

Electrical Diagrams and Operation Manual
BK150FUE-1 SMART START™ NXT SINGLE PHASE CONTROL BOX

For professional installers only
Keep this document in a safe place for future reference

LIMITED LIABILITY!

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Hörmann Flexon LLC
Starpointe Business Park
117 Starpointe Boulevard
Burgettstown, PA 15021-9506
Phone: 724.385.9150
www.hormann-flexon.com
This edition replaces all earlier versions.

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This Manual is directed especially at persons involved with starting up / commissioning the control box of Hörmann Flexon LLC. Starting up the control box must be carried out only by officially trained electrical experts who are familiar with the safety standards of electrical drive and automation technology.

The entity which has placed the control box in service is solely responsible for the completeness of the start-up Manual.

This Manual shows only a small range of the control box functions. Further functions and descriptions for individual door functions as well as more exact specifications for the control box and hazard notes can be found in the main description.

The collecting of information in this document has been done to the best of our knowledge and with due diligence. Hörmann Flexon LLC does not warrant the correctness and completeness of the information in this document. In particular, Hörmann Flexon LLC cannot be held liable for following damages due to faulty or incomplete information. Since mistakes can never be completely avoided in spite of our best efforts, we always welcome feedback.

The installation recommendations contained in this document presume favorable surrounding conditions. Hörmann Flexon LLC assumes no liability for perfect function in environments alien to the system. Hörmann Flexon LLC provides no warranty that the information in this document is free of foreign copyrights. Hörmann Flexon LLC does not grant any licenses for its own or foreign patents or other copyrights in connection with this document. Warranty claims against Hörmann Flexon LLC are the right of the direct contractual partner only and are not transferable. Warranty is assumed only for the products supplied by Hörmann Flexon LLC. There is no warranty for the overall system. The description of products, their use, possibilities and performance data are not to be taken as assured properties and are subject to technical changes.

General notes concerning this document

The following symbols are used in this function description to alert the user to various hazards and useful tips.

 WARNING
Alerts to a possible hazard to persons if the procedure is not performed as described.

 ATTENTION
Alerts to possible damage to the control box.

IMPORTANT
Alerts to information which is important to the function of the control box or door.

 Refers to useful information which is useful but not absolutely necessary for using the control box door controller.

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1 Safety Information

When starting up and operating the control box, the following important safety information as well as the installation and wiring notes must be strictly observed:

- All installation, startup and maintenance work must be performed only by qualified specialists.
- The control box may be opened only if the supply voltage has been switched off completely.
- If the potential free contacts of the output relays or other terminals are supplied by a foreign voltage which is still present after switching off the control box, you must install a sign on the housing that says: "ATTENTION! You must disconnect all supply circuits before opening the housing."
- The control box must never be operated while open. .
- If the connecting lead is damaged, it must be changed by the manufacturer or another qualified person.
- Hazardous voltages remain stored in the intermediate circuit capacitors for up to five minutes after power has been turned off. The discharge time until voltages fall below 60 V DC is a maximum of 5 minutes. Touching internal control box components within this discharge time is hazardous.
- A defective switching power supply can considerably increase the discharge time of the intermediate circuit capacitors down to a voltage of less than 60 V DC. Here discharge times of up to 10 minutes may be possible.
- In case the 24 V control box voltage is short circuited or overloaded, the switching power supply will not start up even though the intermediate circuit capacitors are charged. The display and LED's remain off. The power supply can be restarted only after eliminating the short circuit or extreme overload.
- After turning off the supply, the power supply is still fed from the intermediate circuit capacitors for several seconds and maintains the supply function for a certain time depending on the power supply load.
- The processor circuit with VFD display, EEPROM and multiplexers is galvanically directly connected to the main supply. Note this when taking any measurements (for measurements in the processor circuit, do not use test equipment with PE reference to the measuring circuit).
- It is not permitted to operate the control box without a grounded connector. The absence of a grounded connector will result in hazardous voltages on the controller housing caused by drain capacitors add a period symbol here.
- Turning on or operating the control box in the presence of condensation is not permitted and may result in permanent damage.
- If controllers are used outside the specified temperature range, a regulated and monitored climate controller system must be in place to ensure that the specified working temperature range is maintained when turning on the supply and when operating the controller.
- The control box must never be operated with a damaged membrane keypad or sight glass. Damaged keypads and windows must be replaced. To prevent damage to the keypad, do not use pointed objects to actuate the keys. The keypad is designed for finger operation only.

- Before turning on the control box voltage for the first time, ensure that the processor cards (plug-in modules) are in the correct position. Incorrect fit of the cards can result in damage to the control box, likewise the installation of non-approved third-party equipment.
- When moving the door in deadman mode, ensure that the door area can be inspected by the operator, since in this mode safety equipment such as safety bar and light barrier are defeated.
- Parameter settings and the function of the safety devices have to be checked before operating the door. Parameter settings and wire bridges are only allowed to set by an instructed person.

WARNING

Failure to observe the safety information can result in physical harm or damage to the control box.

This safety information makes no claim to completeness.

If you have questions about the product, contact Hörmann Flexon.

The manufacturer has carefully checked and inspected the device hardware and software, but no warranty is given for a complete absence of errors.

A device mark (nameplate with name and address of the manufacturer, serial number, model number, supply voltage).

2 Technical Data For BK150FUE-1 Smart Start™ NXT Boxes

Dimensions of Housing (W x H x D)	11-5/8" x 15-3/4" x 8-3/16" (300 x 400 x 206mm) without wall brackets
Installation	Vertical using wall bracket on housing bottom
Supply voltage via L1, L2, L3, PE	1PH/3PH 230VAC ±10% 50/60Hz Wye Systems Only
Fuse	20A Class CC
Control Power Consumption	Max. 140W fully assembled with operator not running
Control voltage / External supply 2 (+24VDC Terminals 40, 44, 47, 50, 55, 57, 59) (GND Terminals 36, 46, 49, 53, 73, 83)	- 24VDC ±5% max. 3.5A - Includes all external devices, such as plug-in modules, I/O modules, 24VDC brakes, switched transistor outputs and additional control voltages - Fused and short-circuit proof from a self-resetting central switching regulator - GND potential internally earthed to PE (protective earth potential)
Control voltage / External supply 3 (Terminals 74, 80)	For electronic limit switch and safety trip Nominal value 11.5V/max. 130mA
Control inputs: (Terminals 41, 42, 43, 45, 48, 49, 58, 56, 54, 52, 51)	24VDC/15mA, max. 26VDC/20mA All inputs must be connected potential-free or <5V: inactive = logical 0 >7V: active = logical 1 Min. signal length for input control commands: > 100ms Galvanic separation via optoelectronic coupler on printed circuit board
Serial Interface 1 "DoorCom" RS485-0 (X25/25b)	For electronic limit switches DES or TST PD/PE RS485 level (A,B), terminated by 120Ω Recommended cable: shielded-twisted pair in noisy environment, twisted pair in normal environment.
Serial Interface 2 "AdvDoorCom" CAN-2 (X28/28b)	For operating unit TST UTH, external operation of extension PCB TST RFUxK CAN level (CH, CL), terminated by 120Ω Recommended cable: shielded-twisted pair in noisy environment, twisted pair in normal environment.
Serial Interface 3 CAN-1 for communication module	For module TST RFUCom TTL level (Tx, Rx) Max. cable length: 10cm for internal wiring to module
Serial Interface 4 RS485-1 for communication module	For module TST RFUCom Typical for communication between two doors (loading house/locking) TTL level (Tx, Rx, DDR) Max. cable length: 10cm for internal wiring to module
Serial Interface 5 CAN-0 Extension PCB TST RFUxK (X701)	Suitable for operation of the module TST RFUxK TTL level (Tx, Rx) Max. cable length: 10cm for internal wiring to module
USB:	USB Host (X403) Low-power USB memory stick with FAT32 file structure. USB profile "Mass Storage Device" (8), Sub Class Code "SCSI transparent command set" (6), Interface log "Bulk-only transfer" (0x50), Logical Unit Number (LUN 0), SCSI "Request Sense" <2.5s, USB-Request-Time <2.5s, USB-NAK<36684x, no Hubs possible. Plug: USB type A Max. supply: 100mA Max. cable length: 2m Typical data record size per door cycle (log storage function): approx. 2Kbyte The temperature range must be taken into account if the USB stick is used continually within the control, e.g. as a log memory. Recommendation: <ul style="list-style-type: none">• Industrial Grade (typ.): 0°C ... +70°C• Extended Industrial Grade (typ.) -40°C ... +85°C. USB Device (X401) PC communication with Hörmann service protocol Communication device → virtual serial port Plug USB-type B (mini USB) Max. cable length: 2m Only one USB device can be operated at a time on the USB interface

2 Technical Data For BK150FUE-1 Smart Start™ NXT Boxes

Temperature Range	Ambient Air Temperature: Operation without housing: -20°... +65°C Operation in housing: -20°... +40°C Storage: -25°... +70°C NOTE: Note the temperature-dependent reduction in on-time for the operator (see Operator Output)
Humidity	Up to 80% non-condensing
Vibration	Low-vibration installation, e.g. on a masonry wall
Protection Category	NEMA 4X
Weight	Approx. 24 lbs

3 Mounting Control Box

WARNING

- ▶ Wiring, testing and maintenance work on an open control box may be performed only without power. Observe in particular the points listed under Safety Information.
- ▶ After turning off the control box, dangerous voltage levels remain present for up to 5 minutes.
- ▶ Touching electronic components is dangerous due to residual voltages.
- ▶ Never operate the control box while the cover is removed.

ATTENTION

- ▶ Before turning on the control box for the first time and after finishing the wiring, check whether all connections are tight on the control box and motor side. Loose connections will often damage the converter.
- ▶ All control box voltage inputs are galvanically isolated from the supply by means of base isolation. All components connected to the control box must have additional isolation with a rated voltage of > 230 V.
- ▶ Fast running sectional doors may create very high electrostatic discharge levels. The discharging of this voltage may damage the controller. Therefore suitable measures must be taken to prevent electrostatic discharge.
- ▶ Maximum connection diameters and torque of the printed card terminals used.

ATTENTION

- ▶ During shipment, vibration can cause terminal connections to loosen. Before turning on control box for the first time and after finishing the wiring, check whether all connections are tight on the control box and motor side. **DAMAGE CAUSED BY LOOSE CONNECTIONS WILL VOID THE MANUFACTURER WARRANTY.**

Part	Torque Lb In	AWG	Wire Type
X1, X4	3 - 10	10 - 30	CU
X2, 7, 13-17, 17A, 18 - 20	7	12 - 22	CU
USLKG5	5 - 7	26 - 10	CU
DISC1	7	18 - 8	CU

ATTENTION

- ▶ The buttons on the front of the control box are NOT to be used as activations. Repeated use of the UP ARROW, STOP and DOWN ARROW buttons will cause damage to the keypad membrane. **USE OF THESE BUTTONS AS AN ACTIVATION WILL VOID THE CONTROL BOX MANUFACTURER WARRANTY.**

ATTENTION

- ▶ Do not drill into any part of the control box. This can result in damage of the circuit board and components. **DRILLING INTO THE CONTROL BOX WILL VOID MANUFACTURER WARRANTY.**

ATTENTION

- ▶ Do not remove circuit board or touch any of the electronic components, especially parts of the processor circuit. This can result in damage of the circuit board and components. **REMOVAL OF THE CIRCUIT BOARD AND DAMAGE CAUSED BY TOUCHING THE CIRCUIT BOARD WILL VOID THE CONTROL BOX MANUFACTURER WARRANTY.**

ATTENTION

- ▶ Do not integrate, install or add any devices to the control box without manufacturer approval. **INTEGRATION OR INSTALLATION OF DEVICES NOT APPROVED BY THE MANUFACTURER WILL VOID THE MANUFACTURER WARRANTY.**

ATTENTION

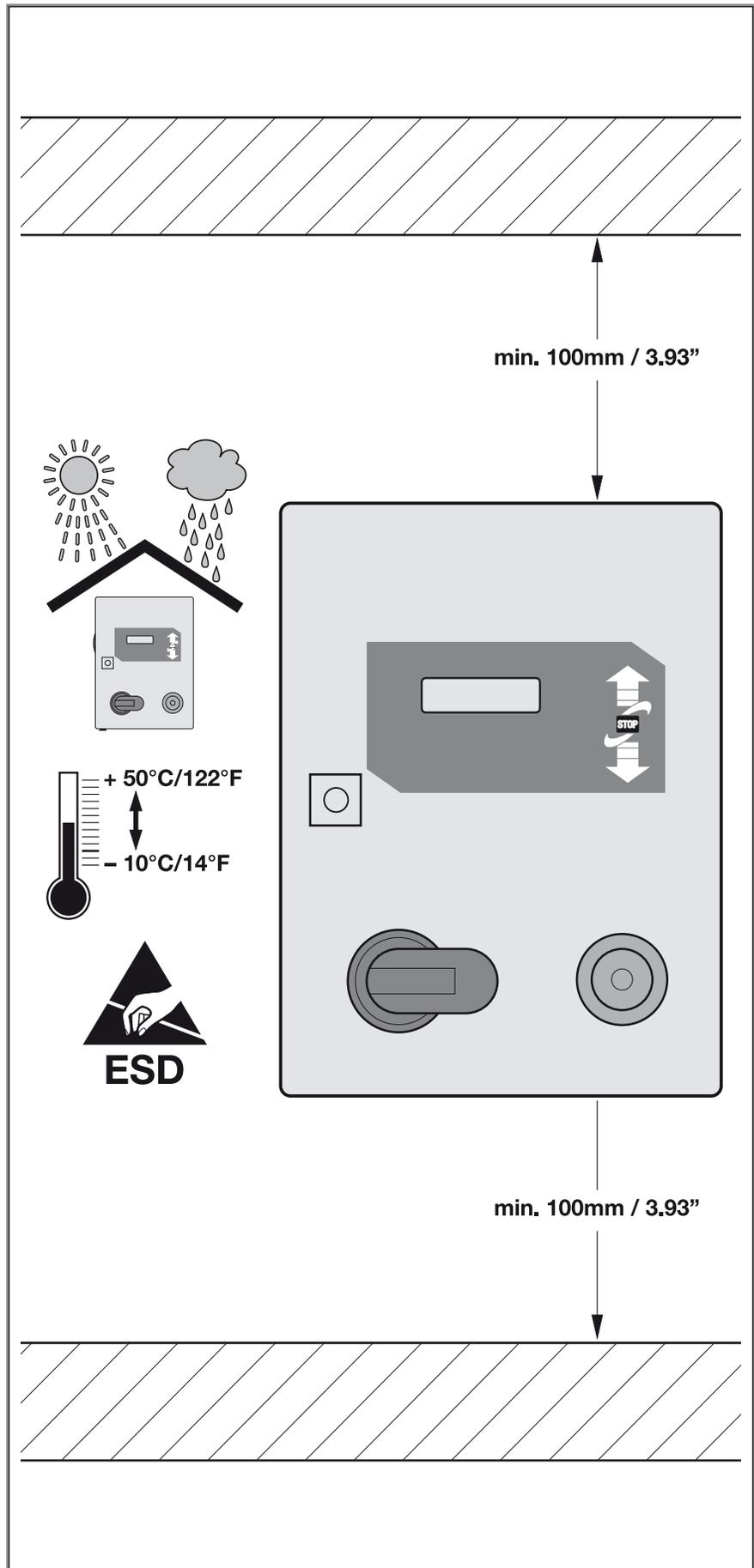
- ▶ **CHANGING OR MANIPULATING FACTORY PARAMETERS WITHOUT THE CONSENT OF THE MANUFACTURER WILL VOID THE MANUFACTURER WARRANTY.**

3 Mounting Control Box

3.1 Mounting Control Box

⚠ WARNING
The system must be switched off while installing the control box.

- ⚠ WARNING**
- ▶ Before installing, check the control box for any transport or other damage. Damage inside the control box may result in hazards to the user.
 - ▶ Do not touch any electronic parts, especially parts of the processor circuit. Electronic components can be damaged or destroyed by electrostatic discharge.
 - ▶ Before opening the housing cover, be sure that no drilling debris on the cover can fall into the housing.
 - ▶ You have to make sure that the housing is installed without tension.
 - ▶ Unused cable entries must be closed in order to achieve NEMA 4.
 - ▶ The cable entries are not allowed to have mechanical stress.
 - ▶ The housing must be mounted with the included spacers between housing and wall.

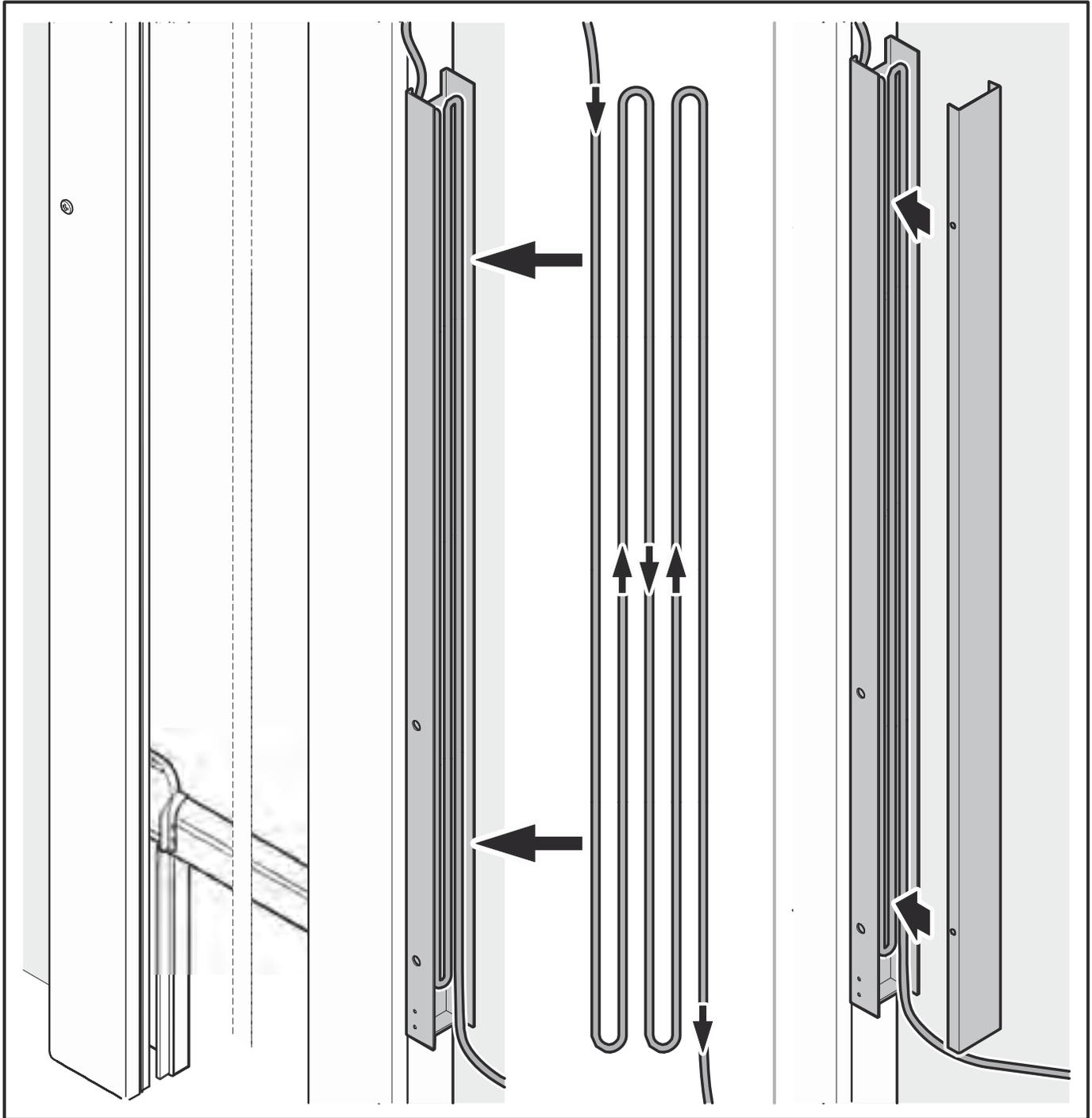


4 Electrical Diagrams for BK150FUE-1 Control Boxes

4.1 Cable Management

NEATLY WRAP EXTRA CABLE USING THE ENTIRE LENGTH OF THE WIRE TROUGH. WIRE TIE CABLES AND INSTALL COVER.

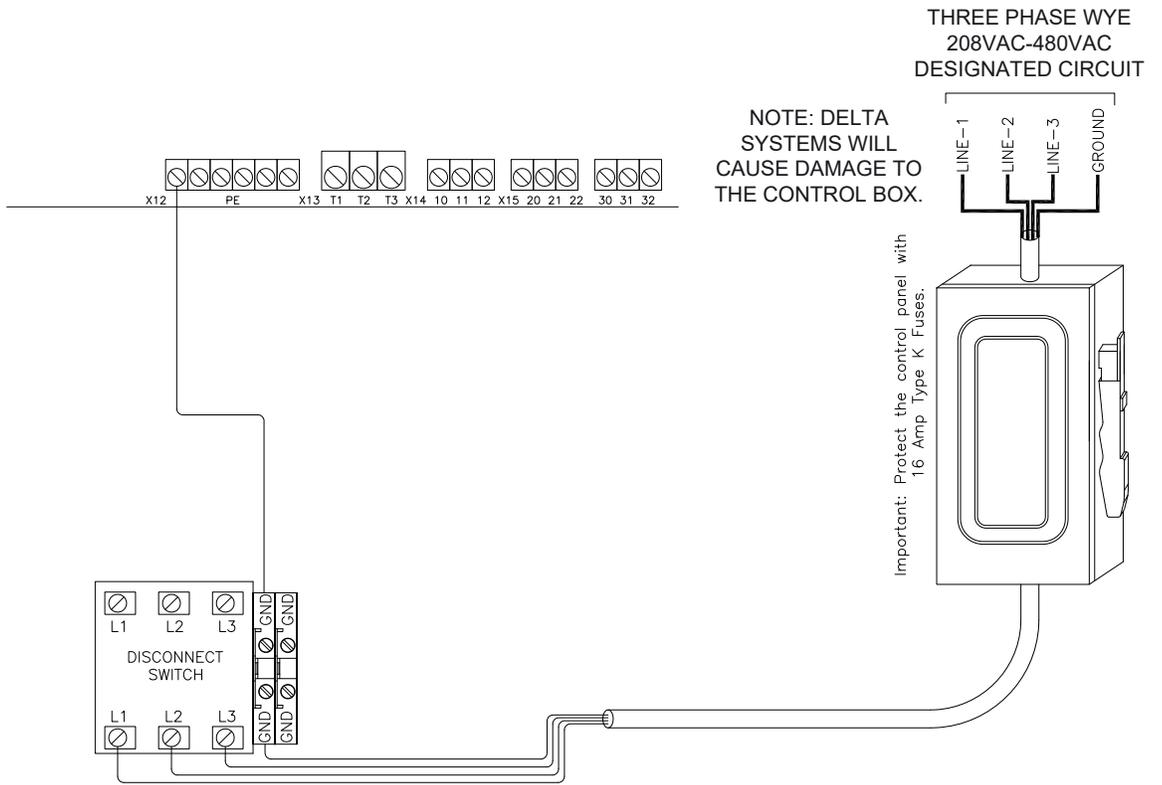
IMPORTANT: DO NOT MAKE COILS! THIS WILL CAUSE EMI PROBLEMS.



