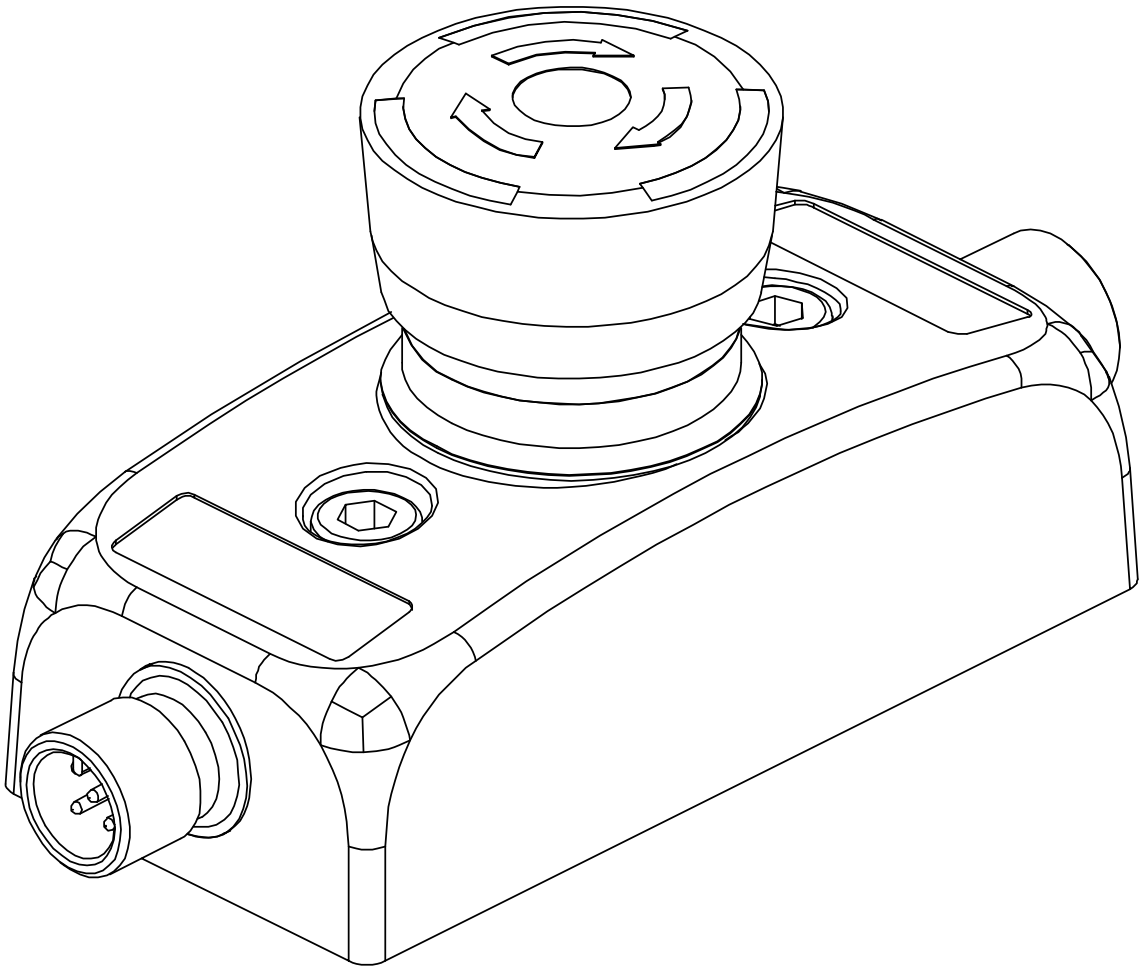
Original instructions

Smile Tina

Emergency stop with indication



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www.abb.com/jokabsafety

Read and understand this document

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

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Table of Contents

1 Introduction

Scope

The purpose of these instructions is to describe the emergency stop Smile Tina 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

Smile is a small size emergency stop that is easy to install wherever needed. Equipped with M12 connections or cable and centralized mounting holes Smile Tina is easy to install, especially on aluminum extrusions. Smile is available in modelsupp safety circuits to be connected to safety relays. Each model is available with either one or two M12 connectors or with cable. Models with two M12-connectors are used for serial connection of emergency stops, for example in dynamic safety circuits to fulfill PL e in according to EN ISO 13849. A LED lamp in the top of the emergency button indicates the present status of the safety circuit. In addition, a Smile model with black button is available to be used as safety stop.

