



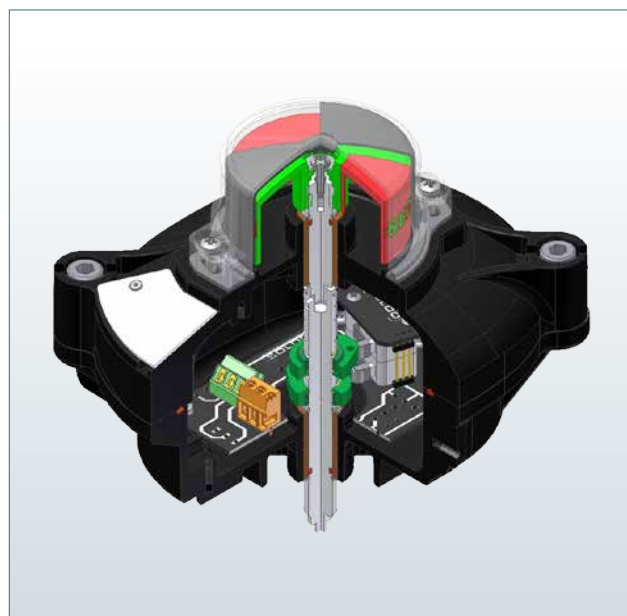
SX - SH limit switch box series

Heavy-duty limit switch boxes, designed for hazardous areas, provide a visual and electrical remote position feedback on automated valves.

The SX matches the Exd IIB T6 standards. The SH is our solution reaching Exd IIB + H2 T6 requirements. SX and SH, thanks to spare pass through terminals, the three cable entries either metric or imperial and different visual position indications, provide a highly customizable solution meeting a wide range of applications. These include, but are not limited to, oil and gas (both on-shore and off-shore) and petrochemical industries.

Features

- Twin shaft design, ensuring a complete sealed device: the shaft is split in two parts, each fitted and sealed into the body and cover for the best weather insulation even during opening operation
- Enhanced flexibility of electrical feedbacks options
- Up to three cable entries available in different sizes
- Easy wiring through the terminal PCB board
- NOVA V3™ switch option ensures extreme durability and high power switching capabilities
- 4-20 mA position transmitter options
- Captive bolts on the screwed lid



Linking the Process
with the Control Room

Product Specification

Technical Data:

Materials

- Die-cast aluminum body and cover with polyester powder coating
- Stainless steel fasteners and shafts

Approvals:

ATEX, IECEX, EAC, CCOE, INMETRO

Ex II 2GD Ex d IIB T4/T5/T6 Gb (SX series)

Ex II 2GD Ex d IIB + H2 T4/T5/T6 Gb (SH series)

Ex tb IIIC T135/T100/T85°C Db

Ta: -20 °C ≤ Ta ≤ 105 °C / 75 °C / 60 °C

UL:

Class I Division 1 Groups B, C, D Division 2 Groups A, B, C, D

Class II Division 1 Groups E, F, G Division 2 Groups F, G

SIL certificate:

Up to SIL 3 certified by TÜV

Protection rating:

IP 66 / 67

Cable entries options:

Up to three cable entries for metric and imperial sizes

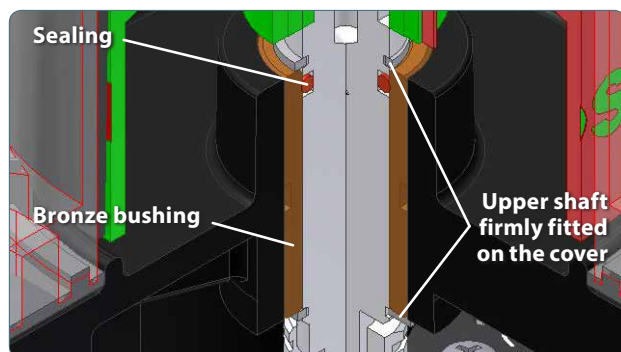
Temperature:

-20 °C +80 °C as standard temperature range
(depending on switch selection)

