Original instructions

Tina 3A/Aps
Adaptor unit
Read and understand this document

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1 Introduction

Scope
The purpose of these instructions is to describe the adaptor units Tina 3A/Aps 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 machine safety.

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

⚠️ Warning! ⚠️
Danger of severe personal injury!
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

ABB Jokab Safety adaptor units are used to adapt conventional safety sensors where the safety relies on e.g. one- or two-channel static signals, OSSD outputs, or short circuit detection, to the dynamic safety circuit monitored by a Vital safety module or Pluto safety-PLC.

Tina 3A and Tina 3Aps are used to adapt safety sensors with mechanical contacts to the dynamic safety circuit. Examples of such safety sensors are emergency stops and switches or light curtains and light beams with internal relay outputs.

Tina 3A is intended for safety sensors prepared with an M20 threaded connector. This allows easy installation of the adaptor unit within the physical enclosure of the safety sensor while keeping the status LED visible on the outside of the housing. Tina 3A is also equipped with a 5-pole M12 connector for easy connection to the dynamic safety circuit. Tina 3Aps is identical to Tina 3A but is also equipped with two additional connection cables for external power supply.

The Tina3A/Aps adaptor unit is intended for use in safety circuits in accordance with EN 60204-1.

⚠️ Warning! In order to maintain the highest safety level and reduce the risk of electrical interference the unit must be installed within the same physical encapsulation as the safety device. The connection cables should be as short as possible (max 150 mm).

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.
3 Connections

Connection cables:
Brown: +24 VDC (Tina 3Aps only)
Blue: 0 VDC (Tina 3Aps only)
Green: Safety loop A1-A2
Orange: Safety loop B1-B2

5-pole M12 connector:
1) Brown: +24 VDC
2) White: Dynamic signal input
3) Blue: 0 VDC
4) Black: Dynamic signal output
5) Grey: Information

NB: The connection cable cross section area is 0.34 mm² and cable length is 150 mm.

Caution! All cable colours according to ABB Jokab Safety standard cables.

Caution! The safety loop cables (green and orange) should not be extended. The cables should be as short as possible as longer cables increase the risk for electrical interference.

Warning!
The information channel output shall never be used for the safety purpose(s).

The connection cables are not monitored and must therefore be installed within the same physical enclosure as the safety device to maintain the highest safety level (fault exclusion, refer to EN ISO 13849-2:2003 Annex D).

The safety loops shall not be used for purposes other than intended. All loading or tampering with loops can lead to serious risk of life.
Connection examples

Tina 3A

Caution! All cable colours according to ABB Jokab Safety standard cables.
Caution! All cable colours according to ABB Jokab Safety standard cables.
4 Installation and maintenance

Installation precautions

The unit must first attach to the M20 connector before the safety loops are connected to the sensor.

⚠️ 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 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.

Testing of the safety functions

Make sure the safety unit is working properly by following these steps:

- Interrupt the dynamic safety circuit before this unit. The LED should flash between green and red.
- Interrupt protection. The LED should light red.
- The LED should light green when protection is OK and if the safety circuit(s) before this unit is not interrupted.

Troubleshooting

<table>
<thead>
<tr>
<th>LED indication</th>
<th>Expected causes of faults</th>
<th>Checking and measures to take</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lights red</td>
<td>Sensor pushed/opened</td>
<td>Check status of the sensor</td>
</tr>
<tr>
<td></td>
<td>Bad connection between loops (green and/or orange) and sensor terminals</td>
<td>Check terminals and fasten them carefully</td>
</tr>
<tr>
<td></td>
<td>24 VDC input to pin-2 (no dynamic signal)</td>
<td>Check if there is 24 VDC to input (pin-2). If Yes, check cable or unit before and fix it.</td>
</tr>
<tr>
<td>No lights</td>
<td>Loss of power supply</td>
<td>Check 24 VDC / 0 VDC power supply</td>
</tr>
<tr>
<td>Lights green (but no dynamic output detected)</td>
<td>Defected dynamic signal input to unit (asymmetric pulses)</td>
<td>Check the dynamic input or the unit before</td>
</tr>
<tr>
<td>Weak lights or red and green lights at the same time</td>
<td>The unit is defect</td>
<td>The unit needs to be replaced. Contact ABB Jokab Safety.</td>
</tr>
</tbody>
</table>

NB: Tina 1A can be used instead of this unit to check if the safety circuit is OK (only for test).

