

Frese Rotary Actuators

ROP-series

Application

Pneumatic ROP-series actuators are used mainly with the OMEGA Compact 3-way Rotary Control Valves for turning the slide to open or close ports A or B. These actuators can also be used with Frese Butterfly Valves.

The double acting actuator operates in both directions using air pressure on both sides of the piston.

The single acting actuator uses air pressure on one side only to move the piston in the desired direction and the spring on the other side of the piston will place the valve slide in open or close position when the air pressure is decreased or removed.

The spring in the single acting actuator will move the valve slide clockwise or the opposite direction depending on the location of the spring in the actuator.

If a handwheel is needed a Declutchable Manual Gear Override will be used.

ROP-series actuators are designed in accordance with the latest international standards and regulations to achieve a higher performance.



Quality

- ROP-series pneumatic actuators designed and manufactured according to ISO9001.
- All actuators are pressure and leak tested and externally marked with dedicated serial number for traceability.
- Fully compliant with the latest international standards including ISO5211, DIN3337 and VDI/VDE3845.
- Fully compliant with NUMAR standard and convenient to replace or mount accessories including solenoid valves, limit switches and all types of the brackets for the EPR positioners.

Design

- A single compact design utilizing identical body and end caps for both double acting and spring return models
- ROP-series piston rack and pinion design for compact construction, symmetric mounting position, high-cycle life and fast operation
- Two independent external travel stop adjustments permit easy and precise adjustment of $\pm 5^\circ$ in both directions
- Multiple bearings and guides on pistons and racks for precise operation, low friction, high cycle life and a blowout proof pinion shaft
- Electroless nickel-plated, bearing guided, one-piece pinion shaft for improved safety and maximum cycle life

Features

- Reliability and high performance
- Fully compliance with all the latest international standards
- Extensive products range allows best versatility at lower price
- Innovations and patented solutions for a universal drive shaft
- Multifunction position indicator
- High precision teeth on piston racks and pinion shaft for accurate positioning, low backlash, and maximum engagement resulting in efficient operation
- Extruded aluminium body with both internal and external corrosion protections having a honed cylinder surface for longer life and a lower coefficient of friction
- High quality bearings and seals that provide a wide operating temperature range, low friction, and high cycle life
- Internal and external stainless steel fasteners for long term corrosion resistance
- Dedicated programme for OMEGA Compact and Frese Butterfly valves
- Higher protection level

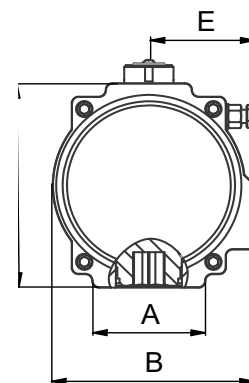
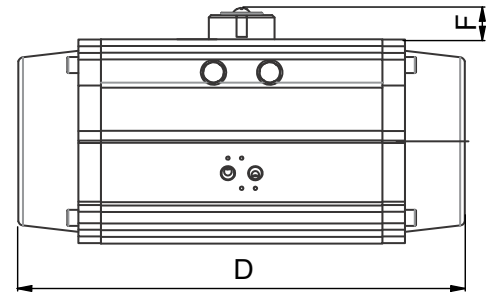
Frese Rotary Actuators

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Technical data

Materials

Body:	Aluminium 6005A-T5
End caps:	Aluminium
Piston:	Aluminium
Drive shaft:	Steel St 45
Spring:	Stainless steel AISI 304
Washer:	Stainless steel AISI 304
Nut:	Stainless steel AISI 304
Indicator thrust bearing:	Stainless steel AISI 304
Thrust washer:	Stainless steel AISI 304
Thrust bearing:	POM + PTFE
Position indicator:	Nylon
Spring seat:	Nylon
O-rings:	NBR
Operating temperature:	-18°C to 80°C (Optional 150°C)

