

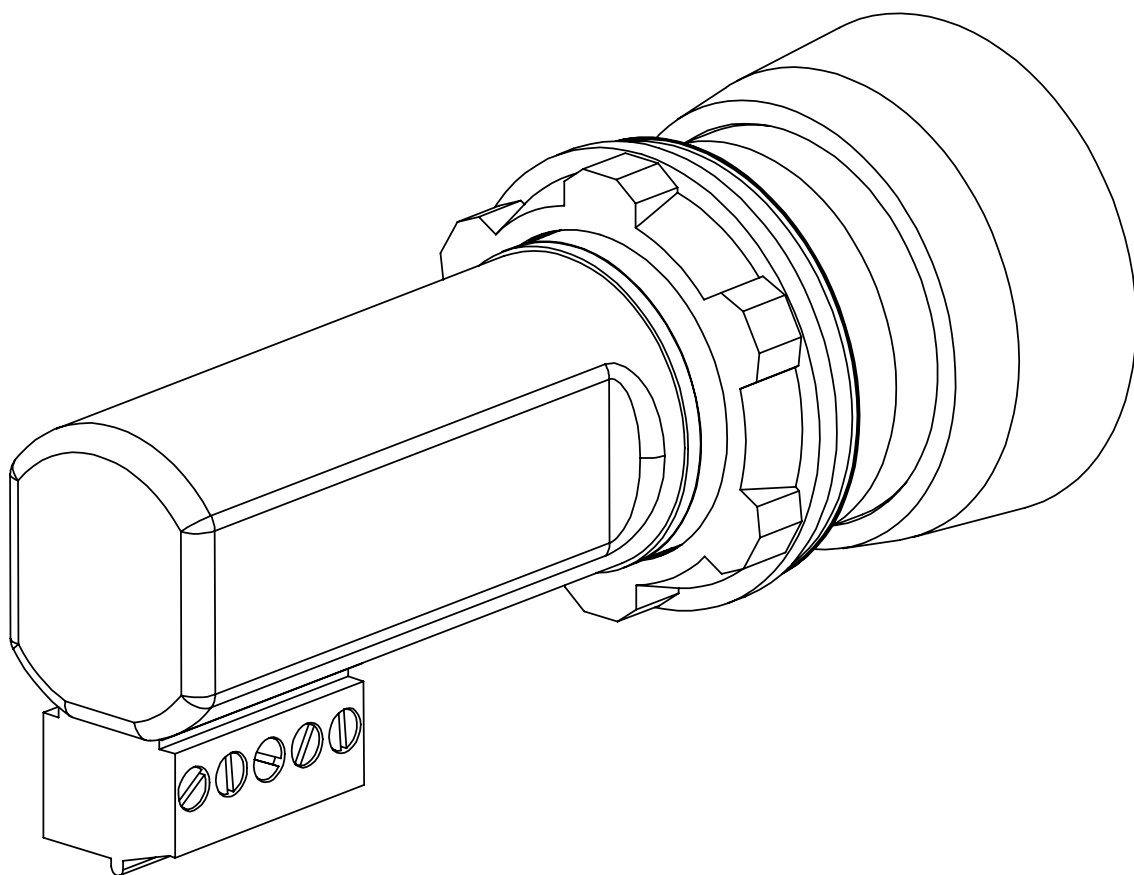
Original Instructions

INCA 1 Tina **INCA 1EC Tina**

**Emergency stop for cabinet
mounting**

INCA 1S Tina **INCA 1SC Tina**

**Secure machine stop for
cabinet mounting**



Please read and understand the contents of this User Manual

Please read and understand this manual before using the products. Please consult your ABB JOKAB SAFETY representative if you have any questions or comments.

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Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this manual.

Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, and installations subject to separate industry or government regulations.

Systems, machines, and equipment that could present a risk to life or property.

