

**PG POWER-GENEX<sup>®</sup>**

# ASD-7000 Series Smart Valve Positioner

(Diagnostics Positioner)



# ASD-7000 Positioner Series

ASD-7000 is the smart valve positioner which offers incomparable and stable control processing performance and advanced self-diagnostics for control valves. ASD-7000 has an outstanding durability and it has an improved control performance thanks to non-contact sensors with accuracy. ASD-7000 has a wide and multi-lingual display that provides diverse information and a current control situation with graph.



## Features

### Easy to use

- Quick auto-calibration by pushing one button
- Detecting RA (reverse acting) or DA (direct acting) automatically regardless of wrong air connections
- By-pass (auto/manual screw)
- Logical trend and histogram collection
- Providing a mounting bracket to meet IEC 60534-6-1 for linear valves
- Supporting a NAMUR mounting pattern VDI/VDE3845 (IEC60534-6-2) and providing a multi-size mounting bracket for rotary valves

### Improved display performance

- Wide and multi-lingual full text graphical TFT LCD with high-resolution and clear graphic images
- Provides 3 steps to re-size information on LCD
- Shows a control history trend, a logical trend and histogram collection

### Various communications

- HART (Ver. 7)
- Profibus PA
- Foundation Fieldbus

### Non-contact position sensor

- Magnetic position sensor (MPS, non-contact)
- Resistant to vibration
- Excellent temperature characteristics

### Improved durability

- Vibration and impact tolerant
- Resistant to dirty air and humidity

### Diagnostics

- Self-diagnostics
- Advanced diagnostics with 4 x pressure sensor
- Valve signature
- Valve step response
- Partial stroke test (PST)

## Options

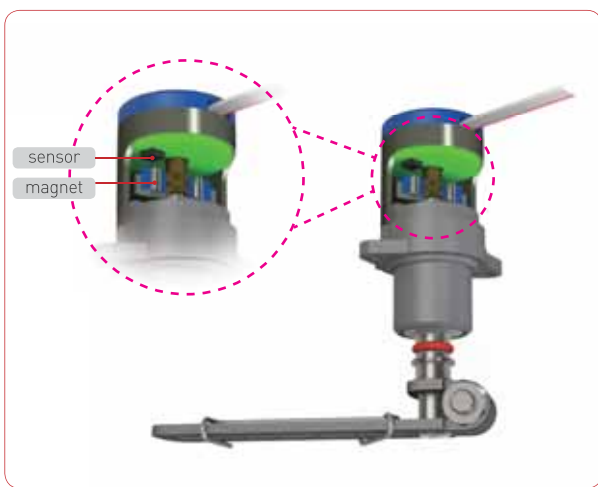
- Output position transmitter (4 - 20 mA)
- 2 x 24VDC software limit switch or 2 x SPDT mechanical limit switch
- Stainless steel body (316SS)
- HART communication
- Profibus PA communication
- Foundation Fieldbus communication

## | Solid body design

- Aluminum housing / Epoxy-coated
- High corrosion-resistant stainless steel 316 body
- Protection class : IP66
- Flameproof Ex db IIC, Dustproof Ex tb IIIC

## | Non-contact sensor providing high durability and improved control performance

- Higher durability than a feedback lever type
- Reduced hysteresis
- Provides a remarkable control performance under a harsh working environment with vibration



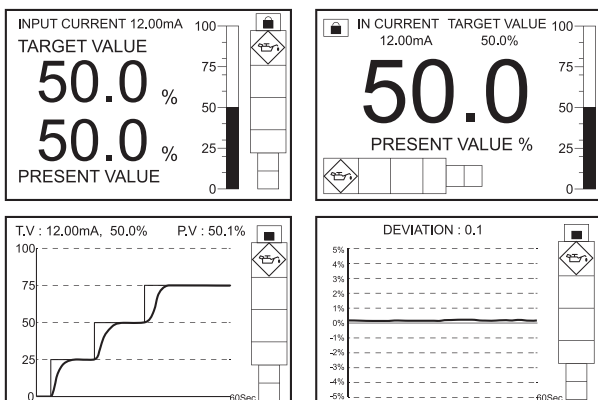
< MPS - Magnetic Position Sensor >

## | Easy and quick auto-calibration

Quick auto-calibration by pushing one button provides optimal positioner setting easily and fast.