4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

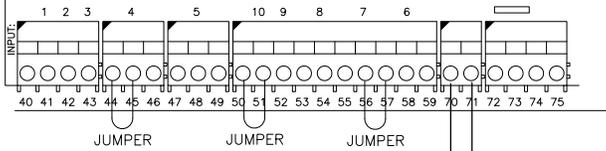
4.2 Power Connections



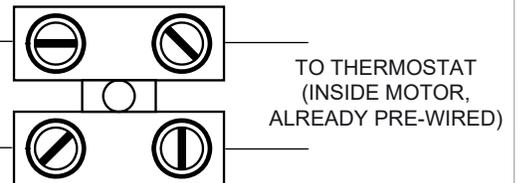
INSIDE CONTROL BOX

4.3 Operator Thermostat Connections (Optional)

NOTE: REMOVE JUMPER WIRE BETWEEN T70 AND T71



INSIDE MOTOR JUNCTION BOX

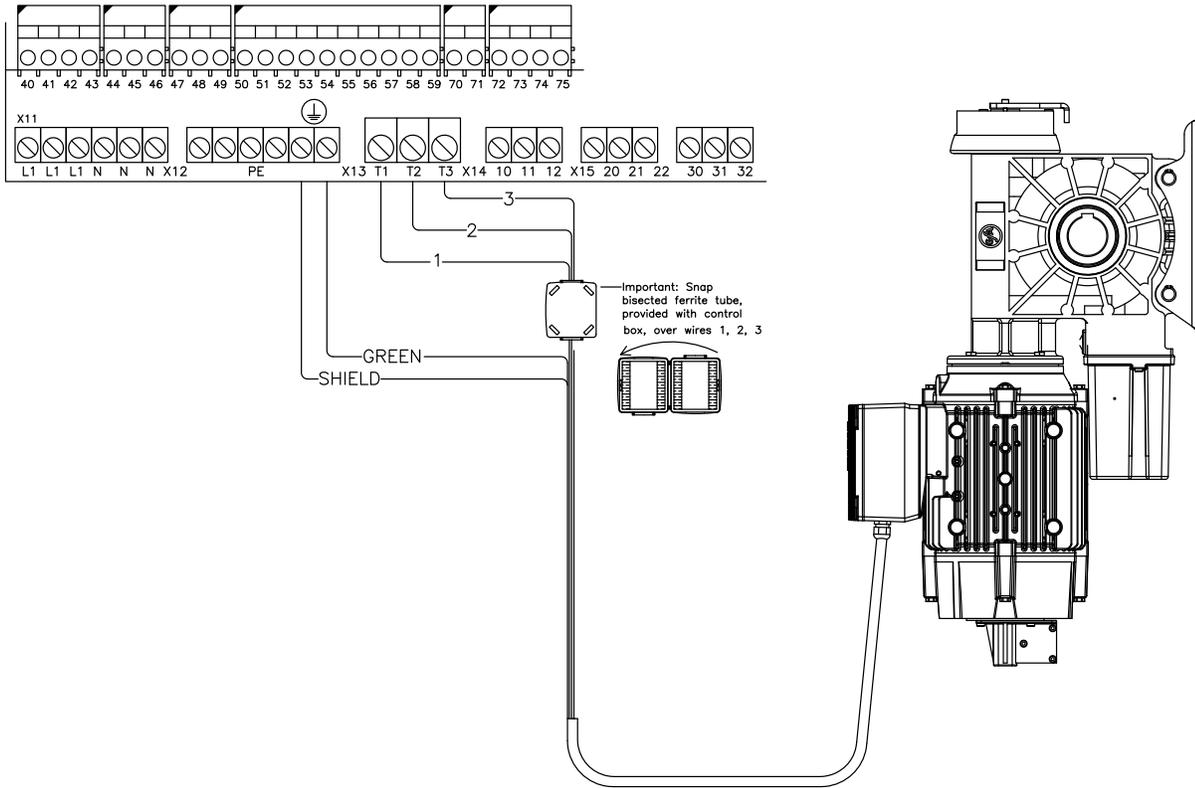


TO ADD THERMOSTAT CONNECTIONS TO THE CONTROL BOX, CONNECT AS SHOWN.

4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

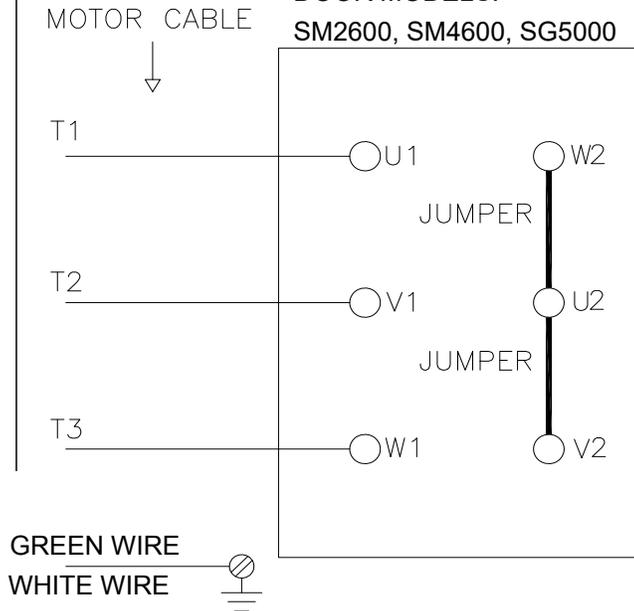
4.4 Motor Connections



INSIDE MOTOR JUNCTION BOX

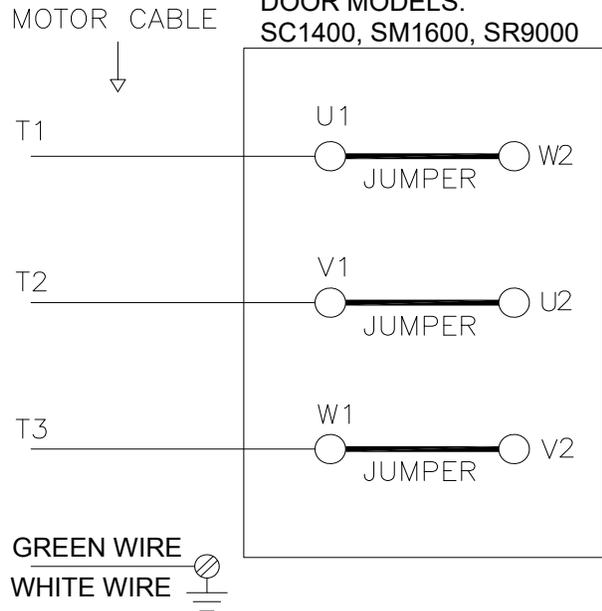
METAL MOTOR JUNCTION BOX — WYE CONFIGURATION

DOOR MODELS:
SM2600, SM4600, SG5000

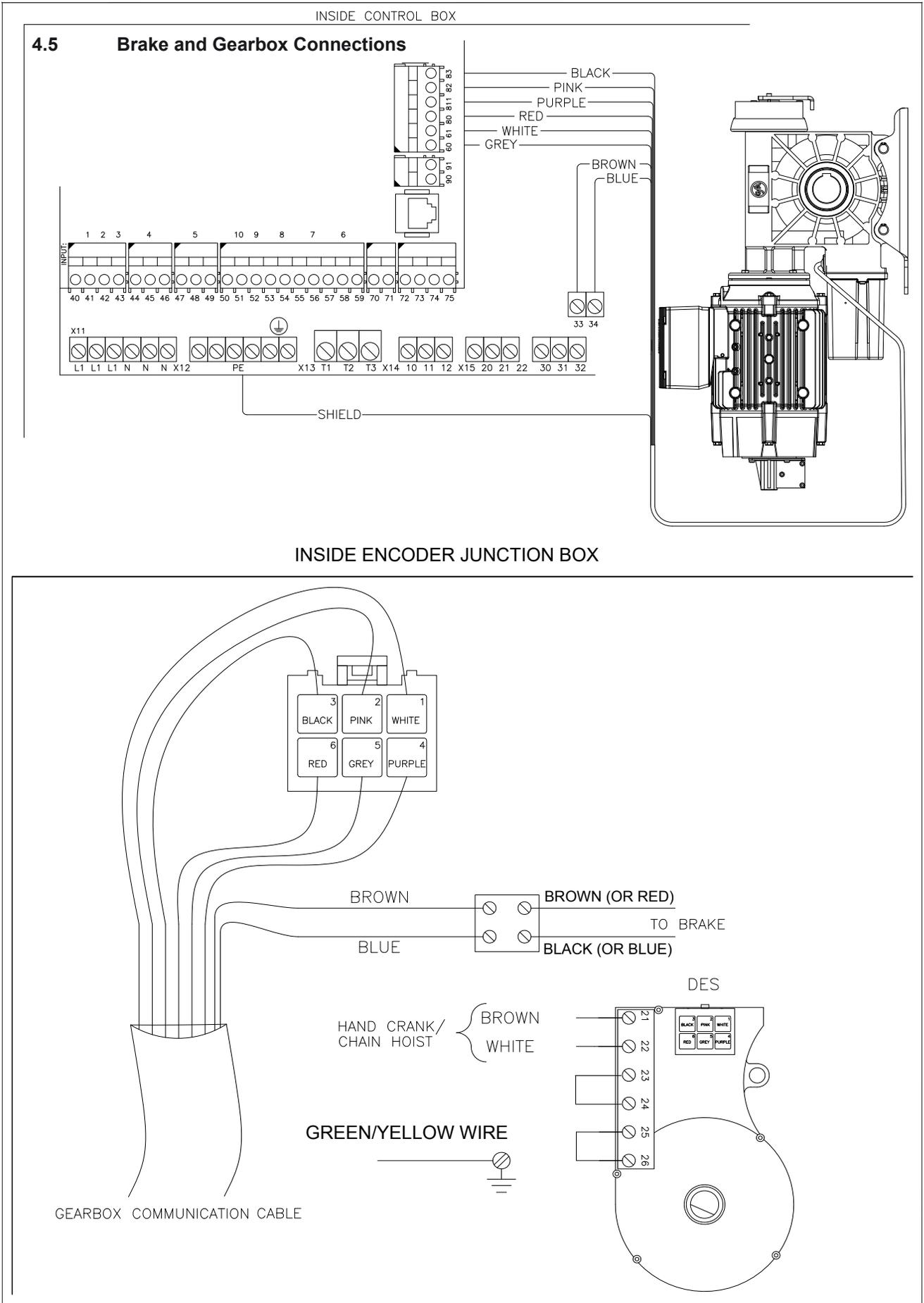


METAL MOTOR JUNCTION BOX — DELTA CONFIGURATION

DOOR MODELS:
SC1400, SM1600, SR9000



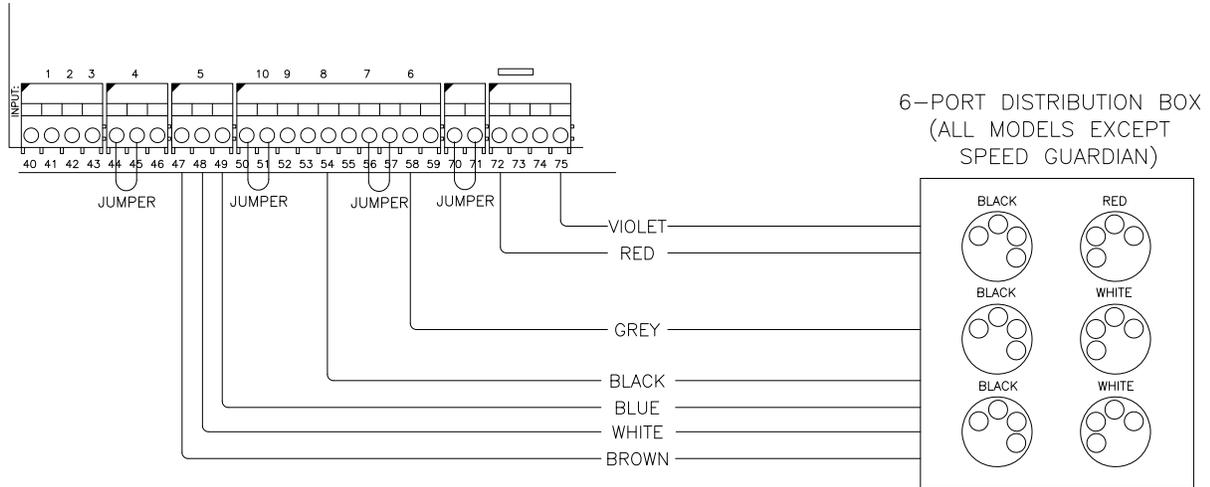
4 Electrical Diagrams for BK150FUE-1 Boxes



4 Electrical Diagrams for BK150FUE-1 Boxes

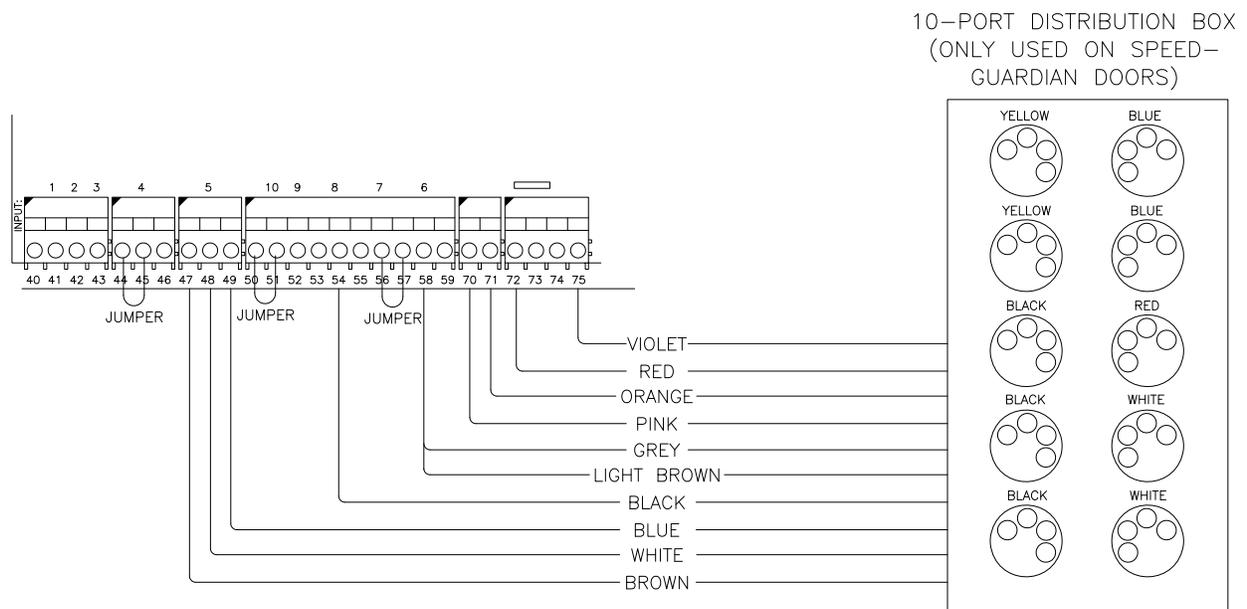
INSIDE CONTROL BOX

4.6 Smart Start™ NXT 6-Port Distribution Box Connections



INSIDE CONTROL BOX

4.7 Smart Start™ NXT 10-Port Distribution Box Connections



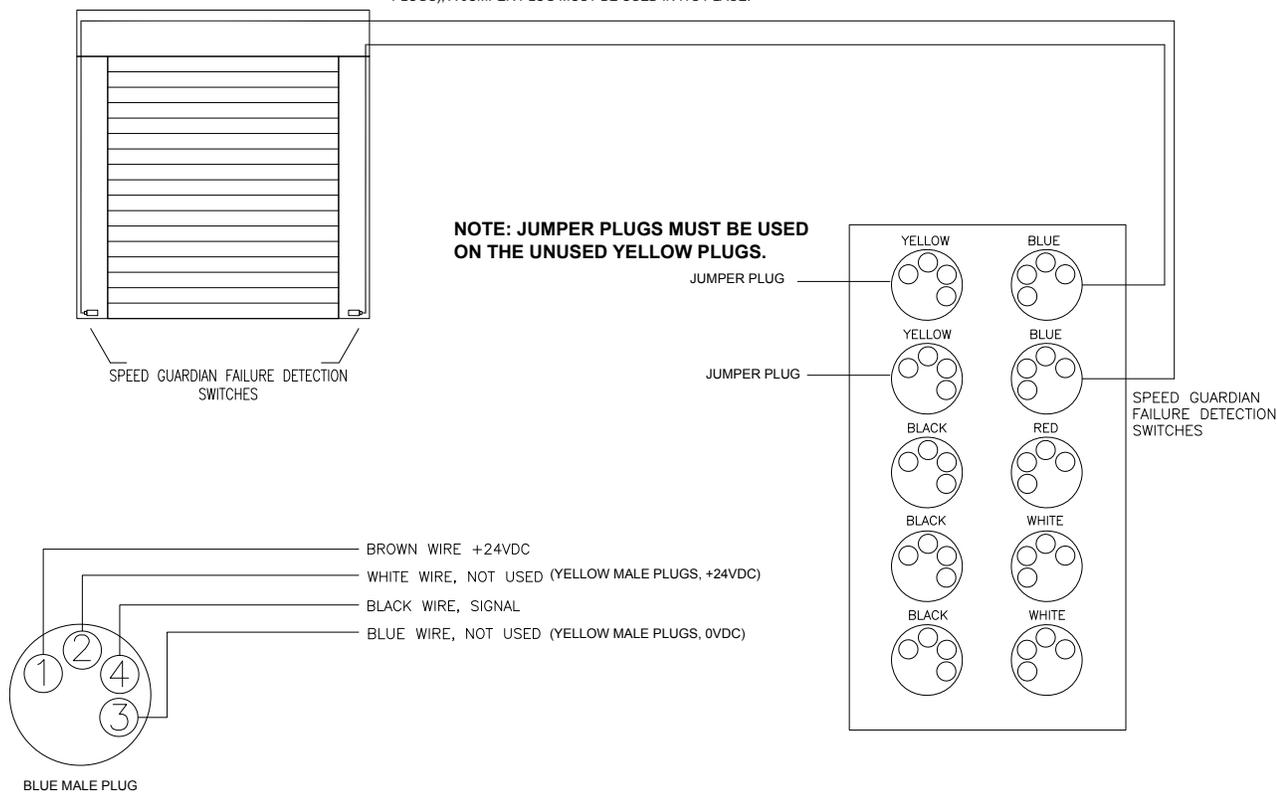
NOTE: IF THE DRIVE BELT TRACKING SWITCHES (H/V MODELS ONLY)(YELLOW PLUGS) ARE NOT BEING USED, A JUMPER PLUG MUST BE USED IN ITS PLACE.

4 Electrical Diagrams for BK150FUE-1 Boxes

4.9 Speed Guardian™ U/N Distribution Box Connections

P. 506 = 0401

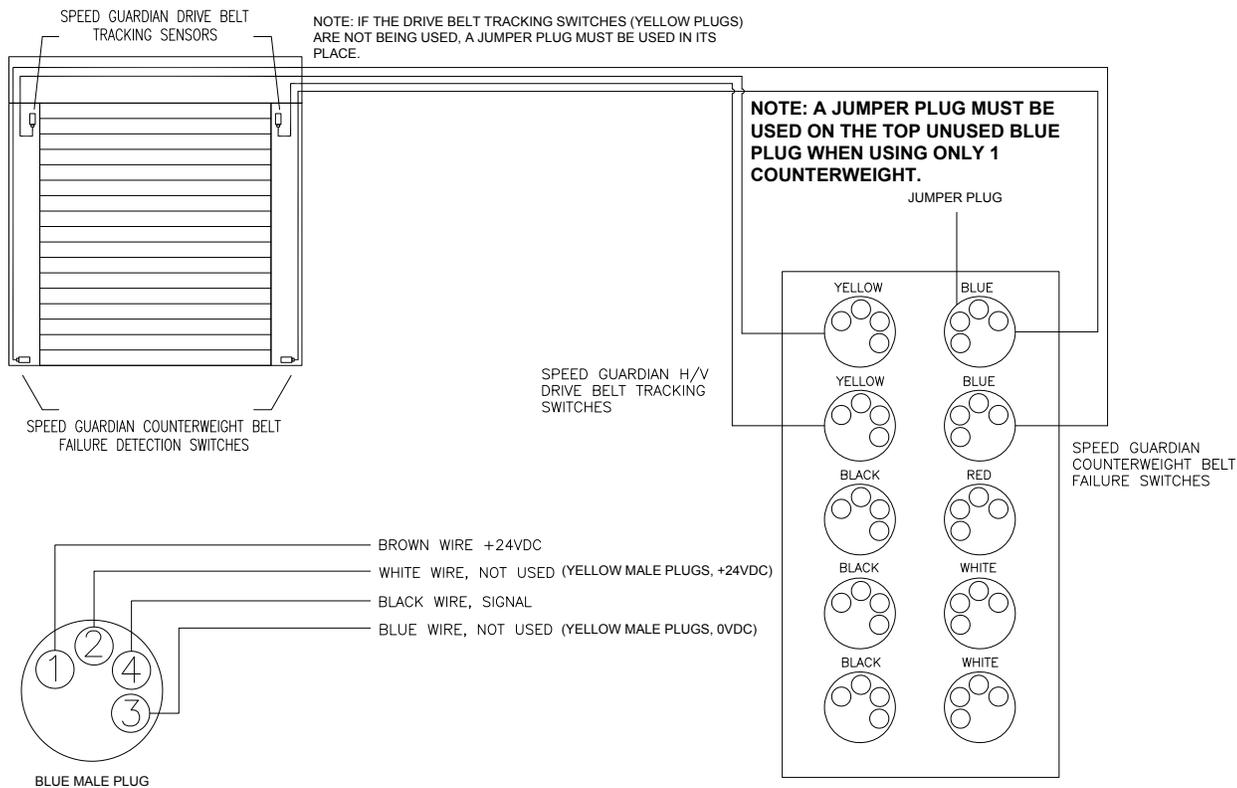
NOTE: IF THE SPEED GUARDIAN U/N CHAIN/SRING FAILURE DETECTION SWITCHES ARE NOT BEING USED (BLUE PLUGS), A JUMPER PLUG MUST BE USED IN ITS PLACE.



