

SAFE-T-PULL®

EMERGENCY STOP SAFETY SWITCH

Installation, Design, Setting Instruction and Technical Documentation

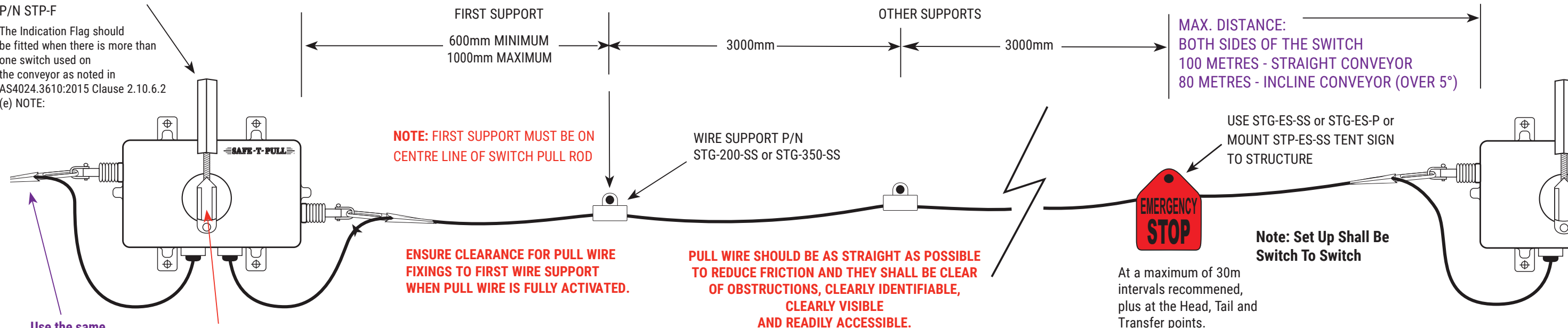
P/No's: STP-P-2-NT & STP-P-4-NT

YELLOW INDICATION FLAG:
P/N STP-F

The Indication Flag should be fitted when there is more than one switch used on the conveyor as noted in AS4024.3610:2015 Clause 2.10.6.2 (e) NOTE:

For emergency stop locations see page 4.

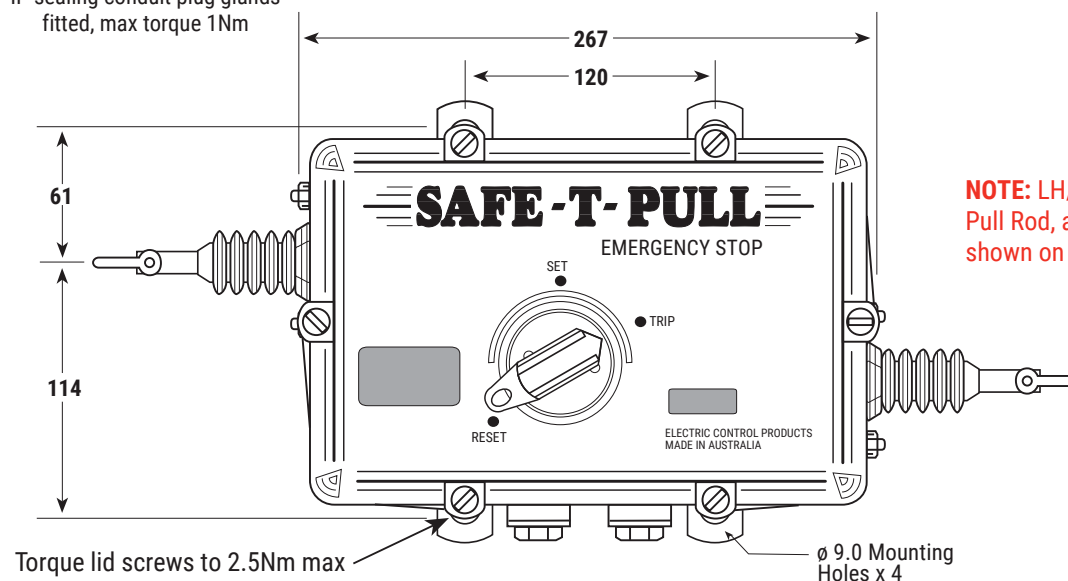
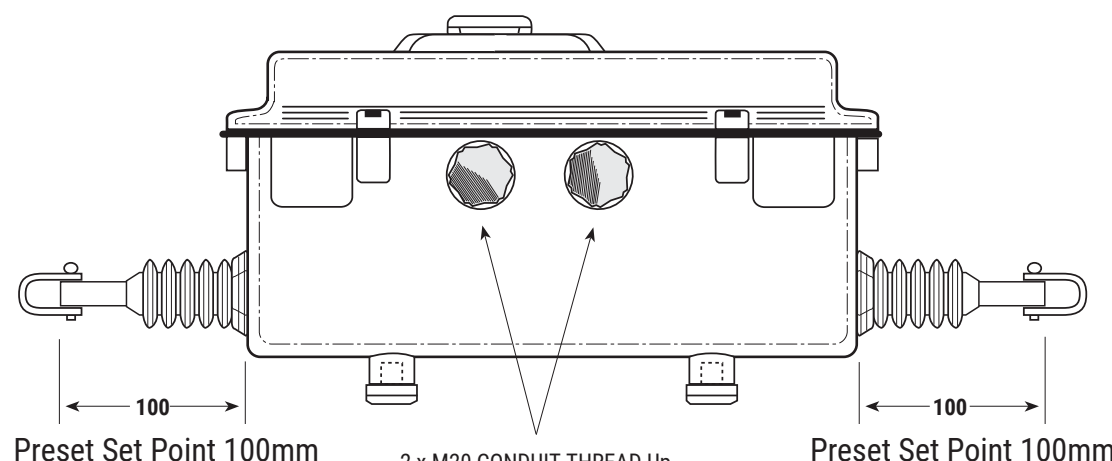
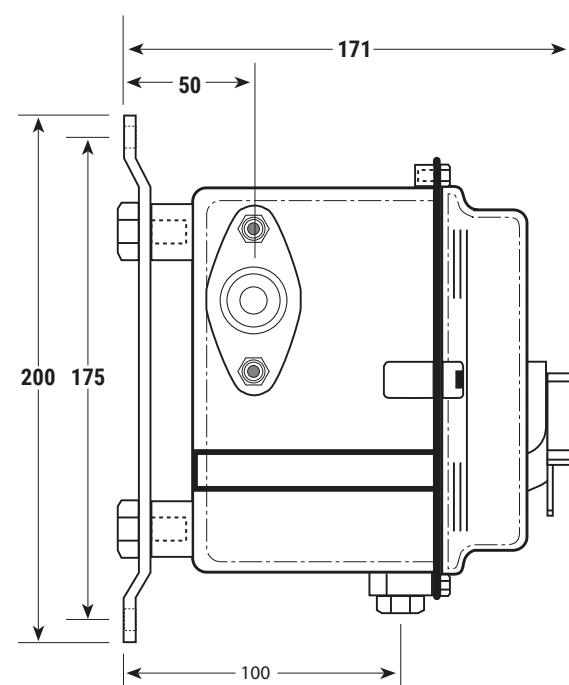
Note: Lanyards are to be fitted in front of removable guards, nip and shear points that are accessible on all bulk handling material conveyors and not to be replacements for guards.



