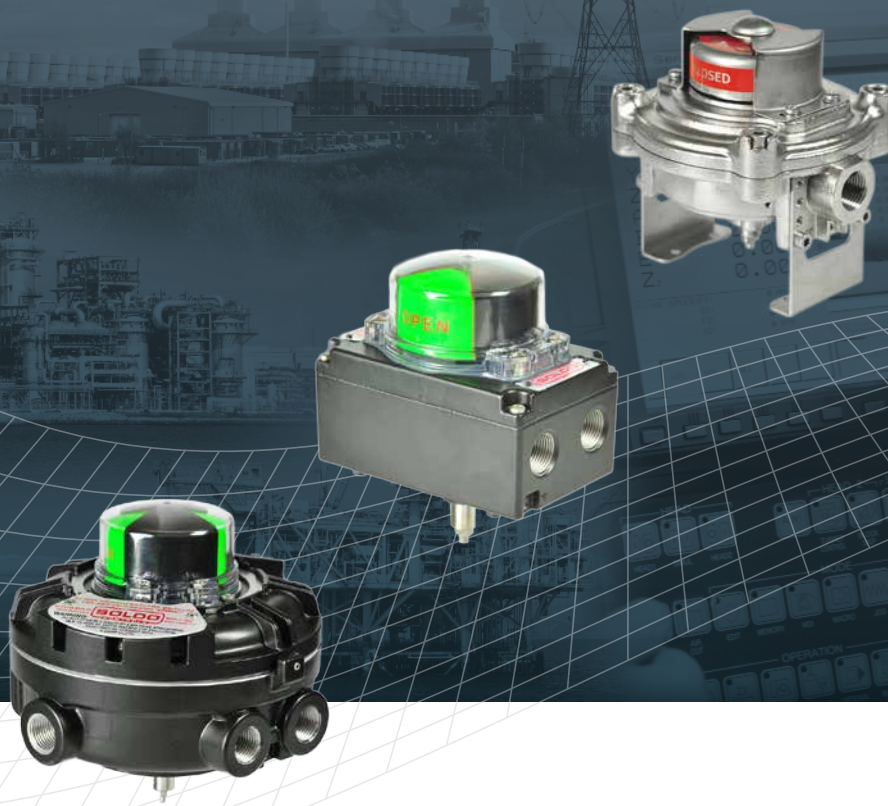# rotork® Instruments

Limit Switch Boxes

SOLDO® CONTROLS
A rotork® Brand

Keeping the World Flowing

rotork®

Keeping the World Flowing

RELIABILITY
IN FLOW CONTROL
**CRITICAL
APPLICATIONS**

❯ Reliable operation
when it matters

Assured reliability for critical applications and environments.

Whether used 24/7 or infrequently, Rotork products will operate reliably and efficiently when called upon.

❯ Quality-driven
global manufacturing

Products designed with 60 years of industry and application knowledge.

Research and development across all our facilities ensures cutting edge products are available for every application.

❯ Customer-focused service
worldwide support

Solving customer challenges and developing new solutions.

From initial enquiry through to product installation, long-term after-sales care and Client Support Programmes (CSP).

❯ Low cost
of ownership

Long-term reliability prolongs service life.

Rotork helps to reduce long term cost of ownership and provides greater efficiency to process and plant.