## | Improved display

ASD positioner has a wide display with high visibility and it's possible to re-size information with 3 steps and available to show a control graph on LCD.



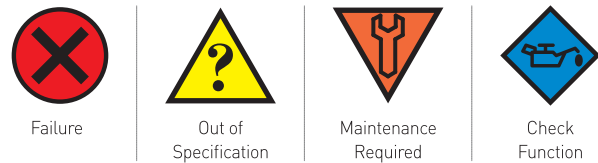
## | Multi-lingual display

English, Chinese and Korean are available on LCD and more languages are planned to add through a continuous update

<p>MODE</p> <ul style="list-style-type: none"> <li>⊕ DISPLAY VARIABLE</li> <li>⊕ MANUAL</li> <li>⊕ MONITORING</li> <li>⊕ AUTO TUNE</li> <li>⊕ PARAMETERS</li> <li>⊕ TEST</li> </ul>	<p>모드</p> <ul style="list-style-type: none"> <li>⊕ 표시 변수</li> <li>⊕ 수동 제어</li> <li>⊕ 모니터링</li> <li>⊕ 오토 튠</li> <li>⊕ 파라미터</li> <li>⊕ 테스트</li> </ul>
<p>模式</p> <ul style="list-style-type: none"> <li>⊕ 显示设置</li> <li>⊕ 手动模式</li> <li>⊕ 监测模式</li> <li>⊕ 自动模式</li> <li>⊕ 参数</li> <li>⊕ 测试</li> </ul>	

## | Self-diagnostics

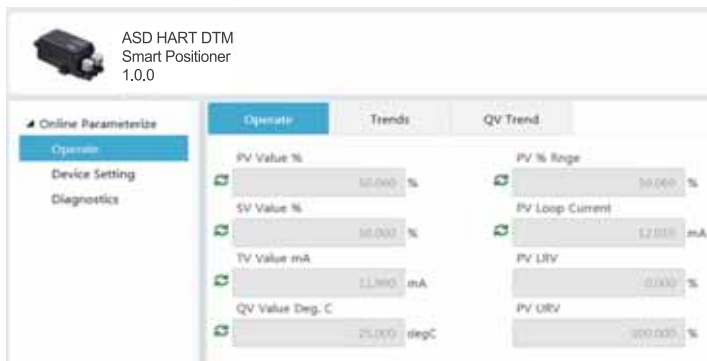
Advanced self-diagnostics is performed with pressure sensors installed inside of ASD positioner and results from self-diagnostics can be shown on LCD or transmitted over communication according to NAMUR NE107 standard.



## | Offline diagnostics (self-diagnostics)

<p><b>Failure</b></p> <ul style="list-style-type: none"> <li>• Loop current failure</li> <li>• Loop voltage failure</li> <li>• Supply air failure</li> <li>• Auto calibration failure</li> </ul>	<p><b>Out of Specification</b></p> <ul style="list-style-type: none"> <li>• Position high / low limit</li> <li>• Temperature high / low limit</li> <li>• Supply air high / low limit</li> </ul>
<p><b>Maintenance Required</b></p> <ul style="list-style-type: none"> <li>• Not calibrated</li> <li>• Use small angle</li> <li>• Deviation error</li> <li>• TUNE-point adjust error</li> </ul>	<p><b>Check Function</b></p> <ul style="list-style-type: none"> <li>• PST Failure</li> <li>• Use SHAPE parameter</li> <li>• Valve friction high</li> <li>• Check EMI / RFI</li> </ul>

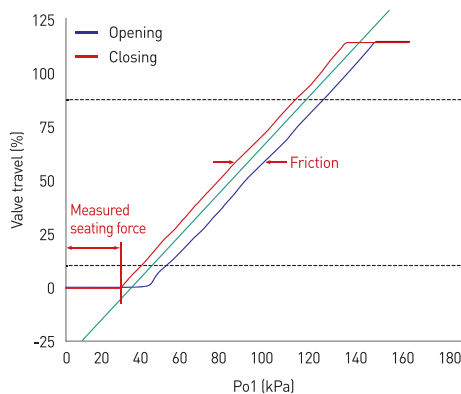
## Online FDT DTM (Device Type Manager)



It's possible to make use of advanced diagnostics of ASD positioner by using an online DTM.

