SOLDO
CONTROLS

SOLDO Product Overview

Linking the Process
with the Control Room

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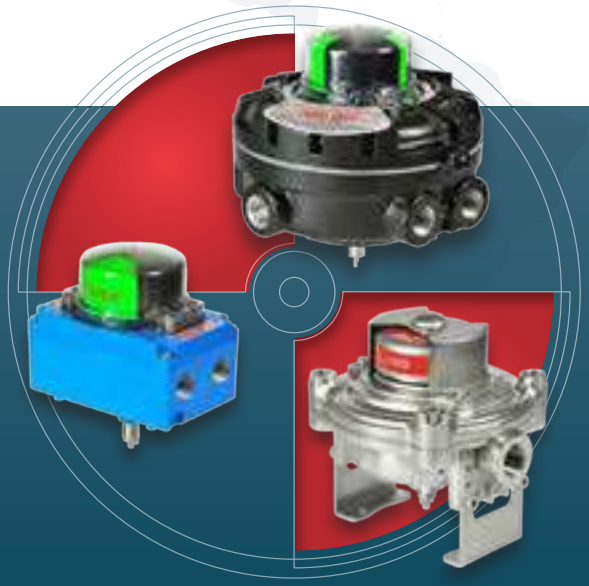

Soldo® is an international company with offices and manufacturing facilities in both Italy and the USA.

As a worldwide company, we specialise in the design and manufacturing of control accessories for the valve automation industry and coupling devices for hazardous area locations. We strive to provide quality products and services with our mission of *"Linking the Process with the Control Room"*.

Our experience and technical expertise enable us to provide complete solutions for special applications from product concept, design, and development through to manufacturing of the finished product.

Soldo's goal is continued product enhancements and additions to meet changing customer needs.

Introduction

The Soldo range of limit switch boxes, proximity sensors, and accessories offers a variety of options. Soldo specializes in the design and manufacture of control accessories for valve automation, providing high quality products and services that guarantee a link between the control room and automated process valves.

Product development programs ensure Soldo is always ready for new markets and applications and able to meet or exceed customer requirements. Soldo products are valued by customers for their advanced design and capabilities including:

Versatility

From cost effective, when price is a concern, to corrosion resistant and explosionproof, when harsh environments are encountered, Soldo products provide the protection and automation that each application demands.

Unique Design Features

Soldo units are a step above the competition with unique split shaft designs. This allows installation where space is a factor and where a low profile limit switch box is not preferred. Soldo limit switches also have easy-set 3 degree cams for independent tool free adjustment.

Simple Installation

Pre-wired PCB switch modules ensure installation is worry free and allows easy installation and wiring directly into terminal strips. The pre-wired boards are conformal coated for environmental protection. Soldo also offers a full line of mounting brackets for all models that do not come with an integral mounting kit.

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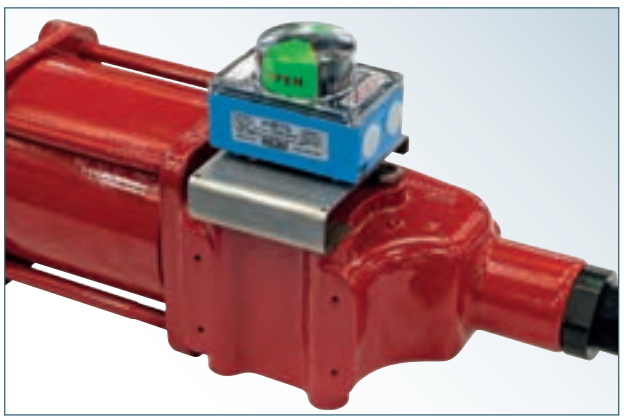


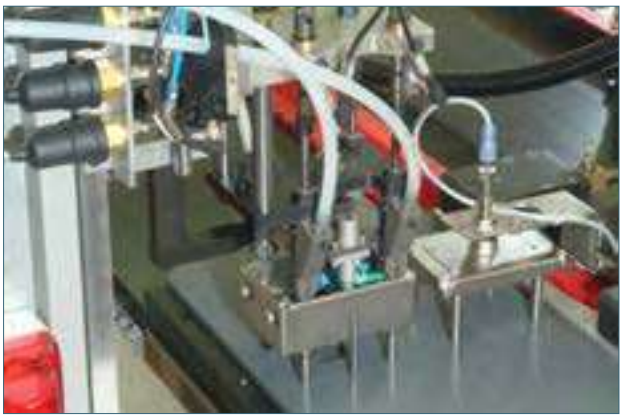
Capabilities and Facilities

Production

Soldo's key to success is the design and manufacturing of high quality control accessories with innovative features that deliver exceptional value. Soldo provides a complete range of products for standard and custom applications.

