Original instructions

JSNY8
Safety interlock switch
Read and understand this document

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1 Introduction

Scope
The purpose of these instructions is to describe the safety interlock switch JSNY8 and to provide the necessary information required for installation and operation.

Audience
This document is intended for authorized installation personnel.

Prerequisites
It is assumed that the reader of this document has knowledge of the following:
- Basic knowledge of ABB/Jokab Safety products.
- Knowledge of safety devices and safety locks.
- Knowledge of machine safety.

Special notes
Pay attention to the following special notes in the document:

⚠️ Warning! An instruction or procedure which, if not carried out correctly, may result in injury to the technician or other personnel.

⚠️ Caution! Danger of damage to the equipment! An instruction or procedure which, if not carried out correctly, may damage the equipment.

NB: Notes are used to provide important or explanatory information.
2 Overview

General description

JSNY8 is a safety interlock switch with a locking function. The switch can only be actuated using a corresponding triple coded actuator and can be mounted in any direction (the switch head can be rotated 4x90 degrees). The actuation direction can be either linear or radial by using a specific actuator. The holding force is 1000 N.

Caution! The actuator must be inserted into the head during the rotation of the head.

Additionally, the JSNY8 is tamper-proof (the switch cannot be actuated with screwdrivers, magnets or other tools).

The switch is well suited to lock a door or hatch to prevent access to machines:

- When the machine perform tasks that are not allowed to be stopped during the process, e.g. welding
- When the machine have long stopping time, e.g. paper machines with a long brake process
- To keep unauthorized persons away from a certain area

NB: To reach a high safety level when connected to the machine control system, it is recommended to use an ABB/Jokab Safety safety relay, Pluto safety-PLC or a Vital safety module with a Tina adaptor unit.

⚠️ Warning! In order to maintain the safety level the actuator may only be procured and used as an integral part of the associated safety switch.

Safety regulations

⚠️ Warning!

Carefully read through this entire manual before using the device.

The devices shall be installed by a trained electrician following the Safety regulations, standards and the Machine directive.

Failure to comply with instructions, operation that is not in accordance with the use prescribed in these instructions, improper installation or handling of the device can affect the safety of people and the plant.

For installation and prescribed use of the product, the special notes in the instructions must be carefully observed and the technical standards relevant to the application must be considered.

In case of failure to comply with the instructions or standards, especially when tampering with and/or modifying the product, any liability is excluded.
Function description

JSNY8 has 2 NC + 2 NC forced disconnect contacts; the first pair is closed when the actuator is inserted into the switch, and the second pair is closed when the locking mechanism is in its locked position. The locking device is controlled through terminals E1-E2, and locking/unlocking characteristics is depending on the model.

There are two main models of the JSNY8, one with spring interlocking (JSNY8S) and one with solenoid interlocking (JSNY8M).

Spring interlocking (JSNY8S)

Spring interlocking (constant current circuit) means that the unit is locked as soon as the actuator is inserted into the switch, and power must be supplied to E1-E2 to unlock the device.

Solenoid interlocking (JSNY8M)

Solenoid interlocking (open circuit principle) means that power must be supplied to E1-E2 to lock the unit. This unlocks the door at power failure.

Emergency release (JSNY8S only)

JSNY8S is prepared for an emergency button which can be used as an emergency release from inside the hazard zone. This emergency button must be fitted to the switch during installation, and may only be reachable from inside the hazard zone. Pushing the emergency button will lead to the release of the locking mechanism and the actuator can be withdrawn.
3 Connections

JSNY8 electrical connections

Contacts description:
Normal state when protection is active, i.e. when the actuator is inserted into the switch and the device is locked.

11-12 NC #1. Opened when actuator is withdrawn.
21-22 NC #2. Opened when actuator is withdrawn.
E1-E2 Power for locking (M-type) / unlocking (S-type)
31-32 NC #3. Opened when JSNY8 is unlocked.
41-42 NC #4. Opened when JSNY8 is unlocked.

By design, locking is not possible unless the actuator is fully inserted into the actuator head. The contacts used to monitor the locking can therefore also be used to monitor the actuator position. Two contacts should be used to achieve an electrical dual-channel connection, out of which at least one of the contacts 31-32 or 41-42 should be used to monitor the locking.