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NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE ABB JOKAB SAFETY PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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Table of Contents

1	Introduction	4
	Scope	4
	Readers	4
	Prior knowledge	4
	Special notes	4
2	Overview	5
	General description.....	5
	Safety instructions	5
3	Connections	6
	Electrical connections	6
	Connection example INCA Tina	7
4	Installation and maintenance	8
	Installation precautions	8
	Maintenance	8
	Testing of safety functions	8
	Troubleshooting	8
5	Operation	9
	LED indication.....	9
	LED indicator for StatusBus.....	9
	Info output (Pin 5) – info-signal/StatusBus	10
	Attributes for Info signal	10
	Connection example INCA Tina StatusBus.....	11
6	Model overview.....	12
	Accessories.....	12
7	Technical data	13
	Dimensions	15
8	EC Declaration of conformity	16

1 Introduction

Scope

The purpose of these instructions is to describe the INCA 1 Tina and INCA 1EC Tina emergency stops and the INCA 1S Tina and INCA 1SC Tina secure machine stops and to provide the requisite installation and operation information.

Readers

This document is intended for authorised installation staff.


Prior knowledge

It is assumed that the reader of this document has knowledge of the following:

- Basic knowledge of products from ABB Jokab Safety.
- General knowledge of machine safety.

Special notes

Pay attention to the following special notes throughout the whole document:

-  **Warning!** Risk of severe personal injury!
An instruction, directive or procedure which, if not performed correctly, could result in injury to the operator or other staff.
- Caution!** Risk of damage to the equipment!
An instruction, directive or procedure which, if not performed correctly, could result in damage to the equipment.
- Note!** Notes are used to provide important or explanatory information.


2 Overview

General description

INCA 1 Tina is an emergency stop which is designed for mounting in a 22.5-mm opening in the equipment cabinet. INCA Tina is designed for use in safety circuits in accordance with EN 60204-1.

There is also an INCA 1S Tina with black stop button, designed as a secure machine stop. In addition, there are INCA 1EC Tina and INCA 1SC Tina which are an emergency stop and secure machine stop with less installation depth and StatusBus.

INCA Tina has been adapted for use with the dynamic safety circuit and must be connected to either the Vital safety module or Safety Pluto PLC. For INCA Tina with StatusBus, the master unit (Pluto) reads the status of each individual unit in the safety circuit. INCA Tina with StatusBus comes configured for static information output, but switches to StatusBus configuration when the StatusBus has been detected.

 **Warning!** The INCA Tina emergency stop normally needs to be supplemented with other safety functions such as an interlock switch. Needs according to risk analysis.

Note! The emergency stop (INCA 1 Tina/INCA 1EC Tina) must **not** be used for normal stoppages of the machine, but only in cases of emergency.

Safety instructions

 **Warning!**

Carefully read through the entire user manual before using the unit.

The units must be installed by a trained electrician who observes the safety regulations, the specified standards and the Machinery Directive.

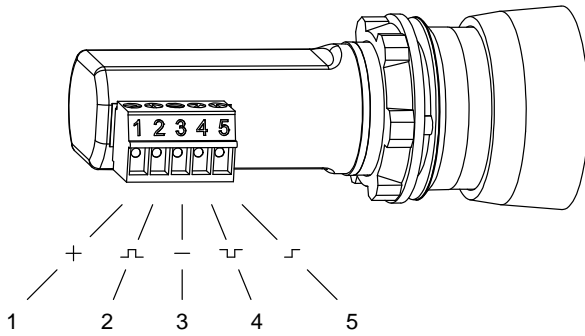
Failure to comply with these instructions, any operation that is not in accordance with what is stated in these instructions, and the improper installation or handling of the unit can all impact on the safety of people and equipment.

For installation and the prescribed use of the product, the special notes indicated must be carefully observed and the technical standards relevant to the application must be complied with.

Failure to comply with the instructions or standards, especially when tampering with and/or modifying the product, voids all liability.

3 Connections

Electrical connections



INCA Tina

5-pin terminal block

- 1) +24 VDC
- 2) Dynamic signal in
- 3) 0 V
- 4) Dynamic signal out
- 5) Information output*

