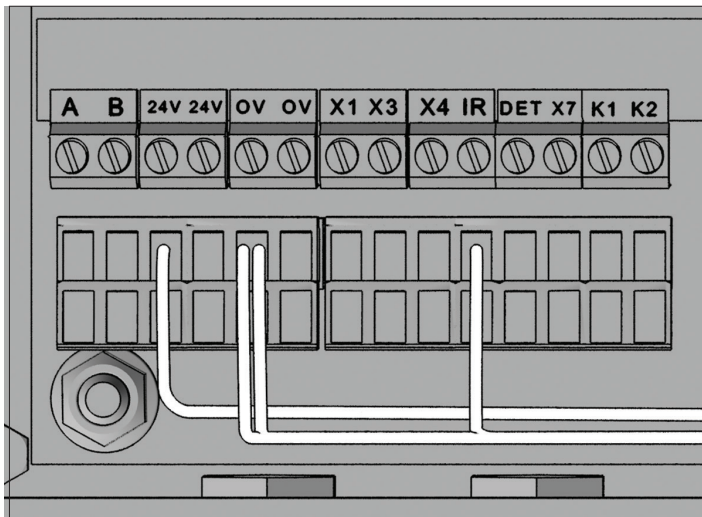
J1 — connects to 24V and 0V
 J2 — COM connects to 0V, NO to IR.

DH-Sensor-KIT Pneumatic Safety Edge

J1 — Power connector

J2 — Control connector

Connection Diagram



J1 — connects to 24V and 0V
 J2 — COM connects to 0V, NO to IR.

Programming of DH-Sensor-KIT Pneumatic Safety Edge and Safety Edge

To record the transmitter signal to the receiver, briefly (about 3 seconds), press S1 button on the receiver, LED1 will start flashing. Then press twice on the security edge profile, D1 indicator will flash twice on the transmitter (sensitive/pneumatic profile is activated). It means the transmitter sent a signal to the receiver which wrote it down. LED1 lights up steadily and the receiver automatically exits the program mode.

To clear the receiver memory, press and hold S1 button for about 5 seconds. LED1 will start to flash, than flashing will fasten and than come to steady light, which means that the receiver memory is cleared.

WARNING!



The receiver should be installed inside the control unit. For proper operation of safety edge distance between receiver and transmitter must not exceed 15 meters. In order to keep the device in working condition the battery needs to be changed every year. Check the device for proper operation once a month.