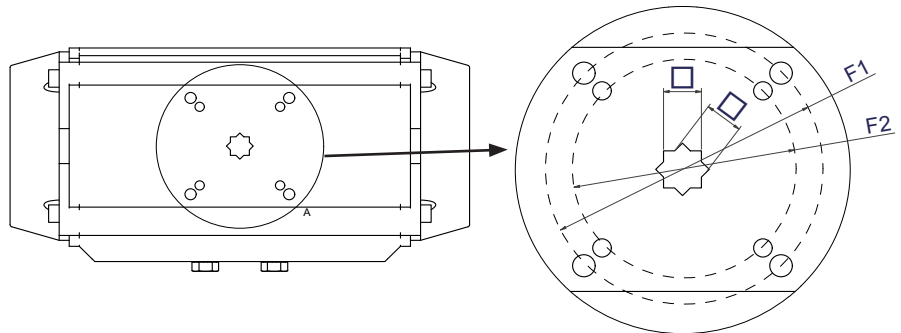


Dimension & Weight

Type Code	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Weight [kg]	
							Double act.	Single act.
085	68	112.5	113	229	63.5	20	3.8	-
095	92	126	123	264	71	20	-	5.9
110	93	138.5	136	266	76.5	20	6.1	-
125	96	157	161	337	85	30	-	12.5
140	110	178	178	377	97	30	14	-
160	112	196	200	414	106	30	-	24
190	136	216.5	232	490	112	30	28	-
210	140	235.5	255	550	120	30	40	-
240	159	262	292	602	131	30	53	78
270	159	295	331	672	174.5	30	74	91
350	270	385	410	845	195	30	-	188
400	290	520	466	956	260	30	220	284

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Connection and torque data



Single acting actuators

Code	SA actuator □ (square)	Flange F1 - F2	Torque spring stroke [Nm]		Torque 7 bar [Nm]	
			90°	0°	0°	90°
B095	17	F05 - F07	83	53	111	81
B110	17	F07 - F10	110	68	146	104
B124	17	F07 - F10	193	122	260	190
B125	22					
B138	17	F10 - F12	293	197	367	271
B139	22					
B140	27					
B159	17	F10 - F12	389	264	521	395
B160	22					
B161	27					
B189	22					
B190	27	F10 - F14	628	436	796	605
B191	36					
B208	22	F14	861	589	1131	858
B209	27					
B210	36					
B240	36	F16	1329	985	1683	1339
B270	36	F16	1886	1342	2410	1866

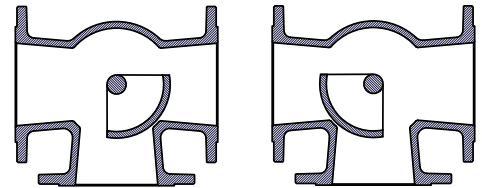
Double acting actuators

Code	DA actuator □ (square)	Flange F1 - F2	Actuator torque (7 bar) NM
C095	17	F07 - F10	164
C110	17	F07 - F10	214
C124	17	F07 - F10	383
C125	22		
C139	22	F10 - F12	565
C140	27		
C159	22		
C160	27	F10 - F12	785
C189	27		
C190	36	F10 - F14	1232
C210	36	F14	1720

Frese Rotary Actuators

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Actuator selection for OMEGA Compact
Leakguard series· C-left & C-right

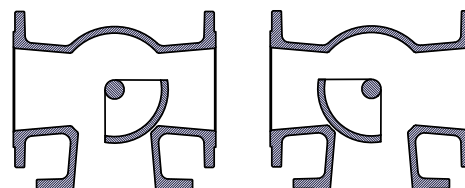


Actuator	Valve size	Actuator Codes in relation to differential pressure across the valve			
		$\Delta P \leq 5\text{bar}$	$\Delta P \leq 10\text{bar}$	$\Delta P \leq 16\text{bar}$	$\Delta P \leq 25\text{bar}$
Single acting	DN65	B095	B095	B095	B095
	DN80	B095	B095	B110	B124
	DN100	B095	B110	B124	B124
	DN125	B124	B124	B124	B138
	DN150	B124	B138	B138	
	DN200	B139	B160	B189	
	DN250	B160	B189	B208 (*SD4 gear)	
	DN300	B190	B209	B209	
	DN350	B240	B270		
	DN400	B240	B270		
	DN450				
	DN500				
	DN550				
	DN600				
	DN650				
	DN700				
	DN800				
Double acting	DN65	C085	C085	C085	C085
	DN80	C095	C095	C095	C095
	DN100	C095	C095	C095	C095
	DN125	C110	C110	C110	C110
	DN150	C110	C110	C110	
	DN200	C125	C125	C125	
	DN250	C125	C139	C139	
	DN300	C140	C140	C160	
	DN350	C190	C190		
	DN400	C190	C190		
	DN450				
	DN500				
	DN550				
	DN600				
	DN650				
	DN700				
	DN800				

