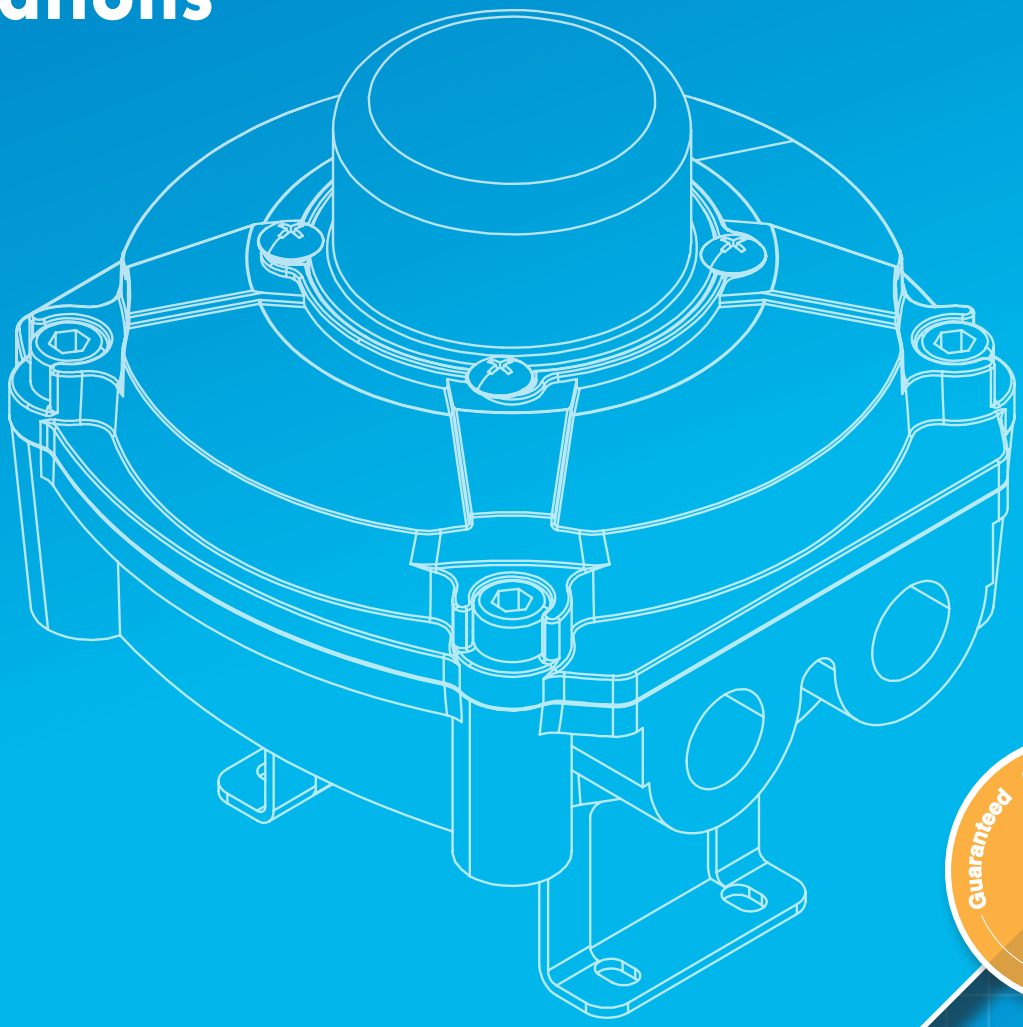
Max-Air

A Brand of Max-Air Technology.

Limit Switches for Hazardous Locations



Guaranteed Quality & Performance 3 Year Warranty

Limit Switches Technical Brochure

Max-Air Technology Inc. | Rotary Actuators & Valve Automation Solutions

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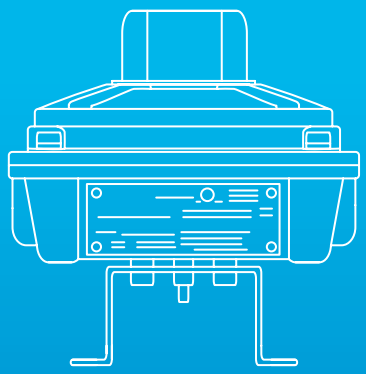
Max-Air Technology

Limit Switches

Hazardous duty limit switch boxes available with mechanical, proximity, or inductive switches.



Max-Air limit switch boxes offer convenient and reliable switch feedback for actuated assemblies, for hazardous duty environments. The NAMUR standard mounting design is compatible with all Max-Air pneumatic actuators.

48 Series Part # Builder

A - ENCLOUSURE	B - SERIES	-	C - CONDUIT ENTRIES	D - SWITCHES	E - INDICTOR TYPE	F - MATERIAL	G - SWITCH TYPE	H - BRACKET	I - BOARD TYPE
MS	48	-	1	2	0	M	0	3	-

Example Part # MS48-120M03

EXAMPLE DESCRIPTION: LIMIT SWITCH BOX, NEMA 4, 4X, 7, 9, 2 SWITCHES, 1/2" NPT CONDUIT THREADS, STANDARD INDICATOR, ALUMINUM LIMIT SWITCH BOX, SILVER PLATED MECHANICAL SPDT SWITCHES, U-BRACKET; UL/CSA APPROVAL, CLASS I, DIV 1, GROUPS C & D, CLASS II, DIV 1, GROUPS E,F,G, CLASS III, TEMP CODE T4A; CLASS I, DIV 2, GROUPS A,B,C,D; IP67; 7-8-7-8 BOARD / TERMINAL STRIP.

