

ALS SERIES

VALVE MONITOR



ACHEM Controls Inc

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About US

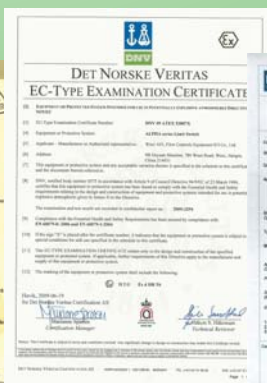


AFL family is a leading manufacturer group of the flow control products in Shanghai area of China. In the light of ISO9001:2000, ISO5211, NAMUR standards and 94/9/EC OF 23 MARCH, EN13980, EN60079-0:2006 EN60079-1:2004 directives, AFL and it's factory have made ALV series namur solenoid valve, C series coils, ALS series valve monitor (limit switch boxes), ALSD series discrete controllers and ALP series valve positioner since 1990. Its products have successfully got the approvals CE, IP66, IP67, CSA, NEMA4, 4X, IECEx and ATEX. The main market areas of the products of AFL family are China, USA, Europe.

AFL family has two factories, one international business company and one development & research room. There are more than 80 employees engaging in research, development, production and marketing in the family. The turnover yearly of the AFL family has reached to USD5 million in 2009.

All of us will do our best to support and meet the inquiry and want from friends everywhere to help you get success.

Quality Certificate



Introduction

ALS series Valve Monitor (limit switch boxes) include ALS200, ALS300, ALS400, ALS500 and ALS600 which are a primary rotary position indication device both for local and remote indication in hazard area. The ALS products were designed to integrate valve and NAMUR rotary pneumatic actuator with a variety of mounting options, internal switches or sensors and/or feedback configurations. This kind of limit switch box was designed through advance and state-of-the-art engineering technology which have the product to be solid, beautiful and with high-level quality. The product also fully meets Exd explosion proof specifications and the bracket is designed in light of ISO5211 and NAMUR standard. The production and quality control of the monitors are fully based on 94/9/EC of 23 March, EN13980, EN60079-0:2006 and EN60079-1:2004.



Main Features

- Compact and Beautiful Design, Polyester powder coated aluminum die-casting housing or stainless steel (304/316) housing.
- Higher level weather proof (IP67)
- Certified for use in all hazardous areas(Class I, Div.1&2, Groups A,B,C and D, Ex d IIB T6, Ex d IIC T6).
- Available for sensors of mechanical, Inductive and magnet.
- Available for sensors communication card with ASi or Devicenet protocol.
- Dual cable entries, 2xG1/2 (Standard) and M20x1.5, NPT1/2(Optional)
- Multipoint terminal strip, standard 8 points and enough strips for connection (14 points for optional).
- Multiview visual Position Indicator, Secure waterproof, multi-angles visual valve positions involving top and side view.
- "Quick-Set" Cam, spring loaded splined cam. no need to adjust again after initial setting and easy setting without tool.
- Captive cover bolts, No worry to loose bolts while cover opens
- Easy mounting, NAMUR and ISO5211 adjustable bracket same as for 30*80-130 H20-30. standard is steel plate and stainless steel (optional)



Ordering Guide

Enclosure / Area Classification	Sensor/Bus	Visual Display
ALS200 Die-cast aluminum: O-ring sealed Dichromate conversion with Polyester power coating Sealed: Buna N O-ring Double cable entry 2-1/2" NPT (Also available with 2-1/2" BSPP ,M20 x 1.5) NAMUR shaft ISO Bracket IP67, NEMA4, 4X	Mechanical Switches M2 2SPDT 5A 125-250VAC, Honeywell (only for 200) M2 2SPDT 15A 125-250VAC, CROUZET (for 300-600) M3 3SPDT 15A 125-250VAC, CROUZET (for 300-600) M4 4SPDT 15A 125-250VAC, CROUZET (for 300-600) M5 2DPDT 15A 125-250VAC, CROUZET (for 300-600) ML2 Low Temp. -40 °C 2SPDT 15A 125-250VAC, CROUZET (for 300-600) MG2 Gold contacts 2SPDT 15A 125-250VAC, CROUZET (for 300-600) 	Y90 90°Yellow OPEN, Red CLOSED Y60 60°Yellow OPEN, Red CLOSED Y45 45°Yellow OPEN, Red CLOSED G90 90°Green OPEN, Red CLOSED G60 60°Green OPEN, Red CLOSED G45 45°Green OPEN, Red CLOSED P90 90° P180 180° L Three way "L" Yellow base red Bar T Three way "T" Yellow base red Bar 
ALS300 Die-cast aluminum: O-ring sealed Dichromate conversion with Polyester power coating Sealed: Buna N O-ring Double cable entry 2-1/2" NPT (Also available with 2-1/2" BSPP ,M20 x 1.5) NAMUR shaft ISO Bracket IP67, NEMA4, 4X	Proximity Sensor PP22 2-p+f Inductive sensors (2 wire) NCB2-V3-No 8DCV, <=1mA  PA22/3 2-ALPS Inductive sensors (2 or 3 wire) 10-30VDC, <=150mA 	
ALS400 Die-cast aluminum: O-ring sealed Dichromate conversion with Polyester power coating Sealed: Buna N O-ring Double cable entry 2-3/4" NPT (Also available with 2-1/2" or 3/4" BSPP , 1/2"NPT, M20 x 1.5) NAMUR shaft ISO Bracket Ex Class I, Div.1 & 2 Groups A, B, C and D Ex d II C T6, IP66, NEMA4, 4X,7,8	Magnet Ssensor QA23 2-ALMS Magnet sensors (3 wire) 5-240 VAC/DC, <=300mA 	
ALS500 Die-cast aluminum: O-ring sealed Dichromate conversion with Polyester power coating Sealed: Buna N O-ring Double cable entry 2-3/4" NPT (Also available with 2-1/2" or 3/4" BSPP , 1/2"NPT, M20 x 1.5) NAMUR shaft ISO Bracket Ex Class I, Div.1 & 2 Groups C and D Ex d II B T6, IP66, NEMA4, 4X,7,8	Analog Output F analog output 4-20mA transmitter (0-90 °) (Available for 300-400with 0 or 2 switches for M1, M2, PP, PA OR QA only)	
ALS600 Stainless steel 304 or 316. Resistance to corrosion of chemicals and salty fog: O-ring sealed Sealed: Buna N O-ring Double cable entry 2-3/4" NPT (Also available with 2-1/2" or 3/4" BSPP , 1/2"NPT, M20 x 1.5) NAMUR shaft ISO Bracket Ex Class I, Div.1 & 2 Groups C and D Ex d II B T6, IP66, NEMA4, 4X,7,8	Sensor-Communication Card AS2 AS-Interface 20-28VDC, <=41mA (2 Hall sensors for 300, 400) DN2 DeviceNet 20-28VDC, <=41mA (2 Hall sensors for 300, 400) 	Visual Display  Proximity Sensor (PP22)  Proximity Sensor (PA23)
Enclosure / Area Classification	Sensor/Bus	

