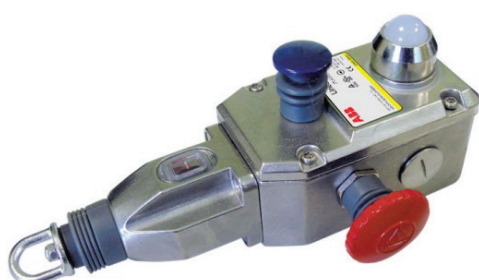


Original instructions

LineStrong-series

Emergency Stop Grab Wire Safety Switch



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.

WARRANTY

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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In no event shall responsibility of ABB/JOKAB SAFETY for any act exceed the individual price of the product on which liability asserted.

IN NO EVENT SHALL ABB/JOKAB SAFETY BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS ABB/JOKAB SAFETY'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

SUITABILITY FOR USE

ABB/JOKAB SAFETY shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the product. At the customer's request, ABB/JOKAB SAFETY will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

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 Emergency Stop Grab Wire Safety Switch system LineStrong-series, and to provide the necessary information required for assembly, installation, checks and adjustments after installation, and maintenance. The instructions also include information necessary to connect LineStrong to a safety circuit.

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

All ABB Jokab Safety Emergency stop grab wire safety switches conform to European Standard EN ISO 13850 and IEC 60947-5-5. They have a positive mechanical linkage between the switch contacts and the wire as per IEC 60947-5-1. The emergency stop switches are brought into the operational condition by pre-tensioning the wire by use of a tensioner / gripper device which clamps the wire and then hooks to the switch eyebolts. Correct tension can be observed by viewing the tension indicator on the switch housing. Once tensioned the switch contact blocks can be set to the operational condition (safety contacts closed, auxiliary contacts open) by pressing a blue reset button on the switch cover.

All of the grab wire safety switches have wire-breakage monitoring. On pulling or breakage (tension loss) of the wire, the safety contacts are positively opened and the auxiliary contacts are closed. The switches are mechanically latched and can then only be returned to the operational condition by a pressing the reset button as required by EN ISO 13850.

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.

Function description for the variants

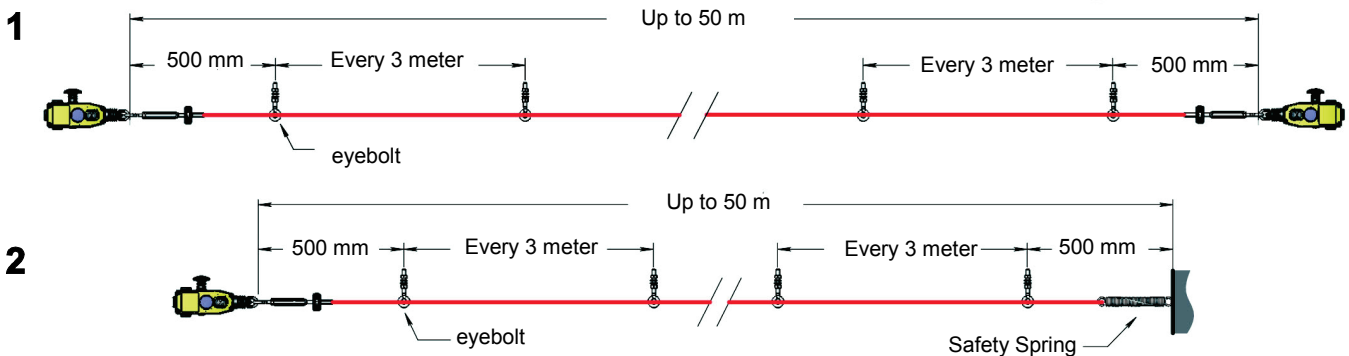
LineStrong1

LineStrong1 is a compact and small, yet robust switch that can handle wires up to 30 meters on a single switch (50 meters on two switches).

When someone pulls the wire of Linestrong1 or if the wire is broken, the switch goes to a safe state, e.g. the machine is emergency-stopped. After a emergency stop the LineStrong1 needs to be reset to be able to run again and this is made on the local reset button. LineStrong1 is equipped with an indication of how taut the wire is, which make the installation or adjustment easy.

The LineStrong1 is made of a rugged die cast housing with a rating of IP67.

A positive forced connection provides a forced disconnect of the safety contacts when the wire is being pulled or broken. The design of the LineStrong1 ensures that the contacts will not fail or be held in a normally closed position, due to failure of the spring mechanism or that welding/sticking of the contacts can occur. The LineStrong1 switch has 2NC and 2NO contacts.



- 1) LineStrong1 with another LineStrong1
- 2) LineStrong1 with safety spring

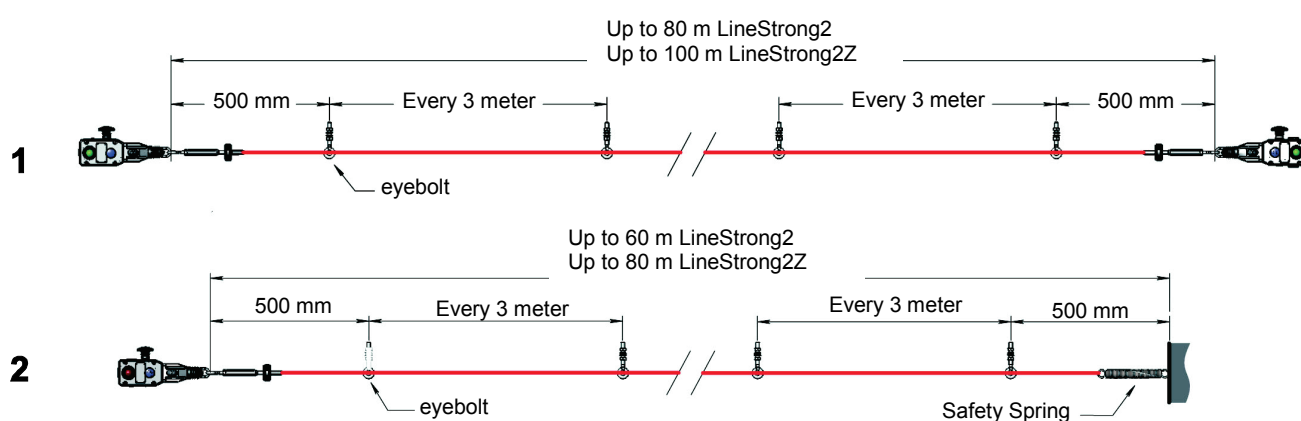
LineStrong2

LineStrong2 is a robust switch that can handle wires up to 80 meters on a single switch (100 meters on two switches). When someone pulls the wire of LineStrong2 or if the wire is broken, the switch goes to a safe state, e.g. the machine is emergency-stopped. After a emergency stop the LineStrong2 needs to be reset to be able to run again and this is made with the local reset button. Additional features on the LineStrong2 are a "normal" emergency stop that is fitted on the side of the grab wire safety switch and also a two coloured LED for indication. LineStrong2 is equipped with an indication of how taut the wire is, which make the installation and adjustment easy.

