ALSD SERIES

DISCRETE VALVE CONTROLLERS

IEC · ATEX · Exd · DeviceNet™

POSITION MONITORING AND CONTROL OF AUTOMATED ON/OFF VALVES

- Suitable for use on rotary and linear applications
- Certified for use in all hazardous areas
- Integrated solutions (bus + sensors + pilot)
- Technology leadership in automated on/off valves

ISO9001:2000

CERTIFICATE OF INSURANCE

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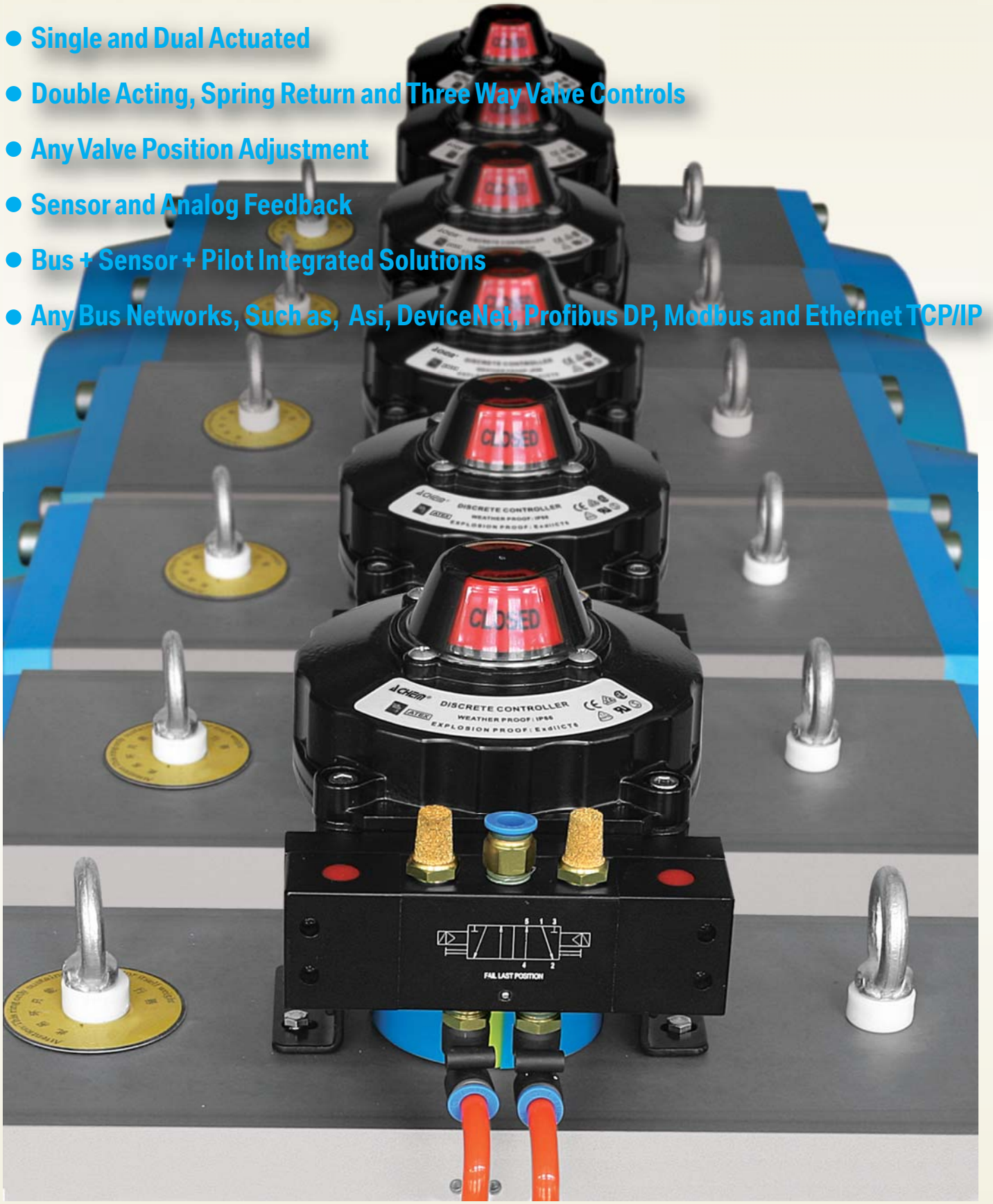
ACHEM®
Valve Control Experts

ACHEM® Discrete Valve Controller Available for

- Single and Dual Actuated
- Double Acting, Spring Return and Three Way Valve Controls
- Any Valve Position Adjustment
- Sensor and Analog Feedback
- Bus + Sensor + Pilot Integrated Solutions
- Any Bus Networks, Such as, Asi, DeviceNet, Profibus DP, Modbus and Ethernet TCP/IP



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ALSD SERIES

DISCRETE VALVE CONTROLLERS

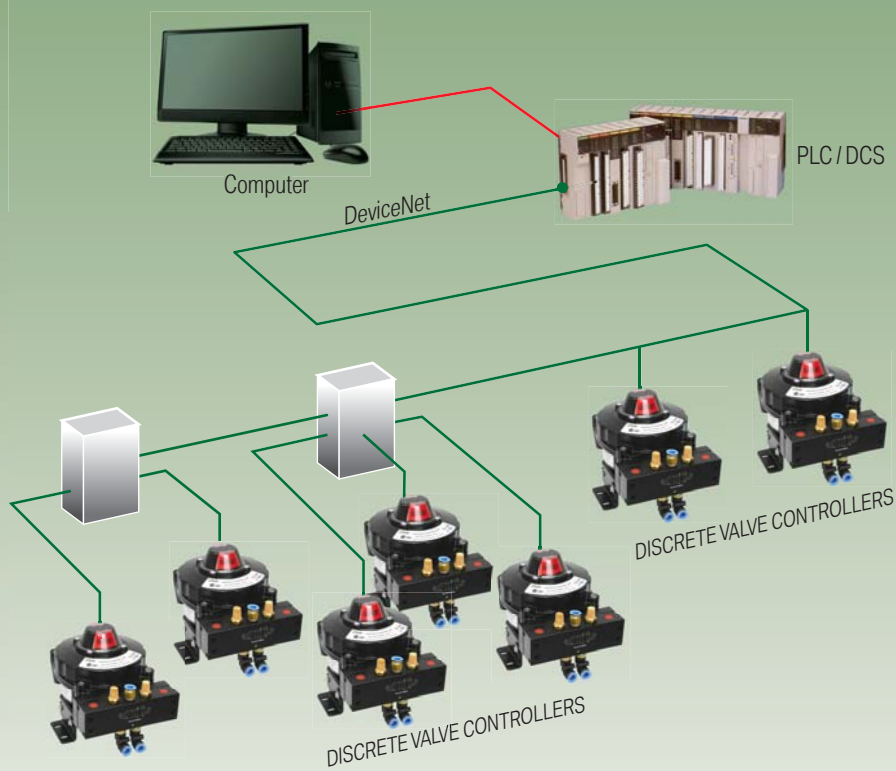
ACHEM® ALSD series Discrete Valve Controller which we have developed and made since 1997 is an optimizing solution for on/off valve control and position sensing in the process industries. Armed with low watt miniature pilot valves, position sensors, and bus communication technology, the ALSD Series Discrete Valve controller help plants, platforms, and pipelines improve productivity and increase safety in the harshest environments and toughest applications.

