

ASCO™ Proportional Valves

with IO-Link Communication Digital Positioner Series

290/390

2-way / 3-way, Pressure Operated, all standard connection types

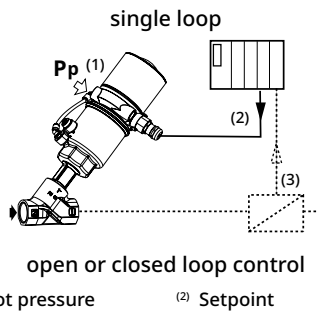
Features and Benefits

- Precise, quick-acting and robust valve suitable for use in industrial environments
- Exceptional long service life
- Real-time control
- Ready-to-use valve
- Power saving function and no air consumption when position is reached
- Manual valve operator
- LED indicators for valve status display
- IO-Link® class A communication protocol for setpoint, feedback and parameters data

Operation

The valve is operated by the Digital Positioner depending on the I/O link communication setpoint. The valve and the actuator are NC type. It closes when no pilot pressure is supplied by the Digital Positioner to the actuator. The valve opens when the Digital Positioner supplies a pilot pressure.

On loss of power the valve returns to its close position, or the position is maintained depending on version.



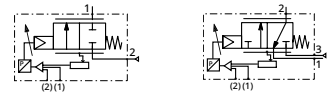
Valve and Digital Positioner general information

Differential pressure	0 to 16 bar (0 to 240 psi) for standard refer to dedicated catalog page for product features
Maximum allowable pressure	16 bar (240 psi)
Ambient temperature range	0°C to +50°C
Fluids	For type, temperature and materials compatibility, see the catalogue pages for the standard valves
Maximum viscosity	600 cSt (mm ² /s)
Pilot fluid	Air or inert gas filtered 50 µm, unlubricated, condensate-free and water-free according to ISO 8573-1: 2010 [7:4:4]
Pilot pressure	5 to 8 bar (72 to 120 psi)
Pilot fluid temperature	0°C to +50°C (32°F to 122°F)
Response time	See following page
Degree of protection	IP66 (EN 60529)

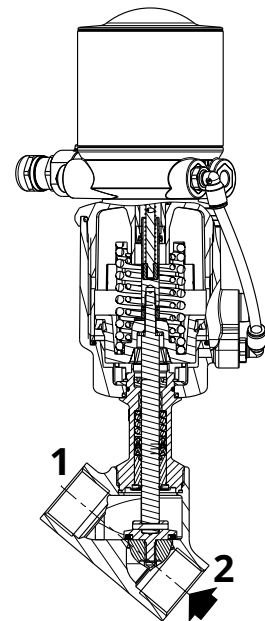
Digital Positioner construction

Body	Glass fiber filled PA
Cover (with LED)	
Top cover	PA (transparent)
Side cover	Glass fiber filled PA or stainless steel AISI 316L
Cover (without LED)	Aluminium
Valve adaptor	Brass or stainless steel
Stem	Stainless steel and PEEK
Guiding and bearing	POM
Seals	NBR
Interface gasket	NBR
Cable gland	Brass nickel plated + NBR (w/ plastic cover) Stainless steel + silicon or NBR (w/ stainless steel cover)

NC



EAC CE UK CA









































Valve construction


Body	For versions and other components, see the catalogue pages for the standard valves
Valve disc (2/2)	Stainless steel AISI 316L profile disc and PTFE disc seal
Valve disc (3/2)	Stainless steel flat disc and PTFE-Carbon disc seal


Electrical characteristics for IO-Link®

Nominal supply voltage	24 V DC ± 10%, max. ripple 10% w/ IO-Link® cable
Power	8 W (4 W, setpoint reached)
IO-Link®	Communication for setpoint and feedback and parameters Protocol specification V1.1 Port Class A device with COM3 (230.4 kBaud)
Process data	2 Byte IN 10 Byte OUT: Status bytes for errors/maintenance/auto initialization/fully closed or open
External sensor signal (option)	Analog input signal for process control with signal 0-10 V or 0/4-20 mA input
Regulation characteristics	Hysteresis < 2% of max. disc stroke Accuracy < 2% of max. disc stroke Repeatability < 1%
Electrical connection	M12 male code A per IEC 61076-2-101 or 1 terminal block with 6 positions Grip, cross section stranded wire : Minimum 0.14 mm ² (26 AWG) Maximum 1.5 mm ² (16 AWG) Stripping length 5 mm
Cable entry	Cable gland M16 x 1.5 Cable 6 to 9.5 mm dia. / 0.23 to 0.37 in