Depending on the environment where the switch will be used, different material can be chosen for the LineStrong2. The basic version has a rugged yellow die cast housing with a rating of IP67. In severe applications as for food processing and chemical industry there is a LineStrong2Z with a total rugged stainless steel 316 body. This version has IP69K enclosure protection (maintained by a double seal lid gasket and seals) and can be high pressure hosed with detergent at high temperature.

LineStrong2 also exist in a version(LineStrong2ZX) with certified explosion proof contact block. LineStrong2ZX is in stainless steel and can be used in European Zone 1, 2, 21,22 environments. (Gas and Dust)

A positive forced connection provides a forced disconnect of the safety contacts when the wire is being pulled or broken. The design of the LineStrong2 ensures that the contacts will not fail or be held in a normally closed position, due to failure of the spring mechanism or that welding/sticking of the contacts can occur. The LineStrong2 switch has 2NC and 2NO contacts.



- 1) LineStrong2 with another LineStrong2
- 2) LineStrong2 with safety spring

LineStrong3

LineStrong3 is a quite robust switch that can handle long wires, up to 200 meters on a single switch. When someone pulls the wire of LineStrong3 or if the wire is broken, the switch goes to a safe state, e.g. the machine is emergency-stopped. After a emergency stop the LineStrong3 needs to be reset to be able to run again and this is made on the local reset button. Additional features on the LineStrong3 is a "normal" emergency stop fitted on the top of the grab wire safety switch and also a two coloured LED for indication. LineStrong3 is equipped with an indication of how taut the wire is, which makes the installation and adjustment easy.

Depending on the environment where the switch will be used, different materials can be chosen for the LineStrong3. The basic version has a rugged yellow die cast housing with a rating of IP67. In severe applications as for food processing and chemical industry, there is a LineStrong3Z with a total rugged stainless steel 316 body. This version has IP69K enclosure protection (maintained by a double seal lid gasket and seals) and can be high pressure hosed with detergent at high temperature.

LineStrong3 also exist in versions with certified explosion proof contact block(X-versions).

LineStrong3LZX/RZX/DZX are in stainless steel and can be used in European Zone 1, 2, 21,22 environments. (Gas and Dust)

A positive forced connection provides a forced disconnect of the safety contacts when the wire is being pulled or broken. The design of the LineStrong3 ensures that the contacts will not fail or be held in a normally closed position, due to failure of the spring mechanism or that welding/sticking of the contacts can occur. The LineStrong3 switch has 4NC and 2NO contacts.

Single wire - LineStrong3L/3R and LineStrong3LZ/3RZ

The LineStrong3L/3R are two different versions depending on installation.

L - "Left hand" - is the version of LineStrong3 where the placement of the grab wire switch is to the left in the installation.

R - "Right hand" - is the version of LineStrong3 where the placement of the grab wire switch is to the right in the installation.

LineStrong3L/3R have die-cast housings and are robust to manage severe indoor or outdoor use.

LineStrong3L/3R are designed to protect a length up to 100 meters on a single switch. If two switches are used together, up to 125 meters.

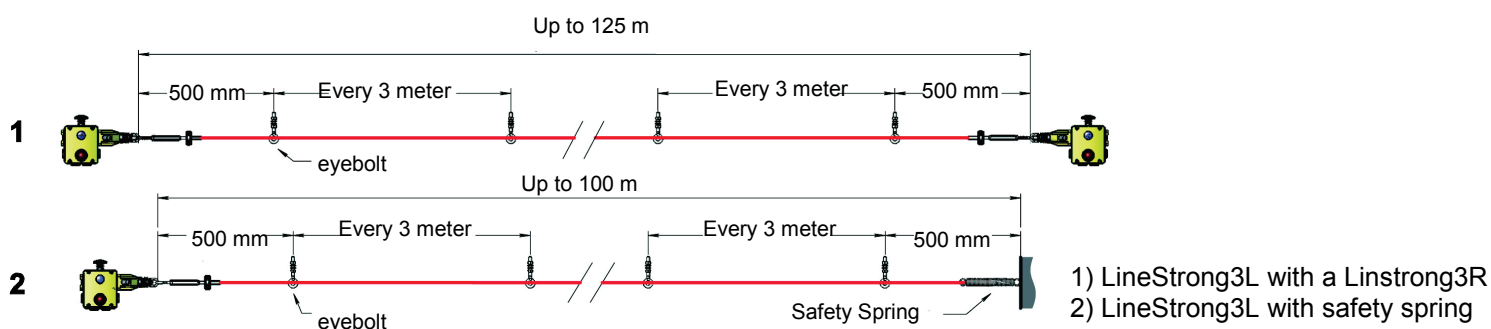
LineStrong3LZ/3RZ are in stainless steel 316 housings and are designed specifically to withstand the tough environments found in the food and pharmaceutical industries. LineStrong3LZ/3RZ are designed to protect a length up to 100 meters on a single switch. If two switches are used together, the wire can go up to 125 meters.



NB! The picture shows the left hand version



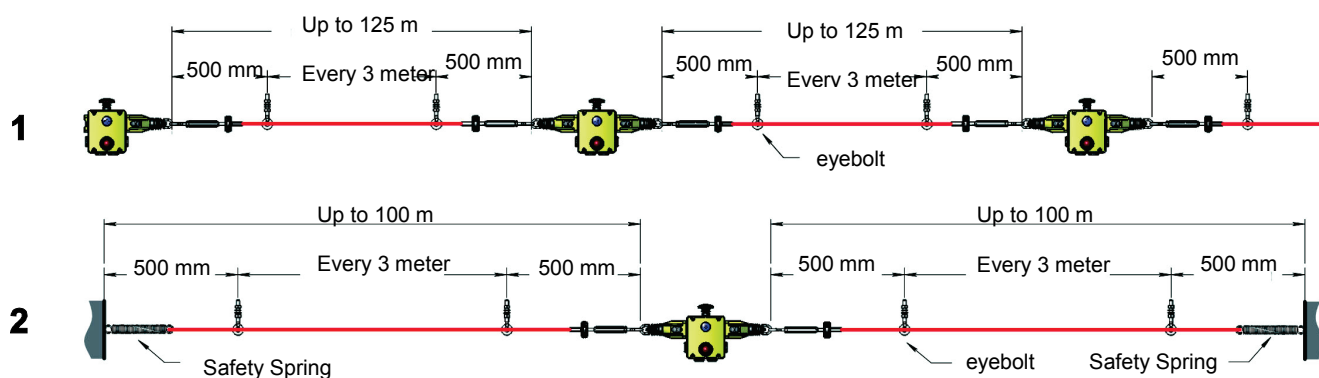
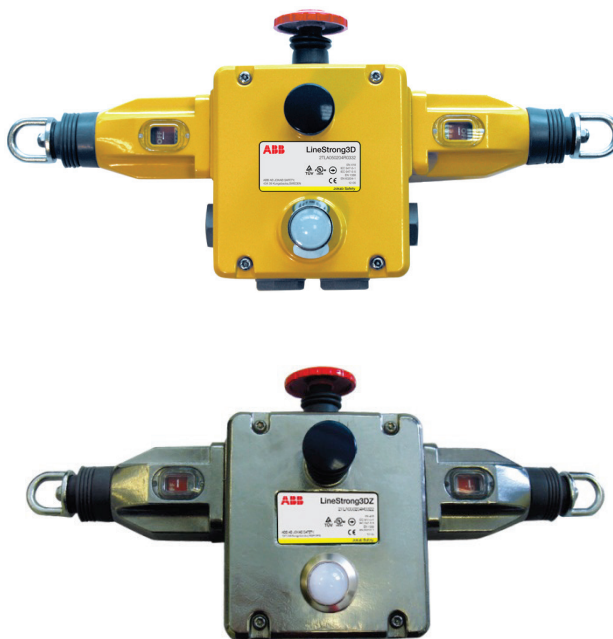
NB! The picture shows the right hand version