4.10 Speed Guardian™ H/V Distribution Box Connections (1 Or 2 Counterweights)

P. 506 = 0401

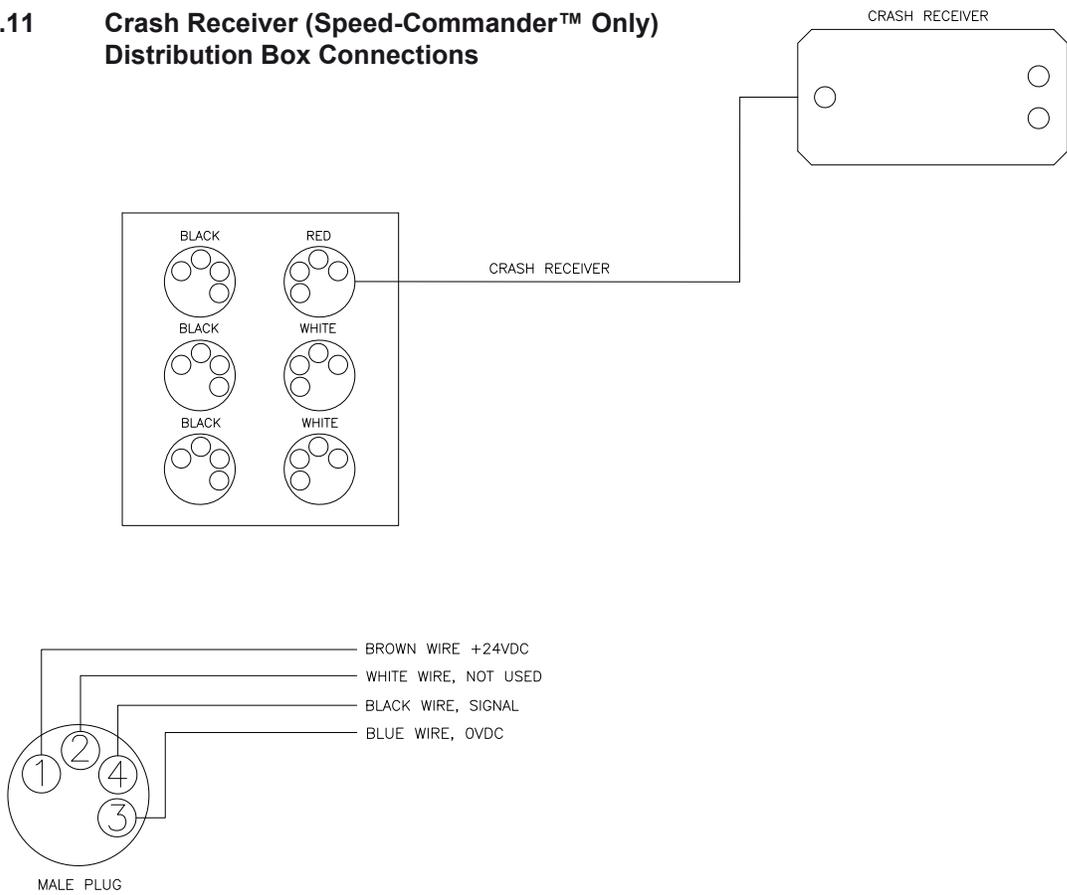
NOTE: IF THE SPEED GUARDIAN H/V COUNTERWEIGHT BELT FAILURE DETECTION SWITCHES ARE NOT BEING USED (BLUE PLUGS), A JUMPER PLUG MUST BE USED IN ITS PLACE.



4 Electrical Diagrams for BK150FUE-1 Boxes

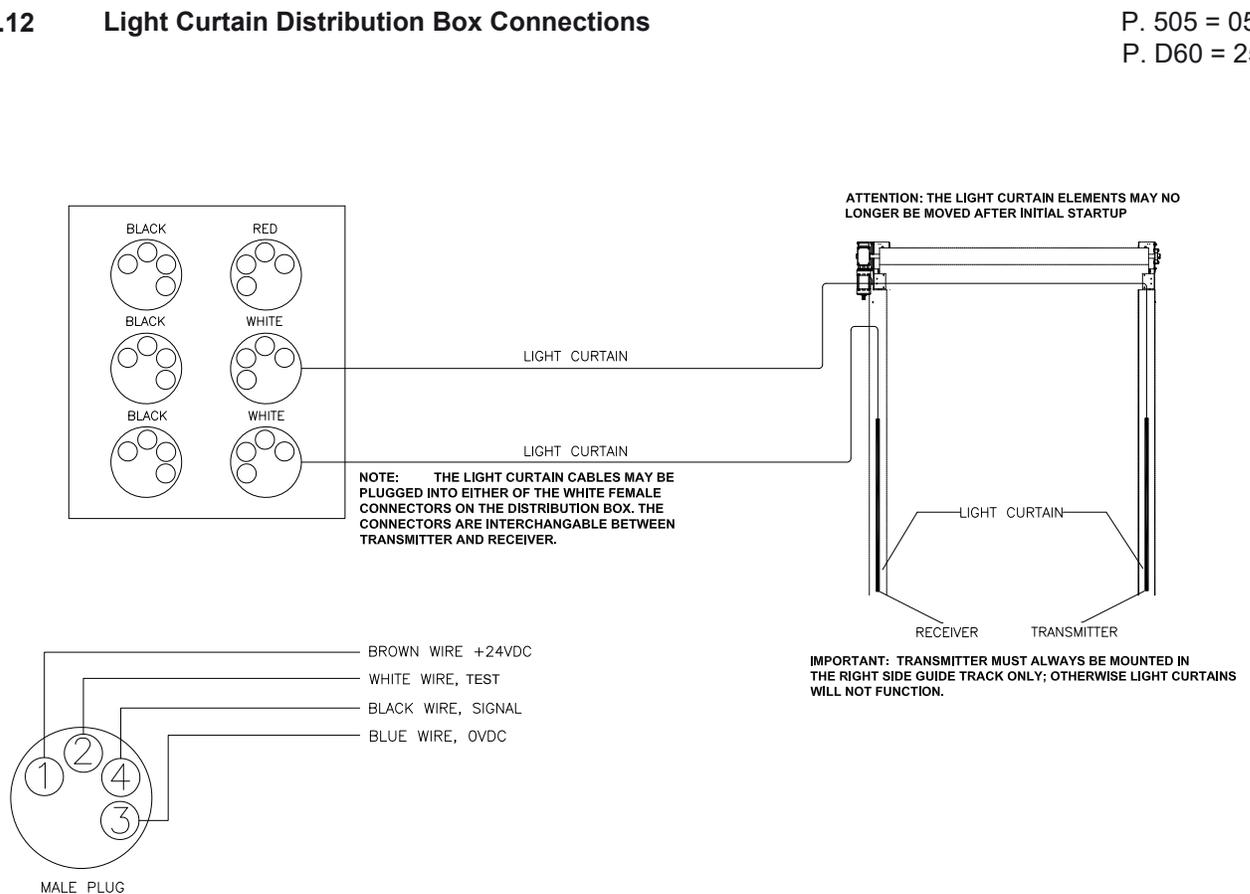
4.11 Crash Receiver (Speed-Commander™ Only) Distribution Box Connections

P. 506 = 0412



4.12 Light Curtain Distribution Box Connections

P. 505 = 0520
P. D60 = 25

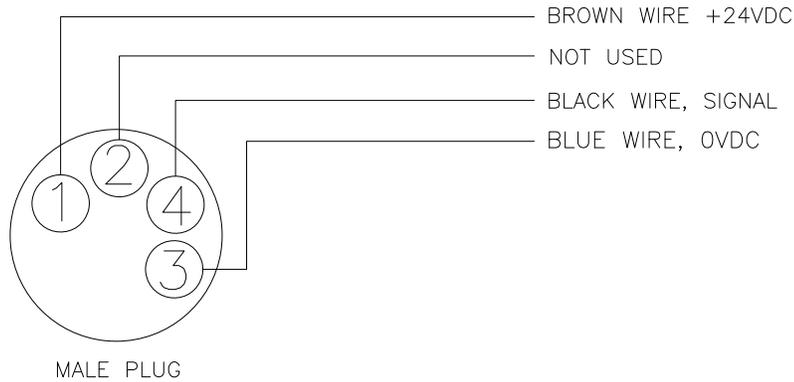


4 Electrical Diagrams for BK150FUE-1 Boxes

4.13 Activations Cable Pinouts

P. 508 = 0101

ACTIVATIONS CABLE –
M8 4-PIN MALE PLUG TO HARDWIRED
4-CONDUCTOR

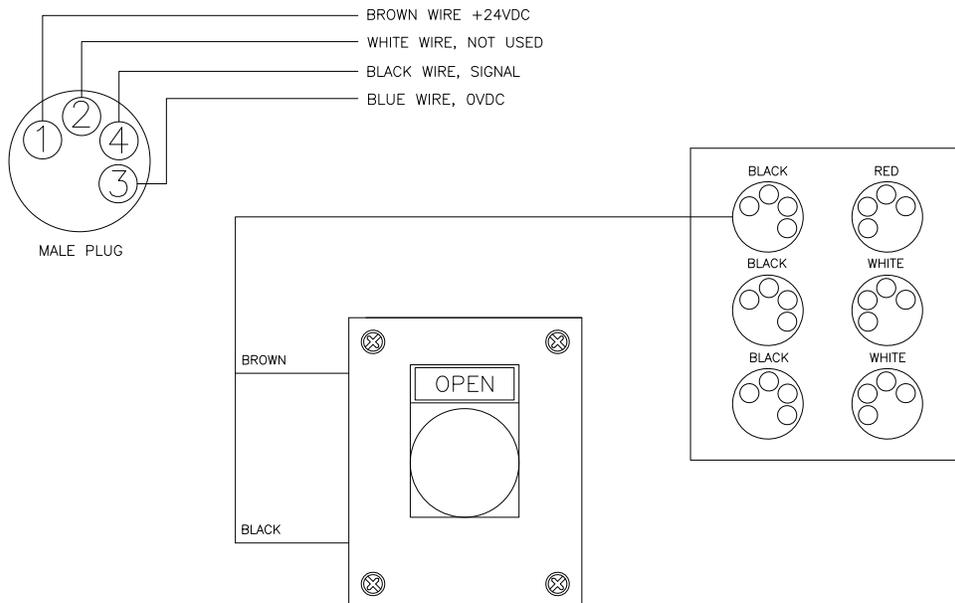


NOTE: THIS CABLE CAN BE USED WITH ANY ONE ACTIVATION (NON-PROTECTION) DEVICE. FOLLOW WIRING PINOUT ABOVE.

4.14 Single Pushbutton Distribution Box Connections (Optional)

P. 508 = 0101

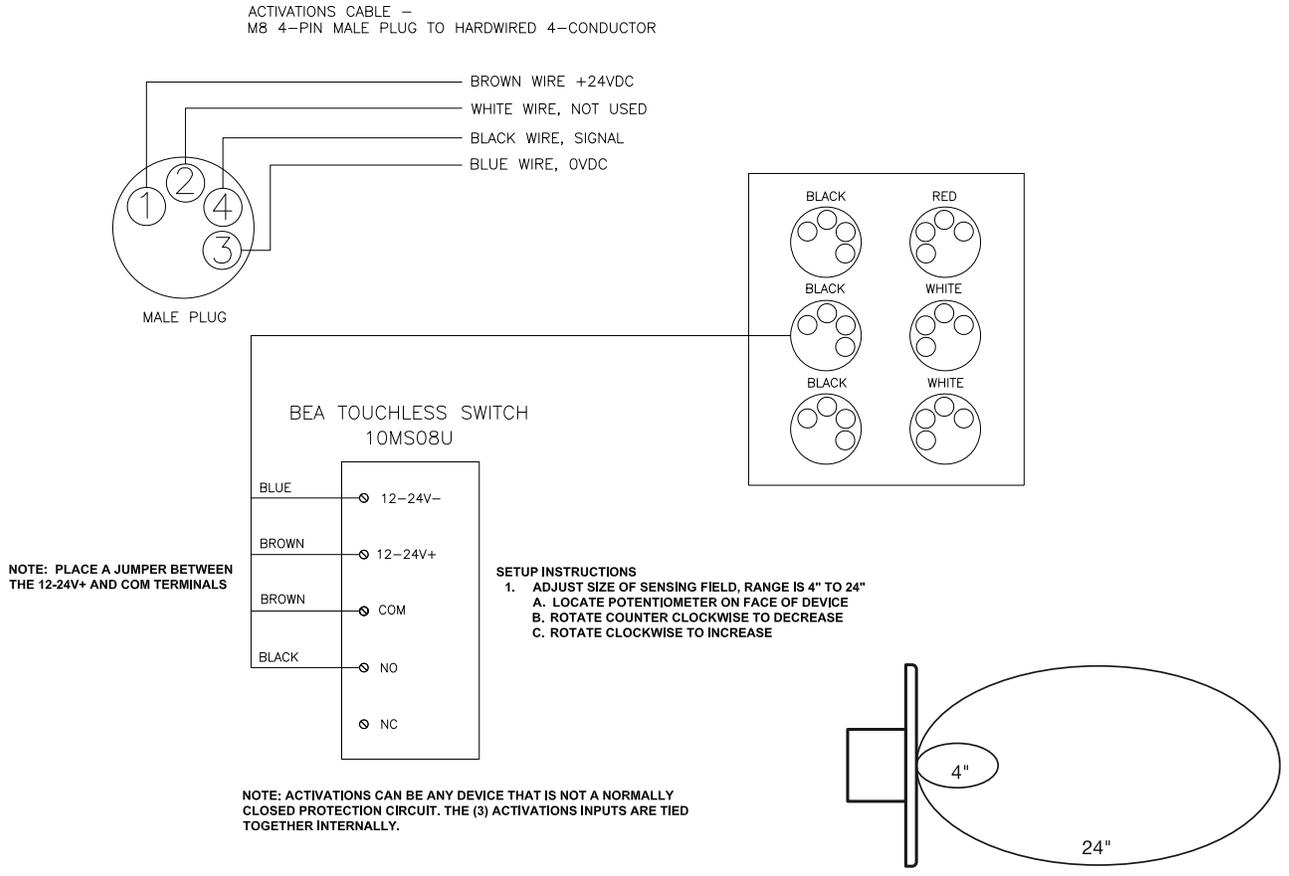
ACTIVATIONS CABLE –
M8 4-PIN MALE PLUG TO HARDWIRED 4-CONDUCTOR



4 Electrical Diagrams for BK150FUE-1 Boxes

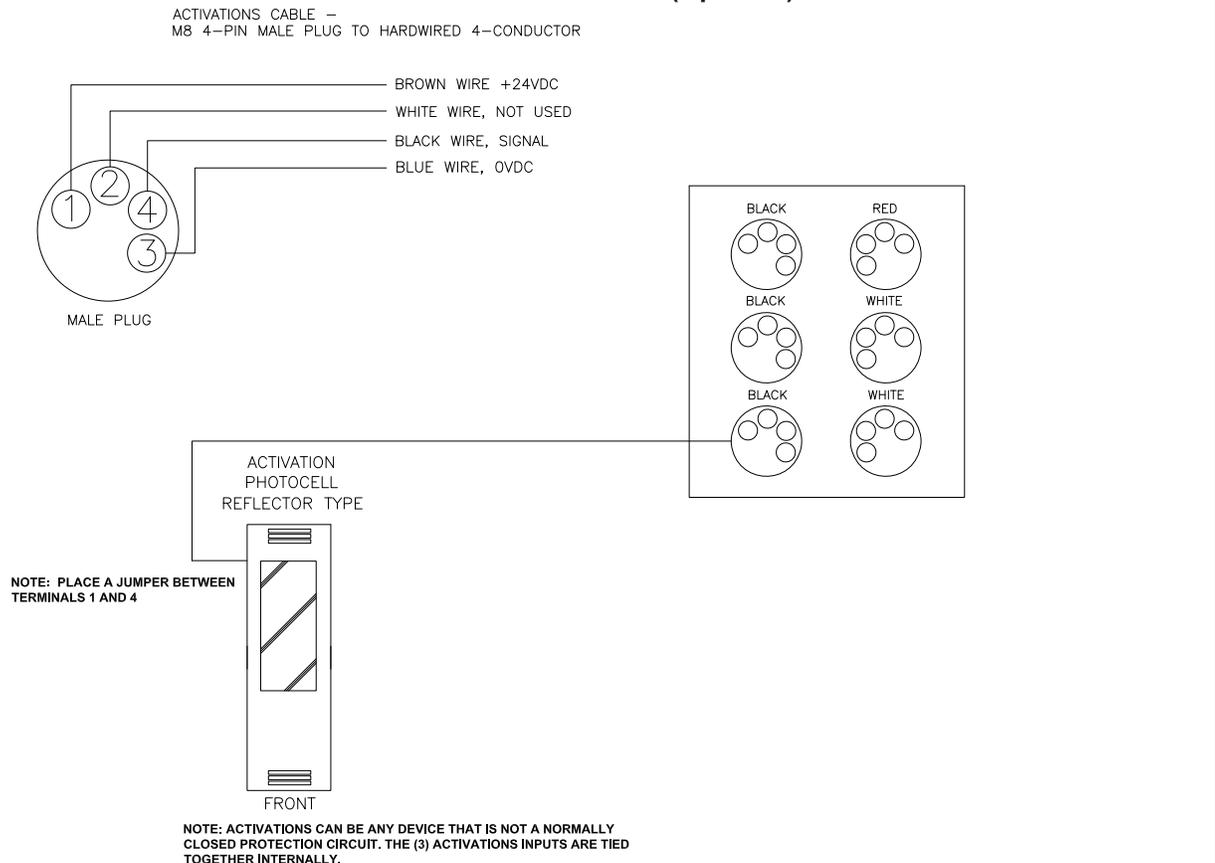
4.15 Touchless Switch Distribution Box Connections (Optional)

P. 508 = 0101



4.16 Photocell Reflector Distribution Box Connections (Optional)

P. 508 = 0101

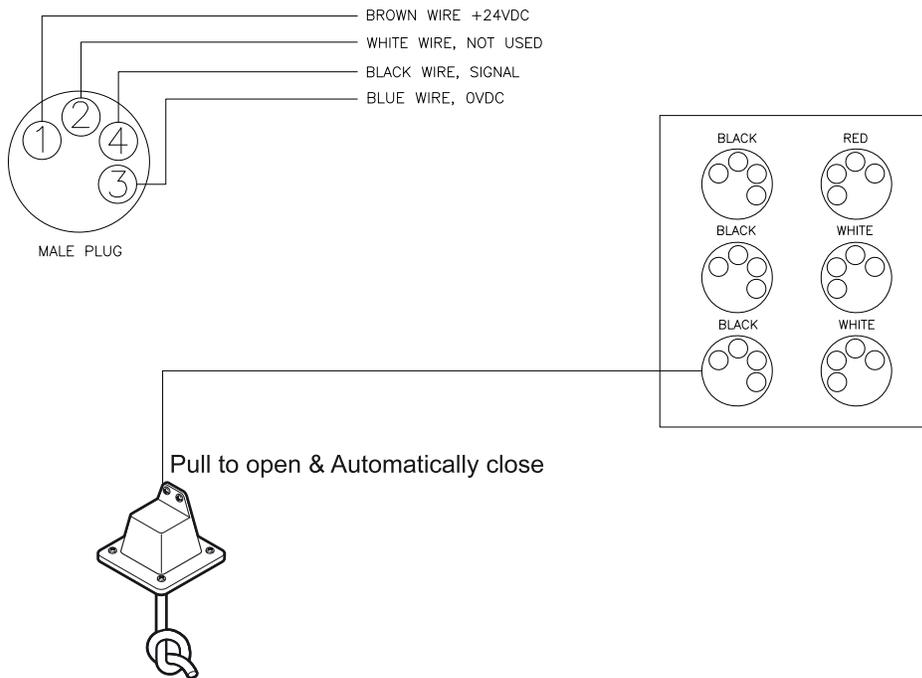


4 Electrical Diagrams for BK150FUE-1 Boxes

4.17 Pull Cord Open Only Distribution Box Connections (Optional)

P. 508 = 0101

ACTIVATIONS CABLE –
M8 4-PIN MALE PLUG TO HARDWIRED 4-CONDUCTOR

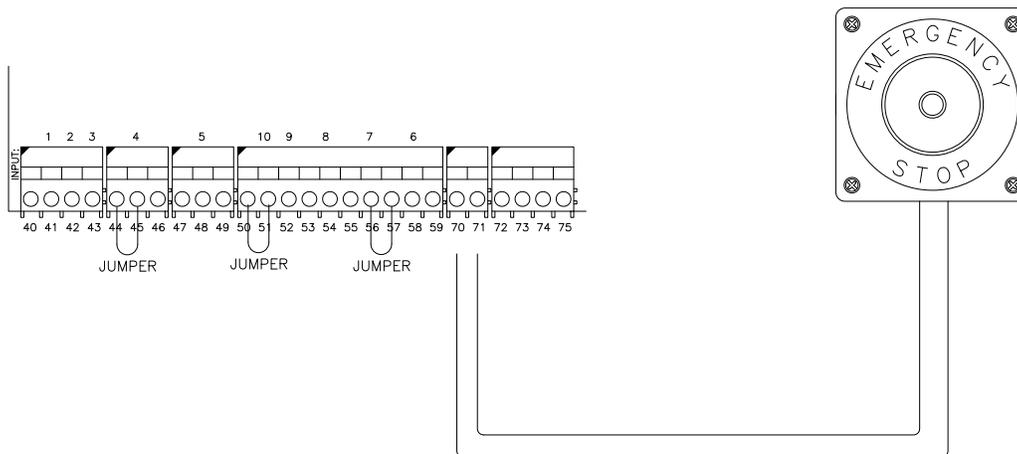


NOTE: ACTIVATIONS CAN BE ANY DEVICE THAT IS NOT A NORMALLY CLOSED PROTECTION CIRCUIT. THE (3) ACTIVATIONS INPUTS ARE TIED TOGETHER INTERNALLY.

4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

4.18 Emergency Stop Connections (Optional)



NOTE: 1. IF OTHER DEVICES ARE CONNECTED TO TERMINALS 70 AND 71, THE EMERGENCY STOP MUST BE CONNECTED IN SERIES WITH THOSE DEVICES.

2. FOR SPEED GUARDIAN DOORS, YOU MUST DISCONNECT THE ORANGE WIRE FROM TERMINAL 71, THEN CONNECT THE ORANGE WIRE TO A WIRE FEEDING ONE SIDE OF THE EMERGENCY STOP. CONNECT THE OTHER SIDE OF THE EMERGENCY STOP BACK TO TERMINAL 71.

3. IF THE EMERGENCY STOP IS REMOVED, AND NO OTHER DEVICES ARE CONNECTED, A JUMPER MUST BE PLACED ACROSS TERMINALS 70 AND 71. FOR SPEED GUARDIAN DOORS, REPLACE THE ORANGE WIRE ON TERMINAL 71.

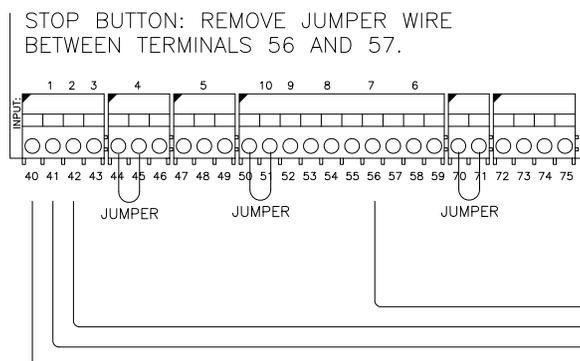
INSIDE CONTROL BOX

4.19 Pushbutton Connections (Optional)

P. 501 = 0101

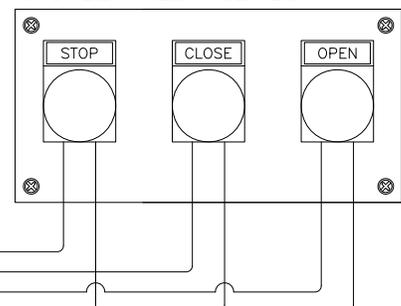
P. 502 = 0701

P. 507 = 0401



STOP BUTTON: REMOVE JUMPER WIRE BETWEEN TERMINALS 56 AND 57.