Main Features

Suitable for use on rotary and linear applications
Certified for use in all hazardous areas(Class I, Div.1&2, Groups A,B,C and D, Ex d IIC T6)
Integrated solutions(bus + sensors + pilot + spool valve)
Available for Any Bus networks, such as, Asi, DeviceNet, Profibus DP, Modbus and Ethernet TCP/IP
NAMUR and ISO5211 adjustable bracket mounting(30×80,130 H20,30)

- **Valve Controls**

- **Bus Networks**



Enclosure / Area Classification

ALSD300

Die-cast aluminum
Dichromate with
Polyester power coated
Sealed: Buna N O-ring
Double cable entry 1/2", M20x1.5
NAMUR shaft ISO Bracket
IP67, NEMA4,4X

ALSD400

Die-cast aluminum
Dichromate with
Polyester power coated
Sealed: Buna N O-ring
Double cable entry 3/4", M20x1.5
NAMUR shaft ISO Bracket
Ex Class I, Div.1& 2
Groups A, B, C and D
Ex d IIC T6, IP66, NEMA4,4X

Enclosure / Area Classification

Controller + Actuator

Coils/Pilot

C1 15mm pilot
Orifice 1.1mm
12,24VDC(<2.3W)
110,220VAC(2.8VA)
Not available for ASI, DN

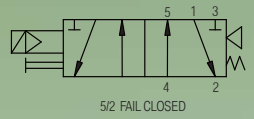
C2 10mm pilot
Orifice 0.7mm
6,12,24VDC(<1.3W)
Available for ASI, DN

C3 15mm Crouzet pilot
Orifice 0.5mm
24VDC(<1W)
Ex ia II C T6
Available for ASI, DN

Coils/Pilot

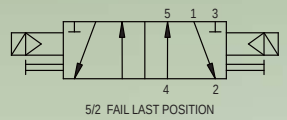
Spool Valve

S1 5/2 Aluminum spool valve
Anodized coated in black
Single pilot actuated
With manual operator
Cv=1.4
3/2 available with plug



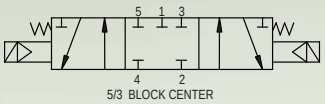
5/2 FAIL CLOSED

S2 5/2 Aluminum spool valve
Anodized coated in black
Dual pilot actuated
With Manual operator
Cv=1.4
3/2 available with plug
Only for ALSD400



5/2 FAIL LAST POSITION

S3 5/3 Aluminum spool valve
Anodized coated in black
Block center Cv=0.67
For Dual pilot actuated
3/2 available with plug
Only for ALSD400



5/3 BLOCK CENTER

Spool Valve

Sensor/Bus

Mechanical Switches (CROUZET)
M2 2SPDT 15A125-250VAC
M3 3SPDT 15A125-250VAC
M4 4SPDT 15A125-250VAC
M5 2DPDT 15A125-250VAC
ML2 Low Temp.-40°C
2SPDT 15A125-250VAC
MG2 Gold contacts
2SPDT 15A125-250VAC

Proximity Sensor
PP22 2-p+f Inductive sensors (2 wire)
NCB2-V3-No 8DCV,<=1mA

PA22/3 2-ALPS Inductive sensors
(2or3 wire)
10-30VDC,<=150mA

Magnet Sensor
QA23 2-ALMS Magnet sensors (3 wire)
5- 240VAC/DC,<=300mA

Sensor-Communication Card
AS2 AS-Interface (2 Hall sensors)
20-28VDC,<=41mA
DN2 DeviceNet (2 Hall sensors)
20-28VDC,<=41mA

Sensor/Bus

Process Control Panel

Blank
NO Control Panel
P1 On/Off Panel
Voltage 24VDC, 90mA
Adjusted by sensors
Adjustment for
– 90° turn actuator
Open 95°~10°,
Closed -5°~80°
– 180° turn actuator
Open 185°~10°,
Closed -5° ~170°
Safety position
FO, FC or FL
Available for ALSD400
P2 Three way Panel
Voltage 24VDC, 90mA
Adjusted by sensors
Adjustment for
– 90° turn actuator
Open 95°~10°,
Middle 45°±35°
Closed -5° ~80°
– 180° turn actuator
Open 185°~10°,
Middle 90°±80°
Closed -5°~170°
Safety position
FO, FC or FL
Available for ALSD400
F Position Transmitter 4-20mA

Process Control Panel

Visual Display

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

Visual Display

Ordering Guide

for ACHEM ALSD series Discrete Valve Controller

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Structure & Material

For sensors without communication card

No.	Part Name	Qty.	Material
1	Box Cover	1	Aluminum Die Casting
2	Box Body	1	Aluminum Die Casting
3	Shaft	1	Stainless Steel
4	Indicator Cover	1	Polycarbonate
5	Indicator	1	ABS
6	Indicator Bolts	4	Stainless Steel
7	Sensors	2-4	Mechanical Switches Proximity sensors Magnet sensors
8	Terminal Strip	8–1 5	Polycarbonate
9	Cam	2	Polycarbonate
10	Spring	1	Stainless Steel
1 1	Cover Bolts	4	Stainless Steel
12	Shaft O-ring	2	NBR
1 3	Housing O-ring	1	NBR
14	Indicator O-ring	1	NBR
15	E-ring	2	Stainless Steel
16A	Coil / Pilot	1	12 / 24VDC (2.3W)， 110 / 220VAC (2.8VA)
16B	Coil / Pilot	1	12 / 24VDC (2.3W)， 110 / 220VAC (2.8VA)
17	Pilot base	1	Aluminum Die Casting
18	Manual Operator	1	Aluminum Die Casting
19	Spool Valves Set	1	Aluminum Die Casting

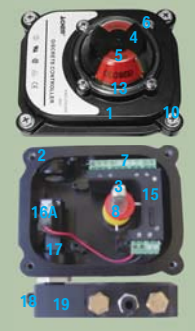
ALSD300C1S1M2

ALSD400C1S2M2

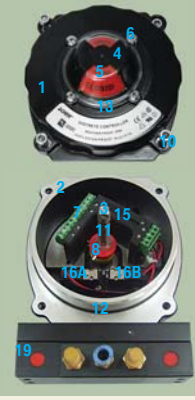
For sensors with communication card (SCC)

No.	Part Name	Qty.	Material
1	Box Cover	1	Aluminum Die Casting
2	Box Body	1	Aluminum Die Casting
3	Shaft	1	Stainless Steel
4	I nd icator Cover	1	Polycarbonate
5	Indicator	1	ABS
6	Indicator Bolts	4	Stainless Steel
7	Terminal Strip	1 4	Polycarbonate
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	E-ring	2	Stainless Steel
15	SCC	1	(2Hall Sensors)
16A	Coil / Pliot	1	6, 12, 24VDC (1.3W)
16B	Coil / Pliot	1	6, 12, 24VDC (1.3W)
17	Pilot base	1	Aluminum Die Casting
18	Manual Operator	1	Aluminum Die Casting
19	Spool Valves Set	1	Aluminum Die Casting