Frese Rotary Actuators

ROP-series

Actuator selection for OMEGA Compact
Standard series: C-left & C-right

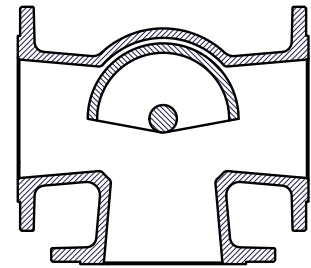


Actuator	Valve size	Actuator Codes in relation to differential pressure across the valve			
		$\Delta P \leq 5\text{bar}$	$\Delta P \leq 10\text{bar}$	$\Delta P \leq 16\text{bar}$	$\Delta P \leq 25\text{bar}$
Single acting	DN65	B095	B095	B095	B095
	DN80	B095	B095	B095	B110
	DN100	B095	B095	B095	B110
	DN125	B110	B110	B124	B124
	DN150	B110	B124	B124	
	DN200	B125	B139	B160	
	DN250	B139	B160	B189	
	DN300	B140	B190	B190	
	DN350	B210	B240		
	DN400	B210	B240		
	DN450				
	DN500				
	DN550				
	DN600				
	DN650				
	DN700				
	DN800				
Double acting	DN65	C085	C085	C085	C085
	DN80	C095	C095	C095	C095
	DN100	C095	C095	C095	C095
	DN125	C110	C110	C110	C110
	DN150	C110	C110	C110	
	DN200	C125	C125	C125	
	DN250	C125	C125	C125	
	DN300	C140	C140	C140	
	DN350	C190	C190		
	DN400	C190	C190		
	DN450				
	DN500				
	DN550				
	DN600				
	DN650				
	DN700				
	DN800				

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Actuator selection for OMEGA Compact
Leakguard series· C-Middle



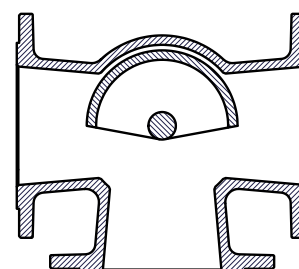
Actuator	Valve size	Actuator Codes in relation to differential pressure across the valve			
		$\Delta P \leq 5\text{bar}$	$\Delta P \leq 10\text{bar}$	$\Delta P \leq 16\text{bar}$	$\Delta P \leq 25\text{bar}$
Single acting	DN65	B110	B110	B110	B110
	DN80	B110	B110	B124	B124
	DN100	B124	B124	B124	B124
	DN125	B124	B138	B138	B138
	DN150	B138	B138	B159	
	DN200	B160	B189	B189	
	DN250	B189	B208 (*SD4 gear)	B208 (*SD4 gear)	
	DN300	B209			
	DN350	B240	B270		
	DN400	B270			
	DN450				
	DN500				
	DN550				
	DN600				
	DN650				
	DN700				
	DN800				
Double acting	DN65	C095	C095	C095	C095
	DN80	C095	C095	C095	C095
	DN100	C095	C095	C095	C095
	DN125	C110	C110	C110	C110
	DN150	C110	C110	C124	
	DN200	C125	C125	C139	
	DN250	C139	C139	C159	
	DN300	C160	C160	C189	
	DN350	C190	C210		
	DN400	C210	C210		
	DN450				
	DN500				
	DN550				
	DN600				
	DN650				
	DN700				
	DN800				