Double wire – LineStrong3D and 3DZ

With wire entries from both sides of the grab wire switch, LineStrong3D can be used for a long protection length. LineStrong3D has a die-cast housing and is robust to manage severe indoor or outdoor use. LineStrong3D is designed to protect a length up to 200 meters on a single switch. If several switches are used together, it will be possible with a length up to 125 meters between the switches. A two colour LED ensures switch status can be seen easily from a distance.

LineStrong3DZ has stainless steel 316 housing and is designed specifically to withstand the tough environments found in the food and pharmaceutical industries. LineStrong3DZ is designed to protect a length up to 200 meters on a single switch. If several switches are used together it will be possible with a length up to 125 meters between the switches.



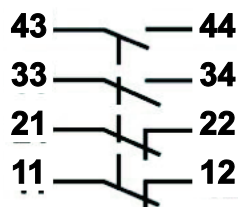
3 Connections

See Chapter Installation and Maintenance for more information regarding installation

Connections

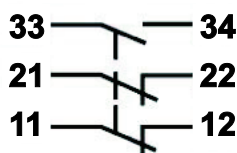
LineStrong1 & LineStrong2

2NC 2NO

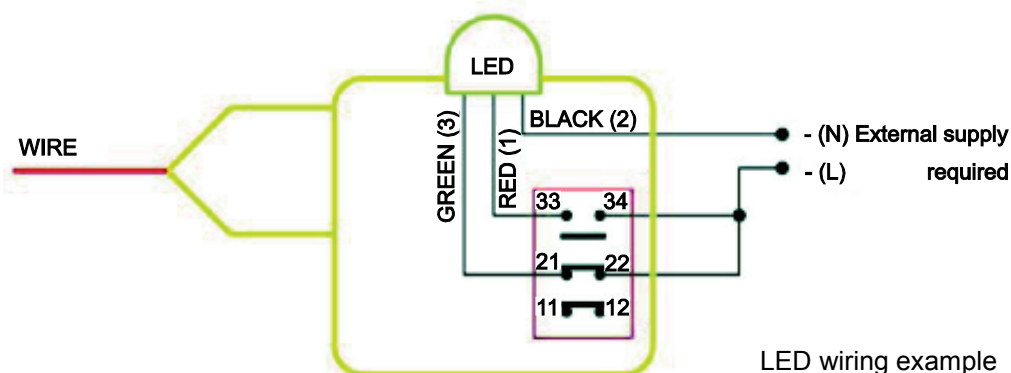
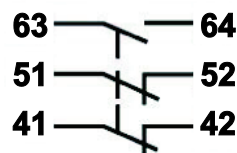


LineStrong3

2NC 1NO

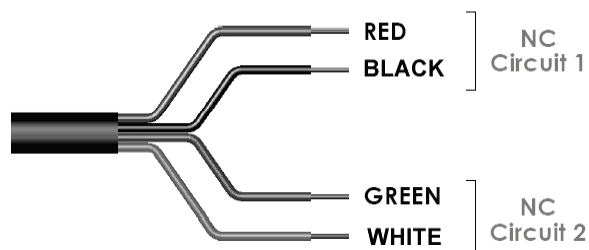


2NC 1NO



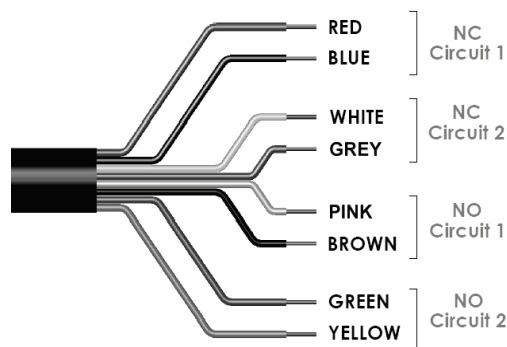
LineStrong2, explosion proof

2NC



LineStrong3, explosion proof

2NC 2NO



Contact blocks

Contact open
Contact closed

				0mm	3.5mm	14.5mm	17.0mm
2NC EX	2NC 2NO	2NC 2NO EX	4NC 2NO	Latched off – Rope Slack	Tension Range (Switch Reset)		Rope Pulled
11/12	11/12	11/12	11/12				
21/22	21/22	21/22	21/22				
			41/42				
			51/52				
	33/34	33/34	33/34				
	43/44	43/44	63/64				

4 Installation and maintenance

Installation of the Safety Switch

1. The installation of all Emergency Stop Grab Wire Safety Switch systems must be in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.
2. According to ISO 13850, corner pulleys may only be mounted such that a complete length of the wire can be observed.
3. Wire support eyebolts must be fitted at 2.5 m. min. to 3m. max.intervals along all wire lengths between switches. The wire must be supported no more than 500mm from the switch eyebolt or Safety Spring (if used). It is important that this first 500mm is not used as part of the active protection coverage.
4. M5 mounting bolts must be used to fix the switches. Tightening torque for mounting bolts to ensure reliable fixing is 4 Nm. Tightening torque for the lid screws,conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter.
5. Tensioning of wire is achieved by use of ABB tensioner / gripper assemblies.
Upon installation, tension to mid position as indicated by the green arrows in the viewing window of each switch. Check operation of all switches and the control circuits by pulling the wire at various locations along the active protection area and resetting each switch by pressing the blue Reset button. Ensure each time that the switches latch off, and require manual resetting by pressing the Reset button. Increase the system tension further, if required, depending upon the checks along the active length of coverage.
If safety switch is fitted with a Mushroom type E-Stop button (Red) then test and reset this part of the switch to ensure correct function of the safety control circuits. Typical operational conditions for successful operation of system is less than 75N pulling force and less than 150mm deflection of rope between eyebolt supports.
6. Recommended wire span options and fittings - (subject to an individual risk assessment for the installation)
See Function description for correct wire span for each variant.

7. Wiring LED (Not on LineStrong1):

Black or Terminal 2 is 0VDC.



- 1) Terminal 1 – red
- 2) Terminal 2 – black
- 3) Terminal 3 – green

When 24VDC is applied to the Red wire or Terminal 1, the lamp will illuminate Red.

When 24VDC is applied to the Green wire or Terminal 3, the lamp will illuminate Green.

