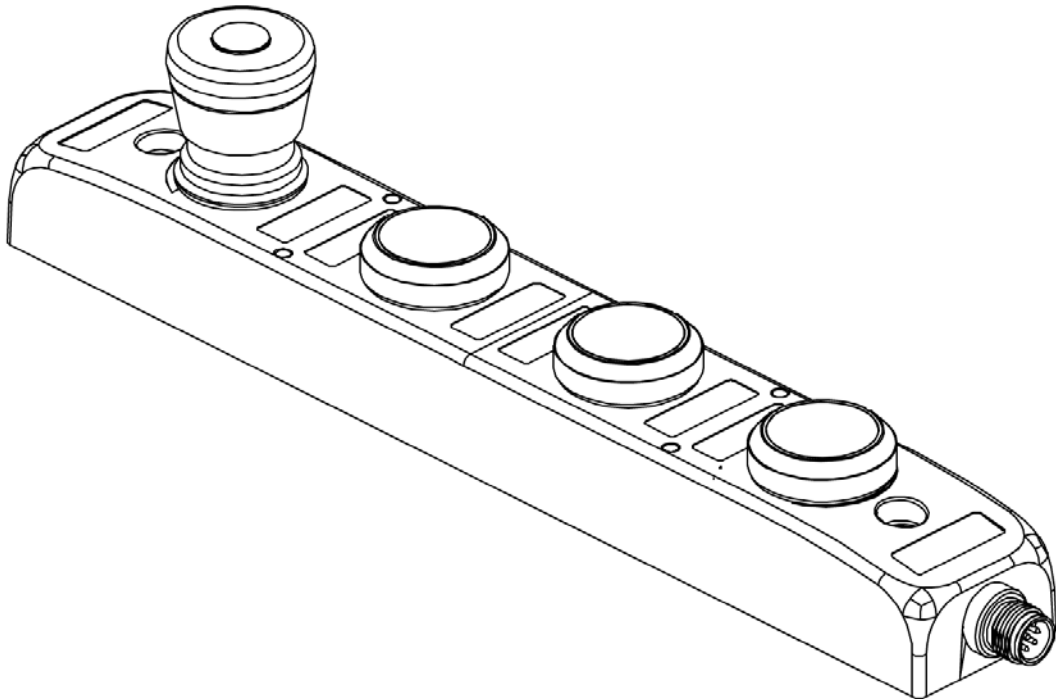


Original instructions

# Smile 41

Push-button box with/without emergency stop



## Read and understand this document

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

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ABB JOKAB SAFETY's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by ABB JOKAB SAFETY.

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### **SUITABILITY FOR USE**

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The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

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

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.

Please know and observe all prohibitions of use applicable to the products.

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.

### **PERFORMANCE DATA**

While every effort has been taken to ensure the accuracy of the information contained in this manual ABB JOKAB SAFETY cannot accept responsibility for errors or omissions and reserves the right to make changes and improvements without notice. Performance data given in this document is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of ABB JOKAB SAFETY'S test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the ABB JOKAB SAFETY Warranty and Limitations of Liability.

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# 1 Introduction

## Scope

The purpose of these instructions is to describe the push-button box Smile 41, with variants Smile 41 WWWWP and Smile 41 EWWWP, and to provide the necessary information required for installation, operation, checks and adjustment after installation and maintenance. Unless other stated, the information given applies to all variants.