※ Available only with HART communication option

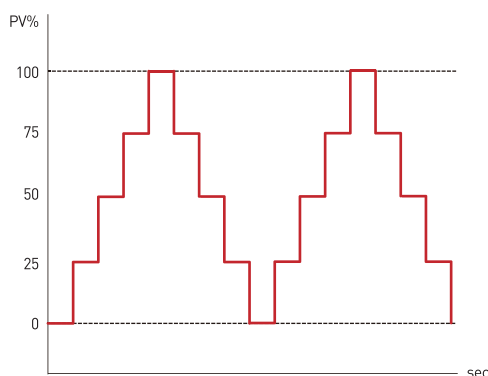
## Online diagnostics (Advanced diagnostics)



### • Valve signature

Valve signature is the result which records air pressure change and valve position according to ramp input signals. The following values about performance of valve control are obtained from this valve signature and it's possible to confirm a current valve status (integrity)

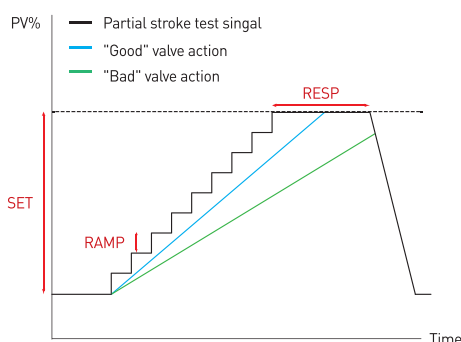
- a. Seating force
- b. Friction
- c. Spring range



### • Valve step response

This is the result which shows a valve control status with on-off signals or on every 25% step.

- a. ON-OFF step
- b. 25% step



### • PST (Partial Stroke Test)

This is the function which records changes by operating the positioner with the set values automatically without influencing system in an automatic control mode.

It's possible to confirm a valve status (integrity) by comparing the past one with the present one.

# Technical specifications

## ASD-7000 Smart valve positioner

Input	
<b>Standard</b>	
Supply power	4 to 20mA, Loop powered
Max.	50mA
Min.	3.6mA
Load voltage at 20mA	6.8V
Impedance at 20mA	340 Ω
<b>HART Communication ver. 7</b>	
<b>- Without advanced diagnostics</b>	
Load voltage at 20mA	7.8V
Impedance at 20mA	390 Ω
<b>- With advanced diagnostics (with 4 pressure sensors)</b>	
Load voltage at 20mA	9.5V
Impedance at 20mA	475 Ω
<b>Profibus PA &amp; Foundation Fieldbus</b>	
Supply power	Bus power 9 – 32VDC
Current Consumption	Profibus - 15mA Foundation Fieldbus - 16mA
Output	
Range	0 – 7 bar (0 – 100 psi)
Air consumption	2.5 L.P.M
	at 1.4 bar (20 psi) supply pressure
	3.0 L.P.M
Air Capacity	at 6 bar (90 psi) supply pressure
	250 L.P.M
	at 1.4 bar (20 psi) supply pressure
	300 L.P.M
	at 6 bar (90 psi) supply pressure
Air Supply	
Instrument air	free of oil, water and dust acc. to DIN/ISO 8573-1 pollution and oil content according to Class 3
Supply pressure	1.4 to 7 bar (20 to 100 psi)
Applicable actuators	
Operating type	Linear, Rotary, Remote
Acting type	Single, Double
Action	direct action(DA), reverse action(RA)
Linkage type	
Travel range	Linear : 10 – 120 mm
	Rotary : 30°– 150° rotation angle
Linkage-less type	
Travel range	Linear : 10 – 120 mm
	Rotary : 30°– 150° rotation angle
	Remote : 3, 5, 10, 15, 20, 30m
※ Other travel range on request	
Characteristics	
Linearity	< ±0.5% F.S
Sensitivity	< ±0.3% F.S
Hysteresis	< ±0.3% F.S
Repeatability	< ±0.2% F.S
Performance characteristic	Linear, Shape (EQ%, Quick), User set