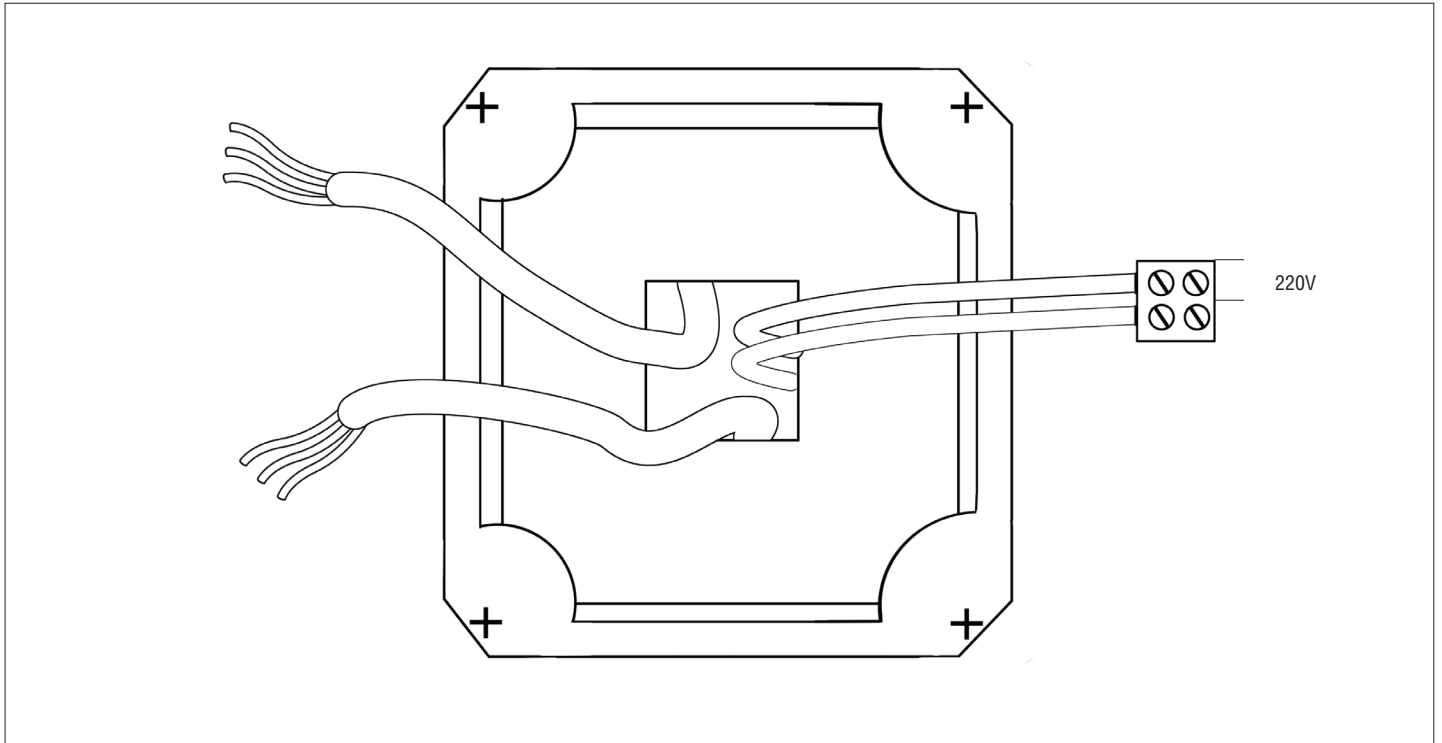
Heating System Connection

It is recommended to connect the heating system to a separate power line with automatic 5 A switch.

Motor Heating System Connection

Input voltage of the motor winding — 230V.

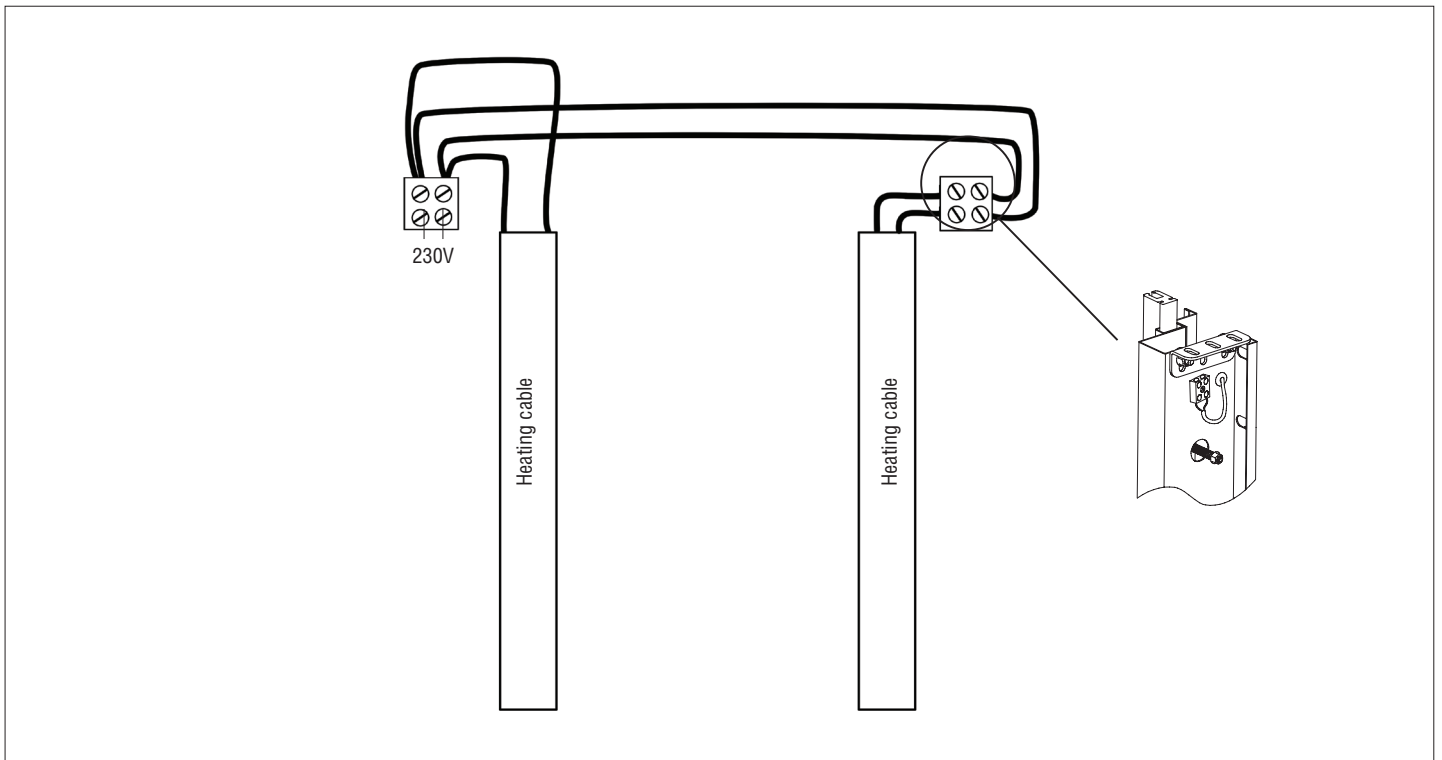
Motor heating power — 32W.



