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Operating Instructions for FS 345 with FS 101 and CS300 FS

GB

To enable fault-free operation to be guaranteed, it is imperative that the rechargeable battery be replaced after every two years of operation. If this maintenance instruction is disregarded, the functional safety of the system and thus also the safety of buildings and persons cannot be guaranteed.

To ensure that the system always functions consistently, the fire alarm function must be checked once every four weeks. In order to check at the same time that the rechargeable battery also functions correctly, the controls must be disconnected from the mains. In this way, the emergency function can be checked to ensure that the door is closed automatically by the auxiliary motor.

Emergency operation is not possible if there is a fault in the safety circuit of the door operator.

To avoid a deep discharge of the rechargeable battery, the battery should not be connected to the FS101 unit until the system is put into operation for the first time.

If deep discharge occurs, the battery cannot be recharged again and must be replaced immediately.

1 Table of contents

GB

2 Key to symbols

Danger of personal injury!
The safety instructions must be observed!

Warning! Danger to property!
The safety instructions must be observed!

Information
Indicates a reference to other sources of information

3 General safety advice

Guarantee

The function and safety of the equipment is only guaranteed if the warnings and safety advice in these operating instructions are adhered to.

Use fort he intended purpose

The FS 345 controls are intended exclusively for controlling door systems with mechanical limit switches.

Target group

Only qualified and trained electricians may connect, program and service the controls.

Qualified and skilled electricians must:

- have knowledge of the general and specific safety and accident prevention regulations,
- have knowledge of the relevant electrical regulations,
- be trained in the use and care of appropriate safety equipment and clothing,
- be capable of recognizing the dangers associated with electricity.

Instructions for installation and connection

- Before commencing electrical works, the system must be disconnected from the mains electricity supply and from the emergency rechargeable battery. Measures must be taken to ensure that the electricity supply remains disconnected for the duration of the works.
- Local safety regulations must be observed.
- Mains cables must be laid separately from control cables.

Regulations and bases for testing

For connecting, programming and servicing, the following regulations must be observed (the list is not exhaustive).

Construction product standards

- EN 12453 (Safety in use of power operated doors - Requirements)
- EN 12978 (Safety devices for power operated doors and gates - Requirements and test methods)

Electromagnetic compatibility (EMC)

- EN 50014-1 (Emission, household appliances)
- EN 61000-3-2 (Disturbances in supply systems - harmonic currents)
- EN 61000-3-3 (Disturbances in supply systems - voltage fluctuations)
- EN 61000-6-2 (Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments)
- EN 61000-6-3 (Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments)

Machinery guidelines

- EN 60204-1 (Safety of machinery, electrical equipment of machines; Part 1: General requirements)
- EN 12100-1 (Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology)

Low voltage

- EN 60335-1 (Household and similar electrical appliances - Safety)
- EN 60335-2-103 (Particular requirements for drives for gates, doors and windows)

Professional association regulations D

- BGR 232 (Directive for Power-driven Windows, Doors and Gates)

Product description

The FS345 controls can be used in connection with fire proof door drives.

The FS345 controls consist of an CS300 door control unit, an FS101 auxiliary circuit board and a rechargeable battery for the solenoid valves, magnetic clutch, DC-motor and for 24V engine brakes.

In the case of fire or power cuts, the emergency rechargeable battery provides the energy for the secondary motor for closing the gate or for the engine brake for holding the gate.

The fire mode is triggered by a continuous command in the fire alarm contact or is time activated if the mains power supply fails. In the case of fire, the door closes with the closing edge system deactivated, or, optionally, with the closing edge activated.

Different models

The following models of the FS345 controls can be supplied:

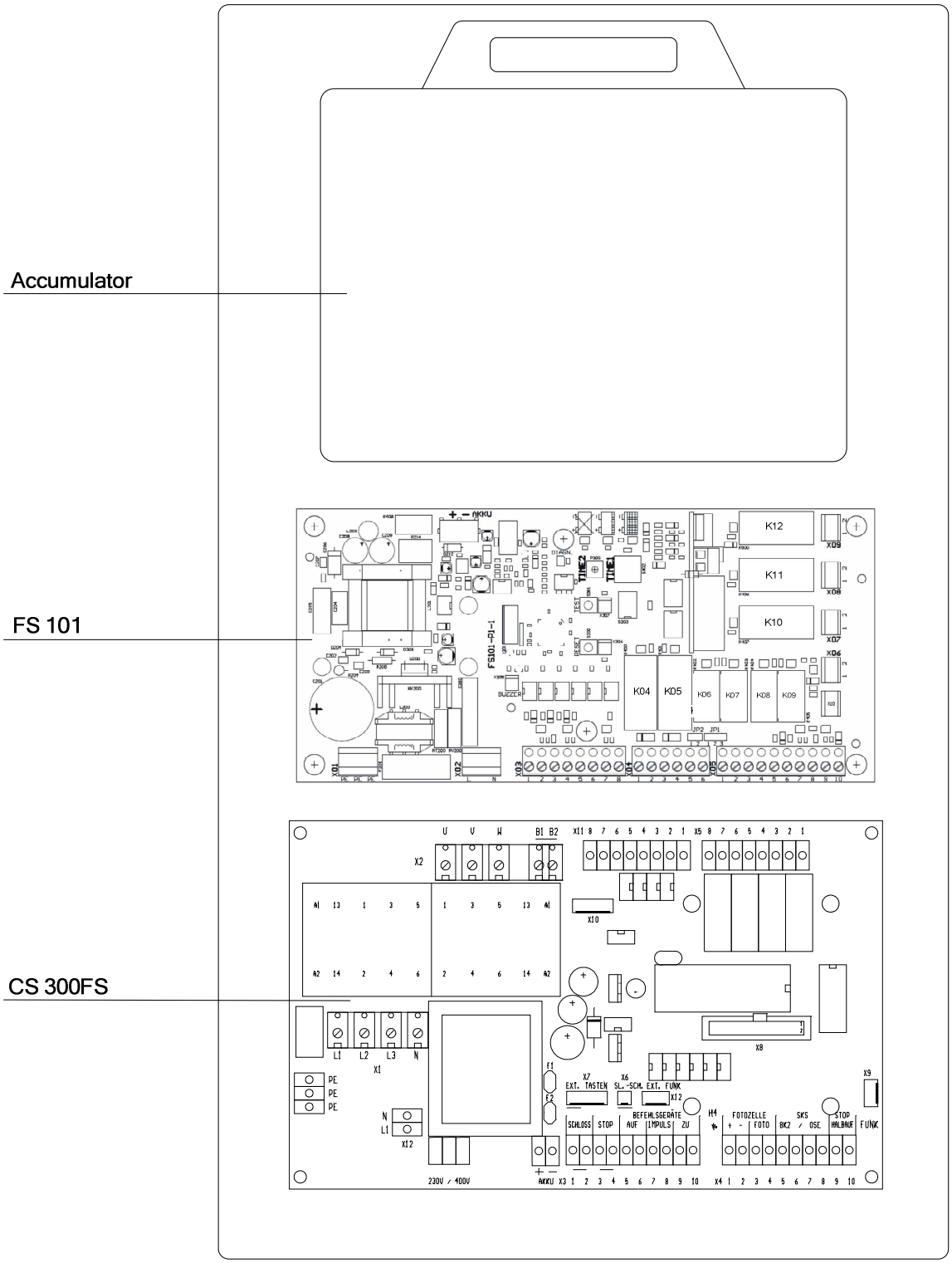
- FS345 controls for dead man operation
- FS345 controls for automatic operation
- FS345 controls for automatic operation with the closing edge system activated in the case of fire

The following housing models are available:

- Housing with OPEN - STOP - CLOSE buttons
- Housing with ON / OFF key switch
- Housing with mains switch
- Housing with emergency OFF switch

The operating instructions describe the connection options and models of the FS345 controls.

GB 4.1 Product drawing

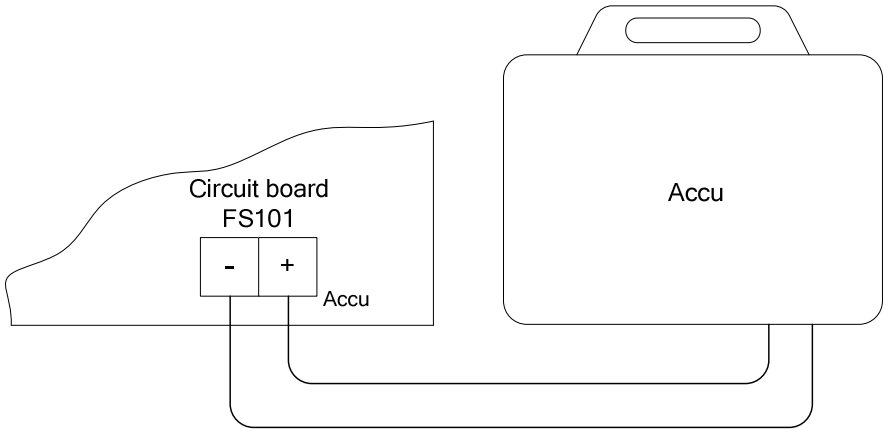


5 Start-up - the emergency operation system FS 101 GB

The FS101 circuit board includes a charger for the rechargeable battery and a microprocessor for controlling the auxiliary drive or the engine brake.

The circuit board is connected to the CS300ME door control unit in the factory and if it is purchased together with a door operator, the correct settings for that operator are also preset in the factory.

All that remains to be connected is a fire alarm, and the rechargeable battery must be connected to the FS101 circuit board via a plug.



To prevent deep discharge of the rechargeable battery, the battery should not be connected to the FS101 circuit board until the door is put into operation.

6 Start-up - gate operation system CS 300FS

Warning!

To ensure that the equipment functions properly, the following conditions must be assured:

- The door is installed and operational.
- The command and safety devices are installed and ready for operation.
- The control unit housing with the FS345 controls is installed.
- All motor connections are secured at the motor and the controls.
- All components to be connected to the controls must have at least one additional isolation with a rated voltage of more than 230 V.

Information:

For the installation of the door and the command and safety devices, the relevant manufacturers' instructions must be adhered to.

