WARNING! Read these instructions **FULLY** before use.
Installation should only be carried out by a **COMPETENT** installer.

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engineered for you

Drawing No:-	LC-3233	Page No:-	1 of 16
Revision No:-		Rev Date:-	
Drawn By:-	R.A.H.	Date:-	05/06/20
Checked By:-	J.C.	Appr' By:-	S.L.
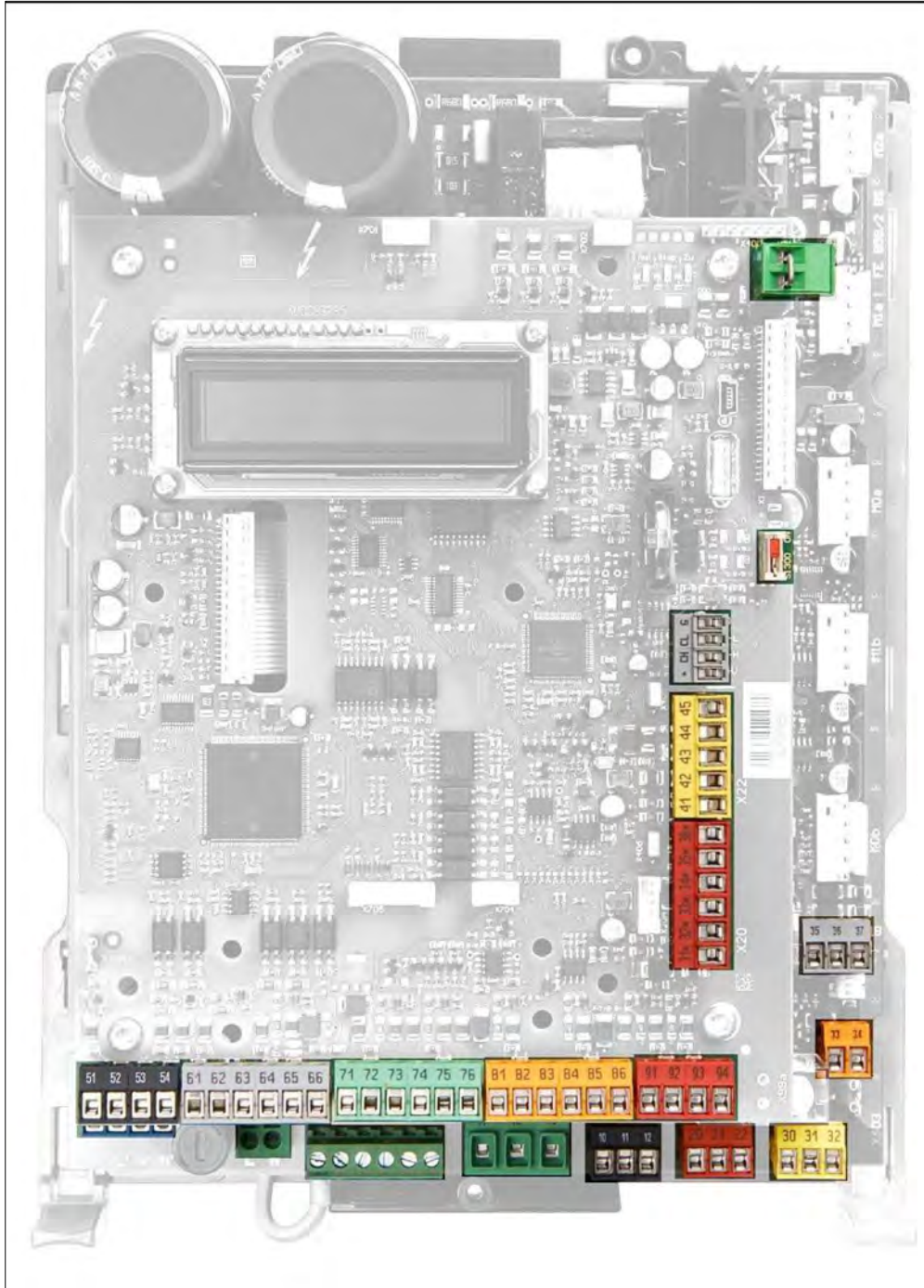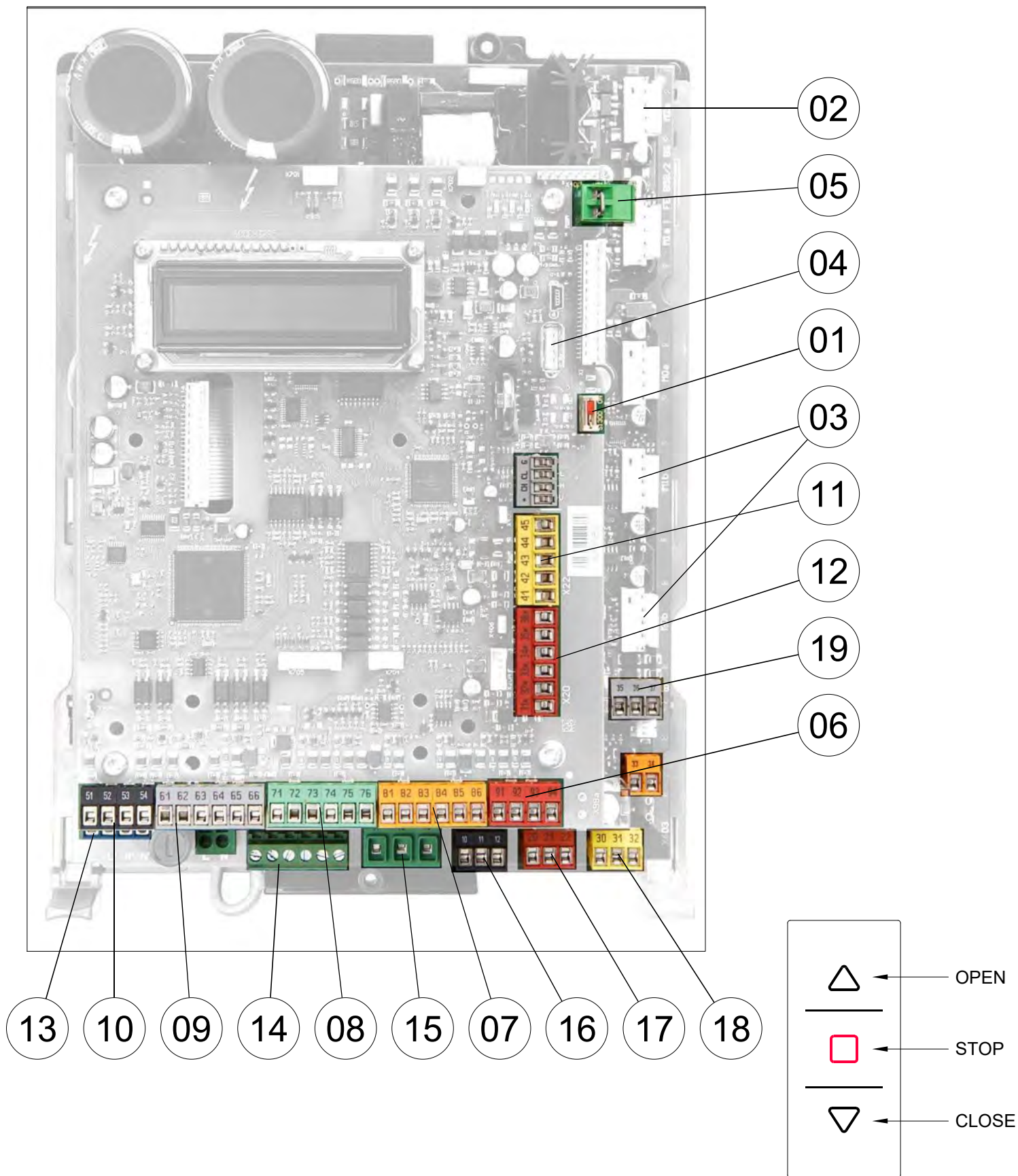
Key	Descripton	Key	Descripton
01	S1300 - Turn on to access parameters	11	Safety Edge / E.Stop 1
02	Radio Card	12	Electronic Limits / E.Stop 2
03	Loop Card	13	Aux 230V Connector
04	USB Stick	14	PE / Earth Connector
05	Emergency Stop Input	15	3ph Motor Connector
06	Open Directional Inputs	16	Programmable Relay K1
07	Aux Limits	17	Programmable Relay K2
08	Photocell / Impulse	18	Programmable Relay K3
09	Mechanical Limits / Aux Inputs	19	24VDC Traffic Light Output 700mA Max
10	External Push Buttons		