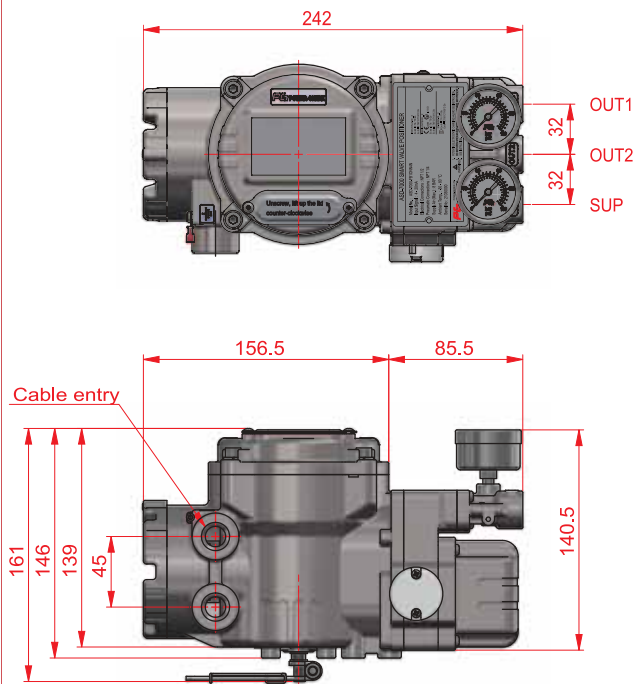
Enclosure	
Material	Aluminum die-cast + Epoxy-coated
	316 Stainless steel housing
Protection class	IP66
Pneumatic connections	PT 1/4
	NPT 1/4
Electrical connections	PF 1/2
	NPT 1/2
	M20 x 1.5
Weight	2.4 kg – Aluminum die-cast
	4.5 kg – Stainless steel 316
Hazardous area approvals	
IECEX	<b>Flameproof,</b>
ATEX	<b>Ex db IIC T6/T5 Gb</b>
KCs	<b>Dustproof</b>
CCC / EAC	<b>Ex tb IIIC T85°C/T100°C Db</b>
Environmental influences	
Ambient temperature	Standard : -30 to 80°C ( -22 to 176°F)
Operating temperature of LCD	-20 to 80°C ( -4 to 176°F)
Vibration	2G, 5 to 400 Hz
Humidity	The dew point should be at least 10°C lower than the temperature of this device.
Feedback options	
<b>Position Transmitter (Output signal)</b>	
Output signal	4-20mA, 2-wired
Supply voltage	12-30VDC
Load Limitation	0 – 1000 Ω (Normally 650Ω at 24VDC)
Linearity	± 0.5%
<b>Limit switches – Programmable software limit switches</b>	
Type	2 x software limit switch
Rating	24VDC
<b>Limit switches – Micro switches</b>	
Type	2 x SPDT
Rating	5A @ 220VAC
Contact	Silver alloy
Ambient temperature	-30 - +85°C
<b>Limit switches – P&amp;F sensor (SJ2-SN)</b>	
Type	NAMUR NC
Supply voltage	Nominal 8.2VDC (5 – 11 VDC)
Current consumption	Target not detected > 3mA
	Target detected < 1mA
Ambient temperature	-40 - +100°C
Mounting brackets	
Linear type	IEC 60534-6-1
Rotary type	IEC 60534-6-2