A - ENCLOUSURE

North American Approvals
MS = Mechanical
PS = Magnetic
IS = Inductive Proximity

European Approvals
BE = Mechanical
BM = Magnetive Proximity
BS = Inductive Proximity

B - SERIES

48 = NEMA 4/4X/7/9, IP67
Class I, Division 1, Groups C and D; Class I, Division 1, Groups C and D;
Class II, Division 1, Groups E, F and G;
Class III; TCode T4A
Ex d IIC T5 Gb;
Ex tb IIIC T108°C Db
Class I, Zone 1, AEx d IIC T5 Gb;
Class II, Zone 21 AEx tb IIIC T108°C Db

C - CONDUIT ENTRIES

1 = 1/2" NPT (2 Places)
2 = M20 x 1.5 (2 Places)

D - SWITCH TYPE

2 = Two (2) Switches
4 = Four (4) Switches (MS Type Only)

E - INDICTOR TYPE

0 = STD, Open/Closed, Yellow/Red
2 = Lport, 3way
3 = Tport, 3way
4 = Arrow, 3way
5 = Open/Close, Red/Green

F - MATERIAL

M = Aluminum, black
7 = Stainless Steel

G - SWITCH TYPE

CODE	TYPE	DESCRIPTION
0	MS	Silver Plated Switches SPDT
S	MS	Gold Plated Switches SPDT
M	PS	Magnetic Reed Switches SPDT
Q	PS	Low Temp Magnetic Reed Switches SPDT
A	IS	IFM NS5002
B	IS	IFM IS5001
D	IS	IFM IS5026
E	IS	IFM IS0003
F	IS	P&F NJ2-V3-N
G	IS	P&F NBB2-V3-E2
H	IS	P&F NBB3-V3-Z4
K	IS	P&F NBB2-V3-E3
L	IS	P&F NBB2-V3-E0
N	IS	P&F NCB2-V3-N0
P	IS	IFM IS5004

H - BRACKET

0 = None
3 = 30x80x30 Namur
6 = Universal Bracket
A = MS-LSB-01 (30x80x20 Namur)
B = MS-LSB-02 (30x80x30 Namur)
E = MS-LSB-05 (30x130x30 Namur)

I - BOARD TYPE

Blank = Standard 7-8-7-8 (Single Coil SV)
1 = Circuit Board 7-8-7-9 (Dual Coil SV)
2 = Circuit board 7-8-9-10

BX45 Series Part # Builder

SERIES	-	A - THREAD	-	2 - SWITCHES	B - INDICTOR TYPE	C - MATERIAL	D - SWITCH TYPE	E - BRACKET	F - BOARD TYPE	G - TEMP
BX45	-	1	-	2	0	M	F	3	-	-

Example Part # BX45-120MF3

EXAMPLE DESCRIPTION: LIMIT SWITCH BOX, BLACK, INTRINSICALLY SAFE ATEX 1GD EXIA IIC T6, IP66-67, WITH 2X P&F NJ2-V3-N, 8.2VDC, 2 WIRES, NC, 2XL/2"NPT CONDUIT ENTRIES, RED/YELLOW INDICATORS, NAMUR BRACKET 80X30 H30 AISI 304

SERIES	A - THREAD	2 - SWITCHES
BX45 = Ex ia IIC T6/T5 Ga Class I, Zone 0 AEx ia IIC T6/T5 Ga IS Class I, Division 1, Groups A, B, C, and D T6/15 Class I, Division 2, Groups A, B, C, and D T6/TS Ex ia IIIC T**°C Da Zone 20, AEx ia IIIC T**°C Da	1 = 1/2" NPT 2 = M20 X 1.5	2 = Two (2) Switches 4 = Four (4) Switches (MS Type Only)

B - INDICTOR TYPE	C - MATERIAL	D - SWITCH TYPE		
		Mechhanical Switches	**Magnetic Switches**	**Namur Proximity Sensor**
0 = STD, Open/Closed, Yellow/Red 2 = Lport, 3way 3 = Tport, 3way 4 = Arrow, 3way 5 = Open/Close, Red/Green	M = Aluminum, black 7 = SS316	S = Omron /D2SW01/SS-01 Inductive Sensor A = IFM NS5002 F = P&F NJ2 V3-N N = P&F NCB2-V3-N0	Z = Littelfuse/Hamlin 59140	X = P&F SJ3.5-N/NAMUR Y = P&F SJ3.5-S1N/NAMUR W = P&F SJ3.5-SN/NAMUR T = P&F SC3.5-N0-BU/NAMUR

E - BRACKET	F - BOARD TYPE	G - TEMPERATURE
0 = None 3 = 30x80x30 Namur 6 = Universal Bracket A = MS-LSB-01 (30x80x20 Namur) B = MS-LSB-02 (30x80x30 Namur) E = MS-LSB-05 (30x130x30 Namur)	Blank = Standard 7-8-7-8 (Single Coil SV) 1 = Circuit Board 7-8-7-9 (Dual Coil SV) 2 = Circuit board 7-8-9-10	Void/0 = STD 4 = Low Temp

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3-YEAR LIMITED WARRANTY

Max-Air Technology Inc. | The Best Way to Automate Your Process

Max-Air Technology provides the following warranty regarding its products. THE WARRANTY STATED HEREIN IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, OR STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. Max-Air Technology warrants its products shall be delivered free from defects in materials and workmanship when these products are used for the purpose for which they were designed and manufactured. Max-Air Technology does not warrant its products against chemical or stress corrosion or against any other failure other than from defects in materials or workmanship. The applicable warranty period is dependent on the clearly identified brand labeling.

The warranty period for Max-Air, Max-Electric, Delta T, and Sesto Valves brand labeled products is for thirty-six (36) months from the delivery date to the Purchaser.