Control System

The system has been specifically designed for high-speed doors and gates. It combines door control features and a variable speed inverter to provide a smooth operating door. Many of the door control features can be adjusted to provide customised operation. In addition, the panel has provision for plug-in modules for radio; loop detectors and safety edge (conductive, pneumatic or optical); volt-free outputs are also available for signalling purposes.

Installation

Ensure that the panel is mounted on a secure structure adjacent to the door, that will not be affected by vibration of the door and that there is at least 100mm clear space around the enclosure. Consideration should be given to the fact that earth leakage currents may exceed 30mA.

Operation

The door may be opened using the Go input, Open pushbutton input, panel mounted keypad button, exit loop or radio (if fitted). The door will open at a slow speed and then smoothly accelerate to fast speed until the intermediate limit is reached, at which point the door will smoothly decelerate for the remainder of the travel distance. The door may be closed using the Auto-Close function, the Close button input, panel mounted keypad button or radio (if fitted). The door will close at a slow speed and then smoothly accelerate to half speed until the intermediate limit is reached, at which point the door will smoothly decelerate for the remainder of the travel distance.

If a safety device is activated (i.e. safety edge or photocell) during the closing cycle the door will stop & return to the fully open position. The door may only be closed once the obstruction has been removed.

Programming

`1. Turn off the door controller and wait until the display has been completely extinguished.
2. Open the cover of the enclosure and switch the DIP switch (see page 2) to ON.
3. Close the cover of the enclosure and turn on the controller.
4. ☐ & △ Press the STOP and OPEN buttons to enter programming mode

> P: Torzyterminalen
> | 000# 1234Zyk

5. △ or ▽ Use the OPEN or CLOSE arrow keys to select the required parameter.

> P: Offenhalt 1 |
> 010=   10 s

Not all the parameters are visible or may be changed immediately;
this depends on password level and type of limitd used.
To access all parameters set P.999 -> 0003.

Editing a selected parameter

> P: Offenhalt1 |
> 010=   10 s

1. ☐ By briefly pressing the STOP key on the membrane keypad
the cursor moves to the right to the stored value
(the parameter is opened) or the preset value is displayed.

> P: Offenhalt1 |z
> 010=   10✓s

2. △ or ▽ The parameter value is increased with the OPEN button
and reduced with the CLOSE button.
If the value has not yet been saved, a question mark is displayed
after the number or the decimal point flashes.

> P: Offenhalt1 |
> 010=   9?s

3. ☐ If the STOP key is only pressed briefly, the set value is not saved
and the value is changed to the originally stored value
i.e. the original value is displayed.

> P: Offenhalt1 |
> 010=   10✓s

☐ If you keep the STOP key pressed until the checkmark is displayed
or the decimal point no longer flashes, the changed value is saved.

> P: Offenhalt1 |
> 010=   9✓s

4. ☐ If you now press the STOP key briefly, you change to the display
of the parameter name or the cursor jumps back to the parameterization.

> P: Offenhalt1 |
> 010=   9 s

Leaving the parameter mode

☐ Keep the STOP button pressed for approx. 3 seconds in order to leave
the parameter mode and change to the door mode.

> FEIG ELECTRONIC
> xxxx
> Zyterminalen

Execute a reset

☐ & △ & ▽ Press STOP, UP & DOWN keys simultaneously
and keep pressed for approx. 3 seconds.

Basic Setup Connections for Electronic Limits

Note:- If the motor travels in the wrong direction, then swap `U`&`V`
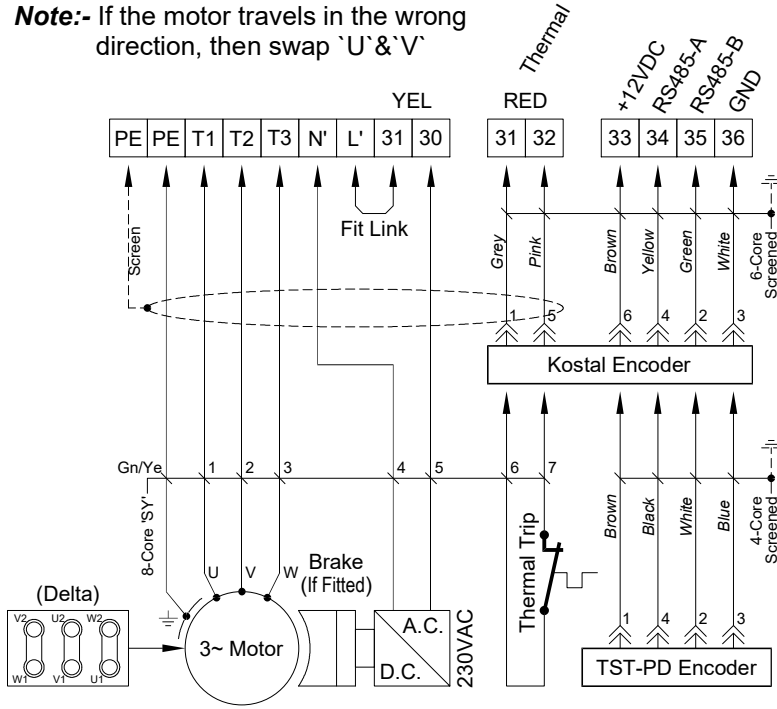
Jumper Settings:
Set the position of `J800` to suit safety edge fitted

J800

1 & 2: 8K2Ω Resistor
2 & 3: 1K2Ω Resistor

Thermal

YEL   RED   +12VDC RS485-A RS485-B GND

| PE | PE | T1 | T2 | T3 | N' | L' | 31 | 30 | | 31 | 32 | | 33 | 34 | 35 | 36 | | 43 | 44 | 45 | | 41 | 42 | | 51 | 53 | | 75 | 76 |

Fit Link

Screen

Grey Pink   Brown Yellow Green White   6-Core Screened

1   5   6   4   2   3

Kostal Encoder

Gn/Ye   1   2   3   4   5   6   7

8-Core 'SY'

Gn/Ye   Brown Black White Blue   4-Core Screened

Thermal Trip

1   4   2   3

TST-PD Encoder

(Delta)

| V2 | U2 | W2 |
| W1 | V1 | U1 |

3~ Motor   U V W   Brake (If Fitted)   A.C. D.C.   230VAC

8K2Ω/1K2Ω   Conductive Edge

Green White Brown   Green White Brown

Transmitter   Receiver

Optical Safety Edge

Link   Link   Photocell

Initial System Setup Profile for Electronic Limits

01. Switch off mains power to the panel & wait approximately 5 minutes for the unit to discharge
02. Put D.I.L. Switch 1 into Service Mode (ON position)
03. Close the door of the control and switch the power on. Press stop and open buttons to enter programming
    The display will read:-

```
P : D e f a u l t s
9 9 1 =              — #
```

Table 4.1:
P.991 - Door Profiles

Motor Frequency Limit Type	50Hz	100Hz
Kostal Encoder	1	2
TST-PD Encoder	3	4

04. Press the membrane keypad Stop button
    The display will read:-

```
P : D e f a u l t s
9 9 1 =              — √ #
```
— Flashing

05. Use the membrane keypad Up/Down buttons to set P.991 - Door Profiles from Table 4.1 shown above
    Note:- Always select a profile suitable to your motor & limit arrangement, before proceeding.
    The display will read:-

```
P : D e f a u l t s
9 9 1 =              x ? #
```
— Profile No.

