



## Positive Guided Relays

**Wide range of switching capabilities!  
Allows expansion of safety relays!  
Used with solid state safety devices!**

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# JSNA MCL Series Mechanically Linked, Force Guided Relays

The MCL Series relays have mechanically linked contacts conforming to IEC 60947-5-4 as required for use in safety related control systems. *(See drawings on mechanically linked contacts on page 3.)*

These relays have a wide range of switching capabilities from 1mA to 10A and are available with contact add-on blocks.

MCL Series relays can be used with solid state output safety devices such as light curtains, laser scanners and safety PLCs. The normally closed contacts can be used for monitoring their proper operating conditions.

## Regulations and Standards

The MCL Series Mechanically Linked, Force Guided Relays are designed and approved in accordance with appropriate standards. Examples of such are: IEC/EN 60947-5-1.



Accessories  
available include  
contact add-on  
blocks and  
a noise filter.  
See details on  
page 12:5.



## Applications

- Light Curtains
- Laser Scanners
- Safety PLCs
- Expansion of Safety Relays

## Features

- Greater Switching Capacity

## Approvals



## Positive Guided Contacts

Positive guided contacts are a requirement in safety circuits to correctly monitor the status of normally open contacts. Guided contacts imply that Normally Open (NO) and Normally closed (NC) will operate together reciprocally but can never be simultaneously closed, even if the NO contacts weld. This requirement is obtained by particular constructional details, such as reduced gap tolerance through which the mobile contact travels and the points of actuation are closer to the actual contact position.

Positive Guided Contacts are also called positive safety contacts, forced contacts, linked contacts, force or positive guided or positively driven contacts.

The positive guided contacts assume different meanings and terminologies in compliance with the product standards which are given below.