Any claims regarding this warranty must be in writing and received by Max-Air Technology before the last effective date of the warranty period, failing which this warranty shall expire. Upon Max-Air Technology's receipt of a warranty claim, Max-Air Technology reserves the right to inspect the product(s) in question at either the field location or at Max-Air Technology manufacturing plant. If, after inspection of the product(s) in question, Max-Air Technology determines that the Purchaser's claim is covered by this warranty, Max-Air Technology's sole liability and the Purchaser's sole remedy under this warranty is limited to the refunding of the purchase price or repair or replacement thereof at Max-Air Technology's option. Warranty repair, replacement or re-performance by Seller shall not extend or renew the applicable warranty period. Max-Air Technology will not be liable for any repairs, labor, material or other expenses that are not specifically authorized in writing by Max-Air Technology, and in no event shall Max-Air Technology be liable for any direct, indirect or consequential damages arising out of any defect from any cause whatsoever. If any Max-Air Technology product is modified or altered at any location other than Max-Air Technology – Wentzville (Missouri) or Max-Air Technology – Agrate Brianza (MB) ITALY without the express written authorization of Max-Air Technology, it is expressly not covered by this warranty. The warranties and remedies are conditioned upon (a) proper storage, installation, use, operation, and maintenance of products, (b) Purchaser keeping accurate and complete records of operation and maintenance during the warranty period and providing Max-Air Technology access to those records, and (c) modification or repair of products only as authorized by Max-Air Technology in writing. Failure to meet any such conditions renders the warranty null and void. Max-Air Technology is not responsible for normal wear and tear. The warranty for such products shall be subject only to the warranty relief, if any, provided by the suppliers and/or manufacturers of such products.

Features & Benefits

Hazardous duty limit switch boxes available with mechanical, proximity, or inductive switches.

Hazardous Switch Feedback

Max-Air limit switch boxes offer convenient and reliable switch feedback for actuated assemblies, for standard or hazardous duty environments. The NAMUR standard mounting design is compatible with all Max-Air pneumatic actuators.

Standard Features:

- Compact Design & Quick Set Cams
- 3D Models Available for All Designs and Sizes
- Easy Wiring Through PCB Terminal, 10pt.
- Single and Dual-Coil Solenoid Valve Options
- High Visibility Open/Close Beacon
- 3-Way T-Port & L-Port Beacon Options
- Inclusive 30x80x30 NAMUR Mounting Bracket
- Other Mounting Brackets Available

48 Series Aluminum & Stainless
Mechanical or non-contact switch options with heavy duty enclosure for hazardous locations.

Voltages	AC/DC, Ordinary & Hazardous Locations
Mounting	NAMUR VDI/VDI 3845
Available Options	T-Port, L-Port, Special Beacons, Low Temp Option

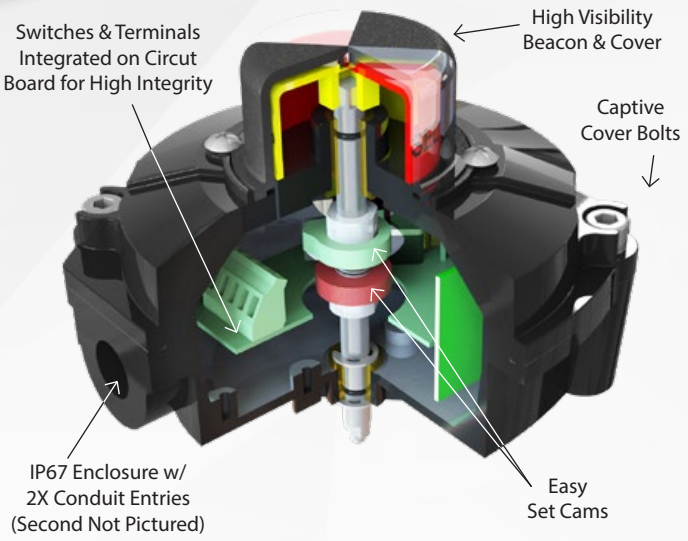
45 Series Aluminum & Stainless
Mechanical or non-contact switch options for ordinary locations.

Voltages	AC/DC, Ordinary & Hazardous Locations
Mounting	NAMUR VDI/VDI 3845
Available Options	T-Port, L-Port, Special Beacons, Low Temp Option

Limit Switch Box Selection

Start from the top of the chart and work down to select the correct Limit Switch Box.

Environment	Standard			Corrosive		
Electrical Classification	Ordinary	Hazardous		Ordinary	Hazardous	
Temperature	Standard	Standard	Extreme (Low)	Standard	Standard	Extreme (Low)
Recommended Series/Options	41 Series 45 Series (Aluminum)	45 Series (BX) w/ Intrinsically Safe (Aluminum) 48 Series (Aluminum)	48 Series w/ Temp. Seals (Aluminum)	41 Series 45 Series (Stainless Steel)	45 Series (BX) w/ Intrinsically Safe (Stainless Steel) 48 Series (Stainless Steel)	48 Series w/ Temp. Seals (Stainless Steel)
Switch Types	Mechanical, Proximity, Inductive					
Available Options	T-Port Beacons, L-Port Beacons, Specialty Beacons, Brackets					



48 Series

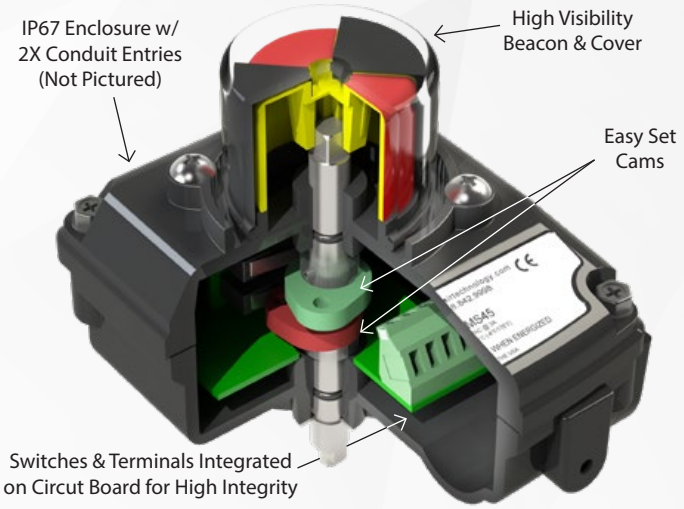
The Max-Air 48 Series Explosion Proof aluminum and stainless steel limit switch boxes are available for the highest level of safety in hazardous environments. Extremely reliable, robust, and time tested the 48 Series is an excellent solution for your position monitoring needs. Switches available with mechanical, proximity and inductive types, and fully certified to North American and European standards.