IO-Link® diagnostic data

Type	Functions	IO-Link® Proportional
Position status	Valve open	 / 
	Valve close	 / 
	Intermediate position	
	Valve moves to open	 / 
	Valve moves to close	 / 
	Hold position	 / 
Initialization	Valve/Digital Positioner in initialization mode	 / 
	Valve/Digital Positioner in manual mode	 / 
	Valve/Digital Positioner not initialized	 / 
Warning	Component ERROR	 / 
	IO-Link® identification	 / 
NAMUR diagnostic mode	Status signal	 / 
	Maintenance required (Still valid output signal)	 / 
	Out of specification (Signal out of the specified range)	
	Piloting pressure is out of range	
	Temperature of piloting fluid is out of range	 / 
	Temperature of PCB is out of range	
	Function check (Temporary non-valid output signal)	 / 
	Failure (= component ERROR ; non-valid output signal)	 / 
Pilot defect		
Valve process data	Cycle counter	
	Distance (km)	
	Response time	
	Dead time	
	Position (open / close)	
	Position (% stroke)	
	Piloting pressure	
	Temperature inside Digital Positioner	

 = information provided by LED visualization

 = information provided by Field bus

Certifications and Approvals

- RoHS compliance / Reach compliant
- Electromagnetic compatibility EMC 2004/108/EC

Options and accessories

- NCS (non condensing system allowing permanent air venting inside the enclosure to avoid moisture)

Valve specifications

Actuator diameter (mm)	DN	Full opening flow Kv (Cv) values for 290 proportional valve						
		2-way Threaded port		2-way Flanged body		2-way ⁽¹⁾ Clamp Butt welding		3-way
		Kv (m ³ /h)	Cv (G/min)	(m ³ /h)	Cv (G/min)	(m ³ /h)	Cv (G/min)	
NC - Normally closed, entry under the disc								
63	15	5.4	6.3	3.7	4.3	5	5.8	Refer for flow value to the specific catalog page
	20	7.5	8.7	6.1	7.1	5.9	6.8	
	25	15.7	18.2	10.1	11.7	13.1	15.2	
	32	24.5	28.4	17.4	20.2	25.8	29.9	
	40	28.5	33.1	21.5	24.9	27	31.3	
50	41.2	47.8	31.7	36.8	42.1	48.8		
90	25	17.2	20.0	11.2	13.0	13.7	15.9	
	32	26.3	30.5	18.2	21.1	27.5	31.9	
	40	32.8	38.0	23.4	27.1	30.6	35.5	
	50	47.1	54.6	34.8	40.4	49	56.8	
	65	71.5	82.9	55.5	64.4	73	84.7	
125	32	26.1	30.3	18.9	21.9	28.2	32.7	
	40	41.9	48.6	26.5	30.7	34.5	40.0	
	50	64.3	74.6	36.9	42.8	66.3	76.9	
	65	85.9	99.6	59.8	69.4	86.8	100.7	

⁽¹⁾ ASME BPE port type.

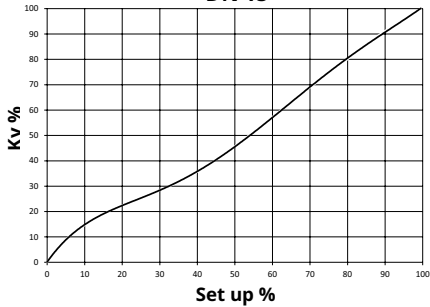
Response times

Series 290 / 390		Response time for full opening (in seconds) for NC valve series 290/390 (6 bar pilot air)					
		63 mm actuator		90 mm actuator		125 mm actuator	
Ø	(DN)	O	C	O	C	O	C
1/2"	(15)	1	1	-	-	-	-
3/4"	(20)	1	1	-	-	-	-
1"	(25)	2	2	2	2.5	-	-
1 1/4"	(32)	2	2	2	2.5	4.6	4.9
1 1/2"	(40)	2	2	2	2.5	5	6
2"	(50)	2	2	2	2.5	5	6
2 1/2"	(65)	-	-	2	2.5	5	6