For Smile Tina with status bus the Pluto master unit checks the status of each separate unit in the safety circuit. At delivery, Smile Tina with status bus is configured for static information, but switches to status bus configuration when such information is detected. Smile Tina is intended for use in safety circuits according to EN 60204-1.

⚠ **Warning!** The Smile Tina emergency stop normaly needs to bee supplemeted with other safety functions such as interlocking guards etc. Refer to risk analysis.

NB: The emergency stop (Smile 11E- Tina) shall **not** be used as normal stop of the machine, only in case of emergency.

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.

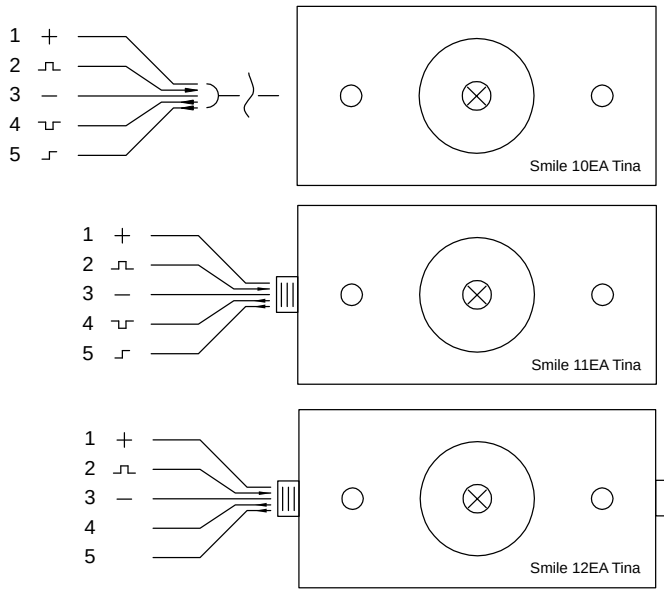
Failure to comply with instructions, operation that is not in accordance with the use prescribed in these instructions, improper installation or handling of the device can affect the safety of people and the plant.

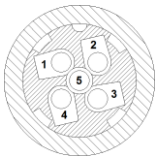
For installation and prescribed use of the product, the special notes in the instructions must be carefully observed and the technical standards relevant to the application must be considered.

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

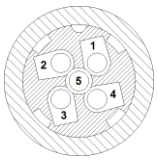
3 Connections

Electrical connections – Smile Tina





M12 5-pole male
seen from cable side



M12 5-pole female
seen from cable side

Smile 10EA Tina

5-pole wired

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

Smile 11EA Tina

M12 5-pole male

1) +24 VDC
2) Dynamic signal input
3) 0 VDC
4) Dynamic signal output
5) Information output*

Smile 12EA Tina

Input

M12 5-pole male

1) +24 VDC
2) Dynamic signal input
3) 0 VDC
4) Not used
5) *

Output

M12 5-pole female

1) +24 VDC
2) Dynamic signal input
3) 0 VDC
4) Not used
5) Information output*

* For Smile Tina EC and Smile Tina SC; 5) Grey:Information output/Status bus output

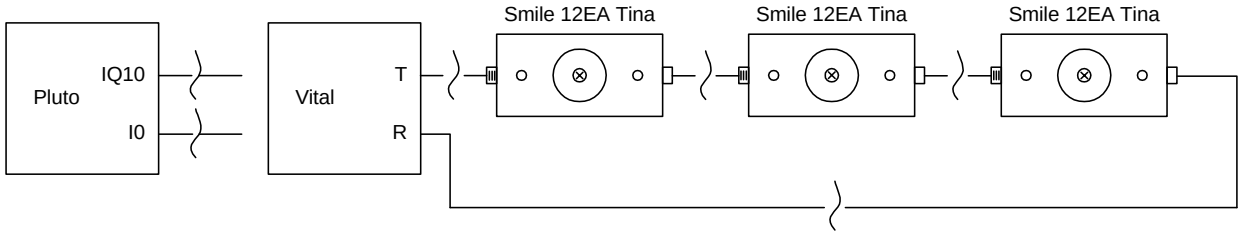
NB: Shielded cable is recommended between this unit and the rest of the safety circuits.