Guides Heating System

Input voltage of the heating cables in side guides — 230V.

Heating cable power — 30W per 1r/m.



5. CONTROL UNIT SETTING

5.1. DOOR CURTAIN POSITION BEFORE SETTING — MIDDLE

1. Turn the main switch to ON position.
2. Turn the switch to MANUAL position, the green light is on. Turn the switch to AUTO position, the yellow light is on.
3. Check the direction of the door curtain movement:
 - Turn the mode switch to MANUAL position.
 - Move the programming switch on the back side of front plate to ADJUST position.
 - Press OPEN button, the door curtain will move up.
 - Press CLOSE button, the door curtain will move down.
 - If the door won't move in the desired direction, it is necessary to reverse the direction of the motor. To do this, swap any two wires coming from the motor («U», «V», «W») in the control unit.
4. Check photocells for proper operation:
 - If the door curtain is in the open position then X7 led is on on the PLC. If the door curtain is in closed position, then X7 is off.

5.2. PROGRAMMING BOTTOM LIMIT POSITION

Before programming the limit position make sure all the door parts are whole and the curtain runs smoothly when using a hand crank.

- Press and hold CLOSE button till the bottom edge of the curtain touches the ground surface.
- Press STOP button.
- Press and hold CLOSE button, MANUAL mode indicator will turn off in 3 seconds.
- Release CLOSE button, MANUAL mode indicator will turn on.
- Release EMERGENCY STOP button by turning it clockwise.
- The DOWN travel limit is now programmed.

5.3. PROGRAMMING TOP LIMIT POSITION

- Press and hold OPEN button till the curtain reaches the desired position.
- Press STOP button.
- Press and hold OPEN button, MANUAL MODE indicator will turn off in 3 seconds.
- Release OPEN button, MANUAL MODE indicator will turn on.
- The UP travel limit is set.
- Release EMERGENCY STOP button by turning it clockwise.
- Move the programming switch on the back side of the front plate to NORMAL position.

5.4. AUTO-CLOSE SETTING

- After programming travel limits of the door curtain, turn mode switch to AUTO position.
- Move the programming switch on the back side of front plate to ADJUST position.
- Press and hold OPEN button, AUTO MODE indicator is off. When the button is released, the indicator will light again, the auto-close time will increase 0.5 seconds.
- Each time you press OPEN button, the auto-close time increases 0.5 seconds.
- Set the desired auto-close time.
- Move the programming switch on the back side of front plate to NORMAL position.
- The auto-close time can be adjusted from 0.5 to 300 seconds.

