



## BoxControl

The modular drive control system for sectional doors, rolling doors and rolling grilles



Slot for:

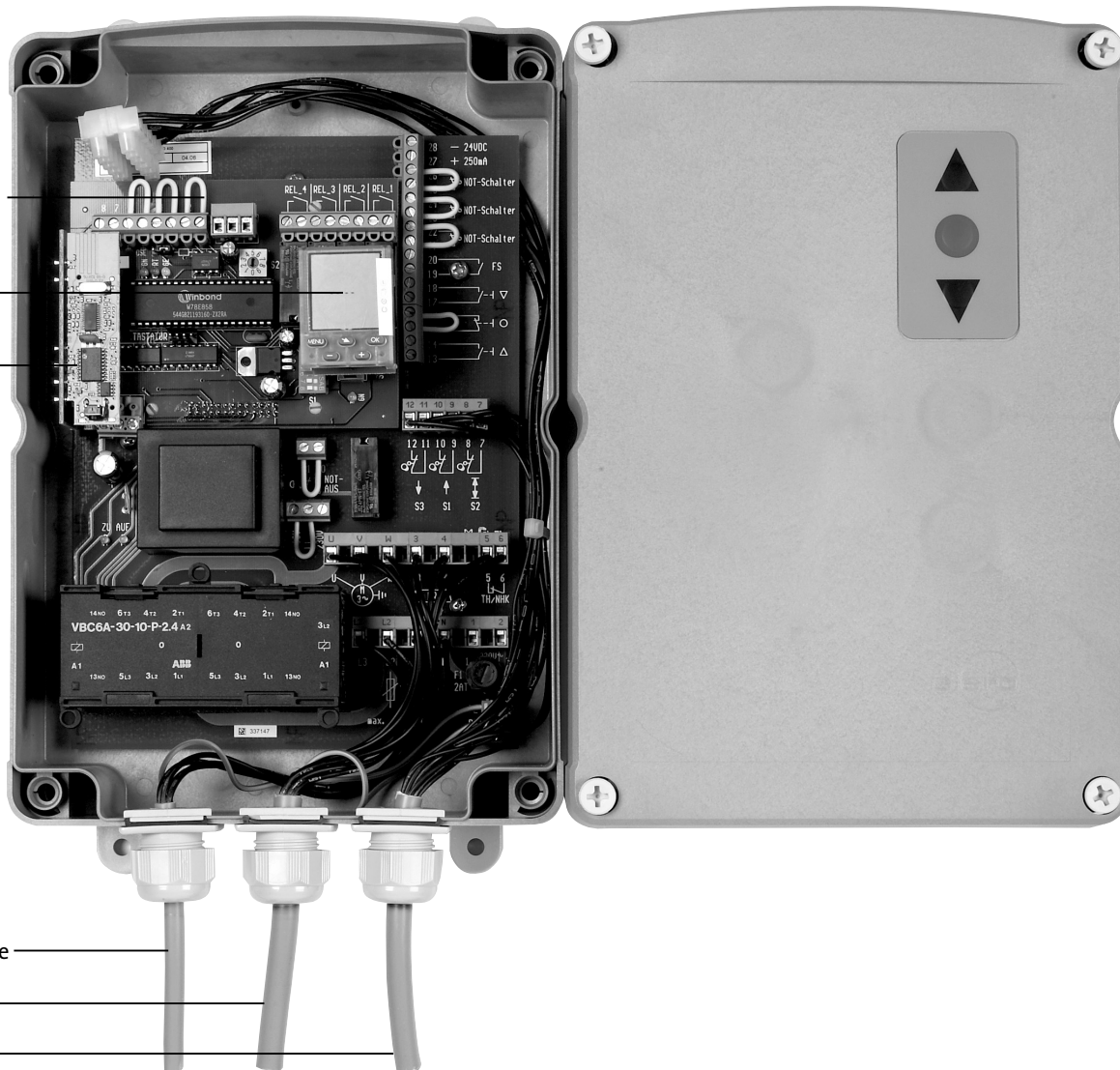
BoxCard basic

BoxCard plus

BoxCard premium

Timer module

Radio module



Power supply cable

Motor power

Control lead



Caution!

For the safety of persons it is important to follow these instructions!  
Take care of these instructions!

## Technical data + mounting

### Technical data:

Supply voltage	1 x 230 V / N / PE 3 x 400 V / N / PE 3 x 400 V / PE 3 x 230 V / N / PE 3 x 230 V / PE
Frequency	50/60 Hz
On-site fuse protection	10 A
Control voltage	24 V DC
Controller fuse internal	2 AT
Power supply external units	24 V DC/250 mA
Breaking capacity	400 V 4 kΩ/230 V 2.2 kΩ
Contactor	Mechanically locked
Contactor status display	LED "OPEN" and "CLOSE"
Integrated brake relay	Yes
Protection class	IP 65 (plug in screws installed vertically downwards)
VDE checked	DIN EN 50 178; DIN EN 60 204-1; DIN EN 12453
Housing dimensions	H 275 x W 200 x D 110 (H 310 with screwed connection)