## 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.

## 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.

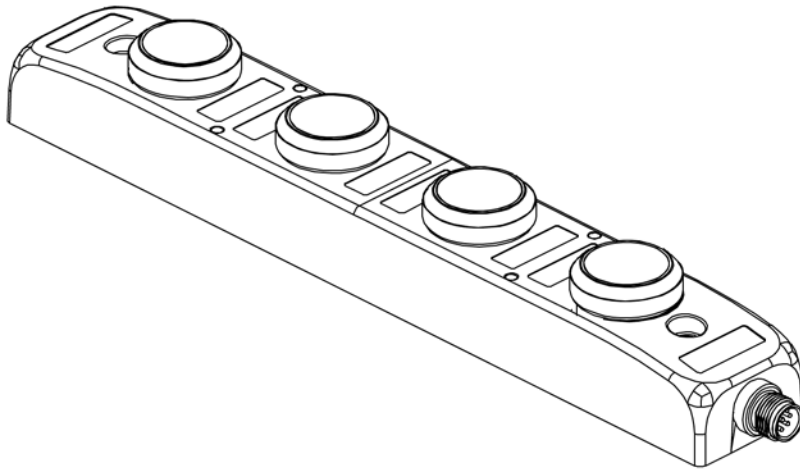
After installation or after changes in existing equipment all safety functions must be tested and verified before the equipment is used.

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

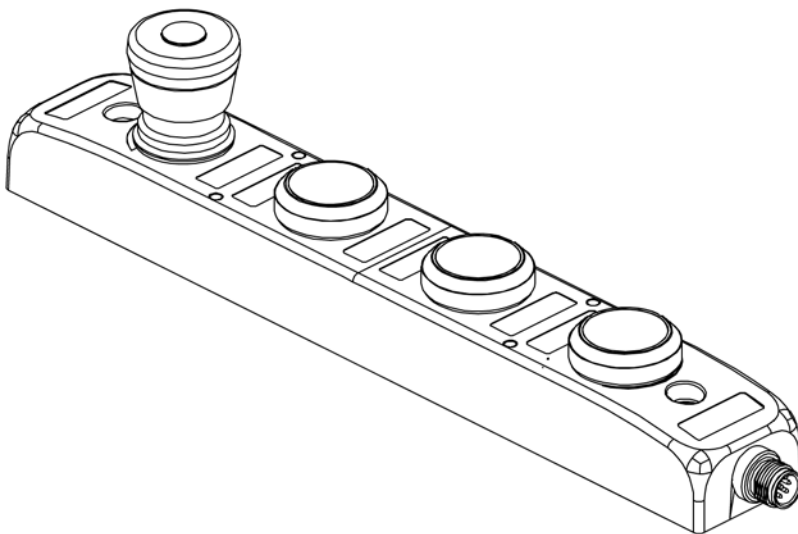
## 2 Overview

### General description

Smile 41 is a push-button box with various possibilities to control the protection surrounding a machine, for instance to allow start, stop and reset when a protective device has been activated. Smile 41 is available in different models:



Smile 41 WWWWP:  
Push-button box with four light buttons.

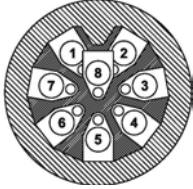


Smile 41 EWWWP:  
Push-button box with emergency stop and three light buttons.

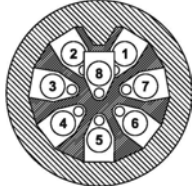
**⚠ Warning!** The emergency stop button must only be used in emergency situations, not as a normal stop signal.