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

Connection examples

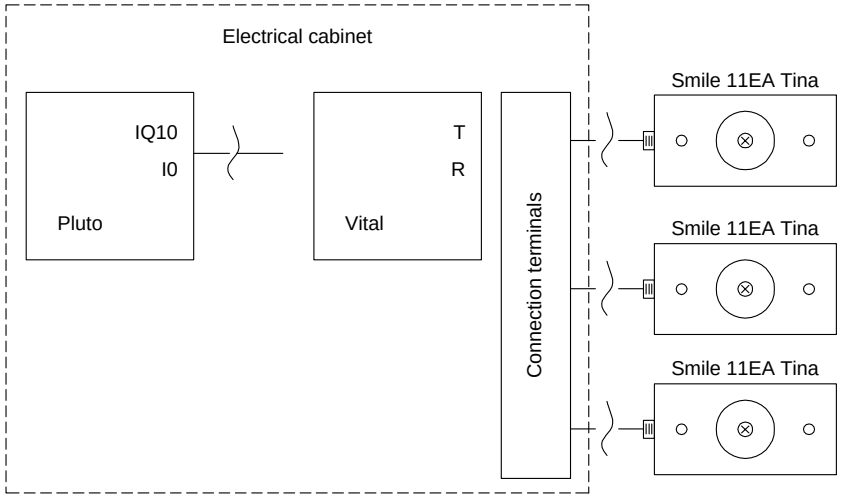
Connection example – Smile 12EA Tina

Three Smile 12EA Tina connected in series to Vital safety monitor or Pluto safety-PLC.



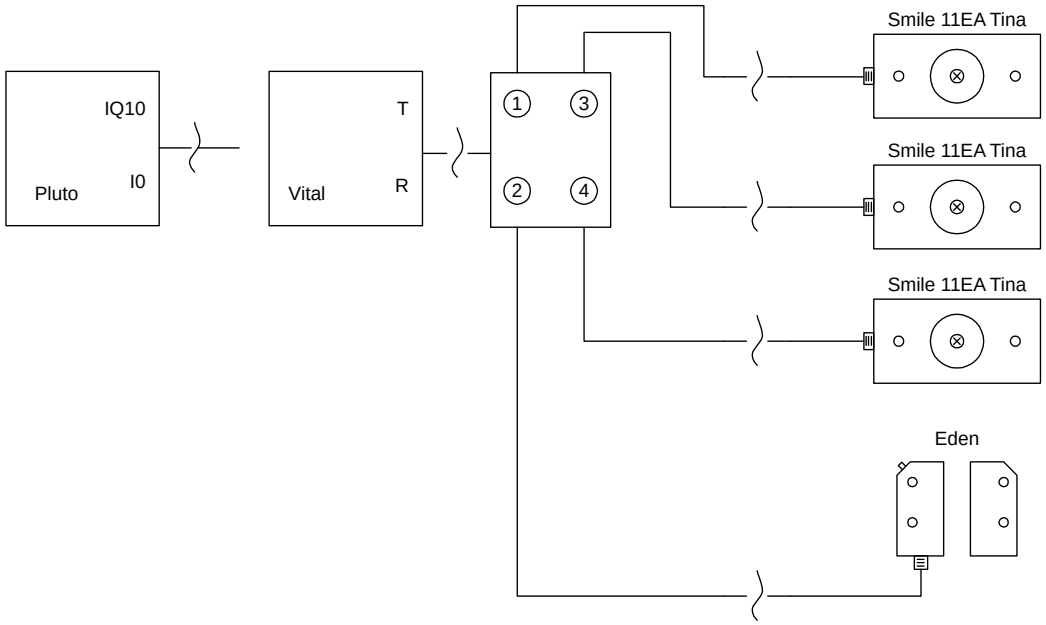
Connection example – Smile 11EA Tina

Three Smile 11EA Tina connected in series to Vital safety module or Pluto safety-PLC through connection terminals in the electrical cabinet.



Connection example – Smile 11EA Tina and Eden

Three Smile 11EA Tina and one Eden connected in series to Vital safety module or Pluto safety-PLC through the connection block Tina 4A.



