Original instructions

LineStrong-series

Emergency Stop Grab Wire Safety Switch













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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 strop 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.

Distance between the eyebolts

We recommend installing the eye bolts across the whole length of the rope, min. 2.5 m to max. 3 m apart

If this cannot be achieved,

Distance between eyebolts	Actions
Less than 0,5 m	These areas must be clearly marked as inactive zones.
0,5 to 2,5 m	Appropriate installation checks must be made at each end and the middle of the rope system. These checks must ensure that the system operates when the rope is pulled in any direction and the parameters to trip the system are satisfied.
2,5 m to 3 m	Recommended
More than 3 m	Checks must be where the distances are extended. These checks must ensure that the system operates when the rope is pulled in any direction and the parameters to trip the system are satisfied. If not satisfied, these areas must be clearly marked as inactive zones.

Function description for the variants

LineStrong1

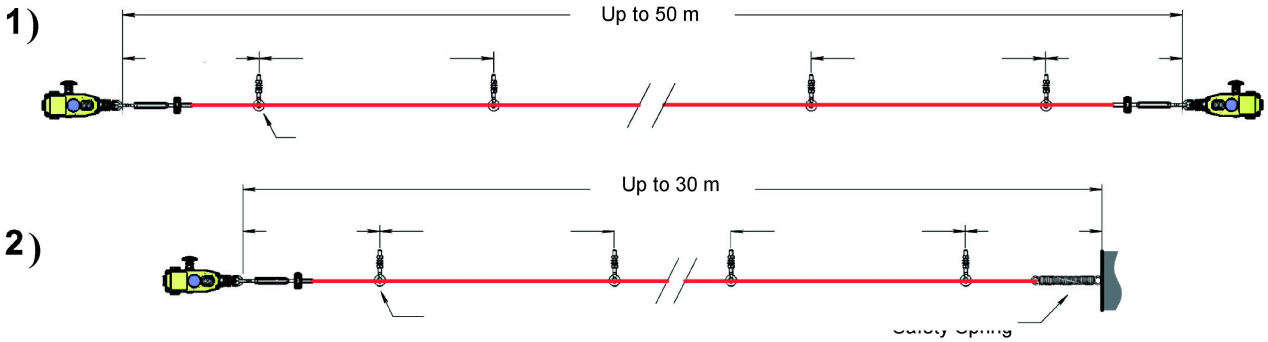
LineStrong1 is a compact and small, yet robust switch that can handle wires up to 30 meters on a single switch (50 meters on two switches).

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

We recommend installing the eye bolts across the whole length of the rope between the switches at min. 2.5 m to max. 3 m. If this cannot be achieved, please see “Distance between eyebolts”.

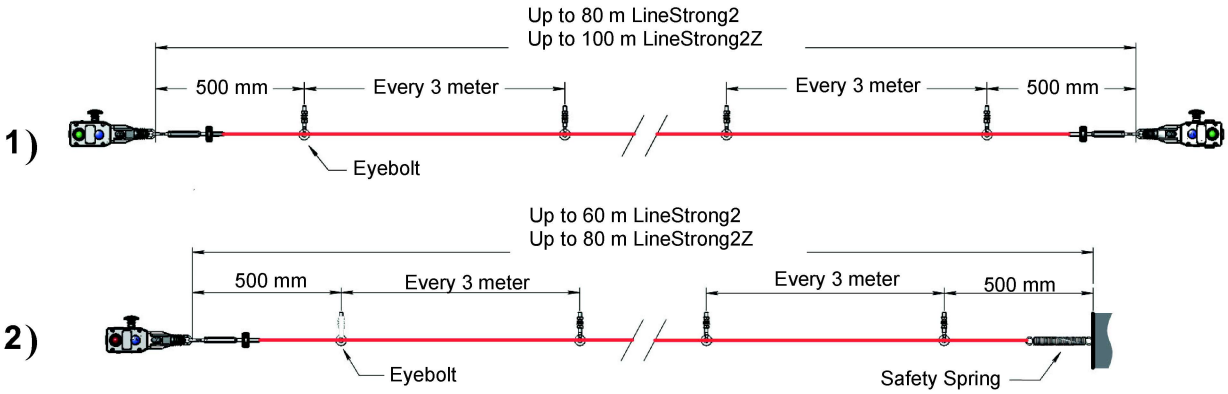
LineStrong2

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.

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

We recommend installing the eye bolts across the whole length of the rope between the switches at min. 2.5 m to max. 3 m. If this cannot be achieved, please see “Distance between eyebolts”.

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.

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.