Service

Our automation centers are equipped with sophisticated machining centers, which allow our highly skilled staff to automate all types of valves. Services that we offer include overall dimensional drawings (paper or electronic copies) as well as customized instruction manuals.



Engineering and Design

Our product range is totally designed and manufactured according to the stringent specifications of both North American and European standards. We are committed to bringing the latest innovative technology and leading edge design methods to market while maintaining the Soldo name for reliability.

- In-house prototyping for quick creation of concept designs provides immediate understanding of how a unit will function under given conditions for a customer's unique application
- 3D CAD modelling means our designs can be accurately manufactured, allowing for more complex forms to further optimize part geometry
- FMEA (Failure Modes and Effects Analysis) allow the design to be robust whilst maximizing the mapping of consumer requirements to the product

Our technical department works with highly sophisticated systems, which include state-of-the art, 3D CAD design software and finite element analysis. It is also supported by our internal laboratory equipped with a CNC 3D measuring machine as well as other devices and instrumentation that allow us to study, analyse, simulate and verify both mechanical/dimensional and electrical/instrumental point of view. Moreover, every process is controlled during all production phases according to specific standards or internal procedures.

This commitment to excellence has earned us the UNI EN ISO 9001:2008 and ATEX certifications that make us a world class well-known company for our high quality standards. From design to finished product and from sales to shipment all procedures and processes are organized to give our customers reliable products and a convenient and punctual service.

Capabilities and Facilities

Testing Facilities

Soldo has extensive industry standard testing facilities. We have a comprehensive set of test stands for testing all our prototype, pre-production and finished production limit switches. We carry out life cycle testing, pressure testing and environmental testing including climate chamber and salt-spray testing in-house.

For tests beyond our in-house capabilities, such as extremely high temperature testing, nuclear, deep-sea hyperbaric and seismic / vibration testing we use industry leading third party facilities.

Quality Assurance and Approvals

Soldo is a certified company by North American and European approval agencies.

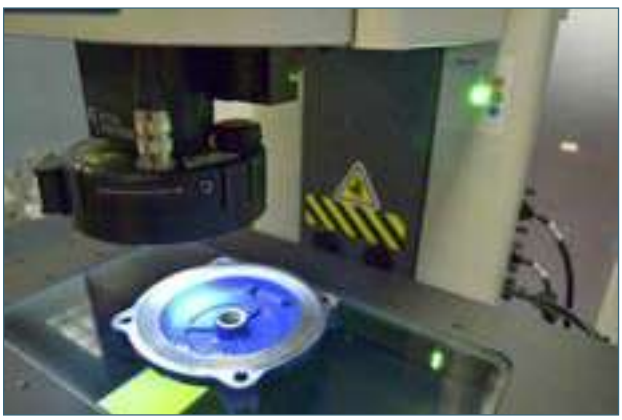
Soldo products are designed and manufactured to the highest possible level of engineering – a principle which drives all areas of our business. To facilitate this objective a documented Quality Management system is established in accordance with ISO9001:2008.

Our manufacturing centers are ISO9001:2008 certified , ATEX certified for the manufacturing of Exd, Exe, Exn and Exi devices, IECex certified for the same category of products as well as UL listed for ordinary location and hazardous areas.