If the LED is fitted but is not used ensure the conductors remain coiled and fixed away from the internal mechanism.

8. To fit Mushroom type Emergency Stop button (Not on LineStrong1):
 - a) Remove M12 threaded plug from the mounting port.
 - b) Apply thread locking solution to the threads of the E Stop mechanism.
 - c) Insert the Emergency Stop Mechanism into the mounting port and tighten to 1.5 Nm.
 - d) After installation test and reset to ensure all safety circuits are functioning correctly.



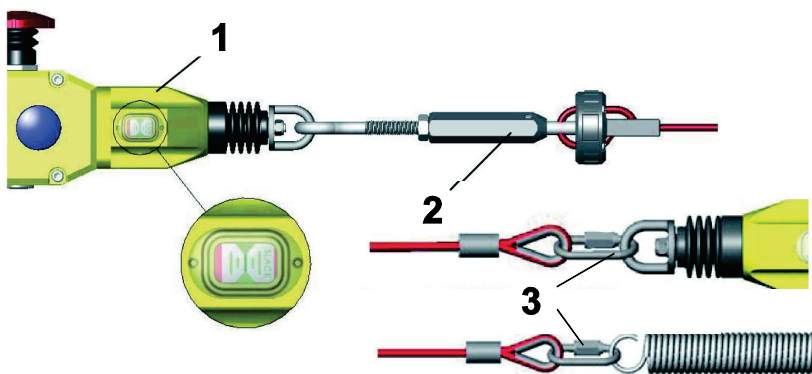
⚠ Warning! All the safety functions must be tested before starting up the system.

Installation of the wire

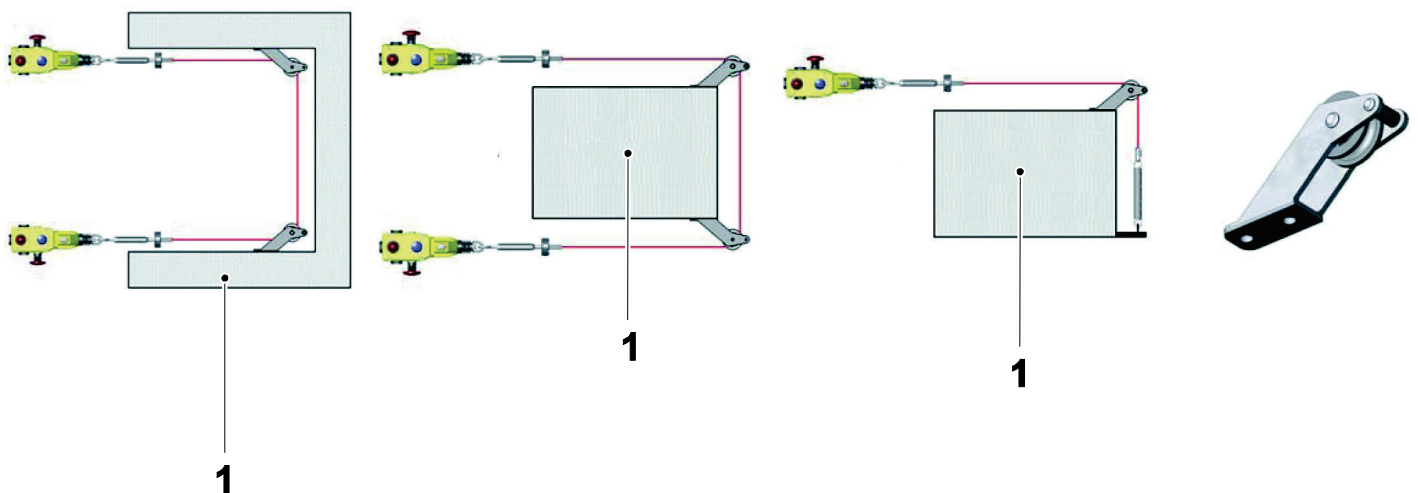
When setting up an Emergency stop grab wire system from ABB Jokab Safety it is recommended to do the tensioning of the wire by using of ABB Jokab Safety Tensioner / Gripper accessory. The installation of the tensioner accessory reduces the installation time. The eyehook, tensioner thimble and the wire strength gripper are in one assembly which enables rapid connection to the switch eyebolts and fast and accurate tensioning of the wire. Thanks to the switch viewing window, systems can be accurately and quickly tensioned. The double clamp mechanism prevents wire slippage.

The end of the safety wire is fed through a central hole in a cone shaped guide which protrudes from the main housing. After being fed through the guide hole, the wire enters the main housing by going through a feed hole and then is looped back through 180 degrees and is fed through a second feed hole on the opposite side of the mechanism. The wire is then pulled for maximum tension and is locked in position by a locking bar inside the main housing which is moved by turning an Allen type locking bolt.

Because of the added friction on the eyebolts and wire when navigating corners, a corner pulley can be used to navigate inside or outside corners without causing damage to the wire.



1. Tension to mid position as indicated by the green arrows in the viewing window of each switch
2. The tensioner thimble allows immediate accurate and final tensioning of the wire, whilst viewing the tension marker through the viewing window on the switch
3. For systems up to 50 meter Quick Link termination is provided for easy connection to either a Safety spring or Switch eyebolt. (Note for systems above 50 meter a Tensioner / Gripper is required each side).

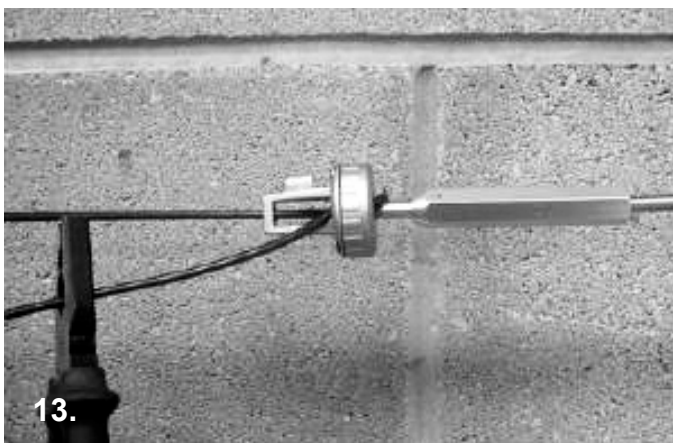
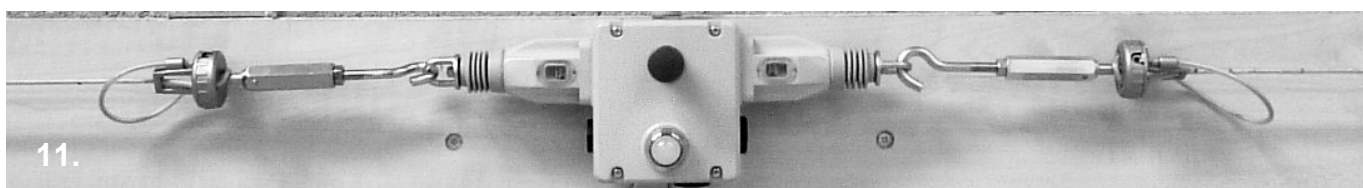
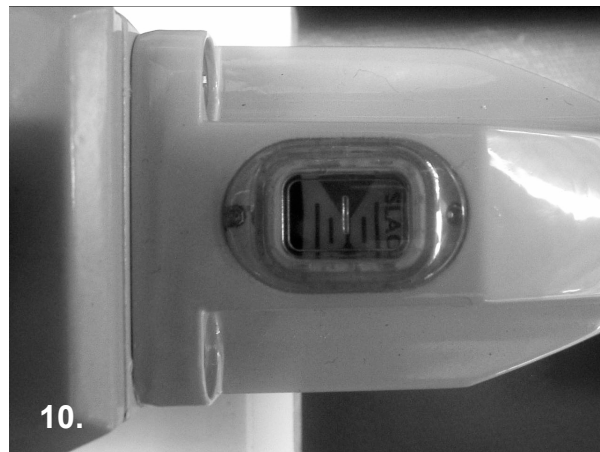