Product Overview Chart

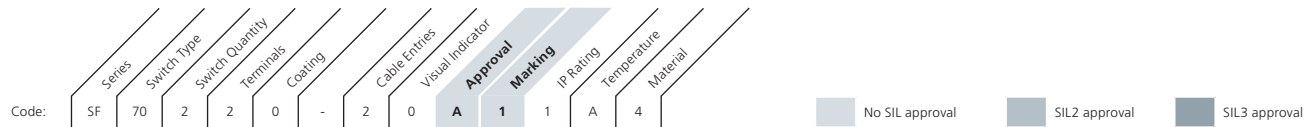|	Model	SP	SM	SB	SF	SS	HW	SX	SH
Application	Industry								
	Valve Type	Rotary Valves	Rotary Valves	Rotary Valves	Rotary Valves	Rotary Valves	Rotary Valves	Rotary Valves	Rotary Valves
Material	Housing	Glass reinforced plastic	Nickel plated aluminium	Copper free aluminium	Copper free aluminium	316 stainless steel	Aluminium	Aluminium	Aluminium
	Cover	Polycarbonate	Polycarbonate	Polycarbonate	Aluminium	316 stainless steel	Aluminium	Aluminium	Aluminium
Certification	IP Rating	IP 65	IP 65	IP 67	IP 66 / 67 IP 67M	IP 66 / 67 IP 67M	IP 66 / 67	IP 66 / 67	IP 66 / 67
	SIL Rating up to:	SIL2	SIL2	SIL3	SIL3	SIL3	SIL3	SIL3	SIL3
	ATEX, IECEX option	Exia IIC T6	Exia IIC T6	Exia IIC T6	Exia IIC T6	Exia IIC T6	–	Exd IIB T6	Exd IIB+H2 T6
	cULus option	–	–	Safe area or Class1/2 Div2	Safe area or Class1/2 Div2	Safe area or Class1/2 Div2	Safe area or Class1/2 Div2	Class 1/2 Div 1/2	Class 1/2 Div 1/2
	EAC option	✔	✔	✔	✔	✔	✔	✔	✔
	CCOE option	✔	✔	✔	✔	✔	–	✔	✔
	INMETRO option	–	–	–	–	–	–	✔	✔
	NEPSI option	–	–	–	–	–	–	–	–
Visual Position Indicator	3D	✔	✔	✔	✔	✔	✔	✔	✔
	Flat	✔	✔	✔	✔	✔	✔	✔	✔
	Multi Port Valves	–	–	✔	✔	✔	✔	✔	✔
	None	–	–	–	✔	✔	✔	–	–
Electrical Feedback	Electro mechanic	✔	✔	✔	✔	✔	✔	✔	✔
	Magnetic	✔	✔	✔	✔	✔	✔	✔	✔
	Inductive	✔	✔	✔	✔	✔	✔	✔	✔
	4-20 mA	–	–	✔	✔	✔	✔	✔	✔
	Communication Protocols	–	–	✔	✔	✔	✔	✔	✔
Features	Twin Shaft Design	–	–	✔	✔	✔	✔	✔	✔
	Temp. Max Range	-20 to +80 °C (-4 to +176 °F)	-20 to +80 °C (-4 to +176 °F)	-30 to +80° C (-22 to +176 °F)	-60 to +105 °C (-76 to +221 °F)	-60 to +105 °C (-76 to +221 °F)	-60 to +105 °C (-76 to +221 °F)	-20 to +105 °C (-4 to +221 °F)	-20 to +105 °C (-4 to +221 °F)
	Integrated Mounting Kit	✔	✔	–	–	–	✔	–	–