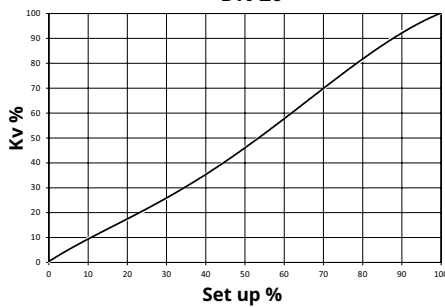
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Kv actuator curves

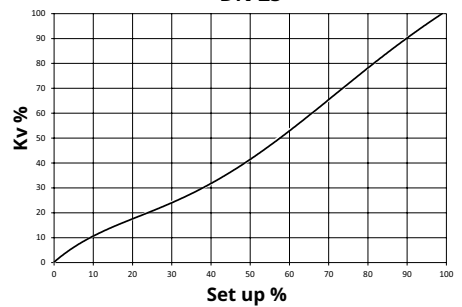
**Actuator 63 mm dia.
DN 15**



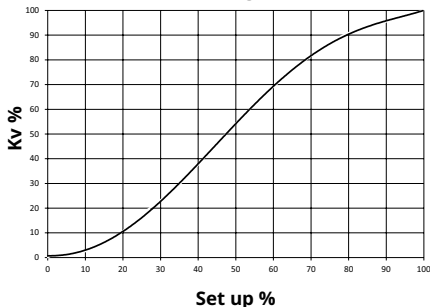
**Actuator 63 mm dia.
DN 20**



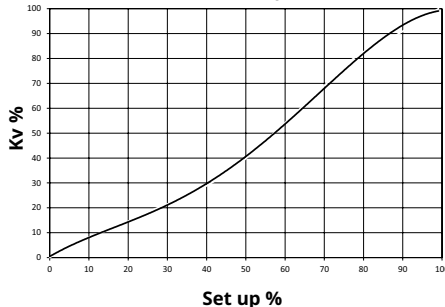
**Actuators 63 mm and 90 mm dia.
DN 25**



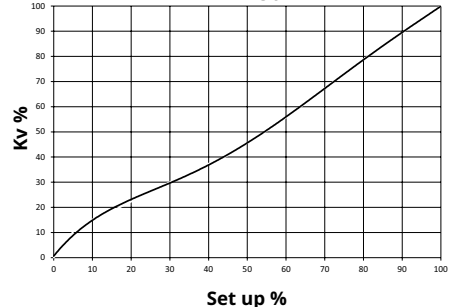
**Actuators 63 mm and 90 mm dia.
DN 32**



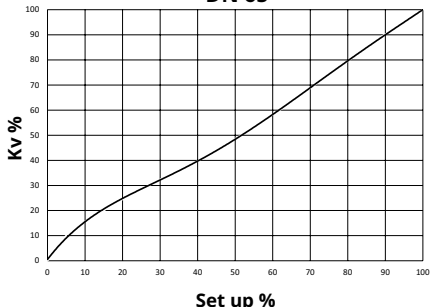
**Actuators 63 mm and 90 mm dia.
DN 40**



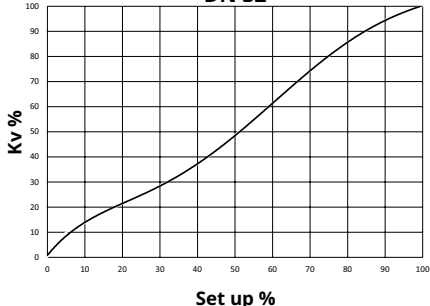
**Actuators 63 mm and 90 mm dia.
DN 50**