5.5. REDUCING AUTO-CLOSE TIME

- Turn the mode switch to AUTO position.
- Move the programming switch on the back side of front plate to ADJUST position.
- Press and hold CLOSE button, AUTO MODE indicator is off. When the button is released, the indicator will light again, the auto-close time will decrease 0.5 seconds.
- Each time you press CLOSE button, the auto-close time decreases 0.5 seconds.
- Move the programming switch on the back side of front plate to NORMAL position.

5.6. AUTO-OPEN SETTING

- This mode is used with the doors operated in freezing chambers.
- Turn the mode switch to AUTO position, AUTO MODE indicator will light on.
- Press STOP button.
- Turn the programming switch on the back side of front plate to ADJUST position, MANUAL MODE indicator will flash.
- Press and hold OPEN button, AUTO MODE indicator will go out (when the button is released, the indicator will light again).
- Each time you press OPEN button, the auto-open time increases 1 minute.
- Each time you press CLOSE button, the auto-open time decreases 1 minute.
- After setting is done, press STOP button, return the switch on the back side of front plate to NORMAL position.
- The auto-open time can be adjusted from 0 to 15 minutes.

5.7. CANCELLATION OF AUTOMATIC OPENING FUNCTION

- Turn the mode switch to AUTO position, AUTO MODE indicator will light.
- Press STOP button.
- Move the switch on the back of front plate to ADJUST position, MANUAL MODE indicator will flash.
- Press and hold CLOSE button till AUTO MODE indicator is off.
- This means that time of automatic opening is zero.
- After setting is done, press STOP button, return the switch on the back side of front plate to NORMAL position.

5.8. CHANGING OPENING AND CLOSING SPEED

Before changing the parameters make sure the switch on the back of front plate is in NORMAL position. Speed is changed with frequency converter.

How to increase opening speed (example)

1. Press PRGM button.
2. Press button ▲ or ▼ to choose Fd parameter.
3. Press ENTER button.
4. Press button ▲ or ▼ to choose Fd.12 parameter.
5. Press ENTER button.
6. Check the current value (for example: 060.0).
7. Press button ▲ to increase the speed to 070.0.
8. Press ENTER button.
9. Press PRGM button 2 times.



WARNING!

One must never change these parameters at random as this may cause serious injury, death or door damage. If you have any special requirements, please contact DoorHan service.

If necessary, it is possible to restore factory settings with frequency converter. Main settings are listed in the table below.

No	Parameter	Function	Factory settings	Min-Max
1	Fd.04	opening (frequency of soft start and slow opening)	15	10 – 20
2	Fd.06	closing (frequency of soft start and slow closing)	15	10 – 20
3	Fd.12	opening speed	60	20 – 90
4	Fd.14	closing speed	40	20 – 90
5	F0.18	acceleration time	0.8	0.7 – 1.2
6	F0.19	deceleration time	0.4	0.3 – 0.8

6. HIGH SPEED DOOR OPERATION

To start operation, turn the main power switch ON. Make sure the mode indicator lights on the control unit. Set the mode switch in the desired position: MANUAL or AUTO.

6.1. MANUAL MODE

Set the MODE switch to MANUAL position. Press and release OPEN button to open the doors. Press and release CLOSE button to close the doors. When the door operation is finished turn the main switch OFF.

6.2. AUTO MODE

Set the MODE switch to AUTO position. For programming auto-close time see page 19. When the door operation is finished turn the main switch OFF.



WARNING!

Do not turn off the power supply until the door curtain is completely closed.

6.3. EMERGENCY STOP

To stop the door in the emergency, press STOP button. To resume the doors, turn STOP button clockwise.