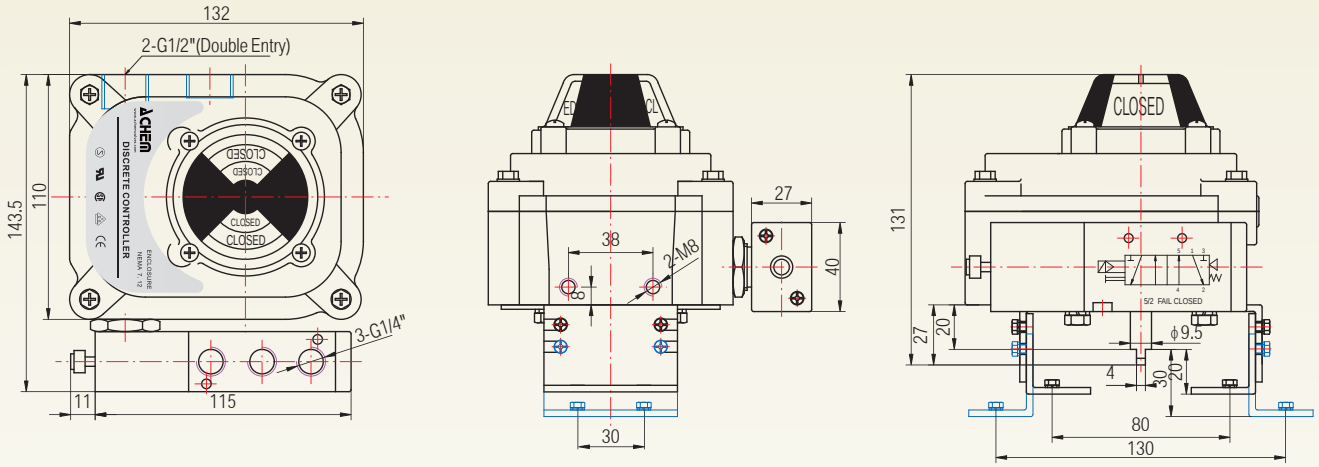
ALSD300C2S1ASi2



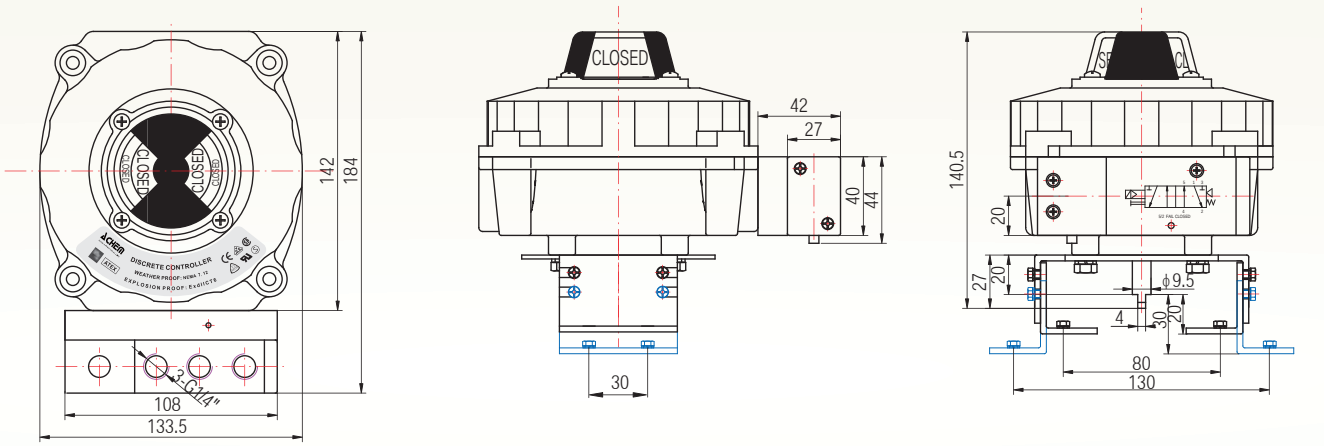
ALSD400C2S2DN2



Dimension

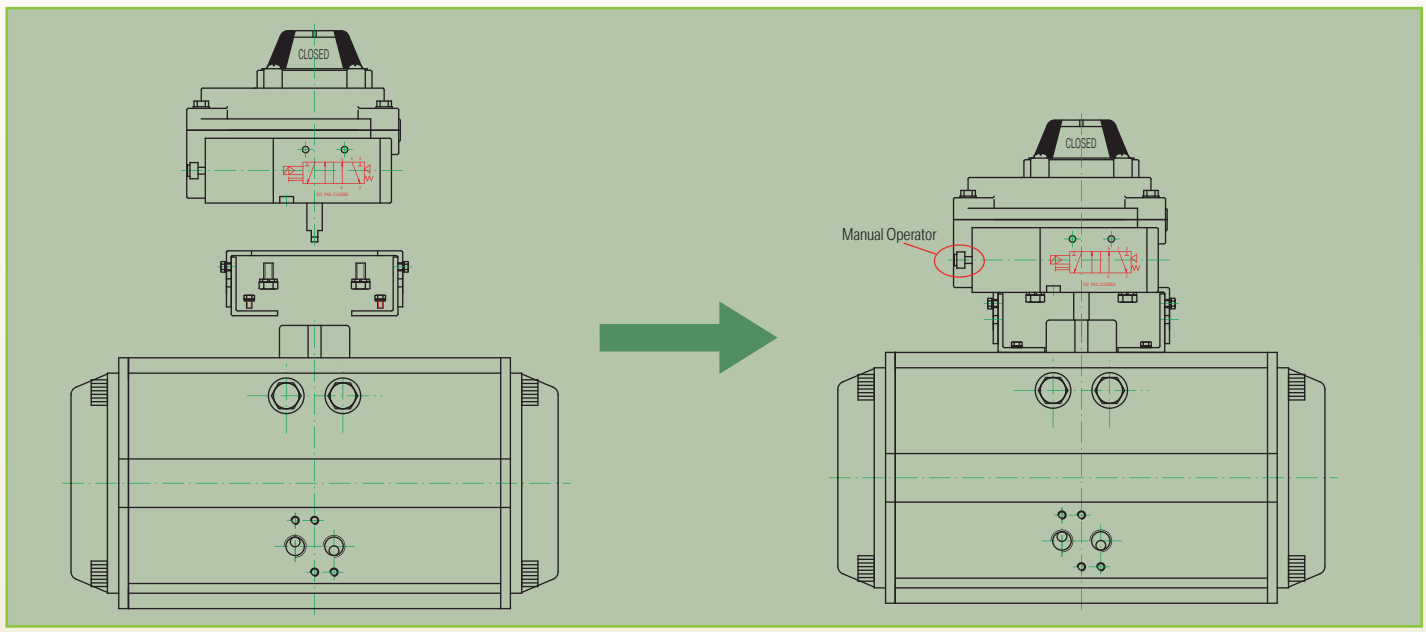


ALSD300C1S1(C2S1, C3S1)XXX

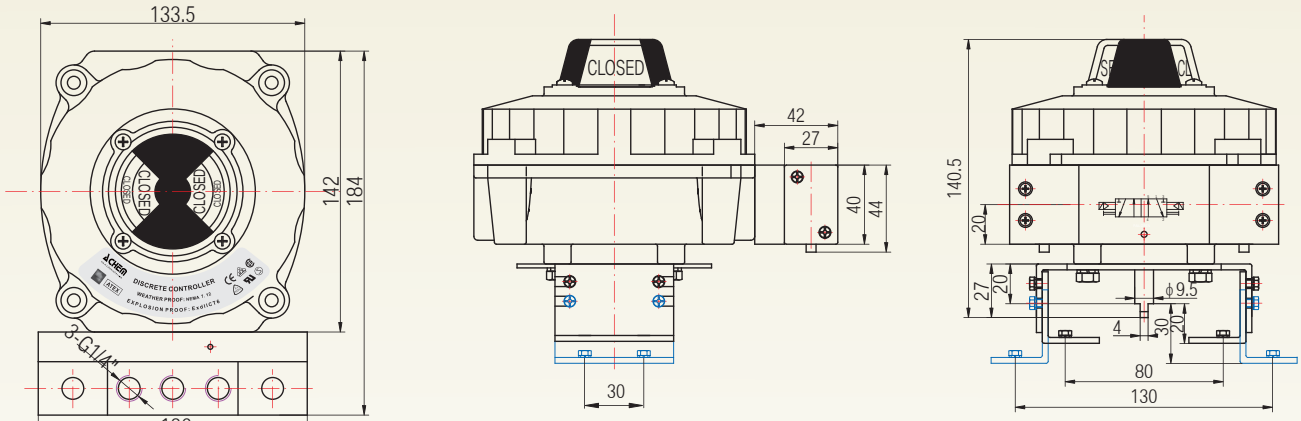


ALSD400C1S1(C2S1, C3S1)XXX

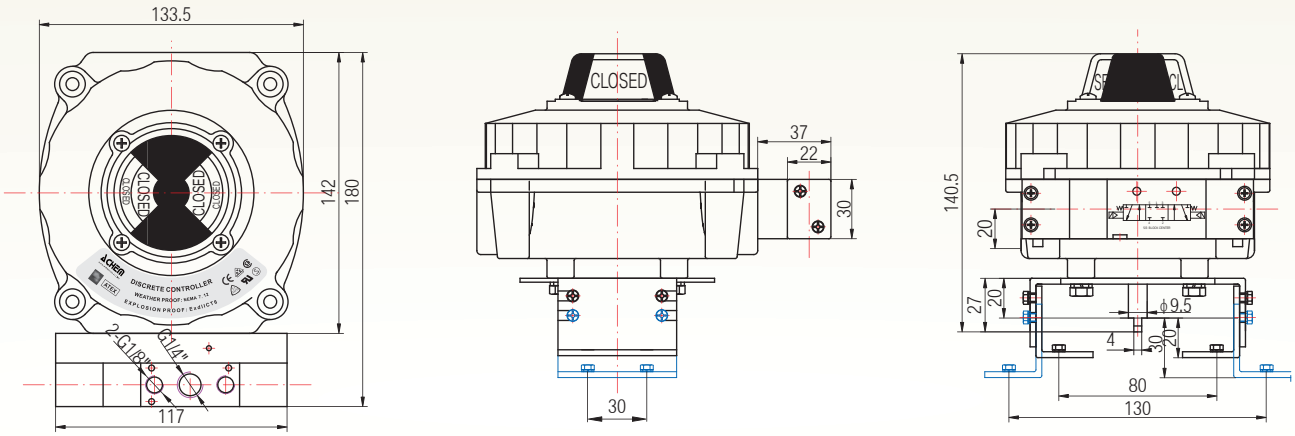
Easy Mounting(30x80,130H20,30)



Dimension

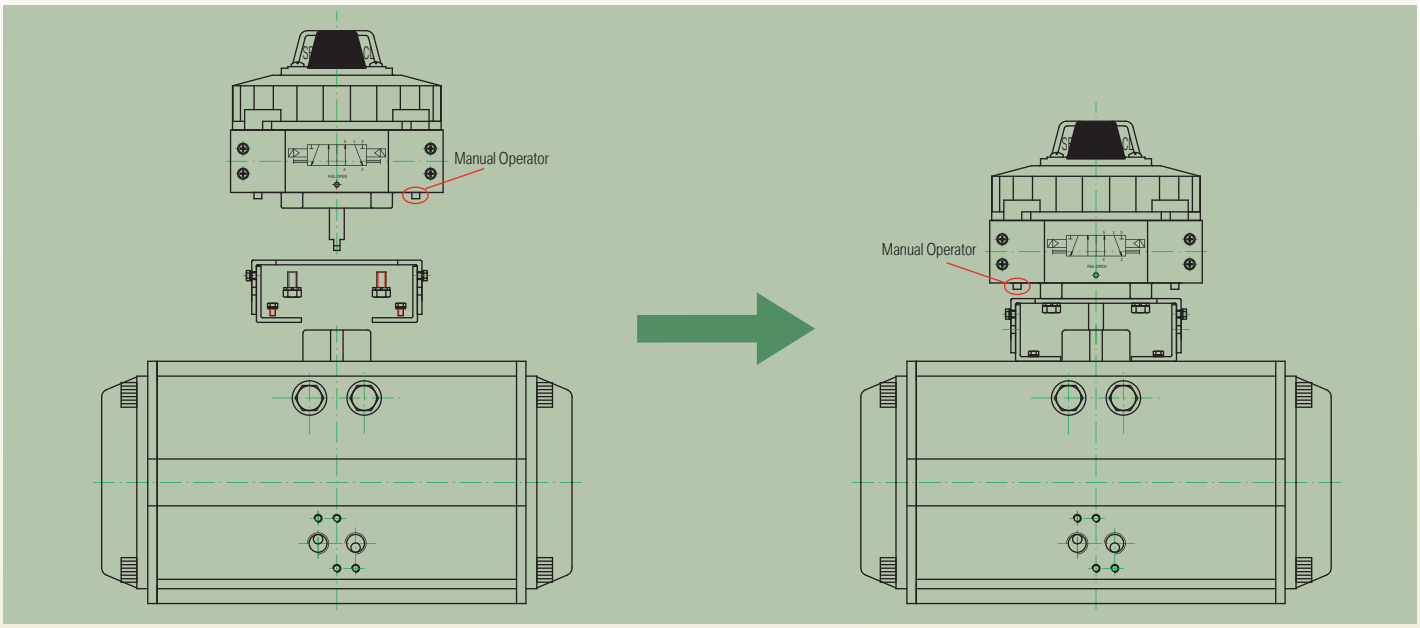


ALSD400C1S2(C2S2, C3S2)XXX



ALSD400C1S3(C2S3, C3S3)XXX