4 Installation and maintenance

Status bus

Smile Tina EC/SC handles static information as well as status bus information. At delivery, the unit is configured for static information at pin 5 with address 0 when connected for the first time. Smile Tina EC/SC can acquire addresses between 0 and 30. For addresses > 0 the unit is in status bus configuration. Pin 5 is used for in- or output signals in communication systems with a master unit like Pluto. The status bus circuit can include up to 30 units. The units can be part of different dynamic circuits connected in parallel to the status bus circuit through pin 5. Connections to the status bus circuit is achieved thorough M12-3S or Tina 4/8. Units without status bus are connected through M12-3A. Units configured for status bus information return to static configuration when assigned with address 0. Further information on status bus configuration can be found in the Pluto manual.

Installation precautions

First mount Smile Tina to the surface with two M5 bolts, and then attach the M12 connection(s).

⚠ **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 (i.e. push the E-stop button). The LED should light red.
- The LED should light green when protection is OK and the safety circuit is not previously broken.

Troubleshooting

LED indicator note	Expected causes of faults	Checking and measures to take
Lights red	E-stop button is down	Reset the button by turning it clockwise and pulling it upward.
	24 VDC input to pin-2 (no dynamic signal)	Check if there is 24 VDC to input (pin-2). If Yes, check cable or unit before and fix it.
No lights	Loss of power supply	Check 24 VDC / 0 VDC power supply
Lights green (but no dynamic output detected)	Defected dynamic signal input to unit (asymmetric pulses)	Check the dynamic input or the unit before
Weak lights or red and green lights at the same time	The unit is defect	The unit needs to be replaced. Contact ABB Jokab Safety.

5 Operation

LED indication

LED	Indication	Description	Input signal on pin-2
LED on Tina	Green	Safety circuit closed (protection OK)	Dynamic signal in
	Green-Red (flash)	Safety circuit open (protection OK)	No dynamic signal in or 0 VDC in
	Red	Safety circuit interrupted (protection open)	+24 VDC in or safety circuit interrupted
	Status bus LED	See data sheet for status bus or the Safey Handbook	

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; i.e. if the emergency button is pressed, the information output signal is always low (L).

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

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.

Info output signal switch	H → L	L → H
Delay Smile Tina xA*	~ 12 ms	~ 0 ms
Delay Smile Tina xC**	~ 40 ms	~ 30 ms

Valid for all EA and SA models of Smile Tina.

**Valid for all EC and SC models of Smile Tina.

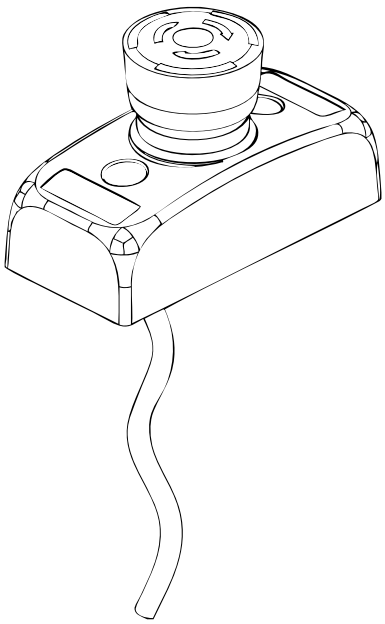
NB: If the unit detects an error (short circuit or interruption) lasting shorter than 13 ms the information output signal is set to low for 1.2 s (1200 ms) and then set to high again. This does not affect Vital since it needs a longer interruption to release. Pluto however does release, which means that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

⚠ **Warning!** The information output signal is not a failsafe signal and shall **never** be used for the safety purpose(s).