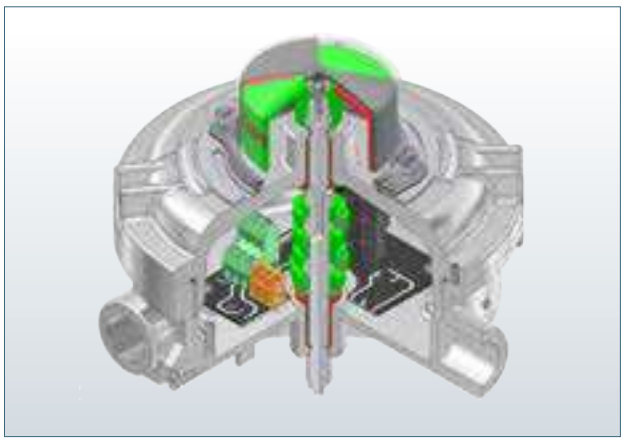
Soldo products are manufactured to meet certification in all foreign markets. Certification options include:

- EAC certified for Russian market
- CCOE certified for Indian market
- INMETRO certified for Brazilian market
- NEPSI certified for Chinese market

Most units are SIL certified up to SI3L level from TÜV.

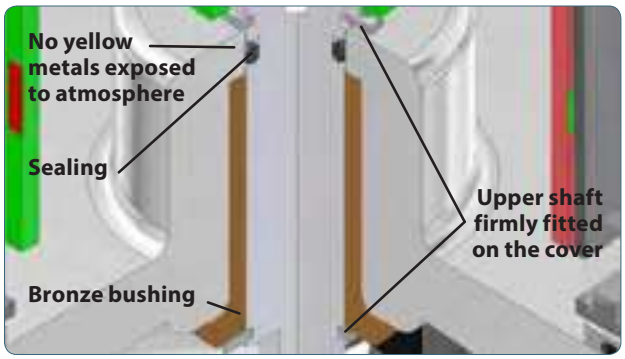


Limit Switch Box Design Features

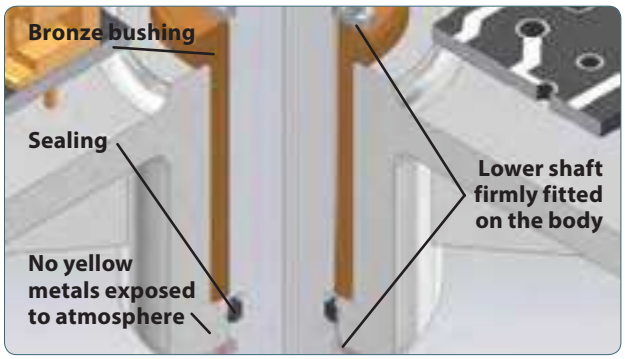


Twin design shaft features:

- 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



Lower shaft

Switch and Sensors

With the knowhow of 17 years' experience in the valve automation feedback, Soldo introduces in the market a complete selection of magnetic limit switches replying to the most critical and demanding requirements. Inert gas hermetically sealing or high power loops or either different contact forms and materials, are no more issues with the high quality Soldo switches.

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 to +95 °C (-58 to +203 °F)

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 to +95 °C (-58 to +203 °F)

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 to +95 °C (-58 to +203 °F)

REED C4

- Proximity hermetically sealed reed SPDT switch
- Inert gas contact chamber
- Rating up to 1A @ 24 VDC
- Temperature range: -60 °C , +100 °C (-76 to +212 °F)

REED C8

- Proximity hermetically sealed reed DPDT switch
- Inert gas contact chamber
- Rating up to 1A @ 24 VDC
- Temperature range: -60 °C , +100 °C (-76 to +212 °F)

