Stiltz™

The home lift company

# Circuit Diagrams
# Component Layout Sheets

Version:LT ASME-7.3

Date : 2024/03/29

# Version Notes

| Version / Date | Notes about the version |
|---|---|
| LT ASME v1 | 1st release |
| LT ASME v2 | Add mid-level function. |
| LT ASME v3 | Change to Mitsubishi inverter. |
| LT ASME-4 | Add auto door function:<br>- Move the output terminal for main relay check to expansion module<br>- Add additional 2pins terminal for auto door power |
| LT ASME-5 | Remove the overload from the safety chain.<br>Change the PLC input of overload to normally close. |
| LT ASME-6 | Change the light circuit breaker CB3 to 6A. |
| LT ASME-6.1 | Update Switch NC OverLoad in page 2;<br>Update 11-15 for relay & contactor descriptions;<br>Add Page 7-SLZ-KRT;<br>Add function descriptions for lock, PLC output 1, contactor check in page 8. |
| LT ASME-6.3 | Updated the manual: Fixed mistakes, added relay descriptions, changed description of lock system, 6 switches down obstruction added, and an image added where the 6 pin of the interlock are shown . |
| LT ASME-7.0 | Add electrical Speed Sensor and battery voltage detection feature:<br>- add a laser sensor for speed detection powered by 24VDC<br>- add a solenoid for Speed Sensor trigger powered by 12VDC<br>- add Speed Sensor spring failed limit and Speed Sensor triggered limit inside the safety chain<br>- add Speed Sensor page for terminal description |
| LT ASME-7.1 | “Speed Sensor” naming clarified |
| LT ASME-7.2 | According to ECN230007;<br>Page 3: PLC input15 position has changed; The bottom obstruction is not linked with bottom button. |
| LT ASME-7.3 | Page 3&7: Update the wiring Number of the safety-Pan. |

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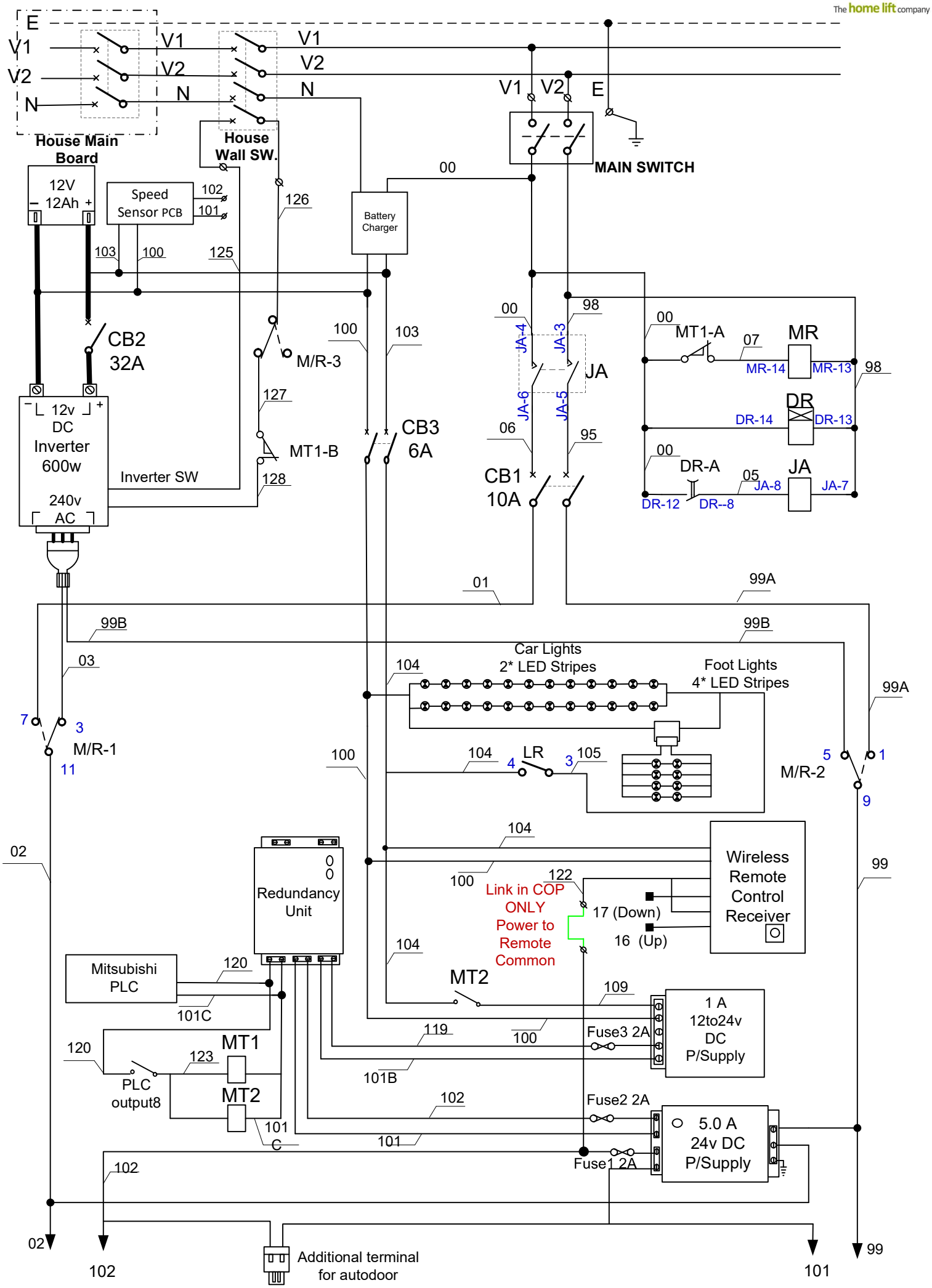
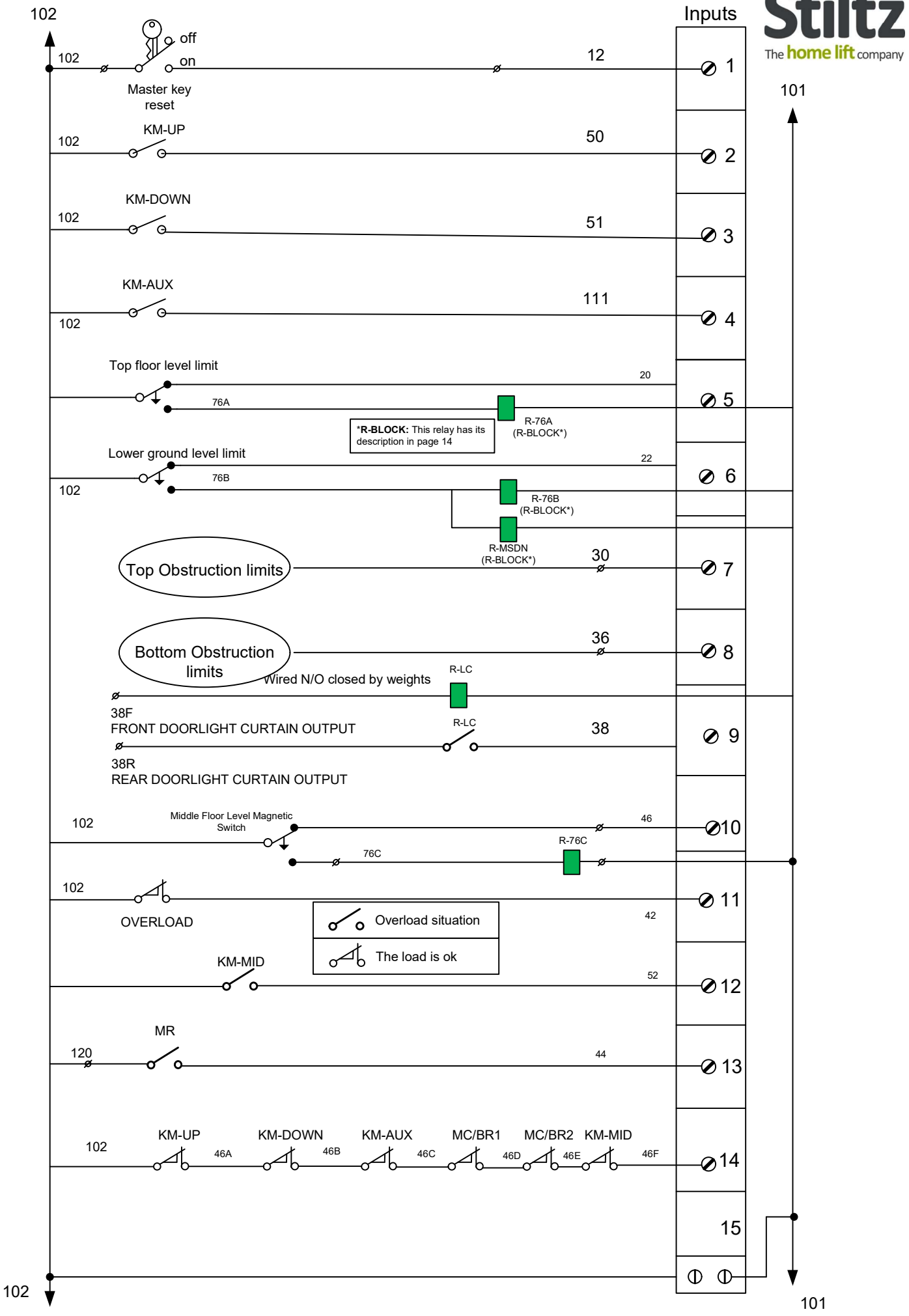
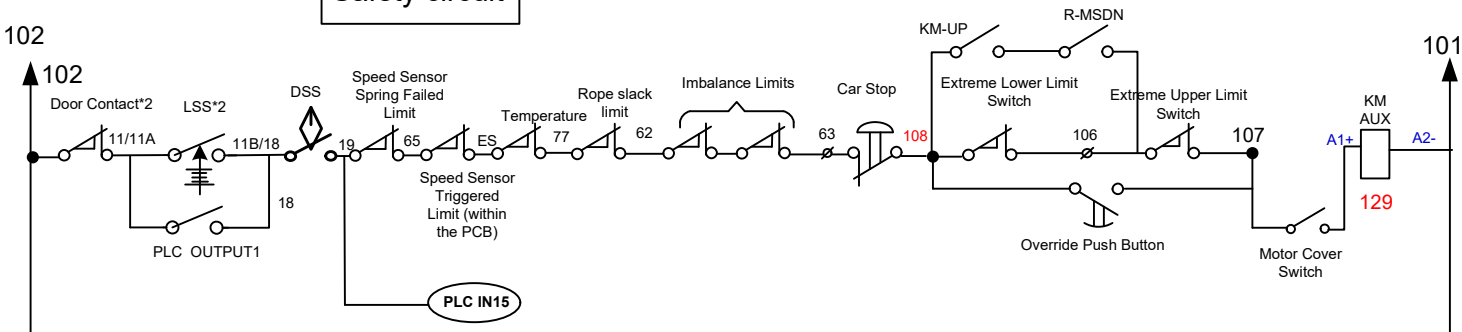
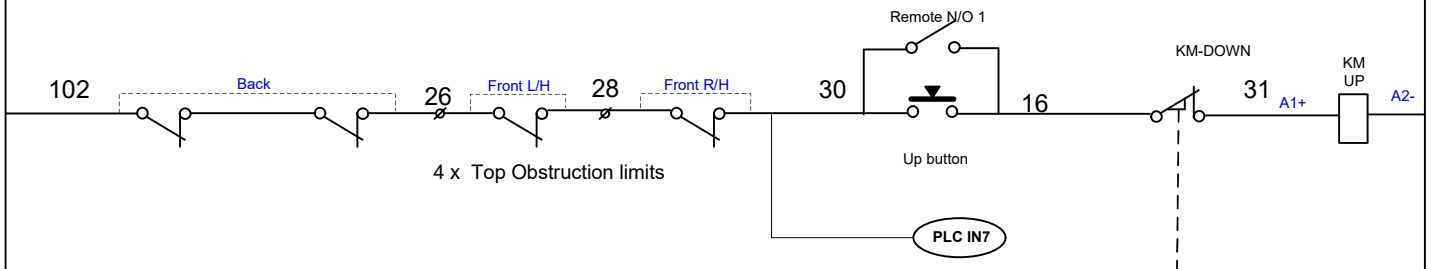
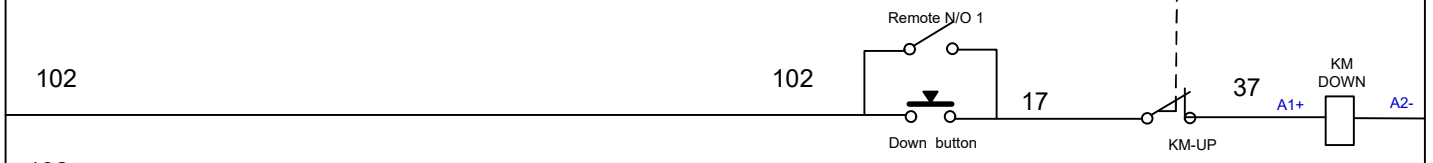