-40 °C +105 °C available on request

Twin shaft design features

- The shaft is split into two parts; both parts fitted and sealed respectively on body and cover
- During opening and closing the grease remains in place ensuring a safe and smooth operation
- Self lubricant bushing on both sides aligning shafts and hedging in o-rings
- The indicator is hardly connected to the upper shaft, avoiding any matching and aligning issue
- The interior electrical components are completely protected against atmosphere environments



Upper shaft

Soldo switch and sensors options:

NOVA V3™ N1

- Proximity hermetically sealed snap acting SPDT switch
- High power loop: rating up to 5A @ 250 VAC - 5A @ 28 VDC
- Temperature range -50 °C , +95 °C



NOVA V3™ N3

- Proximity hermetically sealed snap acting SPDT switch
- High power loop: rating up to 1A @ 250 VAC - 1A @ 30 VDC
- Temperature range -50 °C , +95 °C



NOVA V3™ N4

- Proximity hermetically sealed snap acting DPDT switch
- High power loop: rating up to 5A @ 250 VAC - 5A @ 28 VDC
- Temperature range -50 °C , +95 °C



REED C4

- Proximity hermetically sealed reed SPDT switch
- Inert gas contact chamber
- Rating up to 1A @ 24 VDC
- Temperature range -60 °C , +100 °C

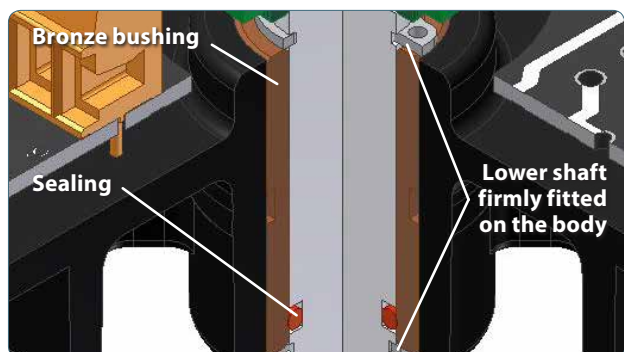


REED C8

- Proximity hermetically sealed reed DPDT switch
- Inert gas contact chamber
- Rating up to 1A @ 24 VDC
- Temperature range -60 °C , +100 °C



More options available on request.