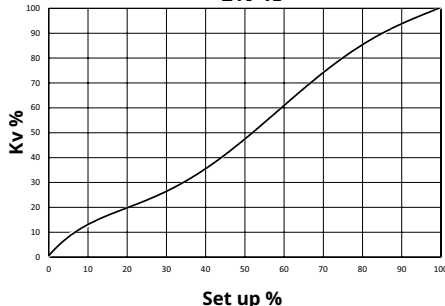
**Actuator 90 mm dia.
DN 65**



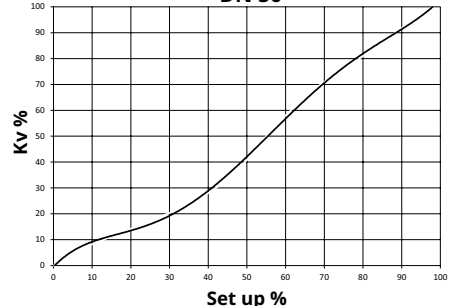
**Actuator 125 mm dia.
DN 32**



**Actuator 125 mm dia.
DN 40**



**Actuator 125 mm dia.
DN 50**



**Actuator 125 mm dia.
DN 65**



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Product selection guide - Valve series 290/390

Configurator - CAD Files

PRODUCT CODE
E 290 D P 3 5 0 D PFB 00

Connection type

- E** = ISO 228/1 and ISO 7/1 (combination thread, G*)
- 8** = NPTF (ANSI B 1.20.3)
- T** = Flange
- J** = ISO 7/1 «Rc»
- W** = Clamp or butt welding

Product series

- 290**
- 390**

Revision letter

- D** = Initial release

Function

- P** = Normally closed with profil disc (2-way valves)
- 0** = Normally closed (3-way valves)

Nominal diameter

- 2** = DN15 - 1/2"
- 3** = DN20 - 3/4"
- 4** = DN25 - 1"
- 5** = DN32 - 1 1/4"
- 6** = DN40 - 1 1/2"
- 7** = DN50 - 2"
- 8** = DN65 - 2 1/2"

Actuator diameter - Piloting connections

- 5** = 63 mm plastic - G 1/8"
- 6** = 63 mm plastic - NPTF 1/8"
- B** = 90 mm plastic - G 1/4"
- C** = 90 mm plastic - NPTF 1/4"
- H** = 125 mm plastic - G 1/4"
- J** = 125 mm plastic - NPTF 1/4"
- 5** = 63 mm stainless steel - G 1/8"
- 6** = 63 mm stainless steel - NPTF 1/8"
- B** = 90 mm stainless steel - G 1/4"
- C** = 90 mm stainless steel - NPTF 1/4"
- H** = 125 mm stainless steel - G 1/4"
- J** = 125 mm stainless steel - NPTF 1/4"

Options

- PFB** = Prepared for Digital Positioner mounting ⁽¹⁾
- 02S** = Oxygen service 15 bar / 60°C
- TC6** = Test tightness class VI
- VAC** = Industrial vacuum 10⁻³ mbar (FPM disc seal)
- M31** = Stainless steel valve body material certified 3.1
- FB0** = EC 1935-2004 and FDA CFR 21 material
- FEM** = Fugitive emission class BH according to ISO 15848-1
- WSP** = PTFE wiper seal
- WSF** = FPM piston seal
- SSF** = Stainless steel insert for plastic actuator
- P16** = Pressure > 16 bar

Valve body material

- D** = Bronze body
- S** = Stainless steel body
- Y** = All 316L

Port type 1 and 2

- 0** = Threaded port
- D** = Flange DIN EN 1092-1 (ISO 7005) standard (2-way)
- P** = Flange ANSI standard 150 (2-way)
- C** = Clamp ISO 2852 / 1127
- 4** = Clamp DIN 32676-A
- 5** = Clamp SMS 3017
- 6** = Clamp ASME BPE
- W** = Butt welding ISO 1127
- 1** = Butt welding DIN EN 10357-A (DIN 11850-S2)
- 2** = Butt welding SMS 3008
- 3** = Butt welding ASME BPE
- U** = 1st and 2nd ways threaded and 3rd way ISO 228/1 and ISO 7/1
- V** = 1st and 2nd ways threaded and 3rd way ISO 7/1 «Rc»
- 8** = 1st and 2nd ways threaded and 3rd way NPTF (ANSI B 1.20.3)

