

# Safety relay/expansion relay BT50(T)

## Approvals:



## Safety relay for:

Emergency stop  
Interlocked hatch

## Features:

Single and "dual" channel  
Test/start input  
Width 22.5 mm  
LED indication  
3 NO/1NC relay outputs  
Supply 24 VDC  
Quick release connector blocks  
BT50 - Additional power terminals  
BT50T - One changeover relay with a double information output (Y14)  
BT50T  
Delay times selectable from 0 - 1.5 s



### Single channel safety relay

The BT50 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 3 NO safety outputs, 1 NC, test input and complete internal supervising, the BT50 is quite unique. In addition you can order delayed outputs (BT50T).

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 BT50 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

The BT50 has a twin and supervised internal 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 BT50 is designed and approved in accordance with appropriate standards.

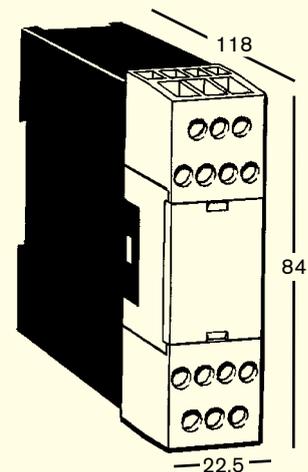
Examples of such are: EN 292-1/2, EN 60204-1, EN 954-1.

### Connection examples

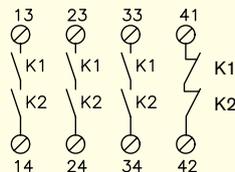
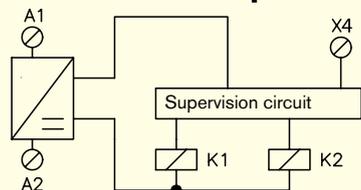
For examples of how our safety relays can solve various safety problems, please see the chapter "Connection examples".

## Technical data – BT50(T)

Manufacturer:	JOKAB SAFETY AB, Sweden
Ordering data:	BT50 or BT50T
Colour:	Black and Beige
Operational voltage:	24 VDC + 15%/-25%
Power consumption:	< 2 VA
Relay outputs:	3 NO + 1 NC
Maximum switching capacity res. load AC:	6A/250 VAC/1500 VA
Maximum switching capacity res. load DC:	6A/24 VDC/150 W
Minimum load:	10mA/10 V(if load on contact has not exceeded 100 mA)
Max Input Wire res. at nom. voltage:	200 Ohm
Response time at deactivation:	<60 ms or delayed max 1500 ms (BT50T)
Terminals (Max. screw torque 1 Nm):	Single strand: 2x1.5 mm <sup>2</sup> Conductor with socket contact: 2x1mm <sup>2</sup> .
Mounting:	35 mm DIN-rail
Protection class enclosure/terminals:	IP 40/20 IEC 60529
Operating temperature range:	-10°C – +55°C
Air and creep distance:	4kV/2 IEC 60664-1
Function indication:	Electrical Supply, Relay and X4
Weight:	200 g



## Technical description – BT50(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.

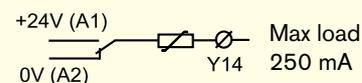
The supervising circuit ensures that both K1 and K2 have dropped before they can be reactivated. The stop function complies with the requirement that a component

fault or external interference cannot lead to a dangerous function.

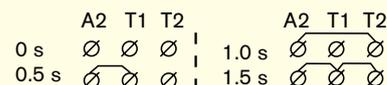
The safety outputs consist of contacts from K1 and K2 connected internally in series across terminals 13 - 14, 23 - 24, and 33 - 34. These contacts are used to cut the power to components which stop or prevent hazardous movements/functions. It is recommended that all switched loads are adequately suppressed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

The NC output 41 - 42 should only be used for monitoring purposes e.g. indication lamp for emergency stop pressed.

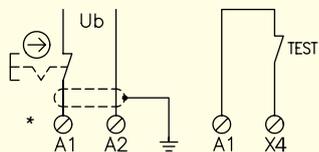
### BT50T - Info. output



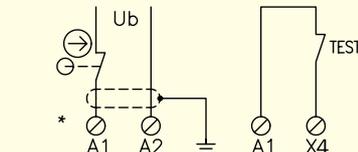
### BT50T - Delay times



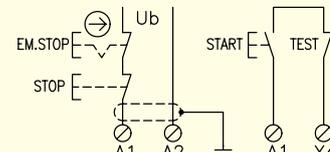
## Electrical connection – BT50(T)



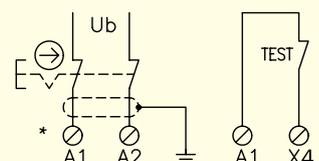
Emergency stop with reset when emergency button returns.



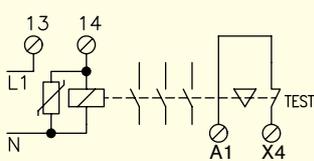
Hatch with automatic reset.



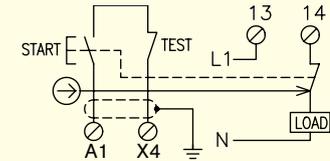
BT50 as emergency stop and control relay with Start and Stop function.



Emergency stop with dual connection direct to the supply voltage.



Controlled monitoring of external contactor, relay, valve or JOKAB SAFETY's expansion relays.



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

\* BT50 has additional power terminals A1 and A2.