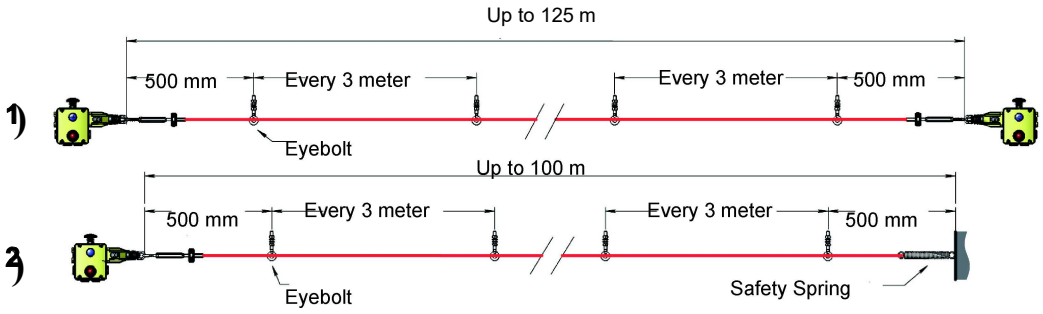
LineStrong3LZ/3RZ are in stainless steel 316 housings and are designed specifically to withstand the tough environments found in the food and pharmaceutical industries. LineStrong3LZ/3RZ are designed to protect a length up to 100 meters on a single switch. If two switches are used together, the wire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



NB: The picture shows the left hand version



NB: The picture shows the right hand version



1) LineStrong3L with a Linstrong3R

2) LineStrong3L with safety spring

We recommend installing the eye bolts across the whole length of the rope between the switches at min. 2.5 m to max. 3 m. If this cannot be achieved, please see “Distance between eyebolts”.

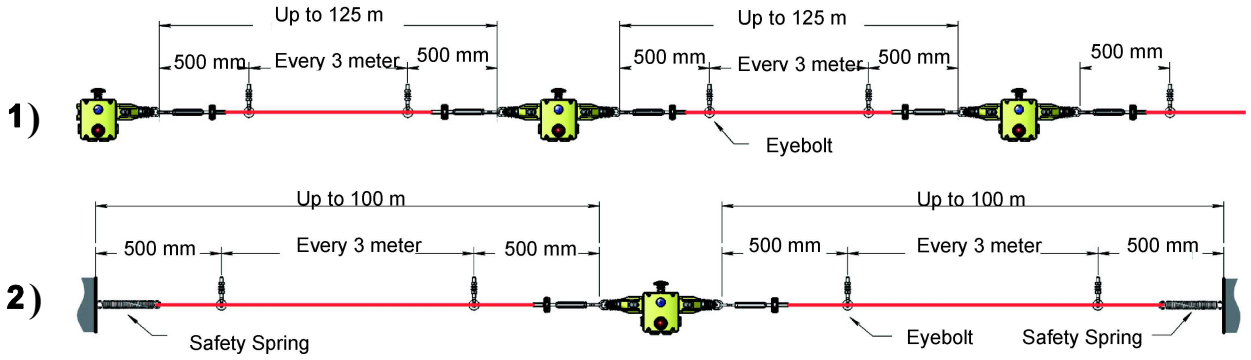
Double wire – LineStrong3D and 3DZ

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.







1) Several LineStrong3D
2) LineStrong3D with safety springs

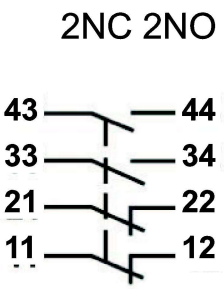
We recommend installing the eye bolts across the whole length of the rope between the switches at min. 2.5 m to max. 3 m. If this cannot be achieved, please see “Distance between eyebolts”.

3 Connections

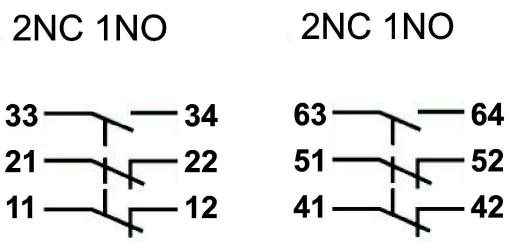
See Chapter Installation and Maintenance for more information regarding installation.