E
V1
V2
N
House Main Board
House Wall SW.
MAIN SWITCH
12V 12Ah
Speed Sensor PCB
Battery Charger
CB2 32A
M/R-3
MT1-B
CB3 6A
CB1 10A
JA
MT1-A
MR
DR
DR-A
12v DC Inverter 600w
240v AC
Inverter SW
Car Lights 2* LED Stripes
Foot Lights 4* LED Stripes
LR
M/R-1
M/R-2
Redundancy Unit
Wireless Remote Control Receiver
Link in COP ONLY Power to Remote Common
17 (Down)
16 (Up)
Mitsubishi PLC
MT1
MT2
PLC output8
1 A 12to24v DC P/Supply
Fuse3 2A
Fuse2 2A
Fuse1 2A
5.0 A 24v DC P/Supply
Additional terminal for autodoor

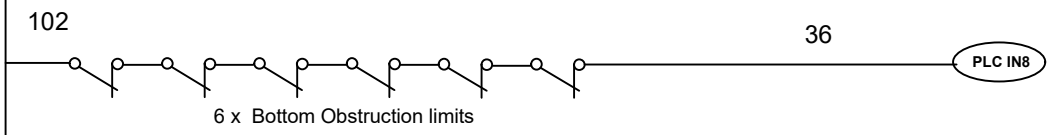

Inputs
102
off
on
Master key reset
12
1
101
KM-UP
50
2
KM-DOWN
51
3
KM-AUX
111
4
Top floor level limit
20
76A
5
R-76A
(R-BLOCK*)
*R-BLOCK: This relay has its description in page 14
Lower ground level limit
22
76B
6
R-76B
(R-BLOCK*)
R-MSDN
(R-BLOCK*)
Top Obstruction limits
30
7
Bottom Obstruction limits
36
8
Wired N/O closed by weights
R-LC
38F
FRONT DOORLIGHT CURTAIN OUTPUT
38
9
38R
REAR DOORLIGHT CURTAIN OUTPUT
Middle Floor Level Magnetic Switch
46
10
76C
R-76C
OVERLOAD
11
42
Overload situation
The load is ok
KM-MID
52
12
MR
120
44
13
KM-UP
KM-DOWN
KM-AUX
MC/BR1
MC/BR2
KM-MID
46A
46B
46C
46D
46E
46F
14
15
102
101