### Important instructions for safe mounting

1. Attach closed control boxes (BoxControl) in the vicinity of the door (recesses for plug-in screws vertically downwards, minimum height 1.5 m)
2. Plug in motor and end switch leads on the drive.
3. Close motor terminal bar with the housing cover.
4. Plug in motor, end switch and mains leads in the BoxControl and connect the earth wires of the mains and motor leads to the earth wire terminals.
5. Plug in BoxCard on the base circuit board.  
Plug in membrane keys (take note of coding).
6. Insert EEC shaped plug and/or switch on master switch!  
The green (power) LED lights up.
7. Check on direction of rotation: Press "OPEN" button.  
The drive rotates in the opening direction and the "OPEN" LED lights up.  
→ If this is not the case, disconnect the plug from the mains and change over phases L1 and L2.
8. Reconnect the control system with the mains supply and check the direction of rotation once again.
9. Install the door.
10. Set end switch. → see "Operating instructions for rolling door drives with mechanical limit switch".
11. Connect up operating units with power supply disconnected and close the control box.

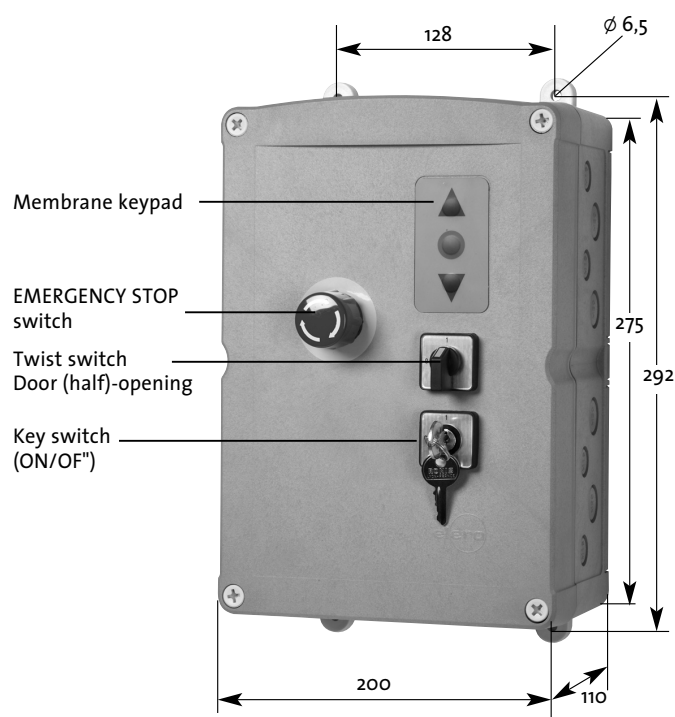


Warning!

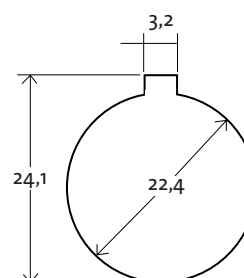
#### Risk of injury due to electrocution!

- The connections to the mains must be made by authorised specialist personnel.
- During connection tasks or changeover of the BoxCard the control system must be disconnected from the mains.
- The mains isolation unit must be secured against any unintentional and unauthorised reconnection and must always be accessible.
- Externally connected components must as a minimum fulfil the basic insulation requirements for 230 volts.

# Installation instructions



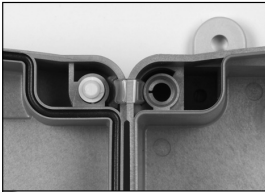
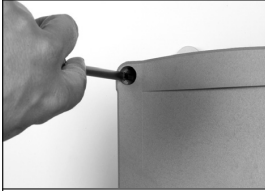
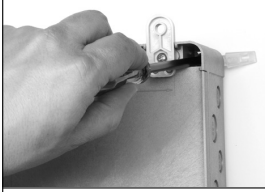

Drilled hole dimensions for the control boxes  
It is essential that these dimensions be adhered to because of the IP 65 class of protection!