Examples of using the corner pulley

1) Machine

Tensioner/Gripper





Maintenance

Every week: Check correct operation of system at locations along all coverage length and also the switch latching mechanism. Check for nominal tension setting, re-tension wire if necessary.

Every 6 months: Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress.

 **Warning!** The safety functions and the mechanics shall be tested regularly.

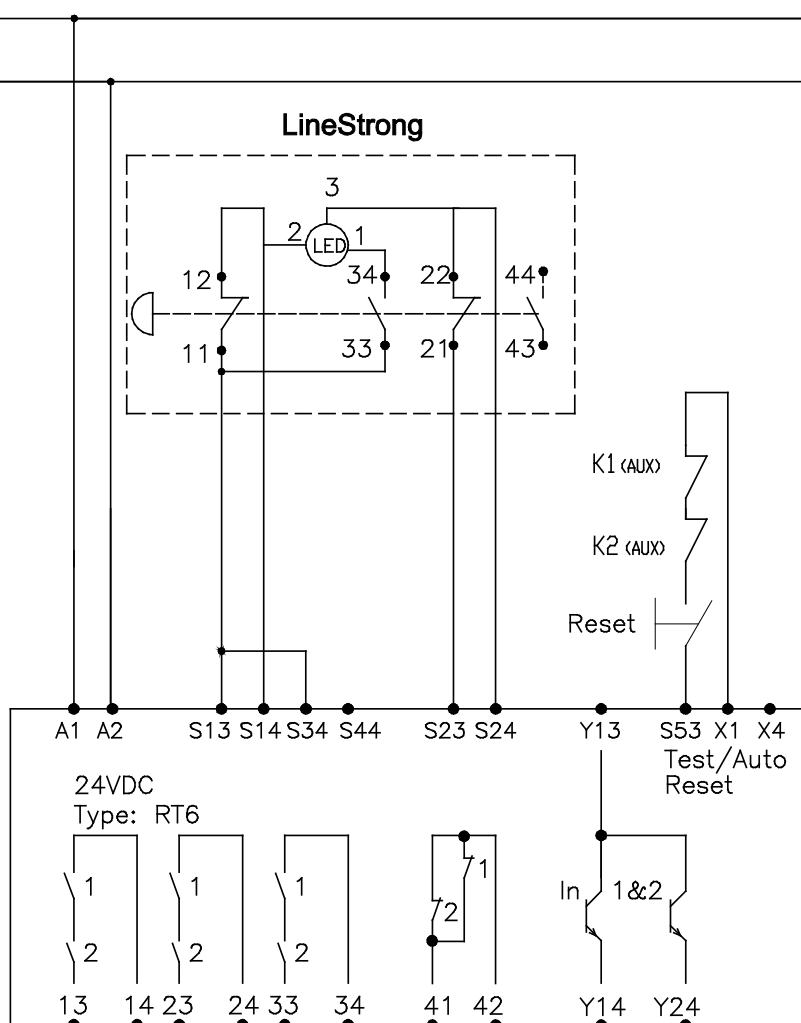
 **Warning!** In case of breakdown or damage to the product, contact the nearest ABB/Jokab Safety Service Office or reseller. Do not try to repair the product yourself since it may accidentally cause permanent damage to the product, impairing the safety of the device which in turn could lead to serious 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 sheet are not implemented. These requirements form part of the product warranty.