# Safety circuit



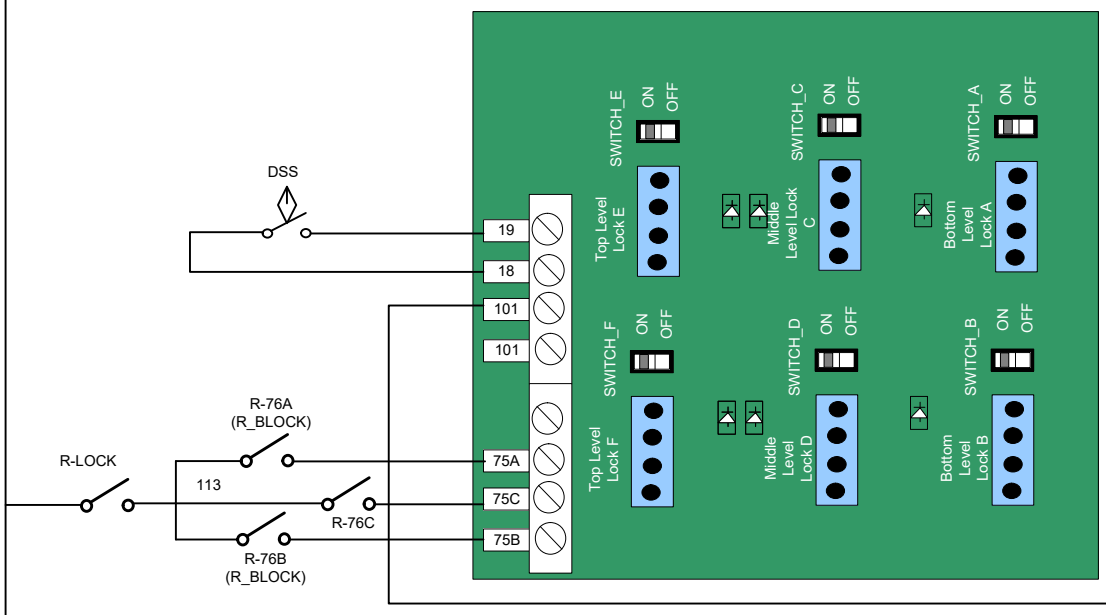



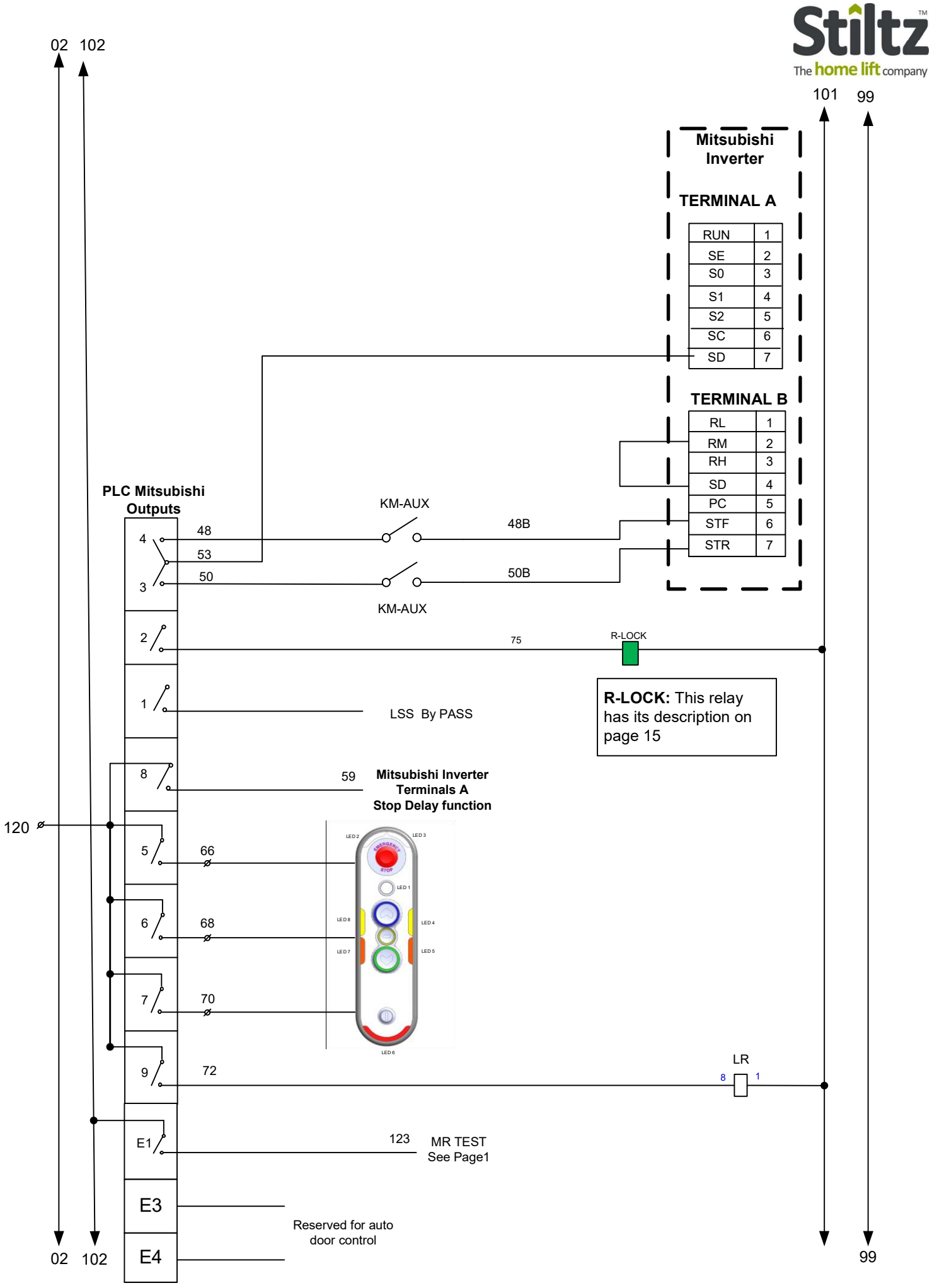




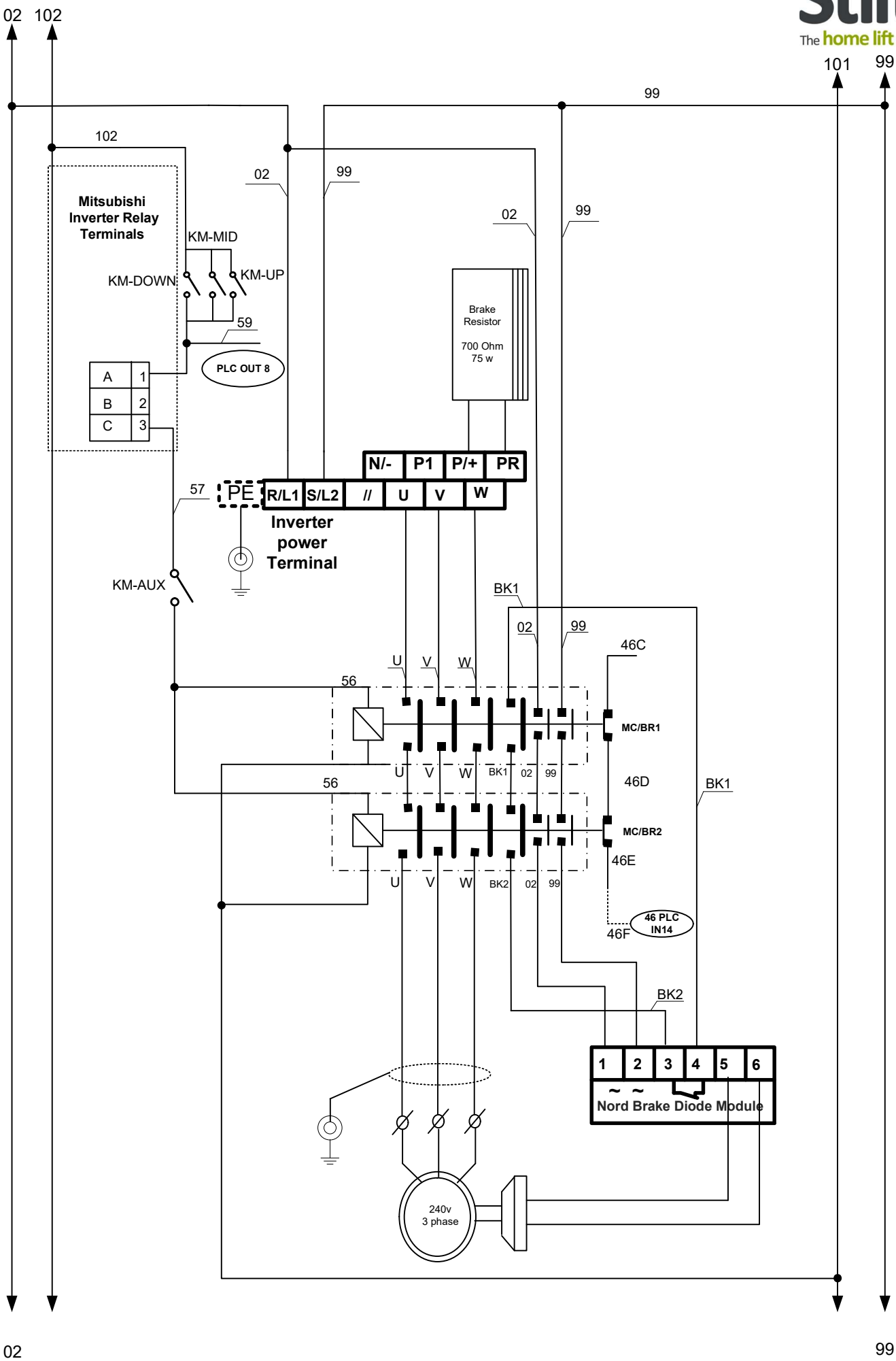



**R-BLOCK:** These relays have their description on page 14

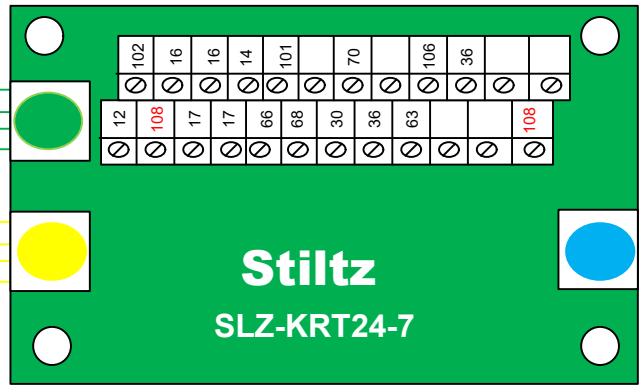
**R-LOCK:** This relay has its description on page 15




**R-LOCK:** This relay has its description on page 15


02
102
101
99
Mitsubishi Inverter Relay Terminals
KM-MID
KM-DOWN
KM-UP
59
PLC OUT 8
A 1
B 2
C 3
Brake Resistor
700 Ohm 75 w
N/- P1 P/+ PR
57
PE
R/L1 S/L2 // U V W
Inverter power Terminal
KM-AUX
BK1
46C
56
MC/BR1
46D
MC/BR2
46E
46F
46 PLC IN14
BK2
1 2 3 4 5 6
Nord Brake Diode Module
240v 3 phase