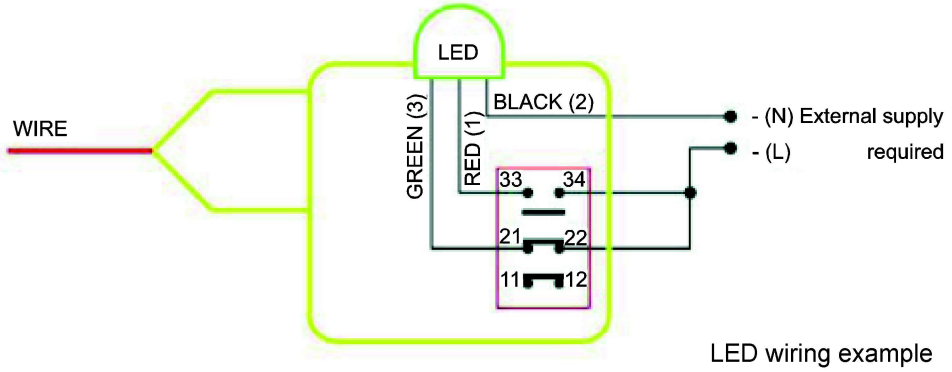
Connections

LineStrong1 & LineStrong2



LineStrong3

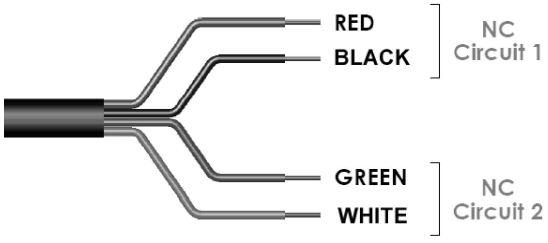




LED wiring example

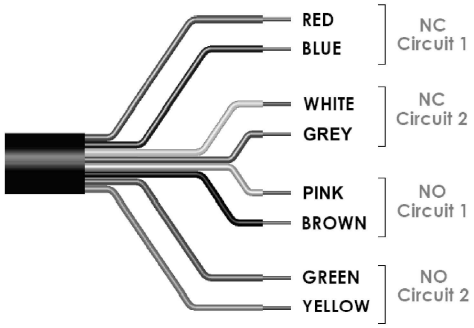
LineStrong2, explosion proof

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.

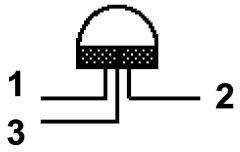
4. M5 mounting bolts must be used to fix the switches. Tightening torque for mounting bolts to ensure reliable fixing is 4 Nm. Tightening torque for the lid screws,conduit entry plugs and cable glands must be 1.5 Nm to ensure IP seal. Only use the correct size gland for the conduit entry and cable outside diameter.

5. Tensioning of wire is achieved by use of ABB tensioner / gripper assemblies.
   Upon installation, tension to mid position is 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 are 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.

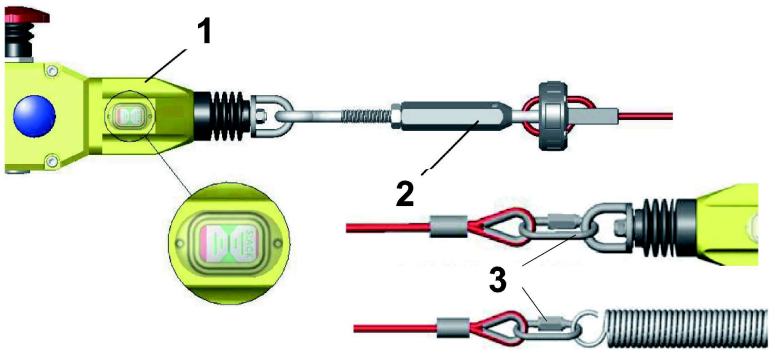
⚠ **Warning!** All the safety functions must be tested before starting up the system.

Installation of the wire

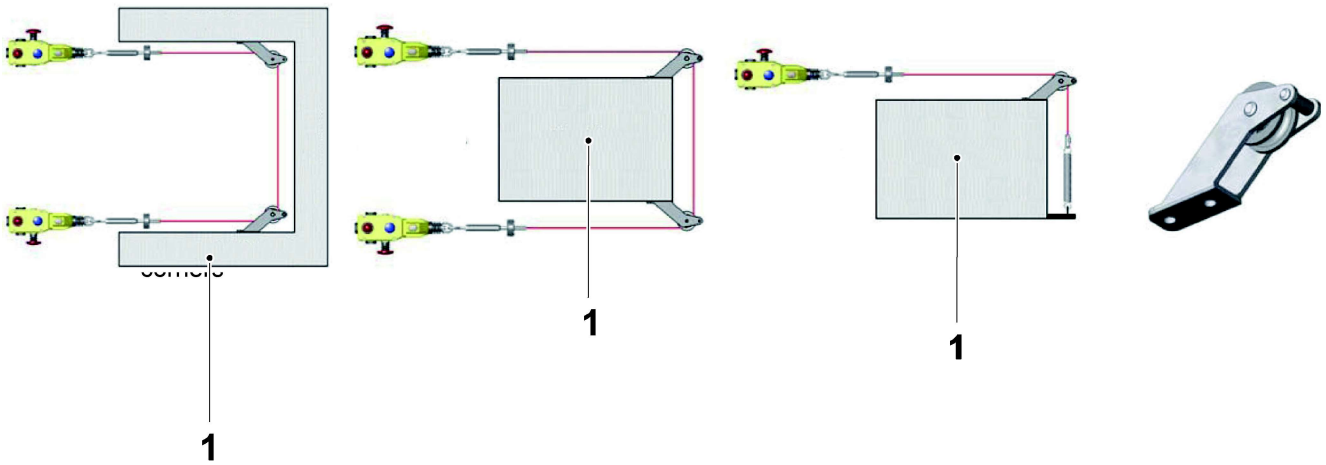
When setting up an Emergency stop grab wire system from ABB Jokab Safety it is recommended to do the tensioning of the wire by using of ABB Jokab Safety Tensioner / Gripper accessory. The installation of the tensioner accessory reduces the installation time. The eyehook, tensioner thimble and the wire 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).