*For INCA 1EC Tina and INCA 1SC Tina: Information/StatusBus output

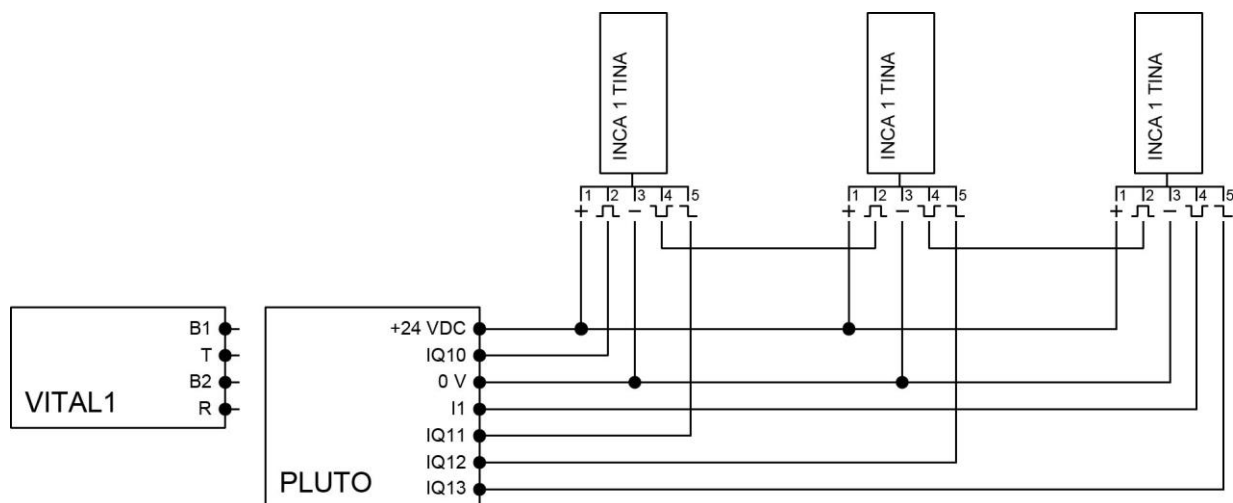
Note! A shielded cable is recommended between this unit and the rest of the safety circuit.

Caution! Follow the pin numbers as labelled on the unit.

Warning! The information output is unsafe and therefore should **never** be used to manage a safety application.

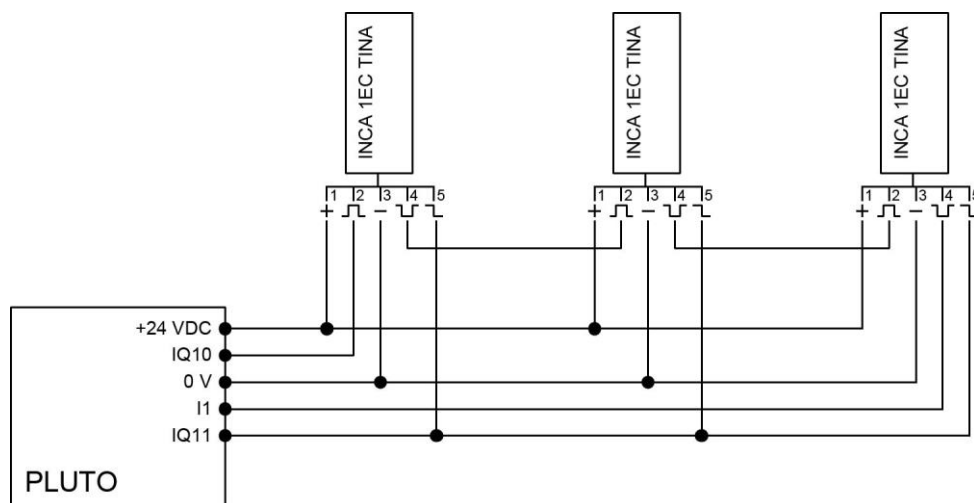
Connection example INCA Tina

Example 1 – INCA 1 Tina to Vital or Pluto



Three INCA 1 Tina with static information output connected in a dynamic loop to the Vital safety module or Safety PLC Pluto.

Example 2 – INCA 1EC Tina to Pluto




Three INCA 1EC Tina with StatusBus connected in a dynamic circuit to Safety PLC Pluto.

4 Installation and maintenance

Installation precautions

Start by fitting INCA Tina in the cabinet, and then attach and tighten the M22 nut. Finish by connecting the manifold block.

 **Warning!** All the safety functions **must** be tested prior to the system being started.

Maintenance

 **Warning!**

The safety functions and mechanism should be tested regularly, at least annually, to ensure that all the safety functions are working properly (EN 62061:2005).

