Read and understand this document

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1 Introduction

Scope
The purpose of these instructions is to describe the adaptor unit Tina 6A 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 6A is used to adapt safety sensors that rely on the detection of short circuits to the dynamic safety circuit. Examples of such safety sensors are safety mats with relay outputs and safety sensors using safety contact rails.

Tina 6A is equipped with a male 5-pole M12-connector for quick installation to the dynamic safety circuit and a female 5-pole M12-connector for easy connection to the safety sensor. The unit is also equipped with a LED for visual status information of the safety sensor and the dynamic safety circuit.

The Tina 6A adaptor unit is intended for use in safety circuits in accordance with EN 60204-1.

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

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

Caution! The safety loop cables (1-4 on the female M12 connector) should be as short as possible to reduce the risk for electrical interference (max 150 mm).

Warning!

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

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.

<table>
<thead>
<tr>
<th>M12 connector (male):</th>
<th>M12 connector (female):</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ) Brown:</td>
<td>1 ) Brown: Loop-A1</td>
</tr>
<tr>
<td>2 ) White: Dynamic signal input</td>
<td>2 ) White: Loop-A2</td>
</tr>
<tr>
<td>3 ) Blue: 0 VDC</td>
<td>3 ) Blue: Loop-B1</td>
</tr>
<tr>
<td>4 ) Black: Dynamic signal output</td>
<td>4 ) Black: Loop-B2</td>
</tr>
<tr>
<td>5 ) Grey: Information</td>
<td>5 ) Grey: Not used</td>
</tr>
</tbody>
</table>

M12 connector (male): 5-pole M12 male connector
M12 connector (female): 5-pole M12 female connector

M12 5-pole male seen from cable side
M12 5-pole female seen from cable side
Connection examples

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

Installation precautions

The unit must first attach to the M12 male connector and then the M12 female connector with the loops to the door edges or safety mats.

⚠️ 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 open</td>
<td>Check status of the sensor</td>
</tr>
<tr>
<td></td>
<td>Bad connection between loops</td>
<td>Check terminals at the door sensitive edges 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>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 in 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).
## 6 Technical data

### Manufacturer

| Address | ABB JOKAB SAFETY  
Varlabergsvägen 11  
SE-434 39 Kungsbacka  
Sweden |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Article number/Ordering data</td>
<td>Tina 6A: 2TLA020054R0600</td>
</tr>
</tbody>
</table>

### Power supply

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

### General

| Protection class | IP67 |
| Ambient temperature | Storage: -30...+70°C  
Operation: -10...+55°C |
| Humidity range | 35 to 85 % (with no icing or condensation) |
| Housing material | PVC |
| Connectors | M12 5-pole male  
M12 5-pole female |
| Size | 62 x 33 x 15 (L x W x H) |
| Weight | ~ 30 g |
| Colour | Black |

### Safety / Harmonized Standards

| Conformity | European Machinery Directive 2006/42/EC  
EN ISO 12100-1:2003, EN ISO 12100-2:2003,  
EN 62061:2005 |
| IEC/EN 61508-1...7 | SIL3, PFHₐ: 4.50*10⁻⁹ |
| EN 62061 | SIL3 |
| EN ISO 13849-1 | Performance level: Pl e, category 4 |
| EN 954-1 | Category 4 |
| Certificates | TÜV Nord, cCSAus |
Dimensions

Tina 6A

NB: All measurements in millimetres.
## 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

<table>
<thead>
<tr>
<th>Product</th>
<th>Certificate</th>
<th>Serialnumber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-contact safety sensor Eden (Adam, Eva) E/C/EC</td>
<td>44 207 10 372092-001</td>
<td>[000 – 000 ... 999-999]</td>
</tr>
<tr>
<td>Adapter unit Tina 1-B, Tina 10-12</td>
<td>44 207 10 372092-001</td>
<td>[000 – 000 ... 999-999]</td>
</tr>
<tr>
<td>Muting unit FMC-Tina</td>
<td>44 207 10 372092-001</td>
<td>[000 – 000 ... 999-999]</td>
</tr>
<tr>
<td>Muting unit FMC-Tina</td>
<td>44 207 10 372092-001</td>
<td>[000 – 000 ... 999-999]</td>
</tr>
<tr>
<td>Muting unit FMC-Tina</td>
<td>44 207 10 372092-001</td>
<td>[000 – 000 ... 999-999]</td>
</tr>
<tr>
<td>Notified body</td>
<td>TÜV NORD CERT GmbH</td>
<td>Langemarckstrasse 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45141 Essen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Germany</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Notified body No. 0044</td>
</tr>
<tr>
<td>Used harmonized standards</td>
<td>EN ISO 12100-1,-2, EN 954-1, EN ISO 13849-1, EN 62061, EN 60204-1, IEC 60664-1, EN 61000-6-2, EN 81000-6-4, EN 60947-5-1, EN 1088</td>
<td></td>
</tr>
</tbody>
</table>

Mats Linger
MD
Kungsbacka 2011-03-02