(1) Digital Positioner selection guide

When ordering the valve and the Digital Positioner series 890, select:

1. PFB option in first
2. For other option, select also PFB (example: PFB + M31)

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Product selection guide - Digital Positioner series 890

Configurator - CAD Files

PRODUCT CODE

G 890 A P P 1 0 1 A00 F1

Piloting connection type

G = ISO 228/1
8 = NPT (ANSI B1.20.1)

Product series

890 = Digital Positioner

Revision letter

A = Initial release

Product type

P = Digital Positioner

Enclosure type

P = Plastic cover
S = Stainless steel cover
A = Aluminium cover (no LED)

Proportional valve specifications

5 = Double loop - 0-10 V DC - Fail close
6 = Double loop - 4-20 mA - Fail close
7 = Single loop - Fail in last position (for IO-Link)
8 = Single loop - Fail close (for IO-Link)

Piloting voltage

F1 = 24 VDC (class F)

Options

A00 = Without
NCS = Non condensing system

Valve type 290/390 NC

1 = Stainless steel actuator
63 mm
2 = Plastic actuator 63 mm and
stainless steel actuator
90 mm
3 = Plastic actuator 90 mm
or 125 mm

**Communication features -
Electrical connection type**

2 = I/O link Communication -
Cable Gland
3 = I/O link Communication -
M12 connector

Installation

- Pilot port G 1/8" according to ISO 228/1 or 1/8" NPT
- Compatible with ASTM 1, 2 and 3 oils
- Installation/maintenance instructions in multiple languages are available on our website
- LED indicators for operating status display and diagnostic functions (Unit can be rotated through 360° around the centreline of the valve actuator)

IO-Link® version:

		Description	LED 1	LED 2	LED 3	LED 4	LED 7
Status mode	Position status	Valve OPEN	●				
		Valve CLOSED		●			
		Valve moves to open	⊙				
		Valve move to close		⊙			
		Hold position			●		
	Initialization	Digital Positioner in initialization mode	⊙	⊙			
Digital Positioner in manual mode				⊙			
Error	1	Digital Positioner not initialized	⊙	⊙		●	
	2	Component error				●	

		Description	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7
IO-Link® Diagnostic mode		Connection to IO-Link® master							●
		Valid set point for IO-Link®							⊙
		No connection to IO-Link® master							●
		IO-Link® identification			●				
		Status signal		●					
		Maintenance required		⊙				⊙	
		Still valid output signal							
		Out of specification	●						
		Signal out of the specified range							
		Function check					●		
	Temporary non-valid output signal								
	Failure (= Component ERROR)				●				
	Non-valid output signal								

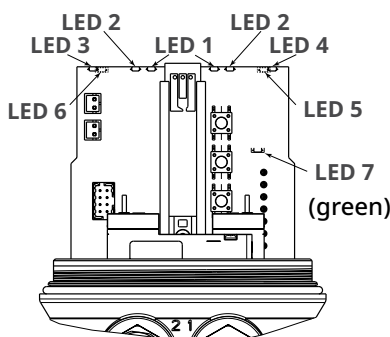
- LED on
- ⊙ LED slow flashing
- LED quick flashing



LED 1, yellow: Valve open position



LED 2, green: Valve close position



LED Status indication		
	LED 3, white	= status (hold position / intermediate position)
	LED 4, red	= Positioner error
	LED 5, orange	= check function
	LED 6, blue	= maintenance required

Installation

• Electrical connection:

IO-Link® Class A Digital Positioner

Screw terminals



M12



1	+24 V DC, power supply, L+	1
2	Not connected	2
3	0 V DC, power supply, L-	3
4	IO-Link® communication CQ	4
5	Not connected	5
6	EMC shield	Body