Structure and Material



ALS-200



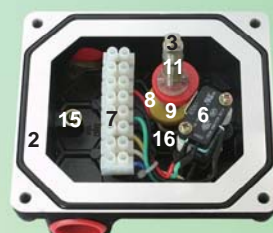
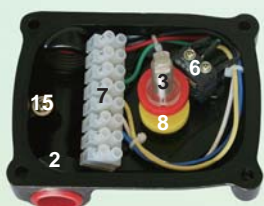
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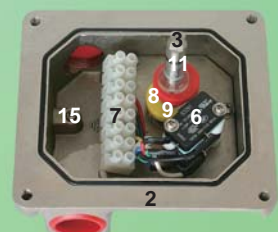
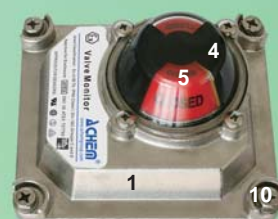
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ALS-500



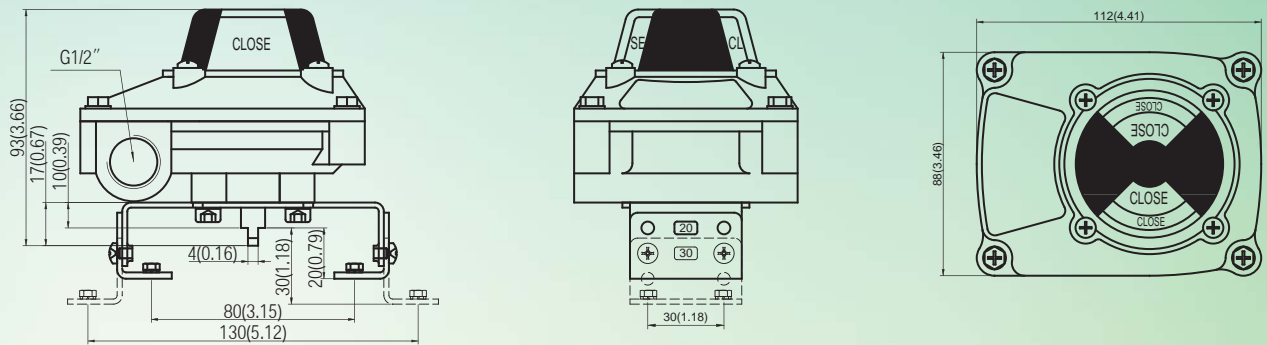
No.	Part Name	Qty.	Material
1	Box Cover	1	Aluminum Die Casting / Stainless Steel only for ALS-600
2	Box Body	1	Aluminum Die Casting / Stainless Steel only for ALS-600
3	Shaft	1	Stainless Steel
4	Indicator Cover	1	Polycarbonate
5	Indicator	1	ABS
6	Limit Switch	2	Mechanical/Proximity/ Magnet sensor
7	Terminal Strip	8-14	Polycarbonate, Tin Plated Brass, Stainless Steel
8	Cam	2	Polycarbonate
9	Spring	1	Stainless Steel
10	Cover Bolts	4	Stainless Steel
11	Shaft O-ring	2	NBR
12	Housing O-ring	1	NBR
13	Indicator O-ring	1	NBR
14	Bushing	2	Bronze
15	Earth Lug	1	Stainless Steel
16	E-ring	2	Stainless Steel



