Safety technique

Emergency Stop Module LG 5925
safemaster

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. 3 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 (isolated), DIN 46 228-1/-2/-3/-4 or
2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3/-4
Width 22,5 mm

Function diagram

Block diagram

Circuit diagrams

Notes

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. 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 BG 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 with S1. S2 is used to change between automatic and manual restart. On automatic start also the terminals S33 - S34 have to be linked. For connection please see application examples.

**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 $U_n$:** DC 24 V, AC 230 V
- **Voltage range:**
  - DC at 10% residual ripple: $0.9 \ldots 1.1 U_n$
  - AC: $0.85 \ldots 1.1 U_n$
- **Nominal consumption:** DC approx. 1.3 W, 250 ms
- **Control voltage on S11:** DC 22 V at $U_n$
- **Control current over S12, S22:** 25 mA at $U_n$
- **Min. voltage on S12, S22:** DC 20 V when relay activated
- **Technical life:** IEC/EN 60 947-5-1
- **Electrical contact life:** $> 10^6$ switching cycles

#### Output

- **Contacts:**
  - LG 5925.02: 2 NO contacts
  - LG 5925.04: 4 NO contact
  - LG 5925.48: 3 NO, 1 NC contact
- **Operate delay typ. at $U_n$:**
  - Manual start: 40 ms
  - Automatic start: 300 ms
- **Release delay typ. at $U_n$:**
  - Disconnecting the supply: 25 ms
  - Disconnecting S12, S22: 20 ms
- **Contact type:** Relay positive guided
- **Nominal output voltage:** AC 250 V
- **Switching of low loads:**
  - (contact 5 μA Au)
  - $\geq 100 \text{ mV}$
  - $\geq 1 \text{ mA}$

### Technical data

#### Thermal current $I_{th}$:

max. 5 A per contact

#### Switching capacity to AC 15:

- 3 A / AC 230 V IEC/EN 60 947-5-1
- 2 A / AC 230 V IEC/EN 60 947-5-1

#### Electrical contact life to 5 A, AC 230 V cos $\varphi = 1$:

$> 1.5 \times 10^6$ switching cycles

#### Permissible operating frequency:

max. 1 200 operating cycles / h

#### Short circuit strength max. fuse rating:

- 6 A gL IEC/EN 60 947-5-1
- 8 A IEC/EN 60 947-5-1

#### Mechanical life:

$> 20 \times 10^6$ switching cycles

### General data

#### Operating mode:

Continuous operation

#### Temperature range:

- -15 ... + 55 °C

#### Clearance and creepage distances:

**Overvoltage category / contamination level:** 4 kV / 2

**EMC:**
- Electrostatic discharge: 8 kV (air) IEC/EN 61 000-4-2
- HF irradiation: 10 V / m IEC/EN 60 1000-4-3
- Fast transients: 2 kV IEC/EN 60 1000-4-4

#### Interference suppression:

Limit value class B EN 55 011

#### Housing:

- IP 40 IEC/EN 60 529
- IP 20 IEC/EN 60 529

#### Vibration resistance:

Amplitude 0.35 mm IEC/EN 60 068-2-6

#### Climate resistance:

15 / 055 / 04 IEC/EN 60 068-1

#### Terminal designation:

EN 50 005

#### Wire connection:

1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4

#### Wire fixing:

Plus-minus terminal screws M 3.5 box terminals with self-lifting clamping piece

#### Mounting:

DIN rail IEC/EN 60 715

#### Weight:

220 g (DC unit)

### Dimensions

- **Width x height x depth:** 22.5 x 90 x 121 mm
Characteristics

Arc limit curve under resistive load

Switching current $I_\text{a}$

Switching voltage $U$ [V]

1. Safe breaking, no continuous arcing under the curve, max. 1 switching cycle/s

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 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

Contact reinforcement by external contactors controlled by one contact path.

Note: Refer to "Unit programming"!

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

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 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

2-channel safety gate monitoring.

Note: Refer to "Unit programming"!
Switches in pos.: S1 no cross fault detection
S2 manual start