Specifications Table		
Ingress Protection	IP67/NEMA4/4X/7/9	
Cable Entries	Standard 1/2" NPT (2 places) Optional M20x1.5 (2 places)	
Temp. Range	Low Temp. (Silicone)	-40°F (-15°C) to 140°F (60°C)
	Standard (BUNA-N)	-4°F (-20°C) to 140°F (60°C)
Terminal Strip	10 Pt. Single Coil & 10 Pt. Dual Coil	
Weight	Aluminum 3.79 lbs (1.72 kg) & Stainless 9.85 lbs (4.47 kg)	
Approvals	See Table on Page 10	

45 Series

The Max-Air 45 Series aluminum and stainless steel series limit switch boxes are an extremely reliable, robust, and time tested solution for your position monitoring needs. Switch boxes available with mechanical, proximity and inductive switch types, and fully certified to North American and European standards.

Specifications Table		
Ingress Protection	IP67/NEMA4/4X	
Cable Entries	Standard 1/2" NPT (2 places), Optional M20x1.5 (2 places)	
Temp. Range	Standard (BUNA-N)	-4°F (-20°C) to 176°F (80°C)
Terminal Strip	10 Pt. Single Coil & 10 Pt. Dual Coil	
Weight	Aluminum 1.62 lbs (0.74 kg) & Stainless 3.94 lbs (1.79 kg)	
Approvals	See Table on Page 12	



Switch Types

Mechanical, Magnetic Proximity, & Inductive Proximity

MS - Mechanical Switches

Mechanical switches are activated by pressing a spring return lever, and have physical contacts plated with a noble metal such as silver or gold. When energized contact is made, a small arc or spark can be produced within the housing of the switch that is not completely sealed off from the atmosphere. Mechanical switches are passive devices that do not require external power to operate.

45 Series

Code 0
Silver Plated Switches SPDT
Rating: 5A@125VAC, 3A@30VDC
Ambient Temp: -13°F to +185°F

Code S
Gold Plated Switches SPDT
Rating: 0.1A@125VAC, 0.1A@30VDC
Ambient Temp: -13°F to +185°F

48 Series

Code 0
Silver Plated Switches SPDT
Rating: 10A@125VAC, 6A@30VDC
Ambient Temp: -13°F to +185°F

Code S
Gold Plated Switches SPDT
Rating: 0.1A@125VAC, 0.1A@30VDC
Ambient Temp: -40°F to +180°F

PS - Magnetic Proximity Switches

Magnetic proximity switches are activated by the presence of a magnetic field, and have hermetically sealed physical contacts plated with a noble metal such as tungsten or rhodium. The encapsulated contact elements are completely isolated from the atmosphere, eliminating arcs or sparks and preventing corrosion. Magnetic switches are passive devices that do not require external power. Because the contacts are "non-sparking" and "non-contact", magnetic type switches are commonly used in hazardous locations.

45 Series

Code 0
Low Power Reed Switches SPDT
Rating: 3W Max, 0.04A@120VAC, 0.20A@24VDC
Ambient Temp: -40°F to +221°F

48 Series

Code M
Reed Switches SPDT
Rating: 100W Max, 0.83A@120VAC, 4.1A@24VDC
Ambient Temp: -4°F to +221°F

Code Q
Low Temp Reed Switches SPDT
Rating: 100W Max, 0.83A@120VAC, 4.1A@24VDC
Ambient Temp: -76°F to +257°F

IS - Inductive Proximity

Inductive proximity switches are activated by the presence of a magnetic or ferritic target which disturbs the sensor's own magnetic field. Inductive switches are "active" devices which require external power and are available in a variety of configurations. Inductive type switches are inherently "non-sparking" and usually operate on low voltage DC power, making them well suited for intrinsically safe applications.

45 Series

Code A

IFM NS5002 2-Wire NC Switches

Rating: 7.5-30VDC, Eexia

Ambient Temp: -4°F to + 158°F

Code B

IFM IS5001 3-Wire PNP NO Switches

Rating: 10-36VDC

Ambient Temp: -13°F to +176°F

Code D

IFM IS5026 2-Wire Programmable Switches

Rating: 5-26VDC

Ambient Temp: -13°F to +176°F

Code E

IFM IS0003 2-Wire NO Switches

Rating: 20-140VAC/10-140VDC

Ambient Temp: -13°F to +176°F

Code F

P&F NJ2-V3-N 2-Wire NC Switches

Rating: 8.2VDC, Eexia

Ambient Temp: -13°F to +212°F

Code G

P&F NBB2-V3-E2 3-Wire PNP NO Switches

Rating: 10-30VDC

Ambient Temp: -13°F to +158°F

Code H

P&F NBB3-V3-Z4 2-Wire NO Switches

Rating: 5-60VDC

Ambient Temp: -13°F to +185°F

Code K

P&F NBB2-V3-E3 3-Wire PNP NC Switches

Rating: 10-30VDC

Ambient Temp: -13°F to +158°F

Code L

P&F NBB2-V3-E0 3-Wire NPN NO Switches

Rating: 10-30VDC

Ambient Temp: -13°F to +158°F

Code N

P&F NCB2-V3-N0 2-Wire NC Switches

Rating: 8.2VDC, Eexia

Ambient Temp: -13°F to +212°F

48 Series Technical Data

Exploded View, Materials of Construction, & Dimensional Data

48 Series

Exploded View & Bill of Materials

- **Certifications**
- CE
- ATEX II 3 D
- ATEX II 2 G Ex d IIC T6 Gb
- ATEX II 2 D Ex t IIIC T*
- SIL-2 Rating
- Class I, Division 1, Groups C and D; Class II, Division 1, Groups E, F and G; Class III; Temp Code T4A
- Class I, Division 2, Groups A, B, C and D; Class II, Division 1, Groups E, F and G; Class III; Temperature Code T4A
- Ex d IIB T5 Gb; Ex tb IIIC T108°C Db
- Ex nA IIC T5 Gc; Ex tb IIIC T108°C Db
- Class I Zone 1, AExd IIB T5 Gb;
- Class II, Zone 21 AEx tb IIIC T108°C Db
- Class I, Zone 2 AEx nA IIC T5Gc;
- Class II, Zone 21, AEx tb IIIC T108°C Db