### 3 Connections

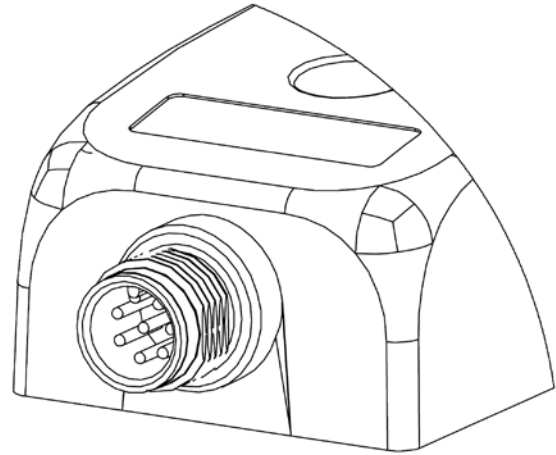
#### Electrical connections



M12 8-pole male connector seen from cable side

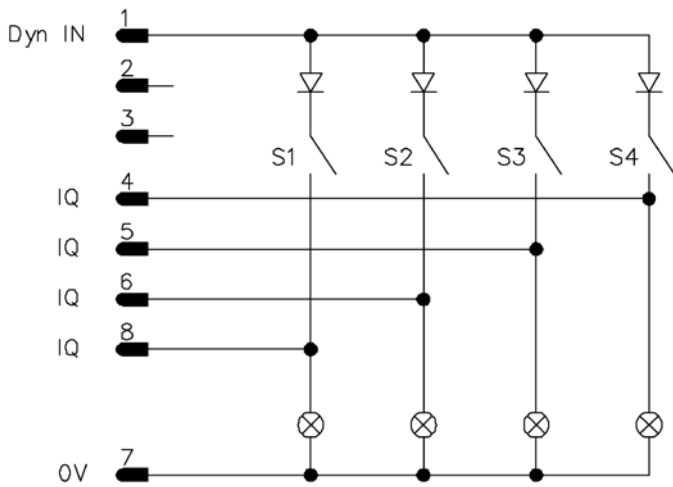


M12 8-pole female connector seen from cable side

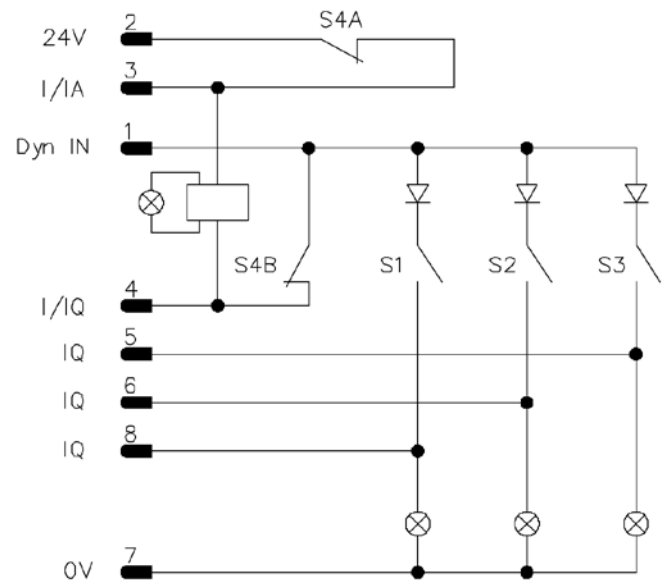


M12 8-pole male connector

#### Electrical diagrams



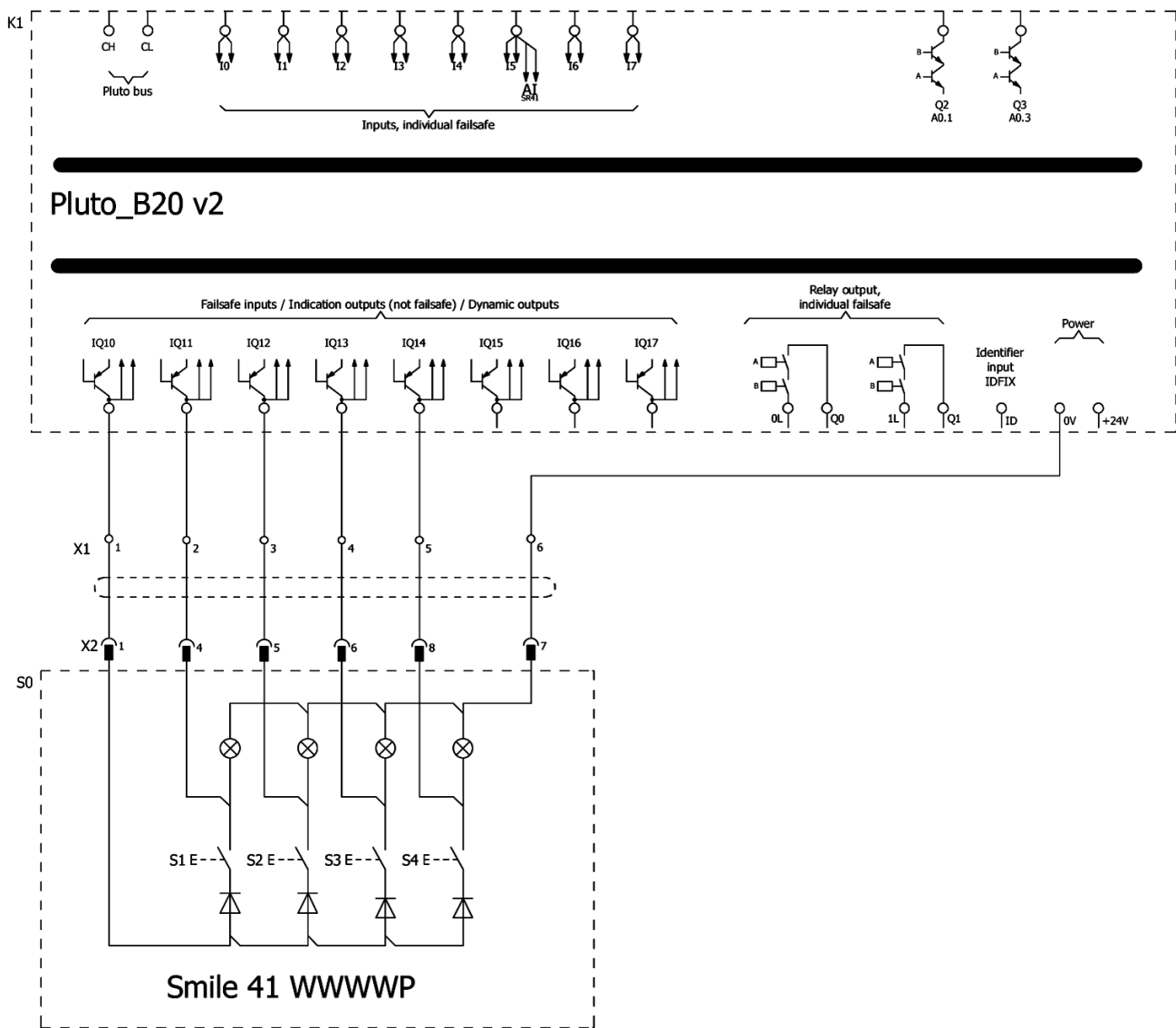