06. Hold the membrane keypad Stop button until 'X' (factory default) appears on the display
    The display will read:-

```
P : D o o r   C y c l e s
0 0 0 #              x c y c
```
— No. of Runs

Note:- Use the membrane keypad Up/Down buttons to scroll through following parameters

07. Select P.100 (Motor Frequency) - Check motor frequency against motor rating plate
08. Select P.101 (Motor Current) - Check motor current against motor rating plate
09. Select P.102 (Power Factor) - Check motor power factor cosφ against motor rating plate
10. Select P.103 (Nominal Motor Voltage) - Check Star/Delta (Y/Δ) configuration against motor rating plate
11. Press & Hold the membraine stop button
    The display will read:-

```
  !   S e t   L i m i t s   !
  0 _ → θ   T o   B e g i n
```

Initial System Setup Profile for Electronic Limits

12. Press and hold the membrane keypad Stop to begin setting the limits.

The display will read:-

→	⬍	T	o		c	l	o	s	e		p	o	s		
		ø		H	o	l	d	θ		i	f		o	k	

13. Operate the door to the Closed position then press and hold the membrane keypad Stop button, if okay.

Note:- If the door opens instead of closing, set P.130 to 1 (see page 3 for editing parameters)

The display will read:-

→	▲	T	o		o	p	e	n		p	o	s			
		ø		H	o	l	d	θ		i	f		o	k	

14. Operate the door to the Open position then press and hold the membrane keypad Stop button, if okay.

15. System setup is complete

The display will read:-

!	A	u	t	o		C	a	l	i	b	r	a	t	e	!
3	4	2	2		→	▼		T	o		B	e	g	i	n

Press the Down button to start the limit calibration run. This will close the door at a reduced rate to allow the panel to configure the intermediate limit positions and the optimum acceleration/deceleration ramps indicating I.555 on the display, then change to I.515

Once the door has closed the door will countdown from 5 seconds. After which it will re-open.

Once open, the door will countdown from 5 seconds and re-close.

This procedue will repeat several times until the process has completed. When completed the I.515 on the display will dissapear.

If the Close Limit needs raising, increase P.221 (125 maximum)
If the Close Limit needs lowering, decrease P.221 (-125 maximum)

If the Open Limit needs raising, increase P.231 (60 maximum)
If the Open Limit needs lowering, decrease P.231 (-60 Maximum)

If the Intermediate Limits require recalibrating then set P.215 to '1'
If the Main Limits require resetting then set P.210 to '1'

Basic Setup Connections for Mechanical/Standard Limits
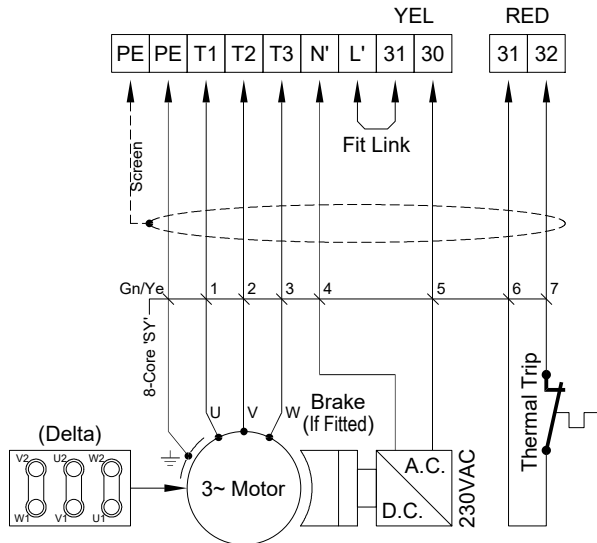
J800 — 1 & 2: 8K2Ω Resistor
2 & 3: 1K2Ω Resistor

Note:- If the motor travels in the wrong direction, then swap `U`&`V`

*Not required for Profile P.991 - 7

Optical Safety Edge
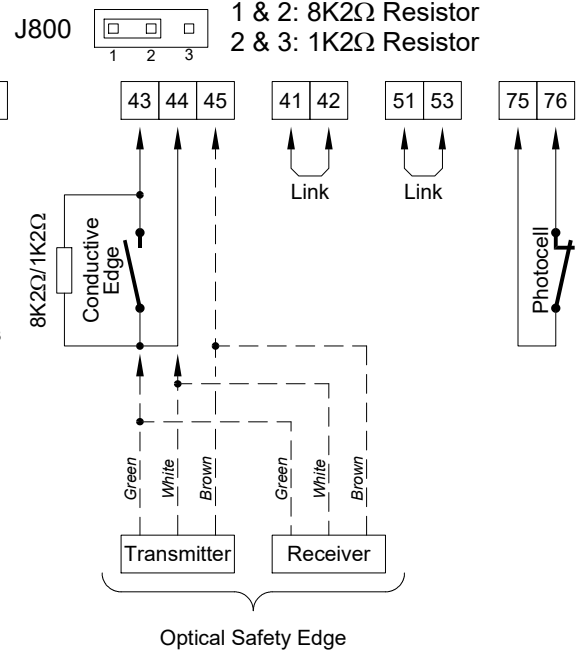
Initial System Setup Profile for Mechanical Limits

1. Pull to release the panel mounted Emergency Stop latching pushbutton & operate the door in Deadman

   Display will read:-

J	o	g		M	o	d	e		⬍				

2. Using the membrane keypad Close button, operate the door until it is approx. 50cm from the fully closed position
   Note:- If the door opens instead of closing, interchange the wires in terminals 'T1' & 'T2'

3. Adjust the Intermediate Close limit to actuate at this point

   Display will read:-

J	o	g		M	o	d	e		⬍				
P	r	e	L	i	m	i	t	C	l	o	s	e	T	8	5

4. Using the membrane keypad Close button operate the door until it reaches the fully closed position.

5. Adjust the Fully Closed limit switch to actuate at this point

   Display will read:-

J	o	g		M	o	d	e		⬍				
D	o	o	r		i	s		C	l	o	s	e	

6. Using the membrane keypad Open button, operate the door until it is approx. 50cm from the fully open position

7. Adjust the Intermediate Open limit to actuate at this point

   Display will read:-

J	o	g		M	o	d	e		⬍				
P	r	e	L	i	m	i	t	O	p	e	n	T	8	2

8. Using the membrane keypad Open button operate the door until it reaches the fully open position

9. Adjust the Fully Open limit switch to actuate at this point

   Display will read:-

J	o	g		M	o	d	e		⬍				
D	o	o	r		i	s		O	p	e	n		

10. If required adjust the safety Fully Open & Close limits
11. Activate the panel mounted Emergency Stop latching pushbutton
12. Select parameter P.980 and change its value from `2' to `0' (Automatic mode)
13. Pull to release the panel mounted Emergency Stop latching pushbutton
14. Switch off mains power to the panel and wait approximately 5 minutes for the unit to discharge
15. Put D.I.L. Switch 1 out of Service Mode (OFF position)
16. Reapply power
17. System Setup is now complete

```
        ┌┬┐ Close
  54 ──◄─○────●──────┐
                     │
           ┌┬┐ E.Stop│
  53 ──◄─────○──╱─────┤
                     │
     ┌┬┐ Open         │
  52 ──◄─○────●───────┤
                     │
  51 ──◄──────────────┘
```
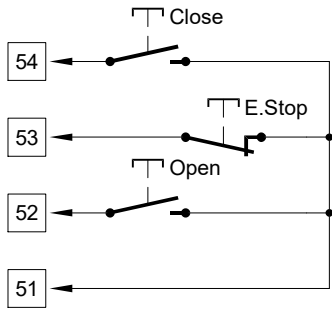
Note:- These connections are isolated when the panel is in `Deadman` mode (i.e. During setup or under fail conditions)