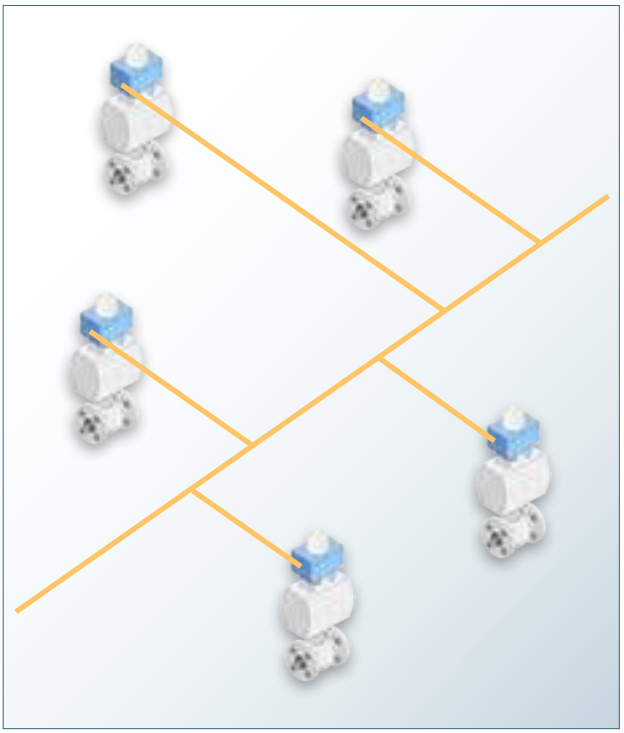
More options available on request.

Protocol Communication

Soldo provides a wide range of solutions for bus communication protocols. AS-i and DeviceNet network bus systems greatly reduce the amount of field wiring, simplifying field installation and start-up while reducing project costs.

Class & Features:

- AS-i 2.0 - 2.1 - 3.0
- DeviceNet ISO 11898-24V
- Limit switch boxes are available in plastic, aluminium or stainless steel housing
- Rotary and linear options available
- Various connection options
- Optional factory pre-addressing



AS-i Features

AS-Interface (AS-i) is the simplest of the industrial networking protocols used in PLC, DCS and PC-based automation systems. It is designed for connecting binary (ON/OFF) devices such as actuators and sensors in discrete manufacturing and process applications using a single cable.

Features:

- Highly efficient alternative to hard wiring of field devices
- Excellent partner to Profibus, DeviceNet, Interbus and Industrial Ethernet network systems
- Proven in hundreds of thousands of applications
- Cut-down AS-i SW version available for ultra-simple devices
- Provides the ideal basis for Functional Safety in machinery safety/emergency stop applications

DeviceNet Features

DeviceNet is a low cost, high speed, communications link to connect process control or industrial devices such as actuators, pressure transmitters and level sensors to a network and eliminate expensive cabling.

The direct connectivity provides process control information as well as important diagnostic data that would otherwise not be accessible over a conventional hardwired system.

Features:

- International open standard IEC61158-CPF2
- Up to 63 devices on each network
- 3 baud rates available; 125 kB, 250 kB and 500 kB
- 4-wire cable, 2 for signal, 2 for power
- Trunk and Drop line permitted
- ODVA certified to ensure compatibility
- EDS electronic device description file

SP - SM limit switch box series

Compact limit switch box, designed not only for the industrial market, but for indoor applications in hazardous areas. Available in either glass reinforced resin or nickel plated aluminium, with flat lid or 3D indicator.

The SP is a corrosion resistant device, able to satisfy the needing in water treatment and desalination plants, both SP and SM, can also match the Ex ia IIC T6 standards with the integral intrinsically safe certification, covering enclosure and electrical components inside. With these devices, we are providing a ready to mount solution, thanks to the integrated NAMUR mounting kit.

Technical Data:

Materials

- Glass reinforced resin body with transparent polycarbonate cover (SP series)
- Nickel plated aluminium body with transparent polycarbonate cover (SM series)
- Stainless steel fasteners

Approvals

ATEX, EAC

Ex II 2GD Ex ia IIC T4/T5/T6
Ex ia IIIB T44°C…….T108°C Db IP6*
Ta: -15 °C ≤ Ta ≤ 80 °C

SIL certificate: Up to SIL 2 certified by TÜV

Protection rating: IP 65

Cable entries options:

One cable entry M20 or 1/2" NPT (SP standard)
Two cable entry M20 or 1/2" NPT (SM)

Temperature:

-15 to +80 °C (+5 to +176 °F) as standard temperature range (depending on switch selection)

SF - SS - SB limit switch box series

Limit switch box designed for safe and hazardous areas, provides a visual and electrical remote position feedback on automated valves.

Available in either die cast aluminium or 316 stainless steel, with different lid choices, from the same enclosure material, for a complete metallic device, to the transparent polycarbonate cover or to a flat lid without visual indication. Designed for weatherproof applications, it can also matches the Ex ia IIC T6 standards with the integral intrinsically safe certification, covering both enclosure and electrical components inside.