Electrical diagram for Smile 41 WWWWP

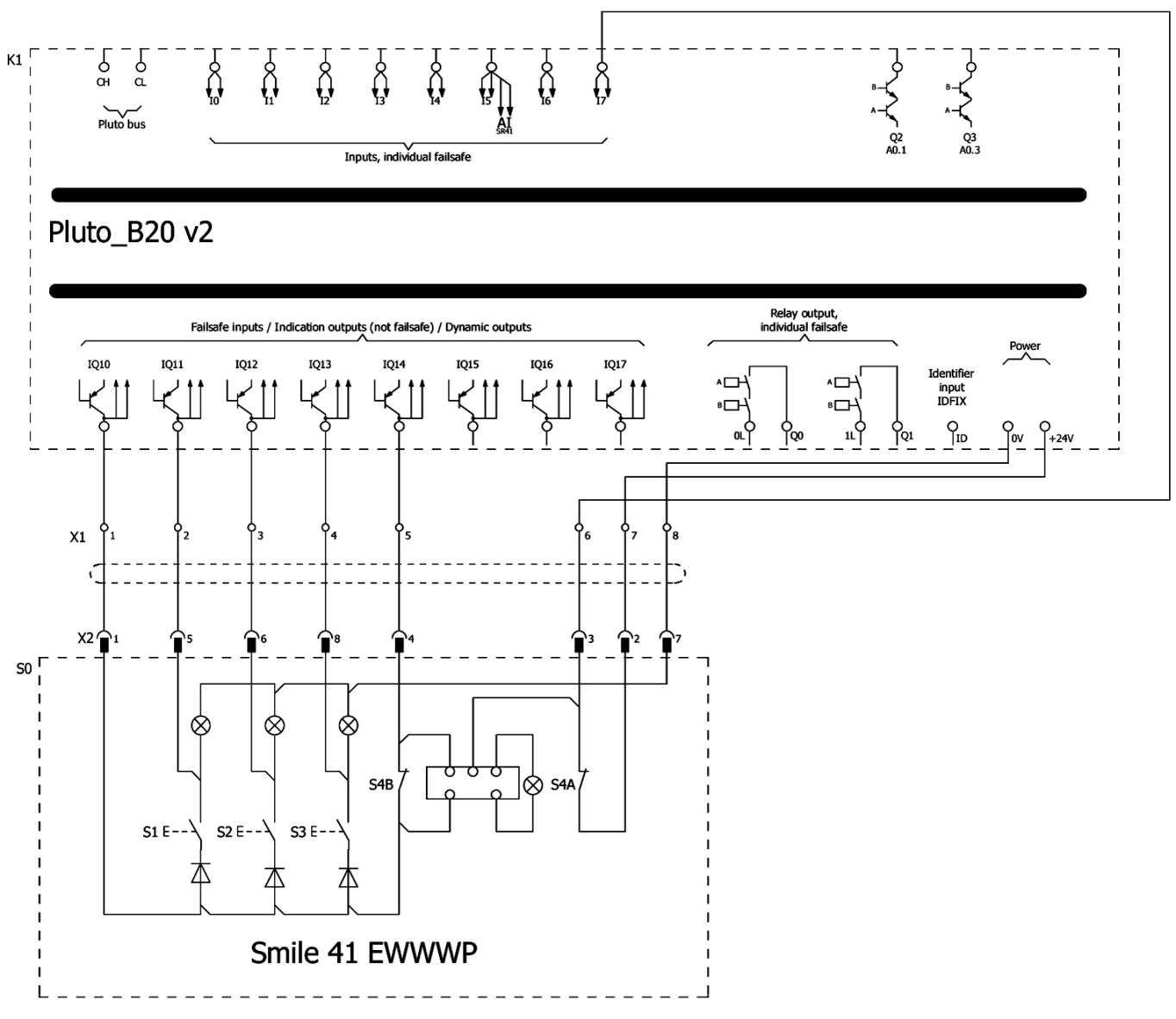


Electrical diagram for Smile 41 EWWWP

**Warning!** To detect a possible short circuit between light buttons, operative system ver 3.6 or later is needed in Pluto. If an older operative system is used, unintentional activation of for instance Reset might occur.