#	DESCRIPTION	MATERIALS
1	Housing	Die Cast Aluminium (AISI 316 Stainless Steel)
2	Shaft	AISI 304 Stainless Steel (AISI 316 Stainless Steel w/ Teflon Coating)
3	Beacon Cover	Polycarbonate
4	High Visibility Beacon	ABS
5	Captive Cover Bolts	Stainless Steel
6	Cams	ABS
7	Spring	Stainless Steel

#	DESCRIPTION	MATERIALS
8	O-Ring	NBR Low Temp Silicone (Optional)
9	Bracket	AISI 304 Stainless Steel AISI 316 Stainless Steel
10	O-Ring	NBR Low Temp Silicone (Optional)
11	Indicator Cover Screws	Stainless Steel
12	PCB Board w/ Switches	Various
13	Shaft Retainer Ring	Stainless Steel

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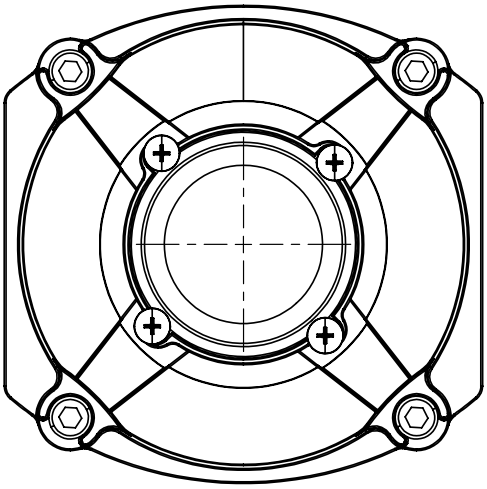
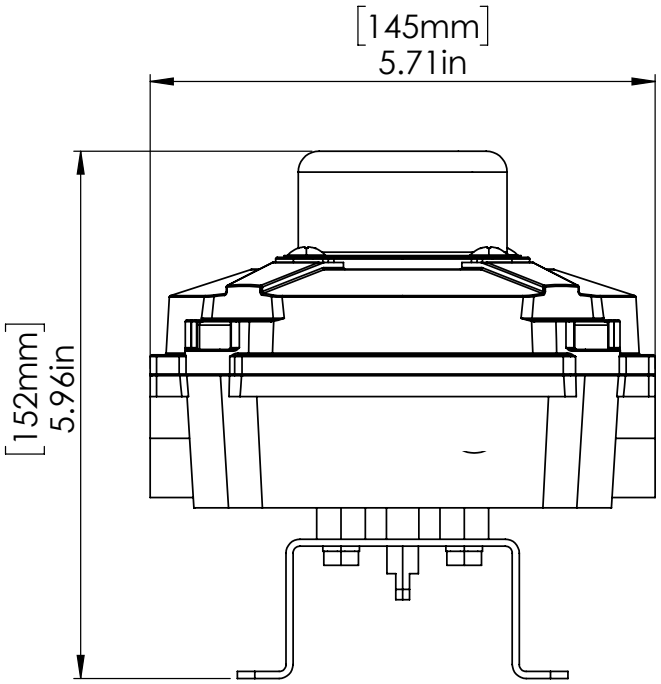
48 Series