5 Application example

24V dc

0V

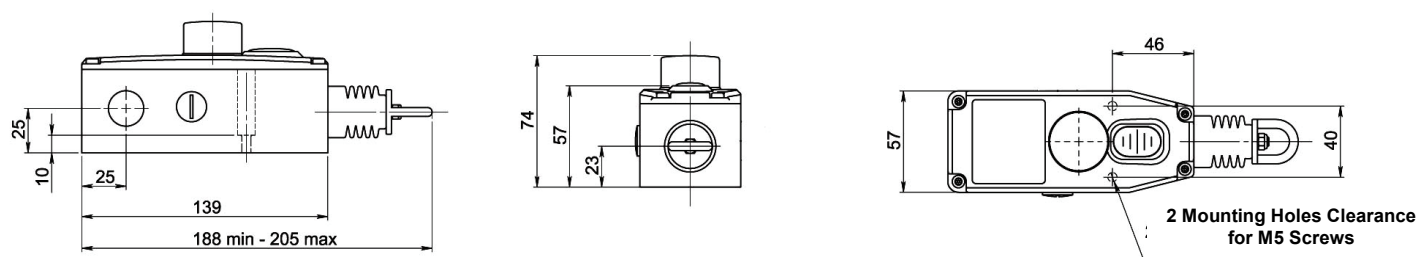


6 Model overview

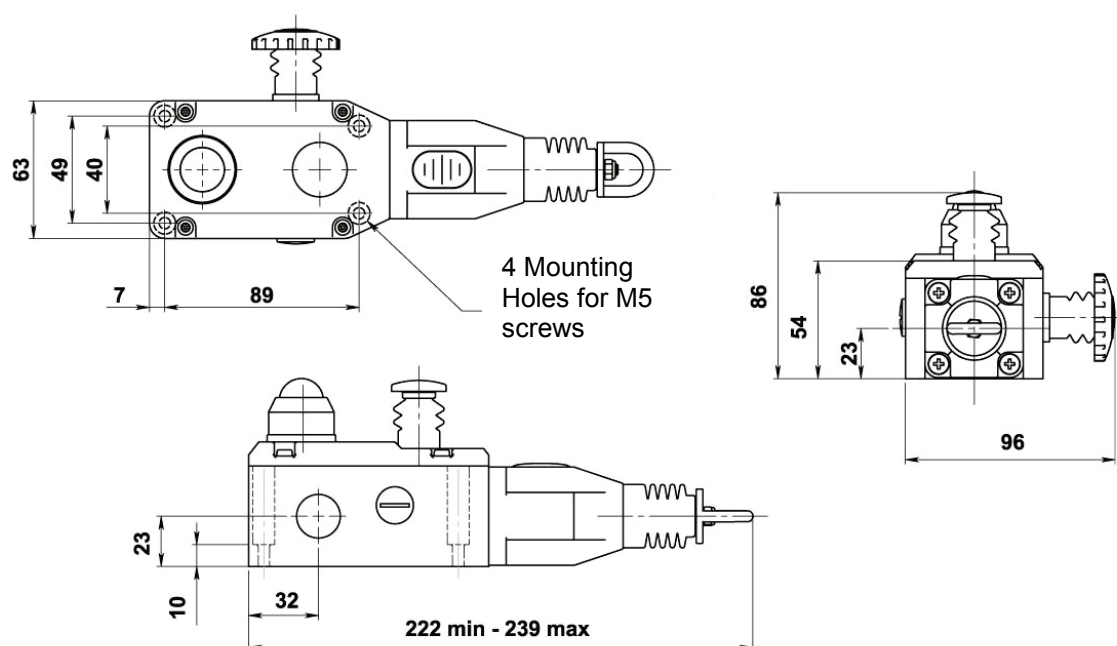
Type	Article number	Description
LineStrong1	2TLA050200R0030	2NC/2NO, M20
LineStrong2	2TLA050202R0332	2NC/2NO, M20, E-Stop, LED
LineStrong2Z	2TLA050202R0322	2NC/2NO, M20, E-Stop, LED, stainless steel
LineStrong2ZX	2TLA050202R7125	2NC, 3m cable, E-Stop, Stainless steel, Explosion proof
LineStrong3L	2TLA050206R0332	4NC/2NO, M20, E-Stop, LED, left
LineStrong3R	2TLA050208R0332	4NC/2NO, M20, E-Stop, LED, right
LineStrong3LZ	2TLA050206R0322	4NC/2NO, M20, E-Stop, LED, left, stainless steel
LineStrong3RZ	2TLA05008R0322	4NC/2NO, M20, E-Stop, LED, right, stainless steel
LineStrong3LZX	2TLA050204R7125	2NC/2NO, 3m cable, E-Stop, Stainless steel, Explosion proof
LineStrong3RZX	2TLA050206R7125	2NC/2NO, 3m cable, E-Stop, Stainless steel, Explosion proof
LineStrong3D	2TLA050204R0332	4NC/2NO, M20, E-Stop, LED, double
LineStrong3DZ	2TLA050204R0322	4NC/2NO, M20, E-Stop, LED, double, stainless steel
LineStrong3DZX	2TLA050208R7125	2NC/2NO, 3m cable, E-stop, Stainless steel, Explosion proof

Dimensions

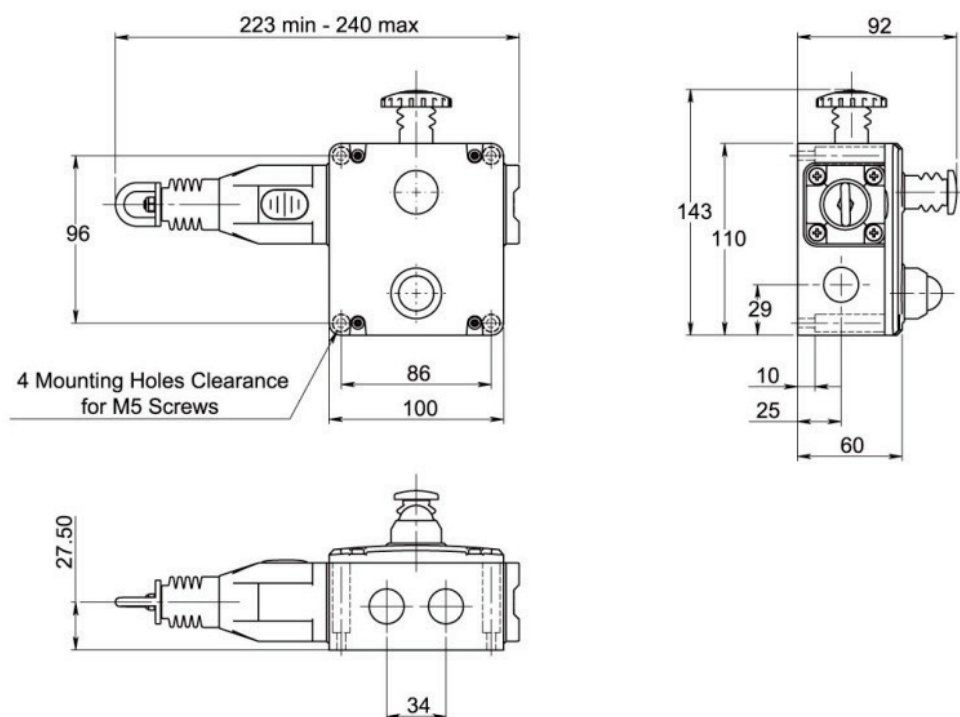
LineStrong1



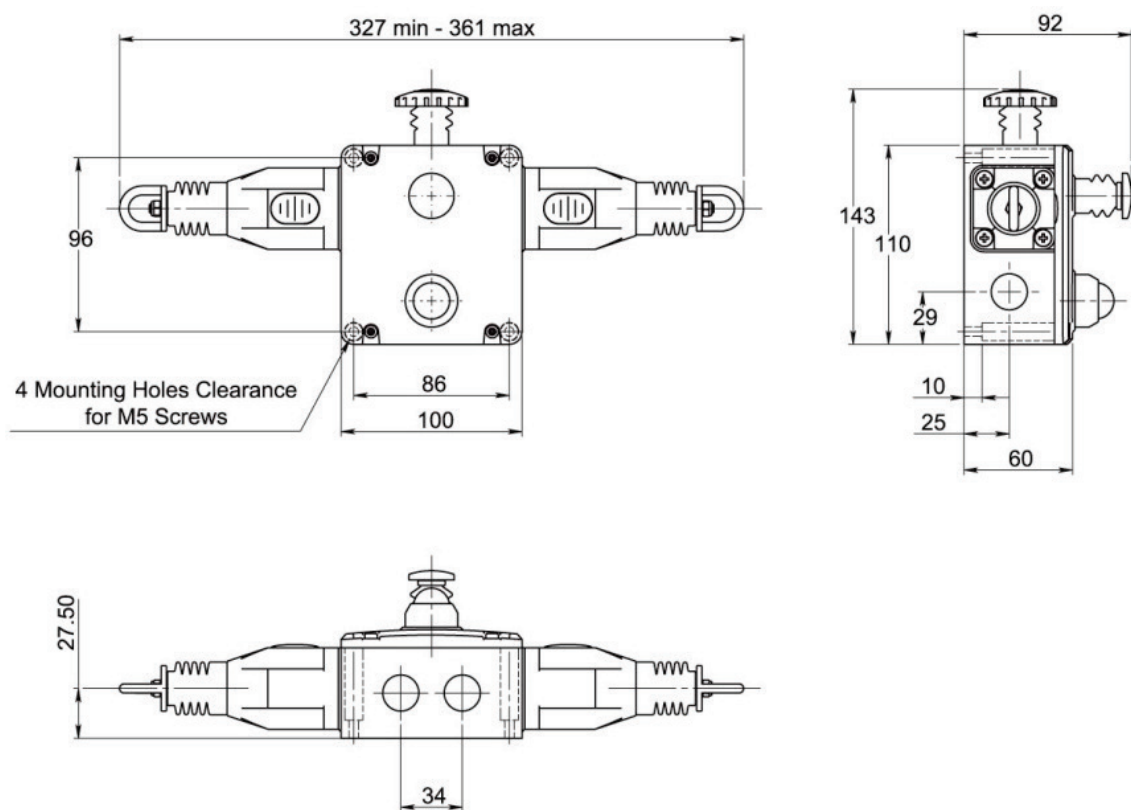
LineStrong2 / LineStrong2Z(X)