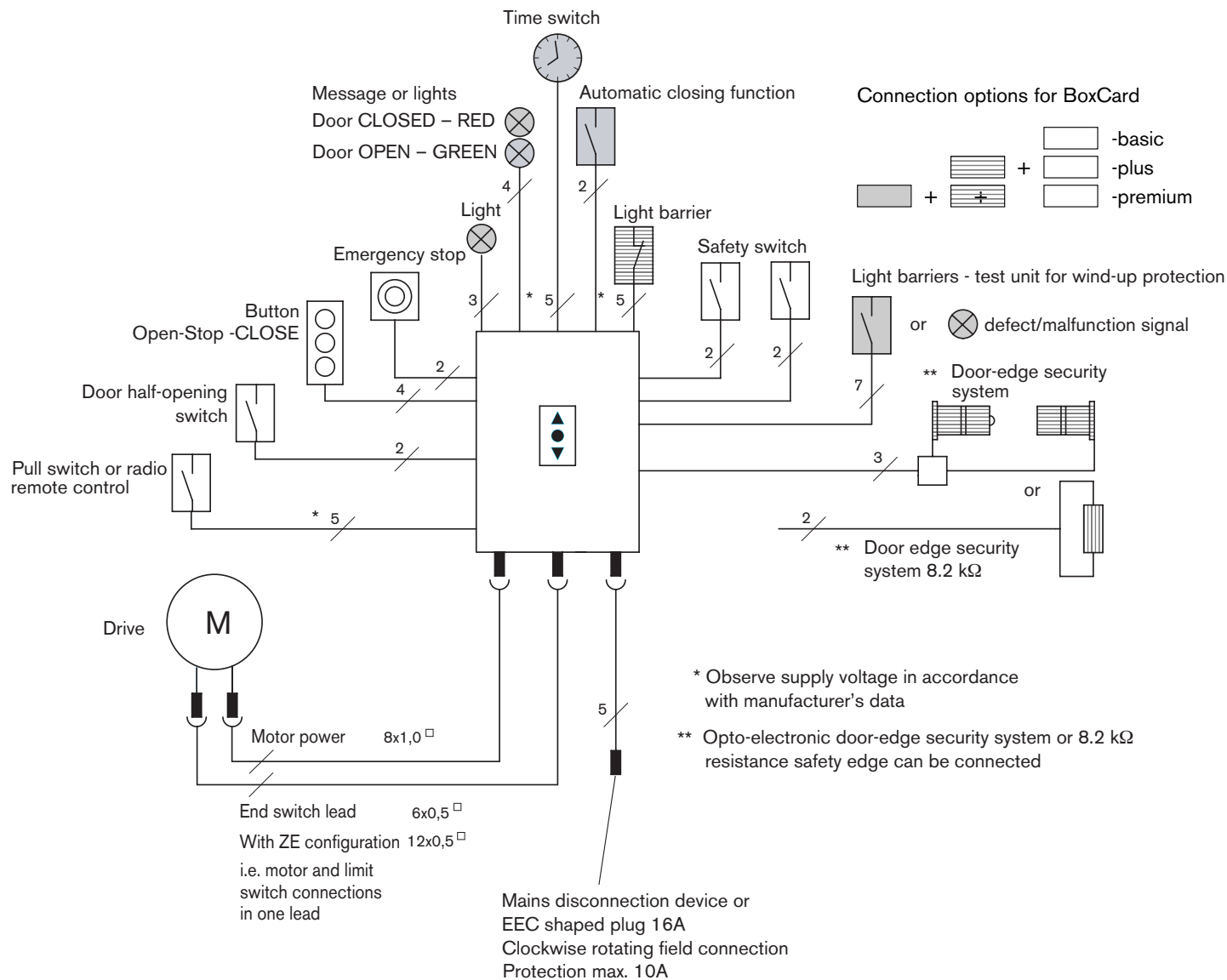
The control boxes shown above can be retrofitted at these positions.  
On the inner face of the cover these positions are marked. Please observe the drilled hole dimensions.

## Installation of the housing cover

The housing cover is attached on the left-hand side by means of a hinge.  
If necessary the cover can also be retrofitted on the right-hand side. See following instructions:

	Before installation of the housing open the housing cover in order to install the hinges on the other side.
	Remove the cover attachment screws. From outside press on the hooks on the hinges with a screwdriver; the hinge can now easily be withdrawn.
	Apply the same procedure from the rear side of the housing base also.
	Push the hinges gently into the cover until the hooks engage. Then insert the hinges with the cover into the housing holes and allow to engage.

# Electrical diagram BoxControl D 400 basic/plus/premium



## Note:

- Do not use motor and control leads in external environment!
- Transmitters and receivers of internal and external one-way light barriers have to be installed back-to-back so that the external light beam does not interfere with the internal receiver and the internal light beam does not interfere with the outside receiver.

## Description for BoxCard basic, plus and premium

Recommendations for doors with	basic	plus	premium
– Control without maintained mode (dead man's control)	●		
– Pulse signal control with or without sight of door (maintained mode)		●	●
– Automatic control system with traffic lights (Automatic closing)			●

### Connection options and functions

♦ Control without maintained mode (dead man's control)	●		
♦ In self-holding mode, connection options for external protection systems	●		
♦ Connection of a door edge security system – OSE opto-electronic safety edge or - an 8.2 kΩ resistance safety edge		●	●
♦ Testing of the door-edge security system signal path		●	●
♦ Connection option light barrier CLOSE		●	●
♦ Connection option pre-limit switch CLOSE		●	●
♦ Connection option automatic closing function switch ON/OFF			●
♦ Connection option timer			●
♦ Connection option emergency key-operated push-button OPEN / CLOSE		●	●
♦ Slot for REX 2000 seasonal timer			●
♦ Slot for 868 MHz or 433 MHz radio receiver		●	●
♦ Connection option RED traffic light ♦ or Door CLOSED signal			●
♦ Connection option GREEN traffic light ♦ or Door Open signal		●	
♦ Connection option garage lighting 1's, or 180's, or as long as the door is open			●
♦ Connection of the wind-up protection light barriers - test unit for "2-one-way light barriers" or one "One-Way Light barrier" or connection of a malfunction / error message			●
♦ Door cycles- Counter – Display via LED		●	●
♦ Maintenance interval counter		●	●

<b>Note:</b>	<ul style="list-style-type: none"> <li>♦ Programming instructions for the radio transmitter unit can be found in the operating instructions supplied with the unit.</li> <li>♦ Before entry into service a check has to be made on the safety modules fitted (e.g. the door-edge security system) to ensure that they are functioning correctly.</li> </ul>
--------------	---

### Function of the door-edge security system

The BoxCard premium is provided with integrated analysis for an opto-electronic safety edge (OSE) or an 8.2 kΩ resistance bar. The jumper on the BoxCard must be assigned to the system that is connected. When the OPEN final limit switch is reached the safety edge is tested. Here the red LED lights up briefly; in the event of a defective door-edge security system the red LED lights up permanently, and the door can only be closed with the emergency key-operated push-button or the membrane keypad with a DIP 1 setting ON in the dead man mode of operation.