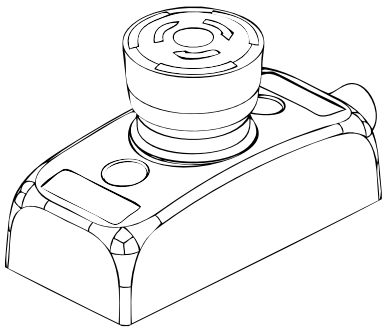
6 Model overview

Type	Article number	Description
Smile 10EA Tina	2TLA030050R0400	Emergency stop with 1 m cable connected at the bottom of the unit
Smile 11EA Tina	2TLA030050R0000	Emergency stop with M12 5-pole connection at the short side of the unit
Smile 12EA Tina	2TLA030050R0200	Emergency stop with M12 5-pole connections at both short sides of the unit
Smile 11EAR Tina	2TLA030050R0100	Emergency stop with a M12 5-pole connection at the short side of the uni
Smile 11SA Tina	2TLA030050R0500	Safety stop with black button and M12 5-pole male connection
Smile 12SA Tina	2TLA030050R0600	Safety stop with black button, M12 5-pole male connection and M12 5-pole female connection
Smile 11SAR Tina	2TLA030050R0700	Safety stop with black button and M12 5-pole male connection, rerversed.
Smile 11 EC Tina	2TLA030050R0900	Emergency stop with M12 5-pole connection at the short side of the unit and status bus.
Smile 11 SC Tina	2TLA030050R1000	Safety stop with black button, M12 5-pole male connection and status bus

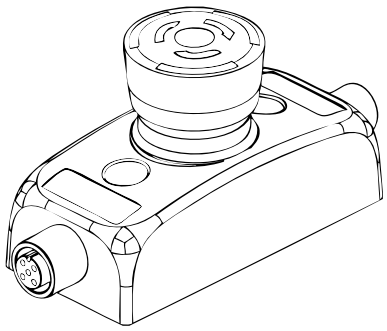
Smile 10EA Tina



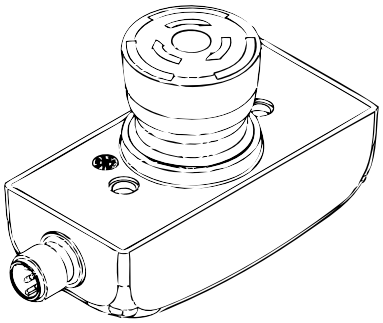
Smile 11EA Tina



Smile 12EA Tina

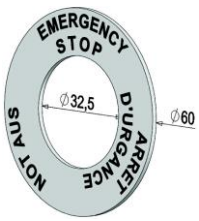


Smile 11EAR Tina



Accessories

Type	Article number	Description
Emergency stop sign	2TLA030054R0700	Ø32.5 mm, Swedish, Danish, Finnish. For reversed Smile.
Emergency stop sign	2TLA030054R0800	Ø32.5 mm, English, French, German. For reversed Smile.



Emergency stop sign
For reversed Smile

Article number:
S, DK, FIN: 2TLA030054R0700
EN, F, D: 2TLA030054R0800

7 Technical data

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

Power supply	
Operating voltage	24 VDC +15 %, -25 %
Total current consumption	47 mA (57 mA with max information output) Information output: Max 10 mA
Time delay t (in/out)	t < 70 µs, EC/SC < 30 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	IP65
Ambient temperature	Storage: -30…+70°C Operation: -10…+55°C
Humidity range	35 to 85 % (with no icing or condensation)
Housing material	Polyamide PA66, Macromelt, polybutylenterephthalate PBT, Polypropene PP, UL 94 V0
Contact material	Silver alloy, gold plated
Connectors	Smile 10EA Tina: 5-pole cable, 1 m Smile 11x Tina: M12 5-pole male Smile 12x Tina: M12 5-pole male, M12 5-pole female
Size	84 x 40 x 52 (L x W x H) – see drawing
Weight	~65 g
Colour	Yellow base, red or black button
Actuator force (E-stop button)	22 +/- 4N
Actuator travel	~4 mm to latch
Mechanical life	> 50,000 operations
Impact resistance (half sinusoidal)	Max. 150 m/s^2, pulse width 11 ms, 3-axis (as per EN IEC 60068-2-27)
Vibration resistance (half sinusoidal)	Max. 50m/s^2 at 10 Hz, 10 cycles, 3-axis (as per EN IEC 60068-2-6)