*) See gear information on page 10

Frese Rotary Actuators

ROP-series

Actuator selection for OMEGA Compact
Standard series· C-Middle



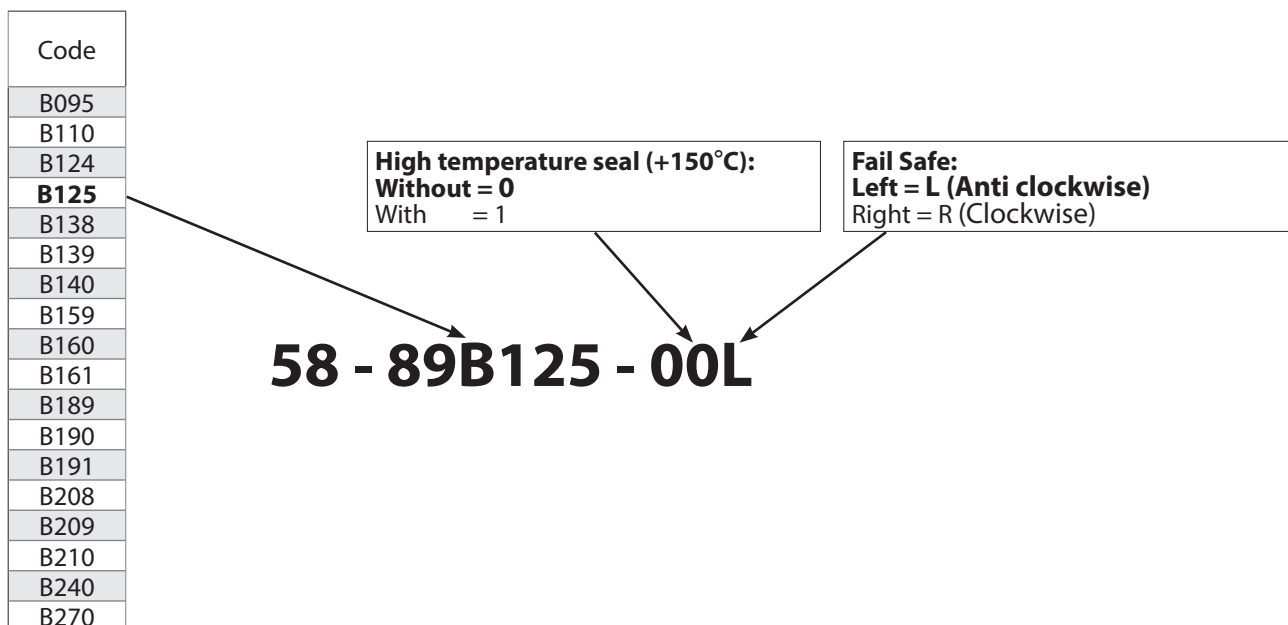
Actuator	Valve size	Actuator Codes in relation to differential pressure across the valve			
		$\Delta P \leq 5\text{bar}$	$\Delta P \leq 10\text{bar}$	$\Delta P \leq 16\text{bar}$	$\Delta P \leq 25\text{bar}$
Single acting	DN65	B095	B095	B095	B095
	DN80	B095	B095	B095	B110
	DN100	B095	B095	B095	B110
	DN125	B110	B110	B124	B124
	DN150	B110	B124	B124	
	DN200	B125	B139	B160	
	DN250	B139	B160	B189	
	DN300	B140	B190	B190	
	DN350	B210	B240		
	DN400	B210	B240		
	DN450				
	DN500				
	DN550				
	DN600				
	DN650				
	DN700				
	DN800				
Double acting	DN65	C085	C085	C085	C085
	DN80	C095	C095	C095	C095
	DN100	C095	C095	C095	C095
	DN125	C110	C110	C110	C110
	DN150	C110	C110	C110	
	DN200	C125	C125	C125	
	DN250	C125	C125	C125	
	DN300	C140	C140	C140	
	DN350	C190	C190		
	DN400	C190	C190		
	DN450				
	DN500				
	DN550				
	DN600				
	DN650				
	DN700				
	DN800				

Frese Rotary Actuators

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Part numbers single acting actuator