7. TROUBLESHOOTING

Problem	Possible cause	Remedy
Door curtain does not move. Motor does not work. There is no indication on control unit.	No power supply	Check power source
	Main switch on the unit front cover is OFF	Turn on the main switch
	Circuit breaker is OFF	Turn the circuit breaker ON
Door curtain does not move. Motor does not work. There is indication on control unit.	STOP button is pressed	Release STOP button
	Hand crank plugged to the motor	Unplug the hand crank. When hand crank is plugged, safety switch is in NC position
	Safety switch is damaged	Check safety switch. To operate the door safety switch should be in NO position
Door curtain starts moving and stops in the intermediate position	Wrong motor electrical connection	Check motor connection. 230V — according to DELTA scheme, 400V — according to STAR scheme (see ELECTRICAL CONNECTIONS)
	Motor brake fault	Check voltage supply to the brake (100V DC). Check brake relay (10)
	Poor contact on encoder connection wires	Check encoder connection
	Encoder is damaged	Change encoder
	Poor contact on photocell connection wires	Check photocell connection
	Photocells are damaged	Change photocells
Door curtain does not move. Green and yellow indicators on control unit flash simultaneously.	Motor brake fault	Check power supply voltage of the brake
	Poor contact on encoder connection wires	Check encoder connections
	Encoder is damaged	Change encoder
	Poor contact on photocell connection wires	Check photocell connections. If the door curtain stopped higher than the photocells then X7 indicator glows steadily on PLC, if the door is closed — X7 indicator doesn't glow
	Photocells are damaged	Change photocells
Door curtain can't find UP and DOWN travel limits	The encoder shaft fastening is loose on the door shaft	Screw the encoder shaft by tightening the setting screw on the door shaft
	The housing of encoder is loose on the reducer	Fix the encoder housing on the reducer

Problem	Possible cause	Remedy
If the main supply is off, door curtain can not find travel limits. Curtain moves up and down many times, then yellow and green indicators start flashing simultaneously.	Photocells ray can come through the curtain lower part (black pocket)	Seal vertical seams on the curtain lower part, then reinstall TOP and BOTTOM limit positions. See CONTROL UNIT SETTINGS section of the instructions manual
	Incorrect setting of the BOTTOM limit position	Reset the BOTTOM limit position. Attention! When setting the BOTTOM limit position make sure the door curtain doesn't lie on the ground making folds
Door curtain does not move. Motor does not work. There is indication on control unit. LD2 and POWER indicators on PLC are on.	The switch on PLC is in STOP position.	Move the switch on PLC to RUN position.
Impossible to set the TOP limit position of the doors	Wrong position of the photocells	Make sure the photosells are aligned
	Wrong sensitivity adjustment of the photocells	Adjust sensitivity on the photocells receiver
	The PLC is damaged	Change the PLC for a properly operating one