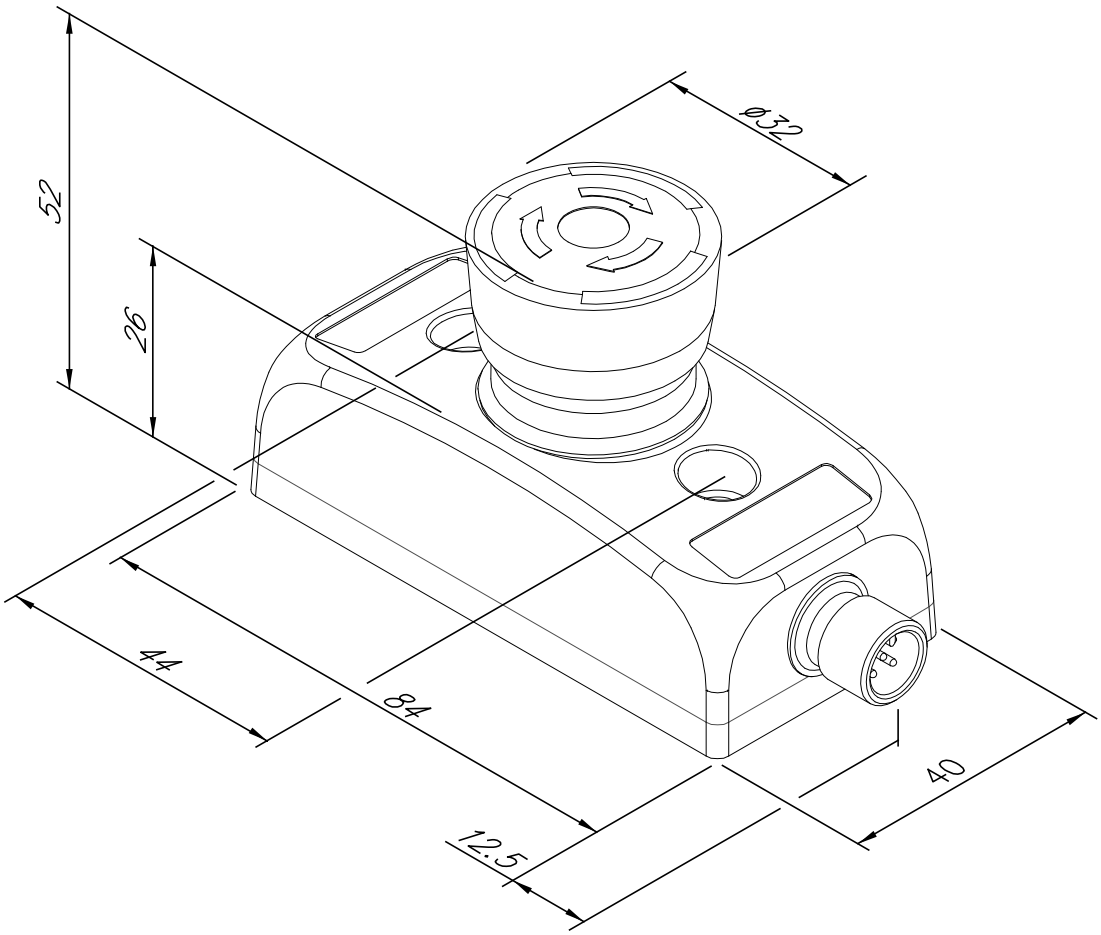
Climate resistance	
Damp heat, cyclical	96 hours, +25°C / 97%, +55°C / 93% relative humidity, as per EN IEC 60068-2-30
Damp heat, sustained	56 days, +40°C / 93% relative humidity, as per EN IEC 60068-2-78
Dry heat	96 hours, +70°C, as per EN IEC 60068-2-2
Cooling	96 hours, -40°C, as per EN IEC 60068-2-1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

Safety-related characteristic data and Conformity	
Conformity	European Machinery Directive 2006/42/EC 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
IEC/EN 61508-1…7	SIL3, PFH_d: $4.66*10^{-9}$
EN 62061	Up to SIL3 depending on system architecture
EN ISO 13849-1	Performance Level up to PL e, cat. 4 depending on system architecture
Certificates	TÜV Nord

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

Dimensions

Dimensions – Smile Tina



NB: All measurements 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

Product	Certificate	Serialnumber
Emergency stop device Smile Tina	44 799 12 408341-004	[000 – 000 ... 999-999]
Emergency stop device Inca-Tina	44 799 12 408341-004	[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

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Kungsbacka 2012-06-05

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