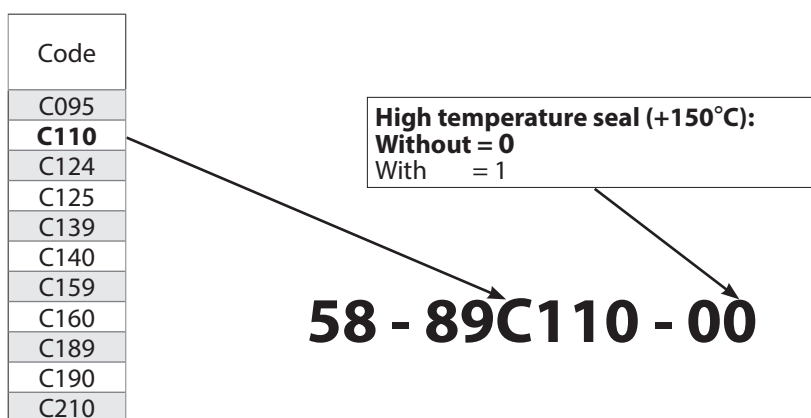
Single acting Rotary Actuators ROP-series part numbers are generated from the following specifications:



Actuator connection and torque data on page 3

Part numbers double acting actuator

Double acting Rotary Actuators ROP-series part numbers are generated from the following specifications:



Actuator connection and torque data on page 3

Please note: Manual override gear with handwheel must be ordered separately

Please note: Gearbox and actuator must be ordered together

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Pneumatic Filter Regulator

The function of the filter regulator is to clean the air for dirt, separate the liquids within the compressed air - and control the speed and precision of the flow of air.

Integrated filter and regulator units save space and require less piping. With the backflow function, it incorporates a mechanism to exhaust the air pressure in the outlet side reliably and quickly. Due to auto drain function, there is no need for manual draining.

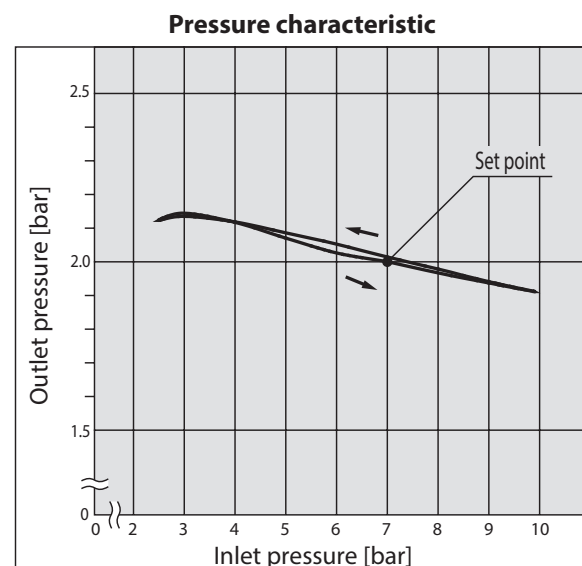
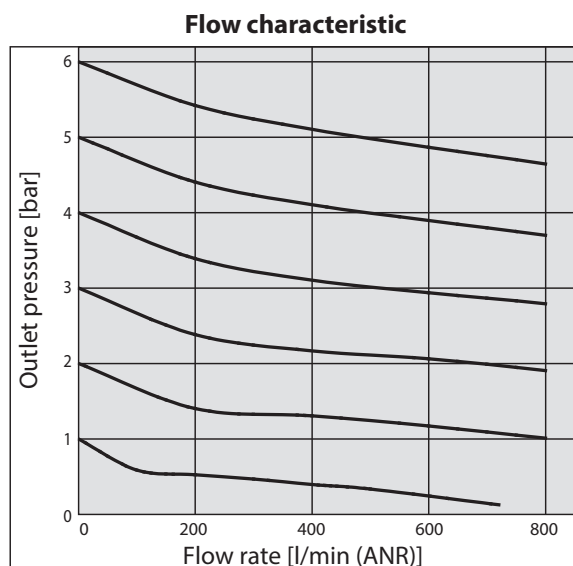
Technical data

Float type auto drain:	N.C. Normally Closed
Backflow function:	Yes
Pipe thread type:	G
Port size:	1/4"
Pressure gauge:	Square embedded, Round type
Fluid Air:	Air
Ambient and fluid temperature:	-5 to 60 °C
Proof pressure:	15 bar
Maximum operating pressure:	10 bar
Set pressure range:	0.5 to 8.5 bar
Nominal filtration rating:	5 µm
Drain capacity:	8 cm ³
Bowl material:	Metal
Bowl guard:	Steel, Polycarbonate
Construction:	Relieving type
Mounting:	With bracket (included)
Weight:	0.2 kg



