Safety technique

Emergency Stop Module LG 5925, LH 5925

**Specifications**
- According to EU directive for machines 98/37/EG
- According to IEC/EN 60 204-1, VDE 0113 part 1 (1998-11)
- Safety category 4 according to EN 954-1
- Output: max. 8 NO contacts, see contacts
- Single and 2-channel operation
- Line fault detection on On-button
- Manual restart or automatic restart when connecting the supply voltage, switch S2
- With or without cross fault monitoring in the E-stop loop, switch S1
- LED indicator for state of operation
- LED indicator for channel 1 and 2
- Removable terminal strips
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4
- As option with plugable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- LG 5925: 22,5 mm width
- LH 5925: 45 mm width

**Options with plugable terminal blocks**
- Terminal block with cage clamp terminals (PC / plugin cageclamp)
- Terminal block with screw terminals (PS / plugin screw)

**Approvals and marking**

- LG 5925: 22,5 mm width
- LH 5925: 45 mm width

**Applications**
- Protection of people and machines
- Emergency stop circuits on machines
- Monitoring of safety gates

**Indicators**
- upper LED: on when supply connected
- lower LEDs: on when relay K1 and K2 energized
- lower LEDs: on when relay K1/K2 and K2/K4 energized

**Function diagram**

---

**Notes**
Removing the terminal blocks with cage clamp terminals
1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks can only be mounted on the belonging plug in terminations.
Circuit diagrams

LG 5925.02  LG5925.04  LG5925.48

Block diagram

LG 5925  LH 5925

Geräteprogrammierung

Disconnect unit before setting of S1
Drawing shows setting at the state of delivery
Notes

The category of a safety relevant part of a control circuit according to EN 954-1 can be different to the category 4 of the E-stop module LG 5925 depending on the external connections.

Line fault detection on On-button:
The line fault detection is only active when S12 and S22 are switched simultaneously. If the On-button is closed before S12, S22 is connected to voltage (also when line fault across On-Button), the output contacts will not close. A line fault across the On-button which occurred after activation of the relay, will be detected with the next activation and the output contacts will not close.

ATTENTION! If a line fault occurs after the voltage has been connected to S12, S22, the unit will be activated because this line fault is similar to the normal On-function.

The gold plated contacts of the LG 5925 mean that this module is also suitable for switching small loads of 1 mVA - 7 VA, 1 mW - 7 W in the range 0.1 - 60 V, 1 - 300 mA. The contacts also permit the maximum switching current. However since the gold plating will be burnt off at this current level, the device is no longer suitable for switching small loads after this.

The terminal S21 permits the operation of the device in IT-systems with insulation monitoring, serves as a reference point for testing the control voltage and is used to connect the E-stop loop when cross fault monitoring is selected.

Connecting the terminal S21 to the protective ground bridges the internal short-circuit protection of Line A2 (+). The short-circuit protection of line A1 (+) remains active.

To alter the functions automatic start - manual start and with or without cross fault monitoring, the switches S1 and S2 are used. These are located behind the front cover (see unit programming).

The setting with or without cross fault monitoring on E-stop buttons is made in the device. To alter the functions automatic start - manual start and with or without cross fault monitoring on E-stop buttons is made in the device. To alter the functions automatic start - manual start and with or without cross fault monitoring on E-stop buttons is made in the device.

ATTENTION - AUTOMATIC START!

According to IEC/EN 60 204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop. Therefore the machine control has to disable the automatic start after emergency stop.