NOTE: ADDITIONAL STOP BUTTONS MUST BE WIRED IN SERIES.

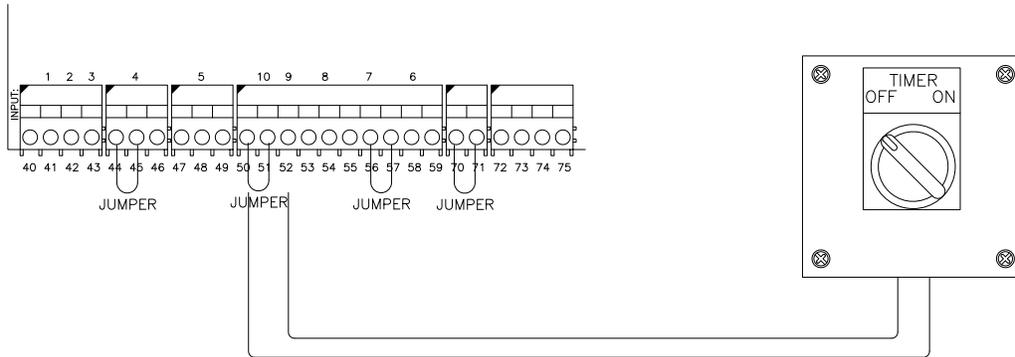


4 Electrical Diagrams for BK150FUE-1 Boxes

P. 509 = 1001

INSIDE CONTROL BOX

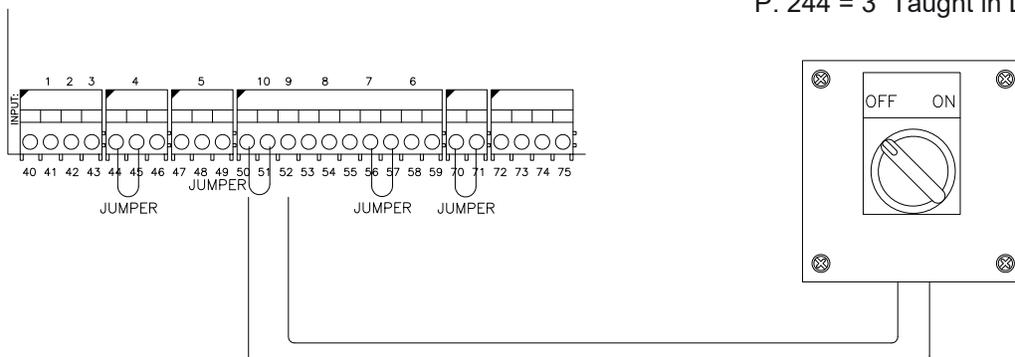
4.20 Timer On/Off Connections (Optional)



INSIDE CONTROL BOX

4.21 Intermediate Stop Connections (Optional)

- P. 509 = 1008
- P. 244 = 0 Disabled
- P. 244 = 1 1/2 Open
- P. 244 = 2 2/3 Open
- P. 244 = 3 Taught in Deadman Mode



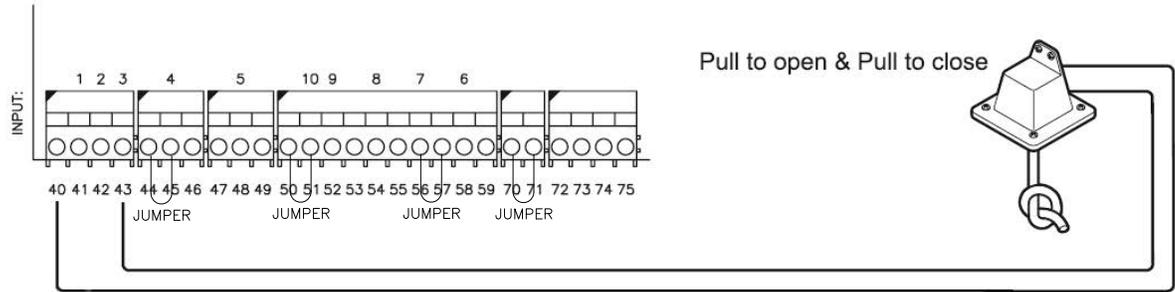
4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

P. 501 = 0101

P. 503 = 0204

4.22 Pull Cord Open & Close Connections (Optional)



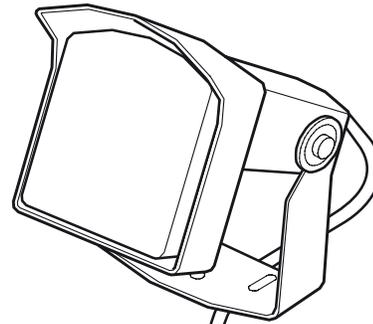
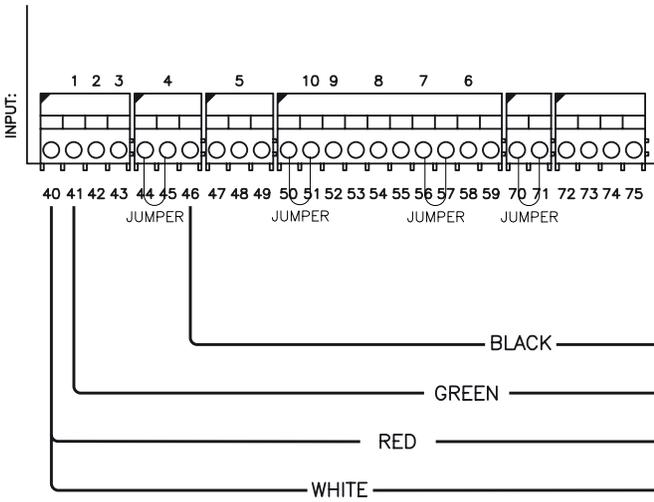
4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

P. 501 = 0101

4.23 Falcon Motion Sensor Connections (Optional)

FALCON



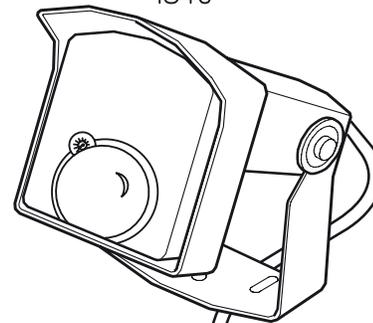
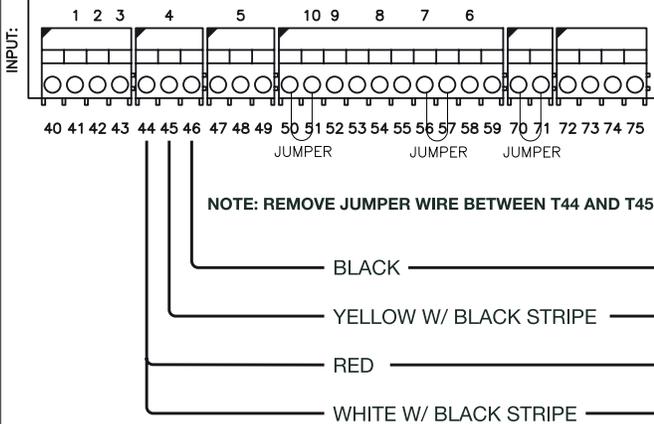
INSIDE CONTROL BOX

P. 504 = 0502

4.24 IS40 Presence Sensor Connections (Optional)

IS40

IMPORTANT: PROTECTION CIRCUITS ARE NORMALLY CLOSED, DO NOT CONNECT MORE THAN 1 PROTECTION DEVICE(S) TO PROTECTION INPUT TERMINAL



4 Electrical Diagrams for BK150FUE-1 Boxes

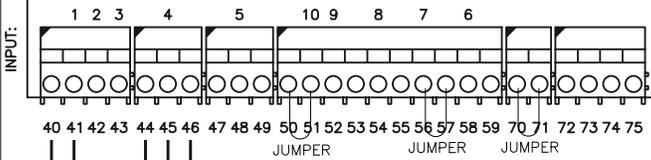
INSIDE CONTROL BOX

P. 501 = 0101

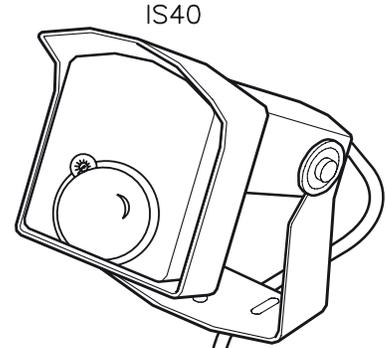
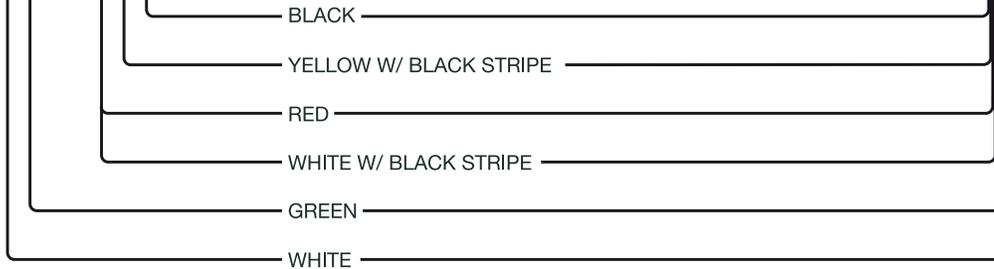
P. 504 = 0502

4.25 IS40 Presence / Motion Sensor Connections (Optional)

IMPORTANT: PROTECTION CIRCUITS ARE NORMALLY CLOSED, DO NOT CONNECT MORE THAN 1 PROTECTION DEVICE(S) TO PROTECTION INPUT TERMINAL



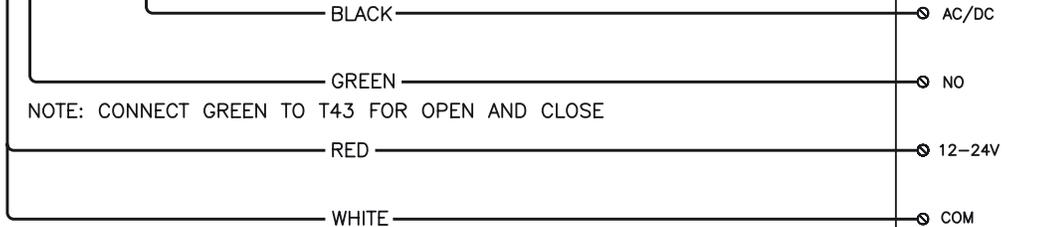
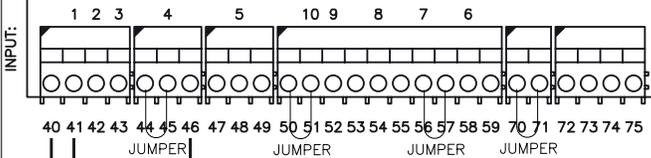
NOTE: REMOVE JUMPER WIRE BETWEEN T44 AND T45



INSIDE CONTROL BOX

P. 501 = 0101

4.26 Remote Control Receiver Connections (Optional)

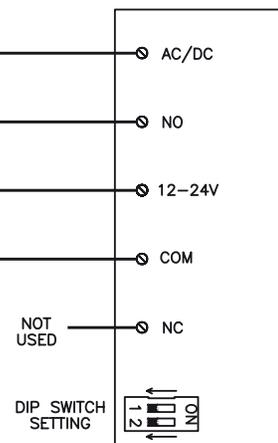


NOTE: CONNECT GREEN TO T43 FOR OPEN AND CLOSE

PROGRAMMING

1. PUSH "NO DELAY" BUTTON ON RECEIVER
2. PUSH TRANSMITTER BUTTON REPEATEDLY UNTIL BLUE LED ON RECEIVER ILLUMINATES
3. REPEAT STEPS 1-2 TO PROGRAM ADDITIONAL TRANSMITTERS

BEA REMOTE RECEIVER
10RD433



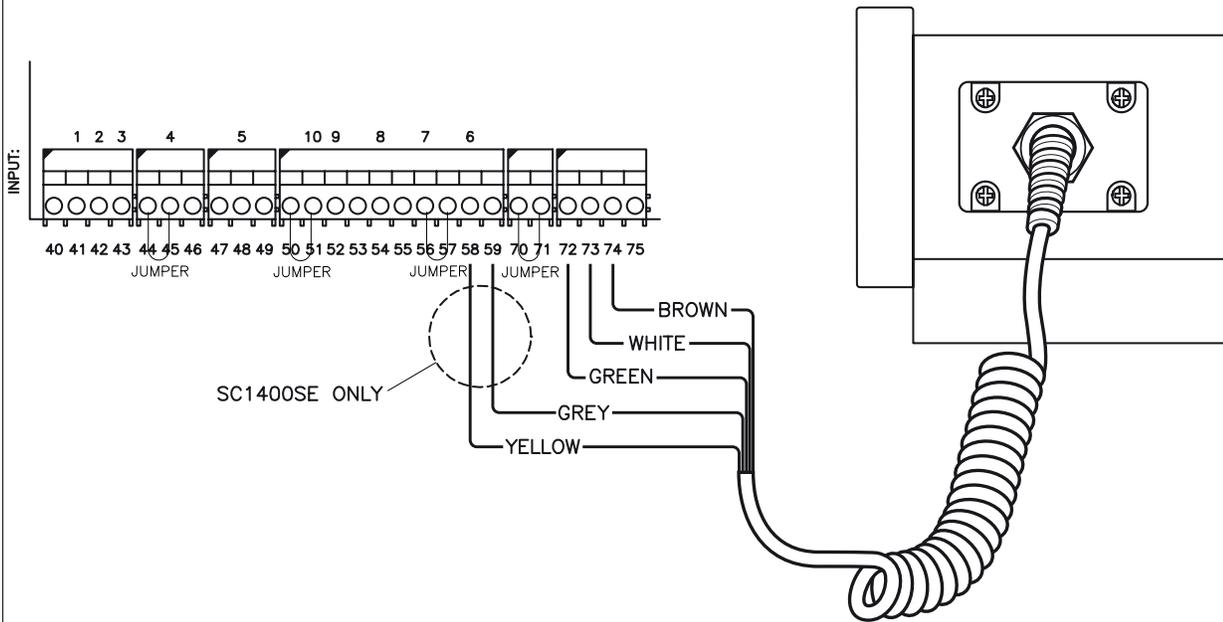
4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

P. 460 = 0005

P. 506 = 0412

4.27 Reversing Edge (Crash) Connections (Optional)

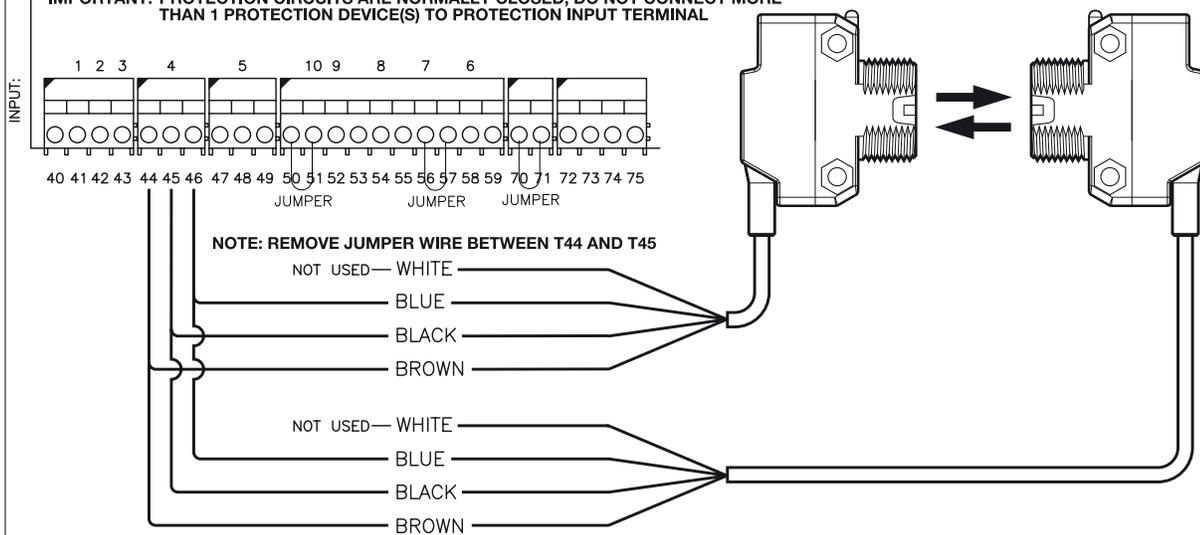


INSIDE CONTROL BOX

P. 504 = 0502

4.28 Photoeye 1 Connections (Door Side) (Optional)

IMPORTANT: PROTECTION CIRCUITS ARE NORMALLY CLOSED, DO NOT CONNECT MORE THAN 1 PROTECTION DEVICE(S) TO PROTECTION INPUT TERMINAL