## Connection examples





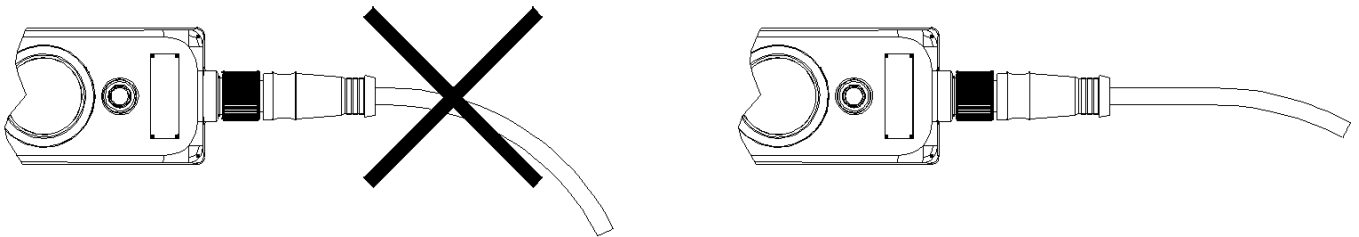


## 4 Installation and maintenance

Smile 41 is primarily intended to be used together with Pluto safety PLC. Light buttons are connected to Pluto IQ's and configured as "lightbutton" in the Pluto programme. The emergency stop is to be connected with dual channel supervision.