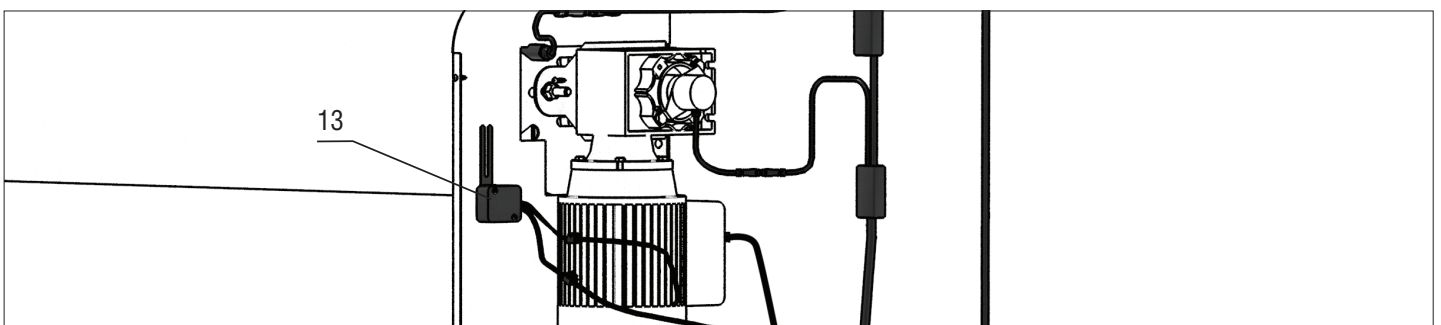
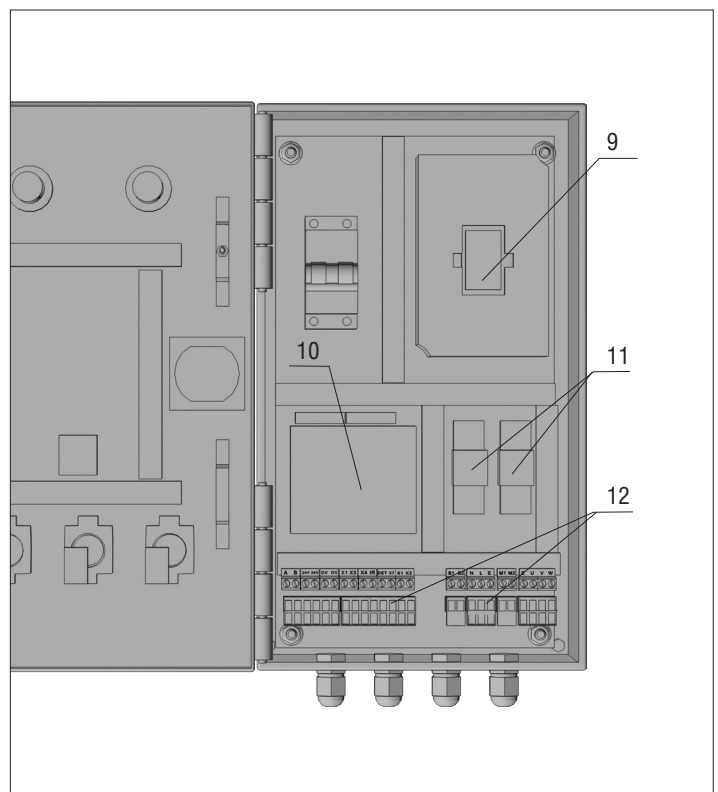
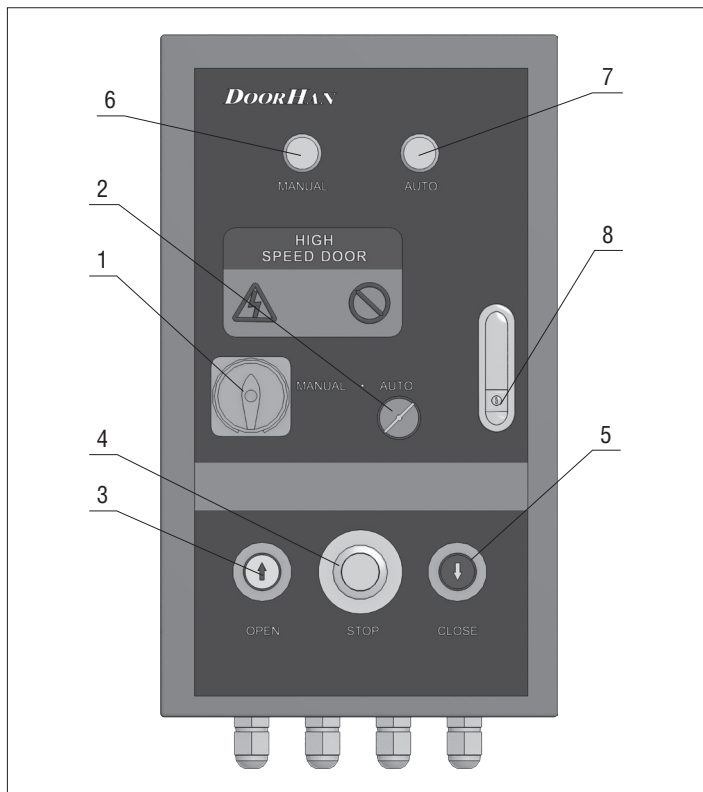
In case of a sudden power failure to restart the doors do as follows:

- If main supply is lost when the door curtain is above the photocell line then turn on power supply. The door curtain will go down to photocells level, than stop and go up. In AUTO mode the curtain will go down as soon as auto-close time expires. In Manual mode press CLOSE button and door curtain will go down.
- If main supply is lost when the door curtain is below the photocell line then turn on power supply. Press OPEN button, the door curtain will go up to the preset UP travel limit and then go down.