IO-Link® Class A Digital Positioner with external sensor

Screw terminals

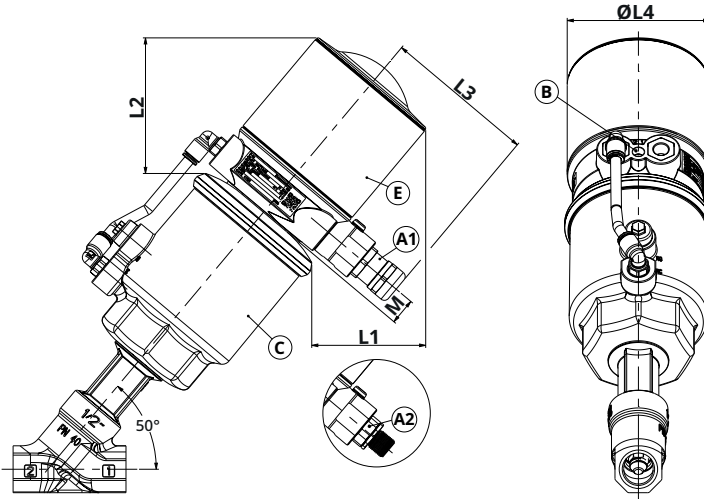


1	+24 V DC, power supply, L+
2	External sensor input
3	0 V DC, power supply, L-
4	IO-Link® communication CQ
5	GND
6	EMC shield

Dimensions mm (inches), Weight kg (Lbs)

Configurator - CAD Files

Angle seat valve - Plastic actuator (with PA or stainless steel side cover)

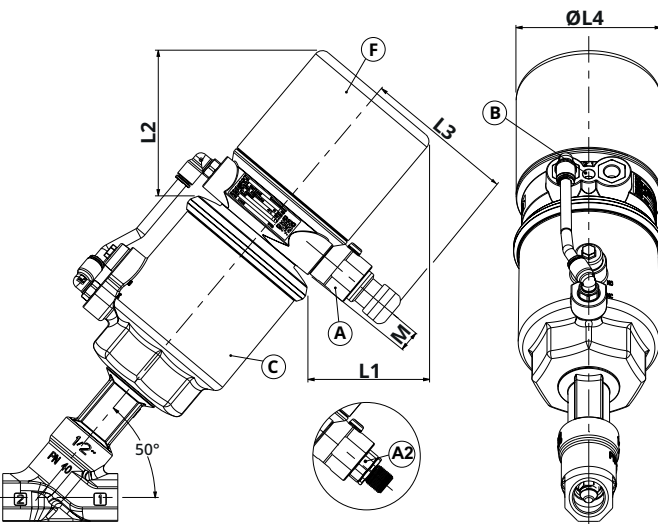


Weight (Digital Positioner alone)		
PA	Stainless steel	
0.470	0.670	kg
1.04	1.48	(Lbs)

- Ⓐ1 Cable gland / Ⓐ2 M12 connector
- Ⓑ Unit rotation lock set screw (orientable through 360°)
- Ⓒ For plastic actuators 63 mm to 125 mm (NC)
- Ⓔ PA cover

Actuator diameter		L1	L2	L3		ØL4	M
				Cable gland	M12		
63 mm	mm	66	78	87	84	82	15.2
	(in)	2.598	3.071	3.425	3.307	3.228	0.6
90 mm	mm	55	70	87	84	82	15.2
	(in)	2.165	2.756	3.425	3.307	3.228	0.6
125 mm	mm	41	58.5	87	84	82	15.2
	(in)	1.614	2.303	3.425	3.307	3.228	0.6

Angle seat valve - Plastic actuator (with aluminium cover)



Weight (Digital Positioner alone)		
Aluminium		
	0.530	kg
	1.17	(Lbs)

- Ⓐ1 Cable gland / Ⓐ2 M12 connector
- Ⓑ Unit rotation lock set screw (orientable through 360°)
- Ⓒ For plastic actuators 63 mm to 125 mm (NC)
- Ⓕ Aluminium cover