### Installation precautions

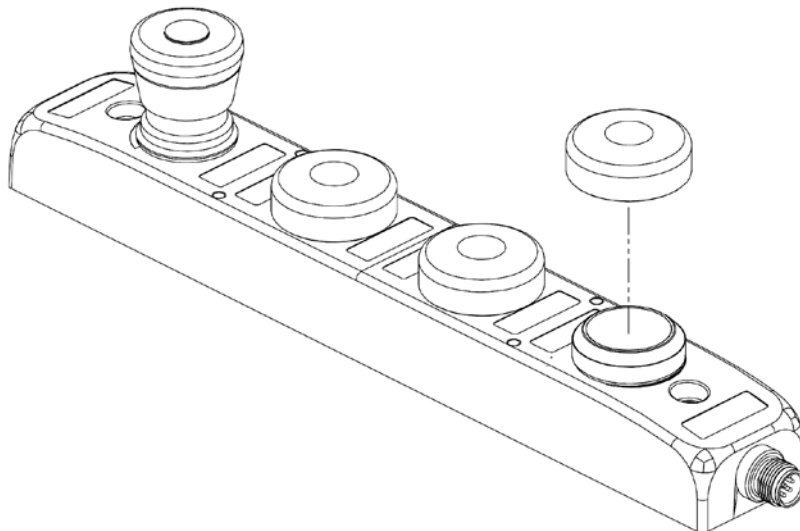
1. Mount the Smile 41 in its intended location, using two M5 bolts.
2. Connect the cable, using the M12 connector.
3. The cable must not be bent too much, especially not close to the Smile 41.



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

### Assembly of coloured filters

To illustrate the different functions of the push-buttons, coloured filters can be pressed over the original push-buttons as shown below. A kit with five filters in different colours is delivered together with the Smile 41.



### 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.

**⚠ Warning!** 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.

**Caution!** ABB Jokab Safety will not accept responsibility for failure of the switch functions if the installation and maintenance requirements shown in this manual are not implemented. These requirements form part of the product warranty.

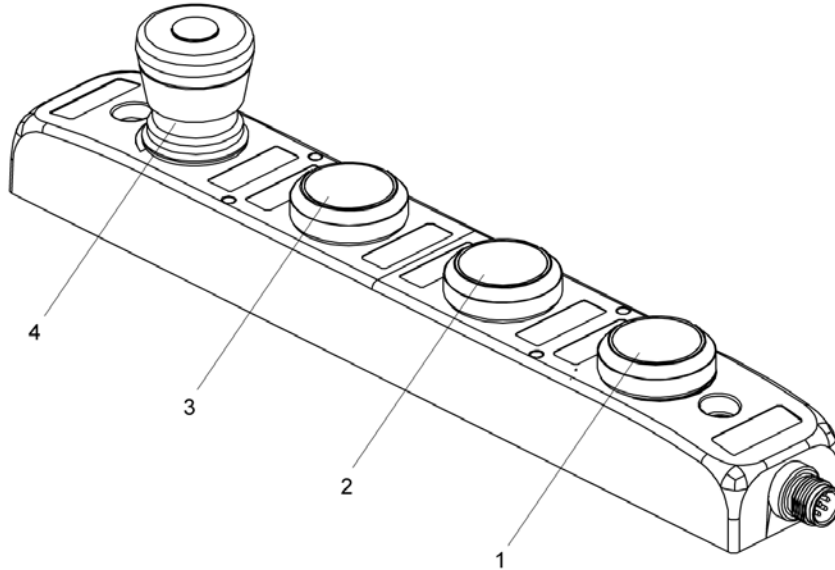
## 5 Operation

### Emergency stop

1. Push the emergency stop button.  
An actuating force of  $22 \pm 4$  N is required and the actuator travel is approximately 4 mm to latch.
2. Pull the button until the button is unlatched.

### LED indication

The LED in the emergency stop shows a red or a green light, depending on if the emergency stop is activated or not. The LEDs in the light buttons are controlled by the inputs. More details on how this is done, with examples, are found in the Pluto manual.