Frese no. 58-8957

Filter characteristic



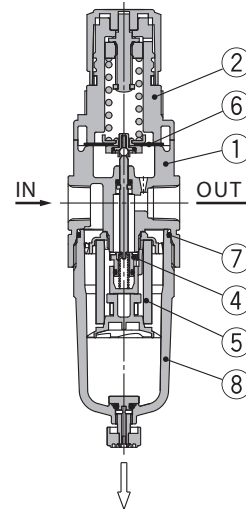
Frese Rotary Actuators

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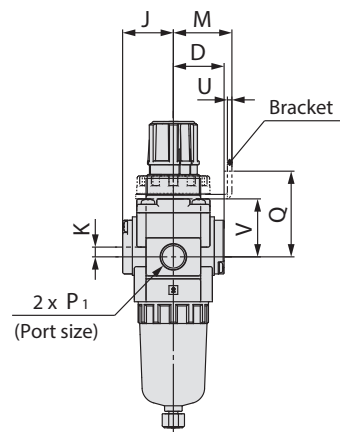
Pneumatic Filter Regulator

Construction

1. Body	Aluminium die-cast
2. Bonnet	Polyacetal
3. Housing	Aluminium die-cast
4. Valve assembly	Brass, HNBR
5. Filter element	Non-woven fabric
6. Diaphragm assembly	Weatherable NBR
7. Bowl O-ring	NBR
8. Bowl assembly	Polycarbonate



Dimensions



Panel mounting dimensions

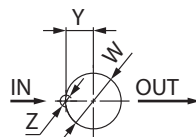
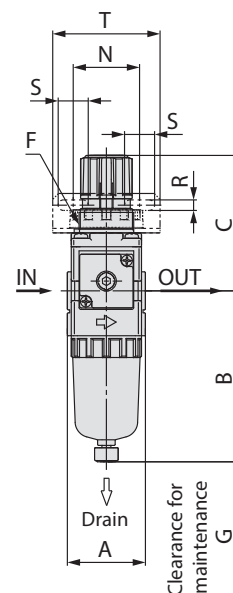


Plate thickness
AW20(K)-B: Max. 3.5



Standard specifications

P1	A	B	C	D	E	F	G	J	K
1/4"	40	160	73	26	-	M28x1	40	26	5

Bracket mount							Panel mount				With auto drain
M	N	Q	R	S	T	U	V	W	Y	Z	B
30	34	44	5.4	15.4	55	2.3	30	28.5	14	6	177

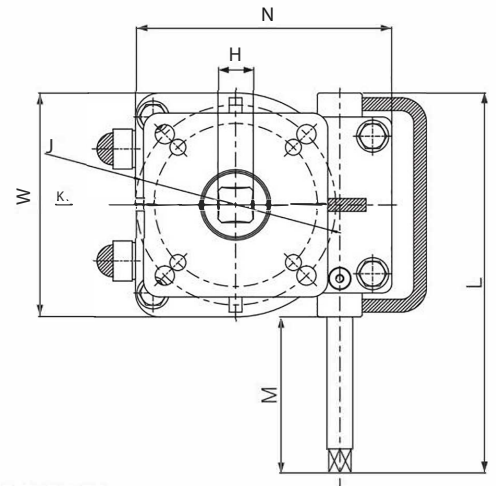
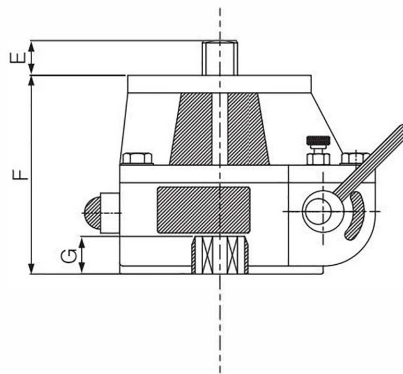
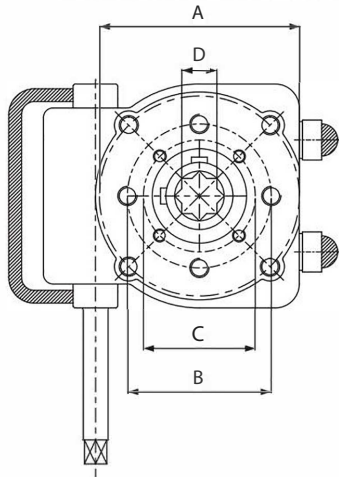
Frese Rotary Actuators

