MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Amikon cover with selected official TESCH pages

F121 MACHINE SAFETY RELAYS

F121×04

F121 SAFETY RELAY

OFFICIAL SOURCES

TESCH official product documentation. Selected pages retain their original content, color and aspect ratio.

Safety Relay F121

E-Stop Relay and Safety Gate Monitor

Characteristics

- Stop category 0
- Safety category 4
- 3 Safety contacts
  1 Auxiliary contact
- 1 Semiconductor output
  with short circuit protection
- Crossfault monitoring
- Monitored or automatic
  reset
- Tested for light curtain
  applications (24 V)



DIN EN 60204 Section 1/ VDE 0113 Section 1 (11/98) prescribes that power circuits with a safety function must be specified as per Section 9.4.
In such safety circuits auxiliary contactors must intervene to guarantee redundancy so that, despite the occurrence of a fault in one of the auxiliary contactors, the safety circuit remains operative.
In every on - off cycle of the machine, the auxiliary contactors must be checked automatically at least once to ensure correct opening and closing of the contacts.
Emergency-stop relay **F121** fulfils this requirement – EN 954-1 – to the highest safety grade 4.
The **F121** can be used as a safety guard monitor or as an E-stop relay in single or dualchannel applications.

Mode of Operation

The dual channel operation shown in wiring example 1 includes crossfault monitoring between both E-stop circuits.

That means in case of shorts between the two E-stop channels the **F121** will de- activate the outputs. This is achieved by an electronic protection circuit in the safety relay. After elimination of the malfunction, the **F121** is ready for operation again.
The application with monitored start checks the start circuit (S33/S34) and will only activate the **F121** if there is a leading edge in this circuit.
If wired for autostartfunction the **F121** will be activated automatically by the supply voltage if the E-stop circuits and the feedback loop (X5/S33) are closed.
In applications, where both E-stop circuits are not closed simultaneously, (e.g. safety gates) channel 2 has to be activated before channel 1.
If the inputs will be activated with external 24V$_{DC}$, the negative pole has to be connected to A2 (Light curtain application).
The open collector semiconductor output may transfer the status of the **F121** via the terminals Y31-Y32 direct to a PLC.
To control NC contacts from external contactors the feedback loop has to be wired in series between the start button respectively X5 and S33 (Autostart).

Models and Ordering Data

Contacts	3 N/O Safety contacts 1 N/C Auxiliary contact , 1Semiconductor output
Type F121	**Order No.**
230 V$_{AC}$	074 00041*
115 V$_{AC}$	074 00042*
42 V$_{AC}$	074 00043
24 V$_{AC/DC}$ *	074 00044*

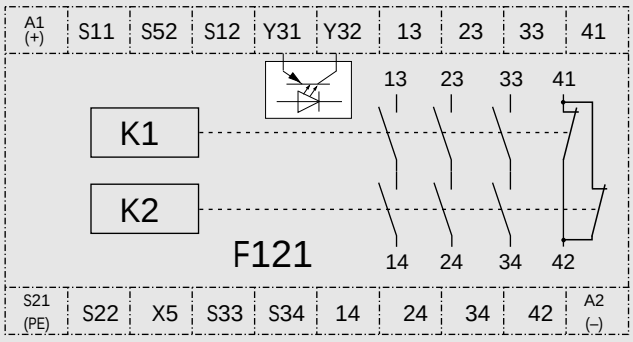
*Do not connect PE to this version

* = Approval for U.S. / Canada

BG

c UL us LISTED

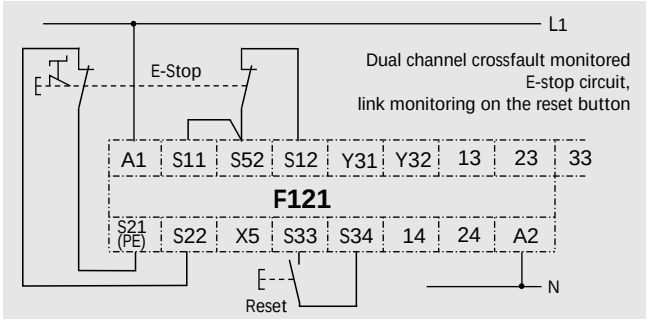
Circuit Diagram



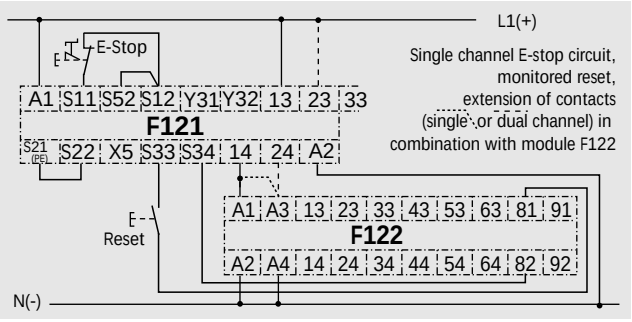
Safety Relay F121 – Safety Gate Monitor and Emergency Stop Relay