⚠️ Warning! Replace defected unit with a new one and never bypass the safety circuit using Tina 1A or any other solution.
### 5 Operation

#### LED indication

<table>
<thead>
<tr>
<th>LED on Tina</th>
<th>LED Indication</th>
<th>Description</th>
<th>Input signal on pin-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Safety circuit closed (protection OK)</td>
<td>Dynamic signal in</td>
<td></td>
</tr>
<tr>
<td>Green-Red (flash)</td>
<td>Safety circuit open (protection OK)</td>
<td>No dynamic signal or 0 VDC in</td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>Safety circuit interrupted (protection open)</td>
<td>+24 VDC in or safety circuit interrupted</td>
<td></td>
</tr>
</tbody>
</table>

#### Information output signal attributes

The information output of the unit (pin-5) is set either high (+24 VDC) or low (0 VDC) depending on four different input signals (pin-2):

- **Dynamic signal** - Dynamic signal input exist, i.e. the safety circuit is OK up until this unit.
- **No dynamic signal** - Dynamic signal input does not exist, i.e. the safety circuit is interrupted before this unit.
- **+24 VDC** - A constant +24 VDC signal is applied = high (H)
- **0 VDC** - The pin is connected to 0 VDC = low (L)

The information output signal depends on the input signal according to the table below. Note that if the safety is interrupted the information output signal is always low (L).

<table>
<thead>
<tr>
<th>Input signal (pin-2)</th>
<th>Dynamic signal</th>
<th>No dynamic signal</th>
<th>+24 VDC</th>
<th>0 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Info output signal (pin-5)</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

The delay for switching the information signal output from high to low (H → L) and low to high (L → H) is given in the table below.

<table>
<thead>
<tr>
<th>Info output signal switch</th>
<th>H → L</th>
<th>L → H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay</td>
<td>~ 12 ms</td>
<td>~ 0 ms</td>
</tr>
</tbody>
</table>

**NB:** If the unit detects an error (short circuit or interruption) lasting shorter than 13 ms the information output signal is set to low for 1.2 s (1200 ms) and then set to high again. This does not affect Vital since it needs 38 ms to release. Pluto however does release, which means that a filter (20 ms) must be implemented if this function is needed.

**WARNING!** The information output signal is not a failsafe signal and should **never** be used for the safety purpose(s).
## Technical data

### Manufacturer

<table>
<thead>
<tr>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABB JOKAB SAFETY</td>
</tr>
<tr>
<td>Varlabergsvägen 11</td>
</tr>
<tr>
<td>SE-434 39 Kungsbacka</td>
</tr>
<tr>
<td>Sweden</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Article number/Ordering data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tina 3A: 2TLA020054R0200</td>
</tr>
<tr>
<td>Tina 3Aps: 2TLA020054R1400</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Operating voltage</th>
<th>24 VDC +15 %, -25 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total current consumption</td>
<td>47 mA (57 mA with max information output) Information output: Max 10 mA</td>
</tr>
<tr>
<td>Time delay t (in/out)</td>
<td>t &lt; 70 µs</td>
</tr>
<tr>
<td>Current through safety device contacts</td>
<td>12 mA</td>
</tr>
<tr>
<td>Short circuit current between contacts</td>
<td>10 mA</td>
</tr>
<tr>
<td>Voltage supply at normal operation (protection OK) and 24 VDC supply voltage</td>
<td>Dynamic input: between 9 and 13 volt (RMS) Dynamic output: between 9 and 13 volt (RMS) Information output: ~ 23 VDC</td>
</tr>
</tbody>
</table>

### General

<table>
<thead>
<tr>
<th>Protection class</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP67</td>
</tr>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Humidity range</td>
</tr>
<tr>
<td>Housing material</td>
</tr>
<tr>
<td>Connectors</td>
</tr>
<tr>
<td>Size</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>Colour</td>
</tr>
</tbody>
</table>

### Safety / Harmonized Standards

<table>
<thead>
<tr>
<th>Conformity</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Machinery Directive 2006/42/EC</td>
</tr>
<tr>
<td>IEC/EN 61508-1...7</td>
</tr>
<tr>
<td>EN 62061</td>
</tr>
<tr>
<td>EN ISO 13849-1</td>
</tr>
<tr>
<td>EN 954-1</td>
</tr>
<tr>
<td>Certificates</td>
</tr>
</tbody>
</table>
Dimensions

Tina 3A

Tina 3Aps

NB: All measurements in millimetres.

The Jokab Safety branded product with article number beginning with 2TLJ is fully compatible with the ABB branded product with article number beginning with 2TLA.
7 EC Declaration of conformity

EC Declaration of conformity

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

declare that the safety components of ABB AB make with type designations and safety functions as listed below, is in conformity with the Directives
2006/42/EC
2006/95/EC
2004/108/EC

Authorised to compile the technical file
ABB AB
JOKAB SAFETY
Varlabergsvägen 11
SE-434 39 Kungsbacka
Sweden

Product
Non-contact safety sensor Eden (Adam, Eva) E/C/EC
Adapter unit Tina 1-8, Tina 10-12
Muting unit FMC-Tina
Non-contact safety sensor Eden including locking function Magne 2A, 2B, 2AX, 2BX

Certificate
44 769 12 408341-003
44 769 12 408341-003
44 769 12 408341-003
44 769 12 408341-003

Serialnumber
[000 – 000 ... 999-999]
[000 – 000 ... 999-999]
[000 – 000 ... 999-999]
[000 – 000 ... 999-999]

Certification body
TÜV NORD CERT GmbH
Langermarkstrasse 20
45141 Essen
Germany

Used harmonized standards

Other used standards
EN 61508:2010

Jesper Kristensson
PRU Manager
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