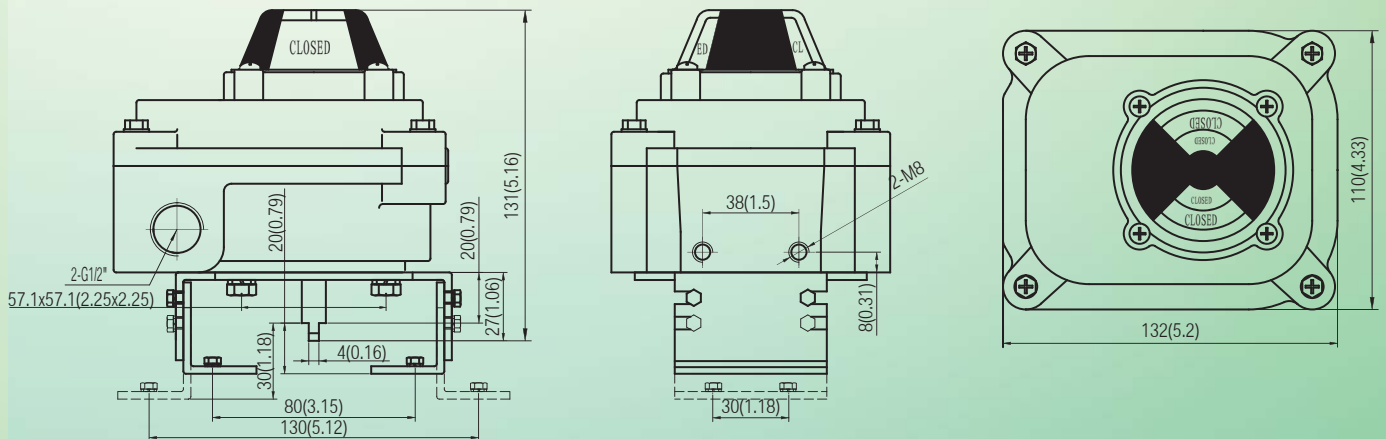
ALS-600

Dimension

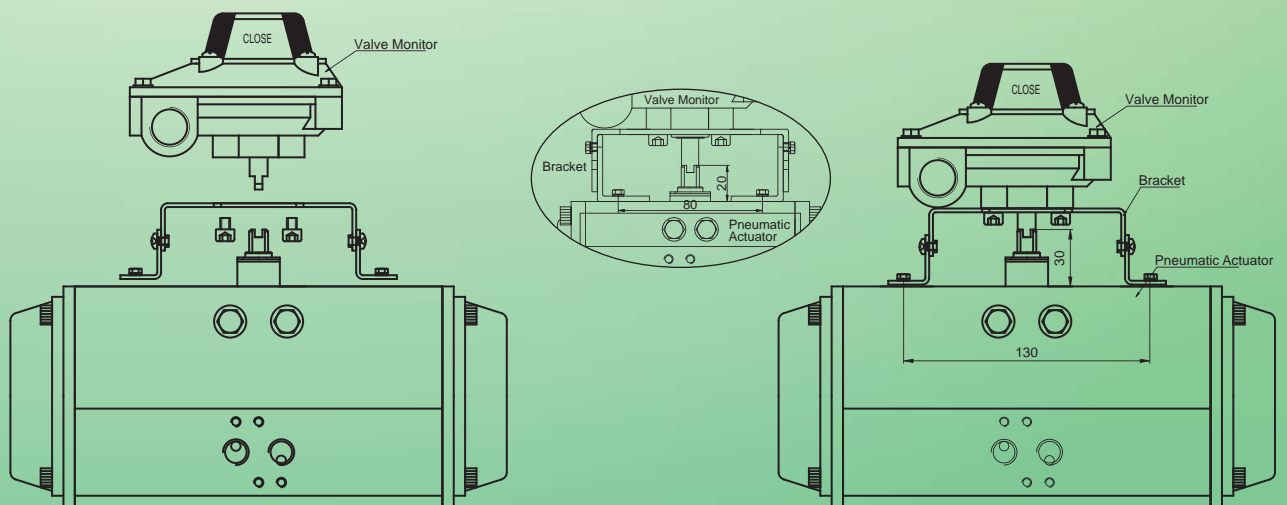
ALS200



ALS300

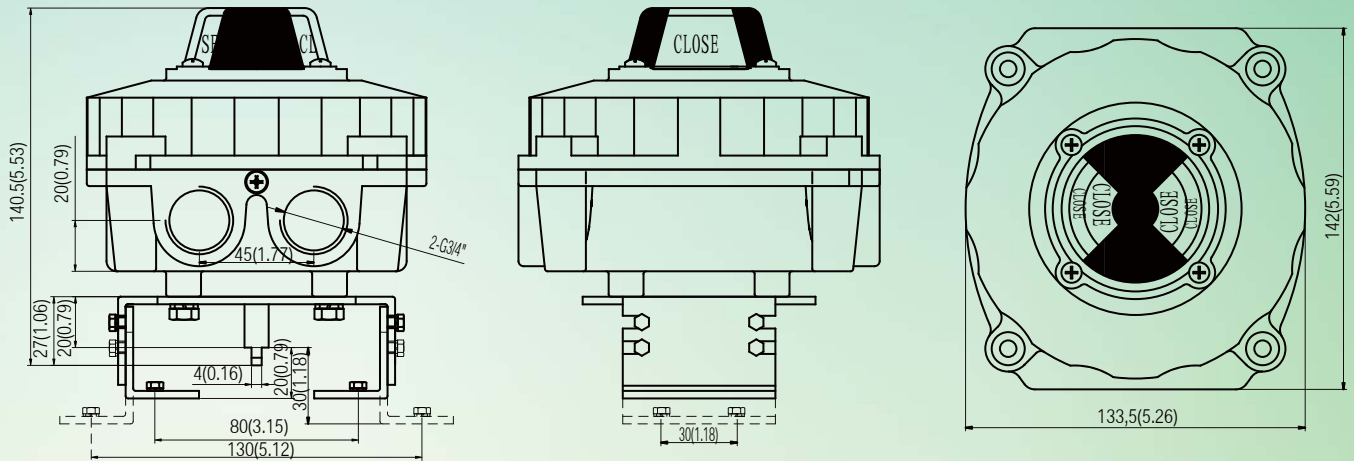


Easy Mounting (30x80,130H20,30)