Product Overview Chart

Water   Power   Factory   Oil   Gas

		SK	SQ	SY	SW	SE	ES	BM	TB
Application	Industry	(icons)	(icons)	(icons)	(icons)	(icons)	(icons)	(icons)	(icons)
	Valve Type	Rotary Valves	Rotary Valves	Rotary Valves	Rotary Valves	Linear Valves	Manual Valves	External Switches General Purpose	External Switches General Purpose
Material	Housing	Aluminium	316L stainless steel	Copper free aluminium	316 stainless steel	Copper free aluminium or 316 stainless steel	Copper free aluminium or 316 stainless steel	316 stainless steel	316 stainless steel or aluminium
	Cover	Aluminium	316L stainless steel	Copper free aluminium	316 stainless steel	Copper free aluminium or 316 stainless steel	Copper free aluminium or 316 stainless steel	316 stainless steel	316 stainless steel or aluminium
Certification	IP Rating	IP 66 / 67 optional IP68	IP 66 / 67 optional IP68	IP 66 / 68	IP 66 / 68	IP67 IP 67M	IP 68	IP 68 subsea option available	IP 68
	SIL Rating up to:	SIL3	SIL3	SIL3	SIL3	SIL3	SIL3	SIL3	SIL3
	ATEX, IECEX option	Exd IIC T6	Exd IIC T6	Exd IIC T6	Exd IIC T6	–	Exd IIC T6	Exd IIC T6 Exia IIC T4	Exd IIC T6
	cULus option	Class 1/2 Div 1/2	–	Class 1/2 Div 1/2	Class 1/2 Div 1/2	–	Class 1/2 Div 1/2	Class 1/2 Div 1/2	
	EAC option	✔	✔	✔	✔	✔	✔	✔	✔
	CCOE option	✔	✔	✔	✔	–	–	–	–
	INMETRO option	✔	✔	✔	✔	–	✔	–	–
	NEPSI option	–	–	✔	✔	–	–	–	–
Visual Position Indicator	3D	✔	✔	✔	✔	–	–	–	–
	Flat	✔	✔	✔	✔	–	–	–	–
	Multi Port Valves	✔	✔	✔	✔	–	–	–	–
	None	–	–	–	–	✔	✔	✔	✔
Electrical Feedback	Electro mechanic	✔	✔	✔	✔	–	–	–	–
	Magnetic	✔	✔	✔	✔	✔	✔	✔	✔
	Inductive	✔	✔	✔	✔	✔	–	–	–
	4-20 mA	–	–	✔	✔	–	–	–	–
	Communication Protocols	–	–	✔	✔	–	–	–	–
Features	Twin Shaft Design	✔	✔	✔	✔	–	–	–	–
	Temp. Max Range	-55 to +105 °C (-67 to +221 °F)	-55 to +105 °C (-67 to +221 °F)	-60 to +105 °C (-76 to +221 °F)	-60 to +105 °C (-76 to +221 °F)	-50 to +105 °C (-58 to +221 °F)	-65 to +150 °C (-85 to +302 °F)	-40 to +105 °C (-40 to +221 °F)	-40 to +105 °C (-40 to +221 °F)
	Integrated Mounting Kit	Optional	Optional	–	–	–	–	–	–

Approvals and Marking

Code selection guide

Code: SF 70 2 2 0 - 2 0 **A** **1** 1 A 4

Series / Switch Type / Switch Quantity / Terminals / Coating / Cable Entries / Visual Indicator / **Approval** / **Marking** / IP Rating / Temperature / Material