Contact your local ABB Jokab Safety Service point or distributor in the event of a breakdown or damage to the product. Do not attempt to repair the product as it may cause permanent damage and impair the safety of the unit which in turn could lead to serious personal injury.

Testing of 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 (i.e. press the emergency stop button). The LED should light red.
- The LED should light green when the safety circuit is closed (protection OK) and the safety circuit has not previously been broken.

Troubleshooting

LED indicator	Expected causes of faults	Checks and measures to take
Lights red	The emergency stop button has been pressed.	Turn the button clockwise and pull it up.
	+24 VDC input to pin 2 (no dynamic signal).	Check for +24 VDC power at the input (pin 2). If this is the case, check the cable or unit before this and fix the problem.
LED off	No power supply.	Check for +24 V DC/0 V power supply.
Lights green (but no dynamic output detected)	Defective dynamic input signal to the unit (asymmetric pulses).	Check the dynamic input signal to the unit before this.
A weak light, or red and green lights at the same time	The unit is defective.	The unit must be replaced. Contact ABB Jokab Safety.

Note! Tina 1A can be used instead of this unit to check if the safety circuit is working correctly (**only** for testing).

 **Warning!** Replace a defective unit with a new one and **never** connect by bypassing the safety circuit using Tina 1A or another solution.

5 Operation

LED indication

Indicator	Description	Probable cause
Green	Safety circuit closed (protection OK).	Dynamic signal in (pin 2).
Green-red (flashes ~ 1 Hz)	Safety circuit is open (protection OK).	No dynamic signal in <u>or</u> 0 V in (pin 2).
Red	Safety circuit is broken (protection open).	+24 VDC in (pin 2) <u>or</u> safety circuit interrupted.

LED indicator for StatusBus

Indicator	Description	Probable cause
Double flash, red 0.11/0.2/0.11/0.67 s, on/off/on/off (+/-10% accepted)	Sensor in StatusBus mode, off. "Ready slave" address 0	Sensor not addressed.
Double flash, green 0.11/0.2/0.11/0.67 s, on/off/on/off	Sensor in StatusBus mode, on. Address 0.	Sensor not addressed.
Off for 5 sec, then flickering flash 0.07/1.9 s, on/off	The flashing usually lasts for 1-4 seconds during the addressing process. Sensor in StatusBus mode, address 31.	If the condition lasts for more than 4 seconds: Sensor failure when addressing, change address.
Scours with stress flash. Scouring cycle: 0.8/0.4 s, on/off Flash frequency: 0.02/0.03 s, on/off	At the command from Pluto Manager.	Sensor identification.

Info output (Pin 5) – info-signal/StatusBus

Info output, pin 5, has two functions for INCA 1EC Tina and INCA 1SC Tina.

At delivery, the info output, pin 5, is configured as a static information output. This means it is high (+24 VDC) when the emergency button is unaffected (circuit OK) and low when the button is pressed (stop). See connection example for INCA Tina.

Info output, pin 5, can also be connected to the StatusBus. A number of units are connected from pin 5 to Safety-PLC Pluto. Pluto serves as the master in a StatusBus system and can receive status information (on/off) from INCA and other types of sensors. Up to 30 sensors can be connected to the same StatusBus.

For more information about the StatusBus, refer to the user manual for Pluto at www.abb.com/jokabsafety.


Attributes for info signal

The static info signal depends on the input signal according to the table below. Note that the info signal is always low (L) if safety is interrupted; i.e. if the emergency stop button is pressed.

Input signal on pin 2	Dynamic signal	No dynamic signal	+24 VDC	0 V
Info signal (pin 5)	High	High	Low	High