Use the same set up on the other side for dual direction switch.

To reset the switch via the switch top only takes 1Nm. If a higher torque is felt, check switch. IEC 60947-5-5 Clause 7.7.4

NOTE: After actuation and before resetting, the machinery shall be inspected along the whole length of the rope in order to detect the reason for activation.
AS4024.1604 Clause 4.54



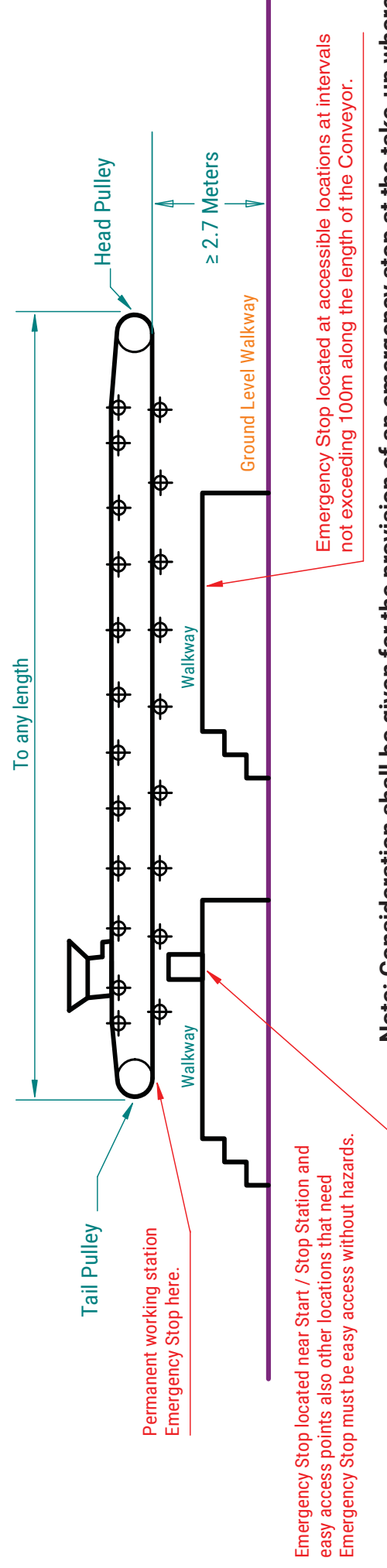
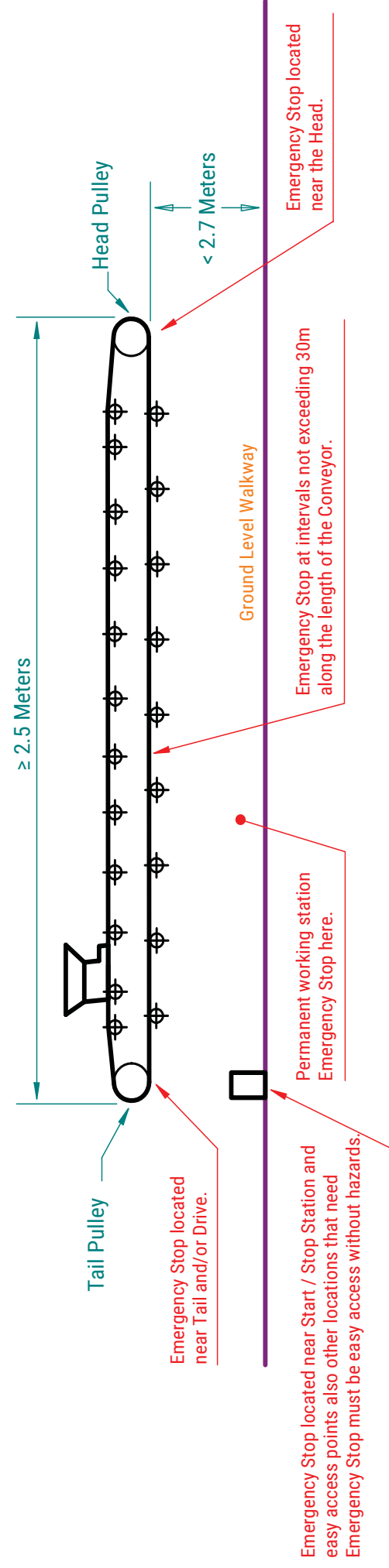
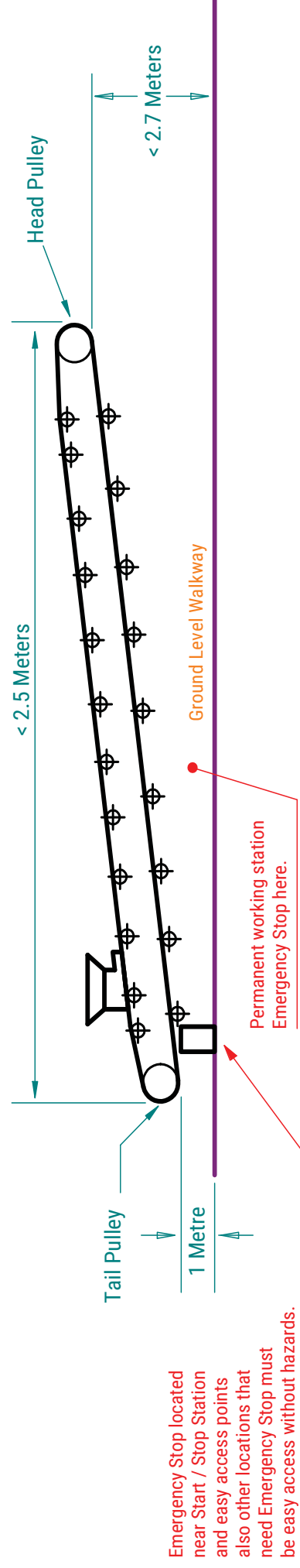
NOTE: LH/RH Switches will only have one Pull Rod, at either end of LH or RH as shown on Part No.

For further installation requirements refer to AS/NZS 4024-1-2014 Series: Safety of Machinery.

Note: To comply with the safety critical functions in AS/NZS 4024.3610 - 2015 Section 2.10.5 Emergency Stop. The locations of Pull Wires, components and elements to achieve the emergency stop function, person - on - conveyor stop, general requirements and Pull Wire design must all be reviewed before installation.