LineStrong 3L/R and LineStrong3LZ(X)/3RZ(X)



LineStrong3D and LineStrong3DZ(X)



NB! All measurements are in mm

Accessories

Type	Article number	Description
Galvanized wire pull kits:		
10 m wire kit	2TLA050210R0130	Wire pull kit includes: Wire Eyebolts Tensioner / Gripper Allan key
20 m wire kit	2TLA050210R0330	
80 m wire kit	2TLA050210R0630	
100 m wire kit	2TLA050210R0730	
Stainless steel wire pull kits:		
50 m wire kit	2TLA050210R0520	
100 m wire kit	2TLA050210R0720	
Wire only:		
10 m wire	2TLA050210R2120	
80 m wire	2TLA050210R2520	
100 m wire	2TLA050210R2620	
1 m wire (order by length)	2TLA020034R0500	
Wire Tensioner:		
Wire Tensioner, stainless steel	2TLA050210R4020	
Wire Tensioner, galvanized	2TLA050210R4030	
Corner pulley:		
Corner pulley, stainless steel	2TLA050210R6020	
Corner pulley, galvanized	2TLA050210R6030	
Eyebolt:		
Eyebolt, M8 x 1.25, stainless steel	2TLA050210R8020	
Eyebolt, M8 x 1.25, galvanized	2TLA050210R8030	
General wire pull accessories		
Safety spring, 220 mm long, stainless steel	2TLA050211R0004	
Screw driver, Anti-Tamper, Torx T20	2TLA050211R0006	
M20 x 1.5 gland	2TLA050040R0002	
M20 x 1.5 conduit plug	2TLA050040R0004	
LED Green/Red 24VDC	2TLA050211R0001	



7 Technical data

LineStrong1

Manufacturer

Address	ABB AB / JOKAB SAFETY Varlabergsvägen 11 SE-434 39 Kungsbacka Sweden
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Electrical characteristics

Contact type	IEC/EN60947-5-1 double break Typ Zb
Contact material	Silver
Termination	Clamp up to 2.5 mm ² conductors
Utilisation category	AC15 A300 3A 240VAC 3A/120VAC 6A/24VDC 2.5A inductive
Thermal current (I _{th})	10 A
Rated insulation/withstand voltages	500VAC / 2500VAC
Short circuit overload protection	Fuse externally 10 A (FF)

General

Wire span	Up to 50 m
Wire tension devise	ABB Jokab Safety Wire Tensioner
Wire type	PVC sheath steel wire 4.0 mm outside diameter
Torque settings	Mounting M5 4.0Nm Lid T20 Torx M4 1.5Nm Terminals 1.0Nm
Tension force (typical mid setting)	130 N
Tension operating force (wire pulled)	< 125N < 300 mm deflection
Vibration resistance	10-500 Hz 0.35 mm
Shock resistance	15 g 11 ms
Conduit entries	3 x M20
Enclosure classification	IP67
Operating temperature	-25°C to +80°C
Enclosure material/cover	Die cast painted yellow
Mounting position	Any
Mounting bolts	4 x M5
Weight (approx.)	0.675 kg

Safety-related characteristic data and Conformity

Conformity	European Machinery Directive 2006/42/EC EN ISO 12100:2010, EN ISO 13850:2008, EN 60204-1:2006+A1:2009 EN 60947-1:2007+A1:2011, EN 60947-5-1:2004+A1:2009, EN 60947-5-5:1997+A1:2005
EN ISO13849-1	Up to PL e, Cat. 4 depending upon system architecture
EN 62061	Up to SIL3 depending upon system architecture
Safety data	
Mechanical reliability B _{10d}	1.5 x 10 ⁶ operations at 100mA load
PFH _D	<1.0x10 ⁻⁷
Proof test interval (life)	21 years
MTTF _d	214 years (8 cycles per hour/24 hours per day/365 days)
Certifications	TÜV, cULus
Information with regard to UL 508	Use 12AWG copper conductors only Electrical Rating: A300 48W5 Type 1 Enclosure Max. Switching Current / Volt / Amp: 120V 6A (720VA break) PF 0.38, 240V 3A (720VA break) PF 0.38

LineStrong2 series

Manufacturer

Address	ABB AB / JOKAB SAFETY Varlabergsvägen 11 SE-434 39 Kungsbacka Sweden
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Electrical characteristics

Contact type	IEC/EN60947-5-1 double break Typ Zb
Contact material	Silver
Termination	Clamp up to 2.5 mm ² conductors
Utilisation category	AC15 A300 3A 240VAC 3A/120VAC 6A/24VDC 2.5A inductive
Thermal current (I _{th})	10 A
Rated insulation/withstand voltages	500VAC / 2500VAC
Short circuit overload protection	Fuse externally 10 A (FF)

Explosion Proof version (X)

Classification	Ex d IIC T6 (-20°C ≤ Ta ≤ +60°C) Gb Ex tb IIIC T85°C (-20°C ≤ Ta ≤ +60°C) Db
Rated Voltage	250V AC/DC
Rated Current	2 pole 4A 4 pole 2.5A

General

Wire span	
LineStrong2	Up to 80 m
LineStrong2Z(X)	Up to 100 m
Wire tension devise	ABB Jokab Safety Wire Tensioner
Wire type	PVC sheath steel wire 4.0 mm outside diameter
Torque settings	Mounting M5 4.0Nm Lid T20 Torx M4 1.5Nm Terminals 1.0Nm
Tension force (typical mid setting)	130 N
Tension operating force (wire pulled)	< 125N < 300 mm deflection

Vibration resistance	10-500 Hz 0.35 mm
Shock resistance	15 g 11 ms
Conduit entries	3 x M20
Enclosure classification	
LineStrong2	IP67
LineStrong2Z(X)	IP69K
Operating temperature	
LineStrong2	-25°C to +80°C
LineStrong2Z(X)	-25°C to +80°C (100°C cleaning)
Enclosure material/cover	
LineStrong2	Die cast painted yellow
LineStrong2Z	Stainless steel 316
Mounting position	Any
Mounting bolts	4 x M5
Weight (approx.)	
LineStrong2	0.880 kg
LineStrong2Z(X)	1.635 kg