Mains connection

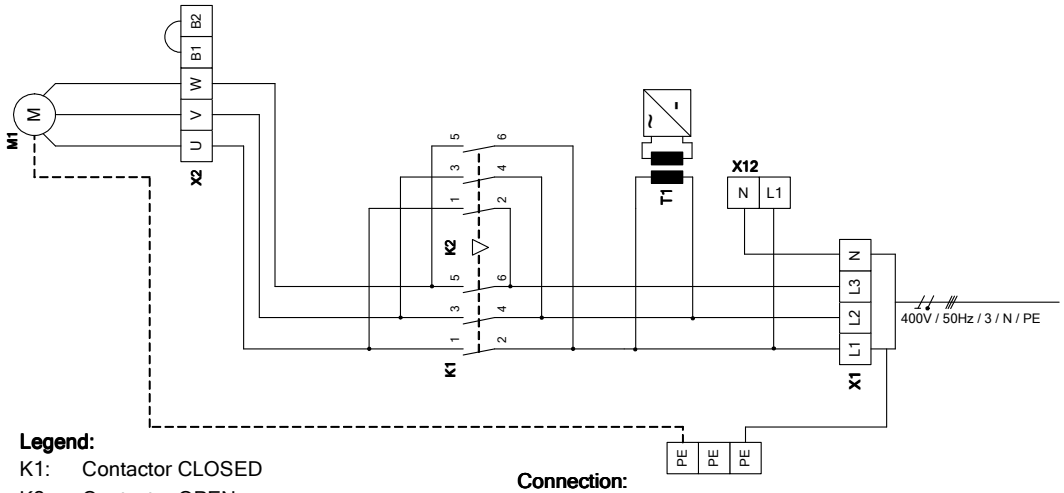
Danger!

To guarantee that the controls function properly, the following points must be ensured:

- The mains voltage must correspond to the voltage stated on the type plate.
- For a permanent connection, an all-pole mains switch must be used.

6.1 Start up – the mains connection and the motor

CS 300FS



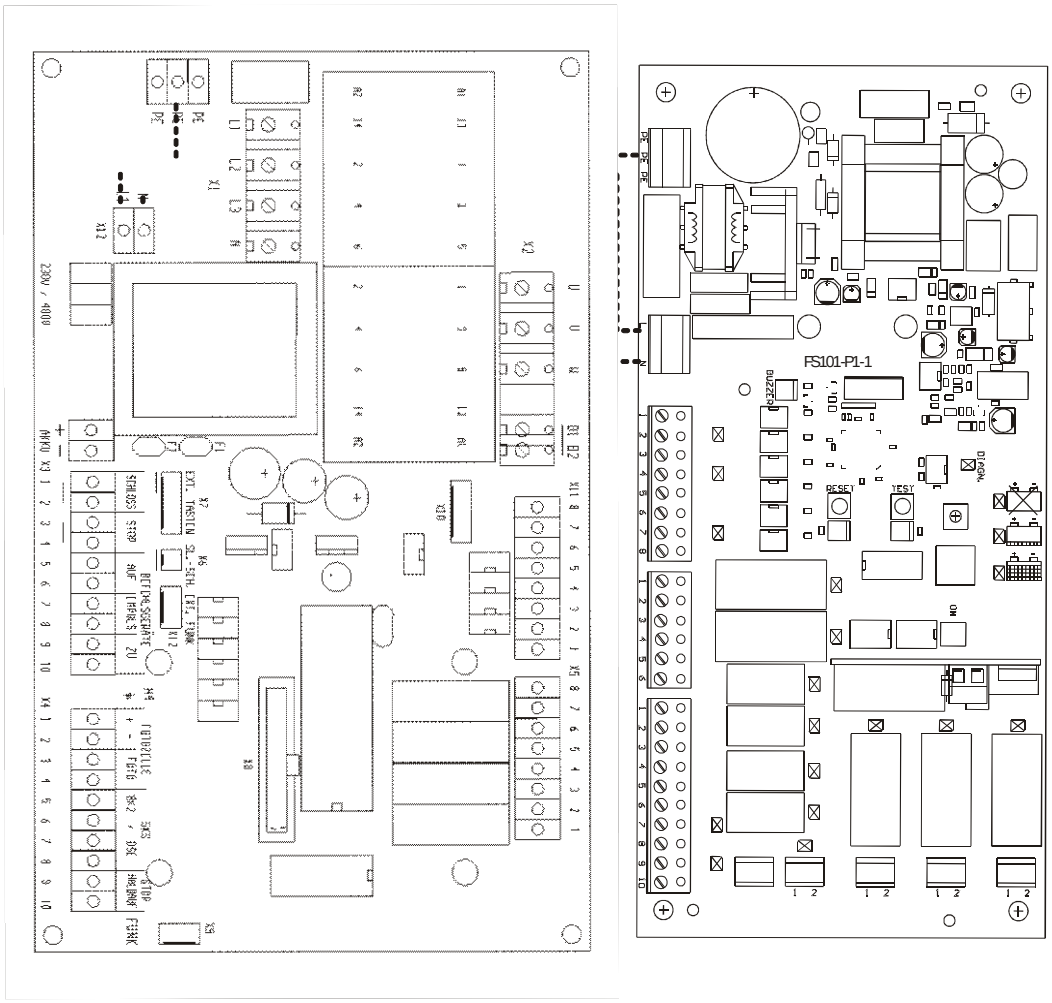
Legend:

K1: Contactor CLOSED
K2: Contactor OPEN
M1: Motor
T1: Transformer
X1: Terminal block for mains connection
X2: Terminal block for motor

Connection:

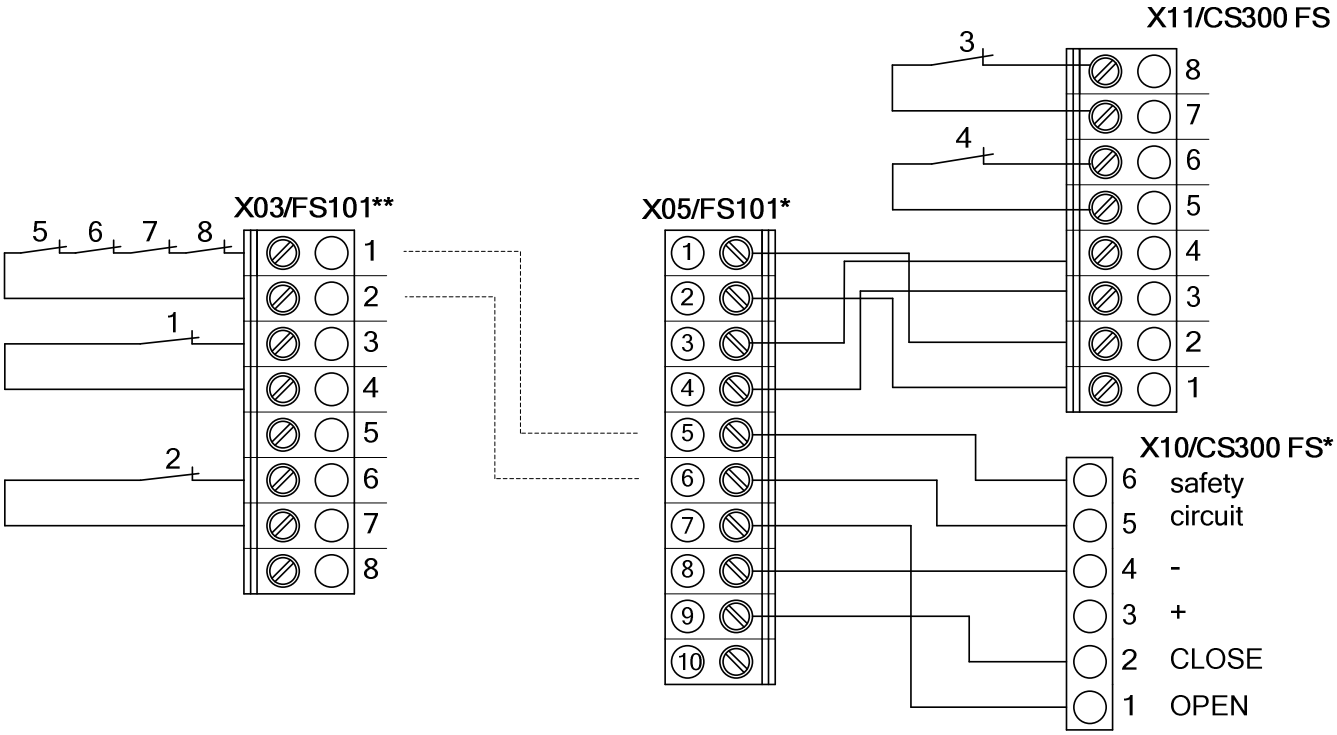
> Connect the controls to the mains supply.
> Connect the controls to the motor.
> The groups of cables must be fixed together close to their relevant terminals using a cable tie.

FS101 – CS 300FS (prewired)



6.2 Start up – the limit switches

Connection arrangement for limit switches
(CS 300FS terminals X11, X10 and FS 101 terminals X03, X05)



[1] limit switch OPEN
[2] limit switch CLOSE
[3] additional limit switch CLOSE
[4] additional limit switch OPEN
[5] Thermal protection motor
[6] emergency operation (opener)
[7] safety limit switch CLOSE
[8] safety limit switch OPEN

**** factory provided: prewired***
***** factory provided: prewired if delivered with drive***

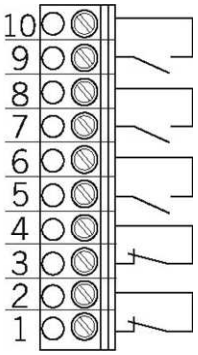
The limit switches (excluding the additional limit switch) are analyzed by the FS101 circuit board and the values are passed on to the CS300FS circuit board.

The allocation of terminal X11 (limit switch) was changed in relation to the allocation of terminal of CS300FS. This must be considered during back fitting.

7 Connection of command and safety devices for normal door operation X3 CS300FS

Command and safety devices can be connected via terminals X3 and X4.

X3/CS 300FS



CLOSE button

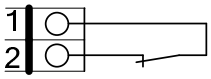
IMPULSE button

OPEN button

STOP button

- emergency off, slack rope switch, wicket door contact, draw in protection

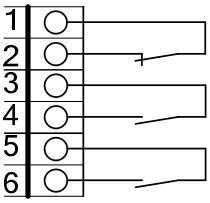
X6/CS 300FS



- terminal block for internal on-off-switch

X7/CS 300FS

- terminal block for internal 3-button input unit



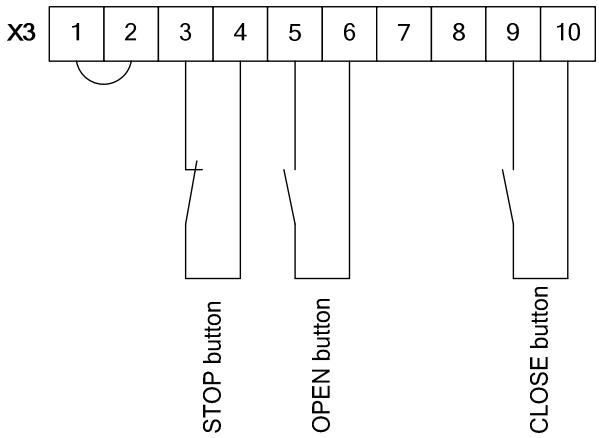
STOP

OPEN

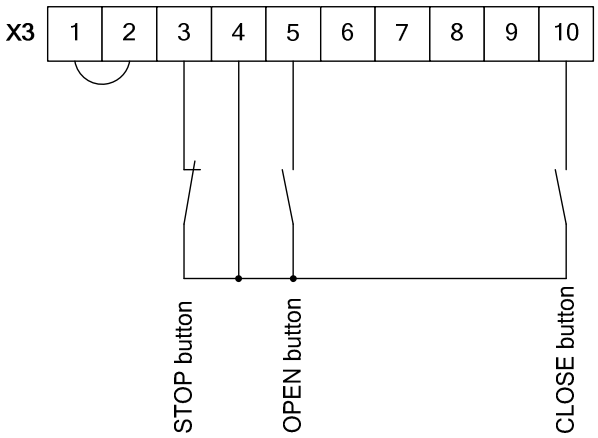
CLOSE

7.1 Connection examples for command devices, terminal block X3/CS 300FS

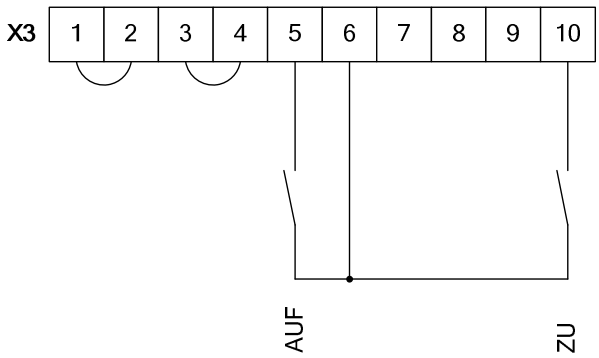
OPEN / STOP / CLOSE button
(for solution with 6 leads)