Photocell Connections

:**Dual Photocell Wiring**

Retro-Reflective Photocell
Stock Code: 33-1005
Operating Range: 0.3-10m

Single Photocell Wiring:

```
  +  Brown ──────●──► 76
  −  Blue ──────────► 74
  White  Common

     3A/30 Vdc
     1A/230 Vac

  Black  N/C ──────► 75
  Grey   N/O
Photocell
```

```
  +  Brown ──────●───────────┐
  −  Blue                     │
  White  Common               │
                              │
     3A/30 Vdc                │
     1A/230 Vac               │
                              │
  Black  N/C   Common  White  │
  Grey   N/O ──○────────────┐ │
Photocell                   │ │

          +  Brown ──────●──► 76
          −  Blue ──────────► 74

             3A/30 Vdc
             1A/230 Vac

          Black  N/C ──────► 75
          Grey   N/O
        Photocell
```

Caution!
Observe supply polarity
It is not recommended to power more
than two photocells from this supply
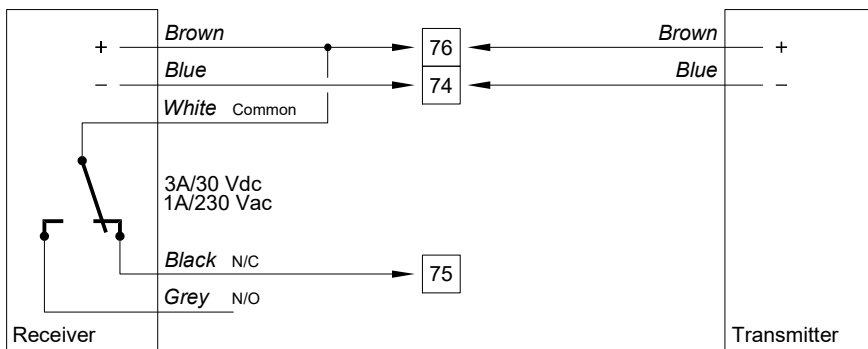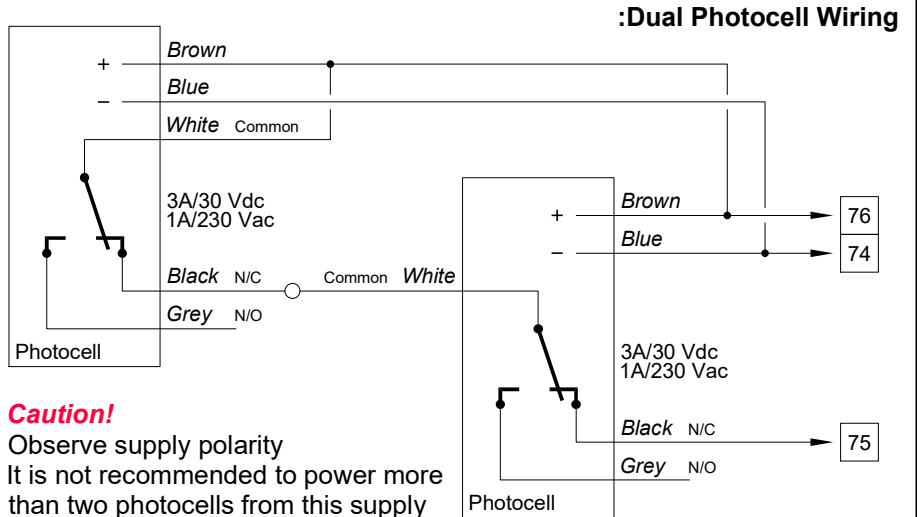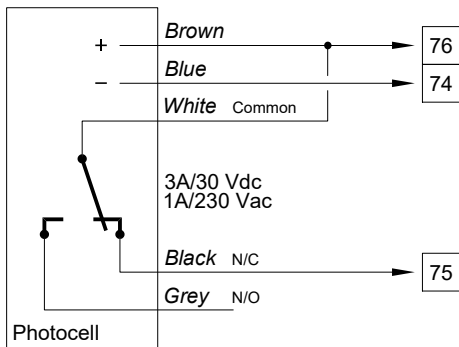
Through-Beam Photocell
Stock Code: 33-0991
Operating Range: 1-20m

```
  +  Brown ──────●──► 76 ◄── Brown  +
  −  Blue ──────────► 74 ◄── Blue   −
  White  Common

     3A/30 Vdc
     1A/230 Vac

  Black  N/C ──────► 75
  Grey   N/O
Receiver                    Transmitter
```

Caution!
Observe supply polarity

Other Connections

①
| 10 | 11 | 12 |
| N/O | Com | N/C |

K1
Programmable
Relay Output
(Default Slave
Open Limit)

②
| 20 | 21 | 22 |
| N/O | Com | N/C |

K2
Programmable
Relay Output
(Default
Close Limit)

③
| 30 | 31 | 32 |
| N/O | Com | N/C |

K3
Programmable
Relay Output
(Default
Brake O/P)

④
| 72 | 73 |
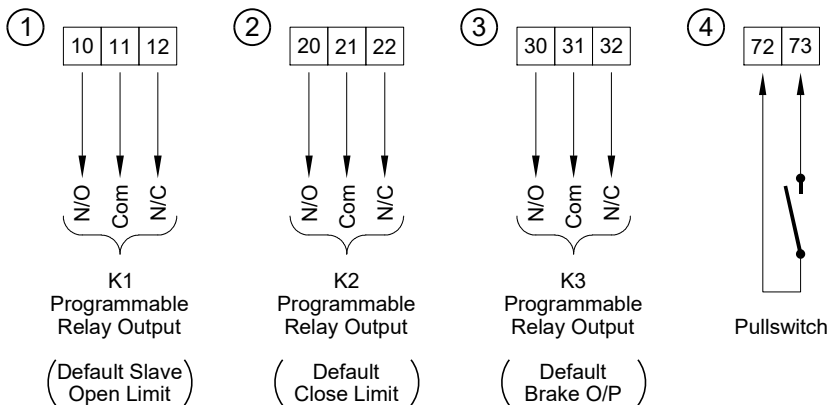
Pullswitch

1. Provides a volt-free output suitable for traffic lights, etc.
2. Provides a volt-free output suitable for traffic light etc.
3. Provides a volt-free output suitable for the motor brake
4. Pullswitch input