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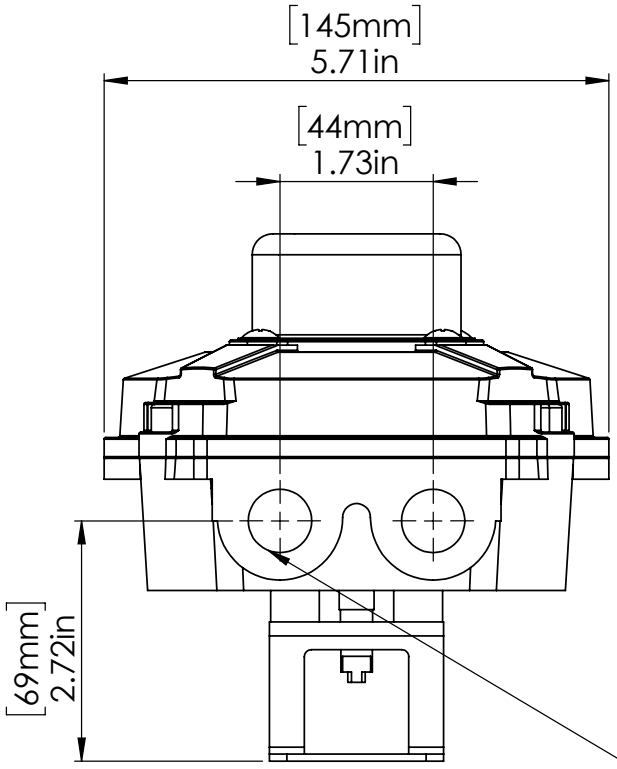
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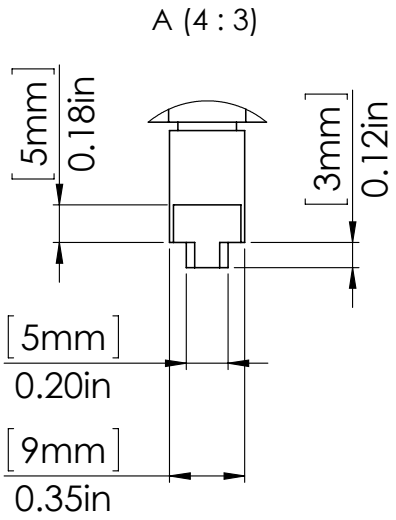
2 X Conduit Entries:
1/2" NPT
(Optional M20 X 1.5)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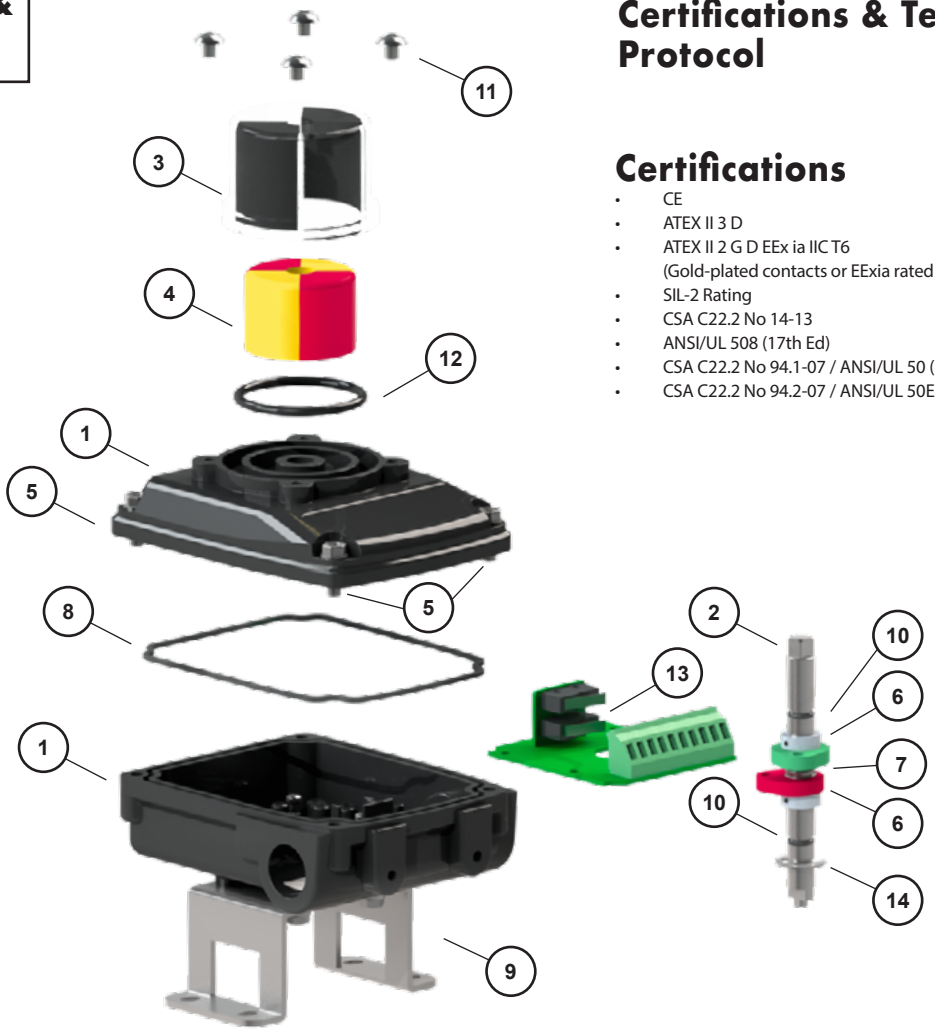
45 Series Technical Data

Exploded View, Materials of Construction, & Dimensional Data

45 Series

Exploded View & Bill of Materials



Certifications & Test Protocol

Certifications

- CE
- ATEX II 3 D
- ATEX II 2 G D EEx ia IIC T6
  (Gold-plated contacts or EExia rated switches only)
- SIL-2 Rating
- CSA C22.2 No 14-13
- ANSI/UL 508 (17th Ed)
- CSA C22.2 No 94.1-07 / ANSI/UL 50 (12th Ed)
- CSA C22.2 No 94.2-07 / ANSI/UL 50E

#	DESCRIPTION	MATERIALS
1	Housing	Die Cast Aluminium AISI 316 Stainless Steel
2	Shaft	AISI 304 Stainless Steel AISI 316 Stainless Steel w/ Teflon Coating
3	Beacon Cover	Polycarbonate
4	High Visibility Beacon	ABS
5	Cover Bolts	Stainless Steel
6	Cams	ABS
7	Spring	Stainless Steel

#	DESCRIPTION	MATERIALS
8	O-Ring	NBR
9	Bracket	AISI 304 Stainless Steel AISI 316 Stainless Steel
10	O-Ring	NBR
11	Indicator Cover Screws	Stainless Steel
12	Indicator Cover O-Ring	NBR Low Temp Silicone (Optional)
13	PCB Board w/ Switches	Various
14	Shaft Retainer Ring	Stainless Steel

