

## Bruksanvisning i original

# Expansionsrelä JSR1T



### Fler utgångar

Genom att koppla expansionsreläer till ett säkerhetsrelä utökas enkelt antalet säkra utgångar. Därigenom kan ett stort antal farliga maskinreläer och funktioner stoppas från ett säkerhetsrelä.

### Säkert mjukstopp

När en grind öppnas genereras ett programstopp till maskinens PLC/ servo, som bryter fariga moment på ett mjukt och kontrollerat sätt. Säkerhetsutgångarna bryter därefter kraftmatningen till motorerna, dvs. när maskinen redan stannat. Normalt krävs mellan 0,5 och 1 sekund för att bromsa fariga maskinmoment på ett mjukt sätt. Mjukstopp har många fördelar:

- Maskinen håller längre.
- Detaljer som bearbetas skadas ej.
- Återstart från stoppad position möjliggörs och förenklas.

Ett säkert mjukstopp åstadkoms med ett säkerhetsrelä som ger programstopp i kombination med ett expansionsrelä, JSR1T, som ger säkra fördröjda stoppsignaler (se inkopplingsexemplen). Frånsägelsefördröjningen på ett JSR1T-relä kan som standard väljas från 0 till 10 sekunder. Genom att koppla flera JSR1T-reläer i serie kan även längre tider erhållas.

### När används fördröjda säkerhetsstopp?

Fördröjd stoppsignal kan användas för nödstopp enligt EN ISO 13850:2008 § 4.1.4. Stoppkategorin 1, dvs ett styrt stopp med kraft tillagning till drivanordningen(arna) för att erhålla stoppet, och därefter bryning av kraftförlösen när stoppet åstadkommes. Stoppkategorin 1 är också tillåten när det inte är möjligt att komma i närheten av maskinen innan ett säkert stopp har stannat maskinen i ex vid:

- Grindar, åtkomsttid normalt över 1 sek.
- Luckor och grindar som är låsta till dess att farliga maskinreläer och funktioner stoppas.
- Långa avstånd mellan en säkerhetsanordning och en farlig maskinfunktion.

### Säkerhetsnivå

JSR1T har dubblerad stoppfunktion, dvs. två reläer med tvångsförda kontakter. Övervakad stoppfunktion erhålls genom att återkoppla testutgången (pilot X1 och X2) till test- eller resetgången på det säkerhetsrelä som utökas.

En förutslätning för säkra fördröjda stopp är att fördröjningen inte ökar vid fel. Detta krav uppfyller JSR1T.

### Inkopplingsexempel

Exempel på hur våra säkerhetsreläer löser olika säkerhetsproblem finner du under "Inkopplingsexempel".

### Föreskrifter och standarder

JSR1T är konstruerat och godkänt enligt tillämpliga standarder i Sverige och utomlands. Se Tekniska data.

## Installationsföreskrifter

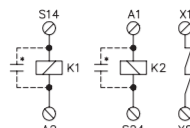
Säkerhetsreläer och andra enheter ska installeras av behörig elektriker i enlighet med säkerhetsföreskrifter, angivna standarder och Maskindirektiv. Alla säkerhetsfunktioner måste testas innan systemet startas. Ingångarna från skyddsanordningar ska anslutas enligt erforderliga krav för att uppfylla förväntad säkerhetsnivå samt för att undvika osäkra situationer.

**Aktas!** Nitpångningen till systemet ska stängas av före installation, modifieringar eller andra justeringar som kan äventyra säkerheten i systemet.

### Underhåll

Säkerhetsfunktionerna ska testas regelbundet, minst en gång per år, för att kontrollera att samtliga av dem fungerar som de ska.

## Teknisk beskrivning – JSR1T



JSR1T måste anslutas till ett säkerhetsrelä för att uppfylla erforderliga säkerhetskrav (se inkopplingsexemplen nedan). Säkerhetsreläet styr och övervakar JSR1T. JSR1T kan kopplas för en- eller tvåkänlig drift - se nedan). När ingångarna S14 och S24 stängs aktiveras relä K1 och K2. Stoppsignal gas, K1 och K2 faller om ingångarna öppnas eller vid spänningsbortfall. K1 och K2 faller antingen direkt eller fördröjt (om detta har beställts). Modulens fördröjningstid är fast och anges på panelen. Fördröjningen är så utförd att tiden inte kan förlängas.

