Original instructions

Smile 41

Push-button box with/without emergency stop
Read and understand this document

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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.

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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! 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 WWWW
Electrical diagram for Smile 41 EWWW

⚠️ 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

Pluto_B20 v2

Smile 41 WWWWP
Pluto_B20 v2

Smile 41 EWWWP
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 program. 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. Tightening torque: 2 Nm.
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 colored filters

To illustrate the different functions of the push-buttons, colored filters can be pressed over the original push-buttons as shown below. A kit with five filters in different colors 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 ± 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

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smile 41 WWWWP</td>
<td>2TLA030057R0000</td>
<td>Push-button box</td>
</tr>
<tr>
<td>Smile 41 EWWWP</td>
<td>2TLA030057R0100</td>
<td>Push-button box with emergency stop</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector M12-C03</td>
<td>2TLA020055R1600</td>
<td>Female for field assembly, 8 poles with screw terminals</td>
</tr>
<tr>
<td>Connector M12-C04</td>
<td>2TLA020055R1700</td>
<td>Male for field assembly, 8 poles with screw terminals</td>
</tr>
<tr>
<td>Cable M12-C103</td>
<td>2TLA020056R4000</td>
<td>Female, 10m cable 8x0.34mm²</td>
</tr>
<tr>
<td>Cable M12-C334</td>
<td>2TLA020056R5100</td>
<td>Male + female, 3m cable 8x0.34mm²</td>
</tr>
<tr>
<td>Cable C8</td>
<td>2TLA020057R1000</td>
<td>Cable per meter, 8x0.34 mm²</td>
</tr>
<tr>
<td>Kit of colored filters</td>
<td>2TLA030059R2600</td>
<td>Blue, green, red, white, yellow</td>
</tr>
</tbody>
</table>

Dimensions

NB: All measurements in millimeter.
### 7 Technical data

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

### Power supply

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>24 VDC ±15%</td>
</tr>
<tr>
<td>Total current consumption</td>
<td>Emergency stop LED indication : 20 mA</td>
</tr>
<tr>
<td></td>
<td>Light button LED indication: 20 mA during activation</td>
</tr>
</tbody>
</table>

### General

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of protection</td>
<td>IP65</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25…+50°C</td>
</tr>
<tr>
<td>Size (HxLxW)</td>
<td>60 x 40 x 260 mm (+13.5 mm M12 connector)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.19 kg</td>
</tr>
<tr>
<td>Colour</td>
<td>Box: Yellow</td>
</tr>
<tr>
<td></td>
<td>Emergency stop: Red</td>
</tr>
<tr>
<td></td>
<td>Lightbutton (without color filter): White</td>
</tr>
<tr>
<td>Actuating force</td>
<td>22 ± 4 N</td>
</tr>
<tr>
<td>Actuator travel</td>
<td>Approx. 4 mm to latch</td>
</tr>
<tr>
<td>Mechanical life</td>
<td>&gt; 50 000 operations</td>
</tr>
<tr>
<td>B10d</td>
<td>65 000 operations</td>
</tr>
</tbody>
</table>

### For the North American market (UL)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enclosure</td>
<td>Type 1</td>
</tr>
<tr>
<td>Cable assemblies</td>
<td>Must comply with CYJV/7. Cord provided shall be 24 AWG (0.2mm²) minimum</td>
</tr>
<tr>
<td>Power source</td>
<td>The Limited voltage source must comply with:</td>
</tr>
<tr>
<td></td>
<td>a) The maximum open circuit voltage potential available to the circuit shall not be more than 42.4 V peak;</td>
</tr>
<tr>
<td></td>
<td>b) 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.</td>
</tr>
<tr>
<td>Conductor size</td>
<td>Maximum ampere ratings of the overcurrent protection, AWG (mm²) Ampere.</td>
</tr>
<tr>
<td></td>
<td>22  (0.32)  3</td>
</tr>
<tr>
<td></td>
<td>20  (0.52)  5</td>
</tr>
<tr>
<td></td>
<td>18  (0.82)  7</td>
</tr>
<tr>
<td></td>
<td>16  (1.3)  10</td>
</tr>
<tr>
<td></td>
<td>14  (2.1)  20</td>
</tr>
<tr>
<td></td>
<td>12  (3.3)  50</td>
</tr>
</tbody>
</table>
### Safety / Harmonized Standards

| Conformity | European Machinery Directive 2006/42/EC  
|  | 2014/30/EU - EMC  
|  | 2011/65/EU - RoHS  
|  | EN 62061:2005+A2:2015,  
|  | IEC 60664-EN 60204-1:2006+A1:2009,  
|  | IEC 60664-1:2007, EN 61000-6-2:2005,  
|  | EN 61000-6-4:2011, EN ISO 13850:2015,  
|  | EN 60947-5-5:2005, EN 61508:2010  
| IEC/EN 61508-1...7 | SIL3, $PFD_{avg}$: $2.95 \times 10^{-6}$, $PFH_D$: $6.95 \times 10^{-9}$  
| EN 62061 | SIL3  
| EN ISO 13849-1 | Performance level: PL e, category 4  
|  | $MTTF_D$: 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, cULus |
8 EC Declaration of conformity

EC Declaration of conformity
(according to 2006/42/EC, Annex II)

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

declare that the safety components of ABB AB make with type
designators and safety functions as listed below, is in
conformity with the Directives

2006/42/EC - Machinery
2014/30/EU - EMC
2011/65/EU - RoHS

Authorised to compile the
technical file

ABB AB
JOKAB SAFETY
Varlabergvägen 11
SE-434 39 Kungsbacka
Sweden

Product
Control box with emergency
stop device

Certificate
44 79913145202

Smile41 EWWW

Certification Body
TÜV Nord Cert GmbH
Langemarckstrasse 20
45141 Essen
Germany

Used harmonized standards
IEC 60664-1:2007, EN 61000-6-2:2005,
EN 61000-6-4:2011, EN ISO 13850:2015

Other used standards
EN 60547-5-5:2005, EN 61508:2010

Tobias Gentzel
R&D Manager
Kungsbacka 2017-02-15

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Original

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