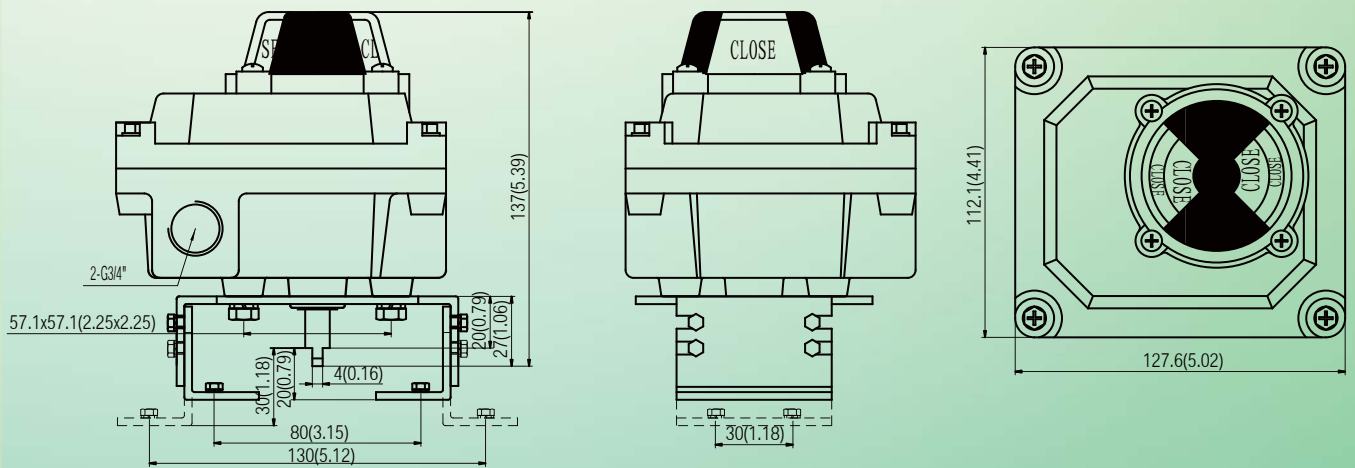


Dimension

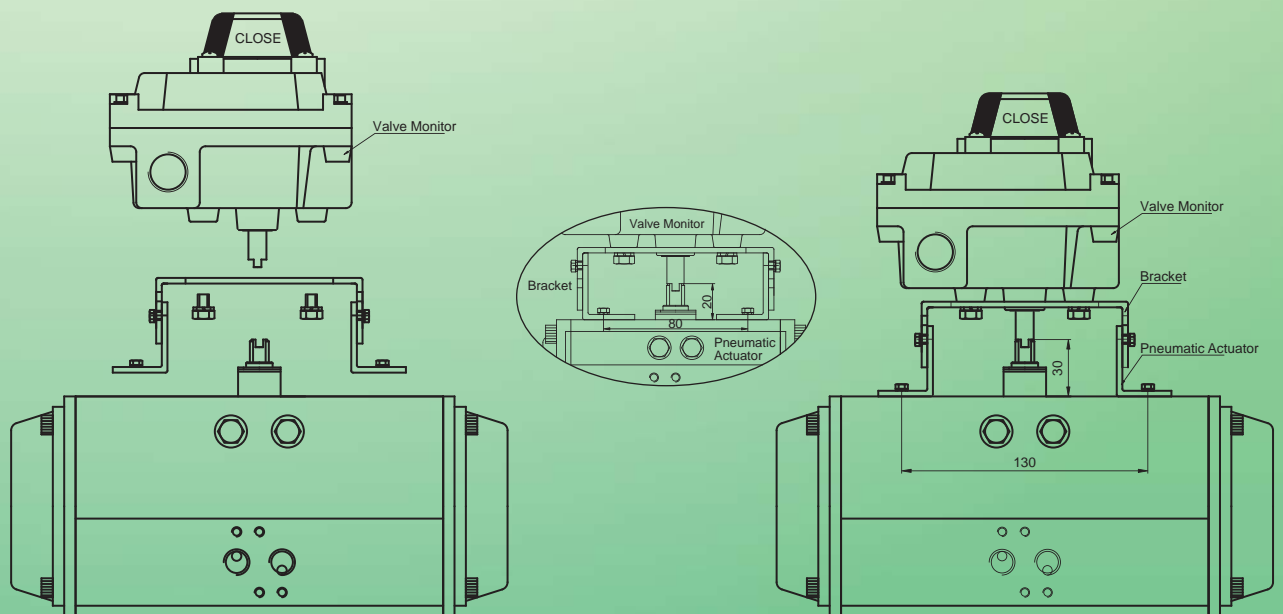
ALS400



ALS500/600

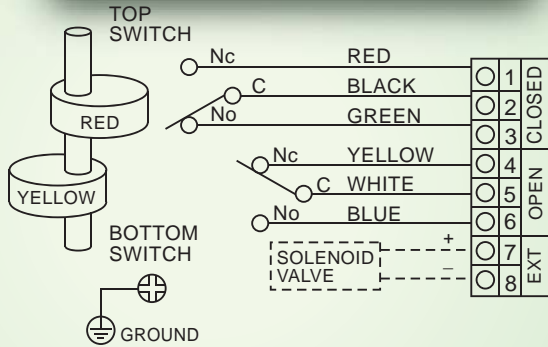


Easy Mounting (30x80,130H20,30)

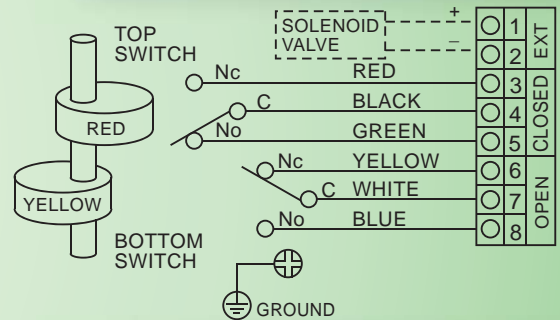


Wiring

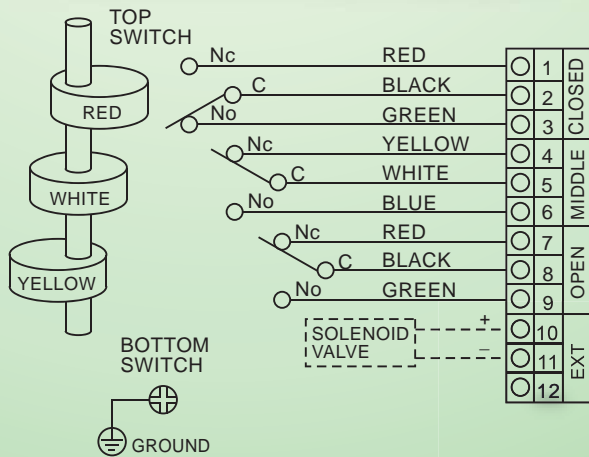
ALS200/300/400M2
2SPDT Mechanical Switches Wiring



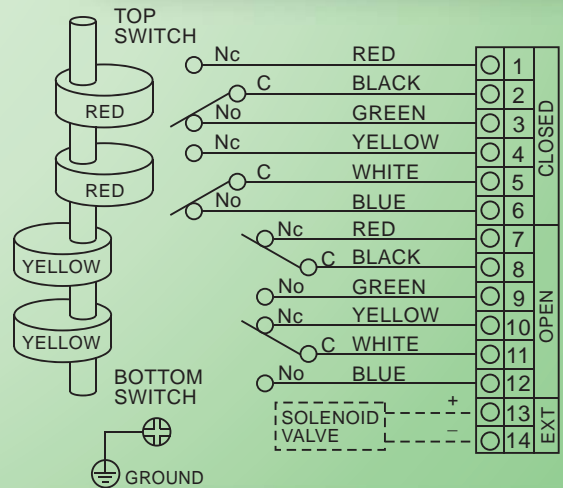
ALS500/600M2
2SPDT Mechanical Switches Wiring



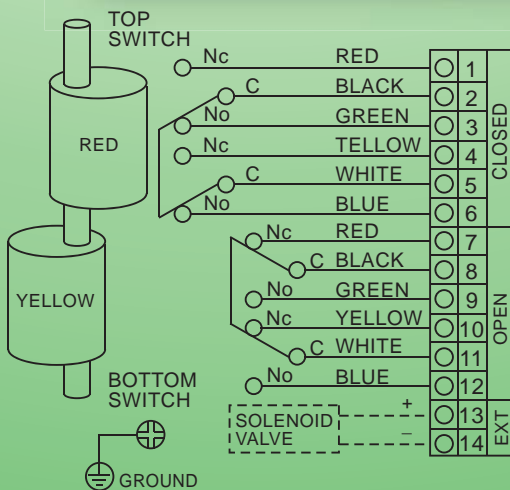
ALS300/400/500/600M3
3SPDT Mechanical Switches Wiring



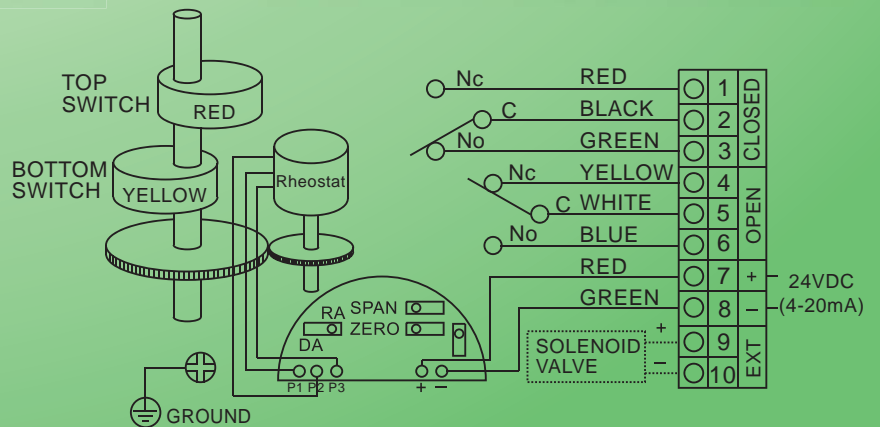
ALS300/400/500/600M4
4SPDT Mechanical Switches Wiring