NB: When connected to a monitoring device such as a safety relay or safety PLC, the reset conditions of the monitoring device differ depending on the connection made due to the dual channel characteristics.
Connection examples

Connection example: JSNY8S connected to safety relay RT6, actuator inserted and locked

A) Interlocking safety switch with manual reset and supervising of external relay contacts

* Closing contact unlocks type S (JSNY8S), opening contact unlocks type M (JSNY8M). Lost motion control or timer should be used if the danger is not removed immediately after shut-off.

** Only AC-relays

B) with automatic reset
System description / Application example

While the machine is running the movable guard is closed. The separate actuator is nested in the head of the safety switch. In this state the safety outputs are closed and unlocking is disabled. In case of e.g. maintenance the operator will need to gear into the machine behind the movable guard. In this case the operator will stop the machine first. The safety switch will keep the actuator locked until the dangerous machine has come to a safe stop. This can be achieved by using a suitable control device, such as a timer or lost motion detector. When the machine is stopped, unlocking is enabled. An unlock command (power supplied or power cut off, depending on type), will unlock the actuator and open the safety circuit. The safety relay will fall, and the machine cannot be started. The movable guard can now be opened. Any of the forced disconnect contacts can be used in the safety circuit. Two contacts are required for a dual-channel system. At least one of the contacts 31-32 or 41-42 should be used to monitor the locking. The remaining two contacts can be used as auxiliary contacts signals or as a complement in the safety circuit to the safety relay, to achieve certain functions.

The contacts for monitoring the position of the actuator are operated directly by the actuator in order to register the position of the guard directly. The contacts for monitoring the locking function are directly connected with the locking bolt. A failure of the locking function can be detected by the safety relay. The design of the locking is of such a kind that the locking cannot be activated unless the actuator is completely inserted into the head of the safety switch. Thus the contacts for monitoring the locking function can also be used to monitor the position of the movable guard. The possibility to monitor both contacts (movable guard and locking function) separately leads to a dual channel mode.
4 Installation and maintenance

JSNY8 is easily fitted on the ABB/Jokab Safety Quick-Guard fencing system using special brackets found in the “Accessory”-section below.

The actuation direction can be chosen either linear or curved, using the appropriate actuator.

Actuators and installation

- **Standard actuator**
  - For sliding doors and hinged doors with actuating radius >400 mm.
  - Head position: 0°, 90°, 180°, 270°.
  - NB: Washers for M4 with outer diameter ø12 mm MUST be used to achieve form-locking!

- **Universal actuator**
  - For hinged doors with actuating radius >150 mm
  - Head position: 0°, 90°, 180°, 270°.
  - NB: Fixing holes ø 5.5 mm symmetric in position with X- or Z-axis.

**Caution!** The actuator must be inserted into the head during the rotation of the head.

**Universal actuator pre-adjustment**

When using the flexible (universal) actuator, proper pre-adjustment of the actuator using the internal hexagon screws are necessary to avoid unnecessary shearing forces on the actuator.

**Actuator mounting**

- 2 x M5 DIN 912 or EN ISO 1207
- \( M_{\text{max}} = 4 \text{ Nm} \)

- Align the actuator with the machine guard so that opening or closing the machine guard does not apply lateral force to the actuator head. Verify by opening and closing the guards several times.

**Caution!** The actuator must be inserted into the head during the rotation of the head.
Auxiliary release (JSNY8S only)

Remove covering plug (SW14 mm), then press piston to release locking function.

An emergency opening pushbutton is available (ordered separately).

To install the emergency opening pushbutton, remove the covering plug and fit the button in its place.

Caution! IP67 is lost when installing this button.

⚠️ Warning!

Auxiliary release shall only be operated during installation or in case of failure of the normal “Power to unlock”. Auxiliary release shall be sealed with lacquer or a wire after completed installation of the safety switch. Material is not supplied.

**Installation precautions**

- The safety switch may not be used as a mechanical stop!
- The actuator must be inserted into the head during the rotation of the head!
- Make sure that the head is properly attached to the switch body. A misaligned or loose head can lead to loss of the safety function.
- The device must be mounted on a plane surface.
- Secure the screws against self-loosening.