Standard Parameters

Parameter Display	Adj. Range	Parameter Function	Factory Setting
Gate Functions			
P .000		Cycle Counter Counts Full Open & Close cycles	0000
P .005		Cycle Maintenance Counter Displays number of gate cycles before maintenance is required (If set)	0000
P .010	[S] 0..200	Auto Close Time (Full Open) 0 :Switched Off	10
P .011	[S] 0..200	Auto Close Time (Part Open) 0 :Switched Off	10
Motor Parameters			
P .100	[Hz] 30..200	Motor Frequency Ensure this is set to same value as stated on the Operator Rating Plate (Normally 50Hz)	50/87
P .101	[A] 0..9,9	Motor Current Set this to the value stated on the Operator Rating Plate for a 230VAC Delta connection	5.0
P .102	[%] 40..100	Power Factor Ensure this is set to same value as stated on the Operator Rating Plate	70/74
P .103	[V] 100..500	Motor Rated Voltage *Caution!* Check Star/Delta Configuration! Ensure this is set to same value as stated on the Operator Rating Plate	230
Torque Parameters			
P .140	[%] 0..30	Torque Boost when Opening Voltage increase in the lower speed range (Set to 15 max.)	10
P .142	0..15 Hz	Sets the amount of I x R compensation for the Open direction	15
P .145	[%] 0..30	Torque Boost when Closing Voltage increase in the lower speed range (Set to 15 max.)	5
P .147	0..15 Hz	Sets the amount of I x R compensation for the Close direction	0
Brake Parameters			
P .180	[Hz] 0..20	Frequency below which the brake is de-energised when reducing speed *Parameter P.999 must be set to 3 to access this parameter*	10
P .185	[Hz] 0..20	Frequency, which has to be exceeded, in order to energise the brake *Parameter P.999 must be set to 3 to access this parameter*	7
P .189	[Hz] 0..50	Torque Boost that is active only below the frequency set by P.185 (Start Boost) *Parameter P.999 must be set to 3 to access this parameter*	15
Limit Switch Selection			
P .200	0..8	0 :Mechanical limit switches 3 :Absolute encoder DES-A using 19200 baud communication speed 4 :Absolute encoder DES-A using 9600 baud communication speed 7 :Absolute encoder DES-B (Kostal) 8 :TST-PD (*Parameter P.205 must be set first*) *Parameter P.999 must be set to 3 to access this parameter*	0/7/8
P .205	0..8	Sets the type of limits:- 0000 :Mechanical limit switches - End of travel limits are N/C, Intermediate limits are N/O 0001 :Mechanical limit switches - All limits are processed as N/C 0300 : Absolute encoder DES-A 0700 : Absolute encoder DES-B (Kostal) 0800 : Feig TST-PD Encoder 0900: Mechanical limit switches with timed assistance (P.202 may need to be adjusted)	0/7/8
Programming the End Positions with Electronic Limit Switches			
P .210	0..5	Selecting the position to be calibrated in Deadman/Jog mode operation ("Teach In"):- 0 :no None/Abort 5 :Eu Close & Fully Open limit switch positions *Note:-* All limits are taught	0
Correcting the End Positions with Electronic Limit Switches			
P .221	[Ink] ±125	Correction value for the Close end position Reduce value to increase travel (Set to 0 in case of new calibration!)	0
P .231	[Ink] ±60	Correction value for the Open end position Reduce value to increase travel (Set to 0 in case of new calibration!)	0

Standard Parameters

Parameter Display	Adj. Range	Parameter Function	Factory Setting
Speed Parameters			
P .310	[Hz] 6..200	Frequency for automatic opening speed Operating frequency until Open pre-limit switch position - Adjust pre-limit switch, if necessary	87
P .350	[Hz] 6..200	Frequency for automatic closing speed Operating frequency until Close pre-limit switch position - Adjust pre-limit switch, if necessary	30/50
P .390	[Hz] 6..100	Frequency for Deadman/Jog mode Opening speed ***Parameter P.999 must be set to 3 to access this parameter***	30
P .395	[Hz] 6..100	Frequency for Deadman/Jog mode Closing speed ***Parameter P.999 must be set to 3 to access this parameter***	30
Run Timer Parameters			
P .410	E[s] 0..9900	Opening Run Timer 0 :Switched Off ***Parameter P.999 must be set to 3 to access this parameter***	15/60
P .415	[s] 0..9900	Closing Run Timer 0 :Switched Off ***Parameter P.999 must be set to 3 to access this parameter***	15/60
P .419	[s] 0..9900	Deadman/Jog mode Run Timer 0 :Switched Off ***Parameter P.999 must be set to 3 to access this parameter***	60
Mechanical Limit Switch Parameters Only			
P .430	[s] 0..5.0	Lag error when using mechanical limit switches - Specifies the time for the motor to move off the limit	2
Electronic Limit Switch Parameters Only			
P .440	[lnk] -60..999	Position for safety edge pre-close limit switch position Reduce value to increase travel	10
P .450	[s] 0.25..3.0	Lag error when using electronic limits	2
P .461	0..4	0 :No deactivation of photocell 2 :Deactivation of photocell after reaching pre-limit 3 :Deactivation of photocell after reaching position set below (P.4b3)	0
P .463	0..9999	Position to deactivate photocells ***Note:-*** 0 is fully closed	0
Safety Edge Parameters			

P .460	0..6	Safety Edge Evaluation (SL) - Evaluation must have once recognised correct termination resistance
		-1 :Automatic recognition of the safety edge
		  0 :OFF - Only possible when no terminating resistance is fitted
		  1 :ON - N/O 8K2 system (e.g. Electric Edge)
		  2 :ON - N/C 8K2 system (e.g. Pneumatic Edge)
		  3 :ON with self testing - N/O 8K2 system (e.g. Tests edge on each closing)
		  4 :ON with self testing - N/C 8K2 system (e.g. Tests edge on each closing)
		  5 :Dynamic Optical System (OSE)
		  6 :Auto Detect
		Parameter P.999 must be set to 3 to access this parameter
			6

P .461	[cnt] 0..5	Maximum number of activations of the Safety Edge 0 :OFF - Unlimited number of activations allowed (prefered setting if using a light curtain as safety edge) >0 :ON - Inverter will fail into `Deadman` operation mode after a set number of activations ***Parameter P.999 must be set to 3 to access this parameter***	3

P .462	0..2	Function of the Safety Edge
		  0 :Stop on Safety Edge, Starting from below the Safety Edge Pre-Close Limit (P.440)
		  1 :Ignore Safety Edge, Starting from below the Safety Edge Pre-Close Limit (P.440)
		  2 :Ignore Safety Edge, Starting from Lower Limit Switch
		Parameter P.999 must be set to 3 to access this parameter
			0

Input Profiles ('x' refers to input number)			

P .501
to
P .50A
	0000
	to
	3201
		Function of Input
		  0101 : Open command (N/O) - open to fully open position with auto-close
		  0201 : Impulse command (N/O) - open to fully open position with auto-close, close on next command
		  0301 : Permanent / hold open command (N/O) - open to either open position without auto-close
		  0401 : Stop command (N/C) - stop in any direction and wait for another command
		  0501 : Photocell command (N/C) - safety B reversing when closing, to previous open position
		  0601 : Auto-Manual select (N/O) - change between Auto (impulse) and Manual (deadman) control
		  0701 : Close command (N/O)
		  0801 : Lock door closed (N/O) - lock the door fully closed, no deadman override possible (interlock)
		  0901 : Cross traffic supression (N/O) - ignore open1 and detector1 commands
		  1001 : Auto-close ON/OFF (N/O) - disables the auto-close
		  1101 : Photocell override limit (N/O) - limit switch to disable the photocell
		
		Example - To use terminals 72 & 73 (Input 4̄) as an additional photocell, set P.50 4̄ to 0501	

Standard Parameters

Parameter Display	Adj. Range	Parameter Function	Factory Setting

		Relay Output Parameters	

P .701 (Relay K1) & P .702 (Relay K2)		Output profile examples:-
		  0000 :Relay deactivated
		  0101 :Door is in the upper end position (Open)
		  0201 :Door is in the lower end position (Closed)
		  0501 :Courtesy Light: On during every Open & Close move with 10 seconds switch off delay
		  0801 :On during every Open & Close move and clearance time/pre-warning time
		  1220 :Red traffic light on outside of door
		  1221 :Flasing red traffic light on outside of door
		  1210 :Green traffic light on outside of door
		  3201 :Brake relay
			0101
			
			&
			
			3201

		TST-RFUxK-A Expansion Board	
P .800	0..5	Activates the TST-RFUxK Expansion Board:- 0 :Board deactivated 5: TST RFUxK 8: TST RFUxIO	0

P .802		Plug-In Options
		  0101 - 1-Channel Safety Edge Card (TST-SURA-1)
		  0106 - 6-Channel Safety Edge Card (TST-SURA-6)
		  0202 - Radio Receiver
		  0302 - Loop Detector 0400: TST MNST Activated
			0202