Technical Data:

Materials

- Die-cast aluminium body and cover with polyester powder coating (SF series)
- AISI 316 stainless steel body and cover with electro-polished finishing (SS series)
- Die-cast aluminium body with polyester powder coating, transparent polycarbonate cover (SB series)
- Stainless steel fasteners and shafts

Approvals

ATEX, IECEx, EAC, CCOE

Ex II 2GD Ex ia IIC T4/T5/T6
Ex ia IIIC T44°C…….T108°C Db IP6* (SF, SS series)
Ex ia IIIB T44°C…….T108°C Db IP6* (SB series)
Ta: -60 °C ≤ Ta ≤ 100 °C

UL: Class I Division 2 Groups A, B, C, D
Class II Division 2 Groups F, G

SIL certificate: Up to SIL 3 certified by TÜV

Protection rating:

IP 66 / 67

Cable entries options:

Two cable entry M20 or 1/2" NPT

Temperature:

-20 to +80 °C (-4 to +176 °F) as standard temperature range (depending on switch selection)

-60 to +105 °C (-76 to +221 °F) available on request

HW limit switch box series

Control unit embedded into a limit switch box. The HW series provides, not only a visual and electrical remote position feedback, but, using a solenoid valve integrated into the housing, it can control an automated valve.

Available in polyester powder coated aluminium, with different lid choices, and with a wide selection of solenoid valves, from the standards 3/2 way to a 5/3 way with special pneumatic design.

The Soldo control unit, is covering from industrial automation to food and beverage, from chemical to naval industries.

It can also meet the requirements of a simple limit switch box, by removing the pneumatic control device, providing a large inner volume able to host up to 6 switches and spare pass through terminals.

Technical Data:

Materials

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

Options:

Network Control

- Profibus network version available

Approvals

CE, UL
Ordinary location

SIL certificate: Up to SIL 3 certified by TÜV

Protection rating:
IP 66 / 67

Cable entries options:
Up to three cable entries M20, M25, $^{1}/_{2}$" NPT or $^{3}/_{4}$" NPT

Temperature:
-15 to +80 °C (+5 to +176 °F) as standard temperature range (depending on switch selection)

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 & gas (both on-shore and off-shore) and petrochemical industries.

Technical Data:

Materials

- Die-cast aluminium 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 to +80 °C (-4 to +176 °F) as standard temperature range (depending on switch selection)

-40 to +105 °C (-40 to +221 °F) available on request

SK - SQ limit switch box series

Compact limit switch box, designed for hazardous areas, provides a visual and electrical remote position feedback on automated valves.

Available in either die cast aluminium or 316L stainless steel, the explosionproof enclosure matches the Exd IIC T6 standards. The SK - SQ switch box series offer a ready to mount solution thanks to the integrated NAMUR mounting kit.

The ideal compact solution for oil & gas (both on-shore and off-shore) and petrochemical industries.

Technical Data:

Materials

- Copper free aluminium body and cover with polyester powder coating
- AISI 316 stainless steel body and cover with electro-polished finishing
- Stainless steel fasteners and shafts

Approvals

ATEX, IECEx, EAC, CCOE, INMETRO

Ex II 2GD Ex d IIC T4/T5/T6 Gb
Ex tb IIIC T135/T100/T85°C Db
Ta: -55 °C ≤ Ta ≤ 105 °C / 80 °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
IP 66 / 68 up to 15 meters for 100 hours

Cable entries options: Two cable entry M20 or 1/2" NPT

Temperature:

-20 to +80 °C (-4 to +176 °F) as standard temperature range (depending on switch selection)

-55 to +105 °C (67 to +221 °F) available on request

SY - SW limit switch box series

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

Available in either copper free aluminium or 316 stainless steel, the explosionproof enclosure matches Exd IIC T6 standards. The SY - SW limit switch box series, thanks to its large inner volume, is able to host up to 6 switches and spare pass through terminals. The availability of four cable entries, either metric or imperial, provide a highly customizable solution meeting a wide range of applications. These include, but are not limited to, oil & gas (both on-shore and off-shore) and petrochemical industries.