Electric Control PRODUCTS

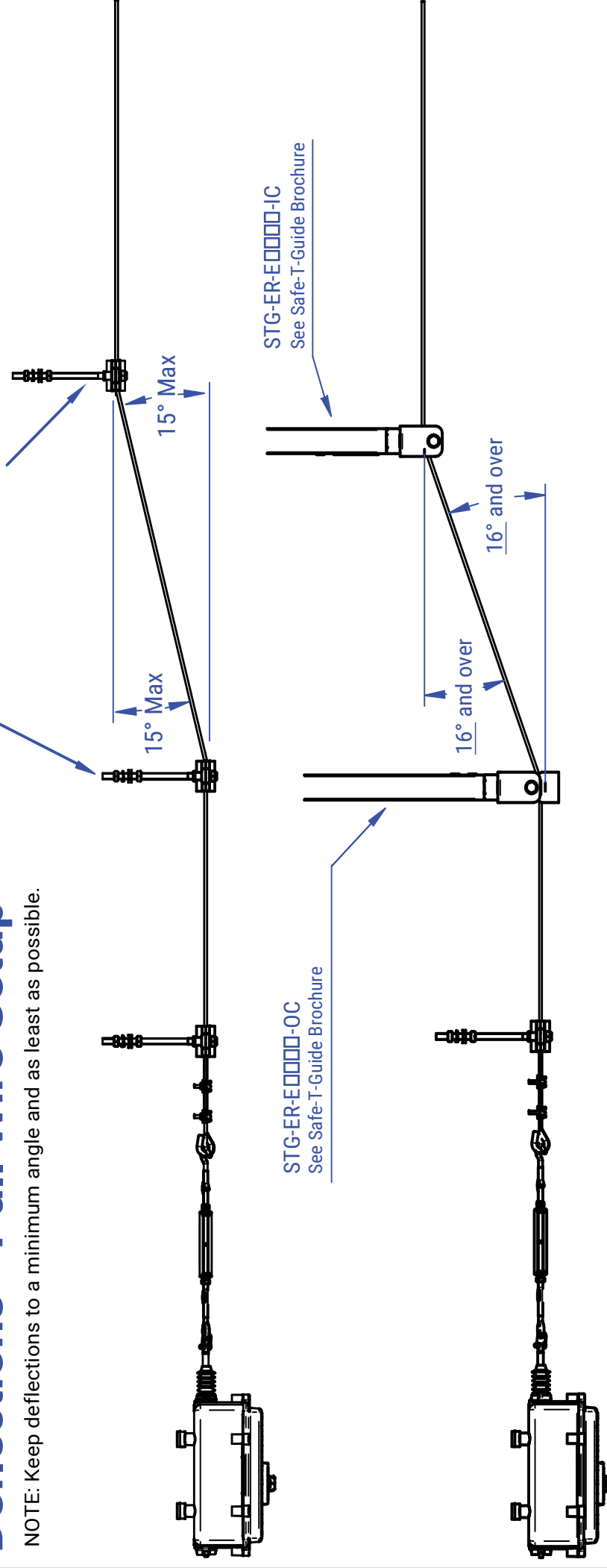
ACN: 060 617 987
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CE Conformity

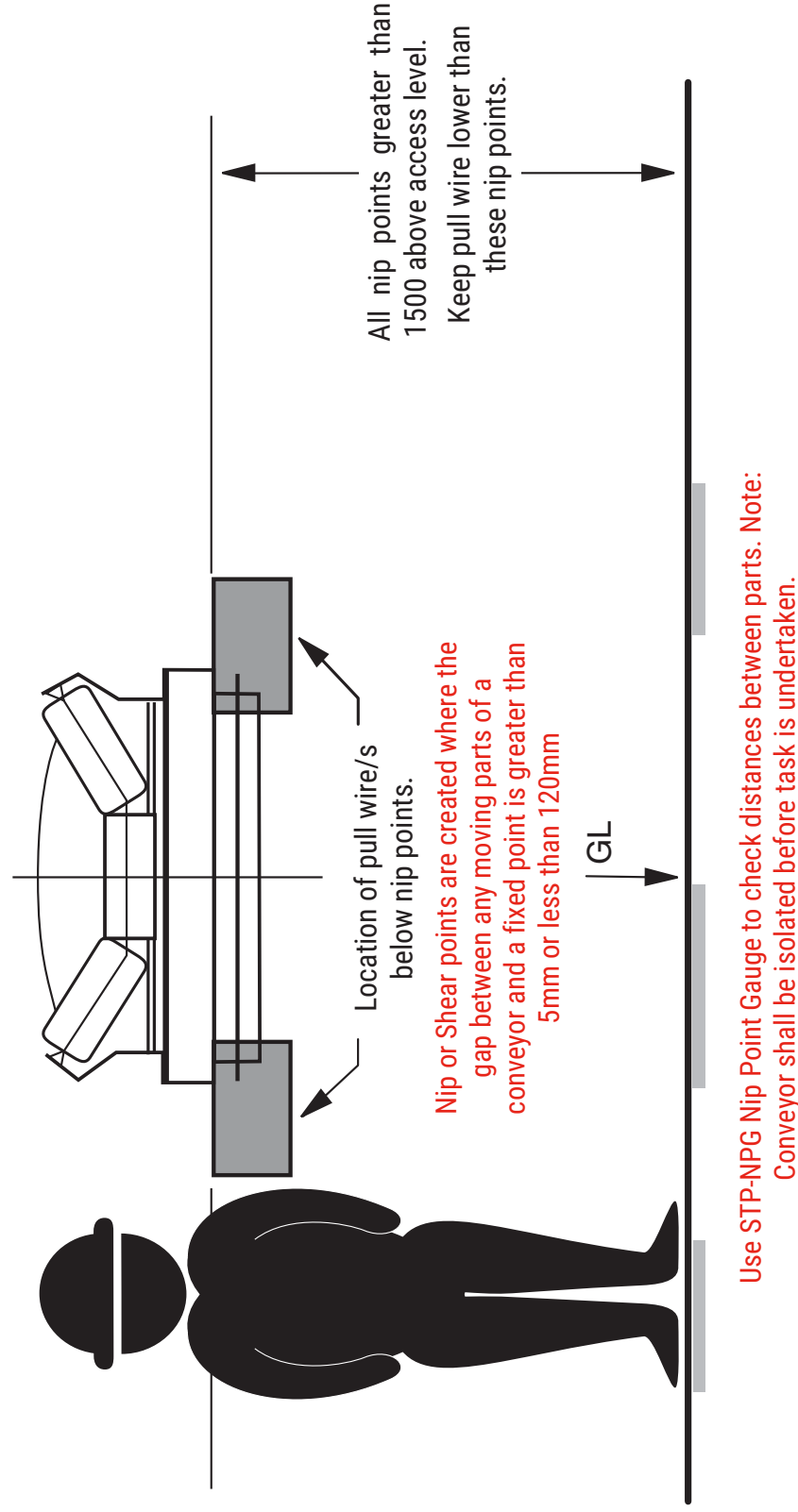
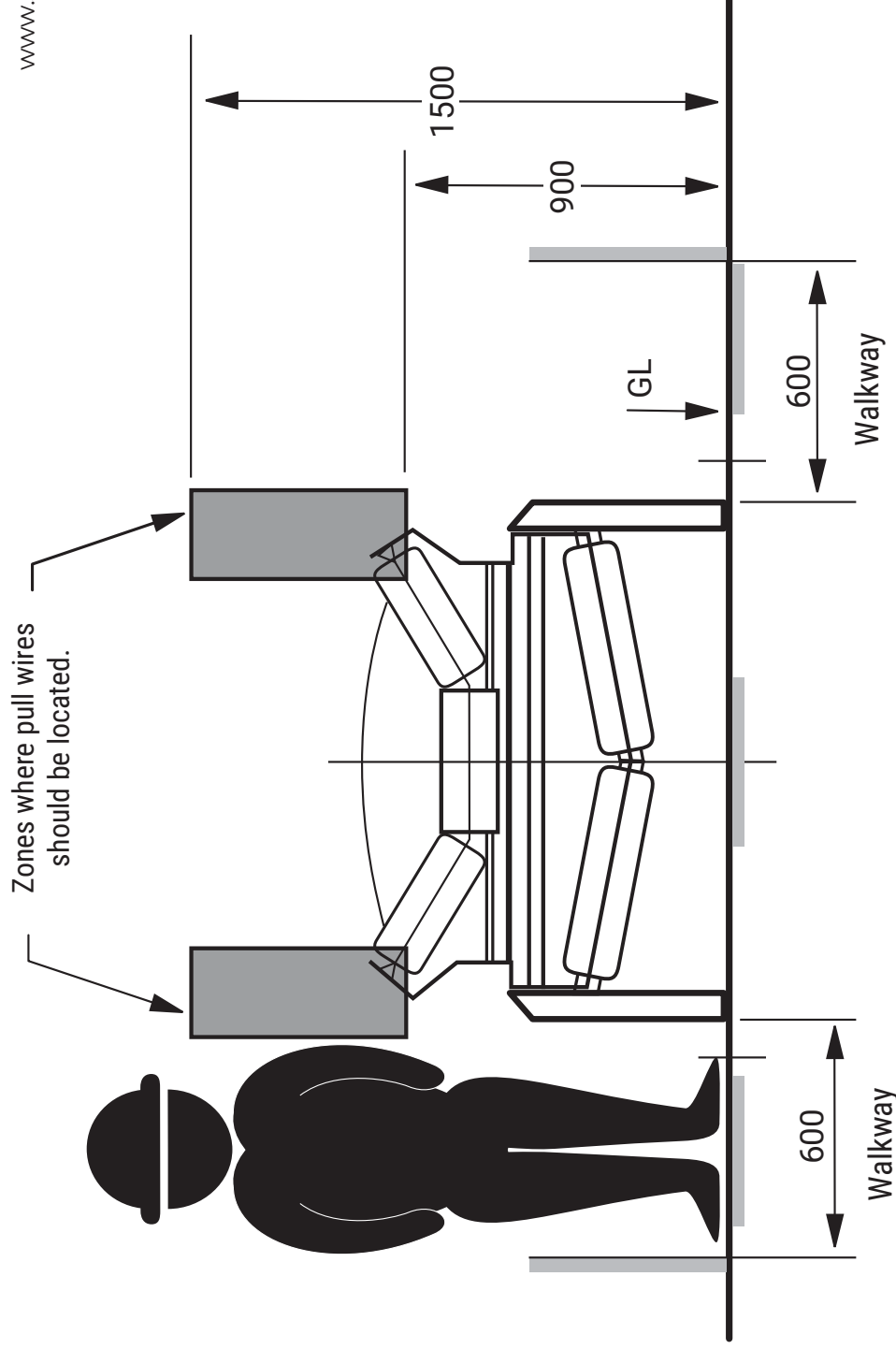