		Diagnostic Parameters	

P .910	0..13	Selection of Display Mode
		  0 - Au :Control sequence (Automatic)
		  1 - F :[Hz] Present motor frequency
		  2 - i :[A] Present motor current (> 1A)
		  3 - u :[V] Present motor voltage
		  4 - i :[A] Intermediate circuit (DC bus) current
		  5 - U :[V] Intermediate circuit (DC bus) voltage
		  6 - c :[°C] Temperature of output transformer
		  7 - C :[°C] Temperature of brake resistor
		  8 - L :[100ms] Latest running time
		  Note:- Only useful for electronic limit switch
		  9 - P :[Ink] Present position course
		  10 - r :[Ink] Present reference position
		  11 - K1 :[dig] Present Channel 1 value of PBA absolute encoder
		  12 - K2 :[dig] Present Channel 2 value of PBA absolute encoder
		  13 - b :[dig] Present reference Voltage (2.5V)
			0

P .920	Eb 1
	Eb 2
	Eb 3
	Eb 4
	Ebcl
	Eb -
		Display of error memory/failures
		- Access by pressing the Membrane Stop
		- Change over by pressing Membrane Open & Close
		- Closing by pressing Membrane Stop
		- Exit by abortion "Eb-"
		  Eb1 - Eb4 :Error messages
		  Ebcl :Delete the complete Error Memory
		  Eb- :Abortion
		  noEr :No errors	

P .940	[V]	Displays present supply voltage	–

		Operating Modes	

P .980	0..2	Extended Service Mode
		  0 - Au :Fully automatic (Impulse, Opening & Closing)
		  1 - Hc :Deadman/Jog mode closing (Manual Closing/Automatic Opening)
		  2 - Hd :Deadman/Jog mode (Manual Opening & Closing)
			0/2

		Parameter Adjustment Modes	
P .990	0..1	Factory setting reset: Reset (1)/Abort (0) **!!!!! Warning - Think !!!!!** ***Parameter P.999 must be set to 3 to access this parameter***	0
P .991	0..12	Door Profile Settings:- (see table below)	–

P .999	1..3	Selection of Parameterisation Mode (Reset after switching off)
		You may...1:- Change customer and initiation parameters
		             2:- Read all parameters and change the initiation parameters only
		             3:- Read and change all parameters (extended parameterisation mode)
			1

Door Profile Settings (P .991):

Profile No.	1	2	3	4	5	6	7	8
Frequency	50Hz	100Hz	50Hz	100Hz	50Hz	100Hz	50Hz	50Hz
Limit Type	Kostal Encoder	Kostal Encoder	TST-PD Encoder	TST-PD Encoder	Mechanical Limit Sw.	Mechanical Limit Sw.	Mechanical Limit Sw.	Timed Slow Limits

Note:- Profile 7 is designed for single speed doors with just Open & Close mechanical limits.
This is suitable when using an inverter for battery back-up, i.e single speed car park shutters

General Door Status

F.000	Door position is too high (above open limit)
F.005	Door position is too low (below close limit)
F.020	Run Timer has been exceeded (during Opening, Closing or Deadman) - see P.410, P.415, P.419
F.030	Lag Error (door has not moved off limit - motor stalled)
F.031	Detected rotation direction deviates from expected direction of rotation
F.080	Maintenance is required
F.090	Controller not parameterized

Safety / Emergency Stop Chain

F.201	Internal Emergency Stop or Watchdog (µProcessor safety check) is triggered
F.211	External Emergency Stop 1 is triggered (Terminals 41 & 42)
F.212	External Emergency Stop 2 is triggered (Terminals 31 & 32)
F.320	Obstacle during opening
F.325	Obstacle during closing
F.360	Short circuit / activation of safety edge
F.361	Number of safety edge activations exceeded - see P.46E
F.362	Redundancy error for safety edge self-check (short circuit)
F.363	Safety edge is open circuit (broken cable etc)
F.364	Safety edge testing in closed position failed
F.365	Redundancy error for safety edge self-check (open circuit)
F.366	Too high a pulse frequency for optical safety edge
F.369	Internal Safety Edge incorrectly parameterized
F.36A	Redundancy error of the 8K2 slip door switch on the internal safety edge evaluation unit
F.371	Number of trips of the Safety input E, normally this is the integrated safety edge evaluation has reached set limit (P.47E)
F.372	Redundancy error with short circuit
F.373	Fault in safety edge (message comes from module)
F.374	Safety edge testing failed
F.379	Safety edge detection defective (coding pin or parameter setting)
F.37A	Redundancy error of the 8K2 slip door switch on the internal safety edge evaluation unit channel 1

General Hardware Failures/Errors

F.410	Excess current (motor current or FU- overall current) - check motor parameters / mains supply voltage is stable under load
F.413	The brake chopper under heavy load
F.420	Excess voltage in DC-bus circuit - check mains supply voltage is not too high / motor is regenerating
F.425	Excess line voltage (mains supply voltage is >256VAC for more than 10 secs)
F.426	Undervoltage Line Supply
F.430	Temperature cooler outside of working range limit 1
F.435	Housing Temperature High
F.440	Excess DC current - check mains supply is stable under load / motor is overloaded / mechanical door problem
F.510	Over current - check motor parameters
F.511	No DC Supply
F.512	Offset Motor Current / DC Bus Current Faulty
F.513	Brake chopper overloaded, not installed or defective
F.514	Error in inrush current limiter
F.515	Motor protection has detected excess current
F.519	IGBT driver component has detected excess current - check for short circuit / earth fault on motor & motor cables
F.520	Excess voltage in intermediate circuit - check mains supply voltage is not too high / motor is regenerating
F.521	Under voltage in intermediate circuit - check mains supply voltage is not too low
F.522	Permissible DC current for a single-phase power supply is too high
F.524	External 24V supply is missing (possibly short circuit)
F.525	Excess line voltage (mains supply voltage is >256VAC for more than 10 secs)
F.530	Over temperature of heat sink
F.535	Housing Temperature High
F.540	Over Current in DC-bus Limit 2

Display Messages & Fault Codes

General Positioning

F .700	Position sensing defective
F .701	Close position not found in timer mode
F .702	Open position not found in timer mode
F .752	Time out during data transmission - No communication with encoder - check encoder cables / encoder parameter P.200
F .760	Position out of usable range
F .766	Internal Error TST PD/PE
F .767	Overtemperature TST PD
F .768	Battery Voltage
F .769	Rotation Speed of PD Shaft too high
F .770	Doorway is too high for parameter set encoder resolution

Internal Systematic Errors

F .920	Internal 2.5V supply is defective		F .960	Parameter check sum
F .921	Internal 15V supply is defective		F .961	Checksum via calibration values
F .922	Incomplete Emergency Stop chain		F .962	Converter parameter not plausible
F .930	External watchdog error / noise satutated enviroment		F .963	Ramp parameter not plausible
F .931	ROM error		F .964	New software fitted / not initialised (factory default P.990 -1)
F .932	RAM error		F .968	Programming error with real time clock
			F .969	Internal error real time clock
			F .970	Parameter processing is disturbed

General Inputs

E .000	Open button on membrane keypad
E .050	Stop button on membrane keypad
E .090	Close button on membrane keypad