Legend: ☐ No SIL approval ☐ SIL2 approval ☐ SIL3 approval

		Weather proof			ATEX			ATEX / IECEx			UL/CSA			EAC			CCOE			INMETRO			NEPSI		
SP/SM	safe area	W0	Z0	Y0				–	–	–	–	–	–	G0	F0	H0				–	–	–	–	–	–
	Intrinsically safe				A1	B1	C1	–	–	–	–	–	–	G1	F1	H1	J1	L1	M1	–	–	–	–	–	–
	Non-incendive (3GD Exn)							–	–	–	–	–	–							–	–	–	–	–	–
SB	Safe area	W0	Z0	Y0				–	–	–	UA	SA	TA	G0	F0	H0				–	–	–	–	–	–
	Intrinsically safe				A1	B1	C1	–	–	–				G1	F1	H1	J1	L1	M1	–	–	–	–	–	–
	Non-incendive (3GD Exn)				A6	B6	C6	–	–	–	U9	S9	T9	G6	F6	H6				–	–	–	–	–	–
SF/SS	Safe area	W0	Z0	Y0				–	–	–	UA	SA	TA	G0	F0	H0				–	–	–	–	–	–
	Intrinsically safe				A1	B1	C1	X1	D1	E1				G1	F1	H1	J1	L1	M1	–	–	–	–	–	–
	Non-incendive (3GD Exn)				A6	B6	C6				U9	S9	T9	G6	F6	H6				–	–	–	–	–	–
	Non-incendive (2D Extb)							XD	DD	ED										–	–	–	–	–	–
	Non-incendive (3D Extc)				A5	B5	C5							G5	F5	H5				–	–	–	–	–	–
HW	Safe area	W0	Z0	Y0	–	–	–				UA	SA	TA	G0	F0	H0	–	–	–	–	–	–	–	–	–
	Non-incendive (3GD Exn)				A6	B6	C6							G6	F6	H6	–	–	–	–	–	–	–	–	–
	Non-incendive (3D Ext)				A5	B5	C5										–	–	–	–	–	–	–	–	–
SK/SQ SY/SW	Safe area	W0	Z0	Y0	–	–	–																		
	Explosion / flame proof (Exd IIC)				–	–	–	X2	D2	E2	U7*	S7*	T7*	G2	F2	H2	J2	L2	M2	I2	O2	P2	N2**	Q2**	R2**
	Non-incendive (Exd enclosure)				–	–	–				U8*	S8*	T8*												
SX	Safe area	W0	Z0	Y0	–	–	–													–	–	–			
	Explosionproof / flameproof (Exd IIB)				–	–	–	X3	D3	E3	U7	S7	T7	G3	F3	H3	J3	L3	M3	I3	O3	P3	–	–	–
	Non-incendive (Exd enclosure)				–	–	–				U8	S8	T8							–	–	–			
SH	Safe area	W0	Z0	Y0	–	–	–													–	–	–			
	Explosionproof / flameproof (Exd IIB+H2)				–	–	–	X4	D4	E4	U7	S7	T7	G4	F4	H4	J4	L4	M4	I4	O4	P4	–	–	–
	Non-incendive (Exd enclosure)				–	–	–				U8	S8	T8							–	–	–			
BM/TB	Safe area	W0	Z0	Y0										G0	F0	H0	–	–	–	–	–	–	–	–	–
	Intrinsically safe							X1	D1	E1							–	–	–	–	–	–	–	–	–
	Explosionproof / flameproof (Exd IIC)				A2	B2	C2				U7*	S7*	T7*	G2	F2	H2	–	–	–	–	–	–	–	–	–
	Non-incendive (Exd enclosure)										U8*	S8*	T8*				–	–	–	–	–	–	–	–	–
ES	Safe area	W0	Z0	Y0	–	–	–										–	–	–	–	–	–			
	Explosionproof / flameproof (Exd IIC)				–	–	–	X2	D2	E2	U7	S7	T7	G2	F2	H2				I2	O2	P2			
	Non-incendive (Exd enclosure)				–	–	–				U8	S8	T8				–	–	–	–	–	–			

* Excluding SQ and TB series
** SY SW series only

SP - SM limit switch box series

Compact limit switch box for industrial, water treatment and light duty applications.

Features

- Integrated mounting kit for NAMUR pattern

- Corrosion free glass reinforced plastic enclosure on SP series

- Nickel plated aluminium body on SM series

- 1 cable entry (SP) or 2 cable entries (SM) either metric or imperial

- Multiple indicator options

- Easy wiring through the terminal PCB board

Approvals

ATEX, EAC, CCOE:

Ex II 2GD Ex ia IIC T4/T5/T6
Ex ia IIIB T44 °C…….T108 °C Db IP6*
Ta: -20 °C ≤ Ta ≤ 80 °C

SIL certificate: Up to SIL 2 certified by TÜV

Protection rating: IP 65
IP 67 on request
Nema 4 4X on request

Temperature:

-20 to +80 °C (-4 to +176 °F) standard temperature range

CE   Ex   ATEX   EHC   SIL✓ SIL LEVEL 2

SP limit switch box

SM limit switch box
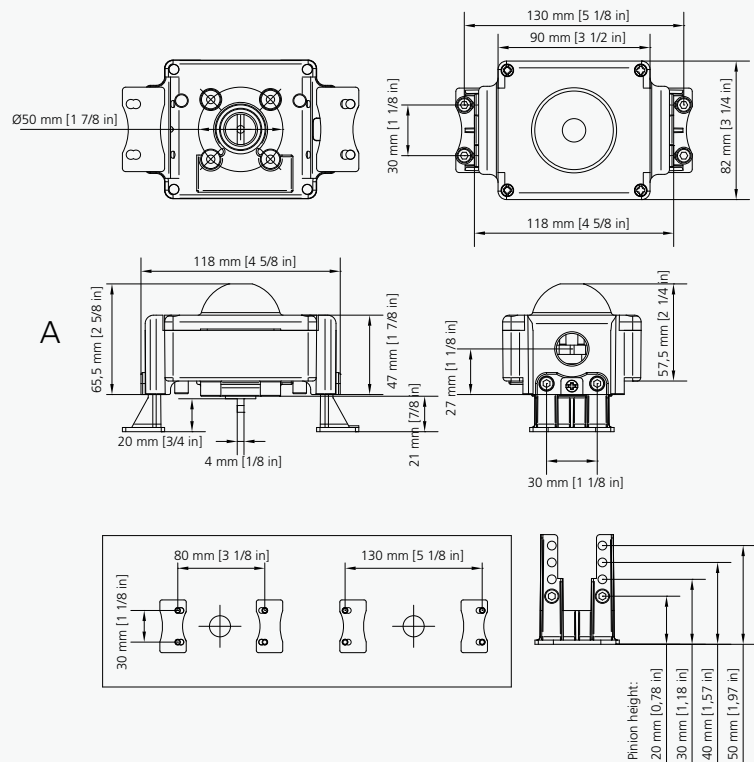
Limit Switch Boxes

Nomenclature

SP N1 2 H 0 - D H W 0 0 R 1

Box
SP = Glass reinforced plastic body with polycarbonate cover
SM = Aluminium body with polycarbonate cover

Switch
01 = SPDT el.mech. switch silver plated contacts
03 = SPDT el.mech. switch gold plated contacts (for Ex'ia')
1F = DPDT el.mech. switch silver plated contacts
C4 = SPDT magnetic hermetically sealed reed switch (for Ex'ia' low temperature)
N1 = SPDT magnetic hermetically sealed silver plated snap acting contacts
N3 = SPDT magnetic hermetically sealed gold plated snap acting contacts (for Ex'ia')
70 = Inductive proximity NAMUR sensor NJ2-V3-N 2 wire NC logic (for Ex'ia')
73 = Inductive proximity sensor model NBB2-V3-E2, 3 wire PNP NO
See additional information and options on pages 14-19

Switch Quantity
2 = 2 switches

Terminals
A = Screw type terminals
4 = Blue screw terminals (for Ex'ia')
0 = Screw terminals with sov connection
2 = Blue screw terminals with sov connection (for Ex'ia')

Coating
0 = Black plastic enclosure (on SP series)
N = Nickel plated aluminium body (on SM series)

Cable Entries
D = 1 cable entry 1/2" NPT
E = 1 cable entry M20 x 1.5
1 = 2 cable entries 1/2" NPT (SM series only)
2 = 2 cable entries M20 x 1.5 (SM series only)

Visual Position Indicator
H = 3D visual position indicator black and yellow
Z = Flat visual position indicator black and yellow
See additional information and options on page 11

Approval
W = Weather proof
A = ATEX certified
G = EAC certification for Russian market
See additional information and options on page 13

Marking
0 = Standard location
1 = Intrinsically safe certification
See additional information and options on page 13

IP Protection rating
0 = Weather proof IP65
7 = Nema 4 and 4X
2 = Weather proof IP67

Temperature
A = Ambient temperature range: -20 to +80 °C (-4 to +176 °F)
B = Ambient temperature range: -20 to +70 °C (-4 to +158 °F) for sensor option 73

Material
1 = Glass reinforced plastic body and polycarbonate cover (on SP series)
2 = Nickel plated aluminium body and polycarbonate cover (on SM series)

SX - SH limit switch box series

Limit switch box designed for explosionproof applications.