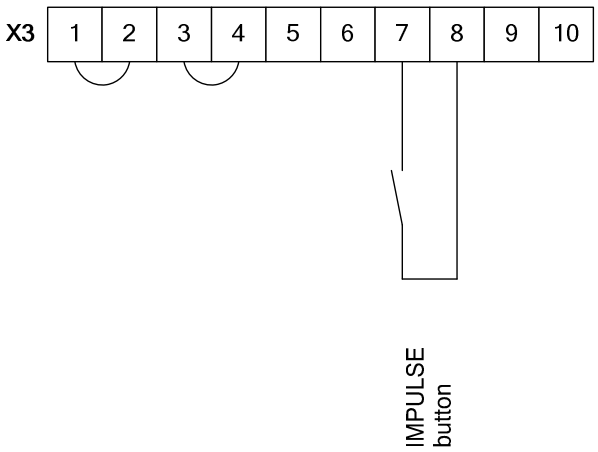
OPEN / STOP / CLOSE button
(for solution with 4 leads)



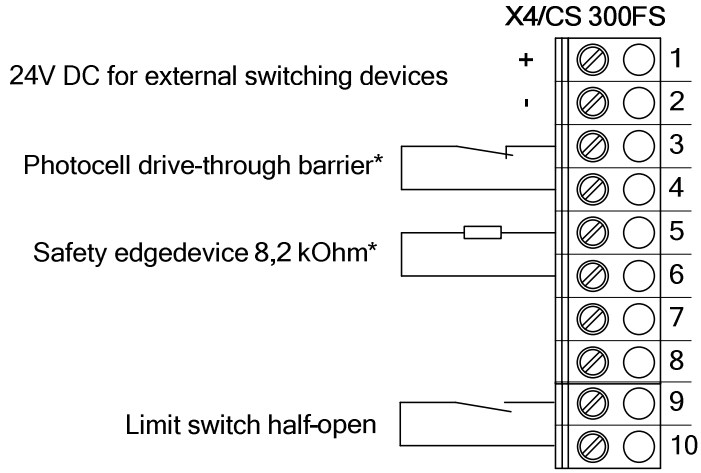
Key switch OPEN / CLOSE



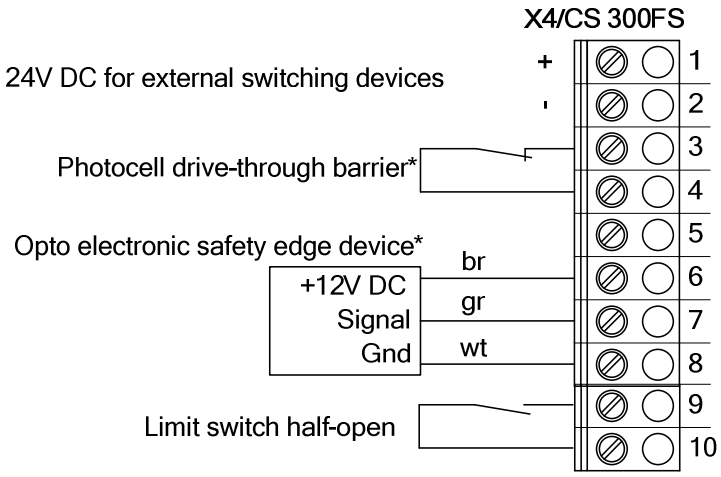
Impulse button
(sequence button)



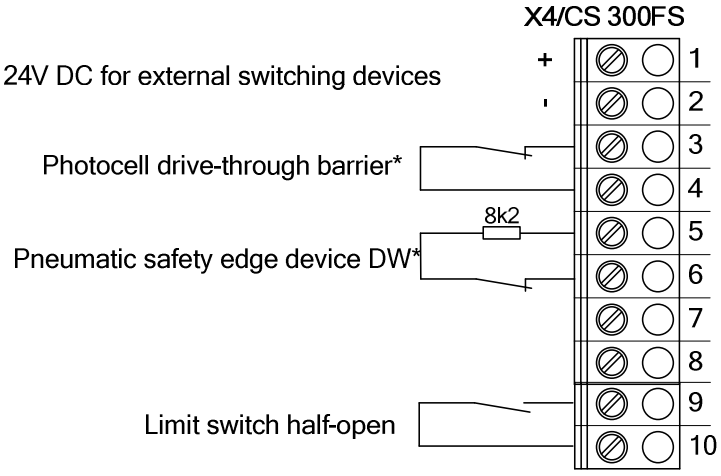
Terminal block X4 (8,2 kOhm safety edge device)



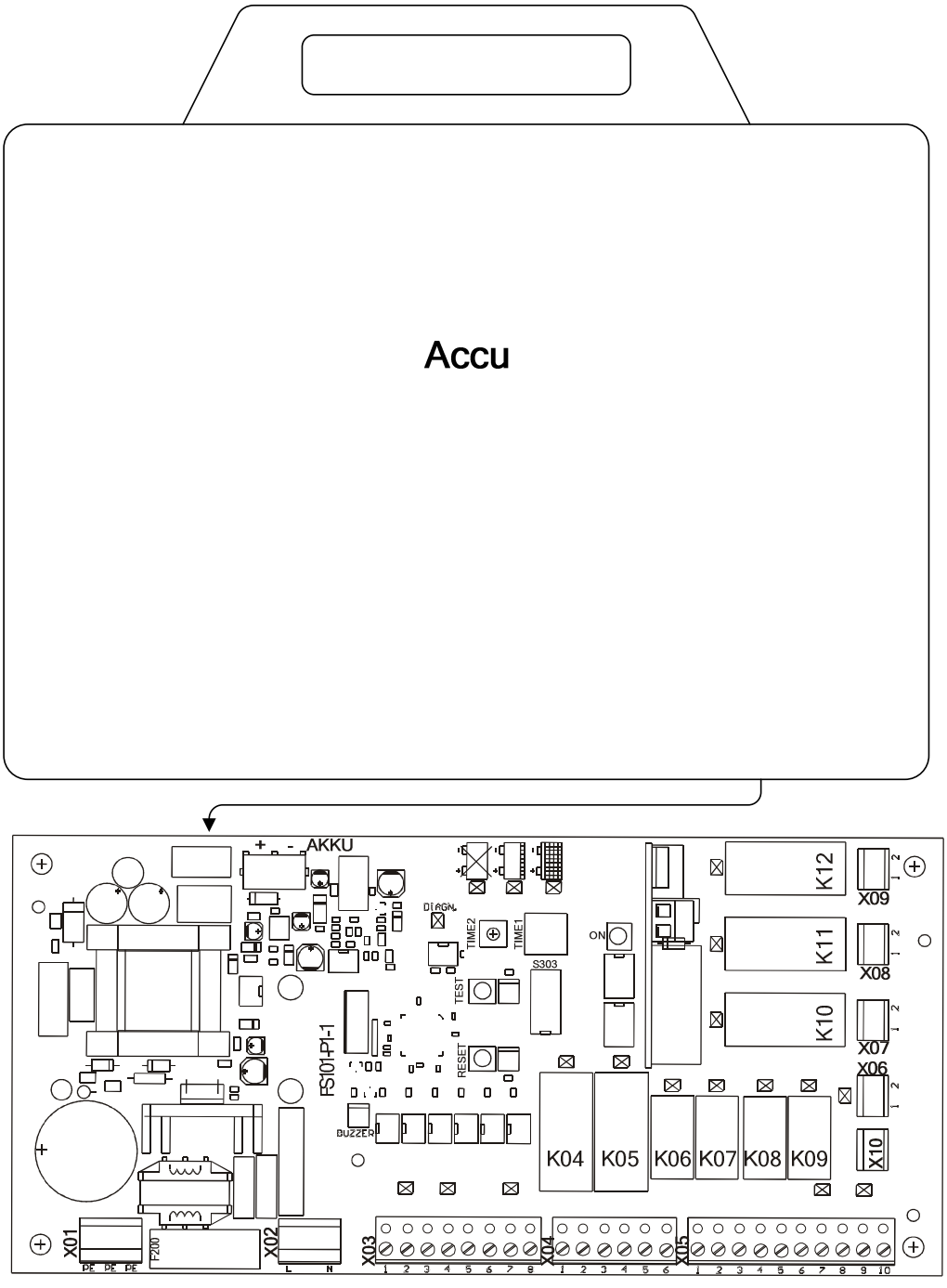
Terminal block X4 (for opto-electronic safety edge device)



Terminal block X4 (for pneumatic safety edge device – DW)



* only effective in down direction



Circuit board FS 101

9 Key to FS101 circuit board

X01/ X02	Power supply 230V / PE
X03	Limit switch connections
X04	Outputs for the auxiliary motor, brake, auxiliary relay
X05	Activation of the CS 300FS circuit board
X06	Fire alarm connection
X07	Potential-free output for fault indicator
X08	Potential-free output for fire alarm
X09	Potential-free output for closing edge device
X10	Input, external 24 V
+-AKKU	Terminal block for battery pack
Time 1	Time-controlled closing if mains power supply fails
Time 2	Timing element for door seal function
S303	DIP switches
Reset	Button – switch off buzzer
Test	Button for testing emergency operation
F200	3.15 A fuse for battery charger
ON	button
K04	Relay secondary motor
K05	Relay engine brake
K06	Relay OPEN / CLOSE command
K07	Relay limit switch OPEN
K08	Relay limit switch CLOSE
K09	Relay Stop
K10	Relay Function / Error
K11	Relay Emergency mode
K12	Relay Closing edge

GB 9.1 DIP switch functions

DIP switch:	
1 ON	Door operator types FT + (HY)*
1 OFF	Door operator types FDF + FTA
2 ON	Fire alarm as normally closed contact
2 OFF	Fire alarm as normally open contact
3 ON	Emergency closing with 400V AC / 24 VDC
3 OFF	Emergency closing with 24V DC
4 ON	With CESD in emergency operation
4 OFF	Without CESD in emergency operation
5 ON	Door closes if a fault occurs
5 OFF	Door remains open if a fault occurs
6 ON	(Door operator types HY)*
6 OFF	Door operator types FT

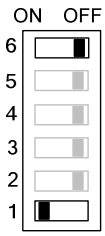
When making changes to the DIP switch settings, the following procedure must be observed:

1. Switch off the mains voltage
2. Switch off the rechargeable battery voltage
3. Change the DIP switch position as required
4. Switch on the rechargeable battery voltage
5. Switch on the mains voltage

* only with version HY

10 Types of door operator

The FS345 controls are designed for use with different types of door operator.