Reaktionstid vid stopp (ingång - utgång)

Max. brytförmåga

Res. last AC

Res. last DC

Max. brytförmåga totalt

Min. last

Kontakmaterial

Silkring utgång (extern)

Vilkorlig kortslutningsström (1 kA)

Max ledningsmotstånd vid nom. spänning

Reaktionstid vid stopp (ingång - utgång)

Anslutningspilot (max. vidr. 1 Nm)

Massiv ledare:

LED-indikering

Vikt

Prestanda (max.)

Överensstämmelse

CE

EN ISO 12100-1:2003

EN ISO 12100-2:2003

EN 60204-1:2006 + A1:2009

IEC 60947-5-1:2009

EN 954-1:1996

EN ISO 13849-1:2008

EN 62061:2005

EN 60947-5-1:2003+A1:2009

EN ISO 12100-1:2003+A1:2009, EN ISO 12100-2:2003+A1:2009, EN 954-1:1996/EN ISO 13849-1:2008, EN 62061:2005, EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-1:2007, EN 61000-6-3:2007, EN 60947-5-1:2003+A1:2009

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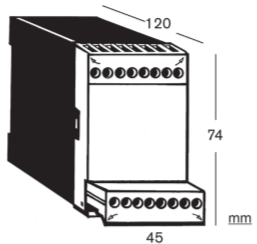
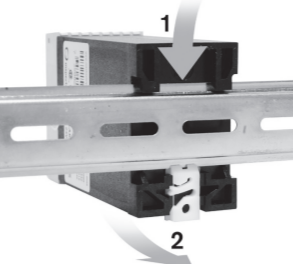
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Tekniska data – JSR1T	
Fabrikat	ABB AB/Jokab Safety, Sverige
Artikelnr./beställningsdata	2TLA01001SR0000 JSR1T 0 6 A 24 DC JSR1T 1.5 6 A 24 DC JSR1T 1.8 6 A 24 DC JSR1T 0.5 6 A 24 D JSR1T 10s 6 A 24 DC JSR1T 1 6 A 24 DC JSR1T 2 6 A 24 DC JSR1T 3 6 A 24 DC JSR1T 5 6 A 24 DC
Färg	Grå
Driftspänning	24 VDC ±15%
Effektförbrukning	1,2 W
Reläutgångar	4 NO + 1 NC
Max. brytförmåga	6 A/250 VAC/1500 VA Res. last AC Induktiv last AC Res. last DC Induktiv last DC
Max. brytförmåga totalt	16 A fördelat på kontaktorna
Min. last	10 mA/10 V (vid max belastning <100 mA)
Kontakmaterial	Ag + Au flash
Silkring utgång (extern)	5 A gL/gG
Vilkorlig kortslutningsström (1 kA)	6 A gG
Max ledningsmotstånd vid nom. spänning	150 Ω (S14, S24)
Reaktionstid vid stopp (ingång - utgång)	<0,020 s, 0,5 s, 1 s, 1,5 s, 2 s, 3 s, 5 s, 8 s, 10 s ±20%
Anslutningspilot (max. vidr. 1 Nm)	1 x 2,5 mm <sup>2</sup> /2 x 1 mm <sup>2</sup> Ledere med ändrylsas: 1 x 4 mm <sup>2</sup> , 2 x 1,5 mm <sup>2</sup>
Montage	35 mm DIN-skena
Skyddsklass kapsling/pilnt	IP 40/20 IEC 60529
Spänningspulstolerans	2,5 kV
Föreningegrad	2
Omgivningstemperatur	-10° till +55° (utan bildning eller kondensation)
Omgivande luftfuktighet	35% till 85%
LED-indikering	Output Relay Supplies
Vikt	280 g
Prestanda (max.)	Kategori 4/PL e (enligt 2006/42/EC) (EN ISO 13849-1:2008) SIL 3 (EN 62061:2005) PFH <sub>1</sub> 1,55E-08 Funktionstest: Reläerna ska köras minst en gång om året
Överensstämmelse	Europeiska maskindirektivet 2006/42/EC
CE	EN ISO 12100-1:2003 EN ISO 12100-2:2003 EN 60204-1:2006 + A1:2009 IEC 60947-5-1:2009 EN 954-1:1996 EN ISO 13849-1:2008 EN 62061:2005
Certifieringar	TUV Nord



Kopplingspilot är avtagbar (utan att kablar behöver lossas)

## Original manual

# Expansion relay JSR1T



### More outputs

When a gate is opened a program stop is first given to the machine's PLC/servo which brakes the dangerous operations in a soft and controlled way. The safety outputs then break the power to the motors, that is, when the machine has already stopped. Normally between 0,5 and 1 second is needed to brake a dangerous machine operation softly.