⚠️ Warning! All the safety functions **must** be tested before starting up the system.

**Maintenance**

⚠️ Warning!

The safety functions and the mechanics shall be tested regularly, at least once every year to confirm that all the safety functions are working properly (EN 62061:2005).

In order to maintain the safety level, regular inspections for tear and wear, as well as fixing and alignment of switch, actuator, brackets, doors etc should be carried out.

In case of breakdown or damage to the product, contact the nearest ABB/Jokab Safety Service Office or reseller. Do not try to repair the product yourself since it may accidentally cause permanent damage to the product, impairing the safety of the device which in turn could lead to serious injury to personnel.
5 Operation

JSNY8S

Spring to lock
JSNY8S “spring to lock”, i.e. the device is locked as soon as the actuator is inserted into the actuator head. By design, the locking cannot be activated unless the actuator is completely inserted into the actuator head.

Power to release
JSNY8S require “power to release”, i.e. the device requires power supplied to E1-E2 in order to unlock the actuator when inserted into the actuator head.

Contact states
The internal contacts (2 NC + 2 NC, “normal” state when machine is allowed to run) are all closed when the actuator is inserted into the actuator head and when the device is locked, i.e. when no power is supplied to E1-E2. Since the locking cannot be activated unless the actuator is completely inserted into the actuator head, the contacts used to monitor the locking can also be used to monitor the position of the movable guard.

JSNY8M

Power to lock
JSNY8M require “power to lock”, i.e. the device requires power supplied to E1-E2 in order to lock the device after the actuator has been inserted into the actuator head. By design, the locking cannot be activated unless the actuator is completely inserted into the actuator head.

Spring to release
JSNY8M “spring to release”, i.e. the device unlocks as soon as the power to E1-E2 is cut off.

Contact states
The internal contacts (2 NC + 2 NC, “normal” state when machine is allowed to run) are all closed when the actuator is inserted into the actuator head and when the device is locked, i.e. when power is supplied to E1-E2. Since the locking cannot be activated unless the actuator is completely inserted into the actuator head, the contacts used to monitor the locking can also be used to monitor the position of the movable guard.
6 Model overview

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSNYM 24 VDC</td>
<td>2TLJ020030R0000</td>
<td>JSNY8 safety switch with solenoid locking (power to lock). 24 VDC.</td>
</tr>
<tr>
<td>JSNY8S 24 VDC</td>
<td>2TLJ020030R0100</td>
<td>JSNY8 safety switch with spring locking (power to unlock). 24 VDC.</td>
</tr>
<tr>
<td>JSNYM 230 VAC</td>
<td>2TLJ020030R0500</td>
<td>JSNY8 safety switch with solenoid locking (power to lock). 230 VAC.</td>
</tr>
<tr>
<td>JSNY8S 230 VAC</td>
<td>2TLJ020030R1500</td>
<td>JSNY8 safety switch with spring locking (power to unlock). 230 VAC.</td>
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</tbody>
</table>

Accessories

Note that all brackets come with nuts and screws for use with ABB/Jokab Safety Quick-Guard fencing system. For further information, contact your local ABB/Jokab Safety sales office.

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<tr>
<th>Type</th>
<th>Article number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSM D4C</td>
<td>2TLJ040033R1600</td>
<td>Brackets for hinged door.</td>
</tr>
<tr>
<td>JSM D4D</td>
<td>2TLJ040033R1700</td>
<td>Brackets for sliding door.</td>
</tr>
<tr>
<td>JSNYEO</td>
<td>2TLJ020032R2000</td>
<td>Emergency opening pushbutton (for JSNY8S only).</td>
</tr>
<tr>
<td>JSNY8/9N1</td>
<td>2TLJ020032R0400</td>
<td>Standard actuator for JSNY8/9. Fixed, for actuating radius &gt;400 mm.</td>
</tr>
<tr>
<td>JSNY8/9N2</td>
<td>2TLJ020032R0500</td>
<td>Universal actuator for JSNY8/9. Flexible, for actuating radius &gt;150 mm.</td>
</tr>
</tbody>
</table>
## Technical data