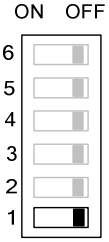
DIP 1 ON and DIP 6 OFF

1. **FT door operators** with 24V DC engine brake.

In emergency mode, the door closes under its own weight.

The weight of the door is held by the engine brake, which is still supplied with electricity. The power supply comes from the mains adapter on the FS101 circuit board; if the mains power is interrupted, power is supplied from the rechargeable battery.

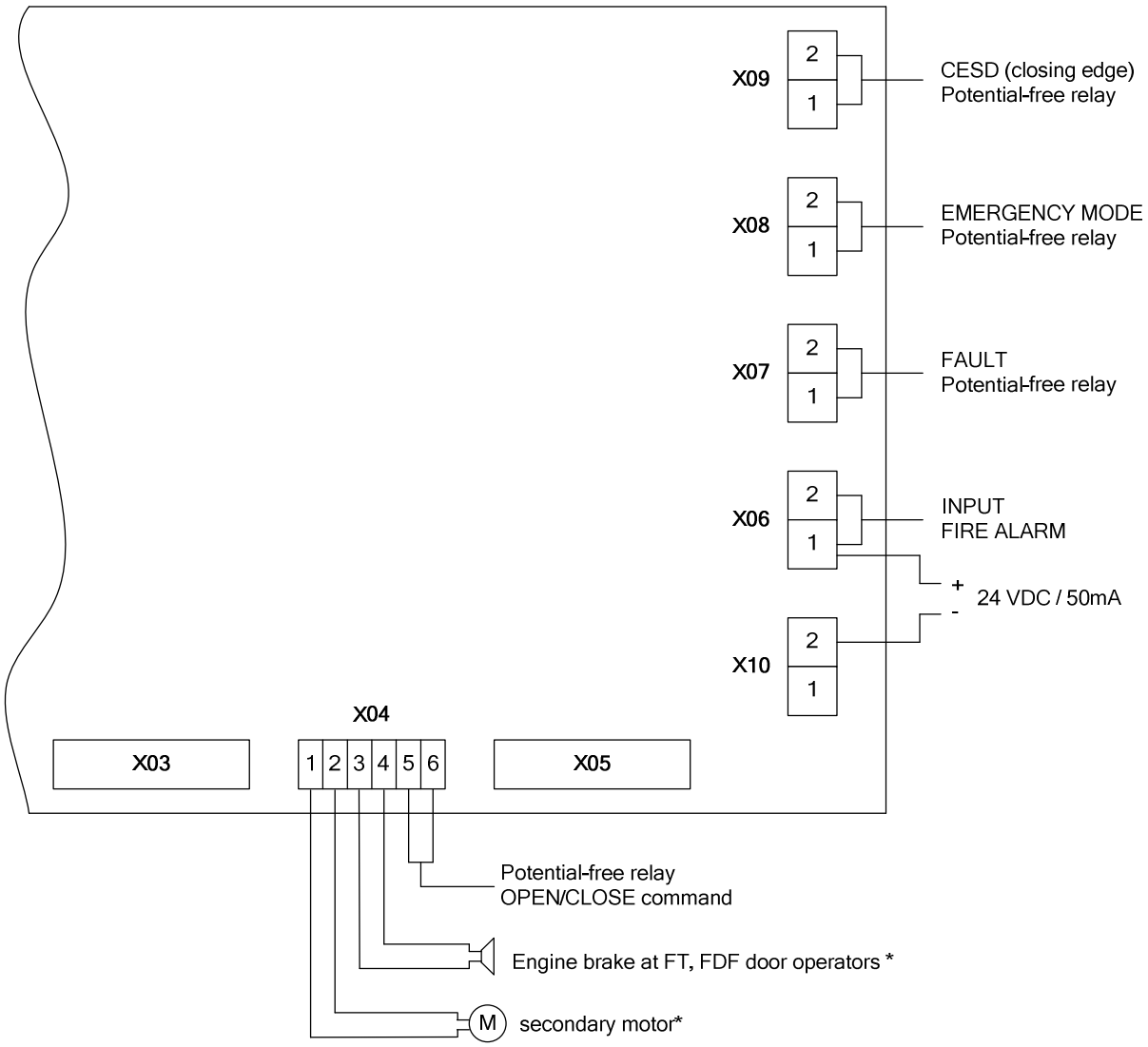
(DIP 6 ON is needed for the version HY)



DIP 1 OFF

1. **FD (FDF, FTA, FDS) door operators** with 24V DC secondary motor and 24V DC engine brake (FDF 5). In emergency mode, the door closes with the 24V DC secondary motor.

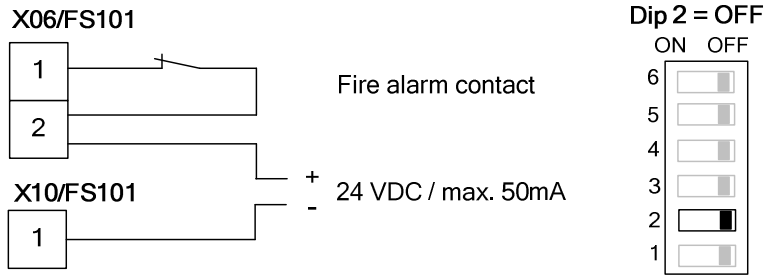
The power supply comes from the mains adapter on the FS101 circuit board; if the mains power is interrupted, power is supplied from the rechargeable battery.



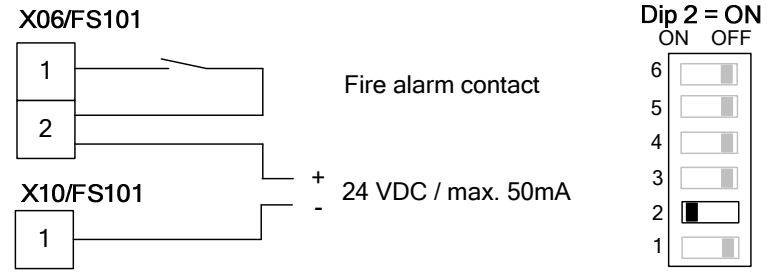
* Please take the connection of the door operators FT3 and FDF6 from the attachment.

11.1 Connection example for fire alarm contact

Terminal strip X06 (potential-free continuous contact as normally open contact)

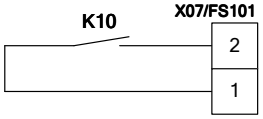


Terminal strip X06 (potential-free continuous contact as normally closed contact)



11.2 Alarms

Terminal strip X07 – relay K10 for fault indication



Potential-free switching contact indicates the following faults:
Rechargeable battery fault / mains power failure: switches if the battery is defective or if the battery voltage is less than 19V.

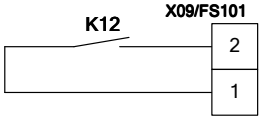
Terminal strip X08 - relay K11 for emergency closing

Potential-free switching contact for emergency operation is active. Switches for emergency closing.

Terminal strip X04 – relay K06 door drive command

Potential-free switching contact for CLOSE or OPEN command depending on DIP switches 1 and 3.
(See 12 and 13.1 for wiring and function)

Terminal strip X09 – relay K12 SKS



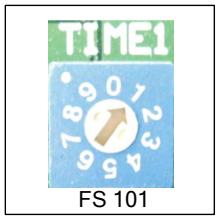
Potential-free switching contact, signalize the state from the safety edge.

12 Adjustment options for TIME 1 (door closes if the mains supply fails) GB

With Timer 1, the controls can delay the automatic closing of the door after a mains power failure by a set period. When set to 0, the door does not close automatically in the event of a mains failure.
If the timer is set so 0 and the mains supply is cut off for a longer period, the deep discharge protection system of the controls comes into play. See 17.1.

0 - No automatic closing in the event of mains failure
1 - In the event of mains failure: door closes after 5 seconds.
2 - In the event of mains failure: door closes after 15 seconds.
3 - In the event of mains failure: door closes after 30 seconds.
4 - In the event of mains failure: door closes after 1 minute.
5 - In the event of mains failure: door closes after 2 minutes.
6 - In the event of mains failure: door closes after 5 minutes.
7 - In the event of mains failure: door closes after 15 minutes.
8 - In the event of mains failure: door closes after 30 minutes.
9 - In the event of mains failure: door closes after 60 minutes.

Timer 1



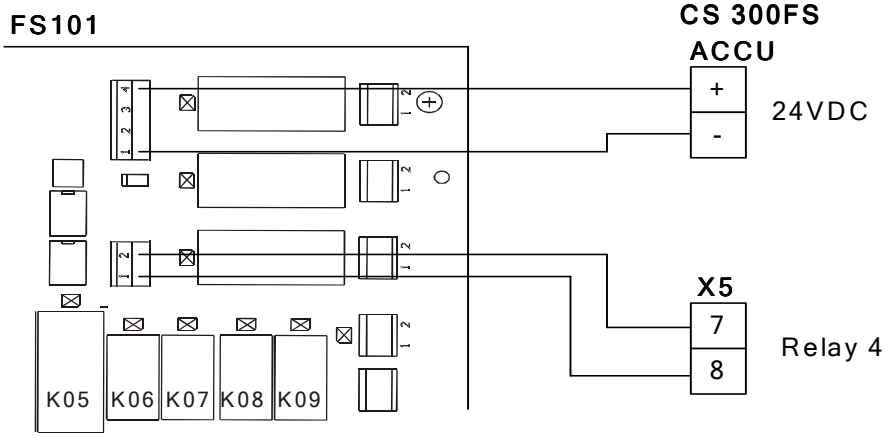
13 Automatic operation with active closing edge in emergency mode

It is possible to monitoring the emergency closing procedure via an electrical contact bar. The door continues to close if the bar is no longer activated and if a delay period of 2 seconds has elapsed. No reversing takes place. The closing edge safety device (CESD) is checked when it reaches the upper end position. If a fault is detected, emergency operation takes place without evaluation of the CESD.