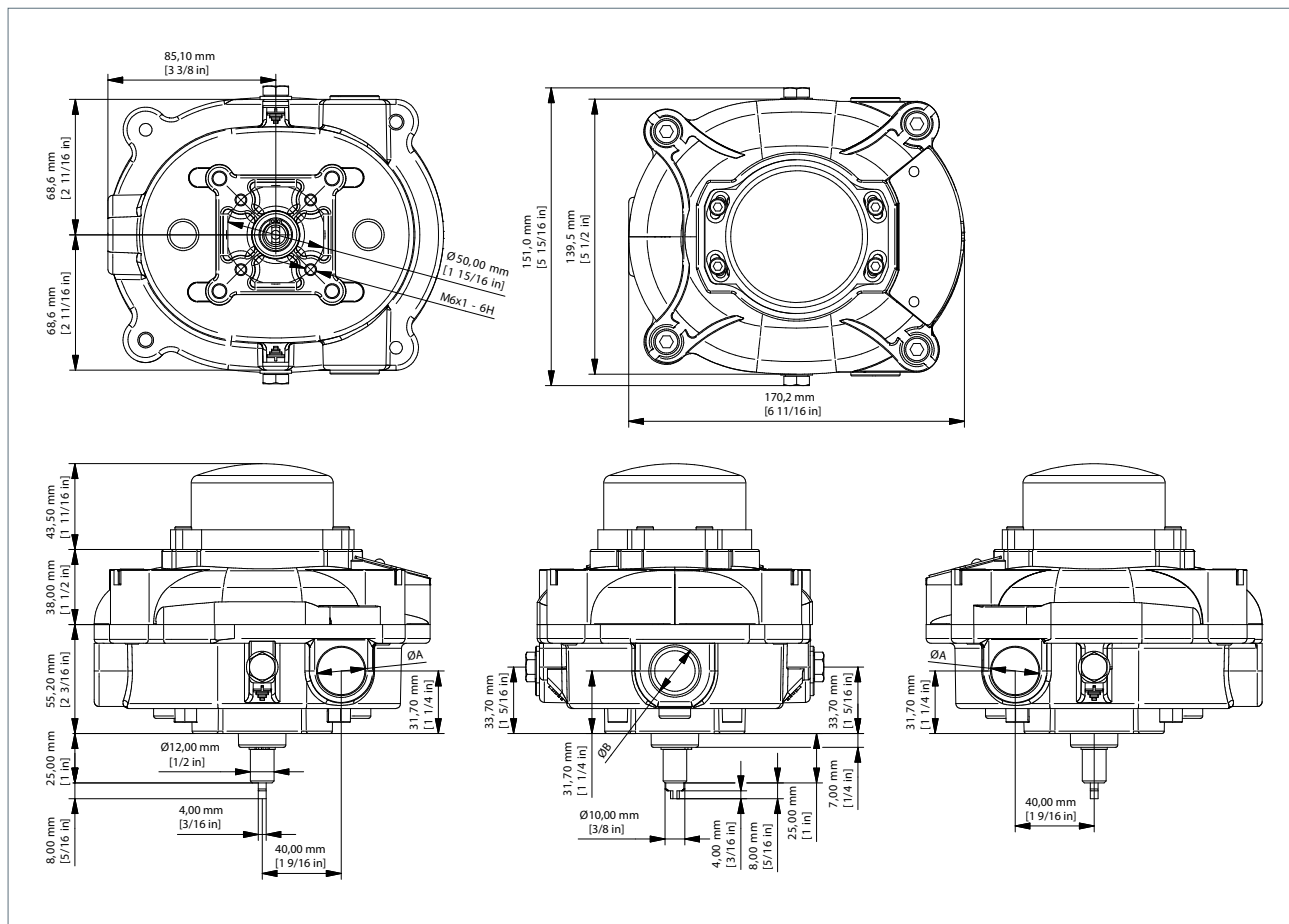
Lower shaft

Product Ordering Matrix

Nomenclature

		SX	N1	2	0	0	-	1	1	X	3	2	A	4
SX Exd IIB applications SH Exd IIB+H2 applications	Box													
01 SPDT elec.mech. switch silver plated contacts 1F DPDT elec.mech. switch silver plated contacts C4 SPDT magnetic hermetically sealed reed switch, rating max. 0,1A @ 120 VAC, 1A @ 24 VDC C8 DPDT magnetic hermetically sealed reed switch, rating max. 0,1A @ 120 VAC, 1A @ 24 VDC N1 SPDT magnetic hermetically sealed silver plated snap acting contacts, max 5A @ 28 VDC, 250 VAC N4 DPDT magnetic hermetically sealed silver plated snap acting contacts, max 5A @ 28 VDC, 250 VAC 32 inductive proximity sensor model NBN4-12GM40-Z0 2 wire, 5-60 VDC 2-100 mA 73 inductive proximity sensor model NBB2-V3-E2, 3 wire PNP NO, 10-30 VDC, 0-100 mA T0 4-20 mA position transmitter, 12-30 VDC H0 4-20 mA HART position transmitter Atex EEx ia IIC T6 / T4 certified 8-30 VDC P0 Partial Stroke Test device with magnetic key	Switch													
2 N°2 switches 4 N°4 switches (on Exd IIB certification)	Switch Quantity													
0 Standard pcb board with 3 extra terminal poles D Stainless steel board with cage clamp terminals A Stainless steel plate with screw type terminals	Terminals													
0 Black powder coating Aluminium	Coating													
1 N°2 cable entries 1/2" NPT 2 N°2 cable entries M20x1,5 X N°3 cable entries 1/2" NPT L N°3 cable entries M20x1,5	Cable Entries													
0 3D plastic visual position indicator red and green T 3D stainless steel position indicator	Visual Position Indicator													
X ATEX and IECEx certified box D ATEX and IECEx certified box with SIL2 approval E ATEX and IECEx certified box with SIL3 approval G EAC certification for Russian market I INMETRO certification for Brazilian market N NEPSI certification for Chinese market J CCOE certification for Indian market U UL certified box W Weather proof * SIL2 / SIL3 options available on request	Approval													
0 Ordinary location 3 Certification marking: Ex II 2GD Exd IIB 4 Certification marking: Ex II 2GD Exd IIB + H2 7 cULus Class1/2 Div1 8 cULus Class1/2 Div2 (with switches code: C4, C8, N1, N3)	Marking													
2 Weather proof IP67 7 Nema 4 and 4X	IP Protection rating													
A Ambient temperature range: -20 °C + 80 °C L Ambient temperature range: -40 °C + 80 °C	Temperature													
3 Die cromated aluminum heavy duty body and cover	Material													