Easy Mounting(30x80,130H20,30)



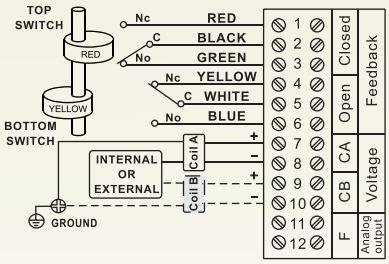
Wiring

Without sensor communication card

M2 (2xSPDT)

For the models of

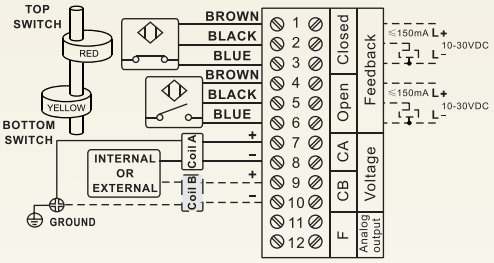
- ALSD300XXXXM2
- ALSD400XXXXM2



PA23 (3-Wire PNP NO)

For the models of

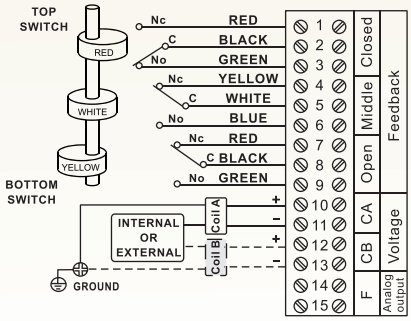
- ALSD300XXXXPA23
- ALSD400XXXXPA23



M3 (3xSPDT)

For the models of

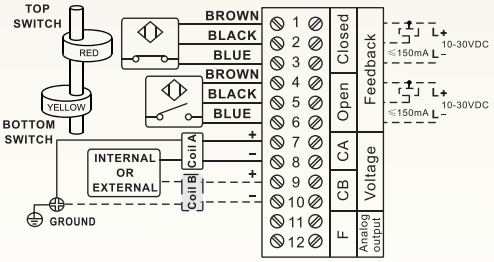
- ALSD300XXXXM3
- ALSD400XXXXM3



PA23 (3-Wire NPN NO)