## 6 Model overview

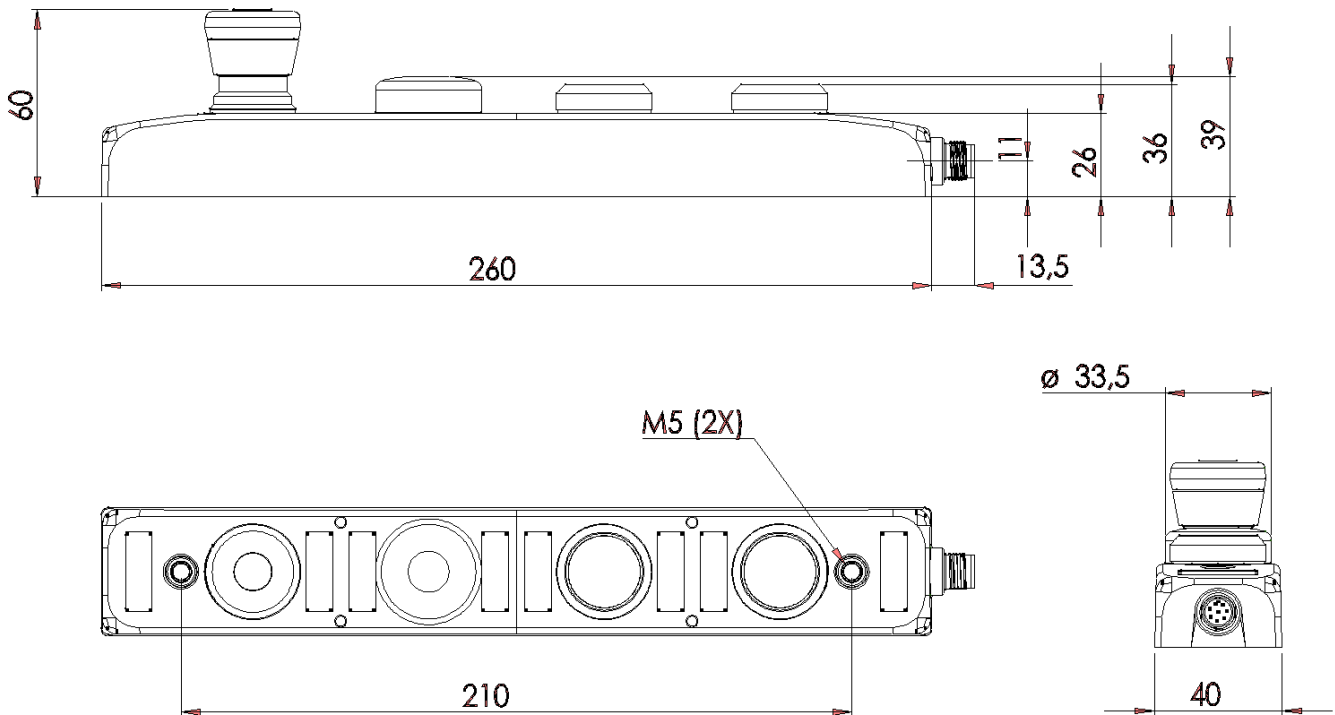
Type	Article number	Description
Smile 41 WWWWP	2TLA030057R0000	Push-button box
Smile 41 EWWWP	2TLA030057R0100	Push-button box with emergency stop

### Accessories

Type	Article number	Description
Connector M12-C03	2TLA020055R1600	Female for field assembly, 8 poles with screw terminals
Connector M12-C04	2TLA020055R1700	Male for field assembly, 8 poles with screw terminals
Cable M12-C103	2TLA020056R4000	Female, 10m cable 8x0.34mm <sup>2</sup>
Cable M12-C334	2TLA020056R5100	Male + female, 3m cable 8x0.34mm <sup>2</sup>
Cable C8	2TLA020057R1000	Cable per meter, 8x0.34 mm <sup>2</sup>
Kit of coloured filters	2TLA030059R2600	Blue, green, red, white, yellow

## Dimensions

NB: All measurements in millimetres.