Dimensional Data



Cable entry dimensions

Code	Entry A+A	Entry B
1	n.2 1/2" NPT	-
2	n.2 M20 x 1,5	-
X	n.2 1/2" NPT	n.1 1/2" NPT
L	n.2 M20 x 1,5	n.1 M20 x 1,5



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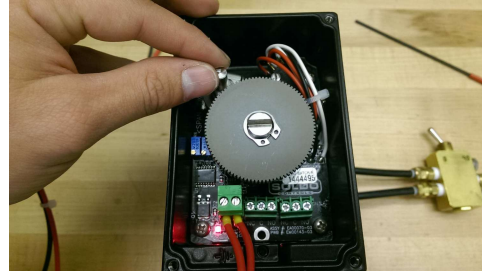
SWI0027	REV. —	MODEL CAF/CSF	TITLE 90° TRANSMITTER CALIBRATION
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SCOPE: Calibration procedure of transmitter series w/ 90° orientation

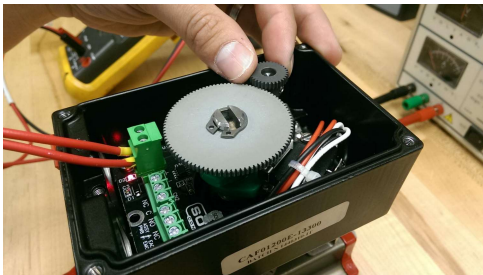
STEP 5: GEAR CALIBRATION



5A) TURN "ZERO" & "SPAN" SCREWS C.W. APPROX. 8 TIMES.



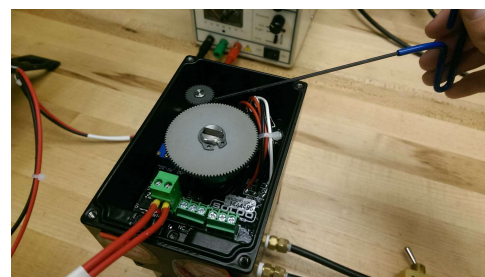
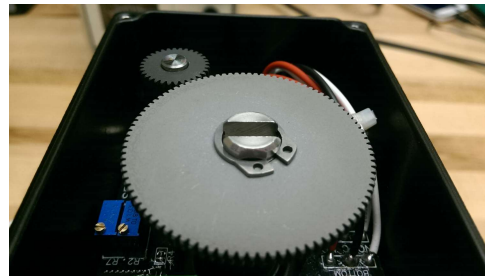
5B) ROTATE POTENTIOMETER UNTIL LED INDICATOR LIGHT REACHES ITS BRIGHTEST POINT & THEN DIMS. THE DIM LOCATION IS STARTING POINT FOR CALIBRATION.



5C) REMOVE SET SCREW FROM SMALL GEAR AND APPLY LOCTITE 542 TO THREADS, RE-INSERT BACK INTO SMALL GEAR. (DO NOT SCREW PAST SHAFT HOLE)

CAREFULLY PLACE SMALL GEAR BACK ONTO POTENTIOMETER. IF ACCIDENTALLY ROTATED, RE-ADJUST ACCORDING TO LED.

TOP OF SMALL GEAR MUST BE FLUSH WITH TOP OF LARGE GEAR. LARGE GEAR MAY NEED TO BE SLIGHTLY PULLED TO ALLOW SMALL GEAR TO ENGAGE TEETH AND SLIDE INTO PLACE -OR- POTENTIOMETER NUT MAY NEED TO BE LOOSENED AND POT. READJUSTED UNTIL BOTH GEAR TEETH MESH ACCORDINGLY.