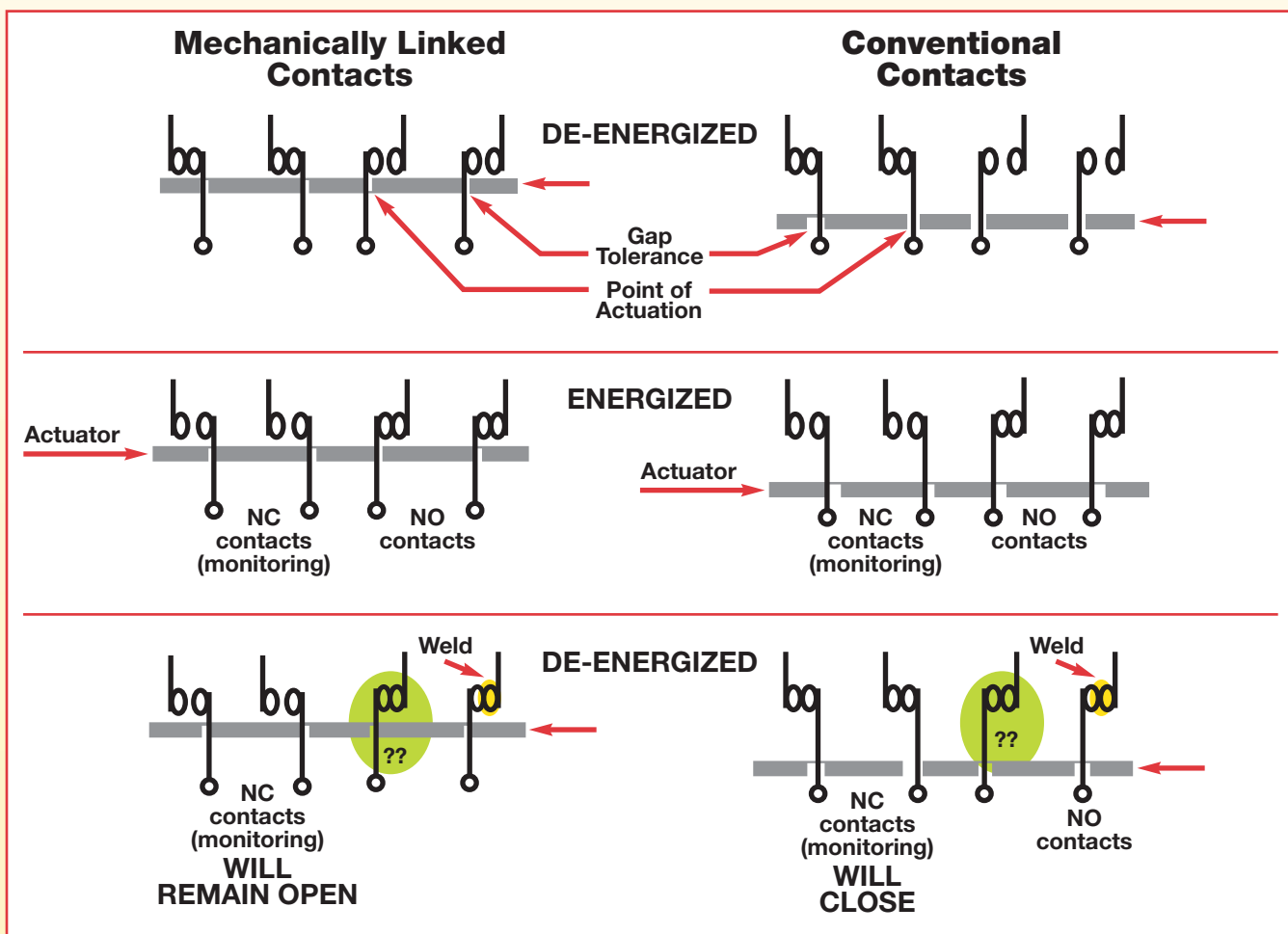
## IEC 60947-5-1/A2 ed. 2 - Annex L

In this case, positively guided contacts are called **mechanically linked contacts**. The requirement is that NO and NC contacts can never be simultaneously closed, even if the NO contact or NC contact welds in closed position.

This requirement applies to auxiliary safety contacts included in control circuit devices where the actuating positively is provided internally; therefore, this does not apply to push buttons or limit switches. The JSNA MCL series relays, as well as the auxiliary add-on contact block, fall into this category. Symbol to identify a mechanically linked contact is shown at the right.



## Physical Properties of Mechanically Linked Contacts



Note: Control circuit devices, operated externally (e.g. push-button or limit-switches) can not have mechanically linked contact elements. Such devices, in safety applications, generally have contacts with Direct Opening Actuation.

## JSNA MCL Technical Data

<b>Manufacturer</b> .....	JOKAB SAFETY
<b>Ordering Data/Article Numbers</b> .....	see page 12:5
<b>Ambient Air Temperature</b>	
Operation.....	-40°C to +60°C
Storage.....	-55°C to +70°C
<b>Maximum Altitude</b> .....	3000 m
<b>Operation Position</b>	
Normal.....	On vertical plane
Allowable.....	+/- 30°
<b>Mounting</b> .....	screw or 35mm DIN rail (EN 50022)
<b>Pole Characteristics</b>	
Poles.....	4
Rated Thermal Current I <sub>th</sub> (≤ 40°C).....	10A
Rated Insulation Voltage U <sub>i</sub> .....	690V
Frequency Limit.....	25 - 400 Hz
<b>Designation of Auxiliary Contacts</b>	
AC.....	A600
DC.....	Q600
	(according to IEC/EN 60947-5-1 UL/CSA)
<b>Terminals</b>	
A.....	7.5 mm
B.....	4 mm
Screw.....	M3
<b>Maximum Tightening Torque</b>	
Contact Terminals.....	1 Nm
Coil Terminals.....	1 Nm
<b>Maximum Wire Section Connectable</b>	
AWG.....	12
Flexible w/o Lug (min-max).....	0.75mm <sup>2</sup> /2.5mm <sup>2</sup>
Flexible c/w Lug.....	2-1mm <sup>2</sup> or 1-2.5mm <sup>2</sup> (with 1 or 2 Conductors)
<b>Terminal Protection</b> .....	IP20 (according to EN 60529) (min 0.75mm <sup>2</sup> /18AWG section)



### AC Control

Rated Control Voltage .....120V  
(at 50, 60, 50-60Hz)

### Operating Voltage Limits

Pick-Up.....75 - 115% U<sub>s</sub>  
Drop-Out.....30 - 55% U<sub>s</sub>

### Average Coil Consumption

Hz in rush/holding.....30/4 VA  
60 Hz in rush/holding.....25/3 VA

Dissipation at 50 HZ.....0.95 W

### DC Control

Rated Control Voltage.....24V

### Operating Voltage Limits

Pick-Up.....70 - 115% U<sub>s</sub>  
Drop-Out.....10 - 20% U<sub>s</sub>

Average Consumption.....3.2 W

### Mechanical Life

AC and DC (millions).....20 cycles

Maximum Operating Cycle.....3600 cycles/h

### Operating Times

#### AC with Control

Closing NO.....12 - 21 ms  
Opening NO.....9 - 18 ms  
Closing NC.....17 - 26 ms  
Opening NC.....7 - 17 ms

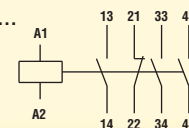
#### DC with Control

Closing NO.....18 - 25 ms  
Opening NO.....2 - 3 ms  
Closing NC.....3 - 5 ms  
Opening NC.....11 - 17 ms

