Safety relay/expansion relay
BT51(T)



Approvals:

Safety relay for:

- Emergency stop
- Interlocked hatch
- Expansion of Pluto

Features:

- Single and “dual” channel
- Test/”reset” input
- Width 22.5 mm
- LED indication
- 4 NO relay outputs
- Supply 24 VDC
- Quick release connector blocks
- BT51 - Additional power terminals
- BT51T - One changeover relay with a double information output (Y14)
- BT51T - Delay times selectable from 0 - 1.5 s

Safety relay/expansion relay to Pluto

The BT51 is designed to connect safety devices, such as emergency stops, directly in the voltage supply circuit to the relay. Despite a maximum built-in width of 22.5 mm the relay is very powerful.

With 4 NO safety outputs, test input and complete internal supervising, the BT51 is quite unique. In addition you can order delayed outputs (BT51T).

In order for the safety outputs to close, the supply voltage, e.g. by means of an emergency stop button, must be connected to A1 and A2 and the test input closed. After actuation of the relay the test input can be opened again.

The test input is intended to supervise that contactors or valves have dropped/returned before a new start can be permitted.The test input can also be used for starting and the start button can be supervised (see connection example on next page).

More outputs

By connecting BT51 to a safety relay/PLC it is easy to increase the number of safe outputs. This means that an unlimited number of dangerous machine operations and functions can be stopped from one safety relay/PLC.

Safety level

BT50 has an internal redundant and monitored safety function. Power failure, internal component faults or external interference cannot result in dangerous functions.

Input via A1 only is not protected from short circuiting, and therefore installation is critical for the safety level to be achieved. To achieve a higher safety level a screened cable can be used and/or connection made to both A1 and A2 (see example overleaf).

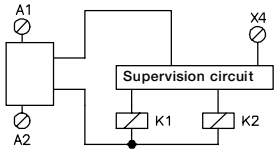
Regulations and standards

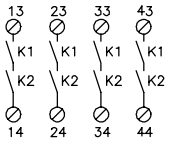
The BT51 is designed and approved in accordance with appropriate directives and standards. See technical data.

Connection examples

For examples of how our safety relays can solve various safety problems, please see the chapter “Connection examples”.

Technical description – BT51(T)



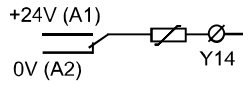


When supply voltage is connected to A1 and A2, relays K1 and K2 are activated. K1 and K2 drop if the supply voltage is disconnected. Both relays K1 and K2 must drop for them to be activated again. Another requirement is that the test circuit, A1 - X4, must be closed for the outputs to be activated. Thereafter A1 - X4 can either be open or constantly closed.

The supervising circuit ensures that both K1 and K2 have dropped before they can be reactivated. The stop function complies with the requirement that a component fault or external interference cannot lead to a dangerous function.

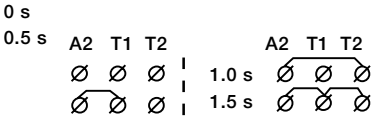
The safety outputs consist of contacts from K1 and K2 connected internally in series across terminals 13 - 14, 23 - 24, 33 - 34 and 43 - 44. These contacts are used to cut the power to components which stop or prevent hazardous movements/functions. It is recommended that all switched loads are adequately suppressed and/or fused in order to provide additional protection for the safety contacts.

BT51T - Info. output



Max load 250 mA

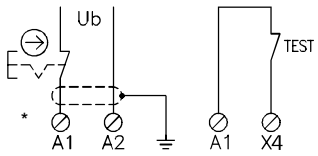
BT51T - Delay times



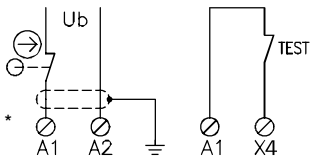
Technical data – BT51(T)

Article number BT51 BT51T	 2TLA010033R2000 2TLA010033R3000
Colour	Grey
Operational voltage	24 VDC + 15%/-25%
Power consumption	1.4 W/1.8 W
Relay Outputs	4 NO
Max. switching capacity Resistive load AC Inductive load AC Resistive load DC Inductive load DC	 6A/250 VAC/1500 VA AC15 240 VAC 2A 6A/24 VDC/150 W DC13 24 VDC 1A
Max. res. load total switching capacity	12 A distributed on all contacts
Min. load	10mA/10 V (if load on contact has not exceeded 100 mA
Contact material	Ag + Au flash
Fuses Output (External)	5A gL/gG
Conditional short-circuit current (1 kA)	6A gG
Max Input Wire res. at nom. voltage	200 Ohms
Response time at deactivation	<20 ms or delayed max 1500 ms (BT51T)
Terminals (Max. screw torque 1 Nm) Single strand: Conductor with socket contact:	 2x1.5 mm^2 2x1 mm^2
Mounting	35 mm DIN-rail
Protection class enclosure/terminals	IP40 / IP20 IEC 60529
Impulse Withstand Voltage	2.5kV
Pollution Degree	2
Operating temperature range	-10°C to +55°C (with no icing or condensation)
Operating humidity range	35% to 85%
LED indication	Electrical Supply, Relay and X4
Weight	200 g
Performance (max.) Functional test: The relays must be cycled at least once a year.	 PL e/Cat. 4 (EN ISO 13849-1:2008) SIL 3 (EN 62061:2005) PFH_D 1.63E-08
Conformity	2006/42/EC, 2006/95/EC, 2004/108/EC, EN 62061:2005 EN ISO 13849-1:2008

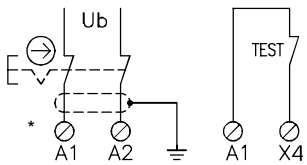
Electrical connection – BT51(T)



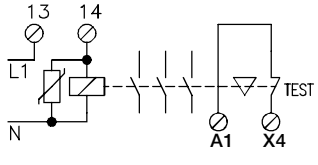
Emergency stop with reset when emergency button returns.



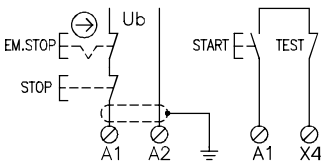
Hatch with automatic reset.



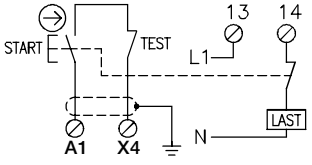
Emergency stop with dual connection direct to the supply voltage.



Controlled monitoring of external contactor, relay, valve or ABB Jokab Safety's expansion relays.



BT51 as emergency stop and control relay with Start and Stop function.



Monitoring to ensure that the On button is not stuck in pressed position. A short circuit over the closing contact is not monitored.

* BT51 has additional power terminals A1 and A2.