## 7 Technical data

### Manufacturer

Address: ABB JOKAB SAFETY  
Varlabergsvägen 11  
434 39 Kungsbacka  
Sweden

### Power supply

Operating voltage 24 VDC  $\pm$ .15%  
Total current consumption Emergency stop LED indication : 20 mA  
Light button LED indication: 20 mA during activation

### General

Degree of protection IP65  
Ambient temperature -25...+50°C  
Size (HxLxW) 60 x 40 x 260 mm (+13.5 mm M12 connector)  
Weight 0.19 kg  
Colour Box: Yellow  
Emergency stop: Red  
Lightbutton (without colour filter): White

	<b>Emergency stop:</b>	<b>Light button:</b>
Actuating force	22 $\pm$ 4 N	7 $\pm$ 3 N
Actuator travel	Approx. 4 mm to latch	Approx. 4 mm
Mechanical life	> 50 000 operations	1000000 operations
B10d	65 000 operations	1300000 operations

### For the North American market (UL)

Enclosure	Type 1																					
Cable assemblies	Must comply with CYJV/7. Cord provided shall be 24 AWG (0.2mm <sup>2</sup> ) minimum																					
Power source	The Limited voltage source must comply with: <ol style="list-style-type: none"> <li>The maximum open circuit voltage potential available to the circuit shall not be more than 42.4 V peak;</li> <li>All external circuit interconnecting cables shall be protected against burnout and damage to the insulation resulting from any overload or short circuit condition per the following table, based on the cable conductor size.</li> </ol>																					
Conductor size	Maximum ampere ratings of the overcurrent protection. <table border="1"> <thead> <tr> <th>AWG</th> <th>(mm<sup>2</sup>)</th> <th>Ampere.</th> </tr> </thead> <tbody> <tr> <td>22</td> <td>(0.32)</td> <td>3</td> </tr> <tr> <td>20</td> <td>(0.52)</td> <td>5</td> </tr> <tr> <td>18</td> <td>(0.82)</td> <td>7</td> </tr> <tr> <td>16</td> <td>(1.3)</td> <td>10</td> </tr> <tr> <td>14</td> <td>(2.1)</td> <td>20</td> </tr> <tr> <td>12</td> <td>(3.3)</td> <td>50</td> </tr> </tbody> </table>	AWG	(mm <sup>2</sup> )	Ampere.	22	(0.32)	3	20	(0.52)	5	18	(0.82)	7	16	(1.3)	10	14	(2.1)	20	12	(3.3)	50
AWG	(mm <sup>2</sup> )	Ampere.																				
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18	(0.82)	7																				
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14	(2.1)	20																				
12	(3.3)	50																				

## Safety / Harmonized Standards

Conformity	European Machinery Directive 2006/42/EC EN ISO 12100:2010, EN ISO 13849-1:2008/AC:2009, EN ISO 13849-2:2008, EN 60204-1:2007+A1, EN ISO 13850:2008
IEC/EN 61508-1...7	SIL3, PFD <sub>avr</sub> : $2.95 \times 10^{-6}$ , PFH <sub>d</sub> : $6.95 \times 10^{-9}$
EN 62061	SIL3
EN ISO 13849-1	Performance level: PL e, category 4 MTTF <sub>d</sub> : High
EN 60947-5-1 & -5	For E-stop button / safety stop button
EN ISO 13850:2008	For E-stop button / safety stop button
Certification	TÜV Nord (pending), cULus (pending), TÜV Süd, (Emergency stop)

## 8 EC Declaration of conformity



### EC Declaration of conformity

(according to 2006/42/EC, Annex2A)

We ABB AB declare that the safety components of ABB AB make with type designations and safety functions as listed below, is in conformity with the Directives  
JOKAB SAFETY  
Varlabergsvägen 11  
SE-434 39 Kungsbacka 2006/42/EC  
Sweden 2006/95/EC

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

#### Product

Control box with emergency stop device

Smile41, versions

WWWWP

EWWWP

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 61000-6-4:2011, EN ISO 13850:2006

Other used standards EN 60947-5-5:2005, EN 61508:2010



Jesper Kristensson  
PRU Manager  
Kungsbacka 2014-08-14

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[www.abb.com](http://www.abb.com)  
[www.jokabsafety.com](http://www.jokabsafety.com)

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