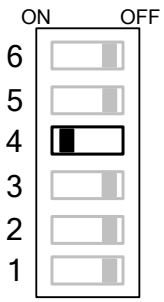
Prerequisites:

- Connection made between CS300Fs and FS101 (see drawing)
- Adjust relay mode 19 for relay 4 (factory setting)
- FS101 DIP switch 4 ON (disconnect main power and battery voltage)
- CESD has to be connect to terminal X 4

Connection CS 300FS + FS101



DIP 4 ON



14 Emergency closing using the door operator

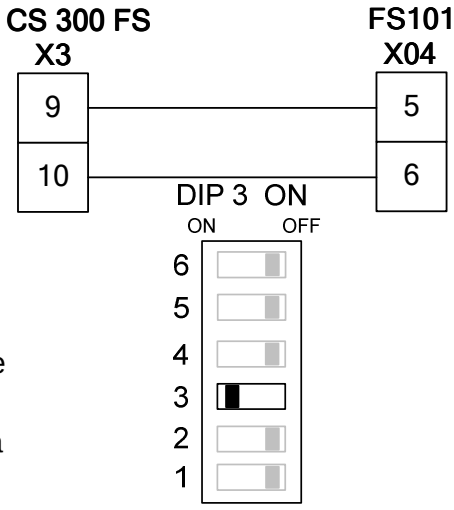
It is possible for the door to be closed using the door operator when the fire alarm is activated.

Prerequisites:

- CS300FS X3/9+10 are connected to FS101 X04/5+6
- DIP switch 3 is set to ON

  (Disconnect main power and battery voltage)

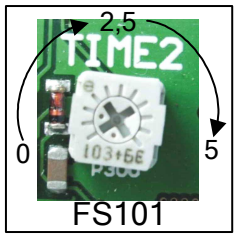
Connection between CS 300FS + FS101



In this case, if the fire alarm is activated and the mains voltage is available, the FS101 circuit board sends a DOWN impulse to the CS300FS circuit board via X06 → X3 connection.
The door is the driven to the CLOSED end position in impulse mode. The safety elements connected to the system are active.
Once the CLOSED end position has been reached, the door cannot be opened again. If the CESD is activated during the closing phase, the door reverses and stops at the OPEN end position. After 30 seconds a further DOWN impulse is sent. If the CESD interrupts the closing phase again, the process is repeated 3 times in total. If the CLOSED end position has not been reached after 120 seconds, the door is then closed via emergency operation mode.

15 Door sealing function for FT fire door operators

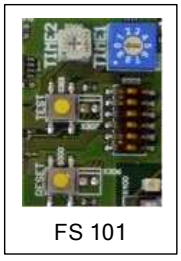
To ensure that the sections of the door close together tightly in emergency mode, the door must be driven beyond the CLOSE limit switch.
With the FS345 controls, this function is time controlled and is set using TIMER 2. A value of 0 to 5 seconds can be selected.



Prerequisites:

- Door operator type FT (DIP 1 ON)
- The system has been set in operation,

  and the limit switches have been set.



Settings:

1. OPEN and CLOSE limit switches are set for normal door operation.
2. Set Timer 2 to the mid-range value of 2.5 seconds.
3. Drive the door to the OPEN end position.
4. Switch off the mains voltage supply and press the TEST button.
5. The door runs to the CLOSED end position in emergency operation mode.
6. The door is then driven beyond the CLOSE limit switch for 2.5 seconds. Only then is power supplied to the engine brake again and the door is held in position.
7. Repeat steps 2 to 6 entering different values for Timer 2 until optimum results are achieved.
8. The CLOSE safety limit switch must be set accordingly.

To ensure that the system functions properly at all times, it is necessary to check the fire alarm function at intervals of four weeks. In order to check at the same time that the rechargeable battery functions properly, the controls must be switched off when carrying out this test. This is the only way to demonstrate that the emergency function is operational and that the door closes automatically via the auxiliary motor.

Procedure:

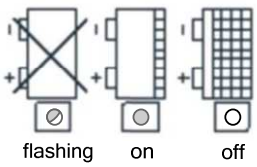
1. Drive the door to the OPEN end position.
2. Switch off the mains voltage power supply.
3. Press the TEST button: emergency operation
   Should commence after a delay of 2 seconds.

FS 101

Check:

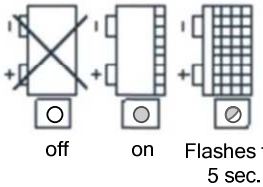
After pressing the TEST button

1. Battery test has started → LED display



☑

2. The integrated buzzer sounds. ☑
3. After 2 seconds, the door moves to the CLOSED end position. ☑
4. The buzzer stops buzzing. ☑
5. → LED display



☑

6. The buzzer sounds once. ☑
7. The test is complete. ☑

17 Integrated buzzer and RESET button

The FS345 control unit has an integrated buzzer that gives an acoustic signal to indicate emergency operation and the condition of the rechargeable battery.

FS 101

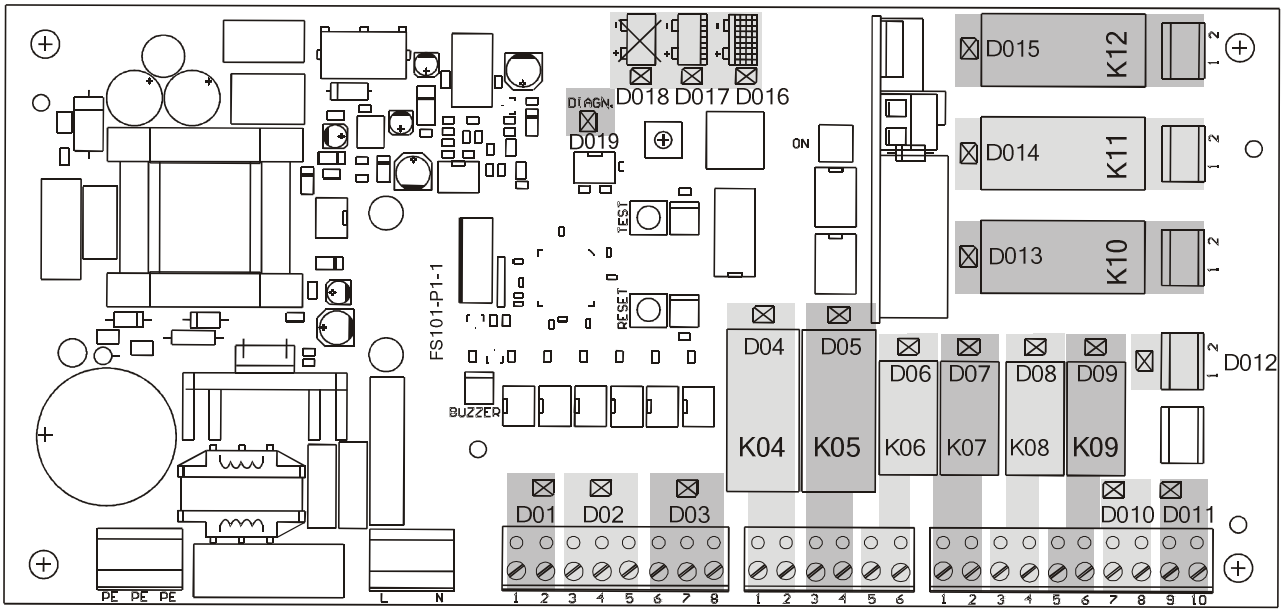
The buzzer sounds with a frequency of 1 Hz during the closing phase in emergency mode.
The buzzer stops sounding when the door is in the CLOSED end position.

If a defective battery is detected during operation or during a test, the buzzer sounds with a frequency of 3 Hz.
The acoustic warning signal can be switched off by pressing the RESET button when the door is in the CLOSED end position. The rechargeable battery must be replaced.

Buzzer	
1 note sounds at intervals of 5 seconds	No mains voltage
1 note sounds at intervals of 1/2 second	Rechargeable battery is defective
4 short notes	Warning before emergency closing
1 note sounds at intervals of a second	Emergency closing

18 The LED indicators of the FS101

The FS345 control unit is equipped with a row of LEDs that indicate the current operating status of the system and signal any faults that may occur. The following table gives an overview of the different faults and status conditions.



18.1 LED Diagnostic FS 101

Code	Color	Description		Error diagnosis
D01	yellow	LED Safety circuit (input X03/1,2)	LED ON LED OFF	OK Missing mains supply / ACCU voltage Safety circuit of the operator interrupted
D02	yellow	LED Limit switch OPEN (input X03/3,4,5)	LED ON LED OFF	Limit switch OPEN not confirmed Limit switch OPEN confirmed
D03	yellow	LED Limit switch CLOSE (input X03/6,7,8)	LED ON LED OFF	Limit switch CLOSED not confirmed Limit switch CLOSED confirmed
D04	yellow	LED Auxiliary motor (output X04/1,2)	LED ON LED OFF	Auxiliary motor is active Auxiliary motor 24V DC is not active
D05	yellow	LED Engine brake (output X04/3,4)	LED ON LED OFF	Engine brake is switched on Engine brake is switched off
D06	yellow	LED Drive command open/close (output X04/ 5,6)	LED ON LED OFF	Drive command open/close at CS300FS active Drive command open/close at CS300FS is not active
D07	yellow	LED Limit switch OPEN (output X05/1,2)	LED ON LED OFF	Limit switch OPEN not confirmed - Limit switch OPEN confirmed - Emergency operation is active
D08	yellow	LED Limit switch CLOSED (output X05/3,4)	LED ON LED OFF	Limit switch CLOSED not confirmed Limit switch CLOSED confirmed
D09	yellow	LED Stop circuit (output X05/5,6)	LED ON LED OFF	OK Missing mains supply / rechargeable battery voltage -Safety circuit on drive unit interrupted - Emergency operation is active
D010	yellow	LED AS130 OPEN (input X05/7,8)	LED ON LED OFF	Door is moving towards OPEN in 400V operation Door is not moving towards OPEN in 400V operation
D011	yellow	LED AS130 CLOSE (input X05/9,10)	LED ON LED OFF	Door is moving towards CLOSED in 400V operation Door is not moving towards CLOSED in 400V operation
D012	yellow	LED Fire detector (input X06/1,2)	LED ON LED OFF	Fire detector is closed Fire detector is open (observe DIP 2)
D013	yellow	LED Operation / fault (output X07/3,4)	LED ON LED OFF	operation / no fault Battery fault, mains
D014	yellow	LED Emergency operation (output X08/1,2)	LED ON LED OFF	Emergency operation is active Emergency operation is not active
D015	yellow	LED CESD (output X09/1,2)	LED ON LED OFF	CESD is OK CESD is interrupted
D016	green	LED charge maintenance	LED ON LED OFF	ACCU is charged, maintenance phase ACCU is charging
D017	yellow	LED charge status	LED ON LED OFF	Charging period Not charging period, ACCU is charged
D018	red	LED ACCU fault	LED ON LED OFF	ACCU defective, CHANGE ACCU ! ACCU OK