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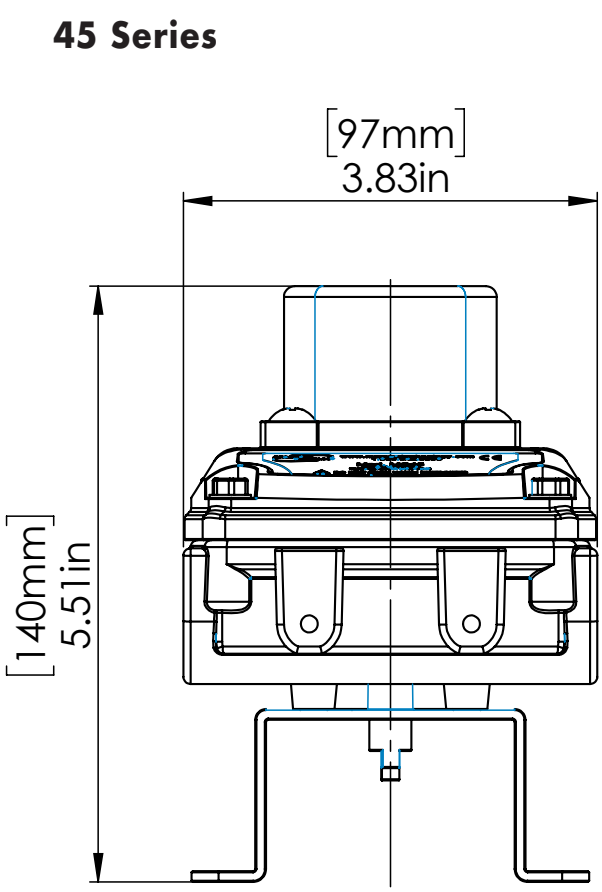
45 Series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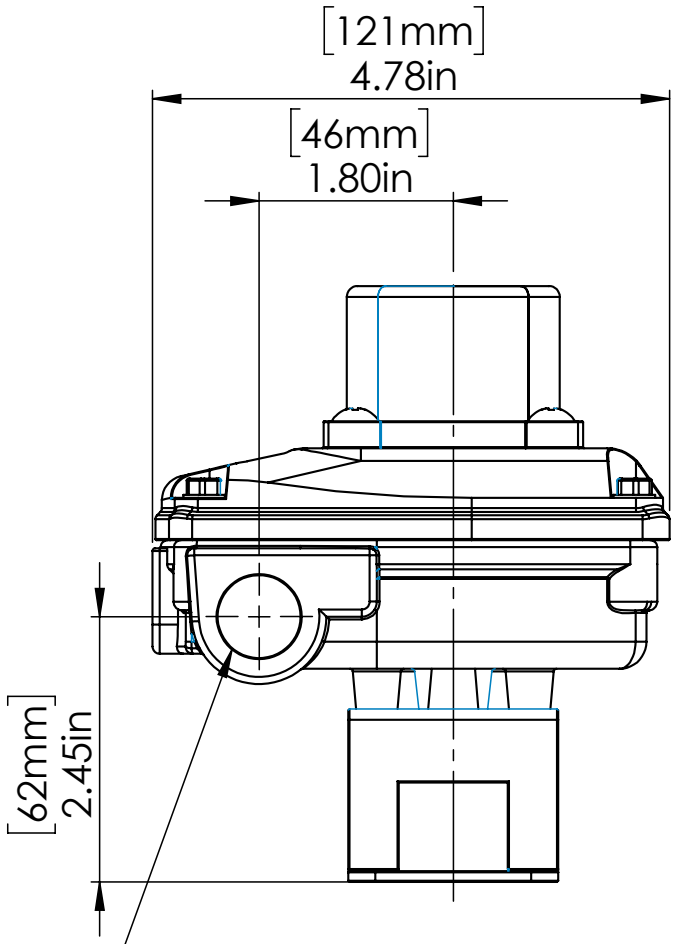
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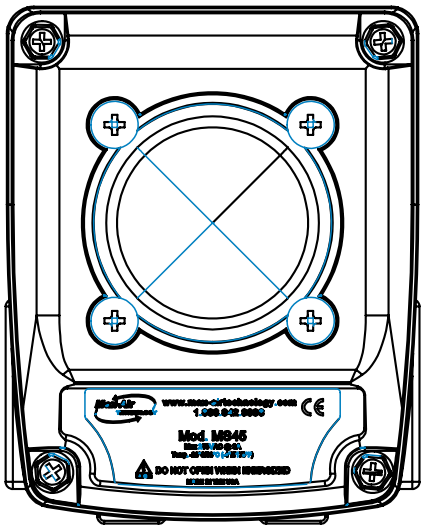
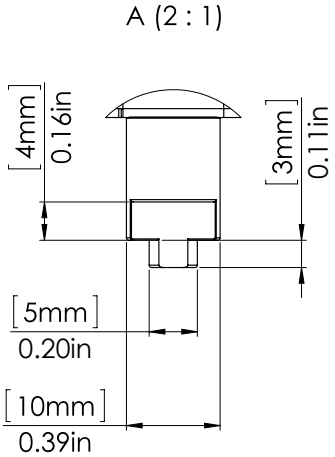
2 X Conduit Entries:
1/2" NPT
(Optional M20X1.5)