### Manufacturer

| Address | ABB AB / JOKAB SAFETY  
Varlabergsvägen 11  
SE-434 39 Kungsbacka  
Sweden |

### Electrical characteristics

| Utilization category | AC12 250 V/10 A  
AC15 230 V/4 A |
<table>
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</thead>
<tbody>
<tr>
<td>Rated insulation voltage (U&lt;sub&gt;i&lt;/sub&gt;)</td>
<td>250 V</td>
</tr>
<tr>
<td>Rated thermal current (I&lt;sub&gt;th&lt;/sub&gt;)</td>
<td>10 A</td>
</tr>
<tr>
<td>Total current max (4 contacts)</td>
<td>10 A</td>
</tr>
<tr>
<td>Short circuit protection (fuse)</td>
<td>10 A slow-blow fuse or 16 A fast act. fuse</td>
</tr>
</tbody>
</table>

### Solenoid

| Duty cycle | 100 % ED (at E1;E2) |
| Temperature class | B (130°C) |
| Power consumption | 5.2 W |
| Switch operation (permanent) | Max 600/h |
| Operating voltage | 24 VDC or 230 VAC, depending on model |

### Mechanical data

| Material | Enclosure: Metallic  
Cover (lid): Metallic  
Actuating mechanism: PA 6 GV/Zn-GD  
Actuator: Steel/PA |
| Colour | Black, yellow label |
| Ambient temperature | -30...+60°C |
| Holding force (max) | Locked: 1000 N (GS-ET 19)  
Unlocked: approx 30 N |
| Switching function/contact configuration | Locking: 2 NC  
Movable guard: 2 NC |
| Mechanical life | 1 million operations (at max 600 operations/h) |
| Actuating radius (min) | Standard actuator: R<sub>min</sub> = 400 mm  
Universal actuator: R<sub>min</sub> = 150 mm |
| Actuating velocity (max) | V<sub>max</sub> = 1.5 m/s |
| Size | See drawings below |
| Weight | Approx 0.55 kg |
| Mounting | 4 x M5 screws ISO1207/DIN 84  
Max. torque: M=2 Nm ISO4762/DIN 912 |
| Cable size (max) | 2.5 mm² stranded wire |
| Terminals | 10 x M3 screw terminals |
| Ground terminals | 2 x M4 |
| Torque | 0.8...1.2 Nm |
| Cable entries | 2 x M20x1.5 |
| Protection class | IP67 according to IEC529 |
NB: 1 holding force test cycle according to GS-ET 19:
a) steady increase of holding force 100 N/s
b) keep max holding force for 5 s.

**Safety / Harmonized Standards**

<table>
<thead>
<tr>
<th>Conformity</th>
<th>European Machinery Directive 2006/42/EC</th>
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<tr>
<th>EN ISO 13849-1</th>
<th>Category 1</th>
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<td>B₁₀₀₅: 2,000,000</td>
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| Certificates | TÜV Nord, BG, CSA |

NB: A single JSNY8 can achieve performance level PL c according to EN ISO 13849 if used correctly with an ABB/Jokab Safety safety relay, Pluto safety-PLC or Vital safety module. If two JSNY8-switches are used for the same safety function, a performance level up to PL e can be achieved. Refer to EN ISO 13849 for details on how to achieve this if necessary.
Dimensions

JSNY8 dimensions

Actuator dimensions

JSNY8/9N1
Standard actuator

JSNY8/9N2
Universal actuator

NB: All measurements in millimetres.
8 EC Declaration of conformity

EC Declaration of conformity
(according to 2006/42/EC, Annex II)

We, ABB AB
JOKAB Safety
Varlabergsvägen 11
SE-434 39 Kungsbacka
Sweden

declare that the safety components of ABB AB manufacture with type
designations and safety functions as listed below, is in conformity with
the Directive

2006/42/EC

Authorised to compile the
technical file

ABB AB
JOKAB Safety
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SE-434 39 Kungsbacka
Sweden

Product
Lockable safety interlock switch
JSNY8
JSNYQ

Used harmonized standards

Jesper Kilsensson
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Kungsbacka 2011-12-06

www.abb.com
www.jokabsafety.com

Original