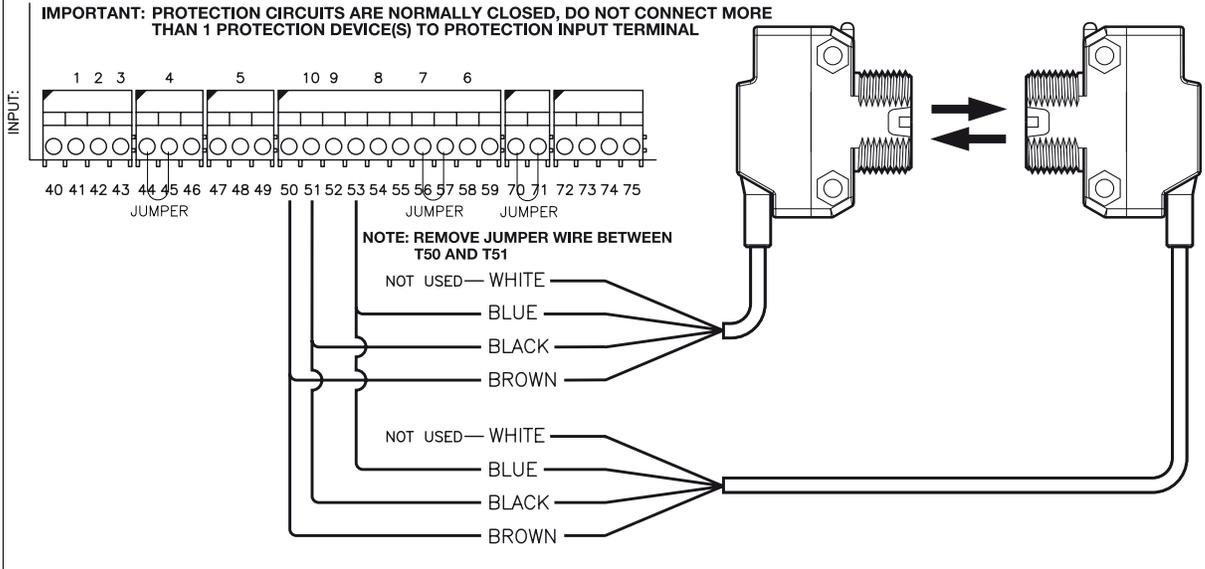


4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

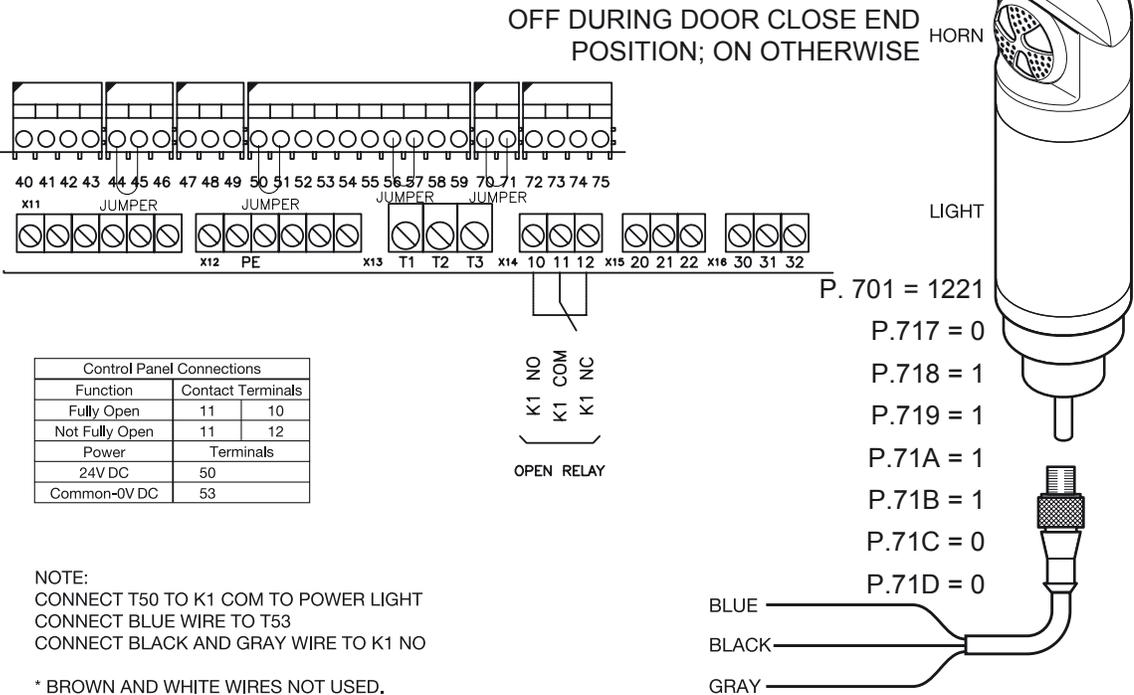
P. 50A = 0502

4.29 Photoeye 2 Connections (Optional)

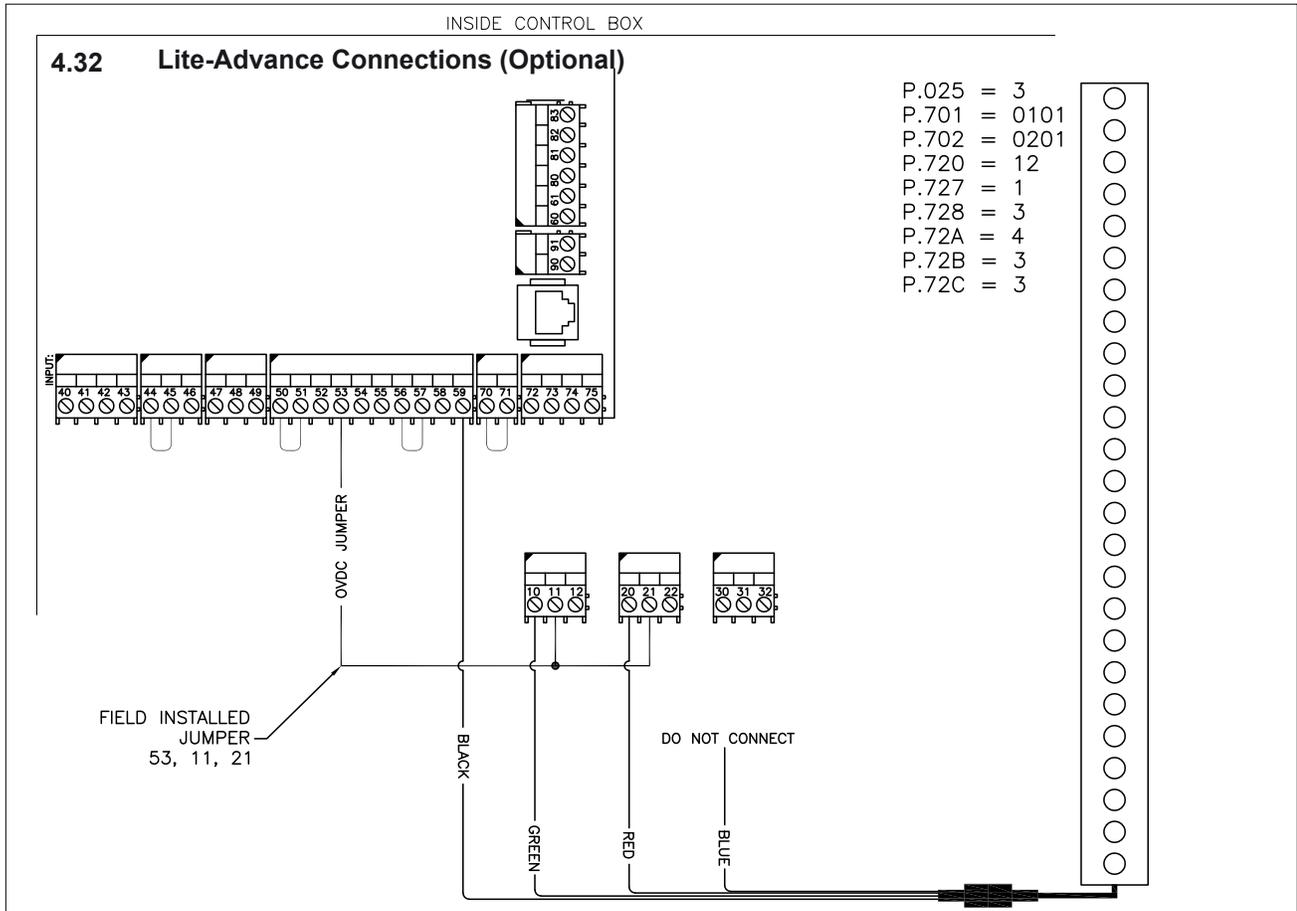
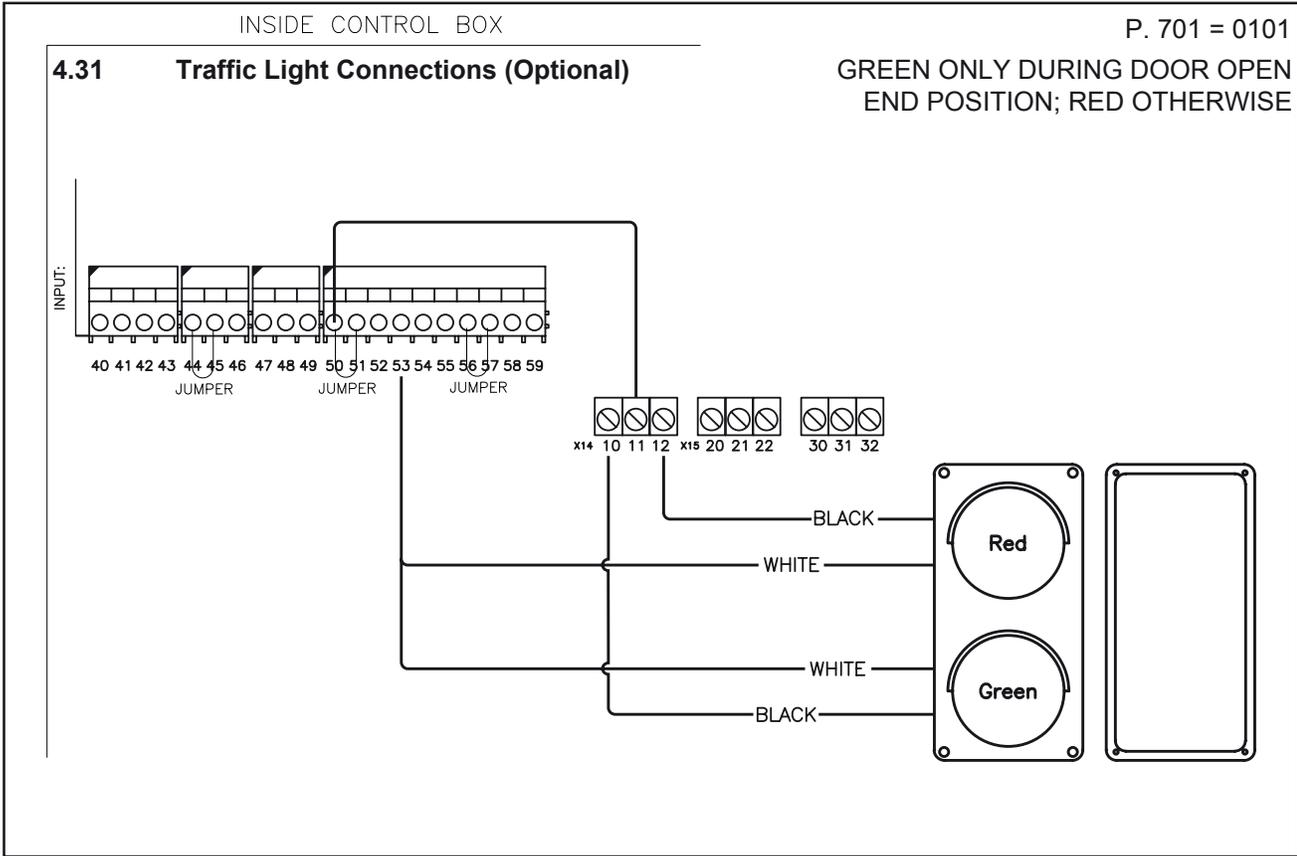


INSIDE CONTROL BOX

4.30 Stack Light Connections (Optional)



4 Electrical Diagrams for BK150FUE-1 Boxes

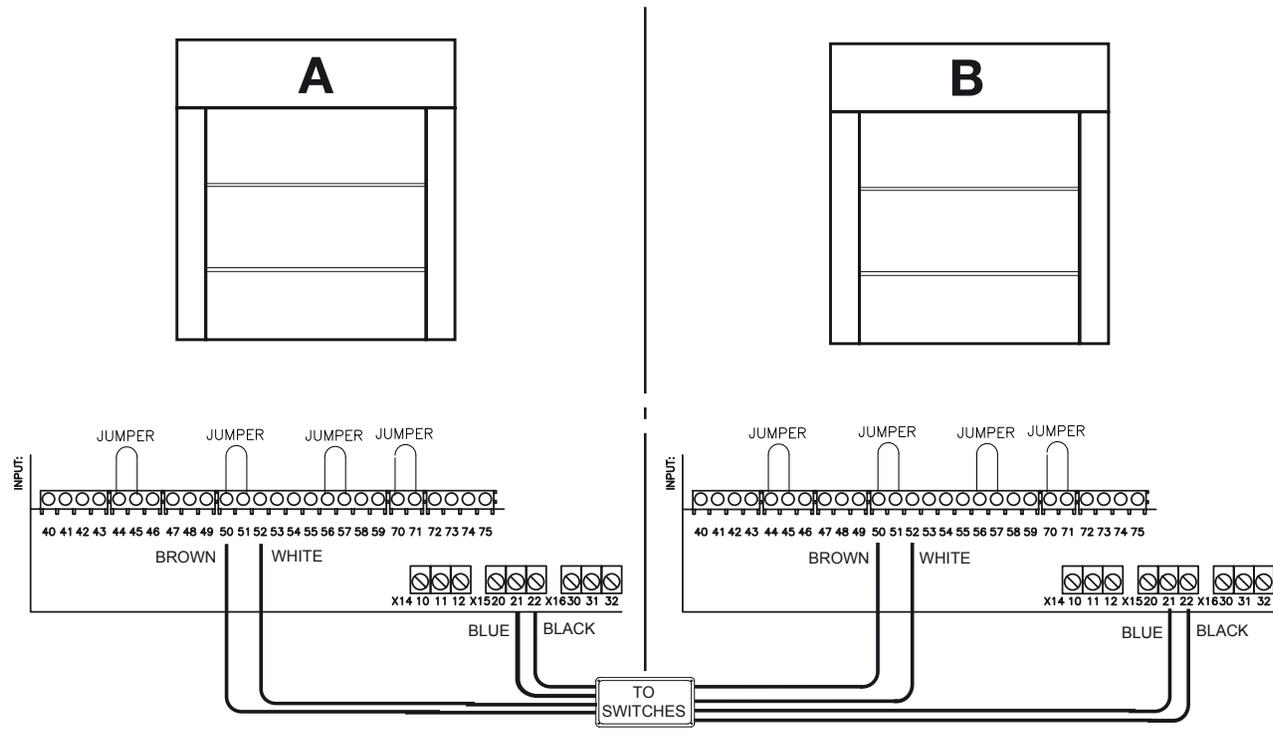


4 Electrical Diagrams for BK150FUE-1 Boxes

4.33 Interlock Connections (Optional)

P. 509 = 0801

P. 702 = 0201



4.34 Induction Loop Connections (Optional)

POSSIBILITIES OF ADJUSTMENT

SENSITIVITY
By adjusting the sensitivity, you determine a change of inductivity for each channel, which a vehicle has to cause in order to set the appropriate output of the detector. Sensitivity adjustment is done separately for each channel with the help of 2 DIP-switches.

SENSITIVITY LEVEL	CHANNEL 1: DIP SWITCH 1,2 CHANNEL 2: DIP SWITCH 5,6
1 LOW	ON OFF/OFF
2 MED/LOW	ON ON/OFF
3 MED/HIGH	ON OFF/ON
4 HIGH	ON ON/ON

HOLDING TIME
The holding time can be adjusted with the help of DIP-switches 3 and 7. After the holding time has expired, a "loop free" signal is emitted, followed by an automatic re-balancing of the loops. The holding time starts as soon as the loop is seized.

HOLDING TIME	CHANNEL 1: DIP SWITCH 3 CHANNEL 2: DIP SWITCH 7
5 MINUTES	ON OFF
INFINITE	ON ON

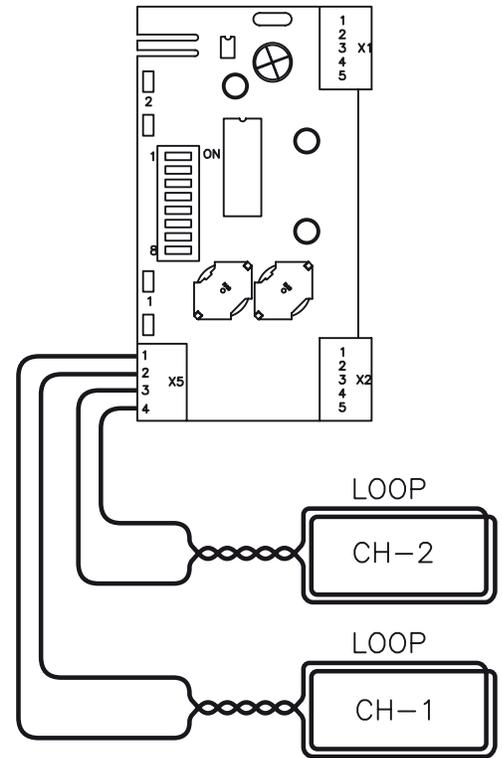
FREQUENCY ADJUSTMENT AND RE-BALANCING
The actual frequency of the detector can be adjusted in two levels with the help of DIP-switches 4 and 8.

FREQUENCY	CHANNEL 1: DIP SWITCH 4 CHANNEL 2: DIP SWITCH 8
LOW	ON OFF
HIGH	ON ON

The admissible frequency range is 30kHz to 130kHz. The frequency depends on the loop geometry, number of turns, inductivity resulting from the loop supply line and the chosen frequency level.

A rebalancing can be manually triggered by changing the frequency adjustment of a channel. As soon as switched on, the detector automatically carries out an adjustment of the loop frequency. In case of a short-term voltage loss of <math><0.1s</math> no rebalancing will take place.

INDUCTION LOOP CARD TST SUVEK2

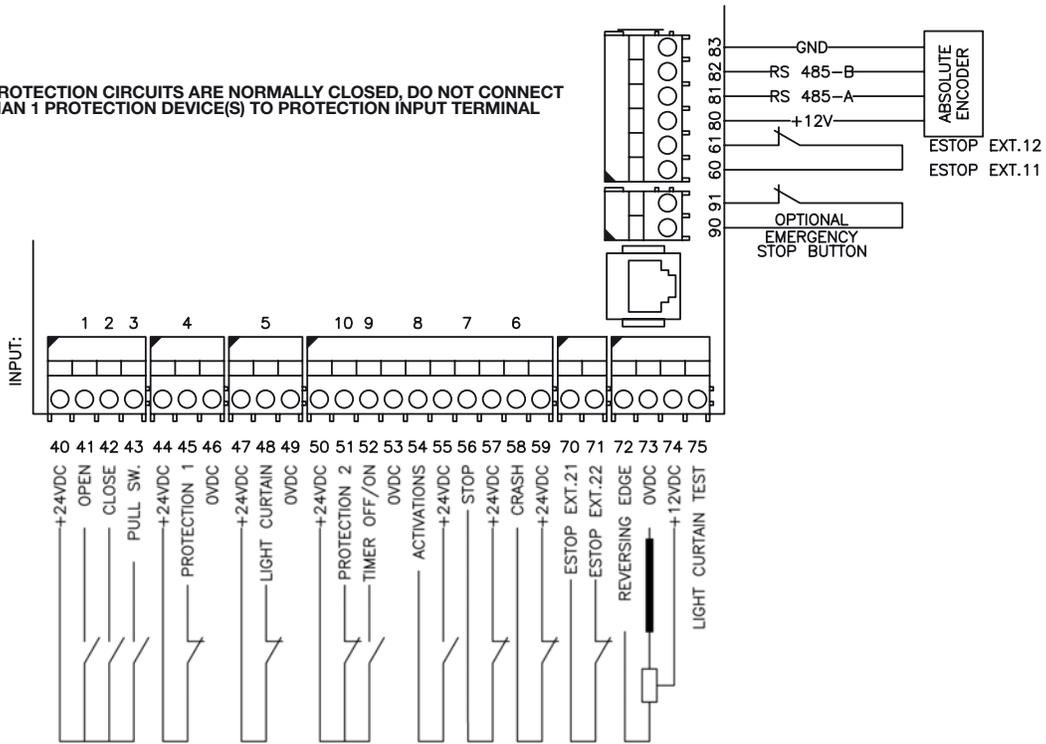


4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

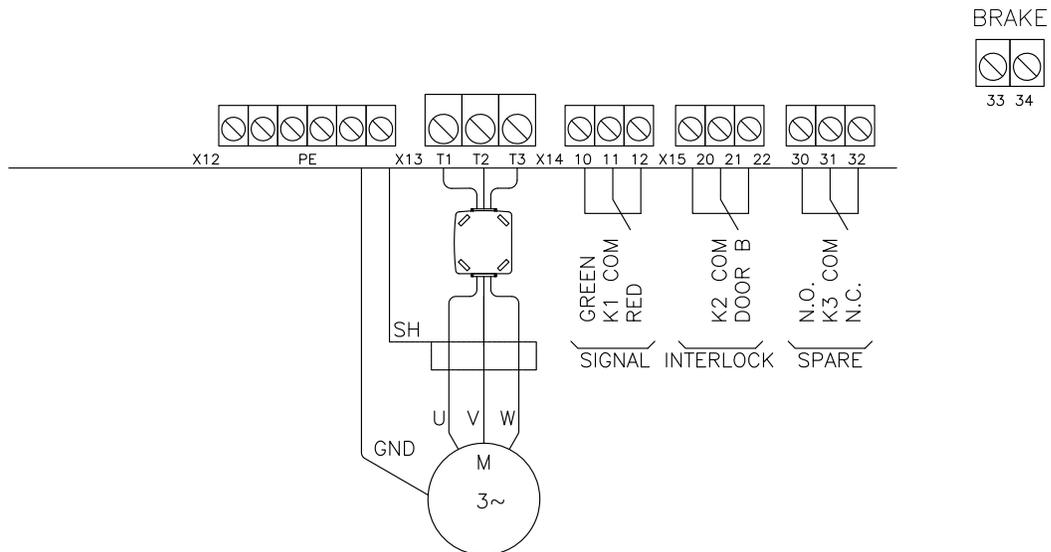
4.35 Input Overview

IMPORTANT: PROTECTION CIRCUITS ARE NORMALLY CLOSED, DO NOT CONNECT MORE THAN 1 PROTECTION DEVICE(S) TO PROTECTION INPUT TERMINAL



INSIDE CONTROL BOX

4.36 Output Overview

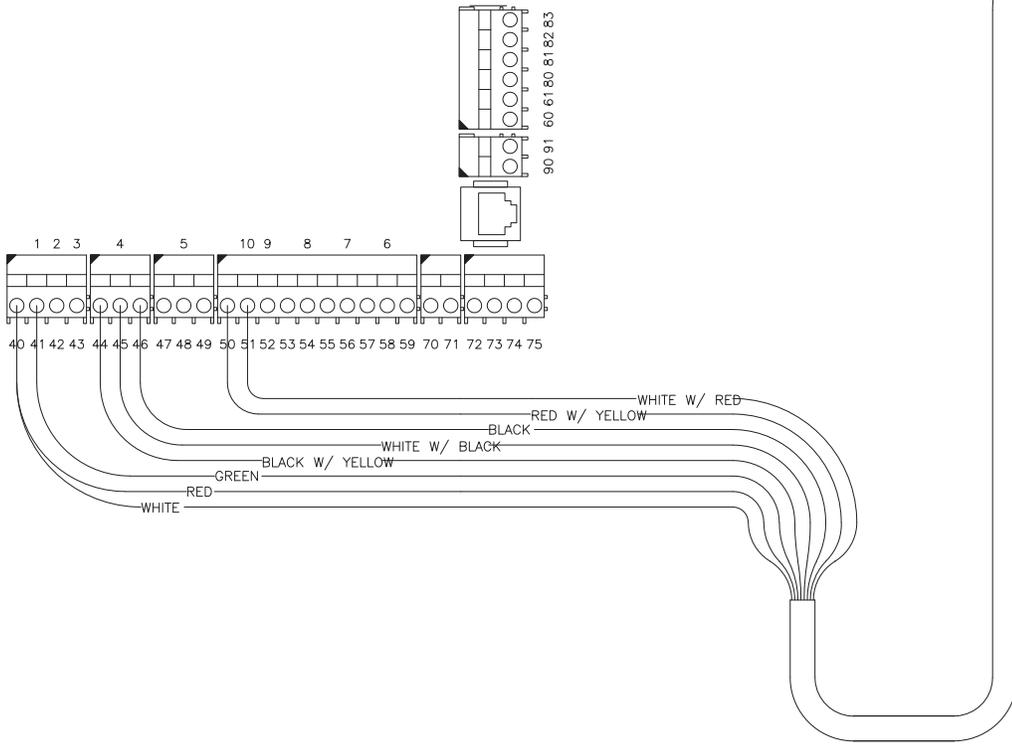


4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

4.37a BEA LZR WideScan -Single Unit (Old Wire Colors)

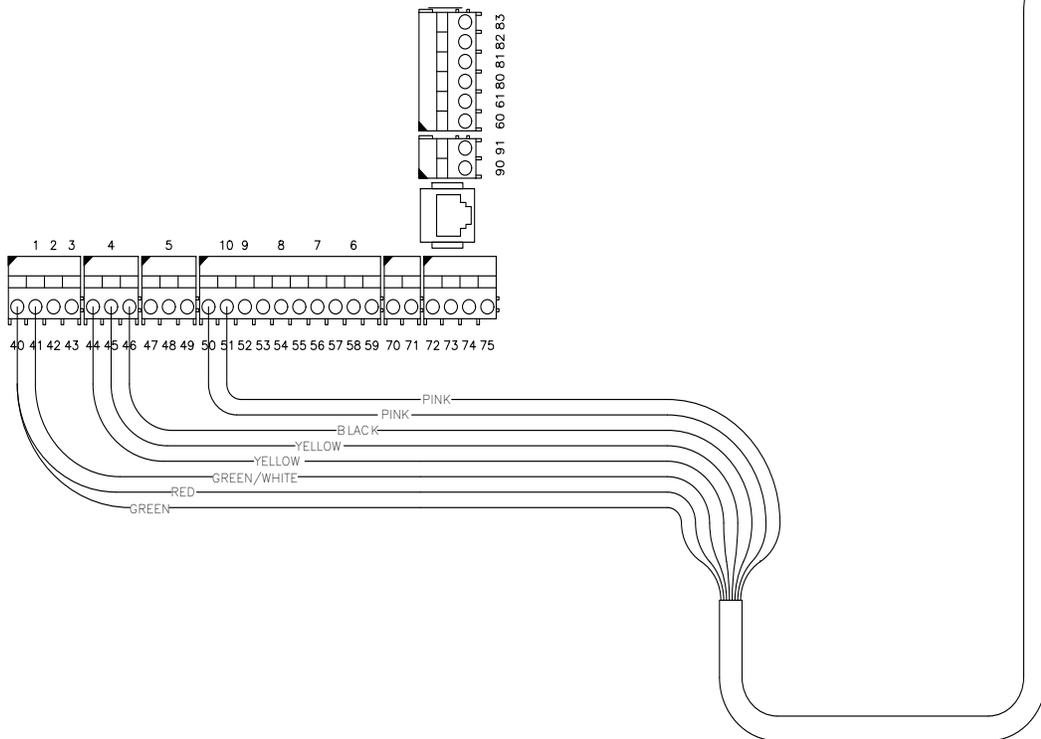
ACT - P.501-0101
 PROT - P.504-0502
 PROT - P.S0A-0502



INSIDE CONTROL BOX

4.37b BEA LZR WideScan - Single Unit (New Wire Colors)