Note: Consideration shall be given for the provision of an emergency stop at the take-up where the take-up is on another level or remote from the main drive.

Deflections - Pull Wire Setup

NOTE: Keep deflections to a minimum angle and as least as possible.





Use STP-NPG Nip Point Gauge to check distances between parts. Note: Conveyor shall be isolated before task is undertaken.

Locations of Pull Wires

The design risk assessment shall determine the most favourable location for the pull wire systems location.

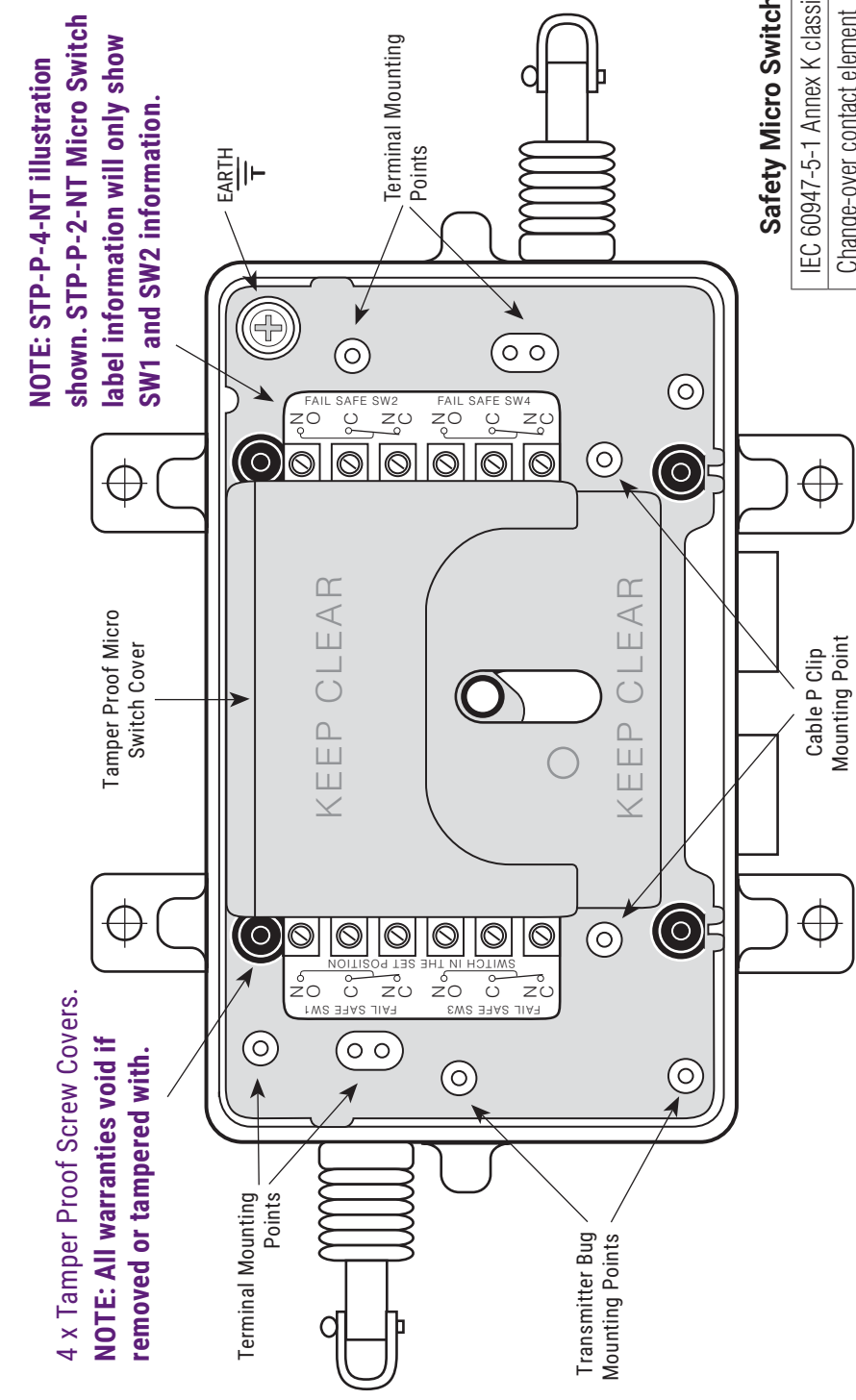
Where practicable, pull wires should be in such a manner that they are, clearly visible, adding signs or colour of pull wires can help. Readily accessible for any personnel that potentially may become trapped in a danger area or any personnel that may be nearby. Outside any readily removable guard and external to the vertical line of any nip or shear point. They should be no further than 1m from the nip or shear point.