ALS300/400/500/600M5
2DPDT Mechanical Switches Wiring

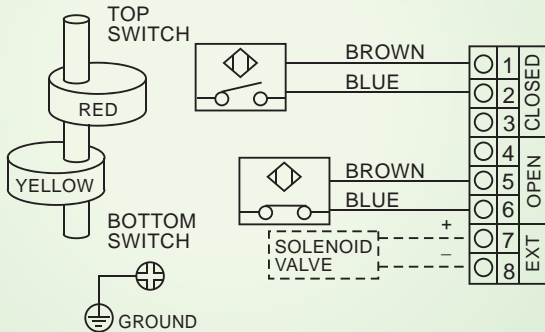


ALS300/400M2F
2SPDT Mechanical Switches Wiring

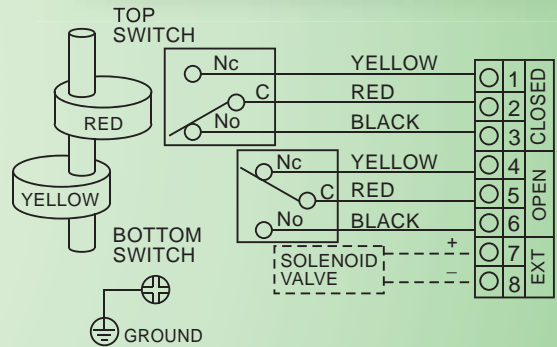


Wiring

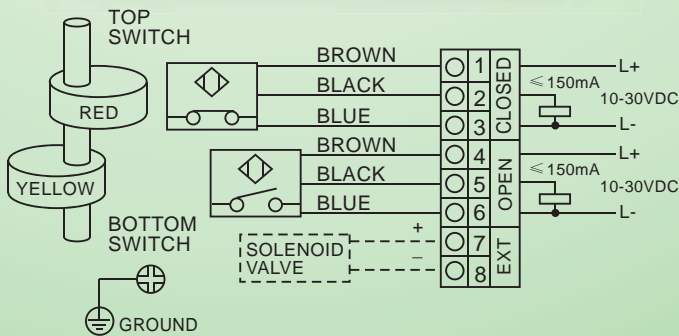
ALS200/300/400/500/600PP22/PA22
NC (2-Wire) Inductive Sensors



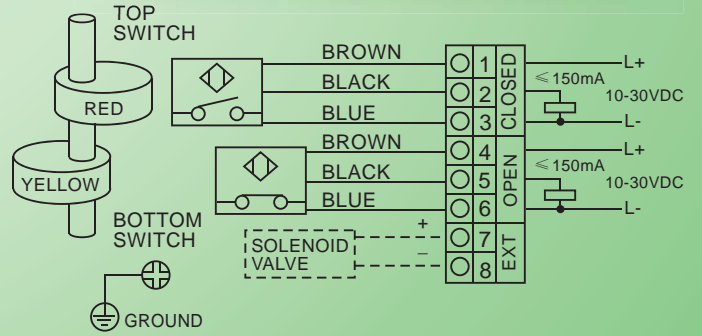
ALS200/300/400/500/600QA23
NC (3-Wire) Magnet Sensors



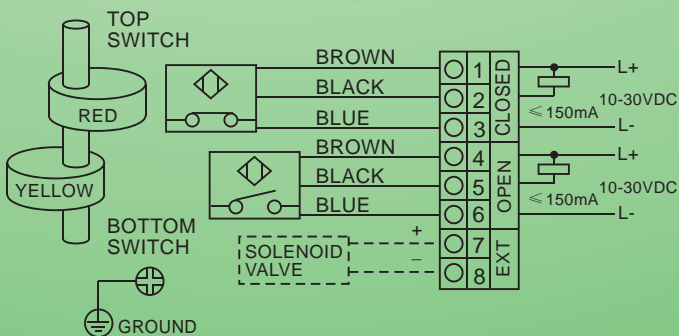
ALS200/300/400/500/600PA23
PNP NO (3-Wire) Inductive Sensors



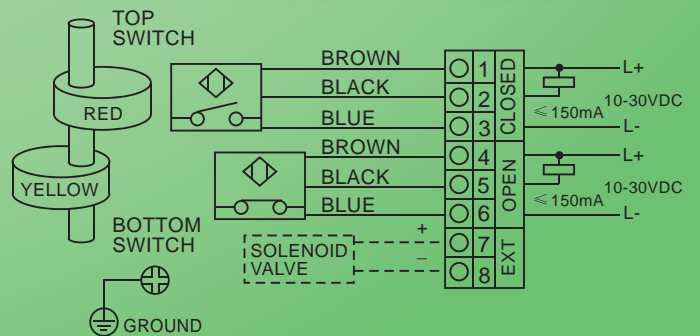
ALS200/300/400/500/600PA23
PNP NC (3-Wire) Inductive Sensors



ALS200/300/400/500/600PA23
NPN NO (3-Wire) Inductive Sensors



ALS200/300/400/500/600PA23
NPN NC (3-Wire) Inductive Sensors



Bus Networks



DeviceNet™

Sensor-Communication Card (SCC)



ACHEM Sensor-Communication Cards are microprocessor based 'brains' that mount inside ALS enclosures to deliver position sensing (Hall) and bus networking functionality to open and closed valves. They combine position sensors, bus communications, solenoid outputs, and wiring terminals into a compact, sealed module that mount into various ALS enclosures.

Bus Networks

ACHEM Sensor-Communication Cards make it easy to connect automated On/Off valves to modern bus networking protocols such as DeviceNet, AS-interface and so on.

SCC Features

- 1, Resistant to impact, moisture, shock, vibration contamination.
- 2, LEDs indicate valve position and facilitate sensor set-up.