Features

- Twin shaft design
- Metallic self lubricating bushings
- Aluminium enclosure with thick protective powder coating
- Up to 3 cable entries either metric or imperial
- Multiple indicator options
- Easy wiring through the terminal PCB board

Approvals

ATEX, IECEx, EAC, CCOE, INMETRO:

Ex II 2GD Ex db IIB T4/T5/T6 Gb (SX series)
Ex II 2GD Ex db 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 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
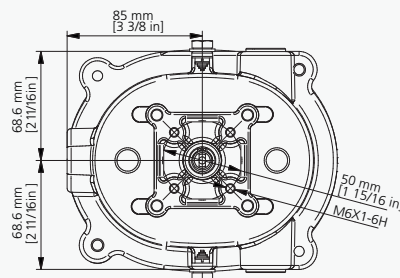
Protection rating: IP 66 / 67
                       Nema 4 4X on request

Temperature:
-20 to +80 °C (-4 to +176 °F) standard temperature range

SX limit switch box
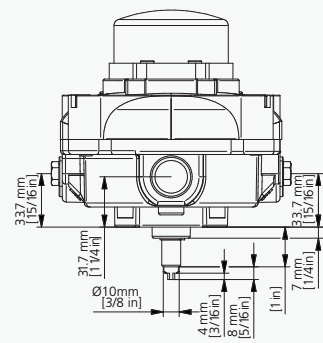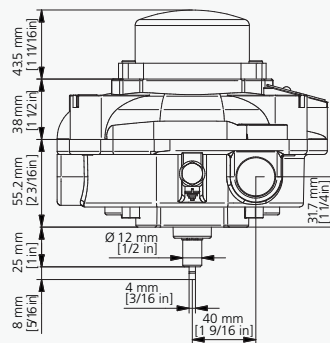
SX - SH limit switch box series

Nomenclature

SX N1 2 0 0 - 1 0 X 3 2 A 4

Box
SX = Exd IIB applications
SH = Exd IIB+H2 applications

Switch
01 = SPDT elec.mech. switch silver plated contacts
1F = DPDT elec.mech. switch silver plated contacts
C4 = SPDT magnetic hermetically sealed reed switch
C8 = DPDT magnetic hermetically sealed reed switch
N1 = SPDT magnetic hermetically sealed silver plated snap acting contacts
N4 = DPDT magnetic hermetically sealed silver plated snap acting contacts
32 = Inductive proximity sensor model NBN4-12GM40-Z0 2 wire
73 = Inductive proximity sensor model NBB2-V3-E2, 3 wire PNP NO
T0 = 4-20 mA position transmitter
H0 = 4-20 mA HART position transmitter Atex EEx ia IIC T6 / T4 certified
P0 = Partial Stroke Test device with magnetic key
See additional information and options on pages 14-19

Switch Quantity
2 = 2 switches
4 = 4 switches (on Exd IIB certification)

Terminals
0 = Screw type terminals with sov connection
A = Screw type terminals
E = Cage clamp terminals with sov connection (for low temperature)
D = Cage clamp terminals (for low temperature)

Coating
0 = Black powder coating

Cable Entries
1 = 2 cable entries 1/2" NPT
2 = 2 cable entries M20x1.5
3 = 2 x 1/2"NPT + 1 x 3/4"NPT cable entries

Visual Position Indicator
0 = 3D plastic visual position indicator red and green
2 = 3-position indicator (T-port 180 deg. Blocked centre)
A = 3-position indicator (L-port)
B = 3-position indicator (T-port 180 deg.)
T = 3D stainless steel position indicator
See additional information and options on page 11

Approval
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
See additional information and options on page 13

Marking
0 = Standard location
3 = Certification marking: Ex II 2GD Exd IIB
4 = Certification marking: Ex II 2GD Exd IIB + H2
7 = cULus Class1/2 Div 1
8 = cULusClass 1/2 Div 1/2 (with switches code: C4, C8, N1, N3)
See additional information and options on page 13

IP Protection rating
1 = Weather proof IP 66/67
7 = Nema 4 and 4X

Temperature
A = Ambient temperature -20 to + 80 °C (-4 to +176 ºF)
E = -25 to +80°C (-13 to +176 ºF) UL approval only

Material
3 = Die cromated aluminium heavy duty body and cover