### Safe soft stop

A safe soft stop is achieved by means of a safety relay which gives the program stop, and an expansion relay, JSR1T, which gives safe delayed stop signals. (See the electrical connection examples). The drop time delay on a JSR1T can as standard be selected from 0 to 10 seconds. By connecting several JSR1T's in series even longer times can be achieved.

Soft stop ensures many advantages:

- The machine lasts longer.
- Parts being processed are not damaged.
- Restart from stopped position is enabled and simplified.

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### When are delayed safe stops used?

Delayed safety stop signals can be used for emergency stops according to EN ISO 13850:2008 clause 4.1.4. Stop category 1, i. e. a controlled stop with power to the actuator(s) available to achieve the stop and then removal of power when stop is achieved.

Stop category 1 may also be permitted when it is not possible to gain physical access to the machine before the safe stop is affected e. g.:

- Gates, access time is normally over 1 sec.
- Covers and gates which are locked until dangerous operations and functions have been stopped.
- Long distances between a safety device and a dangerous machine function.

### Safety level

The JSR1T has twin stop functions, that is, two relays with mechanically operated contacts. A monitored stop function is achieved by connecting the test output (terminals X1 and X2) to the test or reset input on the safety relay which is being expanded.

One condition for a safe delayed stop is that the delay time cannot increase in the event of a fault. The JSR1T complies with this requirement.

### Connection examples

For examples on how our safety relays can solve various safety problems, please see the connection examples.

### Regulations and standards

The JSR1T is designed and approved in accordance with appropriate directives and standards. See Technical data.

## Installation precautions

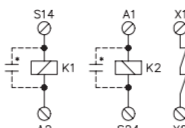
The safety relay and devices shall be installed by a trained electrician following the Safety regulations, standards and the Machinery directive. All the safety functions shall be tested before the starting up of the system. The inputs from the safety devices must be connected according to the requirements needed to fulfill the expected safety level and to avoid unsafe situations.

**Caution:** The main voltage for the system should be switched off before installation, modifications or other adjustments are made that can risk the safety of the system.

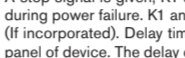
### Maintenance

The safety functions shall be tested periodically, at least once per year to confirm that all the safety functions are working properly.

## Technical description – JSR1T



The JSR1T has to be connected to a safety relay in order to fulfill the necessary safety requirements (see connection examples below). The safety relay controls and monitors the JSR1T. (The JSR1T can be connected for single or dual channel operation - see below). When the inputs S14 and S24 close, relays K1 and K2 are activated. A stop signal is given, K1 and K2 drop, if the inputs are opened or during power failure. K1 and K2 drop either directly or after a delay (if incorporated). Delay time of module is fixed and shown on front panel of device. The delay circuit is so arranged that the design time cannot be exceeded.



To check that both the relays K1 and K2 drop during a stop signal they must be monitored. This is achieved by connecting X1 and X2 to the test or reset input on the safety relay which is expanded (see below). K1 and K2 are mechanically operated relays, therefore, if one of the output contacts should stick closed then the relay's contact in X1-X2 cannot be closed thus preventing a new ready signal being given to the safety relay.

Inductive loads should be equipped with an arc suppressor to protect the output contacts.

Diodes are the best arc suppressors but will increase the switch off time of the load.

**Caution:** This product shall be handled with caution: The product should be replaced with the same product type in a situation where it has been dropped on the floor, knocked strongly, exposed to extreme voltages, temperatures or humidity outside the specified limits.

In case of functional problems: Test the safety functions and devices. The entire system should be tested without disconnecting the power supply. Check that the LED indicator "1" lights when the input S14 is connected to A1. Check that the LED indicator "2" lights when the input S24 is connected to A2. The outputs are On when both inputs are On (JSR1T 0s). The NO-outputs of the time delayed variants of JSR1T open at the selected time delay. In case of a problem with the unit, check the LED status and inspect the involved part of the system. Take measurements where necessary. If the problem is not solved, then contact the nearest ABB/Jokab Safety Service Office or dealer.

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## Elektrisk inkoppling och exempel – JSR1T