For the models of

- ALSD300XXXXPA23
- ALSD400XXXXPA23

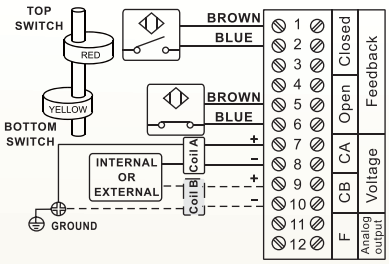


PP22, PA22 (2-Wire NC)

For the models of

- ALSD300XXXXPP22
- ALSD400XXXXPP22

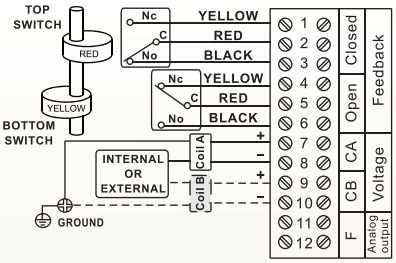
- ALSD300XXXXPA22
- ALSD400XXXXPA22



QA23 (3-Wire NC)

For the models of

- ALSD300XXXXQA23
- ALSD400XXXXQA23



* Wiring in site should be according to a wiring diagram which is located inside of the cover.

Bus Networks

Sensor-Communication Card (SCC)

ACHEM Sensor-Communication Cards are microprocessor based 'brains' that mount inside ALSD 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 ALSD 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 actived	One inputs actived	Two inputs actived	Three inputs actived	Four inputs actived	One output actived	Two outputs actived
Consuption 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

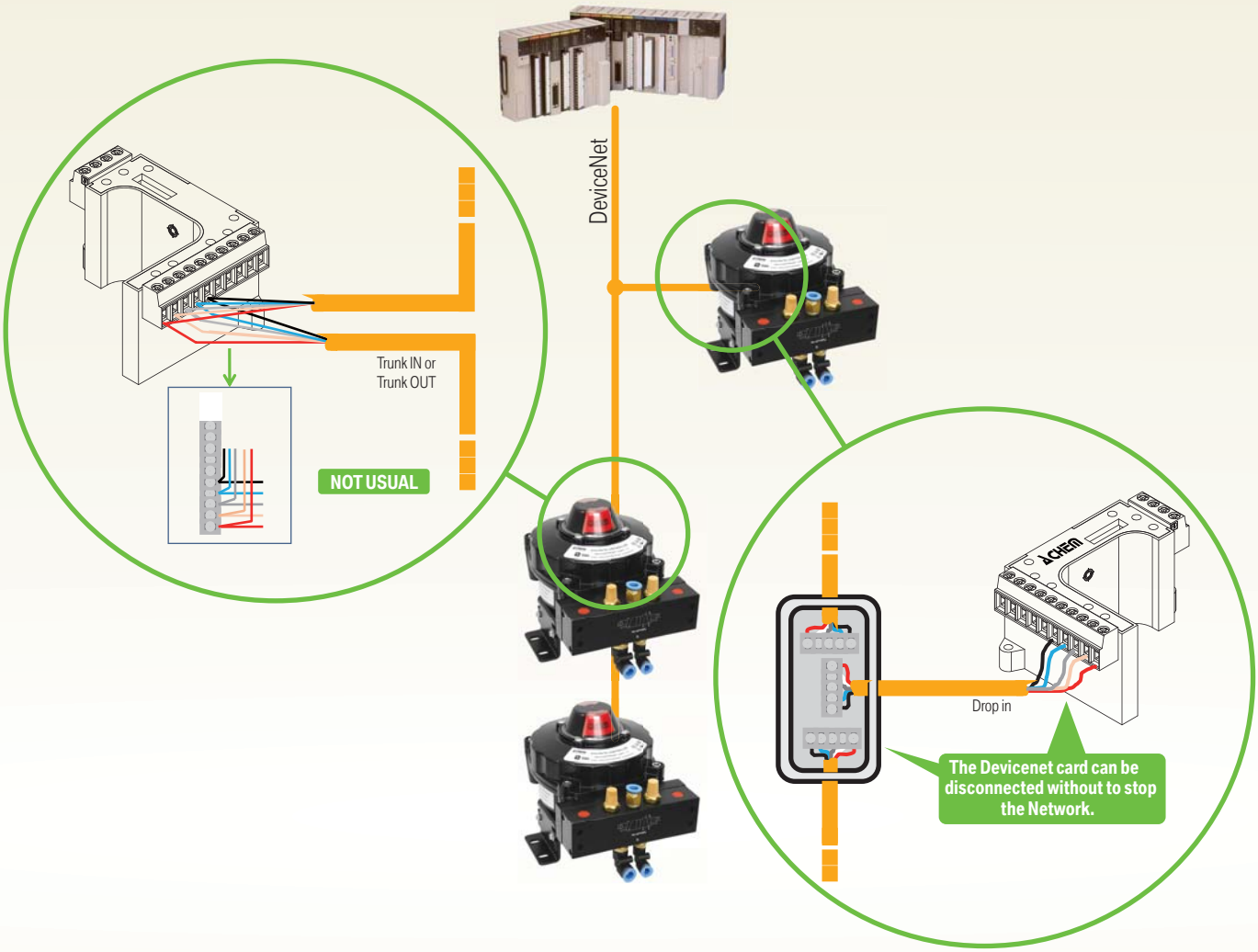
	With no inputs or outputs actived	One inputs actived	Two inputs actived	Three inputs actived	Four inputs actived	One output actived	Two outputs actived
Consuption Current	10.6mA	11.2mA	11.6mA	16mA	16.6mA	Increase the coil current (Max: 1,5W)	Increase the coil current (Max: 1,5W)
Operation Voltage	30Vdc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

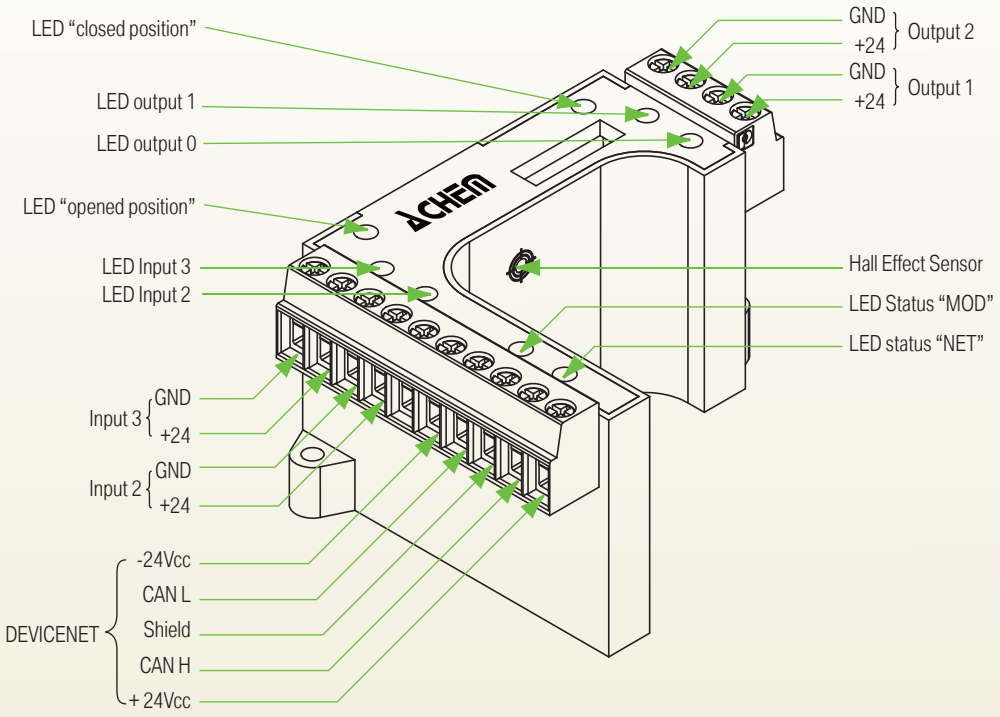
Slave Profile	I/O Code	7	DO=I/O,D1=I/O,D3=I/O
	ID CODE	A	Remote I/O Port
	ID-1	O	
	ID-2	F	