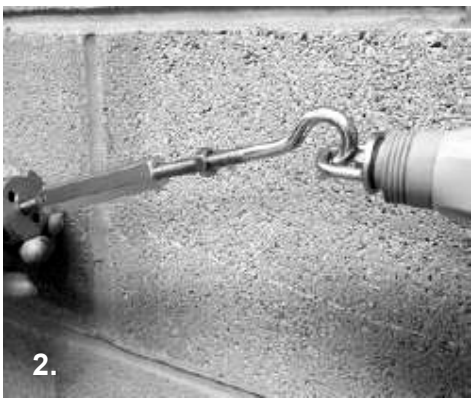


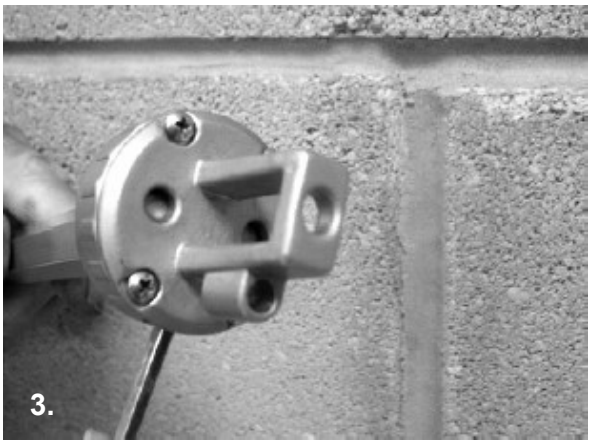
Examples of using the corner pulley

1) Machine

Tensioner/Gripper

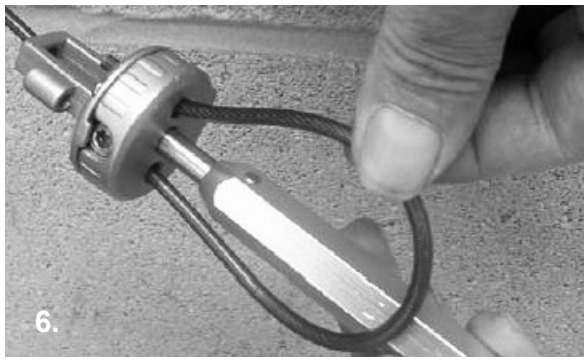








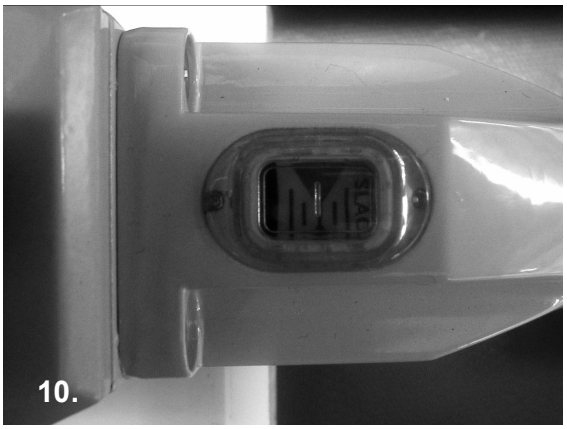


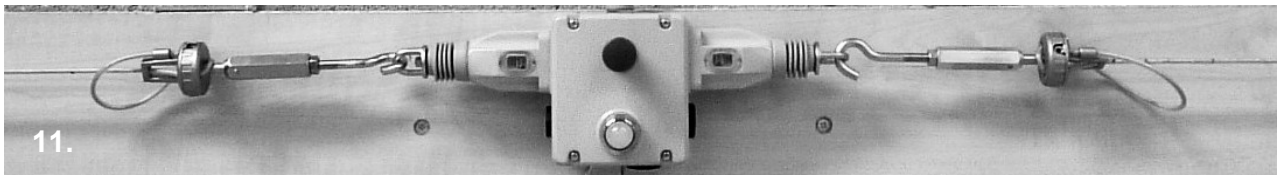


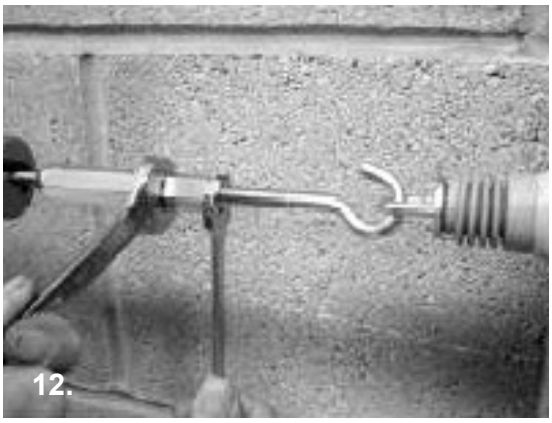


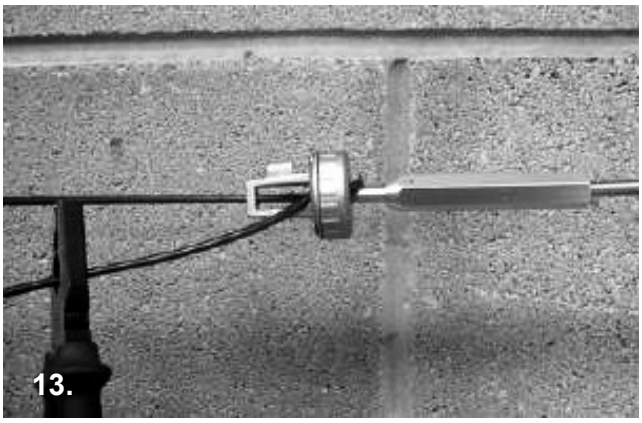