### Technical data

#### Input circuit

- **Nominal Voltage** $U_n$:
  - AC / DC 24 V, AC 230 V
  - other voltages on request
- **Voltage range**
  - AC / DC
  - at 10% residual ripple: $0.9 \ldots 1.1 U_n$
  - AC: $0.85 \ldots 1.1 U_n$
- **Nominal consumption at $U_n$**
  - LG 5925:
    - DC approx. 1.5 W
    - AC approx. 3.7 VA
  - LH 5925:
    - DC approx. 3 W
    - AC approx. 4 VA
  - Min. Off-time:
    - Control voltage on S11 at $U_n$: 250 ms
  - Control current typ. over S12, S22:
    - Control current typ. over S12, S22:
      - 25 mA at $U_n$
  - Min. voltage on S12, S22 when relay activated:
    - DC 20 V at AC/DC units
    - DC 19 V at AC units
  - Short-circuit protection:
    - Internal PTC
  - Overvoltage protection:
    - Internal VDR

#### Output

- **Contacts**
  - LG 5925.02:
    - 2 NO contacts
  - LG 5925.04:
    - 4 NO contact
  - LG 5925.48:
    - 3 NO, 1 NC contact
  - LH 5925.69:
    - 8 NO, 1 NC contact
  - The NO contacts are safety contacts.
  - ATTENTION! The NC contacts 41-42 can only be used for monitoring.

#### Technical data

- **Operate delay typ. at $U_n$**:
  - Manual start: 30 ms
  - automatic start: 350 ms
- **Release delay typ. at $U_n$**
  - Disconnecting the supply: 150 ms at AC units
  - Disconnecting S12, S22: 130 ms at AC units
  - 50 ms at DC units
  - Relay positive guided
  - Nominal output voltage: AC 250 V
  - DC: see limit curve for arc-free operation
- **Switching of low loads**: 100 mV (contact 5 μ A)
  - max. 8 A per contact
  - see current limit curve
- **Switching capacity**
  - to AC 15:
    - 3 A / AC 230 V
    - IEC/EN 60 947-5-1
    - for NO contacts
  - 2 A / AC 230 V
    - IEC/EN 60 947-5-1
    - for NC contacts
  - to DC 13:
    - 4 A / DC 24 V
    - IEC/EN 60 947-5-1
    - 0.5 A / 110 V
    - IEC/EN 60 947-5-1
    - for NO contacts
  - 4 A / 24 V
    - IEC/EN 60 947-5-1
    - for NC contacts
  - to DC 13 NC contacts:
    - 8 A / 24 V > 25 x 10^5
    - ON: 0.4 s, OFF: 9.6 s
    - Electrical contact life
      - to 5 A, AC 230 V cos $\phi = 1$: > 1.5 x 10^6 switching cycles
    - Permissible operating frequency:
      - max. 1 200 operating cycles / h
    - Short circuit strength
      - max. fuse rating:
        - 10 A gL
        - IEC/EN 60 947-5-1
      - 6 A
      - line circuit breaker:
        - > 20 x 10^6 switching cycles
  - **Mechanical life**
    - Continuous operation
    - Temperature range: -15 ... + 55 °C

- **Clearance and creepage distances**
  - Overvoltage category / contamination level: 4 kV / 2
    - IEC 60 664-1
  - **EMC**
    - Electromagnetic discharge:
      - 8 kV (air)
      - IEC/EN 61 000-4-2
    - HF irradiation:
      - 10 V / m
      - IEC/EN 61 000-4-3
    - Fast transients:
      - Surge voltages between wires for power supply:
        - 1 kV, 0.5 kV
        - IEC/EN 60 1100-4-5
      - 24 V at AC/DC units
        - 2 kV
        - IEC/EN 60 1100-4-4
      - between wire and ground:
        - 2 kV
        - IEC/EN 60 1100-4-4
      - Interference suppression:
        - Limit value class B
      - Housing:
        - Limit value class B
        - IEC/EN 60 1100-4-5
      - Terminals:
        - Limit value class B
        - IEC/EN 60 1100-4-4
    - **Degree of protection**
      - Housing:
        - IP 40
        - IEC/EN 60 529
    - **Vibration resistance**
      - Amplitude 0.35 mm
        - IEC/EN 60 068-2-6
      - Frequency 10 ... 55 Hz
    - **Climate resistance**
      - 15 / 055 / 04
        - IEC/EN 60 068-1
      - EN 50 005
    - **Wire connection**
      - DIN 46 228-1/-2/-3/-4
    - **Screw terminals (integrated)**
      - 1 x 4 mm² solid or
      - 2 x 1.5 mm² stranded ferruled or
      - 2 x 2.5 mm² solid
    - **Insulation of wires**
      - or sleeve length: 8 mm
    - **Plugin with screw terminals**
      - max. cross section
      - for connection:
        - 1 x 2.5 mm² solid or
        - 1 x 2.5 mm² stranded ferruled
    - **Insulation of wires**
      - or sleeve length: 8 mm