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™





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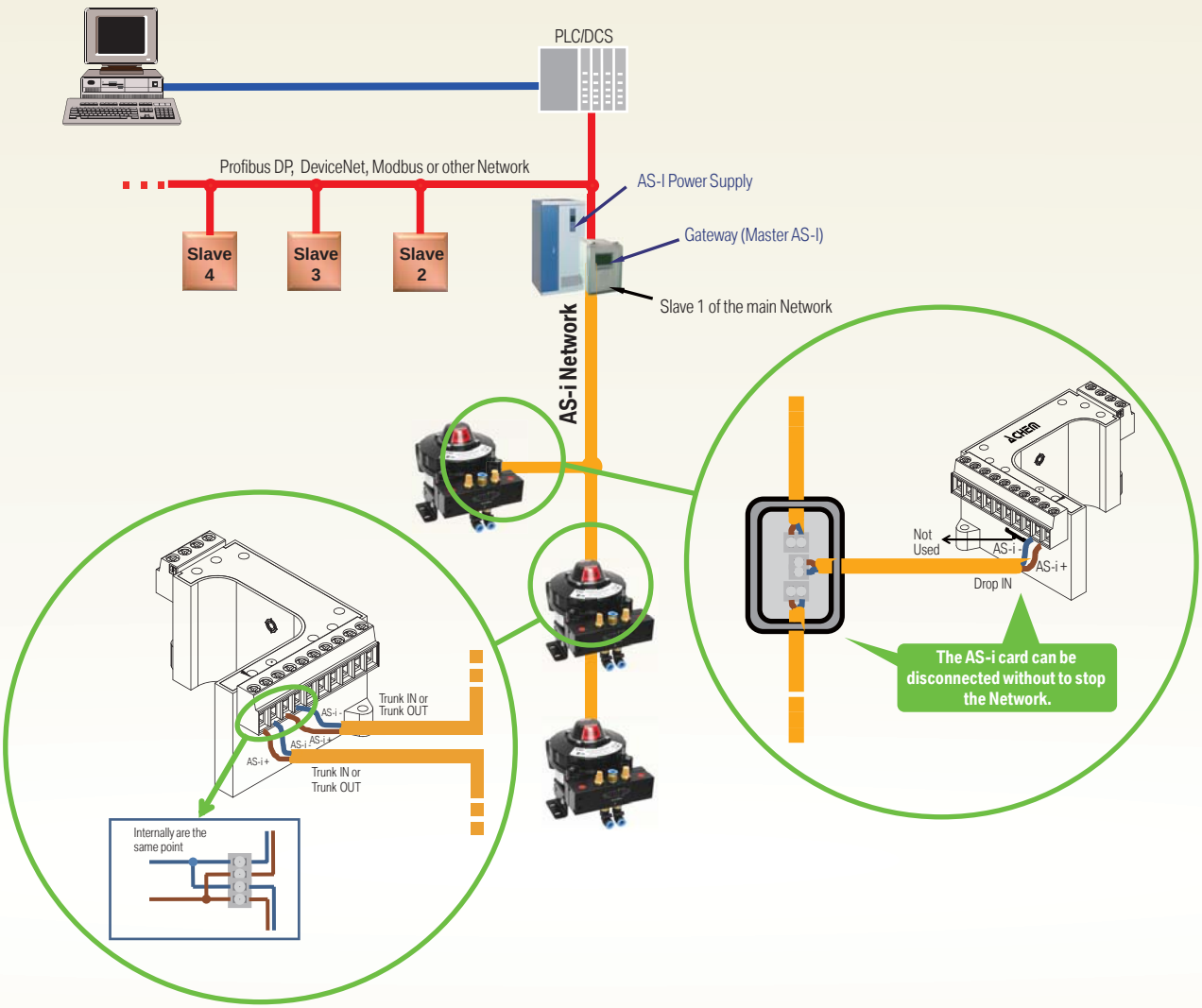
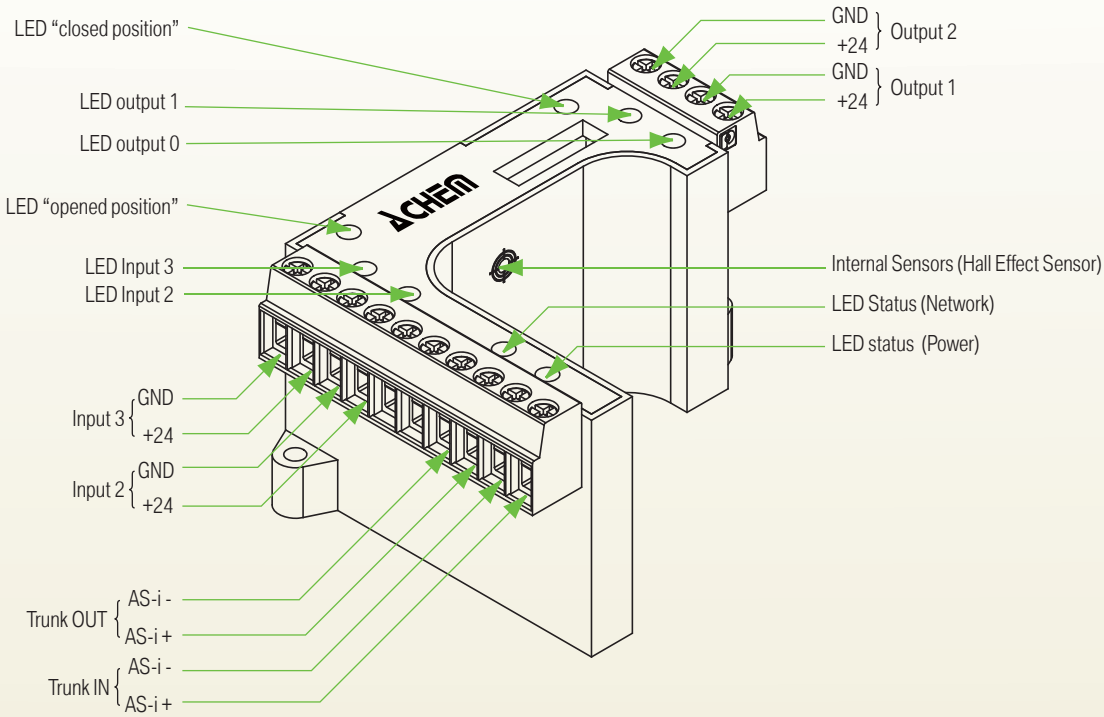
ASi Wiring


PLC/DCS
Profibus DP, DeviceNet, Modbus or other Network
AS-I Power Supply
Gateway (Master AS-I)
Slave 1 of the main Network
Slave 4
Slave 3
Slave 2
AS-i Network
Trunk IN or Trunk OUT
AS-i -
AS-i +
Trunk IN or Trunk OUT
Internally are the same point
Not Used
AS-i -
AS-i +
Drop IN
The AS-i card can be disconnected without to stop the Network.