Technical Data:

Materials

- Copper free aluminium body and cover with polyester powder coating
- AISI 316 stainless steel body and cover with electro-polished finishing
- Stainless steel fasteners and shafts

Approvals:

ATEX, IECEx, EAC, CCOE, INMETRO, NEPSI

Ex II 2GD Ex d IIC T4/T5/T6 Gb
Ex tb IIIC T140/T110/T110°C Db
Ta: -60 °C ≤ Ta ≤ 105 °C / 80 °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 / 68 up to 10 meters for 48 hours

Cable entries options:

Up to four cable entries for metric and imperial sizes

Temperature:

-20 to +80 °C (-4 to +176 °F) as standard temperature range (depending on switch selection)

-60 to +105 °C (-76 to +221 °F) available on request

SE limit switch box series

Limit switch box designed to provide an electrical remote position feedback on automated linear valves.

Available in either die cast aluminium or 316 stainless steel is designed for weatherproof applications, it can also matches hazardous areas requirements using Ex ia IIC T6 NAMUR inductive sensors.

The Soldo limit switch box solution for linear applications can integrate free spare terminal poles working as a junction box.

Flexibility, due to mounting pattern and sensors/switches choices, makes it suitable to cover from industrial automation to food and beverage, from chemical to naval, from oil & gas to petrochemical industries.

Technical Data:

Materials

- Die-cast aluminium body and cover with polyester powder coating
- AISI 316 stainless steel body and cover with electro-polished finishing
- Stainless steel fasteners

Approvals

CE, EAC
Ordinary location

SIL certificate: Up to SIL 3 certified by TÜV

CE EAC SIL SIL LEVEL 3

Protection rating:
IP 65, IP 67 on request

Cable entries options:
Two cable entry M20 or ½" NPT

Temperature:
-20 to +80°C (-4 to +176 °F) as standard temperature range (depending on switch selection)

Low and high temperature executions available on request

ES - Easy switch box

Hazardous area limit switch box for manual valve applications. Explosionproof enclosure, in copper free aluminium or 316 stainless steel, handles the most demanding application in hostile environments. The Easy switch box uses two magnetic sensors to provide electronic feedback to the control room. An easy to mount magnetic target operates the switches.

Features:

- Compact position indication on all manual valves
- Adaptable mounting kit for all applications
- Easily links to the valve with the durable glass reinforced magnetic holder
- Wires through the terminal PCB for easy connection
- Easy to open threaded lid design for manual removal of the cover
- One or two cable entries for versatile use
- Polyester powder coated copper free aluminium housing
- 316 stainless steel housing version for harsh environments
- NOVA V3 switch option for high power rating use

Approvals

ATEX, IECEx, EAC, INMETRO

Ex II 2GD
Ex d IIC T6/T5/T4 Gb
Ex tb IIIC T85/T100/T120 °C Db
Ta = -65 °C ≤ Ta ≤ 105 °C

SIL rating: up to SIL 2 approval on request

UL CE Ex ATEX EAC SIL SIL LEVEL 2

UL: Class I, Division 1 and 2, Groups A, B, C and D
Class II, Division 1 Groups E, F and G
Class II Division 2, Groups F and G

Protection rating

IP66 / 67
IP66 / 68 (15 meters for 70 hours)

Cable entries options:

Standard – Single cable entry
Optional – Two cable entries for the following dimensions:
- M20 x 1,5
- ½" NPT

BM - TB limit switch box series

The BM (BOLT) switch is a threaded body, proximity switch for remote electrical indication of linear and rotary valve/actuator position. These rugged switches are machined from solid billets of stainless steel or aluminium and are totally sealed. The BOLT is ATEX or cULus listed and ideal for a wide range of environmental and hazardous area applications.

The NOVA BOLT proximity sensor has a unique patented sensing system (US Patent 7,489,217). Able to sense any ferromagnetic material in any size, this “Snap Acting” design has full contact pressure in the open or closed state, separating Soldo from any of our competitors. The NOVA sensor is rated for hazardous area applications with the highest ratings available, and there is "No Lead Seal" required.