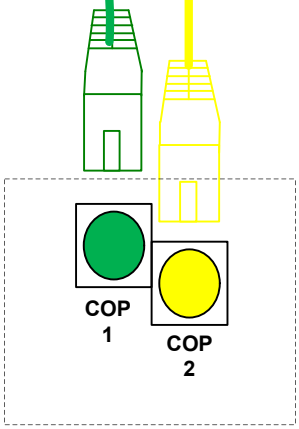
# Type 3 RJ45 Base Blocks



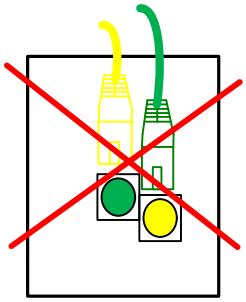

60 - 108 = Stop
12 = Key switch
16 = Up
17 = Down
102 = + 24v

2M Yellow lead

2M Green lead



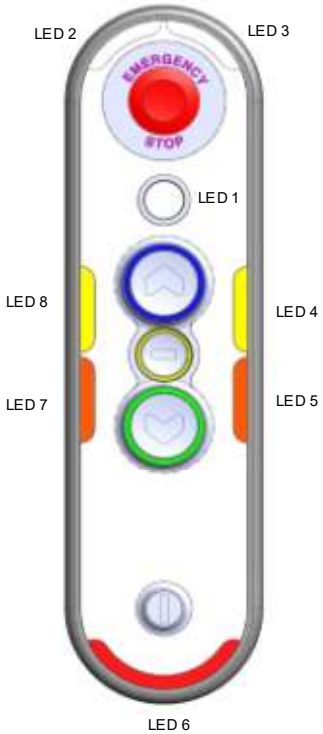

Connection Sockets at back of COP



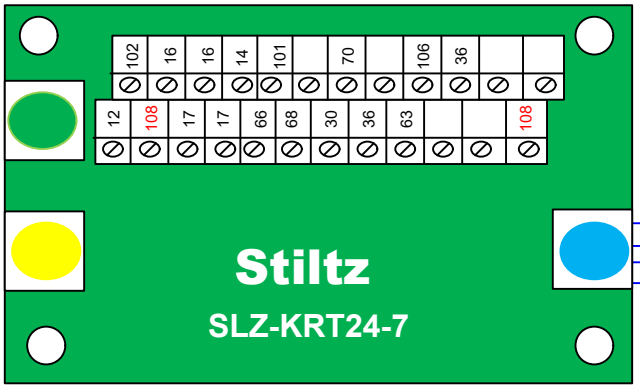
Caution
***MUST Connect Correctly***
Damage to COP will result

## COP Warning Light Functions

| Light Status | ASME |
|---|---|
| Led1 ON | Ready Signal |
| Led2 ON | The door is open |
| Led3 ON | Light Curtain Signal detects something |
| Led4 ON | There is top obstruction |
| Led5 ON | There is bottom obstruction |
| Led6 ON | Safety |
| Led6 ON+ Buzzing | Emergency Stop signal |
| Led7 ON | Overload Signal |
| Led8 ON | No Power Signal |
| Led1/2/3 Flashing | Key is off |
| Led1/8 Flashing (0.5s) | Contactor Check Mode |



# Type 3 RJ45 Base Blocks




( Ext Limit )

Join - ORANGE to Orange with white stripe

Join - BLUE to Green with white stripe

(Obs Limits )

Safety pan "Bridging" lead only needed for installation

3 M lead Blue

36

102

3 x Bottom Obstruction limits

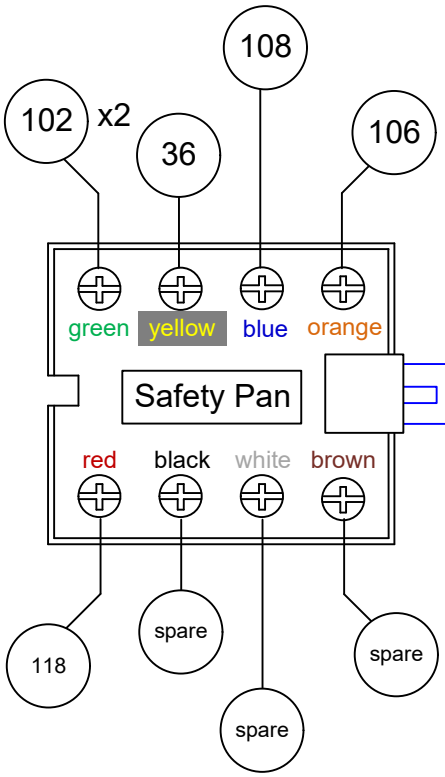
106

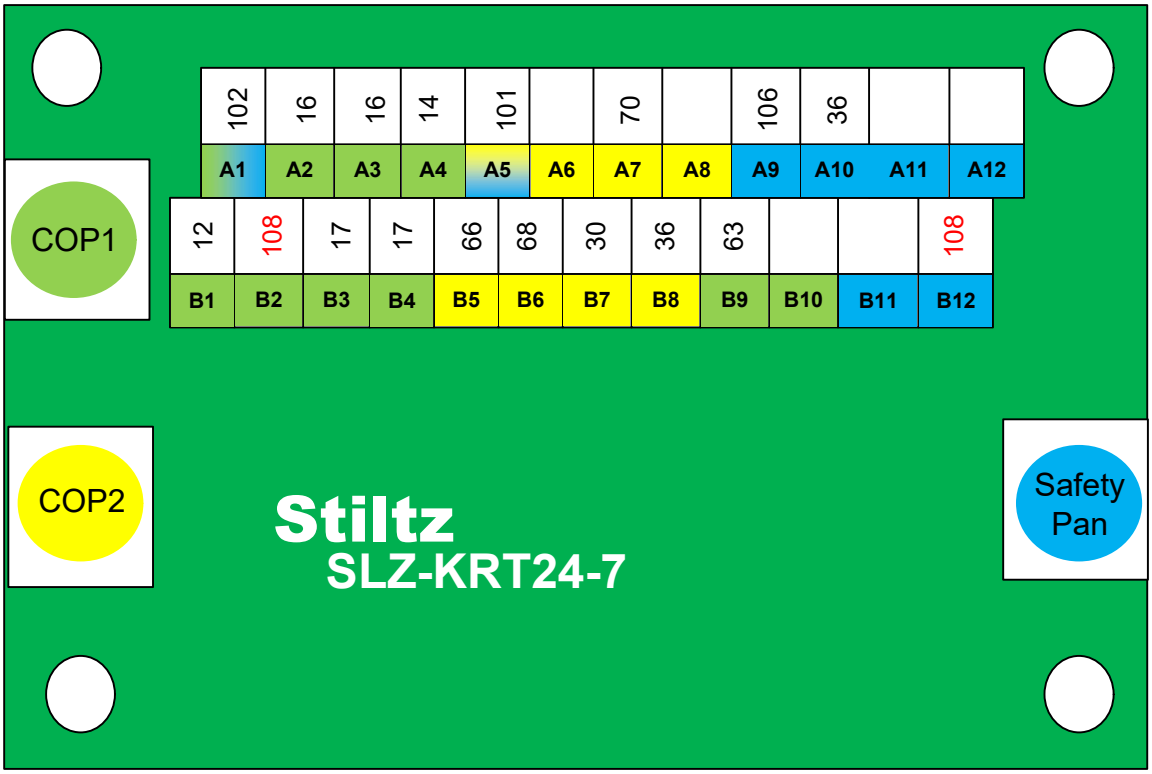
108

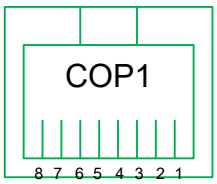
Extreme lower limit switch

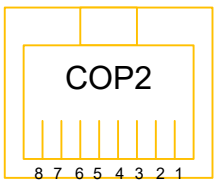
118

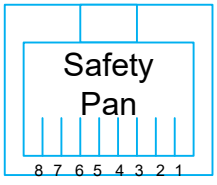
Null





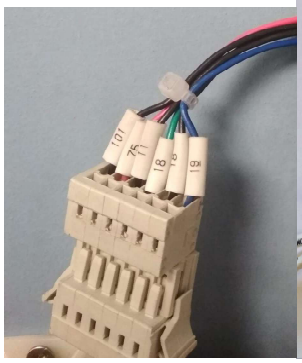




| COP | N | WIRE | REMARKS | POSITION |
|---|---|---|---|---|
| COP1 | 1 | | NULL | B10 |
| COP1 | 2 | 14 | MID | A4 |
| COP1 | 3 | 17 | DOWN | B3,B4 |
| COP1 | 4 | 63 | E-STOP | B9 |
| COP1 | 5 | 64 | E-STOP | B2 |
| COP1 | 6 | 16 | UP | A2,A3 |
| COP1 | 7 | 12 | KEY SWITCH | B1 |
| COP1 | 8 | 102 | 24V | A1 |
| COP2 | 1 | 36 | BOTTOM OBST | B8 |
| COP2 | 2 | | NULL | A8 |
| COP2 | 3 | 30 | TOP OBST | B7 |
| COP2 | 4 | 70 | PLC OUTPUT 7 | A7 |
| COP2 | 5 | 68 | PLC OUTPUT 6 | B6 |
| COP2 | 6 | | NULL | A6 |
| COP2 | 7 | 66 | PLC OUTPUT 5 | B5 |
| COP2 | 8 | 101 | GND | A5 |
| SP | 1 | 106 | EXTREME LIMIT | A9 |
| SP | 2 | 64 | E-STOP | B12 |
| SP | 3 | 36 | BOTTOM OBST | A10 |
| SP | 4 | 102 | 24V | A1 |
| SP | 5 | | NULL | A11 |
| SP | 6 | | NULL | B11 |
| SP | 7 | | NULL | A12 |
| SP | 8 | 101 | GND | A5 |