18.2 Diagnostic LED D019 F101

Code D 019, color red

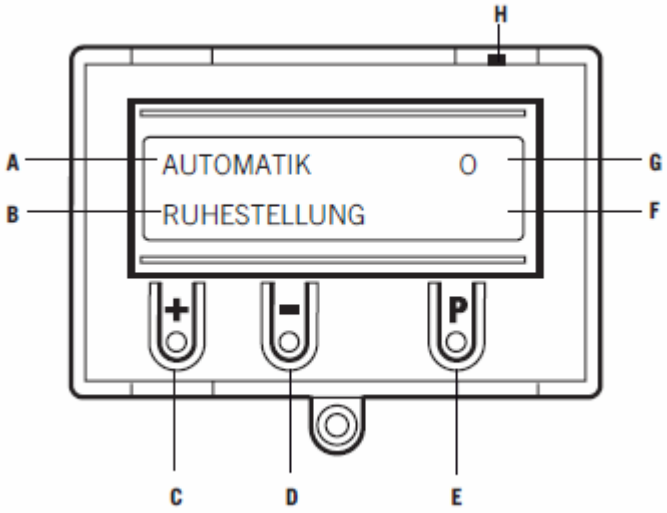
Diagnostic LED (red)	Fault	Action
1 flash	Battery fault	Rechargeable battery is defective: replace
2 flashes	Mains power failure	Battery charger defective; FS101 fuse F2 defective
3 flashes	Command received from fire alarm or from T1, the door should close	
4 flashes	Door has been closed by the fire alarm or by T1	
5 flashes	Safety circuit input X03/1+2 has been interrupted	Check the safety circuit of the door operator
6 flashes	HY Leak (only version FS345 HY))	Check the hydraulic system
7 flashes	CESD defective at OPEN end position	
8 flashes	Door has been closed due to a fault	

18.3 Error diagnosis CS 300FS

Code	Color	Description		Error diagnosis
H4	green	LED connecting block	LED ON LED OFF	OK - connecting block is interrupted - connecting block is defective

Fault / error message	Cause	Rectification
System does not respond	- No voltage supply	- Check the voltage supply of the drive and the controls
Door travels to the CLOSE end position when the OPEN button is pressed.	- Rotating field is connected wrongly	- Check the rotating field and establish clockwise rotating field if necessary
ERROR END POSITION	- The limit switches OPEN and CLOSE are both open, but once have to be closed	- check terminal X11 connection - check limit switch connection - check limit switch adjustment
ERROR RUN TIME	- The programmed running time has been exceeded	- check the path of the door - Re-program the running time
ERROR CESD	- The safety edge protection is faulty - Safety edge protection was triggered	- check the safety edge protection and the spiral cable - Remove obstruction from path of door
ERROR PRESSURE SENSOR TESTING	- The PS switch is not activated at the CLOSE end position	- check the PS switch, spiral cable and profile - check the setting for the CLOSE end position

19 DISPLAY CS 300FS



Legend:
A: Operating mode / diagnostic info
B: Parameters / diagnostic info
C: + button
D: – button
E: P button
F: value / status
G: value / status
H: jumper

19.1 LCD monitor - modes of operation

The control has four modes of operation with the LCD monitor. When the jumper H is pulled, the (+) button, the (-) button and the (P) button have no function. The display still functions.

Operating mode 1: AUTOMATIC
In the AUTOMATIC operating mode the door system is operated.
Display: - displays the function being carried out
- displays any error massages
Advice: If the „self locking“ parameter is set to MOD2 or MOD3 in the input menu, the display changes from AUTOMATIC to MANUAL OPERATION. The buttons + and – are without function.

Operating mode 2: ADJUSTMENT
In the ADJUSTMENT mode, the OPEN/CLOSED end position settings in dead man mode are adjusted with using the + and - buttons.
Display: - displays the operating mode
Advise: The external buttons are without function.

Operating mode 3: INPUT
In the INPUT operating mode, the values of various parameters can be altered.
Display: - displays the selected parameter
- displays the programmed value/status

Operating mode 4: DIAGNOSIS
In the DIAGNOSIS operating mode, door-specific checks can be queried.
Display: - displays the check
- displays the status

19.2. Navigator

AUTOMATIC uU RESTING

Push P-button > 1 sec.

ADJUSTMENT XXXX RESTING	Push + button: Position DOOR OPEN	MANUAL ADJUSTMENT OPEN	Save door position: Push P and + button > 1 sec
	Push - button: Position DOOR CLOSED	MANUAL ADJUSTMENT DOWN	Save door position: Push P and - button > 1 sec

Push P-button > 1 sec.

INPUT	Push + and – > 2 sec.	INPUT GERMAN	Scroll up through menu: + > 2 Sec Scroll down through menu: - > 2 Sec. Select value: P > 1 Sec. Increase value: + Decrease value: - Save value: P > 1 Sec. Return to INPUT: + and - > 1 Sec.
		INPUT RUNNING TIME 60	
		INPUT TIME OPEN 0	
		INPUT FOREWARNING 0	
		INPUT AROUND TIME ,3	
		INPUT MOD1-3 RESTING MOD1	
		INPUT QUICK CLOSE OFF	
		INPUT RELAY 1 MOD6	
		INPUT RELAY 2 MOD7	
		INPUT RELAY 3 MOD1	
		INPUT RELAY 4 MOD19	
		INPUT SENSOR-TEST OFF	
		INPUT DELAY-OPEN OFF	
		INPUT SELF LOCK MOD1	
		INPUT SU-WI MOD1	
		INPUT REVERSE MOD1	

Push P-button > 1 sec.

DIAGNOSIS	.	ES UP ON ES DOWN ON	Scroll up through menu: + > 2 Sec Scroll down through menu: - > 2 Sec. - Return to AUTOMATIC: P Only inquiry possible
		OPEN BUTTON OFF PART OPEN OFF	
		CLOSE BUTTON OFF CESD OFF	
		IMPULS OFF STIMER OFF	
		P/E BARRIER ON STOP CIRCUIT ON	
		BES-OPEN ON BES-CLOSE ON	
		CYCLE xxxx	

Push P-button > 1 sec.

19.3 Diagnostic operating mode

Display	Meaning	Status
ES-OPEN	OPEN end position	OFF: confirmed ON: not confirmed
ES-CLOSE	CLOSE end position	OFF: confirmed ON: not confirmed
OPEN BUTTON	OPEN button	OFF: confirmed ON: not confirmed
PART OPEN	PART-OPEN button (X4 / 9 + 10)	OFF: confirmed ON: not confirmed
CLOSE BUTTON	CLOSE button	OFF: confirmed ON: not confirmed
CESD	Safety edge protection	ON: System is closed OFF: System is interrupted (fault)
IMPULS	Impulse button	OFF: confirmed ON: not confirmed
TIMER	Weekly timer	OFF: confirmed ON: not confirmed
P/E BARRIER	Photoelectric drive-through barrier	ON: closed OFF: interrupted (fault)
STOP CIRCUIT	- Stop button of controls - Stop button of drive	ON: closed OFF: interrupted (fault)
BES-OPEN	Additional limit switch OPEN	OFF: confirmed ON: not confirmed
BES-CLOSE	Additional limit switch CLOSE	OFF: confirmed ON: not confirmed
CYCLE	Door cycle counter	Displays the door cycles

19.4 Automatic operating mode

Display		Description
AUTOMATIC OPEN		The door is driven to the OPEN end position
AUTOMATIC CLOSE		The door is driven to the CLOSED end position
AUTOMATIC RESTING		The door stands between the end position
AUTOMATIC RESTING	O	The door stands at the OPEN end position
AUTOMATIC RESTING	o	The door stands at the position PART OPEN („before-end position“ up)
AUTOMATIC RESTING	U	The door stands at the CLOSED position
AUTOMATIC RESTING	u	The door stands at the position PART CLOSED („before-end position“ down)

19.5 Input operating mode

Function	Description	Setting options	Factory setting
DEUTSCH	Select the menu language	DEUTSCH, ENGLISH, FRANCAIS, ESPANOL, NEDERLANDS, POLSKI, CESKY	DEUTSCH
RUNNING TIME	Monitoring the max. running tine for an open and close movement	1 – 250 Seconds	60 Seconds
OPEN TIME	After the door has opened, it runs in the CLOSE direction again after the set time has elapsed. Open time > 0 = impulse functions only work in OPEN direction	0 – 600 Seconds	0 = auto drive OFF
ADVANCE WARNING TIME	The traffic light flashes before the door starts to move downwards. The programmed forewarning time is only active if the open time > 0 or if in radio-impulse operating mode	0 - 120 Seconds	0 = OFF
TURNAROUND TIME	Standing time at every change of direction	0,1 - 2,0 Seconds (in 1/10 Seconds)	0,3 Seconds
MOD1-3 RESTING	MOD1: in non-operative state OFF MOD2: in non-operative state ON	MOD1 MOD2	MOD1
QUICK CLOSE	ON: The open time is cut short after the photoelectric barrier has been passed (door closes immediately) OFF: The open time continues as usual	ON OFF	OFF
RELAY 1	First 3 Relays can be allocated to a relay mode of 1-18 MOD1: Red lights while the gate moves and flashing in prewarning mode MOD2: Red lights are flashing while the gate moves and flashing in prewarning mode MOD3: Red lights while the gate moves and in prewarning The parameter M1-3 non-operative state takes effect at these 3 MOD	MOD1 – MOD18	MOD6

Function	Description	Setting options	Factory setting
RELAY 2	MOD4: Impulse at OPEN order MOD5: Error message MOD6: OPEN end position MOD7: CLOSE end position MOD8: Final position OPEN denied MOD9: Final position CLOSED denied MOD10: Before-end position OPEN MOD11: Before-end position CLOSE MOD12: From before CLOSE position to CLOSE position MOD13: Magnetic locking function MOD14: Brake MOD15: Brake negated MOD16: Brake remains ON during open time MOD17: Brake remains ON in open time and while changing direction (in SKS, brake falls down) MOD18: Red lights are flashing in prewarning	MOD1 – MOD18	MOD7
RELAY 3		MOD1 – MOD18	MOD1
RELAY 4	MOD19: SKS	MOD 19	MOD19
PRESSURE SENSOR TEST	ON: PS testing is active OFF: PS testing is inactive	ONOFF	OFF
DELAY-OPEN	ON: Forewarning before opening OFF: immediate opening	ONOFF	OFF
SELF LOCK	MOD1: Automatic operation MOD2: Manual operation for OPEN and CLOSE MOD3: Manual operation for CLOSE	MOD1 - MOD3	MOD1
SU/WI	MOD1: PART-OPEN button at terminal X4(9/10) MOD2: PART-OPEN selector switch at terminal X4 (9+10) When the selector switch is closed, all OPEN commands go to the before-end switch OPEN	MOD1MOD2	MOD1
REVERSE	MOD1: It does not take place a reversion, if the additional limit switch is too operated. MOD2: It takes place a reversion, even if the additional limit switch is too operated.	MOD1MOD2	MOD1

20 Rechargeable battery and battery charger

The FS345 control unit has protection against deep discharge of the battery and can carry out regular tests to check the condition of the battery.