Flying leads are not always accepted into plants, for that reason we can provide a complete system comprehensive of bolt switches, directly connected with an integrated junction box either in aluminium or stainless steel. the new apparatus, is on the market with the TB series name, with an integral certification for hazardous areas.

Technical Data:

BM Materials

- Anodized aluminium enclosure (only for American market)
- AISI 316 stainless steel enclosures

TB Materials

- AISI 316 stainless steel bolt switch with coated aluminium junction box
- AISI 316 stainless steel bolt switch and junction box

Approvals

ATEX, IECEx, EAC, CCOE, INMETRO

Ex II 2GD Ex d IIC T6…T4 Gb
Ex tb IIIC T80…T115°C Db IP68
Ta: -40 °C ≤ Ta ≤ 105 °C

UL (only BM):

Class I Division 1 and 2 Groups A, B, C, D
Class II Division 1 Groups E, F, G
Class III Division 1

SIL certificate: Up to SIL 3 certified by TUV

Protection rating:

IP 68
Subsea application available on request

Cable entries options:

Single cable entry M20 or 1/2” NPT

Temperature:

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

-40 to +105 °C (-40 to +221 °F) available on request

DM Series Spring Cartridges

The Soldo DM Series cartridges return manually operated valves to their fail-safe position when the lever or hand wheel is released. The rugged and compact design make our spring-return cartridges suitable for a wide range of environments and hazardous areas.

DM10 Class & Materials:

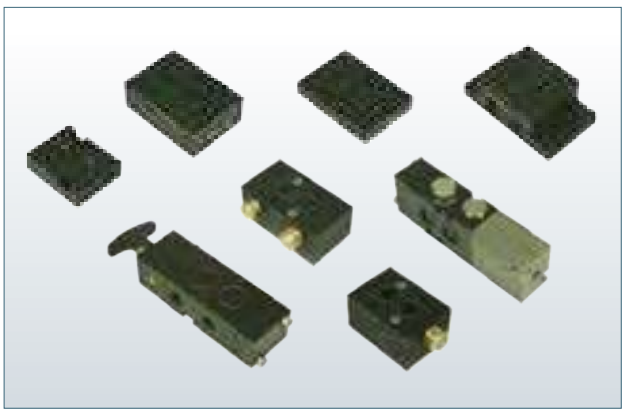
- Hand wheel operator
- Output torque up to 30 Nm (265 lbf.in) ending
- Anodized aluminium body
- Nickel plated carbon steel shaft
- Stainless steel fasteners
- NBR seals
- ISO 5211 mounting pattern
- ATEX Ex II 2GD C T max +75 °C (+167 °F) on request.

DM20 Class & Materials:

- Lever operator (dampened)
- Output torque up to 45 Nm (400 lbf.in) ending
- Anodized aluminium body
- Nickel plated carbon steel shaft
- Zinc plated steel lever with stainless steel fasteners
- NBR seals
- ISO 5211 mounting pattern
- ATEX Ex II 2GD C T max +75 °C (+167 °F) on request.

NAMUR Pneumatic Components

The Soldo NAMUR pneumatic accessories direct mount on NAMUR actuators. Both sides feature the NAMUR mounting pattern enabling “wafer” assembling additional components for both NAMUR 1/4" and 1/2" patterns.



Components available:

- NV62L bypass valve
- NV42L air lock valve
- NF flow fontrol regulator
- NX quick exhaust valve
- NP1/4 and NM1 adapter plate.

Materials:

- Anodized aluminium body
- Stainless steel shaft and screws
- NBR seals.

Product Overview Chart

Water Power Factory Oil Gas

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	Aluminium	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	-15 to +80 °C (+5 to +176 °F)	-15 to +80 °C (+5 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)	-40 to +105 °C (-40 to +221 °F)	-40 to +105 °C (-40 to +221 °F)
	Integrated Mounting Kit	✔	✔	–	–	–	✔	–	–

Product Overview Chart

Water Power Factory Oil Gas

Model		SK	SQ	SY	SW	SE	ES	BM	TB
									
Application	Industry								
	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	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	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 +150 °C (-58 to +302 °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	✔	✔	–	–	–	–	–	–

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