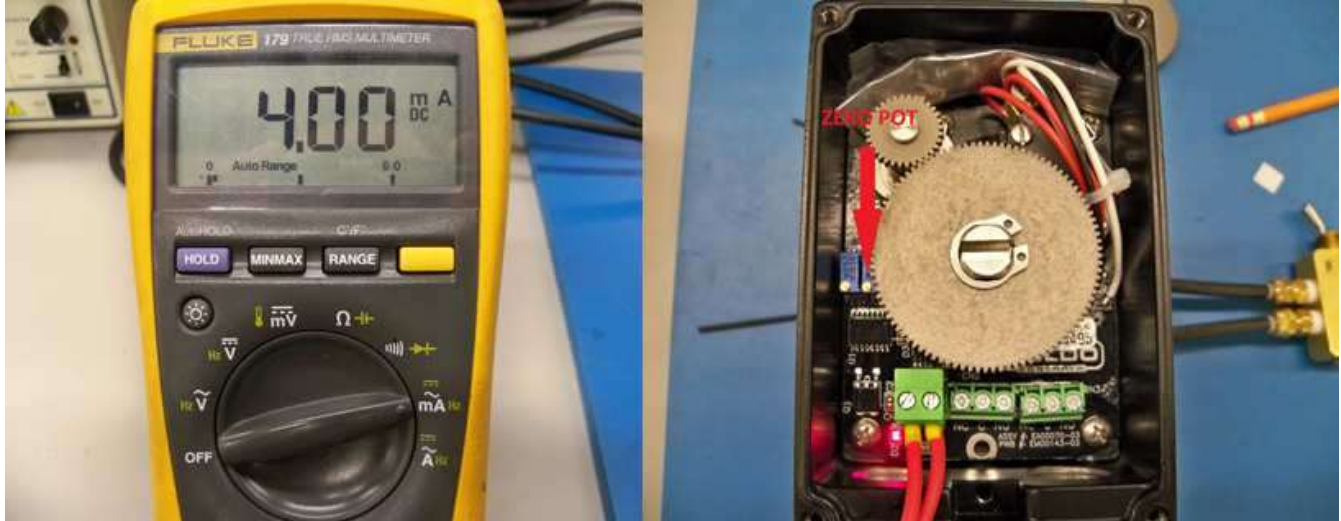
5D) ONCE BOTH GEARS FIT TOGETHER, PROCEED TO TIGHTEN SET SCREW ON SMALL GEAR.

	DATE	NAME
DRAWN	4/13/2015	SL
CHECKED	4/17/15	SF
ENG APPR	5/1/15	GLA
MFG APPR	5/1/15	DC
QC APPR	5/1/15	CR
COMMENTS	LAST ECR: C-19796	
		Sheet 6 of 7

SWI0027	REV. _	MODEL CAF/CSF	TITLE 90° TRANSMITTER CALIBRATION
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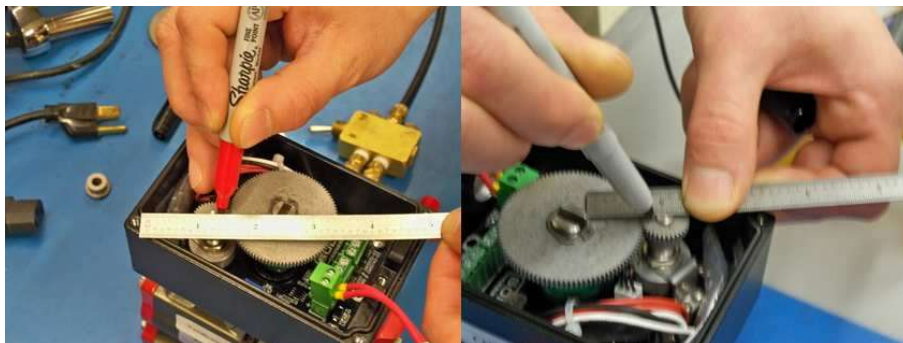
STEP 6: "ZERO" & "SPAN" CALIBRATION



6A) WHILE SHAFT IS IN THE 0° (HORIZONTAL POSITION) ADJUST ZERO POT. CLOCKWISE UNTIL MULTIMETER READS 4.00 ± 0.00 mA.