# Lock System

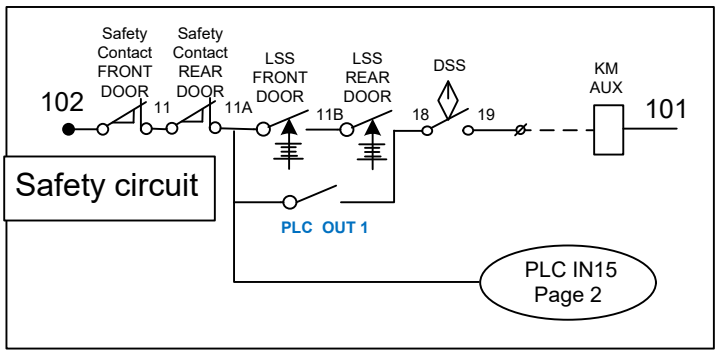


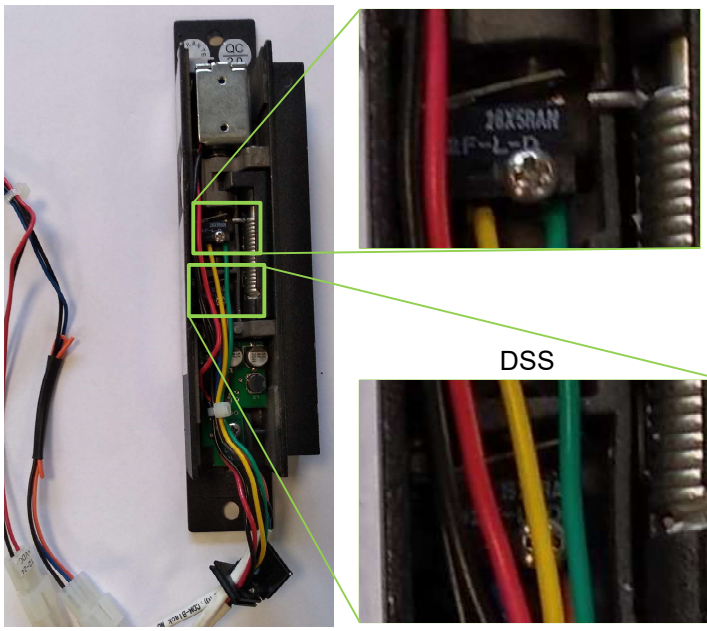
The lock works with 3 signals. One input, and two output signals.

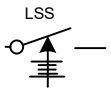
The input signal energises the solenoid and allows the door to be opened.

The output signal advises us about the status of the door. DSS signal indicates if the door is open or closed and LSS signal indicates if the door is locked or not.




LSS






If the door can open, the switch is open and then the AUX relay is not energised.

DSS




If the door is open, the switch is open and then the AUX relay is not energised.

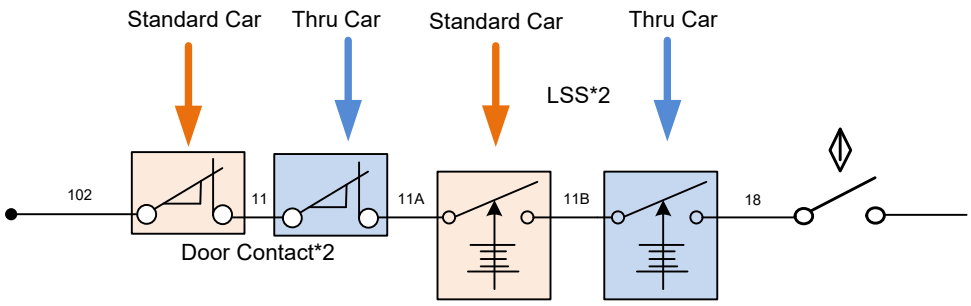
LSS and PLC: LSS is activated when the lift is within the switch range, when this occurs, the PLC 1 Output is closed and the safe line is working without interruptions.

The PLC 2 output enables the unlock that allows to open the door because it is energizing the R-Lock relay.

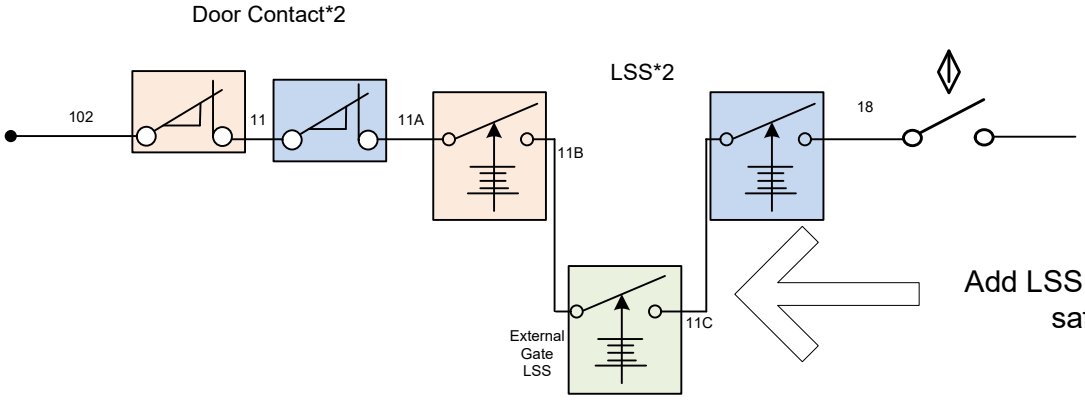
# Contactor Check

The PLC starts the contactor check and returns to normal mode 1 second later.

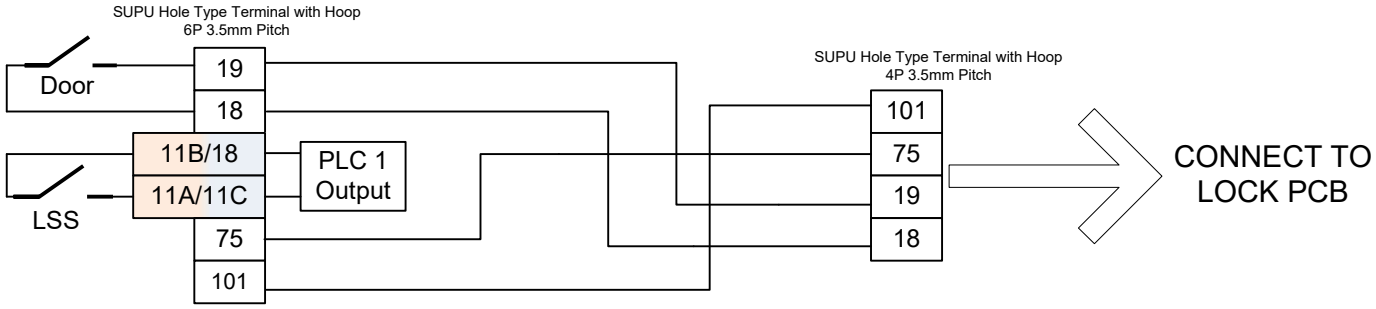
When the lift is within range of the magnetic switch it opens output 1 for 1 second and carries out the contactor check. If the PLC detects that the safety circuit is open, then it allows the return to normal mode.




Original safety chain.