# ASD-7000 Series How to order

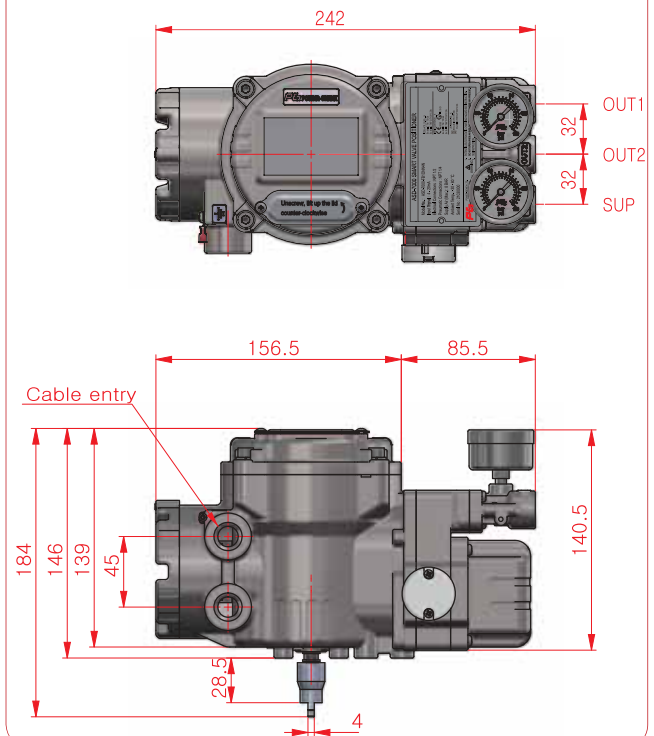
		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
ASD-7000 Series positioner		ASD - 7	X	X	X	-	F	X	X	X	X	X	X	X
1. Body material	Aluminum die-cast	0												
	Stainless steel 316	1												
2. Actuator operation	Linear		0											
	Rotary		1											
3. Feedback type	Linkage type			0										
	Linkage-less type			1										
	Remote type			2										
4. Hazardous area & Protection	<b>Flameproof Ex db IIC T6/T5 Gb</b>					F								
	<b>Dustproof Ex tb IIIC T85°C / T100°C Db</b>													
5. Feedback size	Linkage type	Linear type (ASD-7x00)	Stroke 10 – 60mm				B							
			Stroke 10 - 120mm				C							
	Rotary type (ASD-7x10)	Fork lever					F							
		NAMUR shaft					N							
Linkage-less type	Linear type (ASD-7x01, 7x02)	Stroke 10 – 120mm					B							
		*Others on request												
Rotary type (ASD-7x11, 7x12)	M6 Connector						6							
	M8 Connector						8							
6. Gauge (Out1, Out2 gauge)	6 bar (90 psi)						1							
	10bar (150 psi)						2							
7. Position feedback	None							N						
	Position transmitter (4-20mA)							O						
	Advanced diagnostics + position transmitter (in pending)							A						
8. Limit switches	None								N					
	2 x 24VDC software limit switch								L					
	2 x micro switch (SPDT) - Only for Rotary type								S					
	2 x P&F proximity sensor - Only for Rotary type								P					
9. Communication	None									N				
	HART communication									H				
	Profibus PA (in pending)									P				
	Foundation Fieldbus(in pending)									F				
10. Connection threads (pneumatic – electrical)	PT(Rc) 1/4 – PF(G) 1/2											3		
	NPT 1/4 – NPT 1/2											4		
	PT(Rc) 1/4 – M20x1.5											5		
	NPT 1/4 – M20x1.5											6		
	※ Others on request													
11. Mounting bracket	None												N	
	Linear type / IEC 60534-6-1												L	
	Rotary type / IEC 60534-6-2												R	
12. Remote cable (only for ASD-7xx2)	3, 5, 10, 20, 30m													X
13. Temperature	Standard (-30 - +80°C )													Blank
	Low temperature (-40 - +80°C )													LT