9.


10.


11.


12.


13.


14.

Maintenance

The recommendations below are general, and the frequency of the checks can be adapted to suit the history of use and the environment.

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.

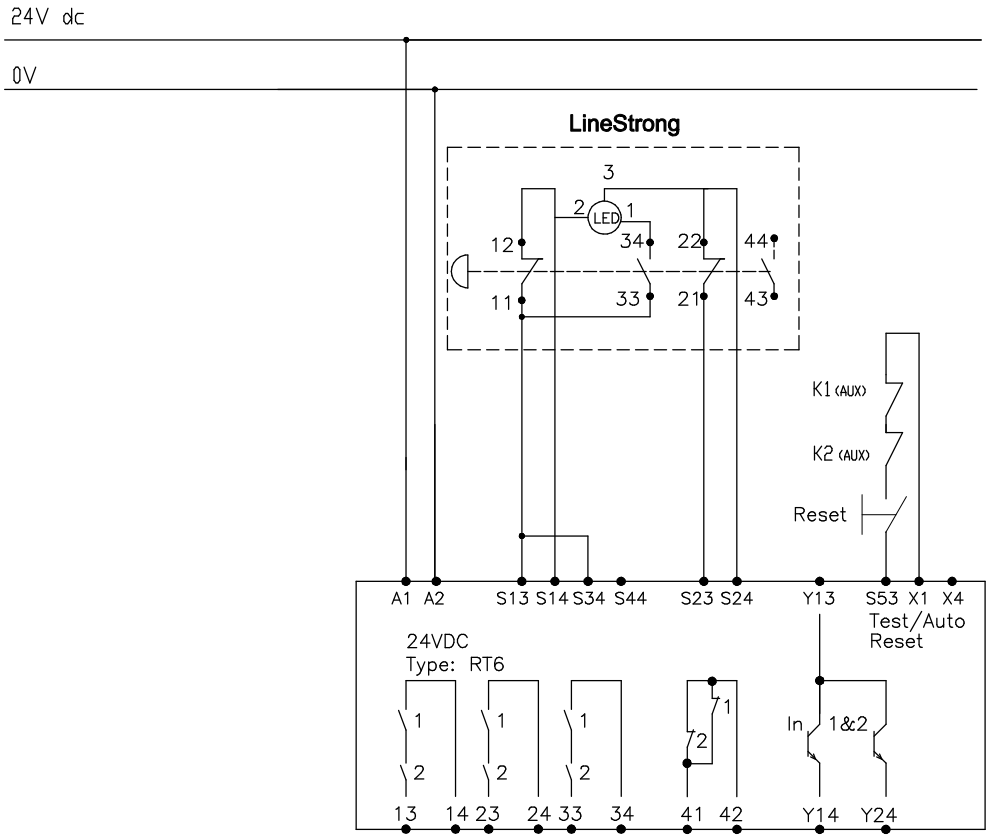
Every 6 months: Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress.