LED "closed position"
LED output 1
LED output 0
LED "opened position"
LED Input 3
LED Input 2
Input 3 GND +24
Input 2 GND +24
Trunk OUT AS-i - AS-i +
Trunk IN AS-i - AS-i +
GND +24 Output 2
GND +24 Output 1
Internal Sensors (Hall Effect Sensor)
LED Status (Network)
LED status (Power)

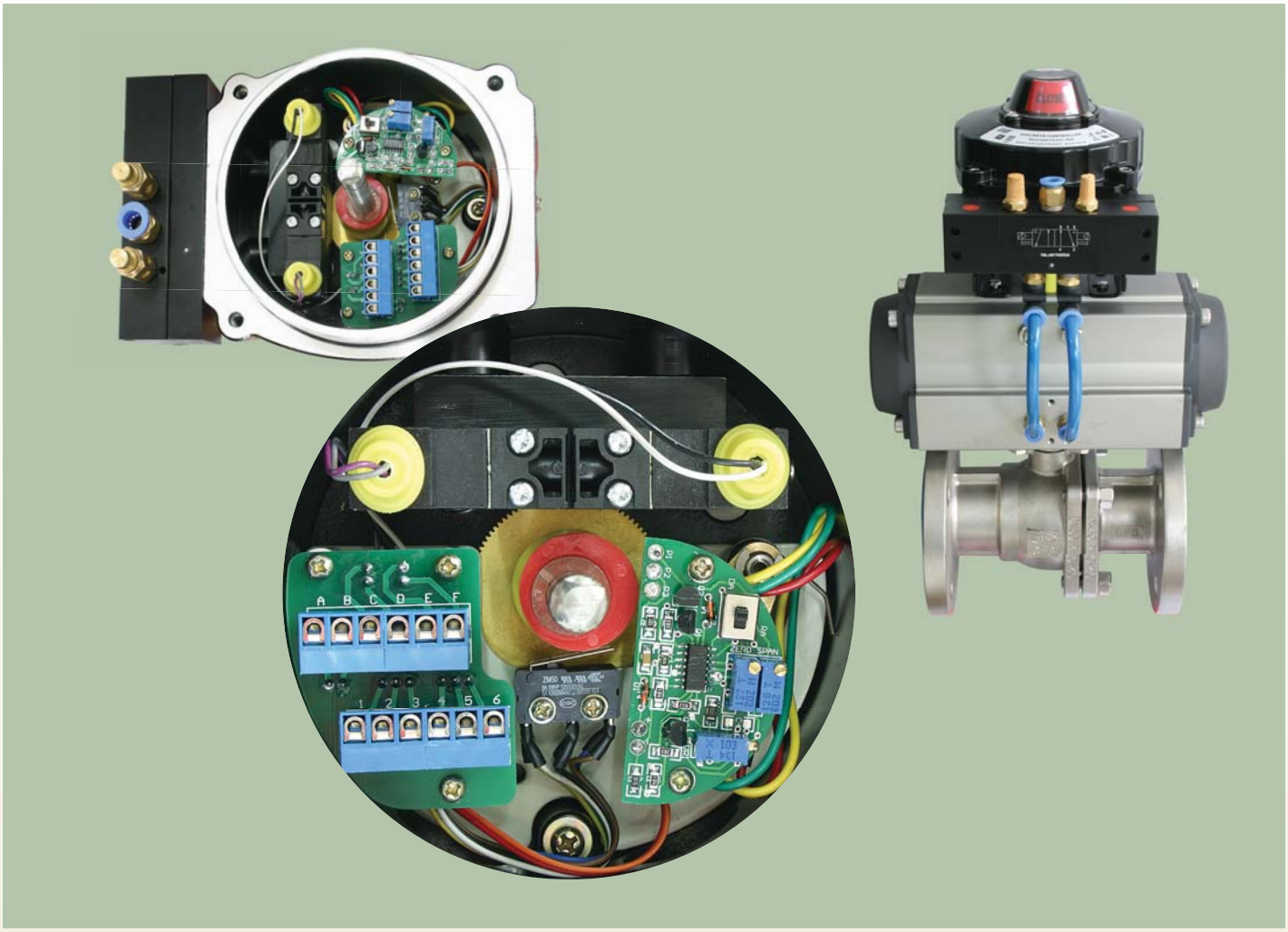
Position Transmitter(PT)

Armed with ACHEM position transmitter, the ALSD series discrete valve controller can feedback the valve position to PLC accurately through the output signal of 4-20mA. Followings are the main technical data.

4-20mA feedback Module		
	**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 : 60~110%
	Linearity	±1%
	Sensitivity	±0.2%
	Hysteresis	0.002
	Supply Voltage	15~30V DC
	Explosion Proof	Non-Explosion

∗Feedback the rotary valve position through analog signal(4-20mA) directly to PLC.

∗Position transmitter together with dual pilot actuated 5/3 spool valve, the discrete controller are able to controls valve position accurately under the help of PLC.



Internal pilot valve

The pilot valve is mounted inside of the ALSD series enclosure. It is available for ALSD discrete controller to be suitable for extreme weather condition and hazardous areas applications.

Pilot/Coils

C1

Pressure rating: 0-10Bar(NC)
Nominal diameter(orifice): 1.1mm
Power consumption: <2.3W
Voltages: 12/24VDC, 24/110/220VAC
Not available for ASI, DN

C2

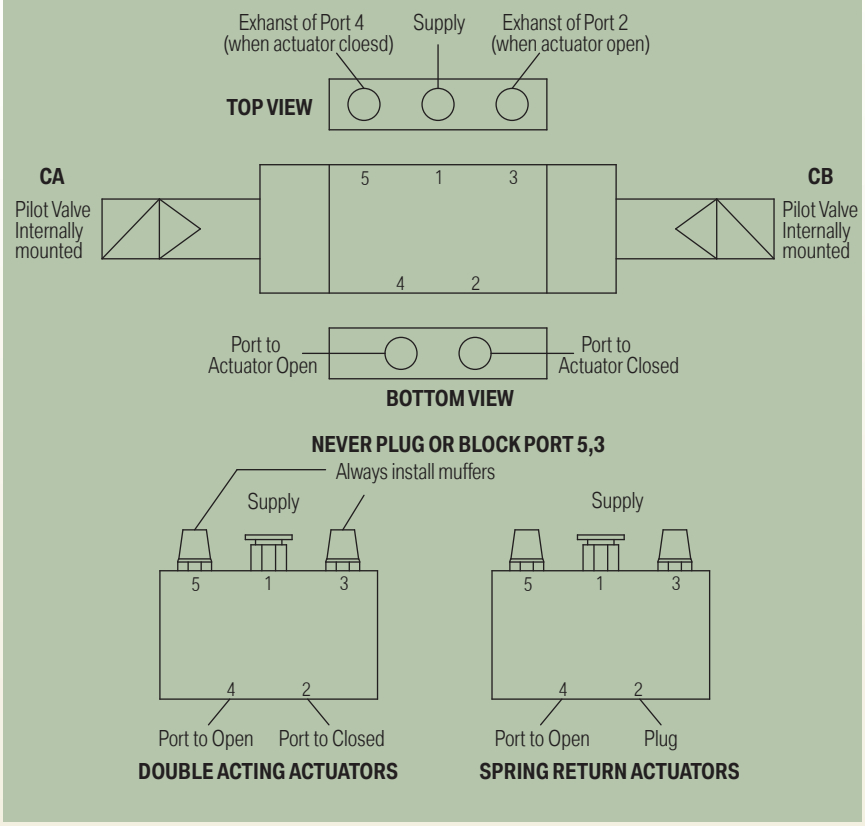
Pressure rating: 0-7Bar(NC)
Nominal diameter(orifice): 0.7mm
Power consumption: <1.3W
Voltages: 6/12/24VDC
Available for ASI, DN