	Standard Configuration (Mechanical limits / Encoder)	Parameter (default Mechanical limits / Encoder)
E .101	Input 1: Open command	P.501 (0101 / 0101)
E .102	Input 2: Stop command	P.502 (0401 / 0401)
E .103	Input 3: Close command	P.503 (0701 / 0701)
E .104	Input 4: Impulse input (single 'GO' command)	P.504 (0201 / 0201)
E .105	Input 5: Photocell	P.505 (0501 / 0501)
E .106	Input 6: Open pre-limit switch / Permanent open command	P.506 (1106 / 0301)
E .107	Input 7: Close pre-limit switch / Auto-Manual select	P.507 (1108 / 0601)
E .108	Input 8: Open limit switch / Lock closed	P.508 (1110 / 0802)
E .109	Input 9: Close limit switch / Cross traffic supression	P.509 (1111 / 0903)
E .110	Input 10: Auto-close ON/OFF	P.50A (1001 / 1001)
E .111	Input 11: Open Command from Inside	P.50B (016 / 0106)
E .112	Input 12: Open Command from Outside	P.50C (0110 / 0110)

Safety / Emergency Stop Chain

E .201	Internal E-Stop "Mushroom Button" tripped
E .211	External E-Stop 1 tripped
E .212	External E-Stop 2 tripped

Safety Edge

E .360	Activation of internal safety edge 1
E .363	Internal safety edge 1 faulty
E .370	Activation of external safety feet
E .373	External safety edge fault

Wireless Plug In Module

E .401	Radio Channel 1
E .402	Radio Channel 2

Induction Loop Evaluation Device: Plug-in Module

E .501	Loop Detector Channel 1
E .502	Loop Detector Channel 2

Internal Inputs

E .900	Fault signal of triggering component

	Information Messages during Automatic Operation
1.021	Emergency open test is running
1.080	Service counter will run off
1.100	Too much speed when open limit is reached
1.150	Too much speed when close limit is reached
1.160	Permanent open is still active
1.161	Priority is still active
1.170	Forced opening active
1.180	Wait for foil key command
1.185	wait for reset by stop foil key
1.199	Door counter is wrong
1.200	New reference position taken over
1.201	Reference position new initialized
1.205	Synchronisation of current limit position
1.210	Limit switch not plausable
1.211	Limit switch not plausable
1.310	Open command to door 2
1.320	Obstacle during opening
1.325	Obstacle during closing
1.360	Disturbed N.C. safety edge
1.363	Disturbed N.O. safety edge
1.510	Correction drive finished
1.515	Active correction drive
1.520	*Pre limit switch reached before full speed was reached-->Adjust ramps
	*Current limiter prevemts the driving in full speed-->Inverter or motor are working on thier limits-->Adjust ramps or limiter
1.555	Measuring rotation factor not ready
1.610	Light line alignment completed successfully
1.615	Light line alignment requested
1.620	Door in PU when syncing but some rays of light are still masked. Adjust P.446 door masking in PU!
1.621	The resolution of the installed position sensor is too low to maintain robust light curtain operation.
	More increments are required per door move. (Message only occurs when DIP on).
1.700	In timer limit switch operating mode (typ. after power on) the door position is not available.
	Deadman speed is maintained until the actual position becomes available again.
1.856	The internal safety edge is tripped because of an WiCab radio problem.

Light Curtain Connections

1.6 - 10m Range
X22: (Yellow)
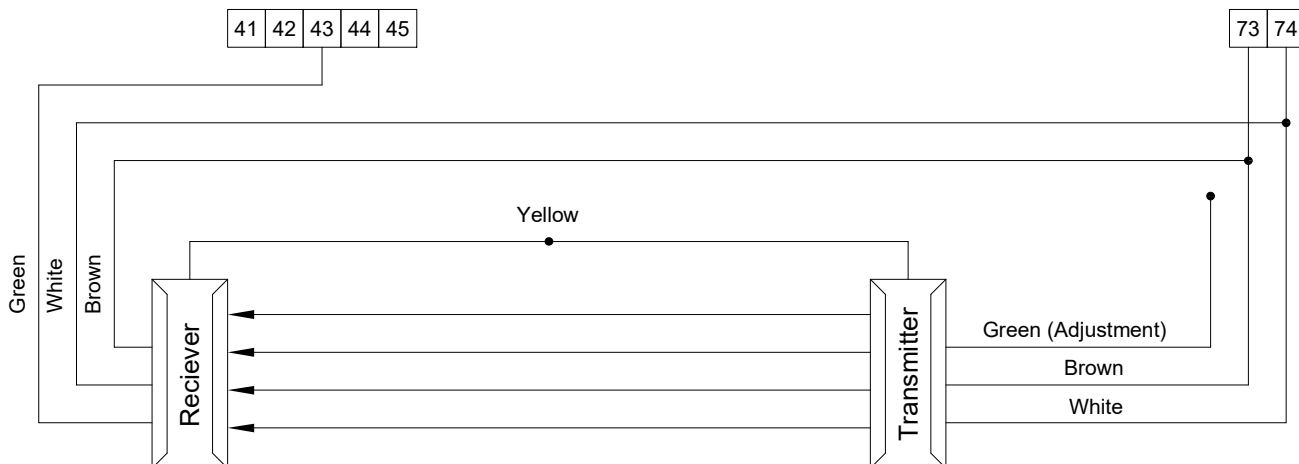
Plug-in 1-Channel Radio Card Instructions (CS-RADIO: Stock Code 28-400125)
Note:- Parameter P.802 must be set to 0202 to enable the Radio Receiver

Circuit Board Layout
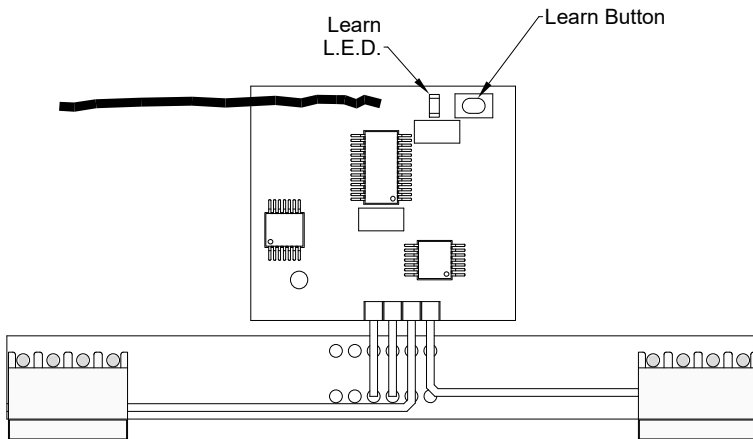
Models Covered

Model	Channels	Code
CS-Radio	1	Fixed

Technical Data

Frequency	433.92 MHz
Current Consumption	12mA
Frequency	433.92MHz
Modulation	ASK
Output	OC Impulse 1s
Max Output Rating	24V/100mA
Operating Temperature	-20°C to +60°C

Programming Handsets into the Receiver

1. Press & release the 'Learn' button once. The L.E.D. will flash.
2. Press the transmitter button of the handset to be learnt.
   The L.E.D. will light for approx 4 seconds to confirm that the code learning process was successful.

Programming Sequence

Press the Learn button to enter programming
(Flashing Red L.E.D.)

Press the Transmitter button to be learnt
(LED lit for 4 seconds to confirm)

Press the Learn button to exit programming
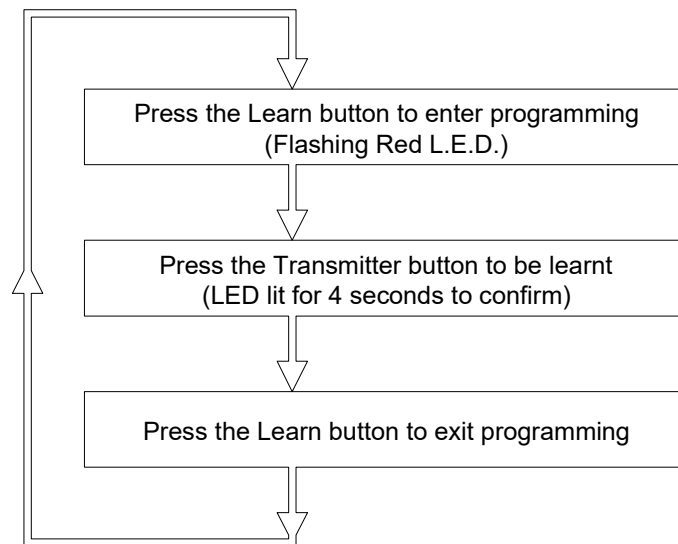
Deleting Individual Handsets from the Receiver

1. Press & hold the 'Learn' button once. The L.E.D. will flash rapidly.
2. Press the transmitter button of the handset to be deleted.
   The L.E.D. will light for approx 4 seconds to confirm that the code deletion process was successful.