8. MAINTENANCE

- Control unit must be installed in a cool, dry and ventilated place, protected from direct sunlight and moisture.
- Check the wiring regularly.
- Keep the control unit clean.

9. SPARE PARTS



No.	Name	Part Number
1	Main switch	HSDC180-445
2	Mode switch (manual & auto)	HSDC180-437
3	OPEN button	HSDC180-436
4	STOP button	HSDC180-438
5	CLOSE button	HSDC180-436
6	Indicator lamp (green, 24V)	HSDC180-185
7	Indicator lamp (yellow, 24V)	HSDC180-435
8	Control unit lock (Suzhou)	HSDC180-388
9	Frequency converter 220V 1.5kW Frequency converter 220V 2.2 kW Frequency converter 380V 1.5 kW Frequency converter 380V 2.2kW	HSDC180-430 HSDC180-431 HSDC180-432 HSDC180-433
10	PLC	HSDC180-434
11	Relay JQX-13F(D) 220V 10A	HSDC180-444
12	PCB	HSDC180-439
13	Brake rectifier	HSDC180-440

10. FAULT CODES

Fault code	Fault type	Reason	Remedy
E001	Inverter module fault	Malfuction caused by external power fields	Inspect external equipment and eliminate interference
		Failure of motor or control unit grounding	Check grounding cable
E002	Over-current during acceleration	Fast acceleration	Check F0.18 parameter of frequency converter for compliance with factory settings, increase acceleration time if necessary
		Low input voltage	Check input voltage and cables cross-section
E003	Over-current during deceleration	Fast deceleration	Check F0.19 parameter of frequency converter for compliance with factory settings, increase deceleration time if necessary
			Decrease deceleration speed
E004	Over-current at constant speed	The door curtain is jammed (because of strong wind, dirty railings, etc.)	Fix the jamming
		Low input voltage	Check input voltage and cables cross-section. Decrease acceleration/deceleration speed
E005	Over-voltage during acceleration	High input voltage	Check input voltage
E006	Over-voltage during deceleration	High input voltage	Check input voltage
E007	Over-voltage at constant speed	High input voltage	Check input voltage
E008	High input voltage	High input voltage	Check input voltage
E009	Low input voltage	Low input voltage	Check input voltage
E010	Driver overload	Fast acceleration	Check F0.18 parameter of frequency converter for compliance with factory settings, increase acceleration time if necessary.
		Low input voltage	Check input voltage
		The door curtain is jammed (because of strong wind, dirty railings, etc.)	Fix the jamming
E011	Driver overload	Low input voltage	Check input voltage
		The door curtain is jammed (because of strong wind, dirty railings, etc.)	Fix the jamming
E012	No input power phase	No input power phase	Check input power supply
E013	No output power phase	Driver cable is damaged	Check both the electric wiring and equipment
		Motor winding cable is damaged	
		No electric contact in power cable connector of the control unit or electric motor	
E014	Control unit overheating	Momentary overcurrent of inverter	Refer to overcurrent solutions
		Output short circuit	Check wiring/driver
		Inverter cooling fans stopped or damaged; or ventilation channel clogged	Replace cooling fans or/and clean ventilation channels
		High ambient temperature	Decrease ambient temperature
		Loose power supply cables; no electrical contact in power cable terminals	Check and tighten cables and terminals
		Input voltage unstable	Check input power supply
		PCB damaged	Replace PCB

Fault code	Fault type	Reason	Remedy
E015	Unstable external power supply	Check external power supply	Check external power supply
E016	Communication fault	PLC – inverter communication fault	Press STOP/RESET button to restart the inverter and consult technical support service
E018	Current detection fault	Loose contact in power cable connections	Check electric wiring and terminals
			Consult technical support service
E019	Auto tuning fault	Consult technical support service	Consult technical support service
E022	EEPROM fault	Consult technical support service	Press STOP/RESET button to restart the inverter and consult technical support service
E023	Current overload	The door curtain is jammed (because of strong wind, dirty railings, etc.)	Fix the jamming
		Low input voltage	Check input voltage and wire cross-section of supply cables
			Decrease opening/closing speed

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