SCC Specifications

DeviceNet™



	With no inputs or outputs activated	One inputs activated	Two inputs activated	Three inputs activated	Four inputs activated	One output activated	Two outputs activated
Consumption Current	25mA	29mA	33mA	37mA	41mA	Add the coil current (Max 0.5w)	Add the coil current (Max 0.5w)
Operation Voltage	20-28Vdc Check voltage range of the solenoid valve used						
Temperature Range	-40°C~85°C						

Input	Type	Reference	Data "Bitmap" Class #4 Instance #4 Attribute #3 (data)
0	Hall effect sensor	Internal sensor	Byte 0, Bit 0 (closed valve) Upper sensor
1	Hall effect sensor	Internal sensor	Byte 0, Bit 1 (opened valve) Lower sensor
2	Active in High	Connector 1 - pin7 (+24) and 8 (GND)	Byte 0, Bit 2
3	Active in High	Connector 1 - pin9 (+24) and 10 (GND)	Byte 0, Bit 3

Output	Type	Reference	Data "Bitmap" Class #4 Instance #32(Static output) Attribute #3 (data)
0	Active in Low	Connector 2 - pin 1 (+24) e2 (out)	Byte 0, Bit 0
1	Active in Low	Connector 2 - pin 3 (+24) e4 (out)	Byte 0, Bit 1

	With no inputs or outputs activated	One inputs activated	Two inputs activated	Three inputs activated	Four inputs activated	One output activated	Two outputs activated
Consumption Current	10.6mA	11.2mA	11.6mA	16mA	16.6mA	Increase the coil current (Max: 1,5W)	Increase the coil current (Max: 1,5W)
Operation Voltage	30Vdc Check voltage range of the solenoid valve used						
Temperature Range	-40°C~85°C						

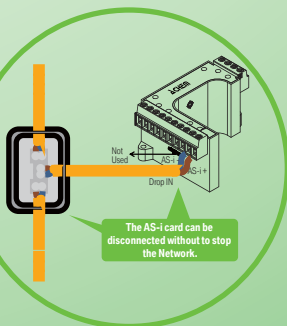
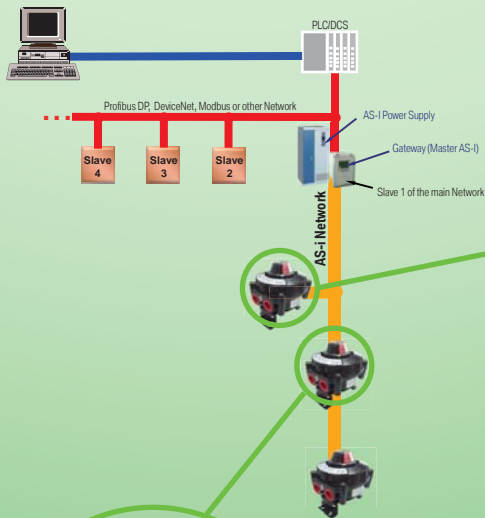
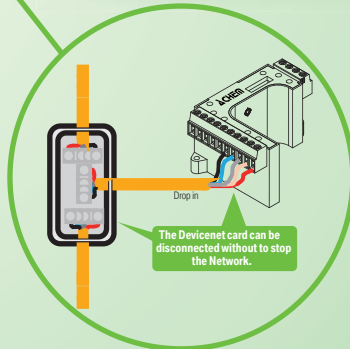
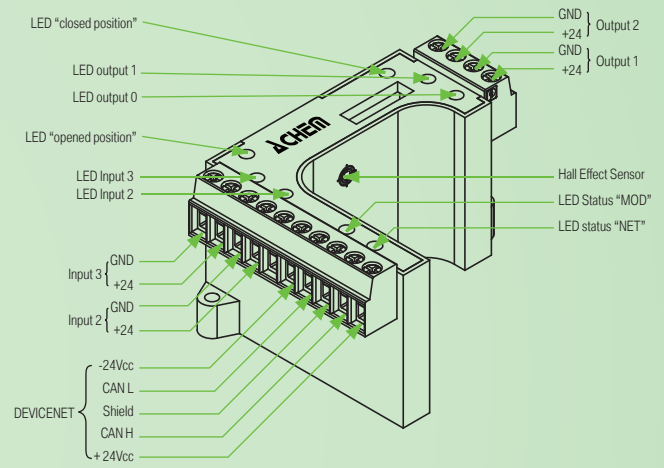
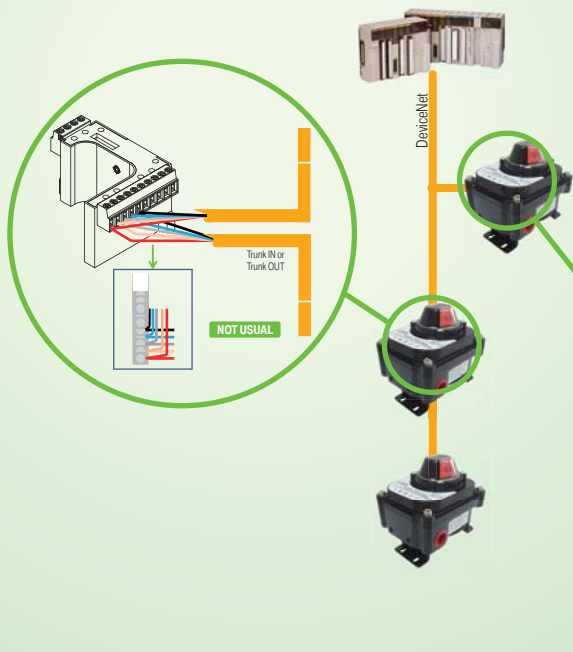
Slave Profile	I/O Code	7	DO=I/O,D1=I/O,D3=I/O
	ID CODE	A	Remote I/O Port
	ID-1	O	
	ID-2	F	

INPUT	TYPE	REFERENCE	DATA
0	Hall effect sensor (Closed)- Upper sensor	Internal sensor	BIT 0
1	Hall effect sensor (Opened)-Lower sensor	Internal sensor	BIT 1
2	Active in High	Conn 1 - pin 7(+24) e 8(GND)	BIT 2
3	Active in High	Conn 1 - pin 9(+24) e 10(GND)	BIT 3