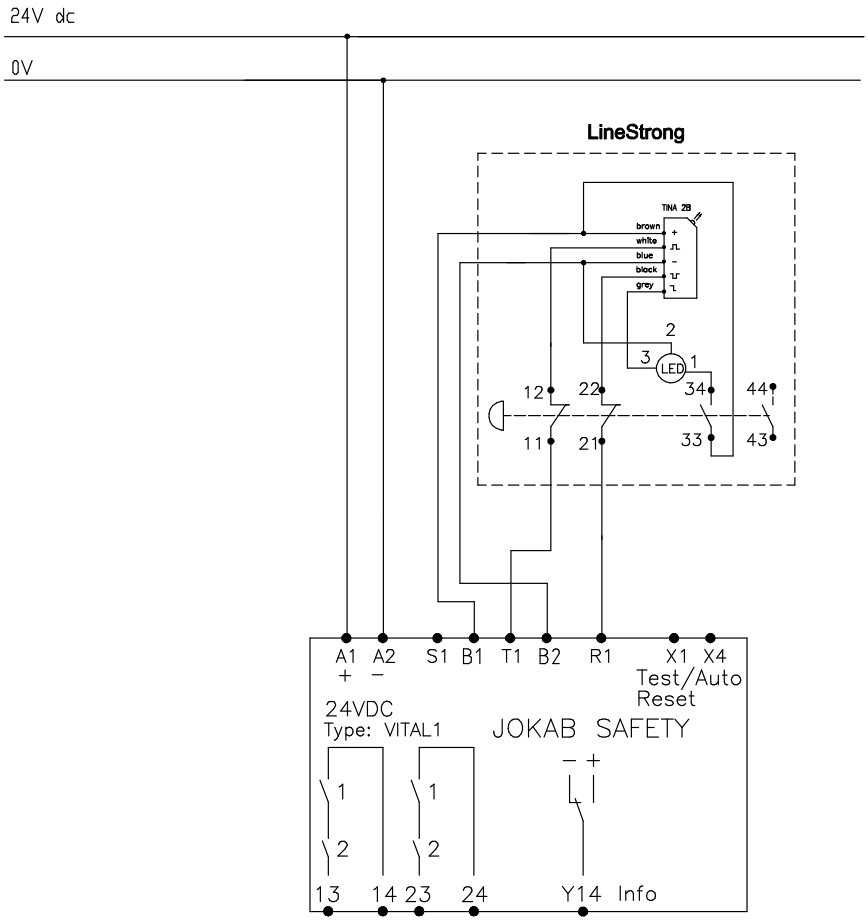
⚠ **Warning**! The safety functions and the mechanics shall be tested regularly, at least once every year, to confirm that all the safety functions are working properly.

⚠ **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 sheet are not implemented. These requirements form part of the product warranty.