ACT - P.501-0101
 PROT - P.504-0502
 PROT - P.S0A-0502

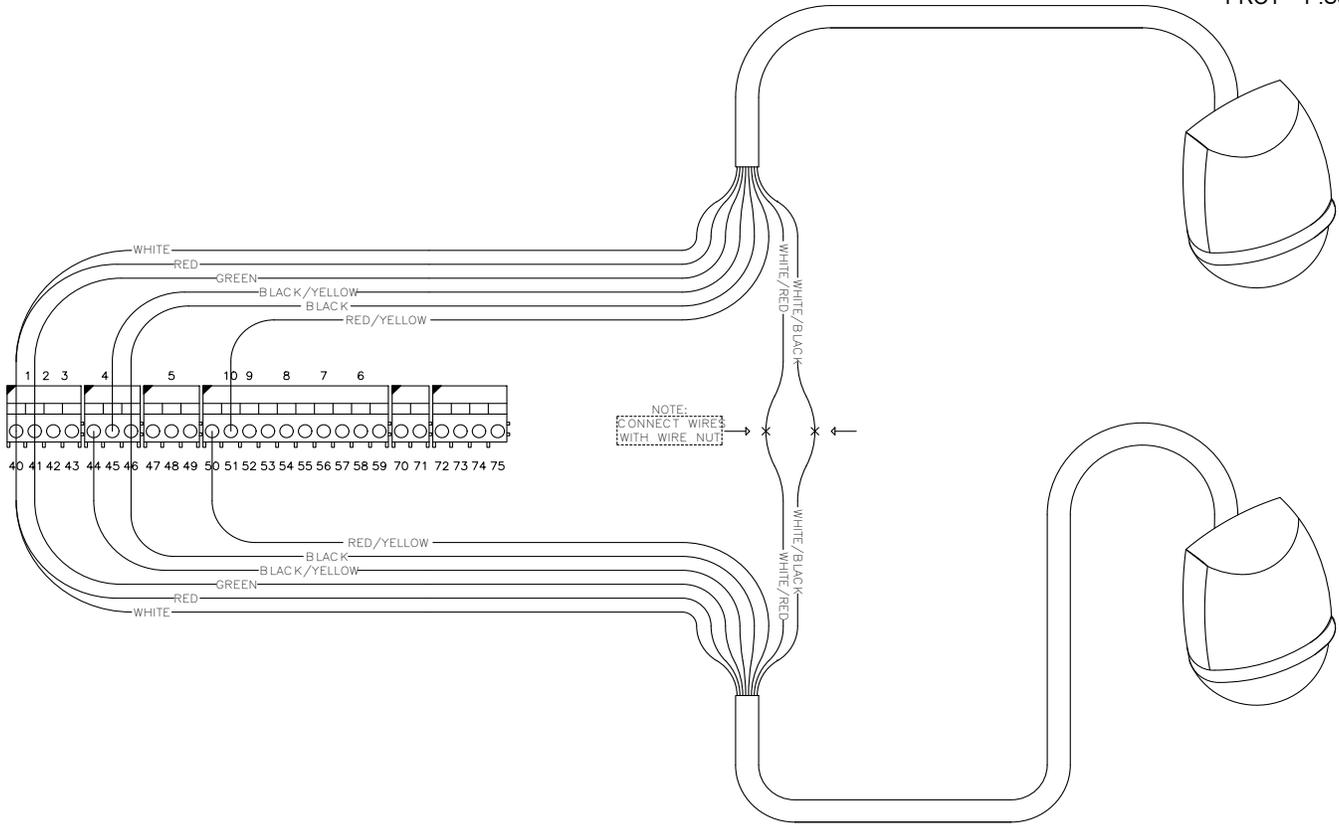


4 Electrical Diagrams for BK150FUE-1 Boxes

INSIDE CONTROL BOX

4.38a BEA LZR WideScan - Double Unit (Old Wire Colors)

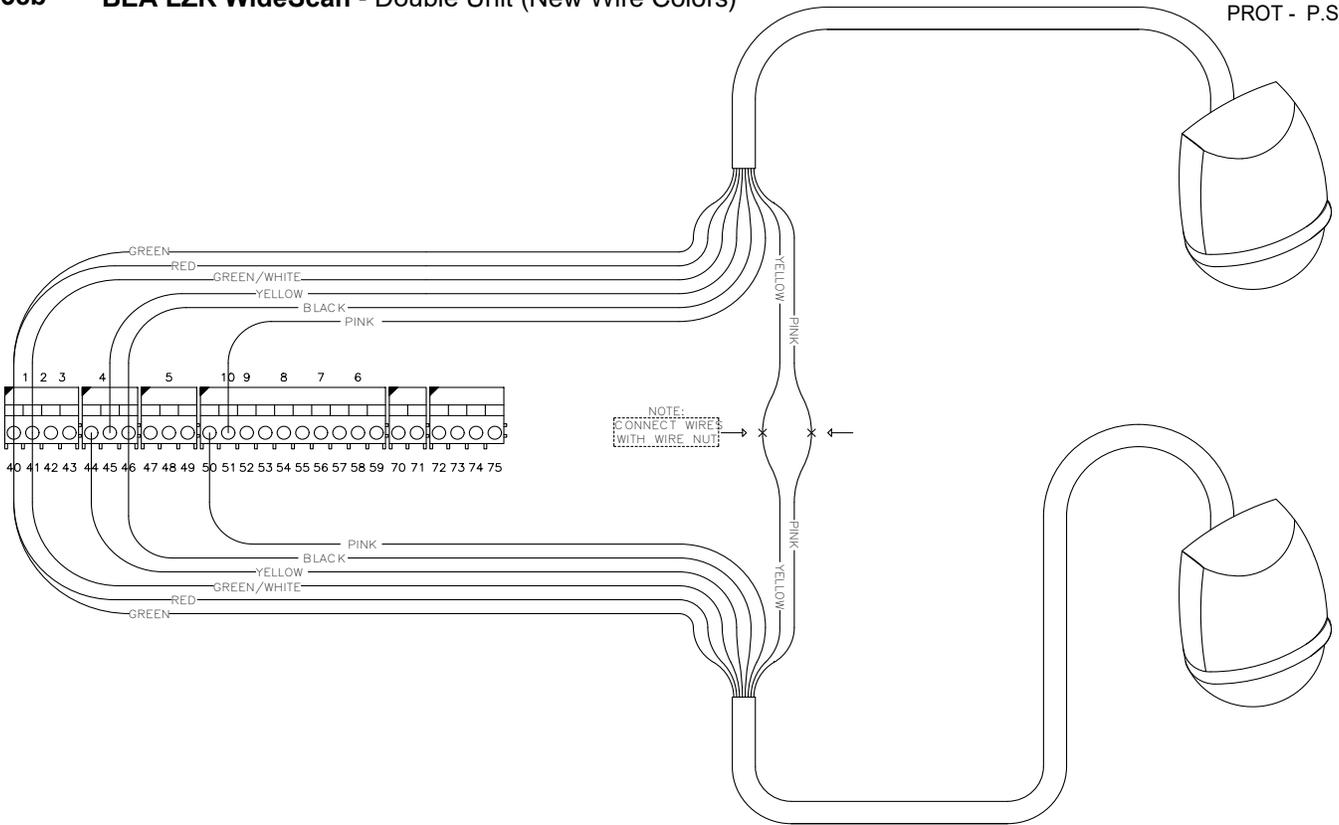
ACT - P.501-0101
 PROT - P.504-0502
 PROT - P.S0A-0502



INSIDE CONTROL BOX

4.38b BEA LZR WideScan - Double Unit (New Wire Colors)

ACT - P.501-0101
 PROT - P.504-0502
 PROT - P.S0A-0502



5 Startup Procedure

1. Pull the Emergency Stop button out.
2. '! Set Limits !' will be displayed.

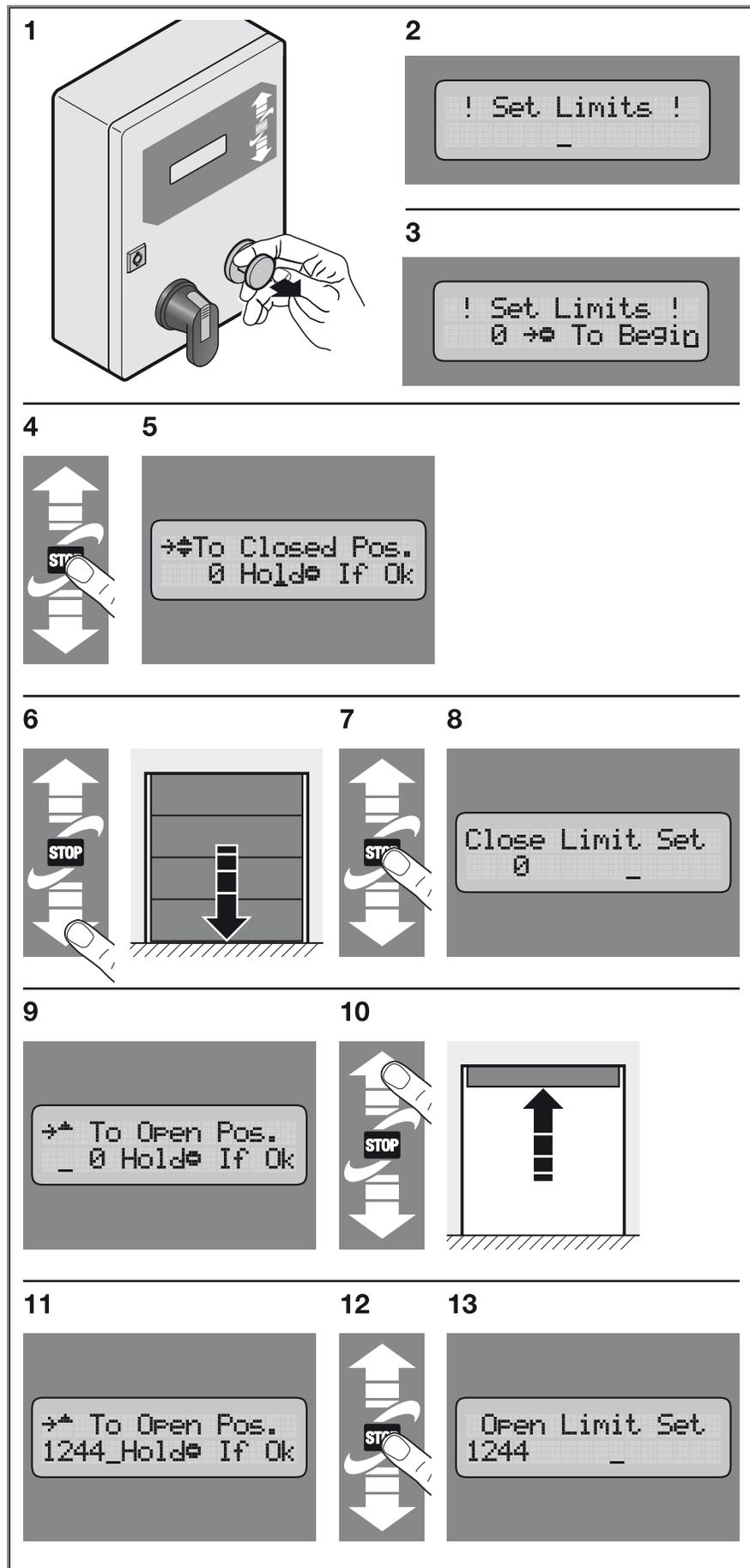
IMPORTANT

Before limits can be set:

- ▶ Track Light Curtain must be operational and free of obstructions. For help and more information see Section 8.

3. After a few seconds, the display will prompt you to press the Stop button.
4. Briefly press the Stop button to begin setting the limits.
5. Set the close limit.
6. Use the arrow buttons to move the door.
7. Press and hold the stop button when finished and don't release until you see '**Close Limit Set**' on the display.
8. When '**Close Limit Set**' is displayed, release the stop button.
9. Set the Open limit.
10. Use the arrow buttons to move the door.
11. The number on the bottom left should increase as the door opens. That number indicates the number of increments moved from the close position.
12. Press and hold the stop button when finished and don't release until you see '**Open Limit Set**' on the display.
13. When '**Open Limit Set**' is displayed, release the stop button.
14. After limits are set move service switch to OFF position. Follow instructions for „How to Disable Parameter Mode“.
See Section 8.7.

The limits are now set and you can run the door. If the door limits need to be adjusted see Section 8.8



6 LCD Messages

Faults can be acknowledged provided they are not reset automatically.

For this, you press the STOP button and keep it pressed and press the EMERGENCY STOP button afterwards. Alternatively, the STOP button can also be kept pressed for approx. 5 seconds.

WARNING

- ▶ The cause of the fault must be resolved first before the corresponding message is acknowledged.

Improper end positions		
F.000	Door position too far up	<ul style="list-style-type: none"> • Too small a parameter value for upper emergency limit switch. • Upper limit switch range (limit switch band) too small. • Mechanical brake defective or improperly set.
F.005	Door position too far down	<ul style="list-style-type: none"> • Too small a parameter value for lower emergency limit switch. • Lower limit switch range (limit switch band) too small. • Mechanical brake defective or improperly set.
Implausibilities in door movement		
F.020	Run time exceeded (during opening, closing or deadman)	<ul style="list-style-type: none"> • Current motor run time has exceeded set maximum run time, door may be sticking or is blocked. • If using mechanical limit switches, one may not have tripped.
F.030	Lag error (position change of the door is less than expected)	<ul style="list-style-type: none"> • Door or motor is blocked. • Too little power for lift torque. • Too little speed. • Mechanical limit switch was not left or is defective. • Absolute or incremental encoder not tightened sufficiently in its mounting. • Wrong positioning system selected (P. 205).
F.031	Detected rotational direction deviates from expected	<ul style="list-style-type: none"> • When using incremental encoders: Channel A and B reversed • Motor rotation direction reversed compared with calibration setting • Too much „pancaking“ when starting, brake releases too soon, or too little torque, adjust boost as necessary.
F.043	Pre-limit switch fault (light barrier)	<ul style="list-style-type: none"> • The pre-limit switch for the light barrier remains activated even in the middle end position or upper end position.
Error messages for incremental encoder		
F.050	Reference switch position deviates from permissible range. During cyclical synchronization	<ul style="list-style-type: none"> • Reference switch constantly tripped (defective). • Reference switch trips too far from the selected reference. • Reference switch trips in the limit switch band. • P270 and P280 are both at the reference switch.
F.051	Reference switch position deviates from permissible range.	<ul style="list-style-type: none"> • Reference switch lies in the limit switch band. • Reference switch is beyond 15% EO. • Reference switch defective.
F.052	Reference switch not recognized	<ul style="list-style-type: none"> • The reference switch is not recognized within 20% EO during automatic synchronization after power-on. • The reference switch is not recognized in the associated end position.
F.060	Crash	<ul style="list-style-type: none"> • The door has been crashed. • The door was not fully open when the power was turned off. • The Crash sensors in the SoftEdge or crash sensor wiring is faulty. • The Crash Reset procedure has not been completed.
Maintenance counter exceeded		
F.080	Fault: Maintenance is required	<ul style="list-style-type: none"> • Service counter has expired
Parameters not set		
F.090	Controller not parameterized	<ul style="list-style-type: none"> • The basic parameters (P. 205, P. 100 to P. 103) for the BK150FUE-1 controller have not yet been set.

Safety chain faults		
F.201	Internal E-Stop „push-button“ tripped or Watchdog (computer monitor)	<ul style="list-style-type: none"> E-Stop chain was interrupted starting at input “internal E-Stop“ without parameterizing mode having been selected. Internal parameter or EEPROM checks defective, pressing the STOP key provides additional information about the cause.
F.211	External E-Stop 1 tripped	<ul style="list-style-type: none"> E-Stop chain was interrupted starting at Input 1.
F.212	External E-Stop 2 tripped	<ul style="list-style-type: none"> E-Stop chain was interrupted starting at Input 2.
Faults in the safety chain		
F.360	Short circuit detected on edge input	<ul style="list-style-type: none"> Short circuit detected on edges with normally closed contact.
F.361	Number of edge trips for closing has reached set limit	<ul style="list-style-type: none"> Parameterized, maximum number of safety edge trips during a door cycle was exceeded.
F.362	Detected rotational direction deviates from expected	<ul style="list-style-type: none"> One of the processing channels for short circuit detection does not react identically with the second channel. Controller board defective.
F.363	Interruption on edge input	<ul style="list-style-type: none"> Connection cable defective or not connected. Termination resistor incorrect or missing. Jumper J600 incorrectly set.
F.364	Safety edge testing failed	<ul style="list-style-type: none"> Safety edge was not activated as expected when requesting a test. The time between request for testing and actual testing not in agreement.
F.365	Redundancy error with interruption	<ul style="list-style-type: none"> One of the processing channels for interruption detection does not react identically with the second channel. Controller board defective. Dynamic optical system connected but not set in Parameter P. 460.
F.366	Too high a pulse frequency for optical safety edge	<ul style="list-style-type: none"> Defective optical safety edge. Defective input for internal safety edge.
F.369	Internal safety edge incorrectly parameterized	<ul style="list-style-type: none"> An internal safety edge is connected but deactivated.
F.373	Fault in the safety edge (message comes from module)	<ul style="list-style-type: none"> Cable break to safety edge, no edge connected, edge termination resistor incorrect or defective. Jumper for termination resistor definition in wrong position. Safety edge processing selected with Parameter P. 470, but module not plugged in or wrong module.
F.374	Safety bar testing failed	<ul style="list-style-type: none"> Pre-limit switch for safety edge incorrectly set or defective. Processing module defective. Safety edge defective.
F.379	Safety edge detection defective (coding pin or parameter setting)	<ul style="list-style-type: none"> No module plugged in but was reported as present by a parameter. The controller was started up with a module other than the one currently plugged in.
F.385	Fault in pre-limit switch for safety edge	<ul style="list-style-type: none"> Pre-limit switch for turning off the safety edge or reversing after safety edge tripping remains tripped even in the upper end position.
General hardware faults		
F.400	Controller hardware reset detected	<ul style="list-style-type: none"> Excessive noise on supply voltage. Internal watchdog tripped. RAM error.
F.410	Over-current (motor current or intermediate circuit)	<ul style="list-style-type: none"> Wrong motor data set (P 100 – P 103). Non-adjusted voltage increase / boost set (P 140 or P 145). Motor not properly dimensioned for door. Door sticks.
F.420	Overvoltage in intermediate circuit Limit 1	<ul style="list-style-type: none"> Brake chopper interference / defective / missing Feed voltage much too high Motor feeds back too much energy in generator mode, door motion energy cannot be sufficiently brought down

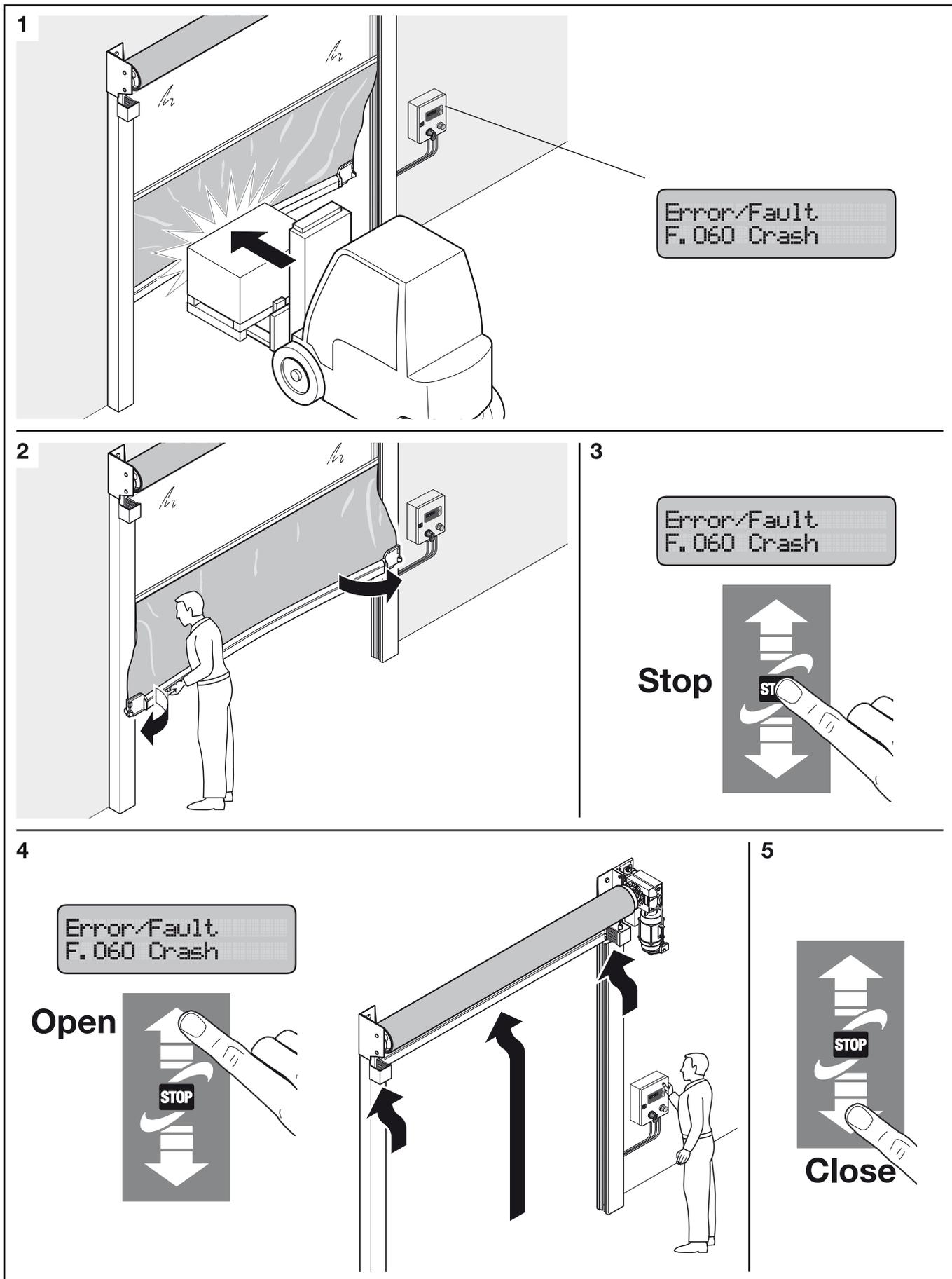
General hardware faults		
F.430	Temperature cooler outside of working range Limit 1	<ul style="list-style-type: none"> Excessive load on final stages or brake chopper. Ambient temperature too low for controller operation. Clock frequency of final stage too high (Parameter P. 160).
F.440	Overcurrent in intermediate circuit Limit 1	<ul style="list-style-type: none"> Boost not adjusted. Motor incorrectly dimensioned for door. Door sticks.
F.510	Motor / intermediate circuit overcurrent Limit 2	<ul style="list-style-type: none"> Wrong motor data set (P 100 – P 103). Non-adjusted voltage increase / boost set (P 140 or P 145). Motor not properly dimensioned for door. Door sticks.
F.515	Motor protection function detected overcurrent	<ul style="list-style-type: none"> Incorrect motor curve (motor rated current) set (P 101). Too much boost (P 140 or P 145). Motor incorrectly dimensioned.
F.519	IGBT driver chip detected overcurrent	<ul style="list-style-type: none"> Short circuit or ground fault on motor terminals. Motor rated current setting extremely wrong (P 100). Extremely too much boost (P 140 or P 145). Motor incorrectly dimensioned. Motor winding defective. Momentary interruption of the E-Stop circuit.
F.520	Overvoltage in intermediate circuit Limit 2	<ul style="list-style-type: none"> Brake chopper interference / defective / missing. Feed voltage much too high. Motor feeds back too much energy in generator mode, door motion energy cannot be sufficiently brought down.
F.521	Overvoltage in intermediate circuit Limit 2	<ul style="list-style-type: none"> Input voltage supply too low, usually at load. Load too great / final stage or brake chopper fault.
F.524	Ext. 24 V supply missing or too low	<ul style="list-style-type: none"> Overload but no short circuit. When 24 V is shorted the controller voltage does not ramp up and glow lamp V 306 comes on.
F.530	Temperature cooler outside of working range Limit 1	<ul style="list-style-type: none"> Excessive load on final stages or brake chopper. Ambient temperature too low for controller operation. Clock frequency of final stage too high (Parameter P. 160).
F.540	Overcurrent in intermediate circuit Limit 2	<ul style="list-style-type: none"> Boost not adjusted. Motor incorrectly dimensioned for door. Door sticks.
Positioning system faults		
F.700	Position sensing defective	<p>For mechanical limit switches:</p> <ul style="list-style-type: none"> At least one limit switch does not correspond to the configured active status. An implausible combination of at least 2 active limit switches. <p>For electronic limit switches:</p> <ul style="list-style-type: none"> After invoking activation of the factory parameters (Parameter P. 990) the corresponding positioning system was not parameterized. Calibration not completed or is incorrect and must be repeated. When activating the intermediate stop the intermediate stop is implausible. Synchronization not finished or reference switch defective.
F.720	Synchronization error in position sensing with incremental encoder	<ul style="list-style-type: none"> Intermediate stop position is less than the minimum incremental value (25). Synchronization was not finished. The selected reference switch was not reached or is outside its tolerance. The incremental encoder is not counting or the door is blocked (also F. 030, lag error). Incremental inputs IN 9 and IN 10 are reversed (also F. 031 rotation error).
F.750	Protocol Transmission error	<ul style="list-style-type: none"> Defective hardware or electrically noisy environment.
F.751	Synchronization FU <-> absolute encoder	<ul style="list-style-type: none"> Defective hardware or electrically noisy environment. Absolute encoder processor electronics defective.