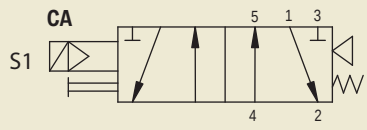
C3

Pressure rating: 0-7Bar(NC)
Nominal diameter(orifice): 0.5mm
Power consumption: <0.7W
Voltages: 12/24VDC
Intrinsically safe: EEx ia IIC T6
Available for ASI, DN

Spool Valve

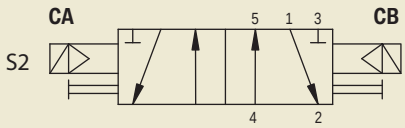
- **Pressure rating:**
  15-100psi(1-8bar)
- **Air flow:**
  Cv = 1.4(S1 and S2)
  Cv = 0.67(S3)
- **Temperature rating:**
  -Standard: -20°C～85°C
  -Low tmp. -40°C～60°C





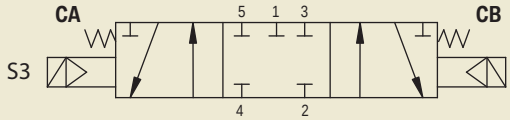
5/2 FAIL CLOSED

CA	Off	On
Valve position	Closed	Open



5/2 FAIL LAST POSITION

CA	Off	On	Off
CB	On	Off	Off
Valve position	Closed	Open	Last Position(Open or Closed)



5/3 BLOCK CENTER

CA	Off	On	Off
CB	On	Off	Off
Valve position	Closed	Open	Last Position(Any Last Position)

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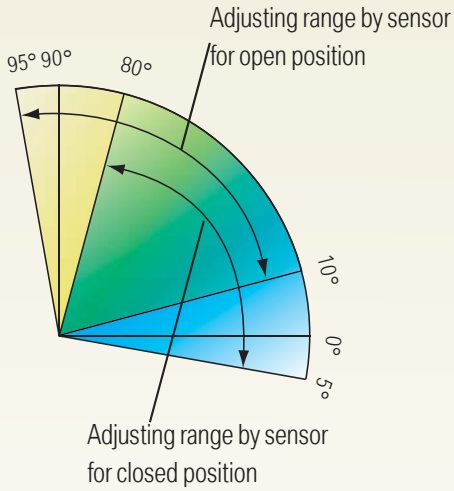
Advanced Application

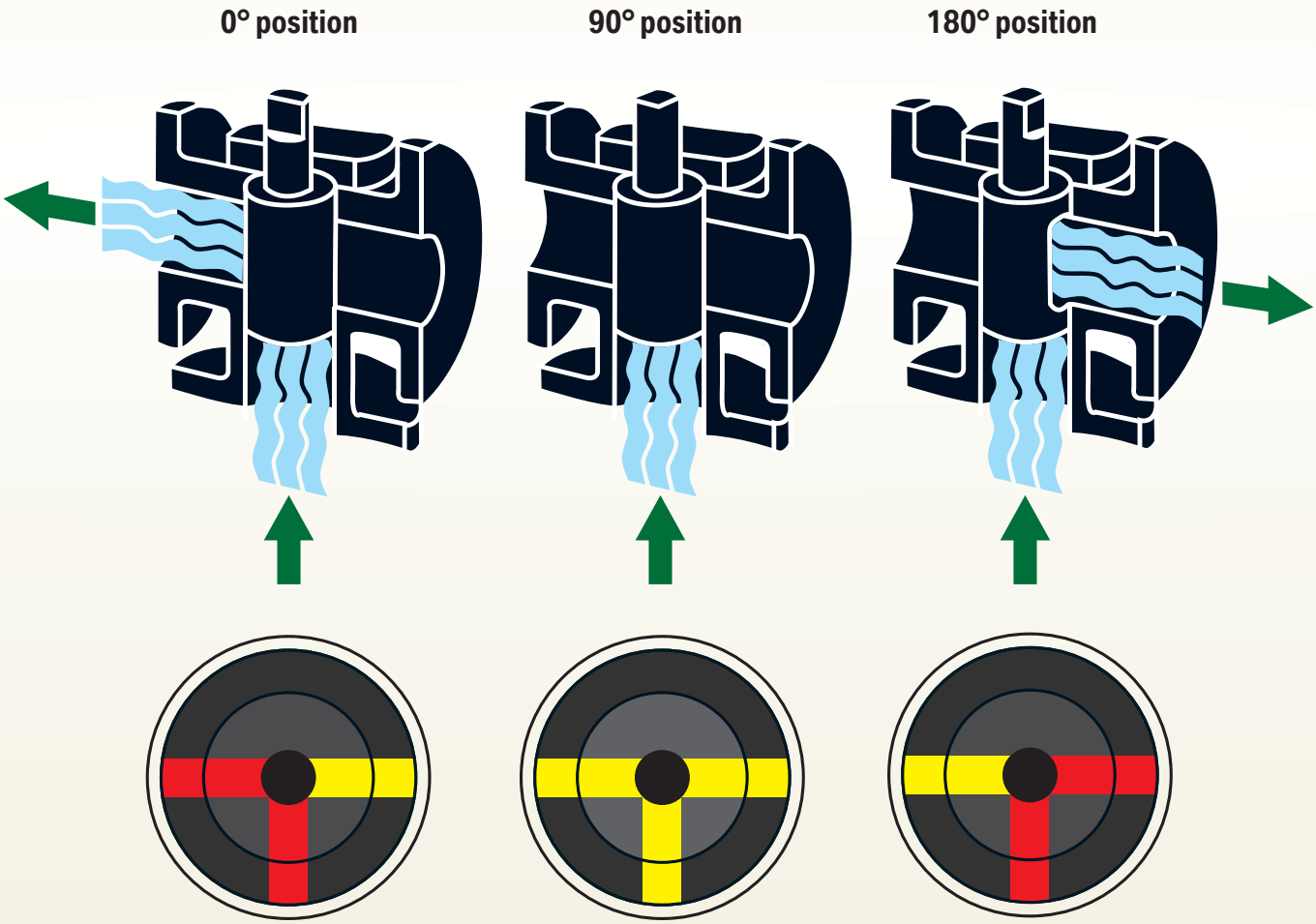
Two way control

On/Off control valve need the adjustment of limit stops in open and closed. Such kind of adjustment is actualized by using the stop bolts in pneumatic actuator. Based on new design control panel, inductive sensors and the dual actuated center block spool valve together, ACHEM's discrete valve controller provide a new solution. The two limit positions of the valve are easy to be adjusted only through setting the inductive sensors position inside of the enclosure. The safety valve positions, such as fail closed, fail open or fail last position are all available in same time.



Three way control

By using ACHEM's unique dual actuated center block spool valve integrated with inductive sensors and ACHEM control panel, the ALSD400C2S3PA33P2 discrete valve controller mounted with pneumatic actuator (on/off only) is able to control three way valve positions (L-open, closed, R-open) accurately, such as 0°, 45°, 90° or 0°, 90°, 180°. The three limit positions are easy to be adjusted only through setting the sensors position inside of the enclosure. The safety valve positions, such as fail closed, fail open or fail last position are all available.



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