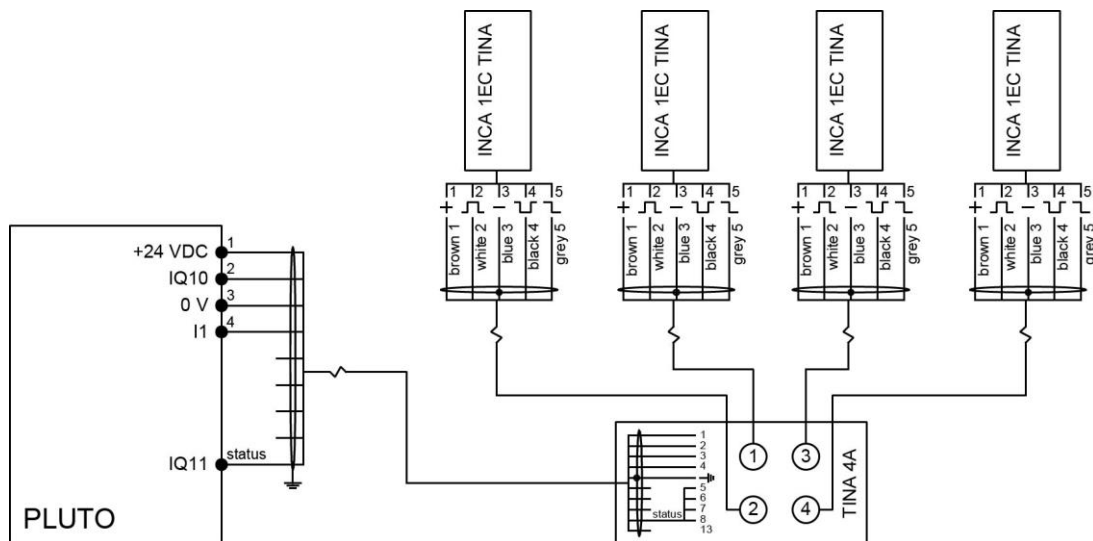
The delay for when the info signal switches from high to low (H → L) and from low to high (L → H) is given in the table below.

Switching of info signal	H → L	L → H
Delay INCA 1 Tina/INCA 1S Tina	~ 12 ms	~ 0 ms
Delay INCA 1EC Tina/INCA 1SC Tina	~ 40 ms	~ 30 ms

 **Warning!** The information output is unsafe and therefore should **never** be used to manage a safety application.

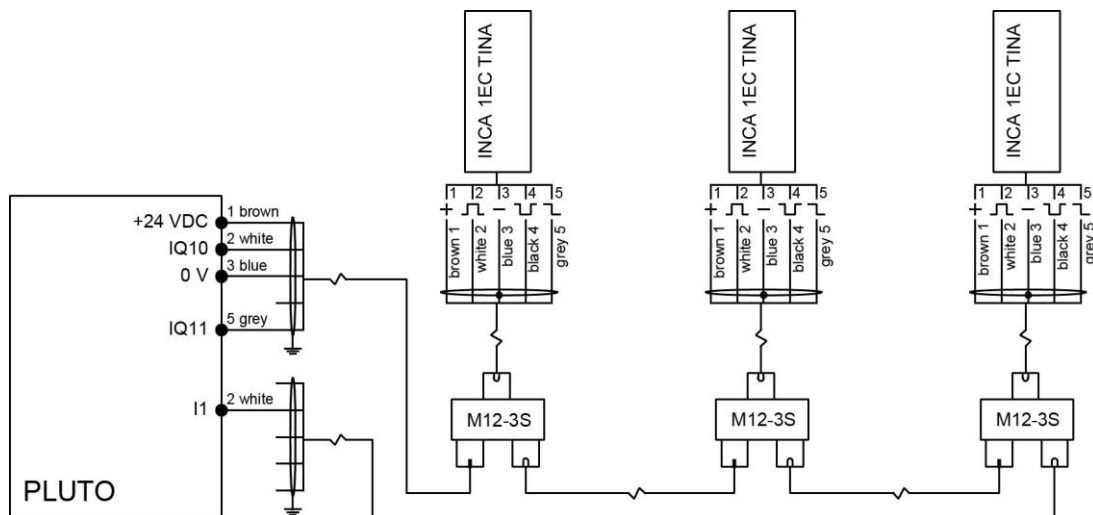
Connection example INCA Tina StatusBus

Example 1 – INCA Tina via Tina 4A to Pluto



Four INCA 1EC Tina with StatusBus connected in a dynamic circuit via Tina 4A to Safety PLC Pluto.

Example 2 – INCA Tina with M12-3S to Pluto



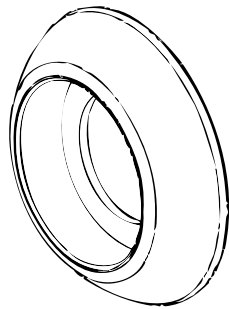
Three INCA 1EC Tina with StatusBus connected in a dynamic circuit with M12-3S to Safety PLC Pluto.