At least 900 mm above the access floor. Should be no more than 1500 mm above the access floor. Where required to be higher than 1500 mm, the pull wire system should be located lower than the nip or shear points.

Also, the consideration of the potential for a person to inadvertently be on a moving conveyor, the severity of injury to a person due to this event and whether a risk control needs to be in place.

Electric Control Products recommends the "Collide Safe" Man-On-Belt switch for this application.

P/N: STP-P-2-NT & STP-P-2-NT MICRO SWITCH CIRCUIT DIAGRAM



IEC60947-5-12016
AS 60947-5-1 2015
Clause K.7.1.4.6.1

Form C or Form Za change over contact elements. Only one contact element (Make or Break) in each switch shall be used.

NOTE: SW 1 and SW 2 S.P.D.T Change-over Safety Micro Switches with Direct Opening Action (IEC 60947-5-1 Annex K) in contact element form C tested and passed too IEC 60947-5-1 fitted in **STP-P-2-NT**

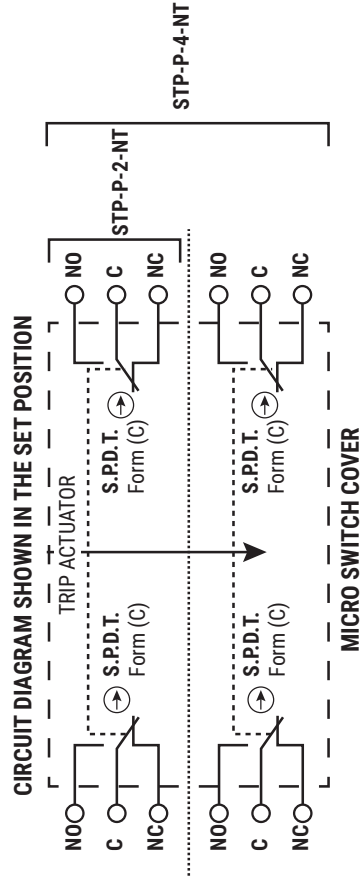
NOTE: SW 1, SW 2, SW 3 and SW 4 S.P.D.T Change-over Safety Micro Switches with Direct Opening Action (IEC 60947-5-1 Annex K) in contact element form C tested and passed too IEC 60947-5-1 fitted in **STP-P-4-NT**

Safety Micro Switch with Direct Opening Action Specifications

IEC 60947-5-1 Annex K classification	☐ Type 1	☒ Type 2 Direct Opening
Change-over contact element	☒ C	☐ Za ☐ Zb
Contact material	Ag-Ni	
Utilization category	AC-15	DC-13
Operational voltage	230 V	60 V DC
Operational current	1,5 A	0,5 Amp DC
Frequency	50/60 Hz	—
Number of electrical cycles	6050 (6 min-1)	—
Number of mechanical cycles	6050 (6 min-1)	—
Conventional free air thermal current	10 A	—
Conventional enclosed thermal current	—	—
Service temperature	-30° C	No Icing +80° C

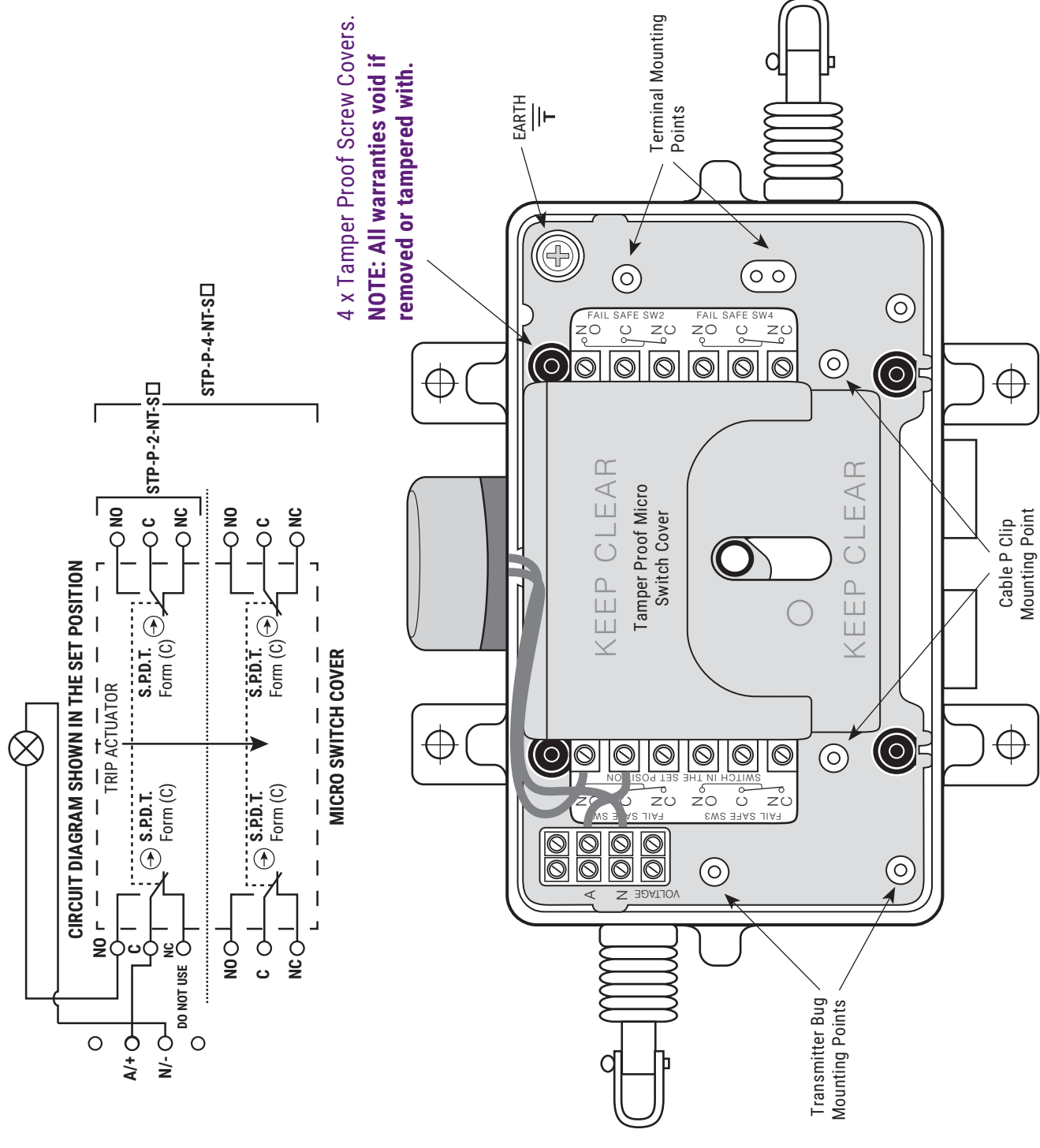
Specifications (short-circuit with standability)