20.1 Protection against deep discharge

If, after being put into operation, the controls are operated for a longer period without the external power supply, the control unit switches itself off after a specified length of time to prevent deep discharge of the rechargeable battery. The length of time depends on the type of door operator and thus on the external devices connected.

DIP 1 ON	Switches off after 8 hours without mains supply voltage
DIP 1 OFF	Switches off after 48 hours without mains supply voltage

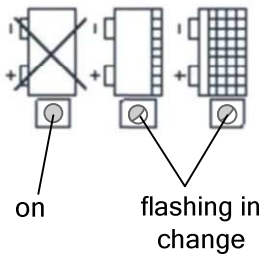
The buzzer sounds continuously for 60 seconds to signal that the battery, and therefore also the control unit, has been switched off.

If the timer 1 on Zero stands (no drive in the case of power failure) in dependence of the DIP switch 5 the gate is controlled closed or left alternatively open. Controlled keeping-open is only with DIP 1 OFF possible.

DIP 5 ON	Gate closes after the audio signal, accumulator/control switches off
DIP 5 OFF	Gate remains open, for accumulator/control switches off

The controls can only be switched on again if the external voltage supply is reconnected.

For FT types of operator (DIP 1 ON), if the mains supply has been interrupted for a period of 8 hours or longer, the battery is charged for 30 minutes as soon as the mains voltage is switched back on. The door controls cannot operate during this charging period.
This charging status is indicated via the recharge LED and can be interrupted by pressing the RESET button.




FS 101

20.2 Cyclic testing of the rechargeable battery

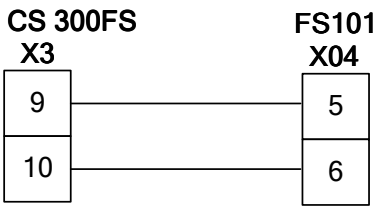
The FS345 control unit is able to test the condition of the battery automatically. In normal operation the battery is disconnected from the controls once every 60 minutes and the battery voltage is checked.

If the battery voltage falls below a specified value, this is recognized as a fault, which is then indicated via the fault relay, the buzzer and the diagnostic LED. It could be that proper operation in emergency mode is then no longer possible.

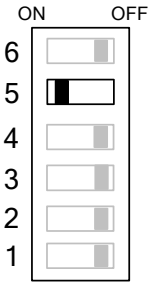
DIP switch 5 can be set to specify whether the door closes or stays open in this case.

DIP 5 ON	The door closes, the battery switches off
DIP 5 OFF	The door stays open, the battery switches off

Verbindung CS300FS + FS101



DIP 5 ON



20.3 Recharging the battery

Advice on recharging maintenance-free lead-acid batteries

Before longer periods of non-usage (two options)
- Disconnect your battery from the charger and store it fully charged.

If the periods of non-usage last for more than three months, charge the battery for at least 36 hours.

- It is also possible to continue to charge your battery for an unlimited period (trickle charging) with the charger switched on. It is advisable to store the battery in a cool room.

High temperatures
Charging the battery at ambient temperatures greater than 30°C is not recommended. Your charger is set in the factory to a charging voltage that is designed for an ambient temperature of 20°C.

Low temperatures
Charging the battery at temperatures lower than 10°C is not recommended. The available capacity is reduced at lower temperatures.

Deep discharge
Please avoid deep discharge of the battery. Should this occur, recharge the battery as soon as possible for a period of 24 hours.

Battery charger

Caution!

Hazards can arise when operating battery chargers:

- Danger of explosion (due to the build up of explosive gases when charging the lead-acid rechargeable battery)

- Danger of fire and short-circuiting (due to electric shocks in moist conditions)

To prevent hazards arising:

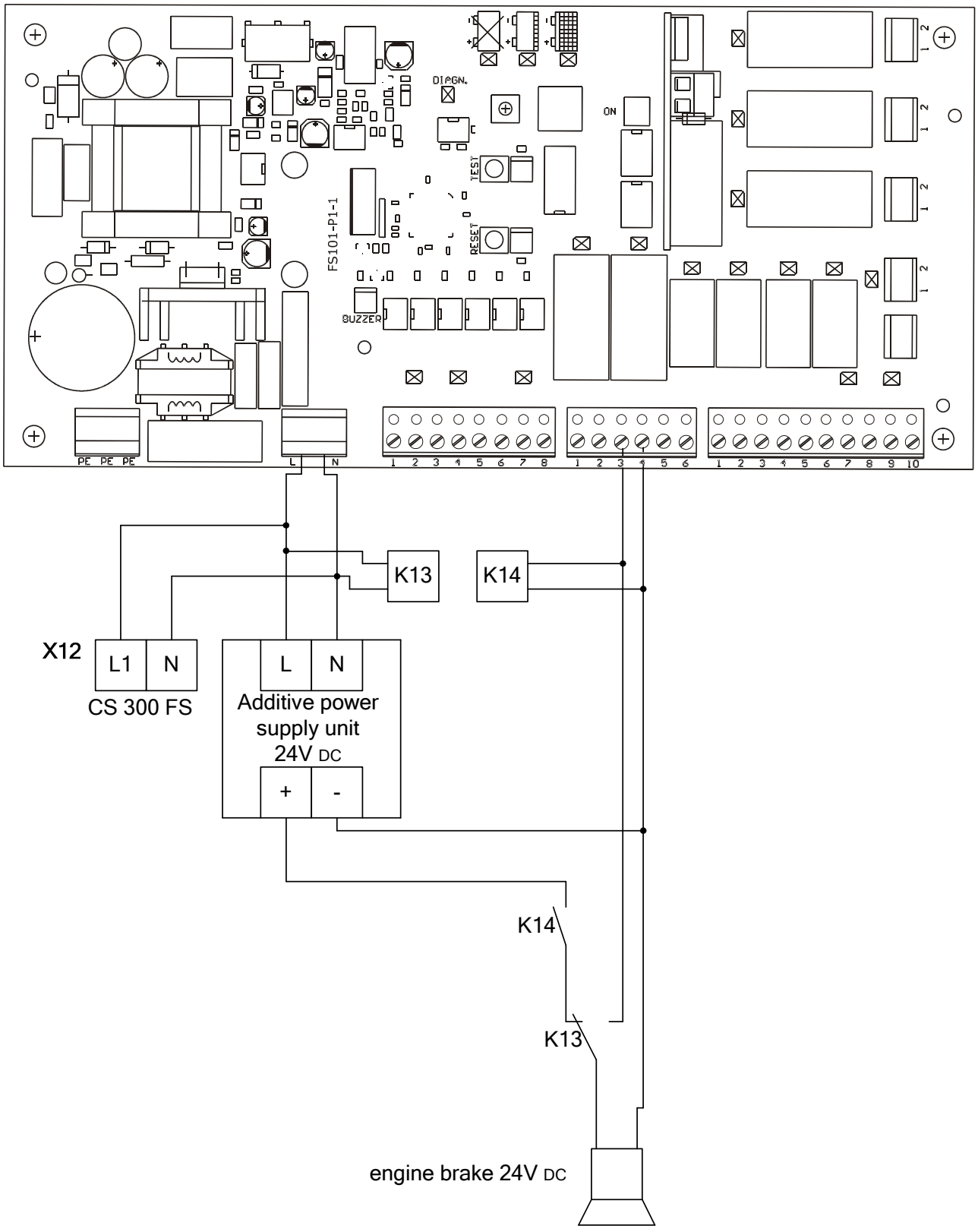
- Ensure that there is sufficient ventilation.
- Avoid open lights and fire.
- Only use the charger in dry rooms.
- Protect the charger against moisture.

Safety advice

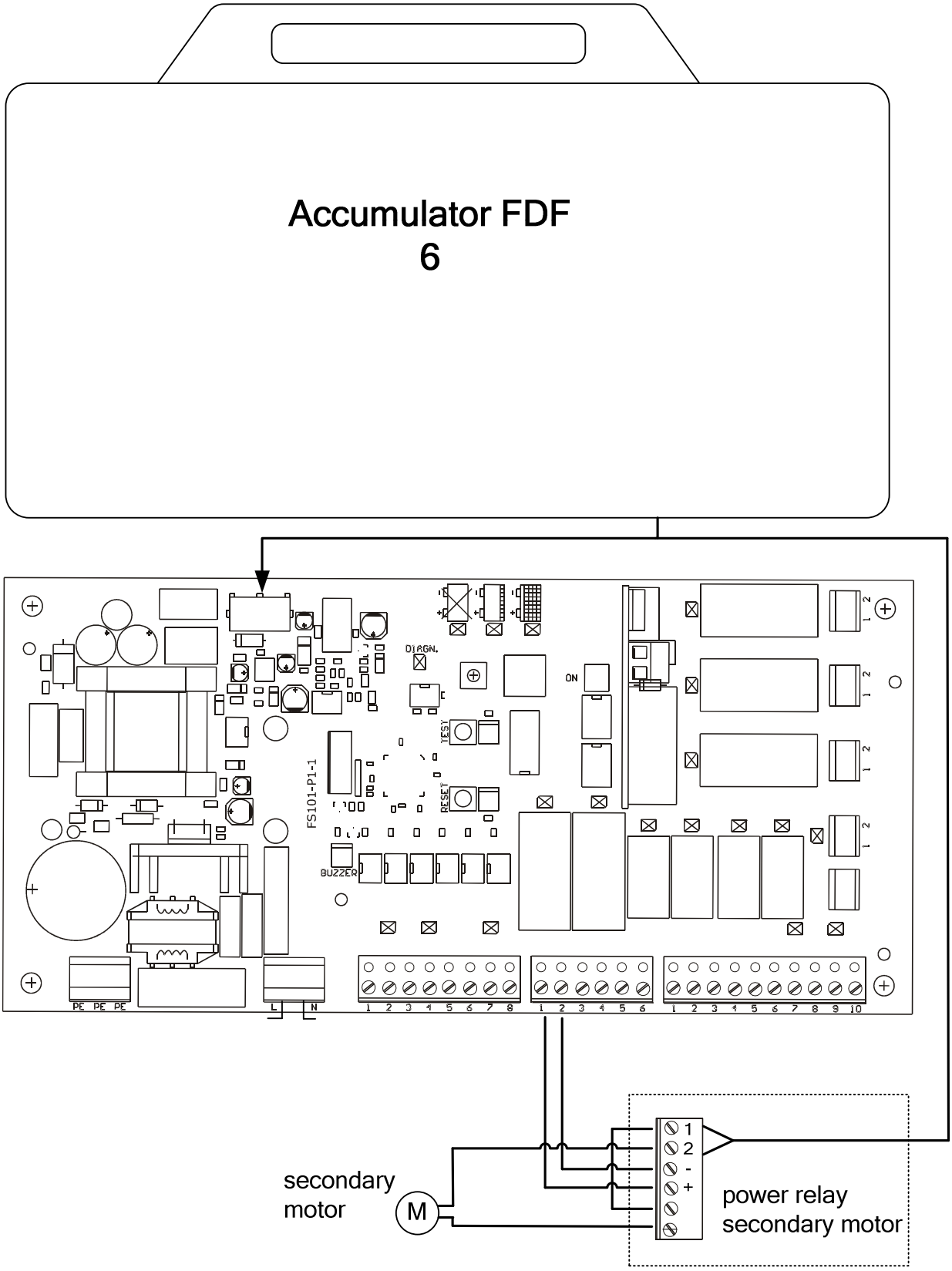
The battery charger of the FS101 circuit board is only suitable for charging maintenance-free lead-acid batteries. Only qualified persons may open the charger and it must never be operated when opened. The charger may only be used in the FS345 control unit. The guarantee is no longer valid if the charger is damaged as a result of being opened incorrectly. Before putting the charger into operation, ensure that there is sufficient ventilation. The charger may only be used in closed rooms and must not be subjected to moist conditions.