6 Model overview

Type	Article number	Description
INCA 1 Tina	2TLA030054R0000	Emergency stop, red button, 5-pin terminal block
INCA 1S Tina	2TLA030054R0200	Secure machine stop, black button, 5-pin terminal block
INCA 1EC Tina	2TLA030054R1400	Emergency stop, red button, 5-pin terminal block, reduced installation depth, StatusBus
INCA 1SC Tina	2TLA030054R1500	Secure machine stop, black button, 5-pin terminal block, reduced installation depth, StatusBus

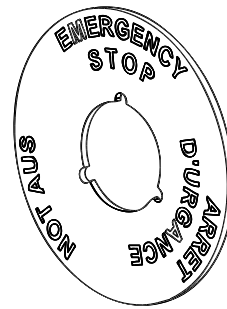
Accessories

Type	Article number	Description
Front ring	2TLA030054R0400	Front ring, yellow, for INCA
Emergency stop sign	2TLA030054R0500	Ø 22.5 mm, Swedish, Danish, Finnish
Emergency stop sign	2TLA030054R0600	Ø 22.5 mm, English, French, German



Front ring, yellow, for INCA

Article number:
2TLA030054R0400



Emergency stop sign

Article number:
SV, DA, FI: 2TLA030054R0500
EN, FR, DE: 2TLA030054R0600

Products from ABB Jokab Safety with part numbers that start with 2TLJ are fully compatible with ABB products that have a part number starting with 2TLA.

7 Technical data

Manufacturer

Address ABB JOKAB SAFETY
Varlabergsvägen 11
SE-434 39 Kungsbacka, Sweden

Voltage supply

Operating voltage	+24 VDC +15 %, -25 %	
Power consumption	INCA 1 Tina/INCA 1S Tina:	47 mA (57 mA with maximum info signal out)
	INCA 1EC Tina/INCA 1SC Tina:	23 mA (33 mA with maximum info signal out)
	Info signal out:	Maximum 10 mA
Time delay t (in/out)	INCA 1 Tina/INCA 1S Tina:	t < 70 μ s
	INCA 1EC Tina/INCA 1SC Tina:	t < 30 μ s
Voltage supply at normal operation (protection OK) and +24 VDC voltage	Dynamic input signal: between 9 and 13 volts (RMS) Dynamic output signal: between 9 and 13 volts (RMS) Info signal out: ~ 23 VDC	

General


Enclosure class	IP65, connection terminal IP20
Ambient temperature	Storage: -30...+70°C Operation: -10...+55°C
Air humidity	35 to 85 % (without icing or condensation)
Material (enclosures)	Polyamide PA66, Macromelt, thermoplastic polyester PBT, Polypropylene PP, UL 94 V0
Contact material	Gold plated silver alloy
Contacts	5-pin terminal block
Size	See drawing
Weight	~ 45 g
Colour	Yellow base, red or black button
Actuating force (Emergency-stop button)	22 +/- 4 N
Actuating movement	~ 4 mm to locking
Mechanical life	> 50,000 cycles
Strength (half-sine)	Max. 150 m/s ² , pulse length 11 ms, 3-axis, (as per EN IEC 60068-2-27)
Vibration resistance (half-sine)	Max. 50 m/s ² , at 10 Hz, 10 cycles, 3-axis, (as per EN IEC 60068-2-6)