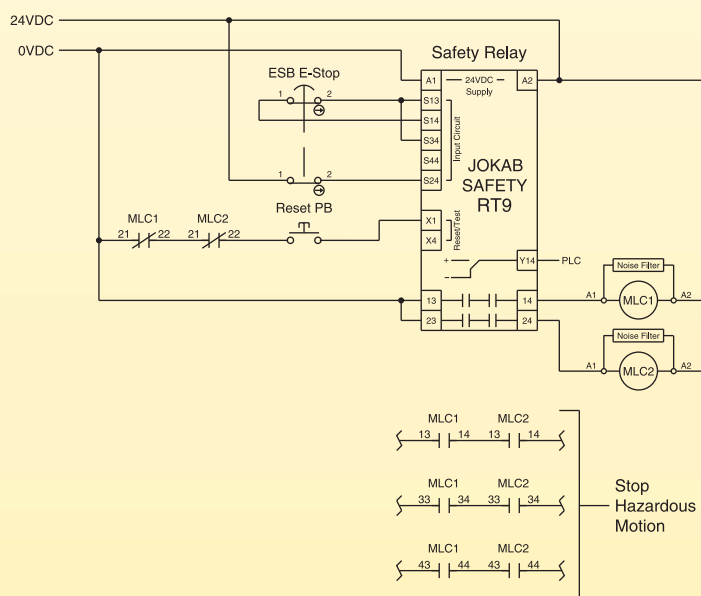
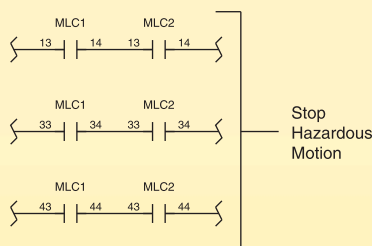
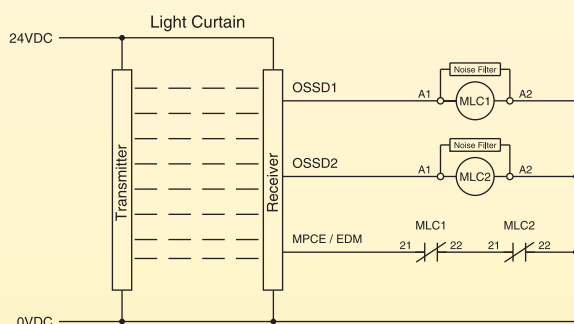
### Pole Characteristics

Minimum Switching Rating.....1mA/5V

### Wiring Diagram



## JSNA MCL Electrical Connection



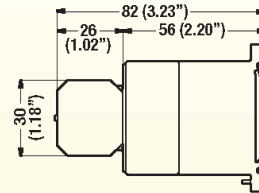
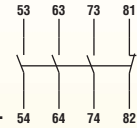


## Add-On Blocks Technical Data

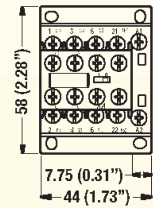
**Manufacturer**..... JOKAB SAFETY  
**Ordering Data/Article Numbers**.....see below  
**Operational Characteristics**  
 Rated Thermal Current I<sub>th</sub> (≤ 40°C)..... 10A  
 Rated Insulation Voltage U<sub>i</sub>.....690V  
**Terminals**  
 Screw..... M3  
 Width..... 6.9 mm  
**Maximum Cross Section Connectable**  
 AWG.....14  
 Flexible w/o Lug..... 2.5mm<sup>2</sup>  
 Flexible w/ Lug..... 2.5mm<sup>2</sup>  
 (with 1 or 2 Conductors)  
**UL Designation**  
 AC.....A600  
 DC.....Q600  
**Minimum Switching Rating**.....1mA/5V  
**Mechanical Life**.....20 cycles (millions)  
**Certifications and Compliance**.....UL recognized/cULus listed  
 (Auxiliary contacts comply with IEC/EN 60947-5-1 standard)



Wiring Diagram.....

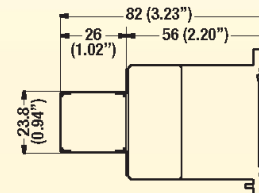


JSNA-MCL-31-XX  
with JSNA-AUC-XX

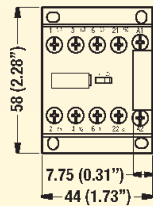


## Noise Filter Technical Data

**Manufacturer**..... JOKAB SAFETY  
**Ordering Data/Article Numbers**.....see below  
**Mounting**.....Quick connect snap  
 (on to MCL series relays)  
**Type**..... Varistor  
**Certifications and Compliance**.....UL recognized/cULus listed



JSNA-MCL-31-XX  
with JSNA-NFV-XX



## Component List - Positive Guided Relays and Accessories

Designation	Article Number	Description
JSNA-MCL-31-120	50-008-02	Mechanically Linked/Force Guided Relay, 120 VAC, 3NO/1NC.
JSNA-MCL-31-24	50-008-03	Mechanically Linked/Force Guided Relay, 24 VAC, 3NO/1NC.
JSNA-AUC-31	50-008-00	Auxiliary contacts with screw terminals, 3NO/1NC.
JSNA-AUC-40	50-008-01	Auxiliary contacts with screw terminals, 4NO/0NC.
JSNA-NFV-120	50-008-04	Noise filter for use with JSNA-MCL-31-120, 120 VAC.
JSNA-NFV-24	50-008-05	Noise filter for use with JSNA-MCL-31-24, 24 VAC.

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