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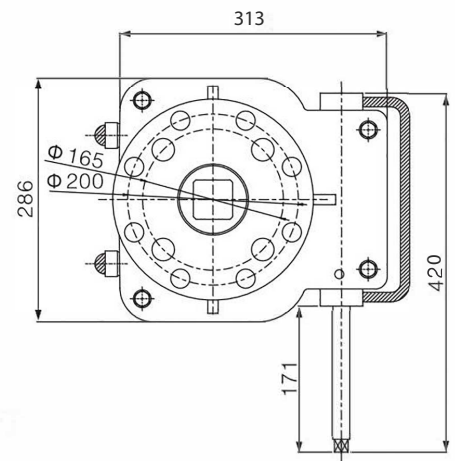
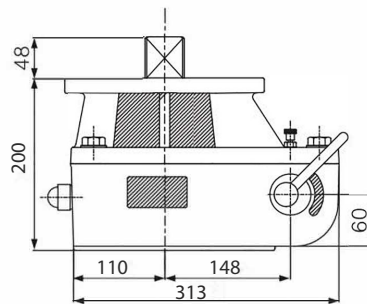
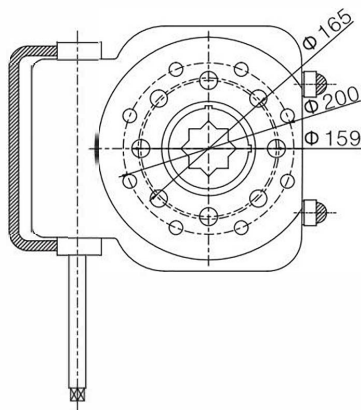
Pneumatic Gear

Dimensions

Dimensions sizes: SD-1 to SD-6



Dimensions sizes: SD-7



Dimensions [mm]

Size	SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7
A	F07	F10	F12	F14	F16	F16	F16
B	ø57	ø70	ø89	ø108	ø108	ø159	ø159
C	F05	F07	F07/F10	F10/F12	F14	F14	ø200
D	15*15	19*19	27*27	27*27	32*32	46*46	46*46
E	15	19	22	28	38	48	48
F	105	110	130	165	185	200	200
G	20	22	28	32	40	50	50
H	17*17	17*17	22*22	27*27	36*36	46*46	46*46
N	115	135	160	200	244	282	313
W	89.5	125	136	187.5	220	251	286
J	F07	F10	F12	F14	F16	F16	F16
K	F05	F07	F10	F10/F12	F14	-	ø200
L	180	220	257	330	370	400	420
M	71	92.3	113	147.8	148	158	171
Handwheel	ø180	ø200	ø280	ø320	ø400	ø500	ø600
Weight [kg]	3	4.5	7	13.7	22	30	38

Frese Rotary Actuators

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Electro-Pneumatic Rotary Positioner

The Electro-Pneumatic Rotary Positioner is a robust valve control device which is giving a confidence in reliable performance and outstanding durability under harsh working environments.

Features

Precise calibration with simple SPAN and ZERO adjustments.
Simple conversion to direct acting or reverse action.
1/2 split range available
Rugged aluminium housing with corrosion-resistant coating.
Vibration resistant design.
Stainless steel gauges standard.