If the door-edge security system is actuated during a closing traverse the control system switches to the upward direction. If the pre-limit switch is triggered the facility stops. If the drive is stopped three times in succession during an automatic closing traverse by the door-edge security system the control system switches to a malfunction state.

The RED traffic light lights up and the malfunction signal switches on.

### Function of the light barrier

If during a closing traverse the light beam is interrupted the drive is stopped and is switched to the upward direction until the OPEN limit switch is reached. If the automatic closing function is switched on the open holding time is then restarted.

DIP 8 ON ⇨ Light barrier starts from an intermediate position the upward direction.

DIP 8 OFF ⇨ Light barrier is out of service in an intermediate position.

In the event of an actuated or defective light barrier the door can be closed with the membrane keypad and the emergency key-operated push-button in the dead man mode of operation.

### Function of the emergency key-operated push-button

The emergency key-operated push-button is to be installed such that the authorised person who controls the door has a complete view of the door and its environment during the movement of the door panel and is not in a hazardous position.

A function is only possible with the emergency key-operated push-button if no emergency stop, final end switch or safety switch has interrupted.

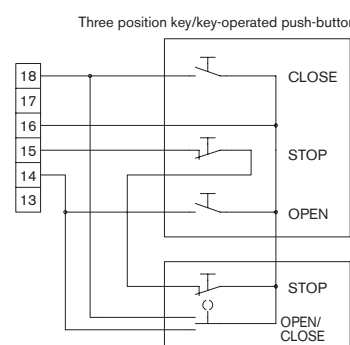
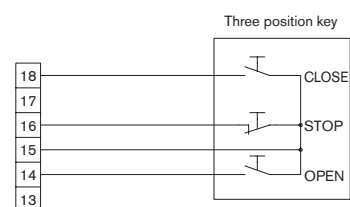
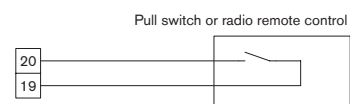
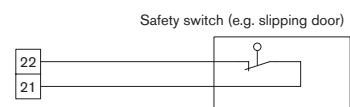
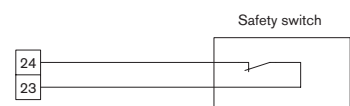
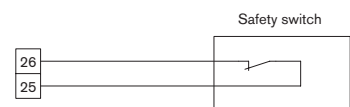
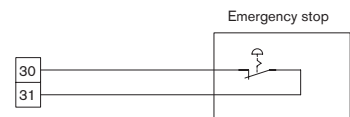
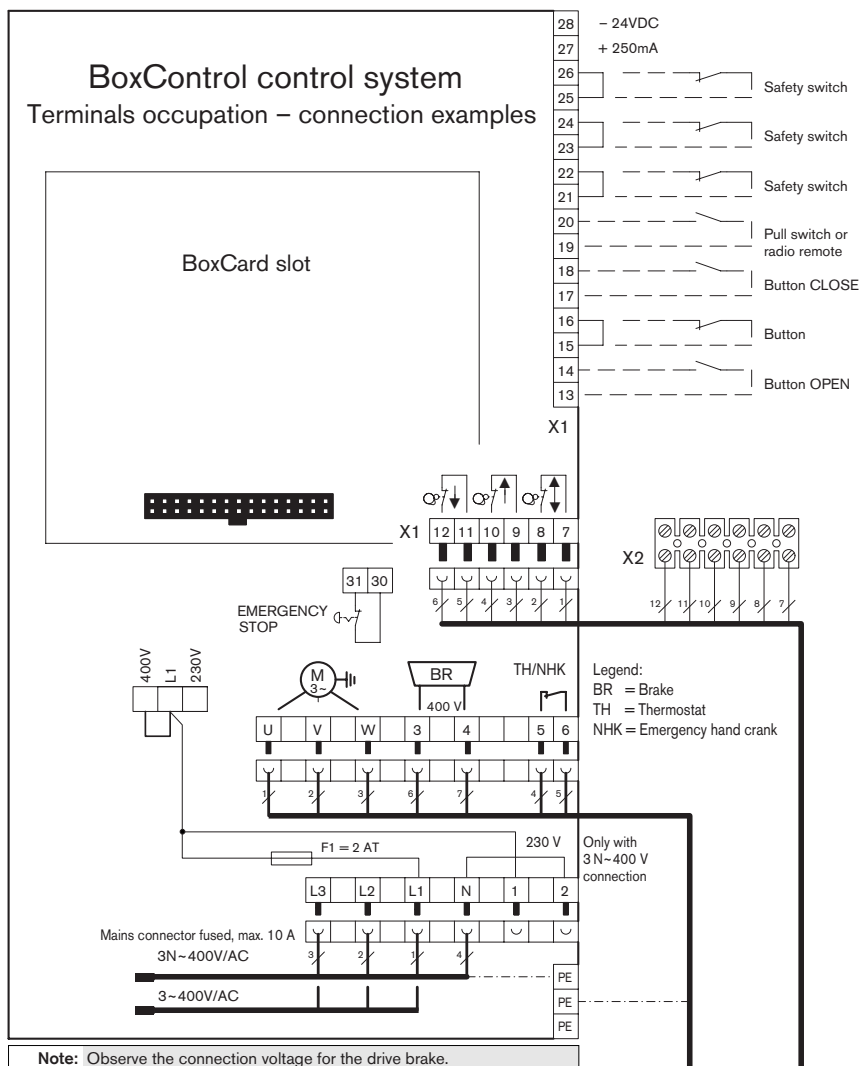
### Function of the wind-up protection system