Rated conditional short-circuit current	3 00 A	1 000 A
Short circuit protective device	Fuse 6 A gG (IEC 60269-2)	Fuse 6 A gR (IEC 60269-4)



P/N: STP-P-2-NT-S & STP-P-4-NT-S

MICRO SWITCH CIRCUIT DIAGRAM for STROBE LIGHT



NOTE: SW 1 and SW 2 S.P.D.T Change-over Safety Micro Switches with Direct Opening Action (IEC 60947-5-1 Annex K) in contact element form C tested and passed too IEC 60947-5-1 fitted in **STP-P-2-NT-S**

SW 1, SW 2, SW 3 and SW 4 S.P.D.T Change-over Safety Micro Switches with Direct Opening Action (IEC 60947-5-1 Annex K) in contact element form C tested and passed too IEC 60947-5-1 fitted in **STP-P-4-NT-S**

WIRING NOTE:
All wires to be kept away from the Tamper Proof Micro Switch Cover. See the "Keep Clear info on the Cover.

Standards

The **SAFE-T-PULL** complies with the relevant parts of these Standards:

IEC 60947-5-1 Ed 3.1	Control circuit devices & switching elements
AS/NZS IEC 60947-5-1:2015	Control circuit devices & switching elements
IEC 60947-5-5 Ed 1.1	Control circuit devices & switching elements-Electrical emergency stop devices with mechanical latching function.
AS/NZS IEC 60947.5.5:2015	Control circuit devices & switching elements-Electrical emergency stop devices with mechanical latching function.
AS/NZS 4024.1-2014	Safety of Machinery.
AS/NZS 4024.3610:2015	Safety of Machinery, conveyors, general requirements.
AS/NZS 4024.3611:2015	Safety of Machinery, conveyors, belt conveyors for bulk materials handling.
Ce Conformity to:	
2006/42/EC	Machinery Directive
2014/35/EU	Low Voltage Directive

Workshop Tested

All switches are either hand or automation tested by trained technicians before leaving ELECTRIC CONTROL PRODUCTS and have a date and name label of manufacture inside them. The switches are then packed insuring full working order to our stringent test parameters.

A certification certificate is available on request for full compliance to the relevant standards.

Modifications of Switch

Any modifications are ONLY to be made by ELECTRIC CONTROL PRODUCTS or one of their registered repairers. Any unauthorized modifications may not comply with the relevant standards and may diminish the integrity and workings of the switch and the warranty will become void.

ELECTRIC CONTROL PRODUCTS and their registered repairers or distributors will not be responsible for any damage caused to the altered switch or any item in, on, related or near the switch, nor any injury incurred, nor actions resulting from the unauthorized alterations.

Returns Policy/ Re Stocking

Please return any defective switch to place of purchase for assessment. If they are deemed to be warranty repairs or not. Return warranty switches as per warranty clause. Restocking returns will only be accepted if received by ELECTRIC CONTROL PRODUCTS in their original condition and within thirty (30) days of delivery date stated on delivery documentation. A restocking fee applies (contact place of purchase for costs).

Warranty

Electric Control Products of Perth Western Australia contact info@safe-t-products.com.au warranty period is Twenty Four (24) months from date of purchase or longer if indicated by Electric Control Products. For warranty to be valid the goods must be received by Electric Control Products before the end of the Twenty Four (24) month period. Electric Control Products warrants that if any product is defective, it will, at its option, replace or repair the product. This warranty shall not apply to any defect which arises from improper use, failure to follow the products instruction, or any repair or modification made without the consent of Electric Control Products.

The customer must contact the Distributor of the product or Electric Control Products of Perth Western Australia via Email info@safe-t-products.com.au before returning the faulty product. If returned they must be suitably packaged and, where relevant, returned in accordance with any particular instructions which Electric Control Products or one of its distributors may have notified the customer at the time of contact for warranty. Returned products must be accompanied by an advice note stating the nature of any defect being claimed. Any products or parts which are replaced by Electric Control Products or one of its distributors shall become the property of Electric Control Products. Title to replacement products shall pass to the customer on delivery, and the period of the warranty shall be calculated from the date of the defective product.

All warranty returns to Electric Control Products will be sent by the customer's freight at their cost. All benefits under this warranty are in addition to other rights and remedies of the consumer under a law in relation to the goods or services to which the warranty relates. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Product Life Expectancy

Electric Control Products estimate the product life expectancy to 10-15 years. Products should be changed after a maximum of 10 year life.

Note: Color fading is not necessarily product failure but a natural progression of any materials through it's life span. This is also dependent on the environment the product is installed in. A shorter or longer product life maybe experienced due to environmental situations. Electric Control Products can't give a written life expectancy on any of it's products due to the different situations the products are used.

Technical Support

Technical advice will be given at any time by Electric Control Products or Distributor on any of the Electric Control Product range. Contact Electric Control Products or your local Distributor for this service.

Obsolete Products

Notification will be given to Distributors only for the products becoming obsolete and a time frame of when this will occur. Please contact Distributors for this information.

The obsolete product range will have spare parts for 12 months after becoming obsolete or until they run out, complete products may be available for a short time after it has become obsolete.

Location Of Emergency Stops

Emergency stops shall be located at each operator control station and other locations where emergency stop is required. Conveyors not greater than 2.5m in length and less than 2.7m above the floor, walkway or platform. A single stop control at a location which is easily accessible by the operator is all that is needed.

Conveyors greater than 2.5m in length and less than 2.7m above the floor, walkway or platform. They must have an emergency stop at the head, tail, drive and intervals not exceeding 30m along the length of the conveyor. Overland and long conveyors must have emergency stops every 30m so lanyards are advised to be used for best coverage for safety critical function.