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Wiring Diagrams

Diagrams for the 48 & 45 Series Limit Switch Boxes

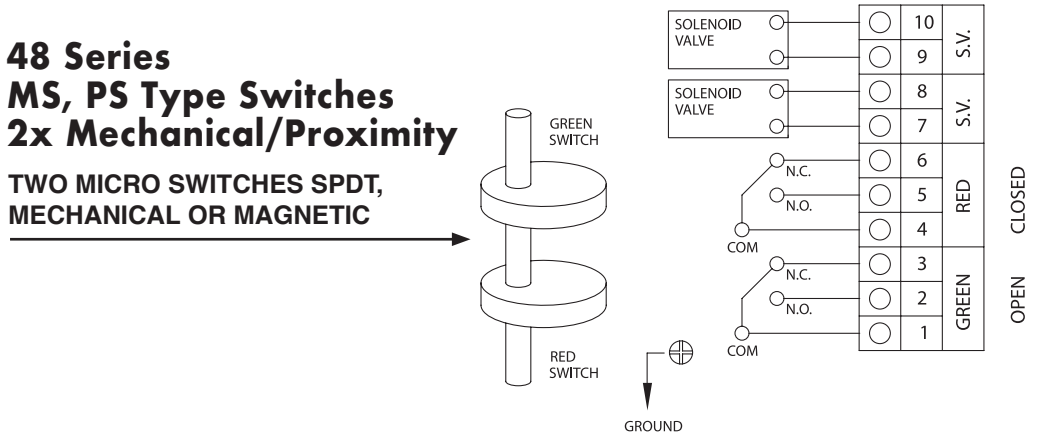
48 Series - Mechanical/Proximity

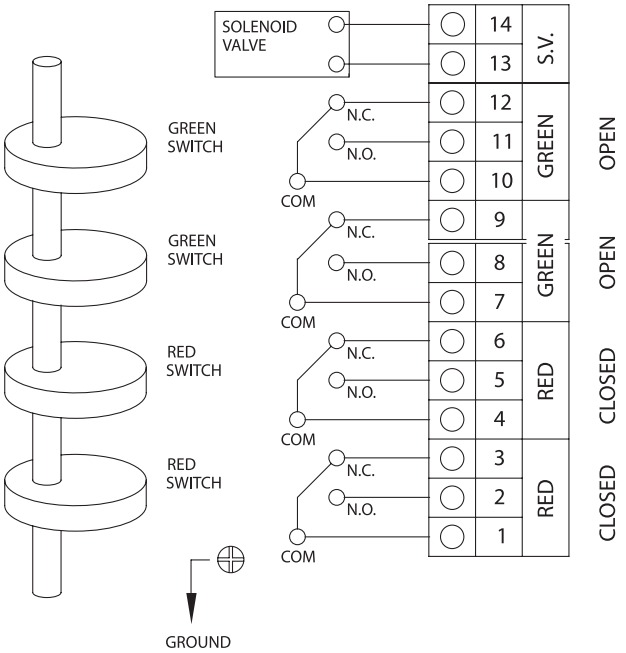
WARNING: NEMA 4, 4x / IP67 protection depends on the wiring connection, so the use of inappropriate components and/or wrong installation will result in a decrease in the protection rating of the switch box.

(Dual Coil Board Option Shown)

48 Series
MS, PS Type Switches
2x Mechanical/Proximity

TWO MICRO SWITCHES SPDT, MECHANICAL OR MAGNETIC





48 Series
MS Type Switches Only
4x Mechanical

FOUR MICRO SWITCHES SPDT, MECHANICAL

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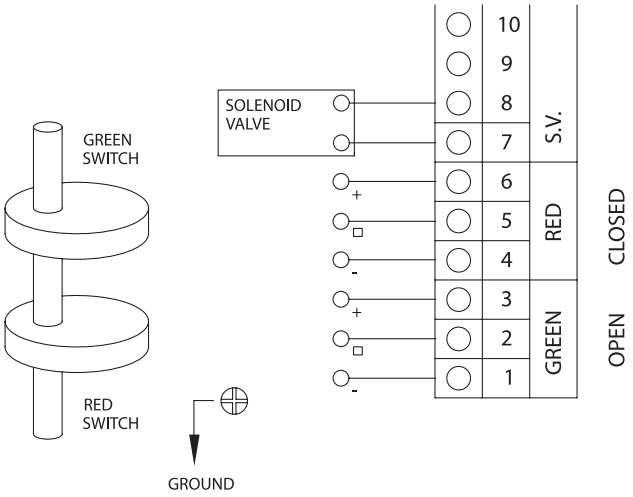
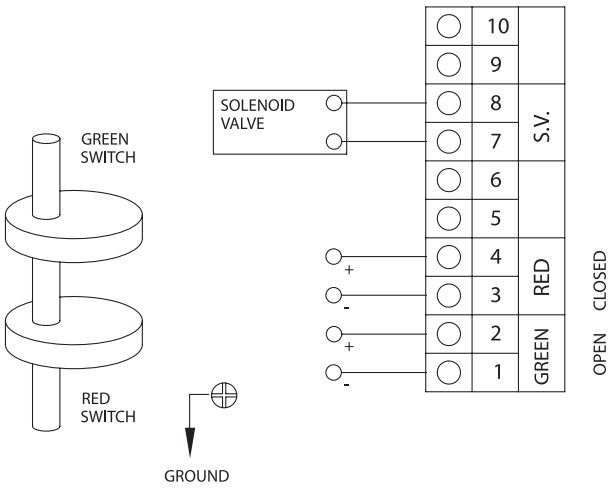
48 Series Inductive Switches

WARNING: NEMA 4, 4x / IP67 protection depends on the wiring connection, so the use of inappropriate components and/or wrong installation will result in a decrease in the protection rating of the switch box.

48 Series
IS Type Switch (3-Wire)
Codes: B, G, K, L

THREE WIRES PROXIMITY





48 Series
IS Type Switch (2 -Wire)
Codes: A, D, E, F, H, N

TWO WIRES PROXIMITY

Standards, Certifications & Approvals

CE, NSF/ANSI 372, ISO 5211, Atex Global, SIL2, NAMUR

CE Marking

is a mandatory conformity marking for certain products sold within the European Economic Area (EEA) since 1985. The CE marking is also found on products sold outside the EEA that are manufactured in, or designed to be sold in, the EEA. This makes the CE marking recognizable worldwide even to people who are not familiar with the European Economic Area. It is in that sense similar to the FCC Declaration of Conformity used on certain electronic devices sold in the United States.

The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EC directives.

NSF/ANSI 372

NSF/ANSI 372

is essentially equivalent to Annex G of NSF/ANSI Standard 61 and assures that the materials used in the water contact components of a water system component do not exceed 0.25% lead content. Some trims excluded. See pg. 2-4

ISO 5211:

This standard defines a standardized interface system between industrial valves and the part turn actuators used operate them. It details the dimensional requirements for both the mounting flanges on both devices as well as the driving and driven components. This standardization simplifies the design of or eliminates the need for interface components between part turn valves and actuators.

Atex Global Approval:

In addition to being designed and produced according to sound engineering practice, the 48 & 45 Series have also been certified to the relevant Atex standards for safety (Machinery Direcrive, annex VIIIB). Additionally it carries a CE mark and is in compliance with Annex VIIB of the Machinery Directive and regulation 80079-36.

SIL2
Safety Integrity Level

SIL2 Approval

The 48 & 45 Series actuators have been independently evaluated by approval authorities which have confirmed that our actuators are SIL 2 capable in accordance with the requirements of IEC 61508 provided that they are installed in accordance with the relevant Safety Manual.

NAMUR

NAMUR

The 48 & 45 Series series actuators come with NAMUR accessory interfaces according to VDI/VDE 3845. The air interface is in the ¼" size.

Email: sales@maxairtech.com
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