Setting: DIP 3 OFF

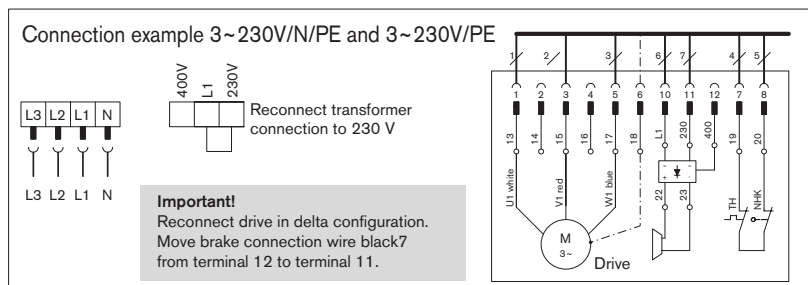
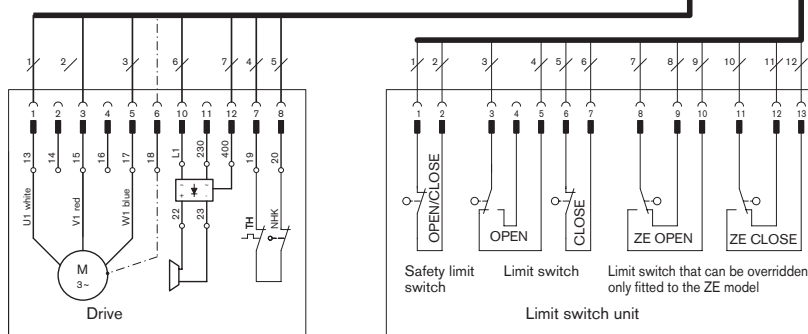
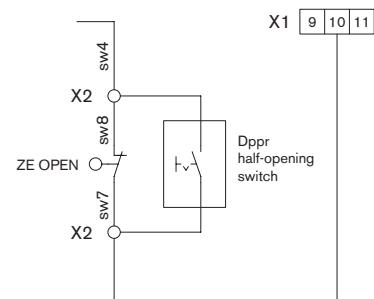
If the CLOSE end switch switches off, the wind-up protection light barriers are automatically checked.

If the light barriers are OK the disconnect contact in the safety chain closes and the drive can be started in the OPEN direction.