## Dimensions ( Linkage type )

ASD-7000 Linear type

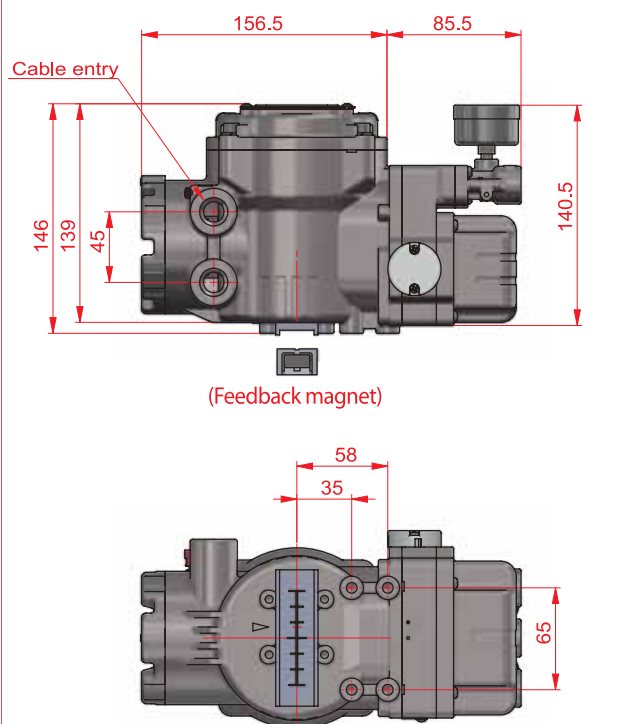


ASD-7010 Rotary type

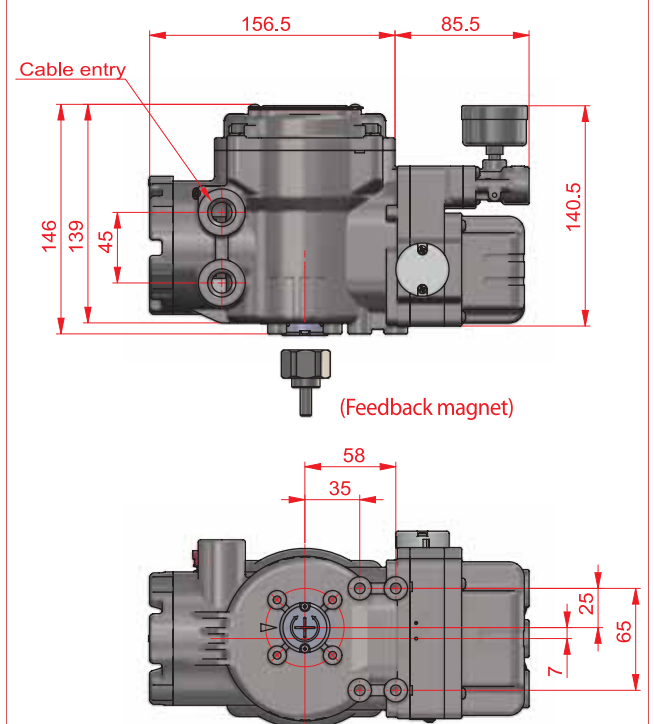


## Dimensions ( Linkage - less type )

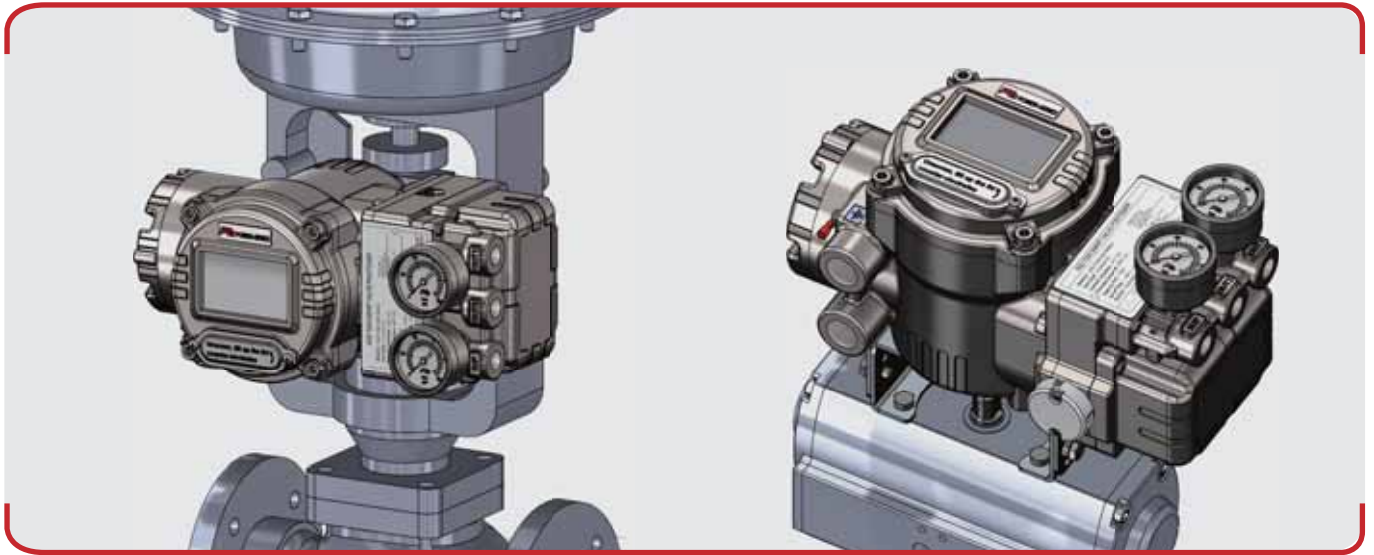
ASD-7001 Linear type



ASD-7011 Rotary type



# All innovation on driving your valve automation



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