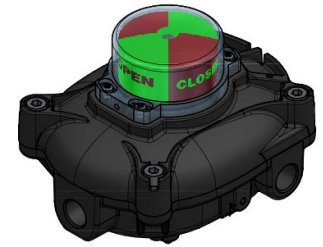
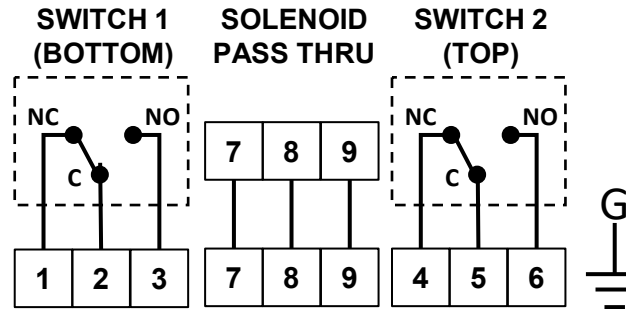
6B) FLIP TOGGLE SWITCH TO ACTUATE SHAFT TO THE 90° POSITION (VERTICAL POSITION). ADJUST "SPAN" POT. SCREW CLOCKWISE UNTIL MULTIMETER READS 20.00 ± 0.00 mA.



6C) FLIP BACK AND FORTH BETWEEN 0° & 90° ENSURING BOTH POINTS ARE SET. ONCE THEY ARE SET, MARK "0°" POSITION WITH RED MARKER, AND "90°" POSITION WITH BLACK MARKER AS SHOWN ABOVE. REMOVE UNIT.

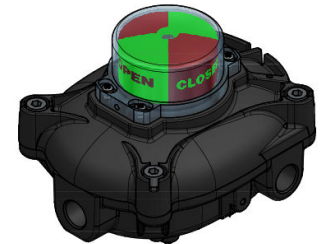
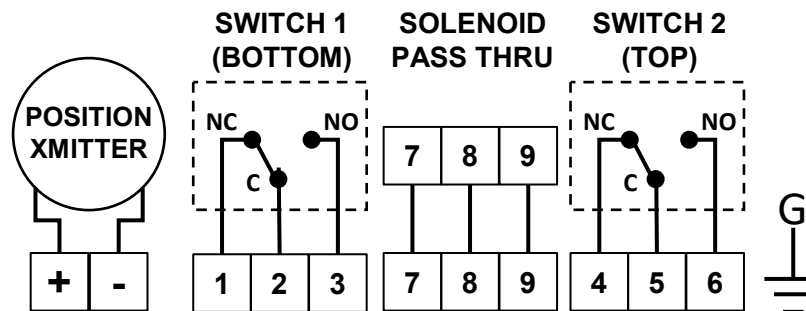
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ENG APPR	5/1/15	GLA
MFG APPR	5/1/15	DC
QC APPR	5/1/15	CR
COMMENTS	LAST ECR: C-19796	
	Sheet 7 of 7	

SCHEM 1 - Electrical Schematics – Soldo SX Series w TWO (2) Limit Switches / No Transmitter – VRG Controls