Conveyors greater than 2.7m above the floor, walkway or platform. Locate emergency stops at positions where accessible and at intervals not exceeding 100m along the conveyor. Lanyards or Emergency Stop buttons may be used.

Emergency stop at positions adjacent to the conveyor where it can be started. Emergency stop at every permanent working station.

Maintenance Procedure

All switches require minimal maintenance but as in AS 4024.3610-2015 maintenance procedure shall be carried out.

Maintenance at 3 Month Intervals

1. Check that the switches are installed as per installation instructions.
2. Visual inspection of enclosure to ensure IP66/67 rating and correctly operating device. i.e. Damaged enclosure, bent pull rod, damaged dust boot etc.
3. Inspect all attachments are tight, free from obstructions and not worn and replace if necessary.
4. Inspect pull wire supports for wear, deterioration and build up of material, replace if necessary.
5. Inspect pull wire for wear or deterioration and replace if necessary.

NOTE: Pigtails and Eyebolts make very high static friction points and cause excessive wear and system disruption. Electric Control Products recommends the STG-200-SS SAFE-T-GUIDE for critical safety function.

Full Safety maintenance procedure at 12 Month recommended intervals, or as per Applied Risk Assessment

System testing note: Tests 1 & 2 (below), are most efficiently run at the same time with 3 personnel walking the conveyor. A 200m pull wire system should take 15-20 min to test. Two people each walk to a separate lanyard switch and the other person stands at the centre of the pull wire run. Test 1 “Axis Pull Wire Test” is initiated by the person at centre of the pull wire run, they pull the wire in one direction. Once one of the switches trips it is reset by the person standing by that switch, then another test 1 is done in the same place as the first but in the opposite direction. The other switch is then reset by the other person standing by that switch. Then test 2, the “90 degree pull wire test” is initiated and tested at one switch just after the first guide. The person closest to this switch initiates this test. Next the person at the pull wire system centre between the two switches initiates the test. Then at the other switch by the other person at the switch as shown in test 2 below. These test measurements are called out by the tester to the person with the test report details. The person with the report will then document the measurements. Once one side of a switch is tested then this is then repeated on the other side, starting with test 1 and so forth down the line of switches.

1. Test that the **SAFE-T-PULL** Lanyard operates correctly.

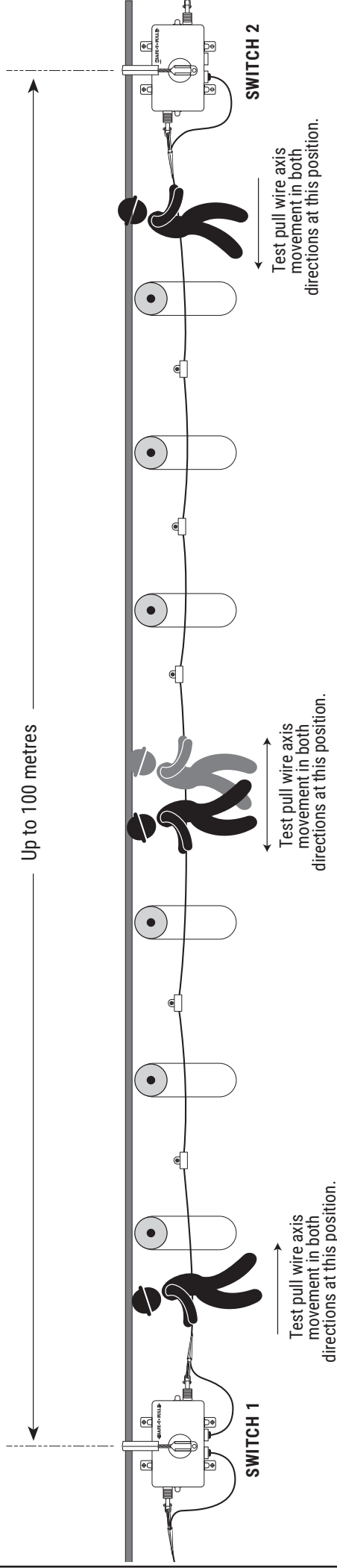
This test is best done at the centre of the pull wire system. This only needs to be done in each direction once and on each side of the switch. After each trip a switch will need to be reset before the next test is to be conducted.

The system should pull and trip easily in each direction. No recorded pull measurements are needed for this test. This is just a pull wire movement test before test 2 is performed.

If the pulling of the wire is difficult or feels hard (should be less than, 10Kgf) then check the installation for worn pull wire, sharp bends, bent supports or items trapping the wire. If the problem is still present, contact the supplier of the product for advice.

NOTE: Keeping the pull wire straight or making sure to use long curved bends or STG-ERD-E roller guides to bend around corners should keep the pull parameters in check.

TEST 1 Axis Pull Wire Test



STP-ES-SS



STG-ES-SS or STG-ES-P



TEST 2: Reset the **SAFE-T-PULL** and attach calibrated **SAFE-T-SCALE** or some other calibrated weight measurement device to the pull wire (See Figure 2), 90 degrees to the pull wire axis. A length measurement needs to be taken as well in this test. The test needs to be conducted 90 degrees to the pull wire's axis. Pull the wire 90 degrees to the axis quickly using the calibrated **SAFE-T-SCALE** or some other calibrated weight measurement device, measure the amount of force it takes to trip a switch. There will be some over pull in this test so factor this into the measurement. Once a switch or both switches trip check to see how far the pull wire needs to be pulled to activate a trip. An easy way to take this measurement when pulling the wire with the scales attached is start with your arm out stretched and pull quickly towards you stopping when your arm is bent 90 degrees next to your side, this measurement is about 400-450 mm. Note, the pulling speed of the test will influence the test results. As the wire is moving the whole length, faster the pull the lower the test result due to the reduction of the static friction between the rope and guides. In an emergency, the switch will not be pulled slowly so the test should replicate this. AS 4024.3610 state the force used to activate a trip shall not exceed 70N (7Kg) and the amount of pull should not exceed 300mm. Note: Electric Control Products risk assessment recommends a pull distance of up-to 450mm and a maximum of 200 N, AS4024.1604 allows this recommendation. Attention must be paid to the surrounding environment and if this distance may be achieved safely. The Ergonomics HB-59 standard gives an average human arm reach distance of 500mm so 450mm pull distance would be acceptable. If the problem is still present, contact the supplier of the product for advice.

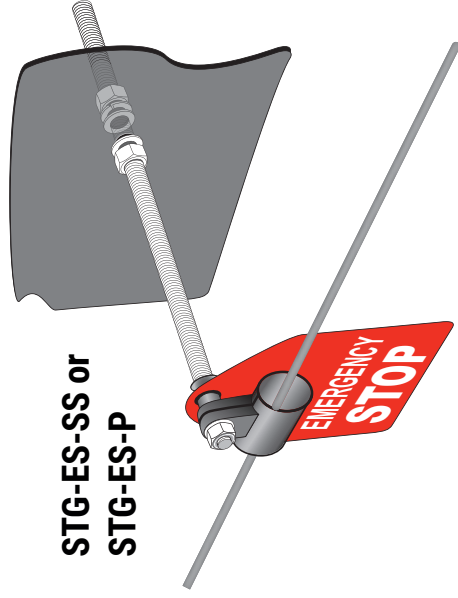
NOTE: If these parameters are higher than what is stated then the installation may need to be changed. Contact Electric Control Products for information on installation instructions.