5 Application examples



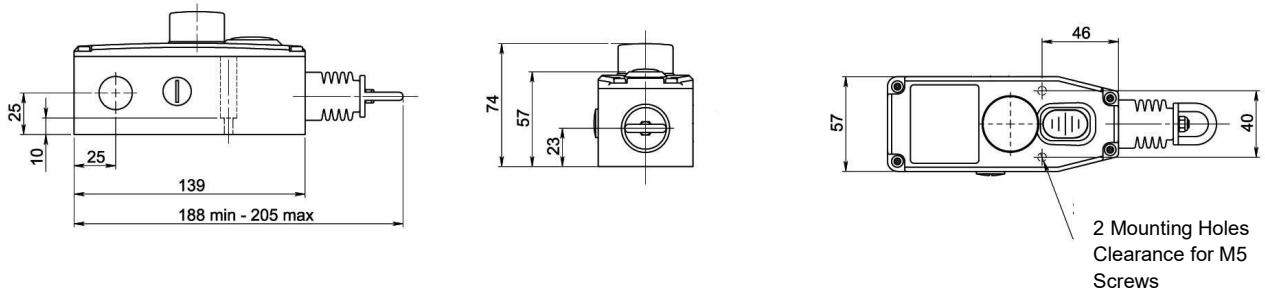


6 Model overview

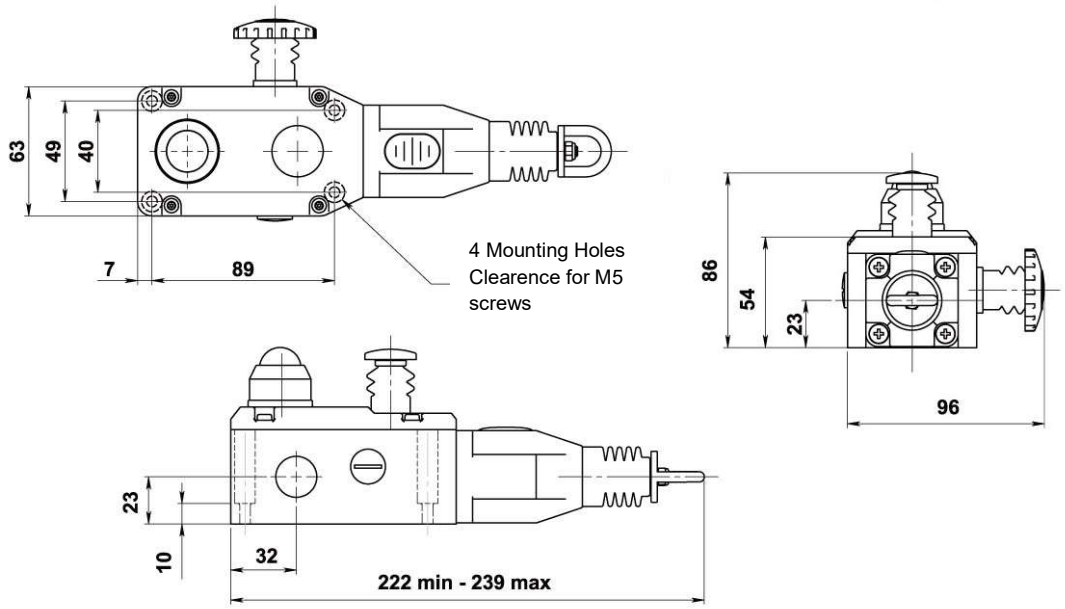
Type	Article number	Description
LineStrong1	2TLA050200R0030	2NC/2NO, M20
LineStrong2	2TLA050202R0332	2NC/2NO, M20, E-Stop, LED
LineStrong2Z	2TLA050202R0322	2NC/2NO, M20, E-Stop, LED, stainless steel
LineStrong3L	2TLA050206R0332	4NC/2NO, M20, E-Stop, LED, left
LineStrong3R	2TLA050208R0332	4NC/2NO, M20, E-Stop, LED, right
LineStrong3LZ	2TLA050206R0322	4NC/2NO, M20, E-Stop, LED, left, stainless steel
LineStrong3RZ	2TLA050208R0322	4NC/2NO, M20, E-Stop, LED, right, stainless steel
LineStrong3D	2TLA050204R0332	4NC/2NO, M20, E-Stop, LED, double
LineStrong3DZ	2TLA050204R0322	4NC/2NO, M20, E-Stop, LED, double, stainless steel