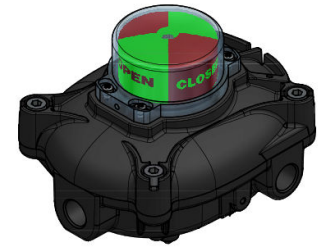
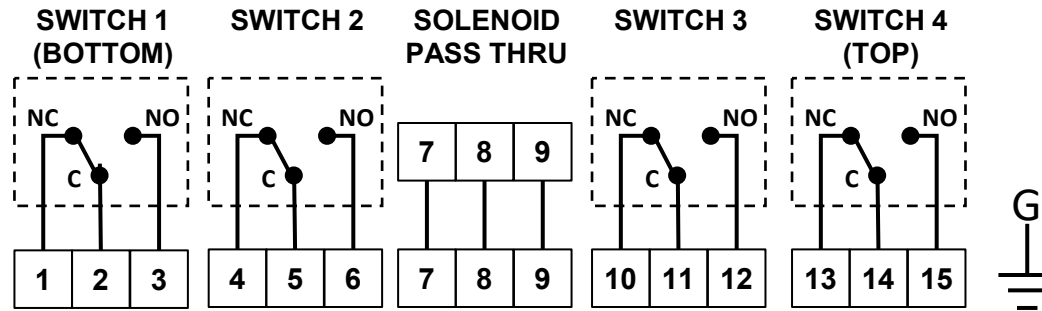
SOLD DO Model No.	VRG Part No.	VRG Code	4-20 mA Transmitter	Limit Switches
SX01200-10U77A3	BA-7925	SOLDOLS2SPDT	NO	2X SPDT Mechanical
SXN1200-10U87A3	BA-7920	SOLDOLS2SPDTPRX	NO	2X SPDT Proximity

SCHEM 2 - Electrical Schematics – Soldo SX Series w TWO (2) Limit Switches / WITH Transmitter – VRG Controls



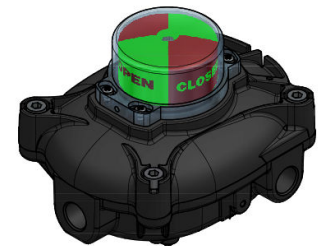
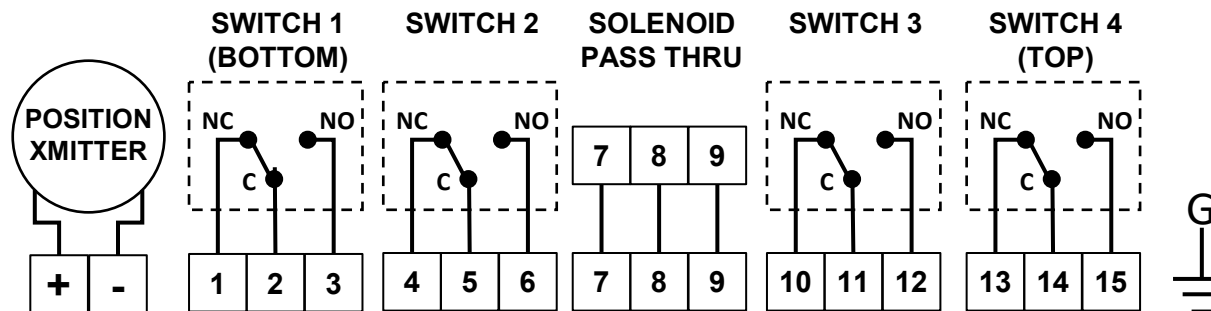
SOLD DO Model No.	VRG Part No.	VRG Code	4-20 mA Transmitter	Limit Switches
SXT12A0-10U77A3	BA-7905	SOLDOLXTS2SPDT	YES	2X SPDT Mechanical
SXT1F2A0-10U77A3	BA-7912	SOLDOXTLS2DPDT	YES	2X DPDT Mechanical
SXTN2A0-10U87A3	BA-7910	SOLDOXTLS2SPDTPRX	YES	2X SPDT Proximity
SXTN44A0-10U77A3	BA-7914	SOLDOXTLS2DPDTPRX	YES	2X DPDT Proximity

SCHEM 3 - Electrical Schematics – Soldo SX Series w FOUR (4) Limit Switches / No Transmitter – VRG Controls



SOLD DO Part No.	VRG Part No.	VRG Code	4-20 mA Transmitter	L:imit Switches
SX01400-10U77A3	BA-7927	SOLDOLS4SPDT	NO	4X SPDT Mechanical
SXN1400-10U87A3	BA-7940	SOLDOLS4SPDTPRX	NO	4X SPDT Proximity

SCHEM 4 - Electrical Schematics – Soldo SX Series w FOUR (4) Limit Switches / WITH Transmitter – VRG Controls



SOLD DO Model No.	VRG Part No.	VRG Code	4-20 mA Transmitter	L:imit Switches
N/A	N/A	N/A	N/A	N/A