Climate resistant

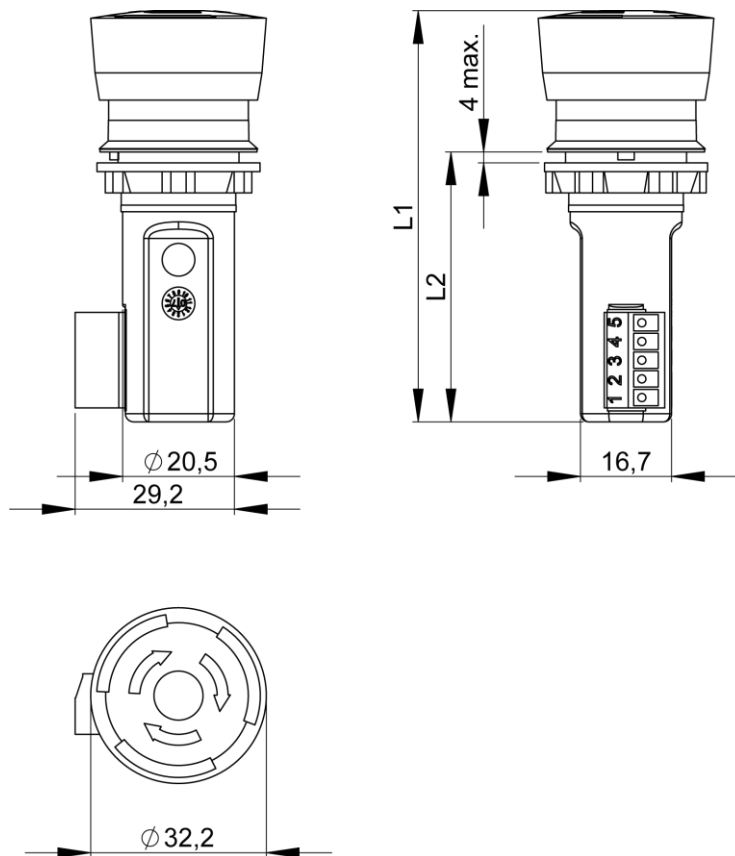
Damp heat, cyclical	96 hours, +25°C/97 %, +55°C/93 % relative humidity, as per EN IEC 60068-2-30
Damp heat, sustained	56 days, +40°C/93 % relative humidity, as per EN IEC 60068-2-78
Dry heat	96 hours, +70°C, as per EN IEC 60068-2-2
Cooling	96 hours, -40°C, as per EN IEC 60068-2-1
Salt mist	96 hours, +35°C in a chemical solution with NaCl as per EN IEC 60068-2-11

Safety/Harmonised standards

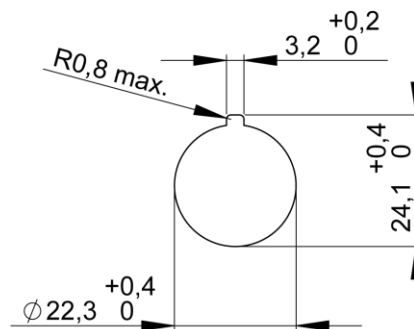
Conformity	2006/42/EC 2006/95/EC CE EN ISO 12100:2010, EN ISO 13849-1:2008, EN 62061:2005, EN 61508:2010, EN 60204-1:2006+A1:2009, IEC 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2007, EN 60947-5-5:2005, EN ISO 13850:2006
IEC/EN 61508-1...7	SIL3, PFH _d : 4.66 x 10 ⁻⁹
EN 62061	SIL3
EN ISO 13849-1	Performance level: PLe, cat4
Certification	TÜV Nord

 **Warning!** The maximum number of operations (cycles) for the INCA Tina emergency stop is 6050.

Dimensions



	L1	L2
INCA 1EC Tina INCA 1SC Tina	75,5	49,5 ±0,5
INCA 1 Tina INCA 1S Tina	80	54 ±0,5



Mounting cut-out

Note! All measurements are given in millimetres.

8 EC Declaration of conformity



EC Declaration of conformity

(according to 2006/42/EC, Annex2A)

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

<u>Product</u>	<u>Certificate</u>	<u>Serialnumber</u>
Emergency stop device Smile Tina	44 799 13 145203	[000 – 000 ... 999-999]
Emergency stop device Inca-Tina	44 799 13 145203	[000 – 000 ... 999-999]

Certification body

TÜV NORD CERT GmbH
Langemarckstrasse 20
45141 Essen
Germany

Used harmonized standards

EN ISO 12100:2010, EN ISO 13849-1:2008, EN 62061:2005,
EN 60204-1:2006+A1:2009, IEC 60664-1:2007, EN 61000-6-2:2005,
EN 61000-6-4:2007, EN 60947-5-5:2005, EN ISO 13850:2006

Other used standards

EN 61508:2010



Jesper Kristensson
PRU Manager
Kungsbacka 2015-09-19