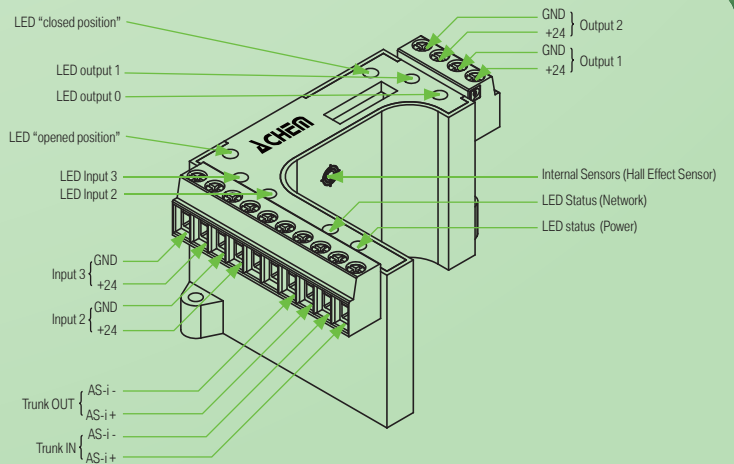
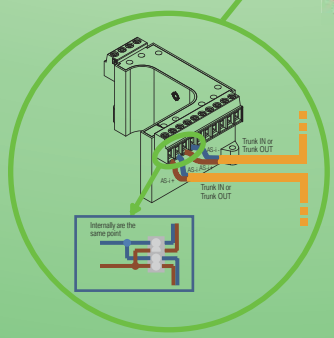
OUTPUT	TYPE	REFERENCE	DATA
0	Active in Low	Conn 2 - pin 1(+24) e 2(out)	BIT 0
1	Active in Low	Conn 2 - pin 3(+24) e 4(out)	BIT 1

DN Wiring

DeviceNet™




ASi Wiring



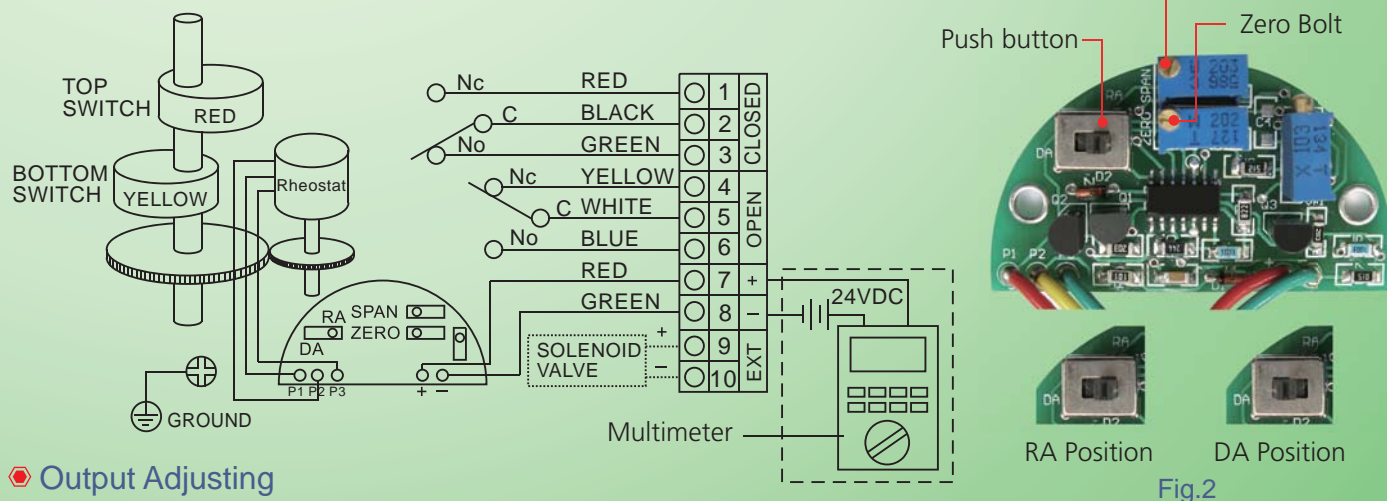
How to adjustment

Position transmitter and Adjustment

Armed with AChem position transmitter, the ALS series valve monitor can sense mechanical position change (angle from 0 degree to 90 degree) of stem being on the valve or actuator or similar device and then converts them into current signal DC4-20mA outputs for the use of computer and/or industry processing control system.

Technical Data	Positon transmitter	
 <p>Fig.1</p>	Description	Technical Data
	Input type	2Wire
	Input Signal	0°~90°
	Output Signal	4-20mA DC
	Load Resistance	0~600 Ohm
	Noise Range	50mVp.p
	Adjustable Range	Zero : ±10% Span : 30~150%
	Linearity	±1%
	Sensitivity	±0.2%
	Hysteresis	0.002
	Supply Voltage	15~30VDC
	Explosion Proof	Non-Explosion

Wiring chart



Output Adjusting

1, Important notice: When the valve monitor with position transmitter is shipped out from our plant, the rotary angle of the stem is settled under closed position. The red point mark on the gears is under point to point position (Zero position seeing Fig.1). Do not circumvolve the stem angle more than 360 degree.

2, After mounting the valve monitor on valve or actuator (should be on closed position), you can adjust the position transmitter in the line of following items.

2.1, Wiring the multimeter or Ampere Meter to the valve monitor according to wiring chart above. Note that the 24VDC electric supply is needed.

2.2, Check the acting type of the valve or actuator: If acting type of the valve is clockwise closed (L-Closed), please push the acting pushbutton to RA position. If acting type of the valve is counterclockwise closed (R-closed), please push the acting pushbutton to DA position (seeing Fig. 2).

2.3, Zero Adjustment: Turn the valve or the actuator to closed position, check the value of electric current of the multimeter. If it is more than 4mA, turn the zero bolt in counterclockwise till the value to 4mA. If it is less than 4mA, turn the zero bolt in clockwise till the value to 4mA. The zero adjustable range is $\pm 10\%$.

2.4, Span Adjustment: Turn the valve or the actuator to open position, check the value of electric current of the multimeter. If it is more than 20mA, turn the span bolt in counterclockwise till the value to 20mA. If it is less than 20mA, turn the span bolt in clockwise till the value to 20mA. The span adjustable range is from 30% to 150%.

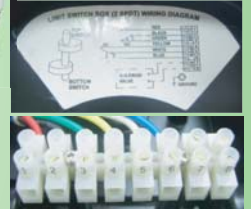
How to adjustment

Limit Switch Adjustment

1. Loosen limit switch box cover screws and remove cover.
2. Rotate actuator to full counterclockwise position. Valve is on fully open or closed position.
3. Lift up bottom cam and turn until switch is activated and then release. Engage cam back onto the splined retainer. Spring will maintain cam engagement.
4. Rotate actuator to full clockwise position. Valve is on fully closed or open position.
5. Push down top cam and turn until switch is activated and then release. Engage cam back onto the splined retainer. Spring will maintain cam engagement.
6. Place cover on limit switch box and tighten.

INSTRUCTION

- Take care to ensure that housing O-ring is properly located in seal groove.
- Keep the box tight while circuits are alive.
- Disconnect supply circuit before opening.
- Ensure the flameproof surface have not any paint and scratch in the process of adjustment.