# Connection plan for DFM/DKM drives

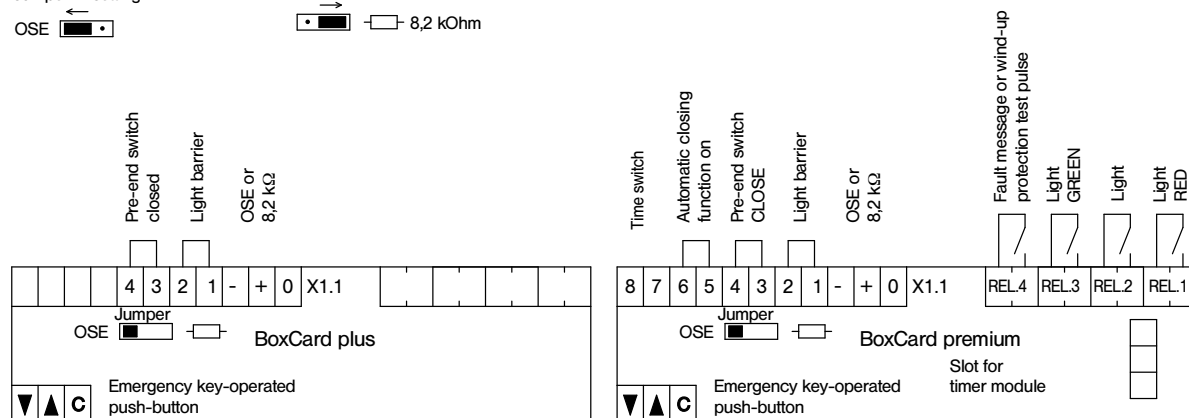
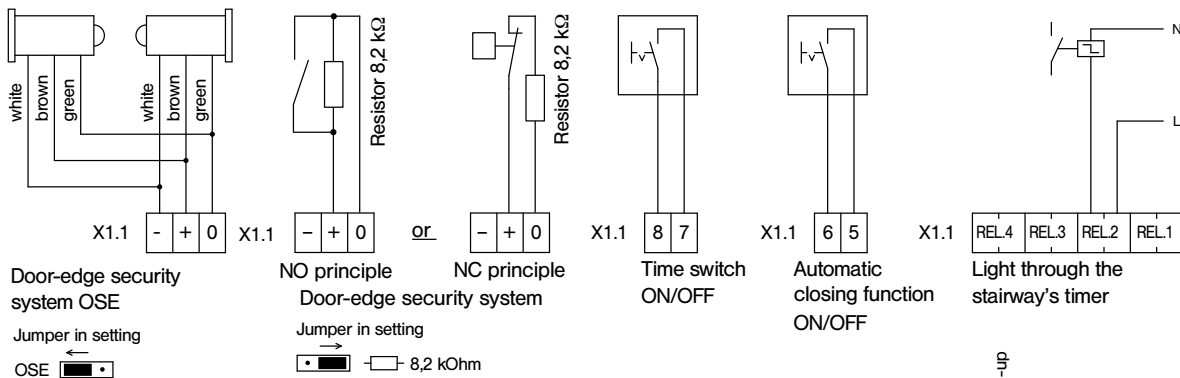
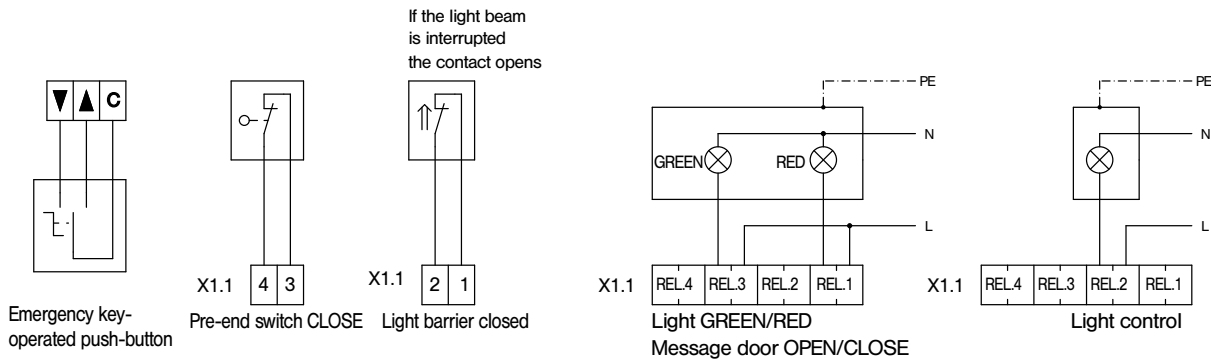
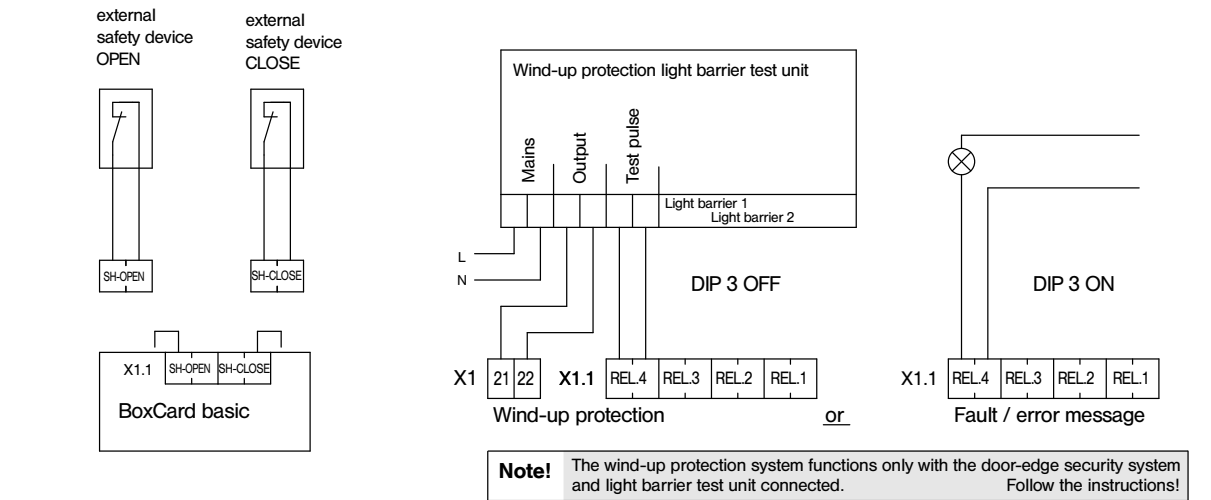


**Door half-opening**  
Connect wire black4 on terminal block X1/10 to terminal block X2/wire black8.  
Connect terminal X2/wire black7 to the terminal block X1/10.