Safety-related characteristic data and Conformity

Conformity	European Machinery Directive 2006/42/EC EN ISO 12100:2010, EN ISO 13850:2008, EN 60204-1:2006+A1:2009 EN 60947-1:2007+A1:2011, EN 60947-5-1:2004+A1:2009, EN 60947-5-5:1997+A1:2005
EN ISO13849-1	Up to PL e, Cat. 4 depending upon system architecture
EN 62061	Up to SIL3 depending upon system architecture
Safety data	
Mechanical reliability B _{10d}	1.5 x 10 ⁶ operations at 100mA load
PFH _D	<1.0x10 ⁻⁷
Proof test interval (life)	21 years
MTTF _d	214 years (8 cycles per hour/24 hours per day/365 days)
Certifications	TÜV, cULus
Information with regard to UL 508	Use 12AWG copper conductors only Electrical Rating: A300 48W5 Type 1 Enclosure Max. Switching Current / Volt / Amp: 120V 6A (720VA break) PF 0.38, 240V 3A (720VA break) PF 0.38

LineStrong3 series

Manufacturer

Address	ABB AB / JOKAB SAFETY Varlabergsvägen 11 SE-434 39 Kungsbacka Sweden
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Electrical characteristics

Contact type	IEC/EN60947-5-1 double break Typ Zb
Contact material	Silver
Termination	Clamp up to 2.5 mm ² conductors
Utilisation category	AC15 A300 3A 240VAC 3A/120VAC 6A/24VDC 2.5A inductive
Thermal current (I _{th})	10 A
Rated insulation/withstand voltages	500VAC / 2500VAC
Short circuit overload protection	Fuse externally 10 A (FF)

Explosion Proof version (X)

Classification	Ex d IIC T6 (-20°C ≤ Ta ≤ +60°C) Gb Ex tb IIIC T85°C (-20°C ≤ Ta ≤ +60°C) Db
Rated Voltage	250V AC/DC
Rated Current	2 pole 4A 4 pole 2.5A

General

Wire span	
LineStrong3L/R/LZ(X)/RZ(X)	Up to 125 m
LineStrong3D/DZ(X)	Up to 250 m
Wire tension devise	ABB Jokab Safety Wire Tensioner
Wire type	PVC sheath steel wire 4.0 mm outside diameter
Torque settings	Mounting M5 4.0Nm Lid T20 Torx M4 1.5Nm Terminals 1.0Nm
Tension force (typical mid setting)	130 N
Tension operating force (wire pulled)	< 125N < 300 mm deflection
Vibration resistance	10-500 Hz 0.35 mm
Shock resistance	15 g 11 ms
Conduit entries	4 x M20
Enclosure classification	
LineStrong3D/L/R	IP67
LineStrong3LZ(X)/RZ(X)/DZ(X)	IP69K
Operating temperature	
LineStrong3D/L/R	-25°C to +80°C
LineStrong3LZ(X)/RZ(X)/DZ(X)	-25°C to +80°C (100°C cleaning)
Enclosure material/cover	
LineStrong3D/L/R	Die cast painted yellow
LineStrong3LZ(X)/RZ(X)/DZ(X)	Stainless steel 316
Mounting position	Any
Mounting bolts	4 x M5
Weight (approx.)	
LineStrong3D	1.320 kg
LineStrong3DZ(X)	2.200 kg
LineStrong3L/R	1.100 kg
LineStrong3LZ(X)/RZ(X)	2.000 kg

Safety-related characteristic data and Conformity

Conformity	European Machinery Directive 2006/42/EC EN ISO 12100:2010, EN ISO 13850:2008, EN 60204-1:2006+A1:2009 EN 60947-1:2007+A1:2011, EN 60947-5-1:2004+A1:2009, EN 60947-5-5:1997+A1:2005
EN ISO13849-1	Up to PL e, Cat. 4 depending upon system architecture
EN 62061	Up to SIL3 depending upon system architecture
Safety data	
Mechanical reliability B_{10d}	1.5×10^6 operations at 100mA load
PFH _D	$<1.0 \times 10^{-7}$
Proof test interval (life)	21 years
MTTF _d	214 years (8 cycles per hour/24 hours per day/365 days)
Certifications	TÜV, cULus
Information with regard to UL 508	Use 12AWG copper conductors only Electrical Rating: A300 48W5 Type 1 Enclosure Max. Switching Current / Volt / Amp: 120V 6A (720VA break) PF 0.38, 240V 3A (720VA break) PF 0.38

The Jokab Safety branded product with articlenumber beginning with 2TLJ is fully compatible with the ABB branded product with articlenumber beginning with 2TLA.

8 EC Declaration of conformity



EC Declaration of conformity

(according to 2006/42/EC, Annex 2A)

We ABB AB
JOKAB SAFETY
Varlabergsgatan 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

Authorised to compile the technical file

ABB AB
JOKAB Safety
Varlabergsgatan 11
SE-434 39 Kungsbacka
Sweden

Product

Emergency stop wire

LineStrong1 LineStrong2 LineStrong2Z
LineStrong3D LineStrong3L LineStrong3R
LineStrong3DZ LineStrong3LZ LineStrong3RZ

Certificate

968/EZ 555.00/12

Certification body

TÜV Rheinland Industrie Service
GmbH
Am Grauen Stein
51105 Köln
Germany

Used harmonized standards

EN ISO 12100:2010, EN ISO 13850:2008,
EN 60204-1:2006:+A1:2009

Other used standards

EN 60947-1:2007:+A1:2011, EN 60947-5-1:2004:+A1:2009,
EN 60947-5-5:1997:+A1:2005



Jesper Kristensson
PRU Manager
Kungsbacka 2012-08-06

www.abb.com
www.jokabsafety.com

Original



EC Declaration of conformity

(according to 2006/42/EC, Annex2A)

We ABB AB
JOKAB SAFETY
Varlabergsgatan 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
94/9/EC

Authorised to compile the technical file

ABB AB
JOKAB Safety
Varlabergsgatan 11
SE-434 39 Kungsbacka
Sweden

Product

Emergency stop wire with explosion proof internal contact
block

LineStrong2X	LineStrong2ZX	
LineStrong3DX	LineStrong3LX	LineStrong3RX
LineStrong3DZX	LineStrong3LZX	LineStrong3RZX

EC-Type Certificate

Baseefa11ATEX0267X (94/9/EC)

Notified body

Baseefa Ltd
Buxton
Derbyshire
SK17 9RZ
United Kingdom
Notified Body No.1180

Certificate

968/EZ 555.00/12

Certification body

TÜV Rheinland Industrie Service
GmbH
Am Grauen Stein
51105 Köln
Germany

Used harmonized standards

EN ISO 12100:2010, EN ISO 13850:2008,
EN 60204-1:2006:+A1:2009, EN 60079-0:2011,
EN 60079-1:2007, EN 60079-31:2008

Other used standards

EN 60947-1:2007:+A1:2011,
EN 60947-5-1:2004:+A1:2009,
EN 60947-5-5:1997:+A1:2005



Jesper Kristensson
PRU Manager
Kungsbacka 2012-08-06

www.abb.com
www.jokabsafety.com

Original

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

www.abb.com/lowvoltage