The right to make changes is reserved

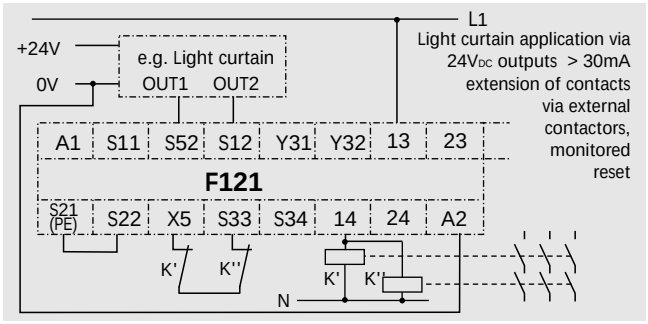
Wiring Example 1



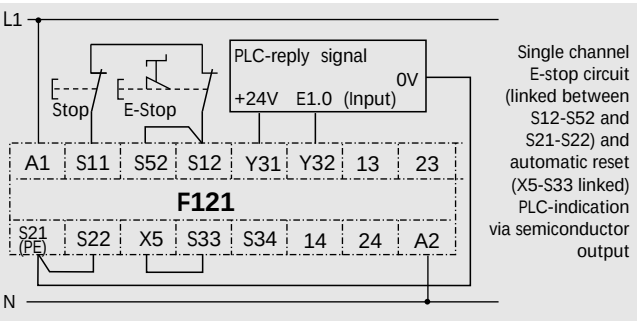
Wiring Example 2



Wiring Example 3



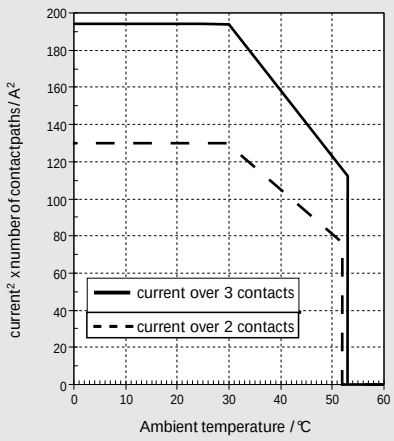
Wiring Example 4



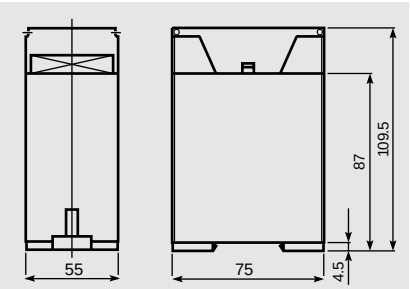
Technical Data

Rated voltage	230 / 115 / 42VAC ; 24VAC/DC
Voltage range	0.8 (0.9 at 24 VDC) to 1.1 x rated voltage
Power consumption	Approx. 4W
Rated insulation voltage	250V
Creep distance and gaps	Overvoltage category III Pollution level 2 to DIN VDE 0110-1 (04/97)
Test voltage	2.5 kV
Ambient temperature	- 5℃ to +55℃
Mode of protection	Terminals IP 20, IP 40 casing to DIN VDE 0470- 1 (11/92)
Switching capacity	250VAC; 1500 VA / 24VDC; 144W, preferably with spark arrest
Thermic current Ith	According to current summary limit curve (right) (max. 10 A in one current path)
Utilisation categorie	AC-15 250V 6A; DC-13 24V 3 A
Response time	Via reset button : <60ms; Autostart: <600ms
Release time	Via E-stop button: <20ms; loss of supply: <250ms
Release time at 24VDC	Via E-stop button or light curtain: <15ms
Recovery time	With monitored reset: >5s / with autoreset: > 2s
Recovery time at 24VDC	>0.1s after E-stop or light curtain operation
Output contacts	3 N/O (safety contacts) / 1 N/C (auxiliary contact)
Semiconductor output	24VDC / 20mA, PNP, short circuit protection
Mechanical lifetime	10^7 switching cycles
Switch material	Ag SN O_2+ 0.5µ Au
Terminals	Terminal box with wire protection
Line cross section	Rigid 4mm², flexible 2.5mm² Connecting lead to be stripped up to max. 4mm
Control circuit	Approx. 24 VDC
Contact protection	Screwed-type fuse max.6A slow blow Auto.circuit breaker max. C10 A quick break
Weight	370g; Typ 24VAC/DC : 290g

Contact De-Rating: Temperature F121



Dimensional Diagram



DIN rail mounting to EN 50022-35x7.5
Screw mounting possible by reversal of snap bracket

TESCH GmbH Automatic Control Components
Graefrather Straße 124 D-42329 Wuppertal
Phone +49-202-7391-0 Fax +49-202-7391-115
http://www.tesch.de eMail: vertrieb-ak@tesch.de
Germany