If Eyebolts or Pigtails are being used, then this could be a factor as they increase the Pull Wire friction and can give high readings. Obstructions or sharp radius bends increase friction and give high readings, the use of the roller guide STG-ERD-E□□-□□ is recommended. The pull parameters are also governed by the positions of the rope guides and the position of the set point of the pull rod. If the rope guides are further apart than 3m then the Nm of force to pull the wire 90 degrees will decrease but the overall pull out length will increase, and this is reversed if the guides are closer than 3m.

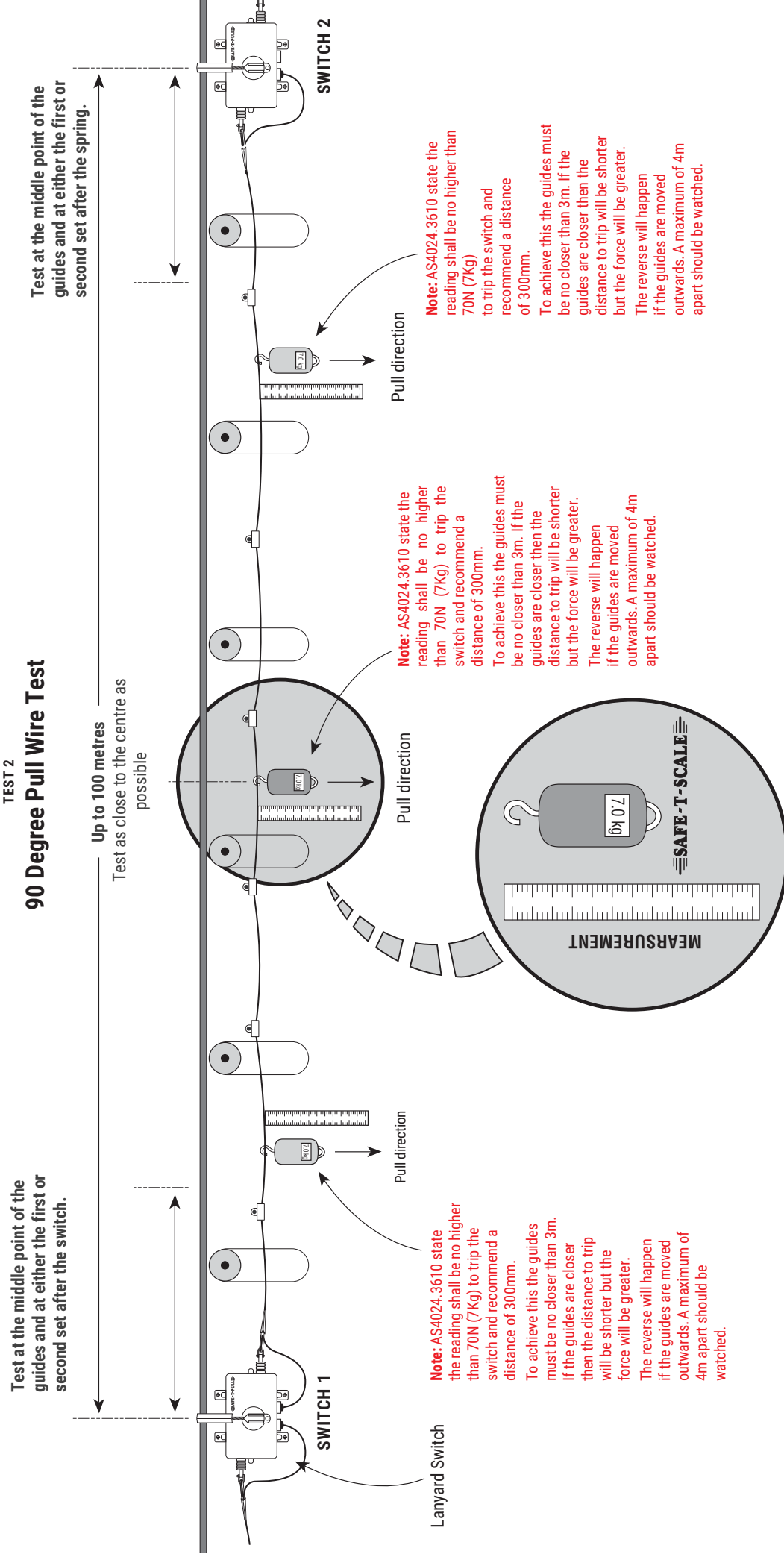
STP-ES-SS



STG-ES-SS or
STG-ES-P



TEST 2 90 Degree Pull Wire Test



CONVEYOR NUMBER:			
SWITCH 1 NUMBER:		SWITCH 2 NUMBER:	
Tick box for Yes (OK) or Cross box for No (Check)			
TEST 1: AXIS PULL WIRE TEST			
WIRE MOVES FREELY ON AXIS			
AWAY FROM SWITCH 1			
AWAY FROM SWITCH 2			
TEST 2: 90 DEGREE PULL WIRE TEST			
SWITCH 1 END	MIDDLE	SWITCH 2 END	
Nm	Nm	Nm	
mm	mm	mm	
GENERAL PULL WIRE SYSTEM INFORMATION			
PULL WIRE NEEDED REPLACING			
PULL WIRE TERMINATION NEEDS FIXING			
PULL WIRE WIRING TERMINATION NEEDS FIXING			
GUIDE POSITION TOO CLOSE			
SWITCH 1 END Under 600mm	GENERAL < 3m	SWITCH 1 END Under 600mm	
GUIDE POSITION TOO FAR			
SWITCH 1 END over 1m	GENERAL > 4m	SWITCH 2 END over 1m	
DEFLECTIONS OVER 16 DEGREES			
STAIRCASE		ROLLER GUIDE USED	
STAIRCASE		ROLLER GUIDE USED	
PULL WIRE INSTALLATION		PULL WIRE BEHIND STRUCTURE	
PULL WIRE WEAR	NOTES	Please Tick Boxes under heading	
		Behind Guard	Behind Objects Not Accessible
HIGH FRICTION POINTS			
WIRE STUCK			
PIGTAILS			
WIRE MOUNTED LOW < 900mm			
WIRE MOUNTED HIGH > 1500mm			
GUIDE REPLACE			
PIG TAIL - Conveyor Position No			
EYE BOLT - Conveyor Position No			
ROPE GUIDE - Conveyor Position No			
SWITCH REPLACEMENT			
DUST BOOT - Conveyor Position No			
LID - Conveyor Position No			
GENERAL - Conveyor Position No			
NOTES:			