Deleting ALL Handsets from the Receiver

1. Press & hold the 'Learn' button once. The L.E.D. will flash rapidly.
2. Press & hold the 'Learn' button once again.
   The L.E.D. will light for approx 4 seconds to confirm that all of the memorised codes have been deleted.

DECLARATION OF CONFORMITY

FEIG ELECTRONIC

FEIG ELECTRONIC GmbH
Lange Straße 4
D- 35781 Weilburg

EG-Konformitätserklärung
nach EG-Maschinenrichtlinie 2006/42/EG, Anhang II A

Hiermit erklären wir, dass die nachstehende Maschine:

Bezeichnung	**Torsteuerung**
Typen	**TST FUF2-xxx / TST FU3F-xxx**
Handelsbezeichnungen	TST FUF2-AH, -APR, -CH, -CPR, -FH, -FPR,
	TST FU3F-AH, -APR, -CH, -CPR, -FH, -FPR

den einschlägigen Bestimmungen folgender Richtlinien entspricht:

Maschinenrichtlinie	2006/42/EG
Niederspannungsrichtlinie	2014/35/EU
ROHS2	2011/65/EU
EMV	2014/30/EU

Angewandte harmonisierte Normen:

EN ISO 13849-1:2015	Sicherheit von Maschinen – Sicherheitsbezogene Teile von Steuerungen
EN 60335-1:2012 / AC:2014	Sicherheit elektrische Geräte für den Hausgebrauch und ähnliche Zwecke
EN 60335-2-103:2015	Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke – Besondere Anforderungen für Antriebe für Tore, Türen und Fenster
EN 62061:2005 + Cor.:2010 + A1:2013 + A2:2015	Sicherheit von Maschinen – Funktionale Sicherheit sicherheitsbezogener elektrischer, elektronischer und programmierbarer elektronischer Steuerungssysteme
EN 61000-6-1:2007	EMV Fachgrundnorm – Störfestigkeit (Wohnbereich)
EN 61000-6-2:2005 / AC:2005	EMV Fachgrundnorm – Störfestigkeit (Industriebereich)
EN 61000-6-3:2007 / A1:2011 / AC:2012	EMV Fachgrundnorm – Störaussendung (Wohnbereich)
EN 61000-6-4:2007 / A1:2011	EMV Fachgrundnorm – Störaussendung (Industriebereich)

Angewandte nationale technische Spezifikationen:

EN 12453:2000 Abschn. 5.2	Nutzungssicherheit kraftbetätigter Tore – Anforderungen Kapitel 5.2 Antriebssysteme und Energieversorgung

Bevollmächtigter für die Zusammenstellung der relevanten technischen Unterlagen:

Weilburg, den 30.01.2017

D. Schäfer

Dirk Schäfer
Technischer Leiter / Technical Director
CONTROLLER & SENSORS (VTM)

Eine Prüfung des Maschinentyps auf Übereinstimmung mit den Anforderungen der EG-Maschinenrichtlinie erfolgte durch die

TÜV NORD CERT GmbH Essen,
Zertifizierungsstelle Maschinen / Certification Body Machinery
Langermarckstraße 20, D-45141 Essen, Notified Body ID. No.: 0044 205 13 132614

Diese Prüfstelle ist zuständig im Sinne von Anhang XI der EG-Maschinenrichtlinie.

Die technische Dokumentation ist am Firmenstandort Weilburg archiviert.

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Die mitgelieferte Produktdokumentation und insbesondere die darin enthaltenen Sicherheitshinweise sind zu beachten.

Die Inbetriebnahme der Torsteuerung wird so lange untersagt, bis diese an ein Tor angebaut wurde und dieses Tor den Bestimmungen der EG-Maschinenrichtlinie entspricht.

Terminal Connections

Option 1: Mechanical Limits

X27 : (RED)
94	GND
93	Input 12	Open Command From Outside
92	Input 11	Open Command From Inside
91	+24V

X26 : (ORANGE)
86	+24V
85	Input 7	Close Pre-Limit Switch
84	GND
83	+24V
82	Input 6	Open Pre-Limit Switch
81	GND

X25 : (GREEN)
76	+24V
75	Input 5	Photocell
74	GND
73	+24V
72	Input 4	Impulse
71	GND

X24 : (GREY)
66	Output 15	+24V
65	Input 10	Auto-Close ON/OFF
64	Input 9	Close Limit Switch
63	GND
62	+24V	Common
61	Input 8	Open Limit Switch

X23 : (BLACK)
54	Input 3	Close
53	Input 2	Stop
52	Input 1	Open
51	+24V	Common

X22 : (YELLOW)
45	+12V
44	GND	8K2Ω/1K2Ω
43	Safety Edge	Safety Edge Closing
42	E.Stop 1	Emergency Stop
41	E.Stop 1

X20 : (RED)
36	GND
35	Channel B
34	Channel A
33	+12V	Interlock Switch / Thermal Switch
32	E.Stop 2
31	E.Stop 2

'OR'

Option 2: Electronic Limits

X27 : (RED)
94	GND
93	Input 12	Open Command From Outside
92	Input 11	Open Command From Inside
91	+24V

Output 26 +24v test, 120mA max

X26 : (ORANGE)
86	+24V
85	Input 7	Manual/Automatic
84	GND
83	+24V
82	Input 6	Permanent Open
81	GND

Output 25 +24v test, 120mA max

X25 : (GREEN)
76	+24V
75	Input 5	Photocell
74	GND
73	+24V
72	Input 4	Impulse
71	GND

X24 : (GREY)
66	Output 15	+24V
65	Input 10	Auto-Close ON/OFF
64	Input 9	Cross Traffic
63	GND
62	+24V	Common
61	Input 8	Lock in Close Position

X23 : (BLACK)
54	Input 3	Close
53	Input 2	Stop
52	Input 1	Open
51	+24V	Common

X22 : (YELLOW)
45	+12V
44	GND	8K2Ω/1K2Ω
43	Safety Edge	Safety Edge Closing
42	E.Stop 1	Emergency Stop
41	E.Stop 1

X20 : (RED)

Terminal		FEIG TST-PD	KOSTAL
36	GND	Blue	White
35	Channel B	White	Green
34	Channel A	Black	Yellow
33	+12V	Brown	Brown
32	E.Stop 2		Pink
31	E.Stop 2		Grey

(Bottom section)

MAINS — L N
(Blue) FUSED 230Vac — L' L' N' N'
EARTH — PE PE PE PE PE PE
MOTOR — T1 T2 T3
(Black) K1 RELAY — 10 11 12 — N/O Com N/C — K1 Relay Output
(Red) K2 RELAY — 20 21 22 — N/O Com N/C — K2 Relay Output
(Yellow) K3 RELAY — 30 31 32
36 37 38 — Green Traffic Light Output 28 / GND / Red Traffic Light Output 29

Brown / Blue / Green/Yellow

L N (earth)

230VAC@50Hz
C16A Supply

Note:-
If the motor travels in the wrong direction, swap `U`&`V`

Screen

(Delta) W2 U2 V2 / U1 V1 W1

U V W
3~ Motor
D.C. / A.C.
230VAC
Brake (If Fitted)

Fit Link

24VDC
700mA
MAX