Positioning system faults		
F.752	Timeout with protocol transmission	<ul style="list-style-type: none"> Interface cable defective / interrupted. Absolute encoder processor electronics defective. Defective hardware or electrically noisy environment.
F.760	Position outside of window	<ul style="list-style-type: none"> Position encoder drive defective. Absolute encoder processing electronics defective. Defective hardware or electrically noisy environment.
F.761	Distance Channel 1 <-> Channel 2 outside allowed window	<ul style="list-style-type: none"> Position encoder drive defective. Defective hardware or electrically noisy environment.
F.762	Electronic limit switch positions incorrect	<ul style="list-style-type: none"> Upper limit switch Eo or intermediate limit switch E1 has exceeded the valid limit range. Controller not yet initialized. Position values during calibration not correct or values are no longer plausible.
F.763	DES-B Error	<ul style="list-style-type: none"> Position encoder drive defective, make a reset.
F.770	Door way is too high for the parameter set Encoder resolution	<ul style="list-style-type: none"> The value of the Parameter P. 202 (set Encoder resolution) is too high for the combination Encoder and Door.
Internal system faults		
F.920	Internal 2.5 V reference voltage incorrect	<ul style="list-style-type: none"> Hardware defect.
F.921	Internal 15 V voltage incorrect	<ul style="list-style-type: none"> Hardware defect.
F.922	E-Stop chain not complete	<ul style="list-style-type: none"> Not all E-Stop inputs are separately jumpered although the entire E-Stop chain is jumpered. Redundant checking of the E-Stop chain tripped.
F.928	Faulty Input Testing	<ul style="list-style-type: none"> Light curtain wired improperly. Light Curtain cable or cable connection is damaged. Light curtain not working properly. Improper parameterization. <p>Note: After problem is fixed hold stop button to clear fault.</p>
F.930	External watchdog incorrect	<ul style="list-style-type: none"> Defective hardware or noise-saturated environment.
F.931	ROM error	<ul style="list-style-type: none"> Wrong EPROM code. Defective hardware or noise-saturated environment.
F.932	RAM error	<ul style="list-style-type: none"> Defective hardware or noise-saturated environment.
F.935	Stack error	<ul style="list-style-type: none"> UserStack or SystemStack overflowed. Possible software error due to recursive invocations (e.g. profile).
F.960	Wrong parameter checksum	<ul style="list-style-type: none"> New EPROM version with different parameters. Controller not yet initialized.
F.961	Checksum from calibration values etc.	<ul style="list-style-type: none"> New EPROM version with different EEPROM structure. Controller not yet initialized.
F.962	Converter parameters not plausible	<ul style="list-style-type: none"> New EPROM version. Controller not yet initialized.
F.963	Ramp parameters not plausible	<ul style="list-style-type: none"> New EPROM version. Controller not yet initialized.
F.964	Program version / manufacturer code	<ul style="list-style-type: none"> New EPROM version. Controller not yet initialized.
F.970	Plausibility param. block error	<ul style="list-style-type: none"> New EPROM version. Controller not yet initialized. Some parameter is implausible.

6 LCD Messages

I.080	Maintenance required soon / service counter nearly expired
I.100	Speed when reaching upper end position too high
I.150	Speed when reaching lower end position too high
I.160	Continuous CLOSED still active
I.170	Forced opening being performed
I.185	Wait for acknowledgement (operator call), display flashes
I.199	Door cycle not plausible (re-initialize parameters)
I.200	Reference position corrected or recognized (after calibration)
I.201	Reference position re-initialized
I.202	Reference position missing
I.203	Reference position incorrect
I.205	Synchronization
I.210	Pre-limit switch Upper not plausible
I.211	Pre-limit switch Lower not possible
I.310	Open-command on Door 2 being issued
I.500	Correction of upper limit switch running
I.501	Upper pre-limit switch corrected
I.502	Upper limit switch band corrected
I.505	Correction of lower limit switch running
I.506	Lower pre-limit switch corrected
I.507	Lower limit switch band corrected
I.510	Limit switch correction finished
I.515	Controller is preparing automatic teach-in of the limit switches
I.520	Maximum speed during automatic limit switch correction is not reached
I.555	Limit switches being corrected

7 Crash Reset Procedure (Speed Commander™ Only)



8 Programming

8.1 How to Access the Parameters

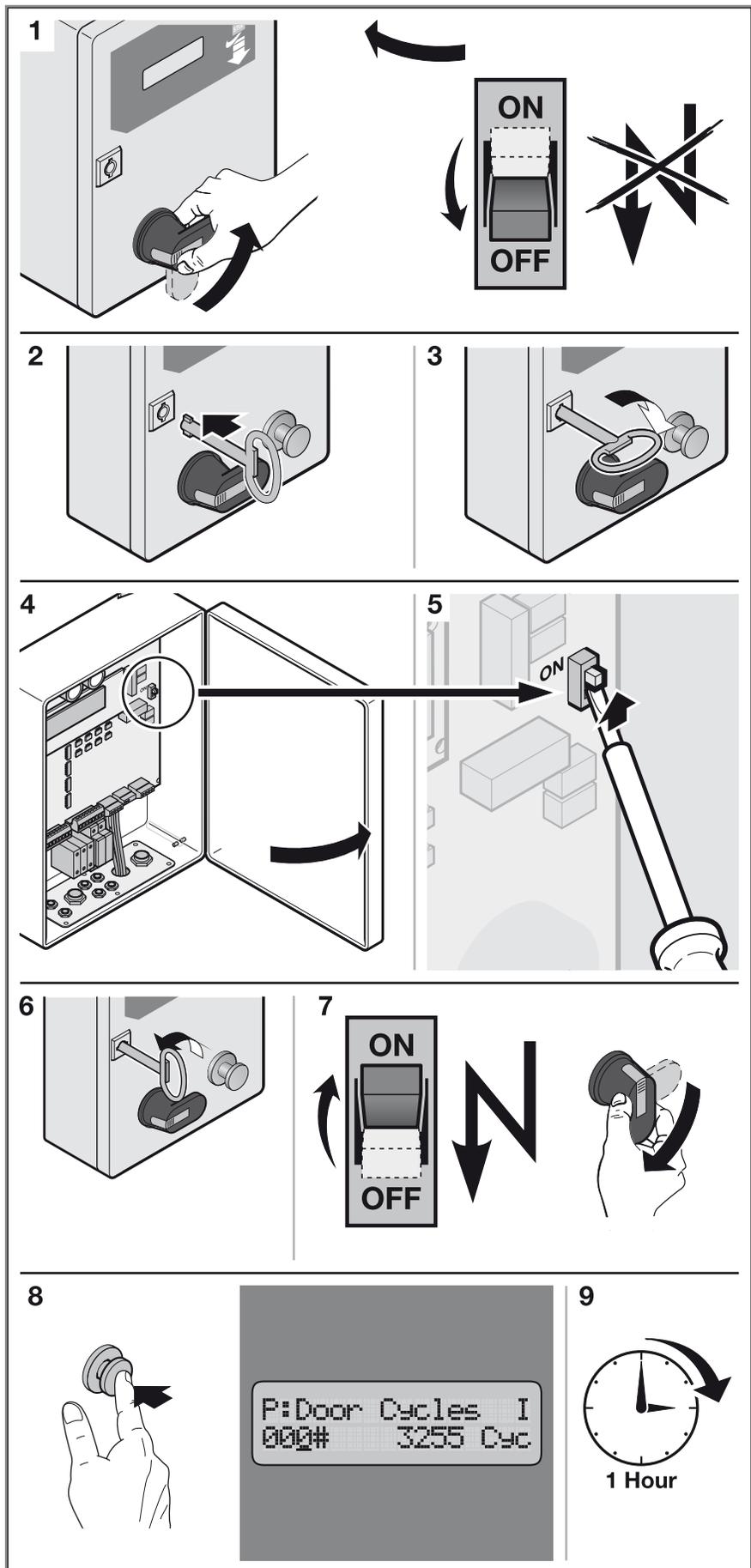
1. Turn the control box power switch OFF.

⚠ DANGER

Allow a minimum of 5 minutes for the frequency inverter stored energy to discharge.
Although the control box power switch is off, there is still power at the switch. For your safety, turn off the main power also. Use OSHA LOCKOUT-TAGOUT to ensure the power cannot be turned without your knowledge.

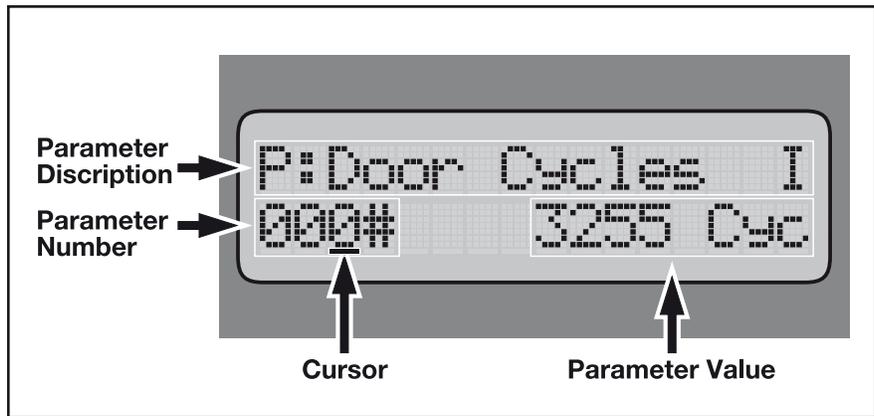
2. Locate the control box key.
3. Insert the key into the latch and then turn the key 90 degrees clockwise. Remove the key when finished.
4. Open the control box door.
5. Locate the service switch in the upper right hand corner of the circuit board. The switch will be white with a red slider on the front. Use a small screwdriver or your fingernail to **GENTLY** slide the RED slider **UP** to the **ON** position. The **ON** position is labeled on the circuit board.
6. Close the control box door. Insert the key into the latch and then turn the key 90 degrees counter-clockwise. Remove the key when finished.
7. Turn On the power source and control box.
8. Once the power is on press the Emergency Stop button IN. The Parameter cannot be accessed until the Emergency Stop button is pressed IN. The display will now show the parameters.

9. **NOTE:** After one hour parameters 017 through 210, 310 through 820, 910, and 930 through 999 cannot be accessed.



8 Programming

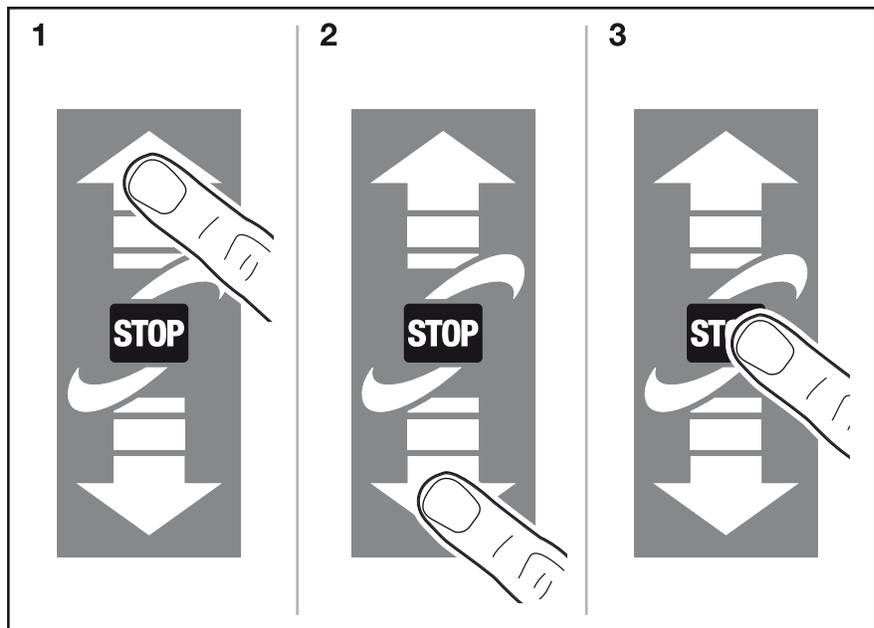
8.2 How to Read the Display



8.3 How to Use the Buttons

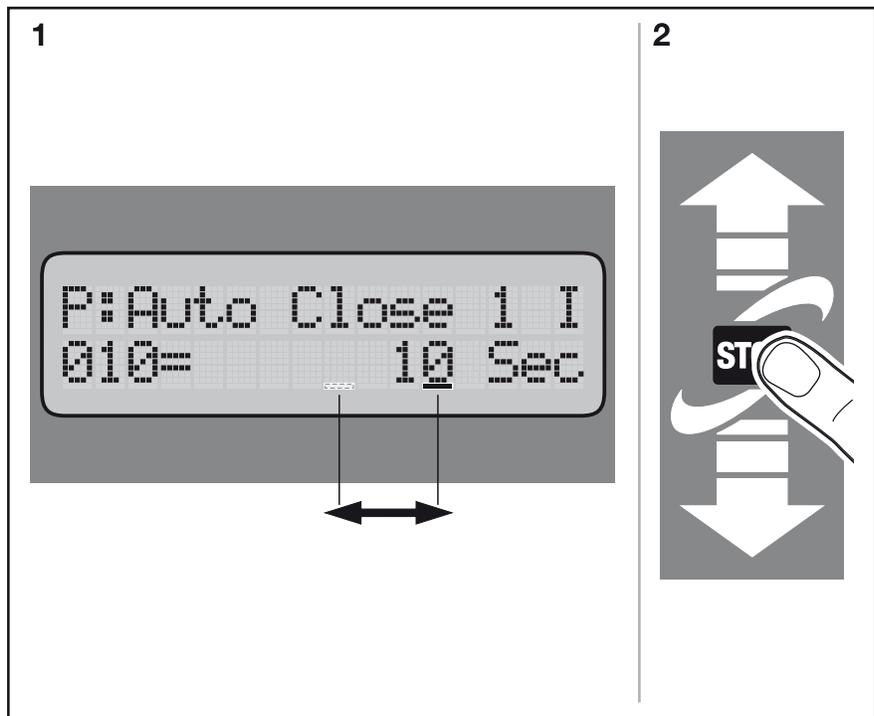
The buttons are located on the front of the control box on the right side of the display.

1. **Up Arrow:** Increases the numbers above the cursor. See parameter list in the back of this book.
2. **Down Arrow:** Decreases the numbers above the cursor.
3. **Stop:** Briefly press the button to move the cursor. Hold the button in to save a parameter value. As a parameter is changed, a "question mark" appears on the screen. When the question mark turns into a "check mark" release the stop button. This acknowledges acceptance of the new value.



8.4 How to Use the Cursor

1. **Description:** The cursor is the small line which blinks about once every second. The cursor is located under the parameter number on the bottom left or parameter value on the bottom right, depending on which one is selected.
Purpose: The cursor is used as a pointer. Whichever number the cursor is under, only that number will be increased or decreased with the Up and Down arrows.
2. **Moving The Cursor:** Move the cursor by pressing the Stop button briefly. The cursor will move from the parameter number to the parameter value, or the parameter value to the parameter number, depending on where the cursor is before you press the Stop button.



8 Programming

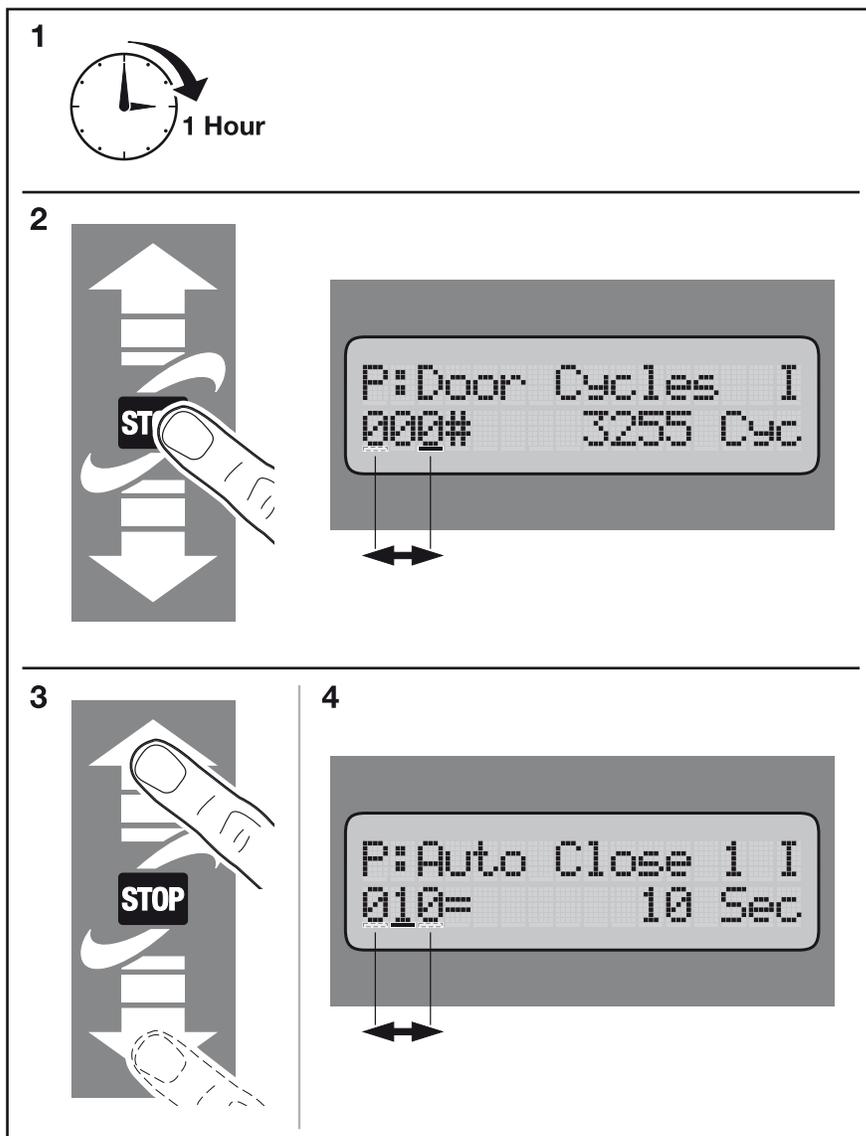
8.5 How to Display a Parameter

1. Select a parameter from the list in the back of this book.

NOTE:

After one hour parameters 017 through 210, 310 through 820, 910, and 930 through 999 can not be accessed.

2. Move the cursor under the parameter number. See 'How to Use the Cursor' for more information.
3. Press the Up and Down arrows to change the parameter displayed to the one you selected from the parameter list. The Up arrow increases the parameter number, and the Down arrow decreases the parameter number. For this example, we chose parameter number 10.
4. Once the parameter you selected from the parameter list is displayed, check the parameter value on the bottom right to see if it is correct.



8.6 How to Change a Parameter Value

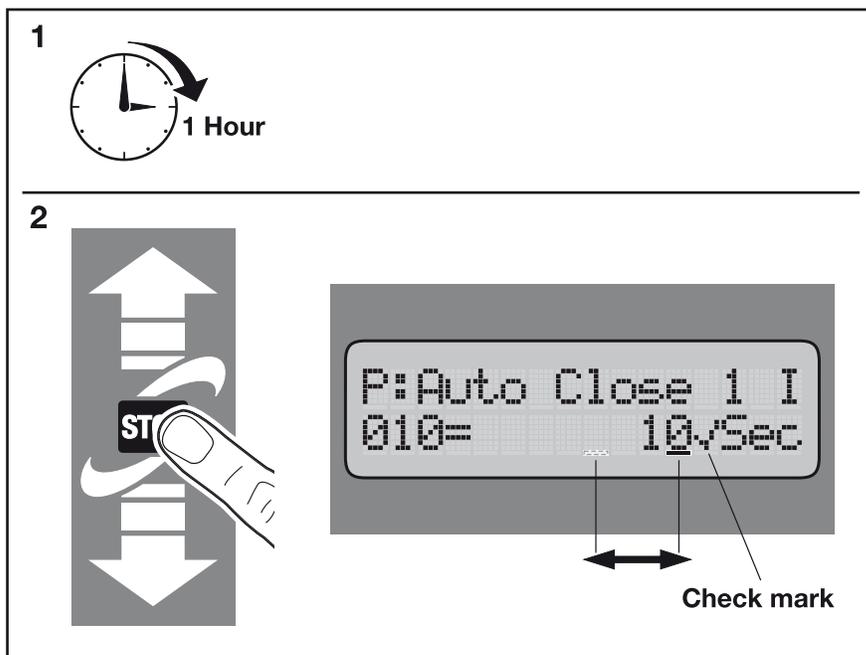
1. Refer to the parameter list in the back of this book to select the correct value to be entered.

NOTE:

After one hour parameters 017 through 210, 310 through 820, 910, and 930 through 999 can not be accessed.

2. Move the cursor under the parameter value. See 'How to Use the Cursor' for more information.

A check mark will appear next to the value to indicate that this is the current value saved for this parameter.



8 Programming

- Press the Up and Down arrows to change the parameter value displayed to the value you have selected from the parameter list. The Up arrow increases the parameter value, and the Down arrow decreases the parameter value.

When changing the value the check mark will be replaced with a question mark. The question mark indicated that the value displayed is not saved.

- To save the new value, press and hold the Stop button until the question mark turns into a check mark.

A check mark will appear next to the value to indicate that this is the current value saved for this parameter. Once the check mark is displayed, release the Stop button.

NOTE:

If you prematurely release the Stop button before the check mark is displayed, the value you selected will not be saved, and the original value saved will be displayed.

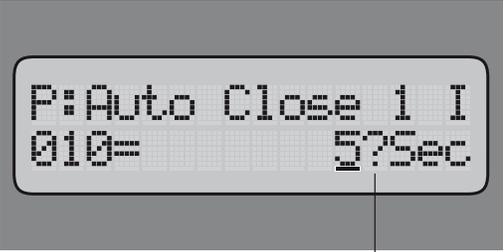
- To change another parameter, move the cursor under the parameter value to the parameter number. See 'How to Use the Cursor' for more information.
- To run the door, pull the Emergency Stop button out. When you finish changing parameters you must disable the parameter mode. See 'How to Disable the Parameter Mode'.