- **Frequency**
  - Continuous operation
  - + 55 °C
**Technical data**

Plugin with cage clamp terminals
- max. cross section for connection: 1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled
- min. cross section for connection: 0.5 mm²
- Insulation of wires or sleeve length: 12 ±0.5 mm
- Wire fixing: Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals
- Mounting: DIN rail IEC/EN 60 715
- Weight: 220 g (DC unit)

**Dimensions**

<table>
<thead>
<tr>
<th>Width x height x depth</th>
<th>LG 5925:</th>
<th>22.5 x 90 x 121 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG 5925 PC:</td>
<td>22.5 x 111 x 121 mm</td>
<td></td>
</tr>
<tr>
<td>LG 5925 PS:</td>
<td>22.5 x 104 x 121 mm</td>
<td></td>
</tr>
<tr>
<td>LH 5925:</td>
<td>22.5 x 90 x 121 mm</td>
<td></td>
</tr>
</tbody>
</table>

**Standard type**

LG 5925.48 AC/DC 24 V
- Article number: 0056025
- Output: 3 NO contacts, 1 NC contact
- Nominal voltage U_N: AC/DC 24 V
- Width: 22.5 mm

**Variant**

LG 5925. _ _ / 60: with CSA-approval

**Ordering example for variants**

- L, 5925 _ _ / 60 PS DC 24 V
- Nominal voltage
- Type of terminals
- without indication: terminal blocks fixed, with screw terminals
- PC (plugin cage clamp): pluggable terminal blocks with cage clamp terminals
- PS (plugin screw): pluggable terminal blocks with screw terminals
- Variant, if required
- Contacts
- G: Width 22.5 mm
- H: Width 45 mm

**Characteristics**

Arc limit curve under resistive load

Max. current at 55°C over 4 contact paths = 4A

Total current limit curve LG 5925

Max. permitted current up to 55°C on 8 contact paths = 2.25A

Total current limit curve LH 5925
Application examples

Single channel emergency stop circuit. This circuit does not have any redundancy in the emergency-stop control circuit.

Note: Refer to "Unit programming"!

Switches in pos.:  
S1 no cross fault detection  
S2 automatic start

Contact reinforcement by external contactors, 2-channel controlled.

The output contacts can be reinforced by external contactors with positive guided contacts for switching currents > 8 A.

Functioning of the external contactors is monitored by looping the NC contacts into the closing circuit (terminals S33-S34).

Note: Refer to "Unit programming"!

Switches in pos.:  
S1 no cross fault detection  
S2 automatic start

2-channel emergency stop circuit. This circuit does not have any redundancy in the emergency-stop control circuit.

Note: Refer to "Unit programming"!

Switches in pos.:  
S1 no cross fault detection  
S2 manual start

2-channel emergency stop circuit without cross fault monitoring.

Note: Refer to "Unit programming"!

Switches in pos.:  
S1 no cross fault detection  
S2 manual start

2-channel emergency stop circuit with cross fault detection

Note: Refer to "Unit programming"!

Switches in pos.:  
S1 cross fault detection  
S2 manual start

Contact reinforcement by external contactors controlled by one contact path.

Note: Refer to "Unit programming"!

Switches in pos.:  
S1 no cross fault detection  
S2 automatic start

2-channel safety gate monitoring.

Note: Refer to "Unit programming"!

Switches in pos.:  
S1 no cross fault detection  
S2 manual start