Any alterations made to the charger shall render the equipment approval invalid.

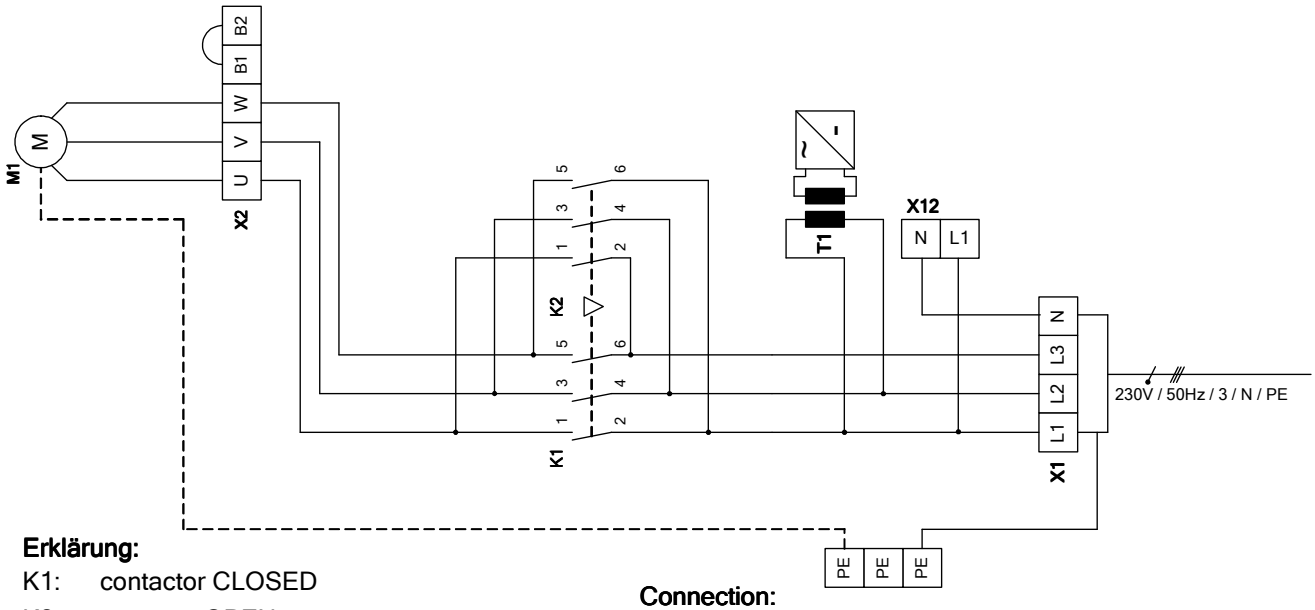
21.1 Connecting diagram engine brake for door operator FT3



21.2 Connecting diagram secondary motor for door operator FDF6



CS 300FS



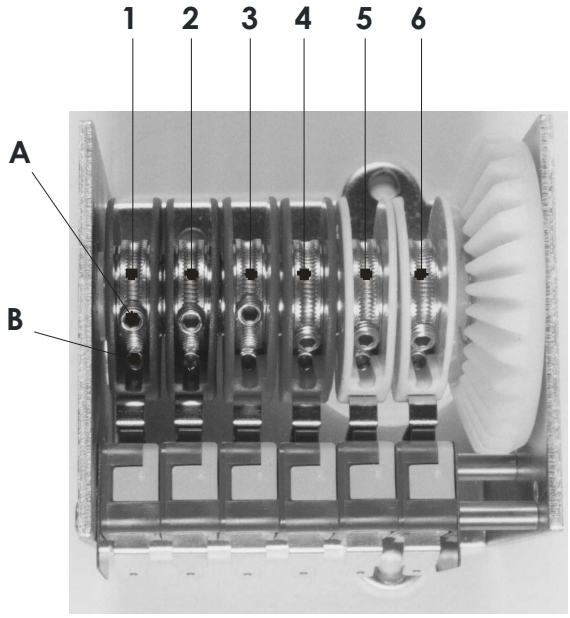
Erklärung:

K1: contactor CLOSED
K2: contacto OPEN
M1: motor
T1: Transformer 230V
X1: terminal strip mains connection
X2: terminal strip motor

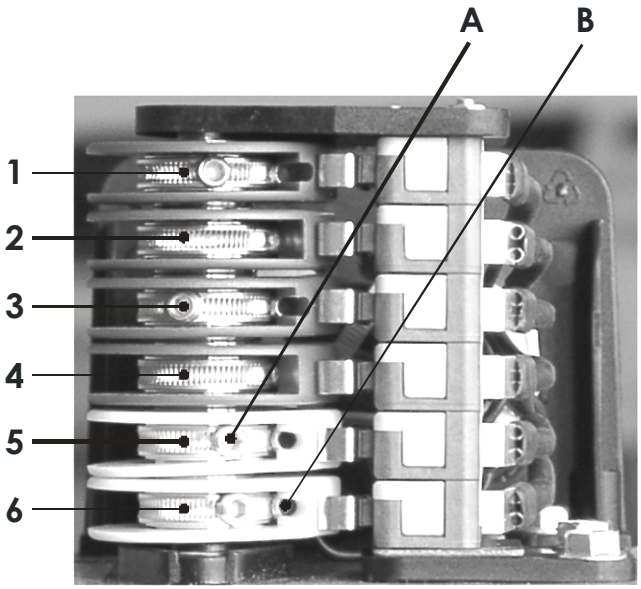
Connection:

> Connect the control to the mains.
> Connect the control to the motor.
> Short before the corresponding screw terminals, groukps of cables should be make safe by means of straps.

22 Adjustment of limit switch FDF / FTA / FDS



FDF

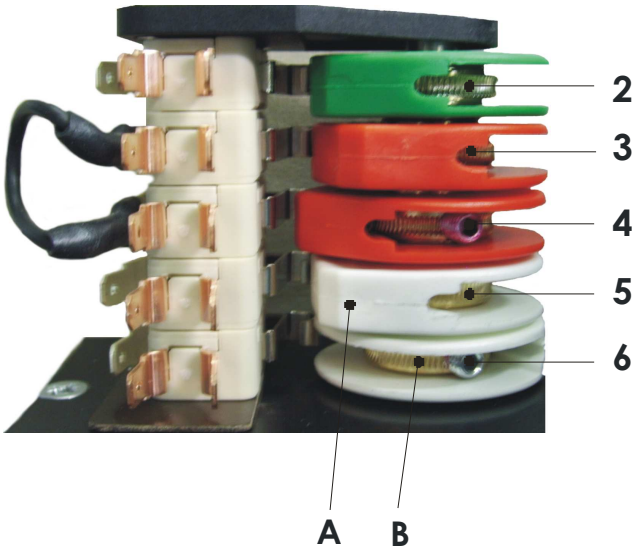


FTA / FDS

1. Additional limit switch OPEN	green
2. Limit switch OPEN	green
3. Safety limit switch OPEN	red
4. Safety limit switch CLOSED	red
5. Limit switch CLOSED	white
6. Additional limit switch CLOSED	white

1) Drive the gate to wished CLOSED position.
2) Set the control cam 5 (white) the way that the limit switch is operated.
3) Tighten the fixing screw A.
4) Fine adjustment is done with the screw B.
5) Drive the gate to wished OPEN position.
6) Set the control cam 2 (green) the way that the limit switch is operated.
7) Tighten the fixing screw A.
8) The safety limit switches 3 and 4 (red) must be set the way that they react directly after passing the control limit switch.
9) After the operation test, control the fixing screw.
10) The additional limit switches 1 and 6 have change-over contact free of potential.

Adjustment of limit switch FT



2.	Limit switch OPEN	green
3.	Safety limit switch OPEN	red
4.	Safety limit switch CLOSED	red
5.	Limit switch CLOSED	white
6.	Additional limit switch CLOSED	white

1) Drive the gate to wished CLOSED position.

2) Set the control cam 5 (white) the way that the limit switch is operated.

3) Tighten the fixing screw A.

4) Fine adjustment is done with the screw B.

5) Drive the gate to wished OPEN position.

6) Set the control cam 2 (green) the way that the limit switch is operated.

7) Tighten the fixing screw A.

8) The safety limit switches 3 and 4 (red) must be set the way that they react directly after passing the control limit switch.

9) After the operation test, control the fixing screw.

10) The additional limit switches 1 and 6 have change-over contact free of potential.

23 Technical data

Supply voltage	3~ 400VAC, 50 Hz, +/- 10% STANDARD 3~ 230VAC, 50 Hz, +/- 10% SPECIAL VERSION Further voltages on request
Power input	Max. 2.2 KW Maximum power consumption of the CS300FS controls themselves = 250mA, secondary Maximum power consumption of the FS101 controls themselves = 200mA, secondary
Motor data	Max 2,2 KW, -3,2 A
Controls voltage	24 VDC
Batteries	Maintenance-free batteries with VdS certification
Fault output relay	If inductive loads are connected (e.g. further relays or brakes), these must be fitted with appropriate suppressor elements (recovery diodes, varistors, RC circuits). Potential-free closed circuit contact; min. 10mA; max. 230V AC / 4A. Once contacts have been used for power circuits, they can no longer be used for extra-low current circuits.
Emergency operation output relay	If inductive loads are connected (e.g. further relays or brakes), these must be fitted with appropriate suppressor elements (recovery diodes, varistors, RC circuits). Potential-free closed circuit contact; min. 10mA; max. 230V AC /16A. Once contacts have been used for power circuits, they can no longer be used for extra-low current circuits.
Mounting	Vertical mounting on the wall, minimum height above floor = 1m
Housing (w x h x d)	300mm x 600mm x 130 mm
Operating temperature	+5°C … +55℃
Storage temperature	-20℃ … +85℃
Protection category	IP 54
Fuse provided on site	Max. 10 A K characteristic
Weight	10.5 Kg