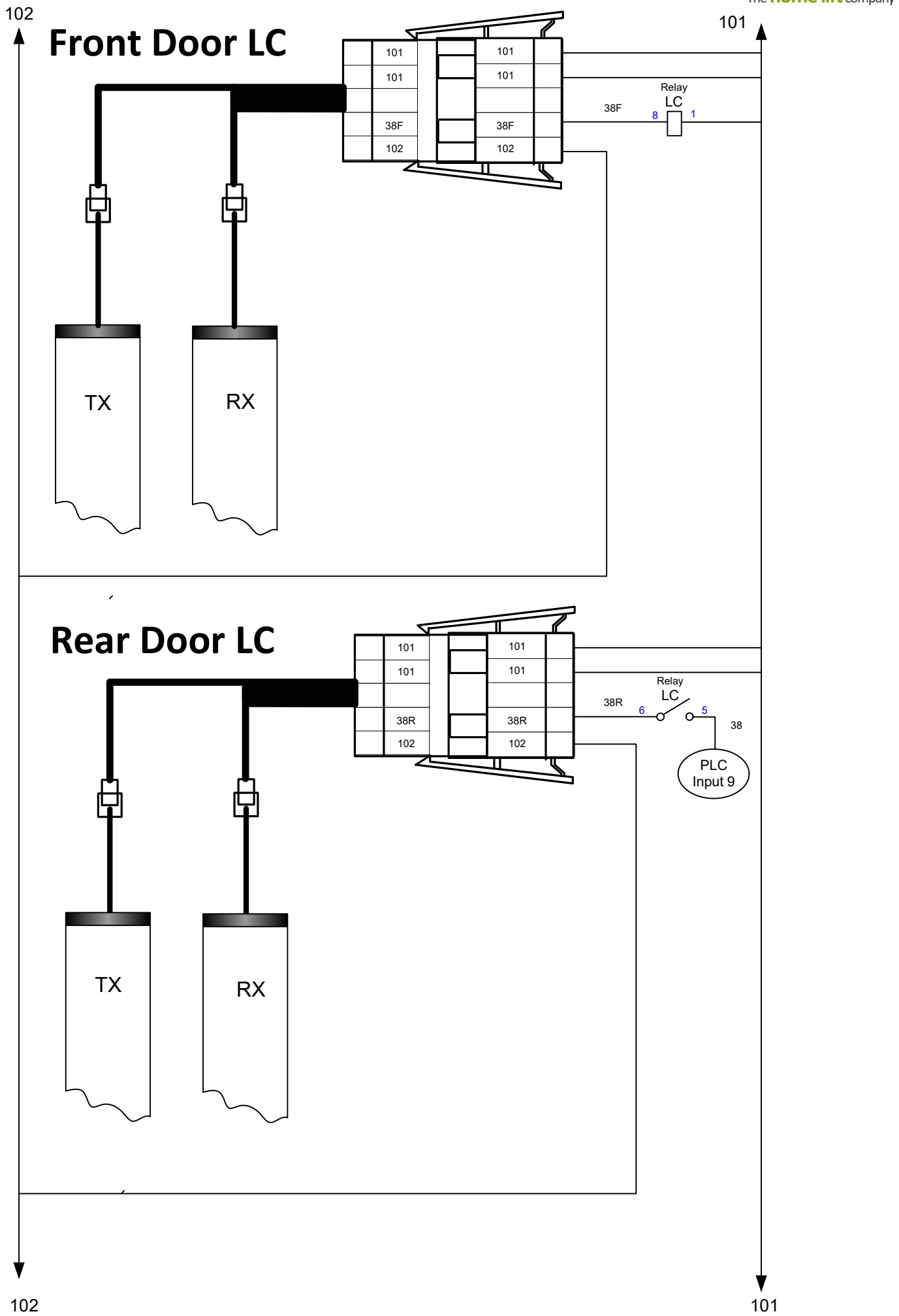



Add LSS signal inside the safety chain.

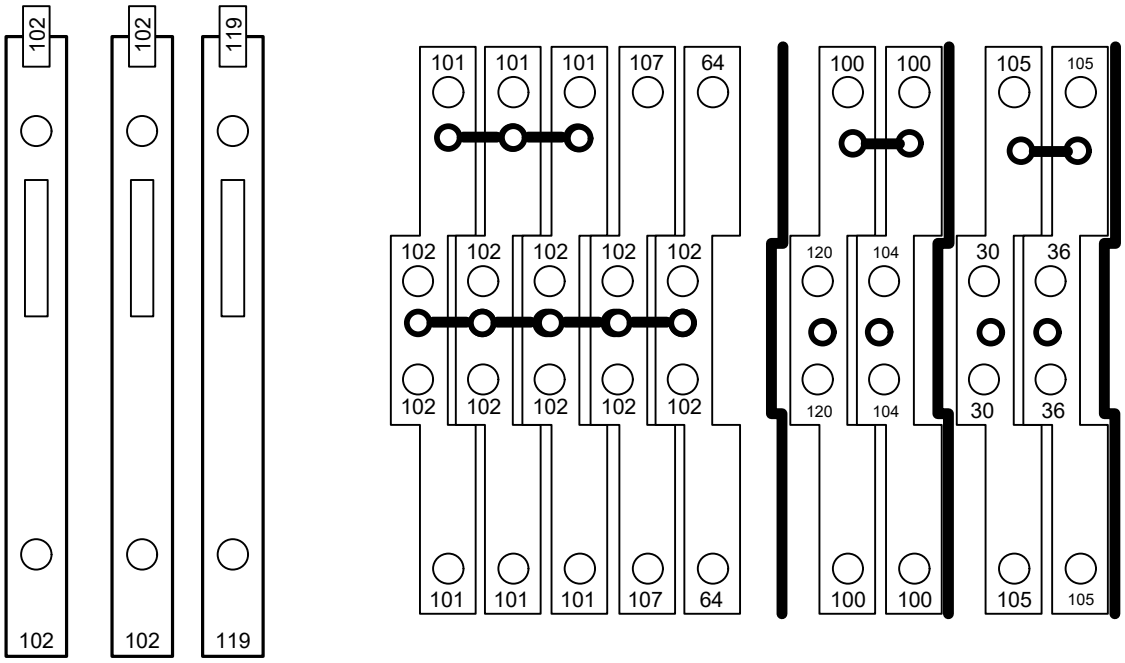



UPDATE STEPS:

1. Find 11B on the panel and remove from the 6P terminal;
2. Connect 11B to External Interlock Kit terminal as above picture shows;
3. Connect 11C between the panel lock 6P terminal and External Interlock Kit terminal.


102
101
Front Door LC
101
101
38F
102
101
101
38F
102
Relay
LC
38F
8
1
TX
RX
Rear Door LC
101
101
38R
102
101
101
38R
102
Relay
LC
38R
6
5
38
PLC
Input 9
TX
RX
102
101

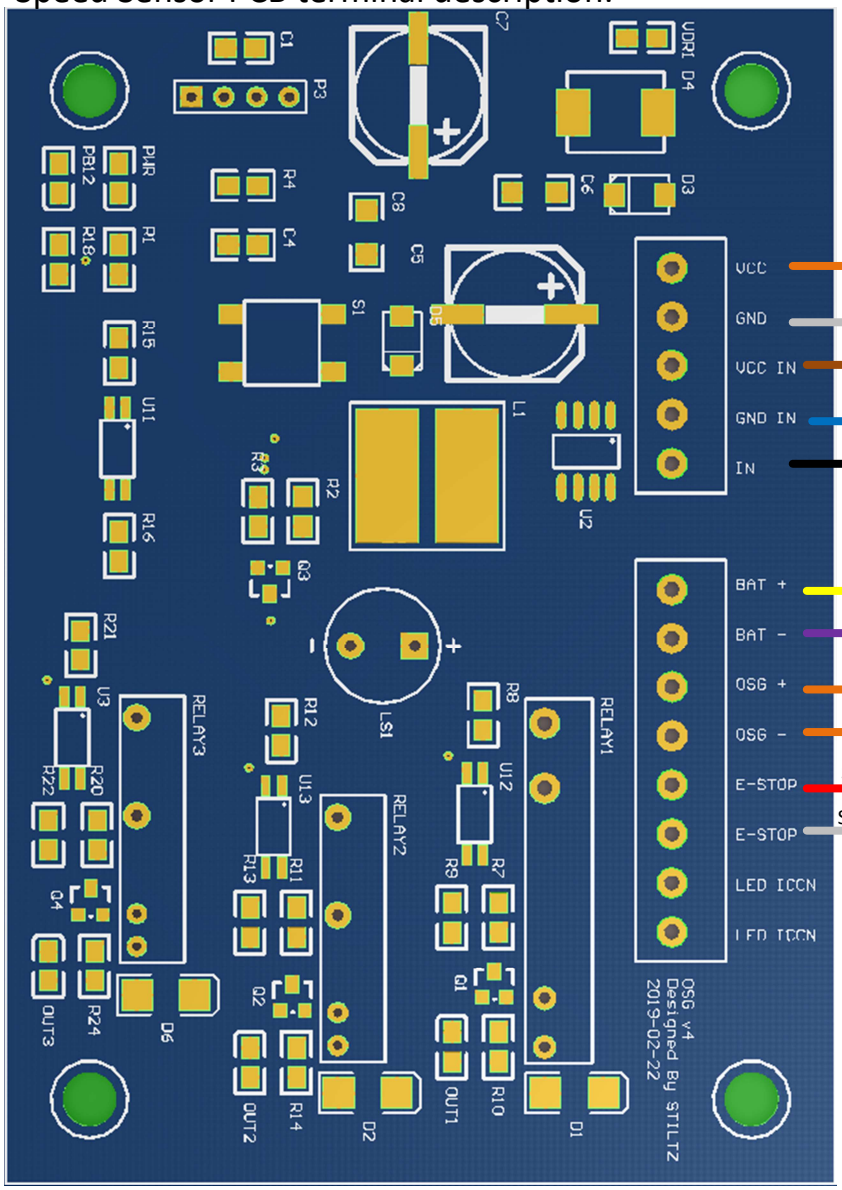
# Terminal Strip Layout




102- 38 Bridge Supplied for Installation to Enable Light Curtain Controller

# Speed Sensor
# LAYOUT

Speed Sensor PCB terminal description:




24VDC 102

24VGND 101

LASER SENSOR POWER +

LASER SENSOR POWER -

LASER SENSOR OUTPUT

**Laser**

12V BATTERY + 103

12V BATTERY - 100

SOLENOID + (RELAY1, NO)

SOLENOID – (GND)

**Solenoid**

Speed Sensor TRIGGERED LIMIT (RELAY2, NC)

Speed Sensor TRIGGERED LIMIT (RELAY2, NC)

ES

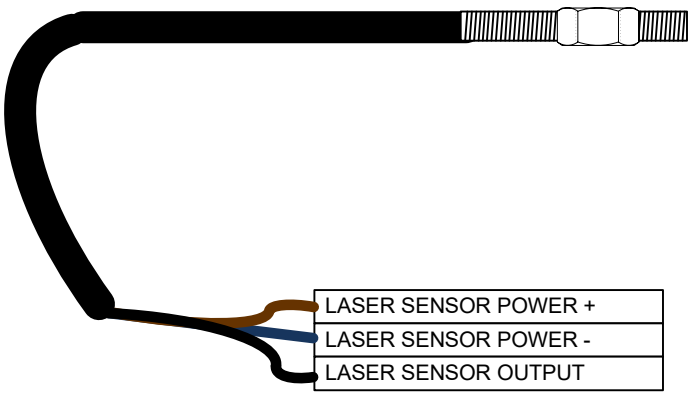
Into the safety circuit line-AUX

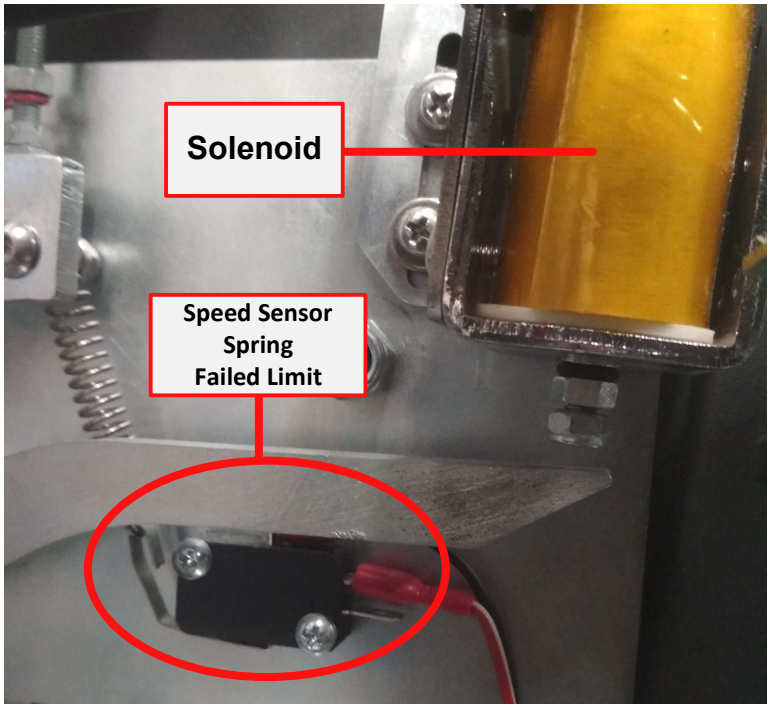
65

19

**Speed Sensor Spring Failed Limit**

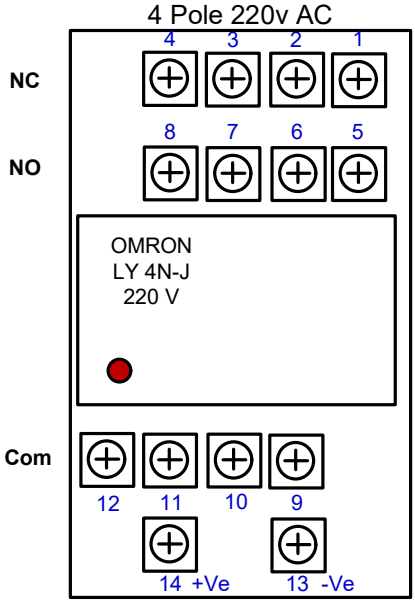
Laser sensor terminal description:

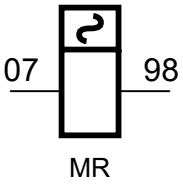


# Relay Terminal Layouts

Relay MR
4 Pole 220v AC

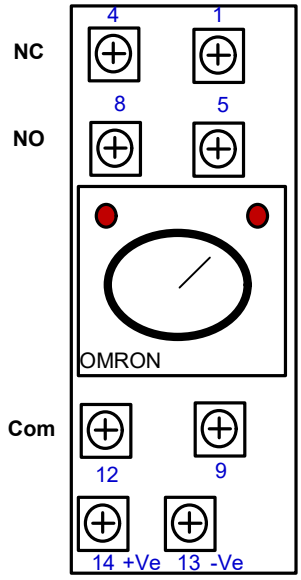


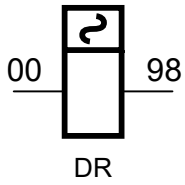




MR Relay decides if the lift use the power battery or the main power

| MR | Switch | Remarks |
|---|---|---|
| NC | IS-IS | Disable the inverter |
| NC | 02-03 | When there is not power, the inverter supplies it |
| NO | 02-01 | Normal use for the power |
| NC | 99-99B | When there is not power, the inverter supplies it |
| NO | 99-99A | Normal use for the power |
| NO | 102-44 | Notify the PLC if the power is off |

Relay DR
2 Pole 220v AC

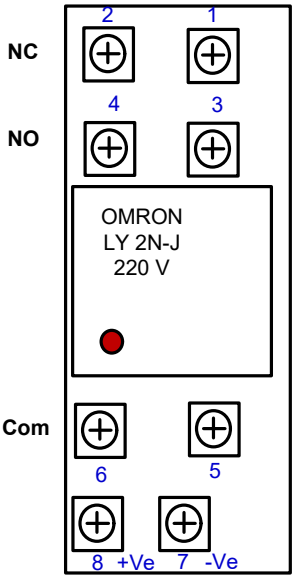


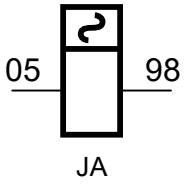




DR Relay delays 8 seconds for activated the JA Relay. It is because the battery is charged for 8 seconds before starting to work the rest of the hoist.

| DR | Switch | Remarks |
|---|---|---|
| NO | 00-05 | Enable the JA relay after 8 seconds |

Relay JA
2 Pole 220v AC

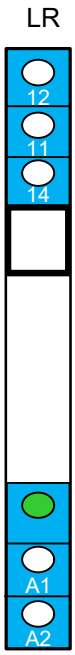


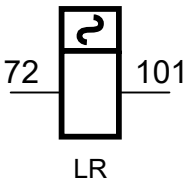




JA Relay let pass the power to the rest of hoist

| JA | Switch | Remarks |
|---|---|---|
| NO | 00-06 | Enable the power |
| NO | 98-95 | Enable the power |

# Relay Terminal Layouts



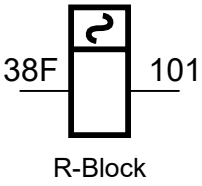




LR Relay activates the lights

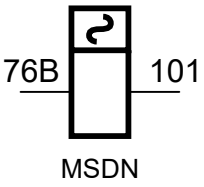
| LR | Switch | Remarks |
|---|---|---|
| NO | 104-105 | Enable the lights |

R-BLOCK

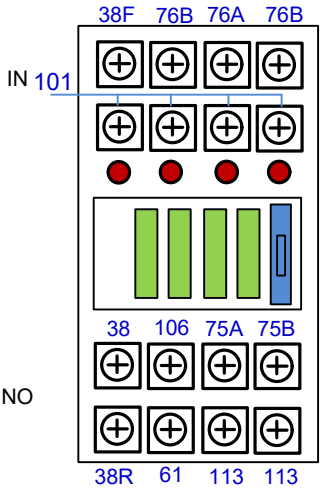
R-Block Relay are 4 different relays with similar functions:

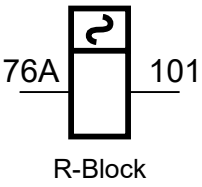



Activated by the curtains

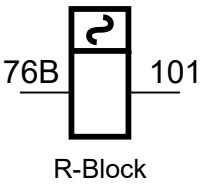



It is activated by bottom magnetic switch



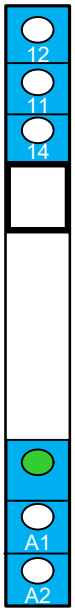

It is activated by top magnetic switch

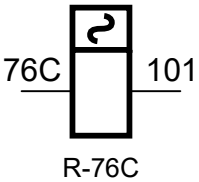



It is activated by bottom magnetic switch

| R-BLOCK | SWITCH | REMARKS |
|---|---|---|
| NO | 38-38R | Advises the PLC that there is an obstruction in the curtains. |
| NO | 61-106 | Link lower extreme switch at bottom landing position. |
| NO | 113-75A | Enable top doors. |
| NO | 113-75B | Enable bottom doors. |

R-76C

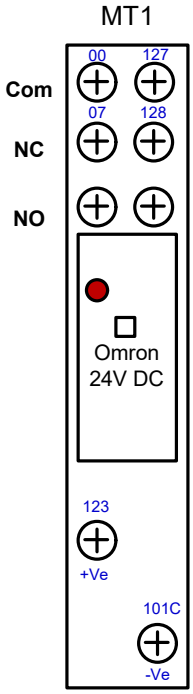


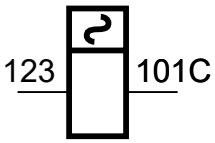




It is activated by medium magnetic switch

| 76C | Switch | Remarks |
|---|---|---|
| NO | 75C-113 | Enable middle doors |

# Relay Terminal Layouts

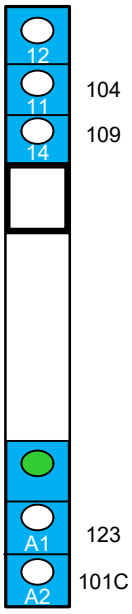


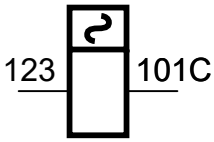




MT1

It is activated to check the battery and inverter.

| UP | SWITCH | REMARKS |
|---|---|---|
| NO | 00-07 | Cut off the power for MR. |
| NO | 127-128 | Cut off the inverter switch. |

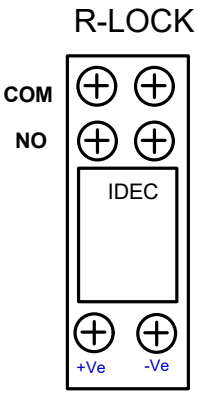


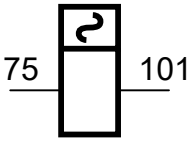




MT2

It is activated to check the battery and inverter.

| UP | SWITCH | REMARKS |
|---|---|---|
| NO | 104-109 | This enable the 12V to 12V-24V power supply. |



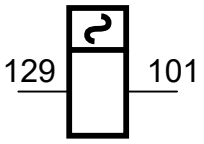




R-Lock

It is activated by the PLC for enable the magnetic switches.

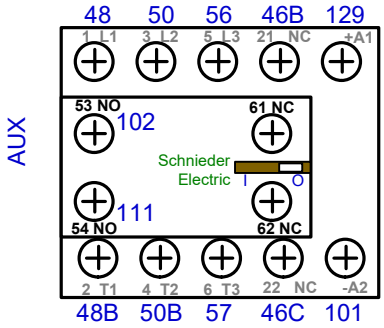
| Lock | Switch | Remarks |
|---|---|---|
| NO | 113-102 | Enable Lock PCB |

# Contactor Terminal Layouts

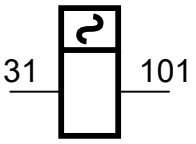



KM-AUX

This relay is in the safety circuit. If there is not any problem, it is activated all time.

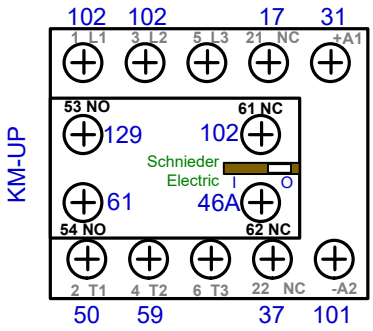



| AUX | SWITCH | REMARKS |
|---|---|---|
| NC | 46B-46C | This disables the input 14. Page 2 |
| NO | 102-111 | This enables the input 4. Page 2 |
| NO | 56-57 | This enables MC/BR1 & MC/BR2. Page 4 |
| NO | 48-48B | This enables the inverter. Page 4 |
| NO | 50-50B | This enables the inverter. Page 4 |

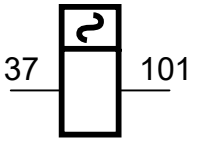



KM-UP

This relay is activated when the lift is going to top floor.

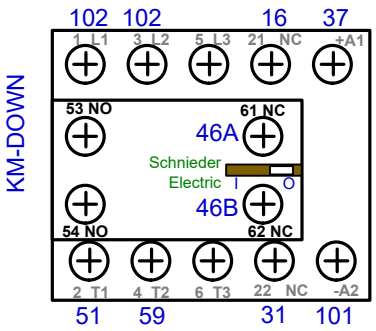



| UP | SWITCH | REMARKS |
|---|---|---|
| NC | 17-37 | This disables the Contactor DOWN. Page 3 |
| NC | 102-46A | This disables the input 14. Page2 |
| NO | 102-50 | This enables the input 2. Page 2 |
| NO | 102-59 | This enable wire 59, terminal C in the inverter. Page 4 |
| NO | 61-129 | The bridge for the extreme lower limit switch. Page 3 |

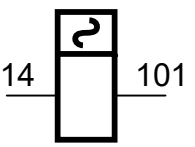



KM-DOWN

This relay is activated when the lift is going to bottom floor.

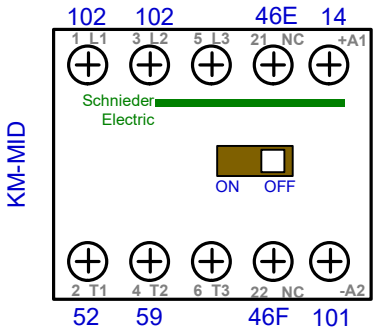



| DOWN | SWITCH | REMARKS |
|---|---|---|
| NC | 16-31 | This disables the Contactor UP. Page 3 |
| NC | 46A-46B | This disables the input 14. Page2 |
| NO | 102-51 | This enables the input 3. Page 2 |
| NO | 102-59 | This enable wire 59, terminal C in the inverter. Page 4 |

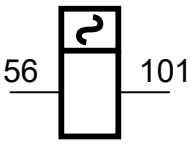



KM-MID

This relay is activated when the lift is going to a middle stop.

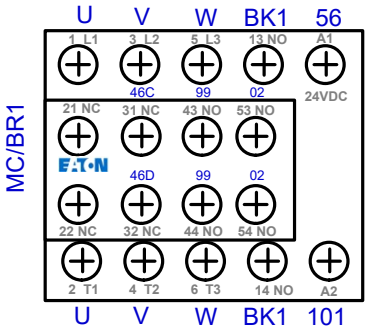



| MID | SWITCH | REMARKS |
|---|---|---|
| NC | 46E-46F | This disables the input 14. Page2 |
| NO | 102-52 | This enables the input 12. Page 2 |
| NO | 102-59 | This enable wire 59, terminal C in the inverter. Page 4 |

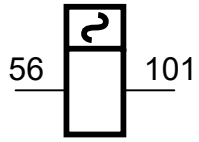



MC/BR1

This relay is activated when the lift is moving.
Without energy, the brake is activated.

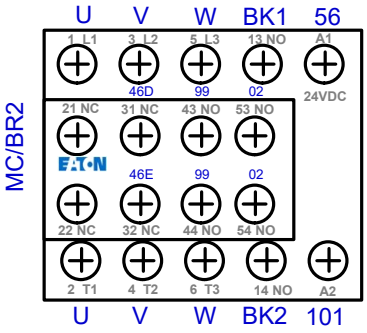



| MC/BR1 | SWITCH | REMARKS |
|---|---|---|
| NC | 46C-46D | This disables the input 14. Page 2 |
| NO | U | This enables power in the motor. Page 5 |
| NO | V | This enables power in the motor. Page 5 |
| NO | W | This enables power in the motor. Page 5 |
| NO | 99 | This enables power in the motor brake. Page 5 |
| NO | 02 | This enables power in the motor brake. Page 5 |
| NO | BK1 | This enables power in the motor brake. Page 5 |




MC/BR2

This relay is activated when the lift is moving.
Without energy, the brake is activated.




| MC/BR2 | SWITCH | REMARKS |
|---|---|---|
| NC | 46D-46E | This disables the input 14. Page 2 |
| NO | U | This enables power in the motor. Page 5 |
| NO | V | This enables power in the motor. Page 5 |
| NO | W | This enables power in the motor. Page 5 |
| NO | 99 | This enables power in the motor brake. Page 5 |
| NO | 02 | This enables power in the motor brake. Page 5 |
| NO | BK1-BK2 | This enables power in the motor brake. Page 5 |