Dimensions

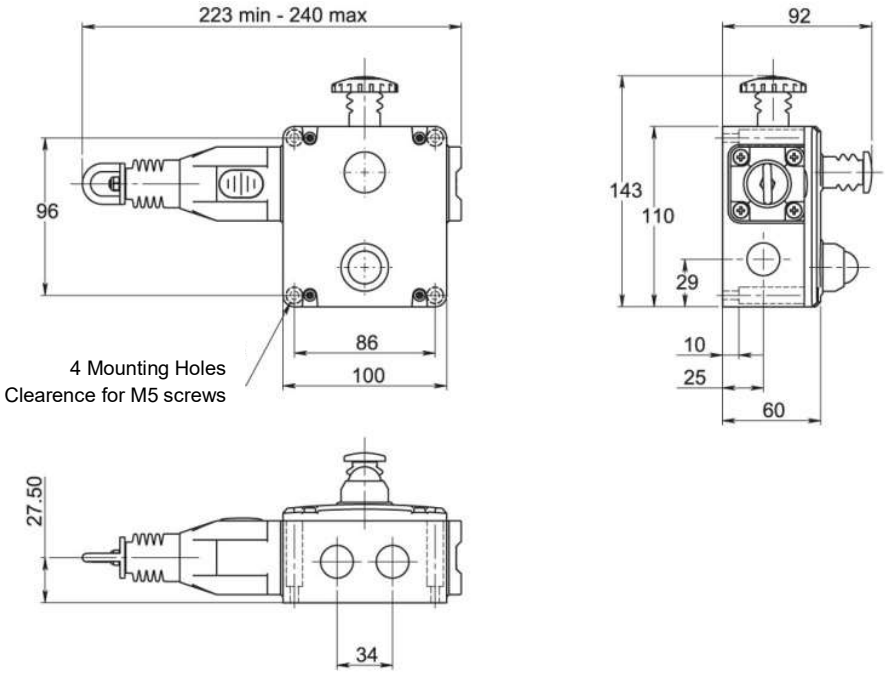
LineStrong1



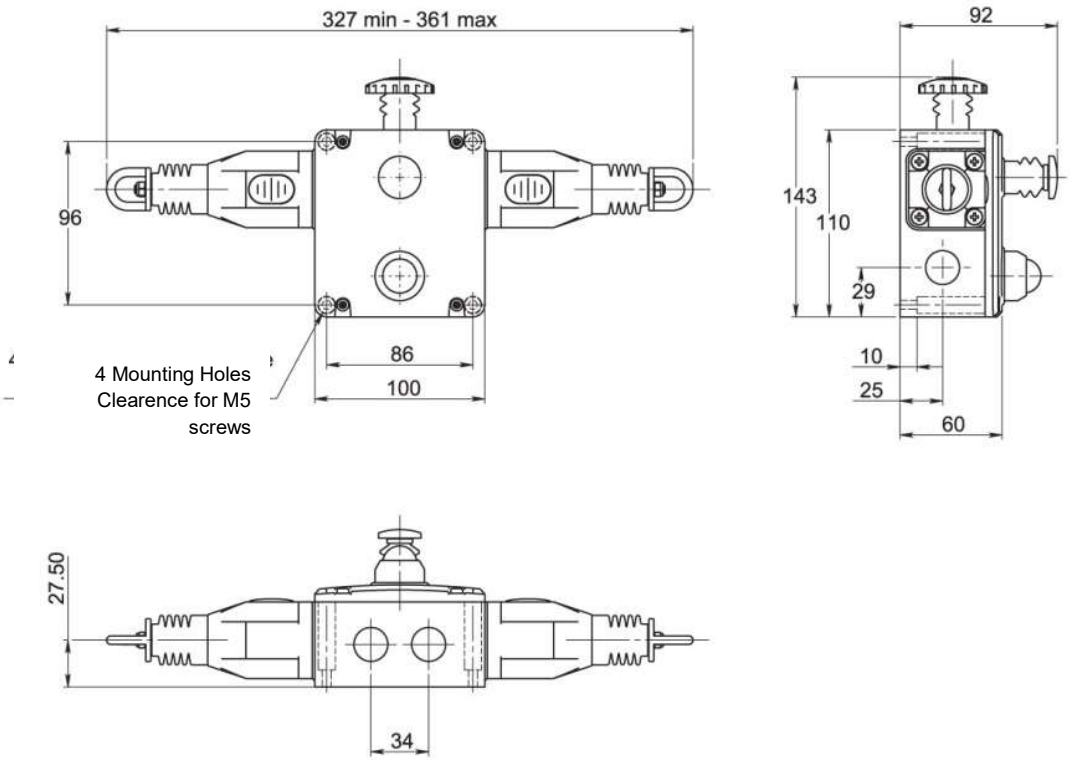
LineStrong2 / LineStrong2Z



LineStrong3L/R and LineStrong3LZ/3RZ



LineStrong3D and LineStrong3DZ



NB: All measurements are in mm

Accessories

Type	Article number	Description
Galvanized wire pull kits:		Wire pull kit includes: Wire Eyebolts Tensioner / Gripper Allen key
10 m wire kit	2TLA050210R0130	
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 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, 8pcs	2TLA050210R8020	
Eyebolt, M8 x 1.25, galvanized, 8pcs	2TLA050210R8030	
General wire pull accessories:		
Safety spring, 220 mm long, SS	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	

* Wire still in galvanized steel, but with the standard red PVC sheath.



7 Technical data

LineStrong1

Manufacturer	
Address	ABB AB / JOKAB SAFETY Varlabergsvägen 11 SE-434 39 Kungsbacka Sweden
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 (Ith)	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 x 1.5
Enclosure classification	IP67
Ambient temperature	-25°C to +80°C
Material	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
Electrical characteristics	
Contact type	IEC/EN60947-5-1 double break Typ Zb
Contact material	Silver
Termination	Clamp up to 2.5 mm2 conductors
Utilisation category	AC15 A300 3A 240VAC 3A/120VAC 6A/24VDC 2.5A inductive
Thermal current (Ith)	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 LineStrong2Z(X)	 Up to 80 m 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 x 1.5
Enclosure classification LineStrong2 LineStrong2Z(X)	 IP67 IP67, IP69K
Operating temperature LineStrong2 LineStrong2Z(X)	 -25°C to +80°C -25°C to +80°C (100°C cleaning)
Material LineStrong2 LineStrong2Z	 Die cast painted yellow 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 Electrification Sweden AB / JOKAB SAFETY Varlabergsvägen 11 SE-434 39 Kungsbacka Sweden
Electrical characteristics	
Contact type	IEC/EN60947-5-1 double break Typ Zb
Contact material	Silver
Termination	Clamp up to 2.5 mm2 conductors
Utilisation category	AC15 A300 3A 240VAC 3A/120VAC 6A/24VDC 2.5A inductive
Thermal current (Ith)	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) LineStrong3D/DZ(X)	 Up to 125 m 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 x 1.5
Enclosure classification LineStrong3D/L/R LineStrong3LZ(X)/RZ(X)/DZ(X)	 IP67 IP69K
Ambient temperature LineStrong3D/L/R LineStrong3LZ(X)/RZ(X)/DZ(X)	 -25°C to +80°C -25°C to +80°C (100°C cleaning)
Material LineStrong3D/L/R LineStrong3LZ(X)/RZ(X)/DZ(X)	 Die cast painted yellow 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 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

8 EC Declaration of conformity

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

Product			**Certificate**
Emergency stop wire			968/EZ 555.00/12
LineStrong1	LineStrong2	LineStrong2Z	
LineStrong3D	LineStrong3L	LineStrong3R	
LineStrong3DZ	LineStrong3LZ	LineStrong3RZ	

Certification boy	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 Electrification Sweden AB / JOKAB SAFETY Varlabergsvägen 11, SE-434 39 Kungsbacka, Sweden

www.abb.com/jokabsafety