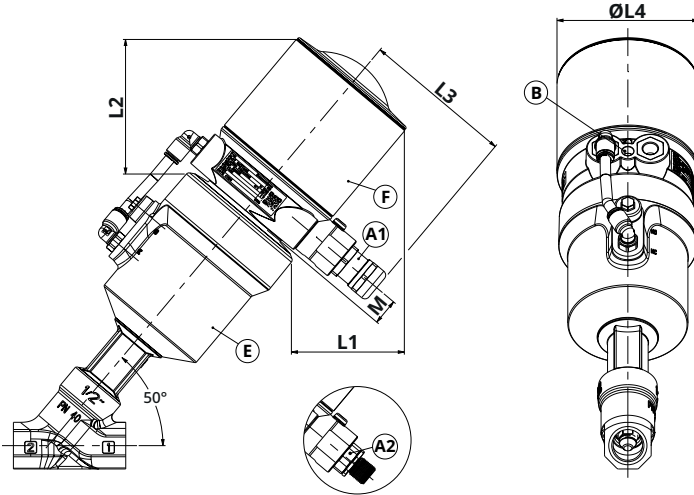
Actuator diameter		L1	L2	L3		ØL4	M
				Cable gland	M12		
63 mm	mm	69	82	87	81	82	15.2
	(in)	2.717	3.228	3.425	3.189	3.328	0.6
90 mm	mm	58	74	87	81	82	15.2
	(in)	2.283	2.913	3.425	3.189	3.328	0.6
125 mm	mm	44.5	62.5	87	81	82	15.2
	(in)	1.752	2.461	3.425	3.189	3.328	0.6

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Dimensions mm (inches), Weight kg (Lbs)

Configurator - CAD Files

Angle seat valve - Stainless steel actuator (with PA or stainless steel cover)

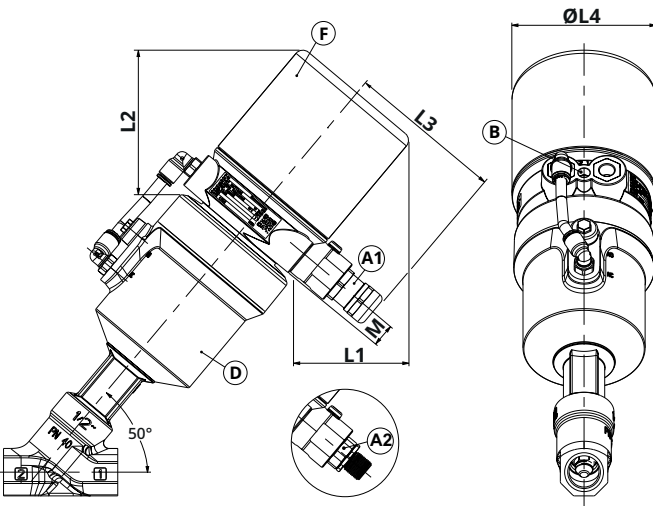


Weight (Digital Positioner alone)		
PA	Stainless steel	
0.480	0.680	kg
1.06	1.5	(Lbs)

- (A1) Cable gland / (A2) M12 connector
- (B) Unit rotation lock set screw (orientable through 360°)
- (E) For stainless steel actuators 63 mm and 90 mm (NC)
- (F) Stainless steel cover

Actuator diameter		L1	L2	L3		ØL4	M
				Cable gland	M12		
63 mm	mm	66	78.5	87	84	82	15.2
	(in)	2.598	3.091	3.425	3.307	3.228	0.6
90 mm	mm	56.5	70.5	87	84	82	15.2
	(in)	2.224	2.776	3.425	3.307	3.228	0.6

Angle seat valve - Stainless steel actuator (with aluminium cover)



Weight (Digital Positioner alone)		
Aluminium		
	0.540	kg
	1.19	(Lbs)

- (A1) Cable gland / (A2) M12 connector
- (B) Unit rotation lock set screw (orientable through 360°)
- (D) For stainless steel actuators 63 mm and 90 mm (NC/NO)
- (F) Aluminium cover

Actuator diameter		L1	L2	L3		ØL4	M
				Cable gland	M12		
63 mm	mm	69.5	82.5	87	81	82	15.2
	(in)	2.736	3.248	3.425	3.189	3.328	0.6
90 mm	mm	60	75	87	81	82	15.2
	(in)	2.362	2.953	3.425	3.189	3.328	0.6

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