Electrical Wiring

INSTALLATION

1. Remove limit switch box cover (Disconnect supply circuit before opening).
2. Remove protection plugs from conduit entries and install conduit or plugs suitable for type of protection required.
3. Engage wires in terminal strip using a small screwdriver.

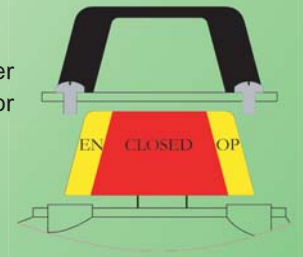
INSTRUCTION

- Ensure the flameproof surface have not any paint and scratch in the process of adjustment.
- All user connections are made at a numbered terminal strip. A wiring diagram is located inside the cover and indicated which terminal numbers correspond to switch contacts: normally open, normally closed common, etc. Simply follow the wiring diagram and electric code to connect switches to your system.
- Solenoids may also be wired through the switch box. At least two auxiliary terminals are included as an option. A ground screw is also included. Simply wire the solenoid to auxiliary terminals, and then connect power leads to the opposite terminal side.
- Be sure to properly ground the solenoid at provided ground terminal.
- ALS series Exd switch boxes include two 3/4" BSPP conduit entries. Be sure to follow the National Electric Code regulations for rigid conduit, flexible conduit or cable systems as applicable.

Indicator Setting

1. Remove four screws and remove indicator cover.
2. Lift up indicator from the cover.
3. Set indicator on cover according to valve position.

4. Replace indicator cover and fasten with cover screws. Check to ensure that position indicator O-ring is properly located in seal groove.



INSTRUCTION

- Use only wet cloth when cleaning the indicator.
- Indicators are easily adjusted to match the dome's clear windows or the special rotor angle indicator, such as 45°, 60° or 3 way indicator. Simply loosen the four screws to adjust the indicator. Make sure dome window line up with rotor quadrants. Finally, tighten the screws to insure a good seal.

Inspection and Maintenance

Inspect the components of the limit switch box for wear or damage and replace where necessary.

- RECOMMENDED REPLACEMENT PARTS:

1. Limit switch. 2. Position indicator O-ring. 3. Housing O-ring. 4. Shaft O-rings (top and bottom)

Storage

To store ALS series Exd limit switch box, the following cautions are recommended:

- Ensure the flameproof surface have not any paint and scratch.
- Ensure the limit switch box is completely dry and water free.
- Maintain the entrances of cable by fitting the original or replacement plastic corks.
- Protect from dust, dirt and damage by packing in box or plastic bag.

Important Notice

* ALL ALS LIMIT SWITCH BOX HAVE BEEN 100% FACTORY TESTED IN OPERATION, WATERTIGHTNESS AND PRESSURE TESTED WITH 15BAR WITH 60SECONDS.

* REPAIRS OF FLAMEPROOF JOINTS MUCH BE MADE IN COMPLIANCE WITH THE STRUCTURAL SPECIFICATIONS PROVIDED BY THE MANUFACTURER.

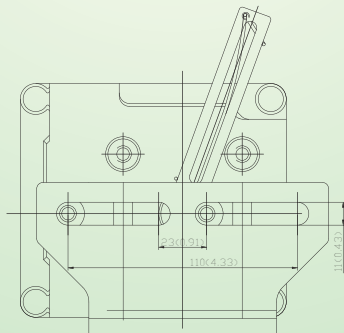
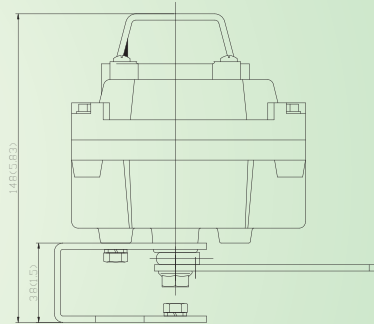
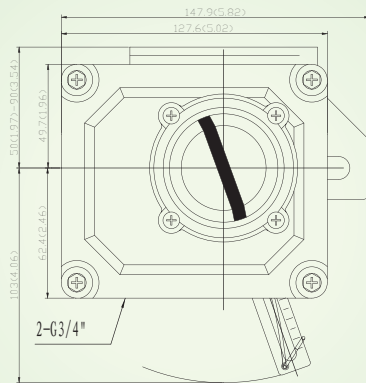
* TECHNOLOGY CONSULTING: WILSONALPHA@GMAIL.COM

* INFORMATION HEREIN INCLUDING PRODUCT SPECIFICATION IS SUBJECT TO CHANGE WITHOUT NOYICE.

Special Application of ALS series Valve Monitor

Linear Application

(ALS500M2L, Lever: 10~70mm. Available for all model of ALS series Valve Monitor)



Directly Mounted the Valve Monitor on the Valve and/or Gear Box
(Available for all model of ALS series Valve Monitor)



Mounted on Ball Valve



Mounted on 3 way valve

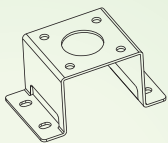
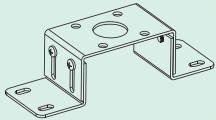
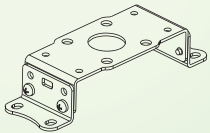
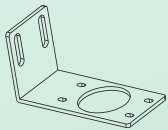
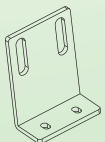
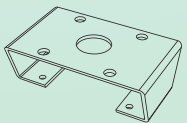
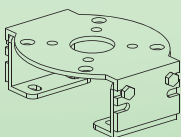


High Temperature
Valve Monitor (150 °C)



Mounted on Gear Box

ISO Mounting Bracket

Model No.	Photo	Material		Application	
MB-1.0		Carbon Steel Polyester Powder coated	S.S.304-2mm	30x80 H:20	ALS200
				30x80 H:30	
MB-1.1		Carbon Steel Polyester Powder coated	S.S.304-2mm	30x130 H:30~50	ALS200
MB-2.3		Carbon Steel Polyester Powder coated	/	30x80-130 H:20~30	ALS200
MB-3.0		Carbon Steel Polyester Powder coated	S.S.304-3mm	30x80 H:20~30	ALS300
MB-3.1		Carbon Steel Polyester Powder coated	S.S.304-3mm	30x130 H:30~50	ALS300
MB-3.2		Carbon Steel Polyester Powder coated	S.S.304-3mm	30x80 H:20	ALS300 ALS400 ALS500/600
MB-3.3		Carbon Steel Polyester Powder coated	S.S.304-3mm	30x80-130 H:20~30 H:50	ALS300 ALS400 ALS500/600