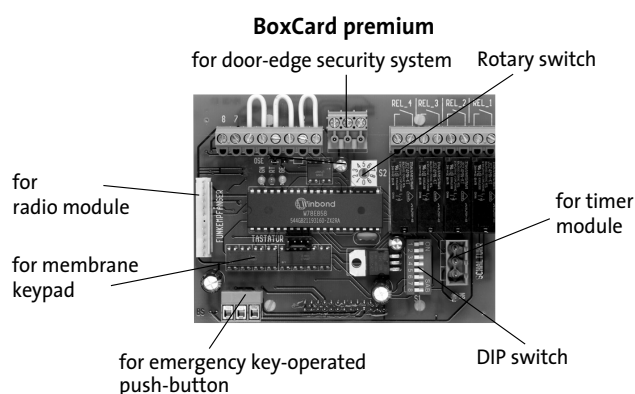
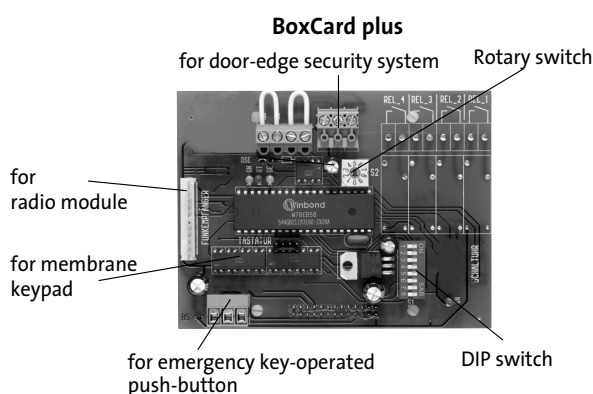
When connecting other drives, please follow the recommendations of their wiring diagram.

# Terminal diagrams BoxControl D 400 basic/plus/premium



**Note!** The pulse and automatic control system only functions if the door-edge security system is connected. When connecting an external door-edge security system, connect a 8.2 kΩ resistor in series with the switch contact.

# BoxControl D 400 plus/premium



## Operating modes for BoxCard plus and premium

The operating modes can be adjusted via the rotary switch

- ♦ Dead man mode of operation = rotary switch setting 0
- ♦ Maintained mode = rotary switch setting 1
- ♦ Automatic closing function = rotary switch setting 2-9 only for premium

### Dead man mode of operation = rotary switch setting 0.

With the OPEN/CLOSE momentary contact switches the drive can be opened and closed in a dead man mode of operation. The entry pull switch is non-functioning. Both the door-edge security system and the safety chain are active.

The light barrier is non-functioning. For DIP 1 switch setting ON the facility can be closed using the membrane keypad if the door-edge security system has actuated, or is defective.

### Maintained mode = rotary switch setting 1

Traverse commands OPEN/CLOSE are implemented in maintained mode.

The radio receiver that can be plugged in can be programmed via the store key. The radio signal is configured as a control sequence (OPEN-STOP-CLOSE-STOP-OPEN ...). In addition there is the option of connecting an external receiver or a pull switch.

## Automatic closing function = rotary switch setting 2 to 9 and automatic closing function switch on, or with bridge across terminals nos. 5 –6

The door is opened via an OPEN button, or via the radio remote control unit. After the set open holding time the control system starts the prewarning time and then the downward direction. If the light barrier is actuated during the open holding time or the prewarning time the open holding time is restarted. In rotary switch setting 9 the automatic system closes the facility after traversing the light barrier, at the latest after 120 s.

- Rotary switch setting 2 Open holding time 5 s
- Rotary switch setting 3 Open holding time 10 s
- Rotary switch setting 4 Open holding time 20 s
- Rotary switch setting 5 Open holding time 30 s
- Rotary switch setting 6 Open holding time 45 s
- Rotary switch setting 7 Open holding time 60 s
- Rotary switch setting 8 Open holding time 90 s
- Rotary switch setting 9 After traversing the light barrier the door closes after 5 s; if the light barrier is not traversed the door closes after 120 s.

## Additional functions that can be set via DIP switches

OFF	DIP-Switch	Factory setting	ON
Closing not possible via the membrane keypad if door-edge security system defective or actuated.	1	ON	Closing via membrane keypad if door-edge security system is defective
Before reaching CLOSE pre-limit switch, reversing 1 s if door-edge security system is actuated	2	ON	Before reaching CLOSE end position, reversing if door-edge security system is actuated
Test pulse for light barrier - test unit	3	ON	Malfunction or error message relay 4
Light activation 180 s If the automatic system is switched on until the door has closed.	4	ON	Light activation 1 sec for stairwell automatic system etc.
Door Open/Closed signal	5	ON	Traffic light activation red/green
Switching on delay off	6	OFF	Switching on delay on Traffic light flashes for 3 s before and during every door movement
Maintenance interval is only indicated via flashing YELLOW LED	7	OFF	Maintenance interval is indicated via the RED traffic light
Light barrier does not switch the facility from an intermediate position into the upward direction.	8	OFF	Light barrier also starts the facility from an intermediate position into the upward direction.

## BoxControl D 400 plus/premium

### Door cycle counter

With actuated limit switch CLOSE or pre-limit switch CLOSE (terminals 3 –4 not bridged) press additionally the CLOSE membrane key for 5 s, then the counter status is indicated by flashing of the YELLOW LED. The counter status is indicated in steps of 10, 100, 1,000, 10,000, and 100,000. The output of the counter status begins with the 10 digits.

Between the digits the yellow LED is extinguished in each case for 2 s.