⚠ WARNING

Leaving the parameter mode enabled after service could lead to accidental parameter changes which could be a danger to the equipment and personnel.

3

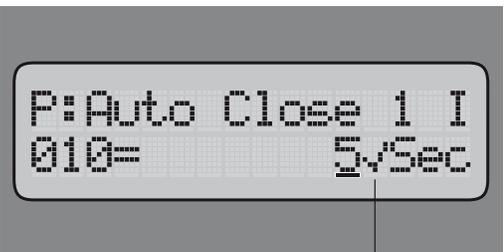




Question mark

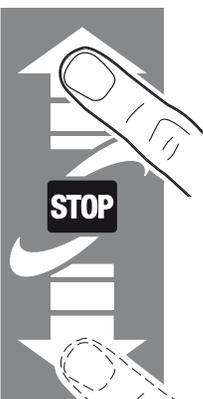
4

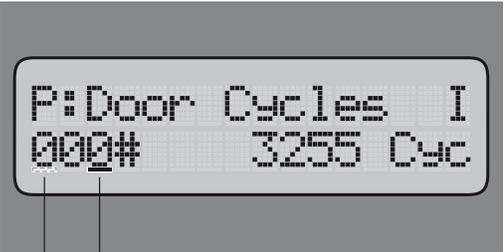




Check mark

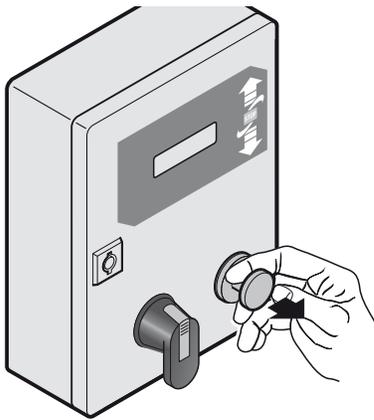
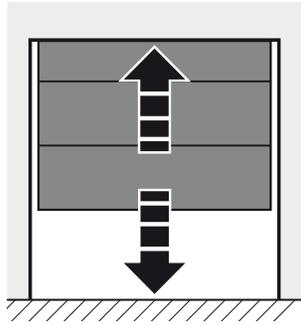
5





Cursor

6

8 Programming

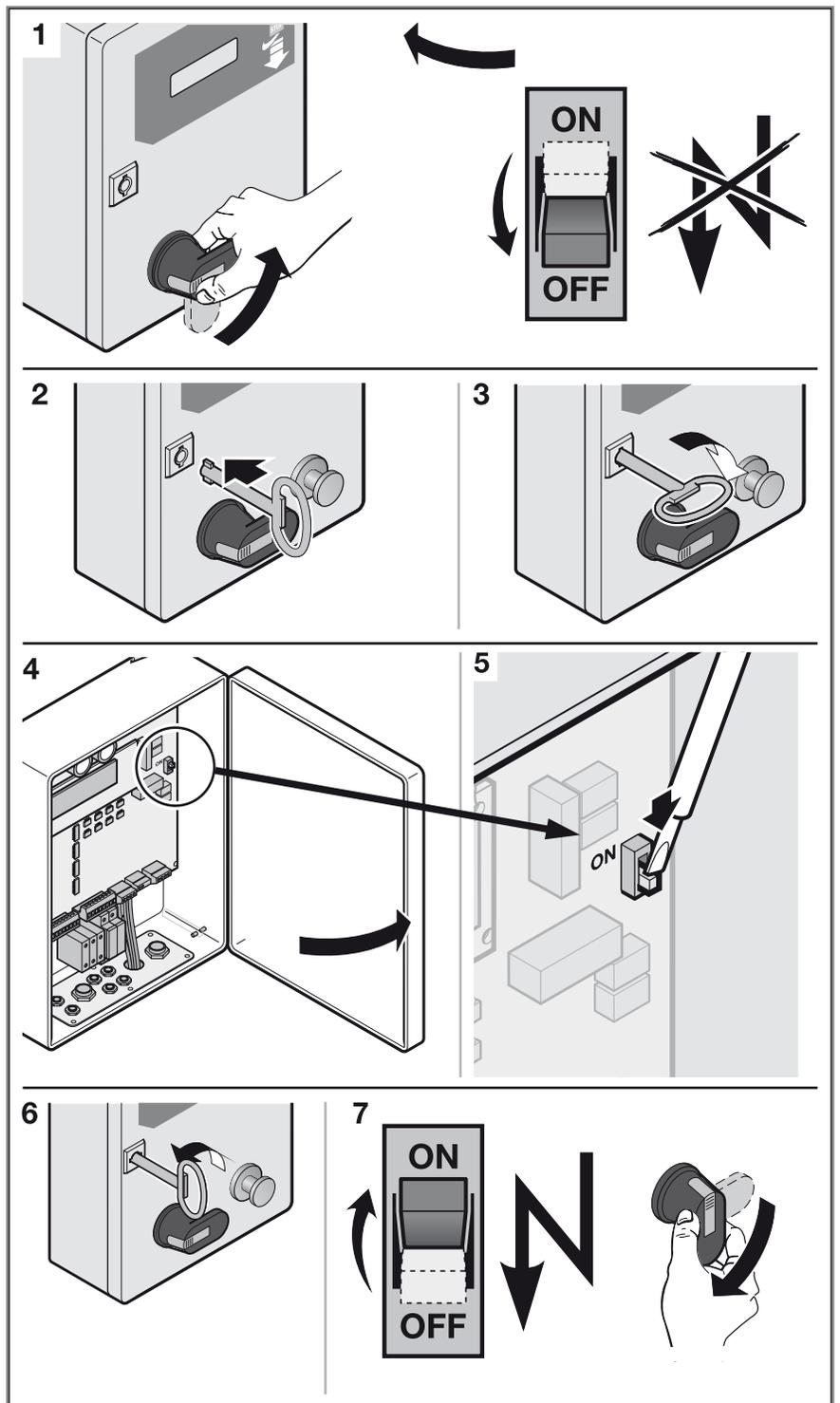
8.7 How to Disable the Parameter Mode

1. Turn the control box power switch **OFF**.

⚠ DANGER

Allow a minimum of 5 minutes for the frequency inverter stored energy to discharge.
Although the control box power switch is off, there is still power at the switch. For your safety, turn off the main power also. Use OSHA LOCKOUT-TAGOUT to ensure the power cannot be turned without your knowledge.

2. Locate the control box key.
3. Insert the key into the latch and then turn the key 90 degrees clockwise. Remove the key when finished.
4. Open the control box door.
5. Locate the service switch in the upper right hand corner of the circuit board. The switch will be white with a red slider on the front. Use a small screwdriver or your fingernail to **GENTLY** slide the **RED** slider Down to the off position. The **OFF** position is not labeled on the circuit board.
6. Close the control box door. Insert the key into the latch and then turn the key 90 degrees counter-clockwise. Remove the key when finished.
7. Turn **On** the power source and control box.



8.8 How to adjust limits

1. Follow procedure in section 8.1 **“How To Access Parameters”**
2. To adjust Open Limit select P231
3. To adjust Close Limit select P221

Notes:

- A change to positive value will cause the Open/Close limit position to move UP.
 - A change to negative value will cause the Open/Close limit position to move DOWN.
 - 10 increments equals approximately 1 inch.
4. When finished follow procedure in Section 8.7 **“How to Disable the Parameter Mode”**

8 Programming

8.9 Parameter List

NOTE:

You must be in parameter mode to access parameters.
See 'HOW TO ACCESS THE PARAMETERS.'

After one hour parameters 017 through 210, 310 through 820, 910, and 930 through 999 can not be accessed.

P.	[unit] Range	Door Functions	Default
000	[Cycles]	Door cycle counter display.	
005	[Cycles]	Displays number of door cycles until maintenance is required.	
010	[s] 0..200	Open hold time 1 (End position Upper - Eo) 0: Automatic closing deactivated	
011	[s] 0..200	Open hold time 2 (Intermediate hold position - E1) 0 = turned off	
017	[s] 0..60	Operating	60 seconds
025	[s] 0..20	Pre-warning time before close 0 = Pre-warning time turned off	
P.	[unit] Range	Motor rated data	Default
130	0..1	Motor rotational field 0 = Right rotating / 1 = Left rotating This is set at the factory. Do not change without factory approval.	
P.	[unit] Range	Boost	Default
140	[%] 0..30	Voltage increase of the U/f characteristic curve (Boost) in % of rated voltage for opening (Boost in the lower speed range) This is set at the factory. Do not change without factory approval.	
145	[%] 0..30	Voltage increase of the U/f characteristic curve (Boost) in % of rated voltage for closing (Boost in the lower speed range) This is set at the factory. Do not change without factory approval.	
P.	[unit] Range	New teaching of the end positions	Default
210	0...5	This parameter is used to start a new teaching of the end positions. The corresponding end positions are moved to in deadman mode after activating the procedure and saved by holding down the Stop key. Select from the following settings: 1: Limit switch Lower, limit switch Upper and if appropriate limit switch Intermediate Stop are taught. 2: Upper limit switch (intermediate stop: see P. 244) 3: Limit switch Lower and limit switch Upper are taught. 4: Limit switch Intermediate Stop is taught. 5: All limit switches are taught. Teaching the Intermediate Stop limit switch depends on the setting in Parameter P. 244 (see section Partial Opening / Intermediate Stop)	
221	Increments ± 125	Correction value End position door CLOSE This parameter is used to shift the entire lower end position, i. e., the end position is shifted together with the associated pre-limit switches. A change in the parameter value in the positive direction causes the end position to shift up. A change in the parameter value in the negative direction causes the end position to shift down.	
231	Increments ± 60	Correction value End position Door OPEN This parameter is used to shift the entire Door OPEN end position, i.e., the end position is shifted together with the associated pre-limit switches. A change in the parameter value in a positive direction causes the end position to shift up. A change in the parameter value in the negative direction causes the end position to shift down.	

8 Programming

P.	[unit] Range	Speeds	Default
310	[Hz] 6...150	Travel frequency for rapid OPEN Here you specify the maximum open speed in Hz.	
350	[Hz] 6...60	Travel frequency for rapid CLOSE Here you specify the maximum close speed in Hz.	
910	0..22	<p>Display mode selection With the aid of this parameter you can show the variables listed below in the display of the door controller. The following variables are displayed: (request by STOP button or during motor movement)</p> <p>0: The control sequence is displayed (Automatic) 1: [Hz] The current travel speed 2: [A] The current motor current 3: [V] The current motor voltage 4: [A] The current DC-Bus current 5: [V] The current DC-Bus voltage 6: [°C] The power stage temperature in °Celsius 7: [°F] The power stage temperature in °Fahrenheit 8: [s] The run-time of the motor during the last door operation 9: [Increments] The current position 10: [Increments] The position of the reference 11: [Dig] Channel 1 value of the absolute encoder 12: [Dig] Channel 2 value of the absolute encoder 13: [V] Current reference voltage 14: [°C] Temperature inside the housing in °Celsius 15: [°F] Temperature inside the housing in °Fahrenheit 16: Reserved 17: Reserved 18: Rotation speed of the TST PD shaft (only with TST PD) 19: Reserved 20: Reserved 21: Number of position requisition without answer 22: Number of wrong received signs in TST PD encoder</p> <p>(activates also the output in P. 955)  Settings 9 to 15 only have meaning when using an electronic limit switch.  Settings 14 and 15 are only possible when using BK150FUE-1.</p>	0
920	Eb 1 Eb 2 Eb 3 Eb 4 Eb 5 Eb 6 Eb 7 Eb 8 Ebcl Eb--	<p>Error memory The controller stores the last four errors in the error memory. After opening Parameter P. 920:</p> <ul style="list-style-type: none"> • Change level using OPEN and CLOSE keys • Opening the error memory with STOP key • Closing the error memory with STOP key • Exiting Parameter P.920 with Eb - <p>Eb 1: Error messages 1 (most recent error) Eb 2: Error message 2 Eb 3: Error message 3 Eb 4: Error message 4 Eb 5: Error message 5 Eb 6: Error message 6 Eb 7: Error message 7 Eb 8: Error message 8 Ebcl: Clear the complete error memory Eb--: Exit the error memory, jump back to Parameter P.920  Er — in the display means that no error was entered.</p>	EB1
925		Software Version This parameter displays the version of the currently used software.	
930	[s] 0...120.0	Motor run-time In this parameter the time required for the last door operation is stored.	

P.	[unit] Range	Speeds	Default
940	[V]	Input voltage In this parameter the amount of the currently present input voltage is displayed.	
973	0...1	Resetting the maintenance counter By setting this parameter to 1, the maintenance counter is reset.	0
980	0...5	<p>Operating mode This parameter is used to set the operating mode for the controller. The following modes are possible:</p> <p>0: OPEN and CLOSE move in self-holding (Automatic) 1: OPEN move in self-holding, CLOSE move in manual mode (partial automatic) 2: OPEN and CLOSE move in Manual mode (deadman) 3: Deadman emergency operation</p> <div style="background-color: #cccccc; text-align: center; padding: 5px;"> <p>⚠ WARNING</p> <p>▶ All safety devices and limit switches are ignored.</p> </div> <p>4: Endurance test with safety devices 5: Endurance test without safety devices</p> <div style="background-color: #cccccc; text-align: center; padding: 5px;"> <p>⚠ WARNING</p> <p>▶ All safety devices and limit switches are ignored.</p> </div> <p>☞ The endurance test setting is lost after turning off the controller. The controller then reverts to manual mode.</p>	
999	0..FFFF	<p>Password The password provides access to the various parameter levels.</p> <p>1: Start-up (commissioning) level 2: Expanded start-up (commissioning) level</p> <p>IMPORTANT There are different parameters visible depending on the password level. Changing parameters without knowledge of their function is forbidden. To avoid failure caused by unauthorized access, passwords should only be given to authorized personnel.</p>	1

9 Light Curtain

9.1 Initial start-up and adjustment

1. Connect control
2. The status display (red LED on the receiver) flashes quickly during the adjustment process.
3. The system is ready for operation once the green LEDs are lit.
At least one light beam is interrupted if the status display (red LED on the receiver) is lit.

ATTENTION

The light curtain elements may no longer be moved after initial start-up!

9.2 Output logic

Object	Output	Yellow LED
Present	Open	OFF
Not present	Closed	ON

9.3 LED display

Red	Status
Yellow	Output
Green	Operating voltage

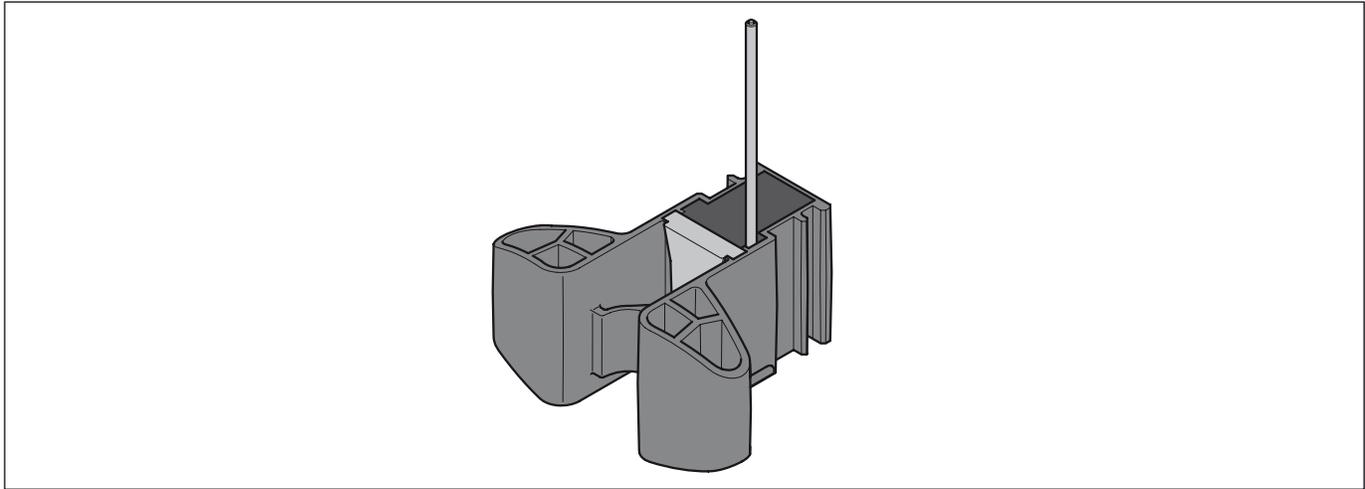
9.4 Troubleshooting

Possible cause	Troubleshooting
The red status LED in the SGT receiver is continually lit	<ul style="list-style-type: none">• Transmitter is inactive, check the wiring, check the test signal• Bottommost beam is interrupted, remove the obstruction• Extraneous light in the bottommost beam
Yellow output LED flickering	<ul style="list-style-type: none">• Extraneous light from another system, change the fitting position of the other system, eliminate the light from the other system

10 Radio Crash Switch (Speed Commander™ Only)

10.1 Technical Data: Transmitter Module

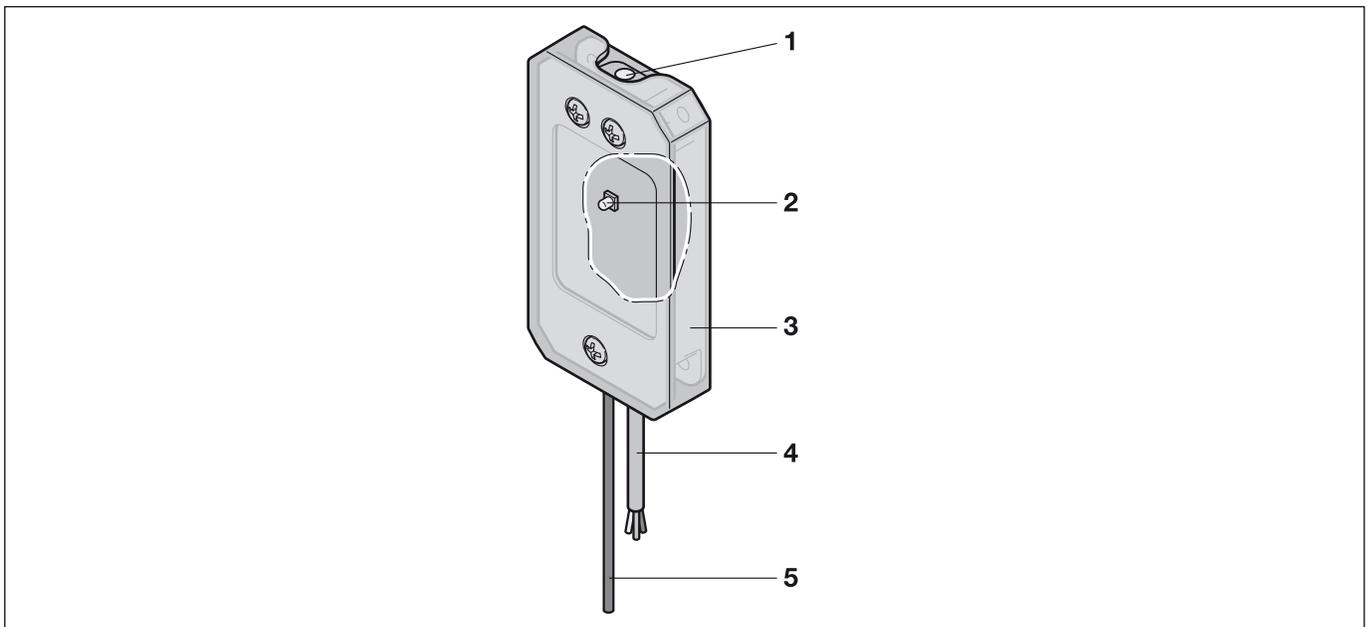
Frequency band	433 MHz, FM
Coding	Hard coded, max. 65,000 different transmission codes
Protection category	IP 65, embedded
Application temperature	- 20°C – + 60°C
Housing material	TPE / DuPont Hytrel 7246, black
Pressure-sensitive pad material	Silicone, translucent
LED display	Red, shining through the pressure-sensitive pad
Battery	Lithium CR 1/3 1A2H, 3.0 V, 170 mAh, permanently installed Battery service life approx. 3 years
Module - disposal	Hazardous waste because of the embedded battery



10 Radio Crash Switch (Speed Commander™ Only)

10.2 Technical Data: Receiver Module

Reception channels	2
Contact time	minimum 35 ms (without malfunctions of the radio distance)
Protection category	IP 65, screwed
Housing material	ABS transparent grey, PA6 GF30, TPE
Dimensions	75 x 40 x 13 mm without cable
Connection	3-core connection cable LIYY 3x0.14 ² , configuration see door control wiring diagram
Output signal	Transistor output Status OK +24 V (current limited) Status crash/error Open
LED display	Red



- 1 Programming button
- 2 Status LED
- 3 Lid made of grey transparent plastic
- 4 Connection cable, configuration see door control wiring diagram
- 5 Antenna

10 Radio Crash Switch (Speed Commander™ Only)

10.3 Function description

Delivery condition

Transmitter hard coded, receiver is programmed. To be installed next to the Distribution Block with double sided tape.

Programming

Briefly press the programming button, the LED flashes slowly. Within the next 5 minutes, first actuate the **first and then the second** crash switch. When the radio signal of the **first** crash switch is received, the LED flashes 8x very quickly while the code is being stored. During this time, you cannot teach in a second code yet. The LED then flashes again slowly and you can teach in the second transmitter. When the radio signal of the **second** crash switch is received, the LED flashes again 8x and goes out. You have to always teach in two **different** crash switches on a receiver.

Delete programming

Push and hold the programming button. The LED flashes 2x and goes out. After 10 seconds, the flashing begins again. Now release the button. Now no more transmitters are encoded, the LED remains on.

Normal transmission operation

Upon actuation of the crash switch, the transmitter generates the radio code and sends it to the receiver. The LED of the transmitter flashes once. When receiving the signal, the LED of the receiver lights up for 4 seconds. At the same time, the release signal of the transistor output is disconnected for 4 seconds.

The total number of actuations (max. 65,000) of each individual crash switch is contained encrypted in the radio data log.

Decreasing battery voltage

If the voltage of the fitted battery falls below a certain value, the LED in the crash switch blinks twice instead of once after actuation in normal operation. The LED in the receiver signals this by continuous flashing. This switch should no longer be applied as new.

If the value drops below a second, lower threshold, the flashing of the receiver slows down and the release signal for the door control is interrupted.

The concerned crash switch must be replaced immediately in case of this display.

LED Displays

Transmitter	Receiver	Note
Off	Off	Resting state
Flashes 1x	Flashes 1x	Upon actuation: Function OK, crash signal is transmitted
Flashes 2x	Continuous flashi Located in the black gearbox connection cavity on operator. ng	Upon actuation: Battery voltage decreased, crash signal is transmitted, replace transmitter
Flashes 2x	Continuous flashing	Upon actuation: Battery voltage very low, crash signal is transmitted – replace transmitter
—	Constant light	Unit is not programmed – teach-in 2 transmitters

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2091715_D - BK150FUE-1 UL Installation and User's Manual