After the output of the last stored value the yellow LED lights up for 5 s and the output of the counter status is complete.

### Maintenance interval

Factory setting 5,000 cycles,

- counted when the “Door OPEN” limit switch is reached
- display is via the flashing LED YELLOW, and if DIP 7 is ON then at the same time via the cycling relay (relay 1).

### Reset of maintenance interval

The CLOSE limit switch must be actuated, set the rotary switch to setting 8 and then press the membrane keys STOP and CLOSE for approx. 5 s.

### Modify maintenance interval

The CLOSE limit switch must be actuated	set	Date
– Rotary switch setting 1: 1,000 cycles		
– Rotary switch setting 2: 3,000 cycles		
– Rotary switch setting 3: 5,000 cycles		
– Rotary switch setting 4: 8,000 cycles		
– Rotary switch setting 5: 12,000 cycles		

Press the membrane keys STOP and CLOSE at the same time for approx. 5 s; the stored value is indicated via the flashing YELLOW LED.

1x blinking corresponds to 1,000 cycles  
3x blinking –3,000 cycles etc.

### Error messages

The display shows the red LED blinking. Blinking frequency 1 Hz: with the DIP switch 3 set to ON, malfunction

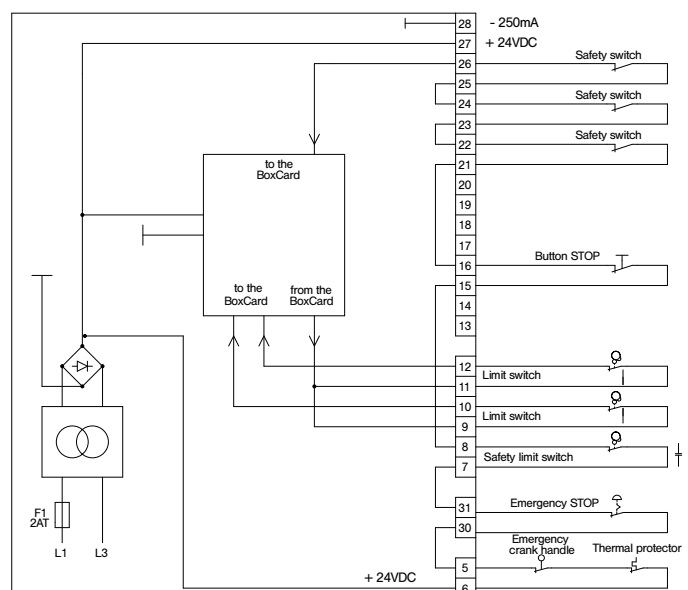
or error messages are continuously displayed through relay 4.

	Effect:	Defect signal relay 4
“Pre-limit switch CLOSE” defective with door open and if the pre-limit switch contact is open	No reversing, door CLOSE only in dead man mode	1 times flash 2 s pause
Voltage return	Only an indication, no effect on the door function	2 times flash 2 s pause
Run time monitoring	Dead man mode OPEN and CLOSE as far as traverse to nearest limit switch, then maintained mode again	3 times flash 2 s pause
Door-edge security system is actuated or defective	Reversal as far as end position OPEN or STOP for closing traverse, according to the setting of Dip 2. Dead man mode in downward direction using membrane keypad according to the setting of Dip 1 until the defect has been removed.	4 times flash 2 s pause
• Door-edge security system test defect • Door-edge security system actuated for longer than 2 minutes with door not closed	Dead man mode in close direction through the membrane keypad or the emergency key operated push button, until defect has been removed.	Steady light
• light barrier triggered Light barrier interrupted for longer than 2 minutes	Dead man mode in downward direction until defect has been removed and reversal as far as OPEN end position for closing traverse	5 times flash 2 s pause
EMERGENCY STOP chain	Door traverse no more possible, until malfunction has been removed see wiring diagram „safety limit switch chain“	6 times flash 2 s pause
Wind-up safety device - light barrier test unit	DIP 3 OFF; test unit not connected or faulty	7 times flash 2 s pause

### BoxControl safety limit switch chain:

For the control system to function, all terminals of the safety chain, emergency stop, emergency hand crank/ thermostat, safety limit switch and stop must be connected or bridged.

Please take note of the circuit diagrams!



## MANUFACTURER'S DECLARATION

according to Machine Directive 98/37/EEC  
with modifications (article 4 (2)) 2)

We hereby declare that the product(s) as listed below  
complies/comply with the guidelines of the European communities.

Product name: **BoxControl**

- BoxControl D 400 basic/plus/premium

Description: Control system for automatic operation of door facilities

Compliance of the specified product(s) with the relevant protection requirements of the directives is demonstrated through compliance with the following standards:

- EMC Directive 89/336/EEC
- Low Voltage Directive 73/23/EEC
- EN 50178
- EN 60 204-1
- EN 12453
- EN 12445

Commissioning of this/these product(s) is only permitted once the machine in which the above-mentioned product(s) is/are to be installed has been verified to comply with the relevant directives or national standards.

Beuren, 10. 05. 2006

*U. Seeker*

Ulrich Seeker  
CE-Officer

**elero GmbH**  
**Antriebstechnik**  
Linsenhofer Str. 59-63  
D-72660 Beuren