Technical data

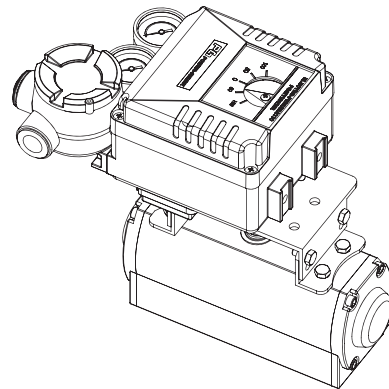
Input Signal:	4-20 mA DC
Input Resistance:	235 ±15Ω
Air Supply:	Max. 7.0 bar free of oil, water and moisture
Operating Angle:	60-100° (Adjustable)
Pneumatic Connections:	PT(Rc) 1/4
Electrical Connections:	PF(G) 1/2
Protection Class:	Ex dmb IIB+h ₂ T6 Ex dmb IIC T6/T5 Ex ia IIC T6 / IP66
Ambient Temperature:	-20°C to 70°C
Pressure Gauge:	Stainless steel
Output Characteristics:	Linear
Linearity	Single: Within ±1.0% F.S.
	Double: Within ±1.5% F.S.
Sensitivity:	Within ±0.5% F.S.
Hysteresis:	Within ±1.0% F.S.
Repeatability:	Within ±0.5% F.S.
Air Consumption:	5 l/min. (Sup. 1.4 bar)
Flow Capacity:	80 l/min. (Sup. 1.4 bar)
Material:	Aluminium die-cast
Weight:	3.5 kg



Positioner with flat indicator



Positioner with dome indicator



Product programme

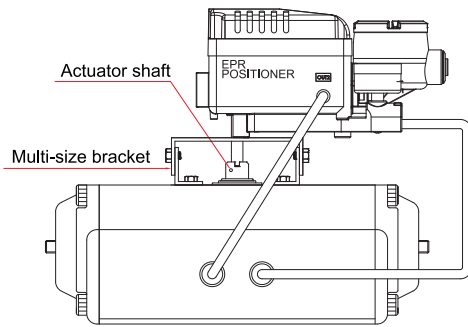
Type	Indicator type	Limit switch
58-8959	Flat	Without
58-8960	Dome	With

Frese Rotary Actuators

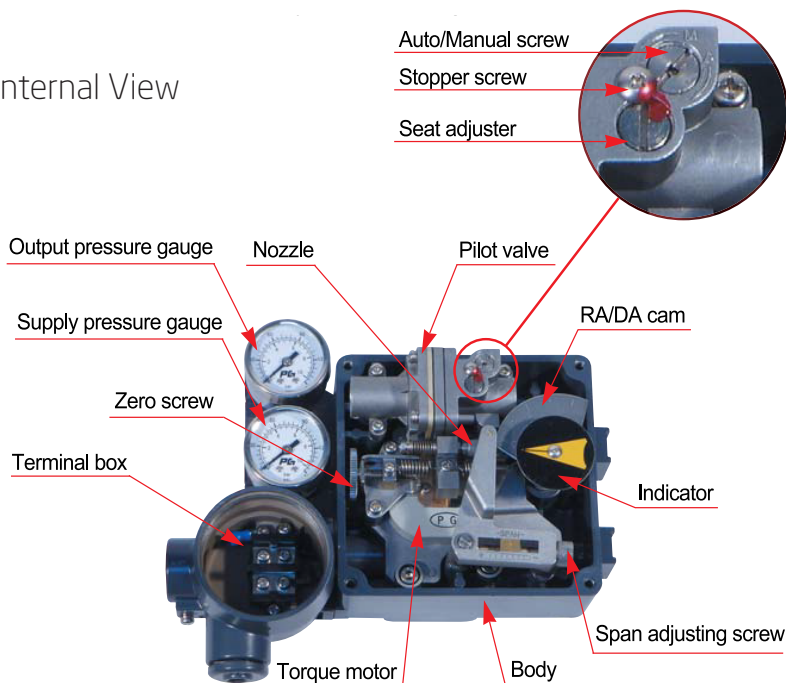
ROP-series

Electro-Pneumatic Rotary Positioner

Mounting

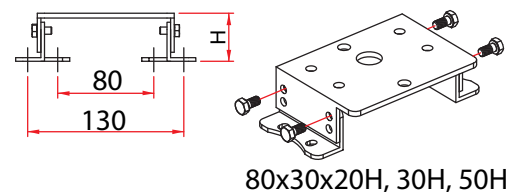
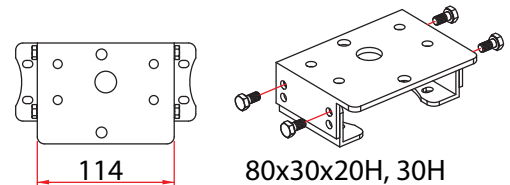


Internal View

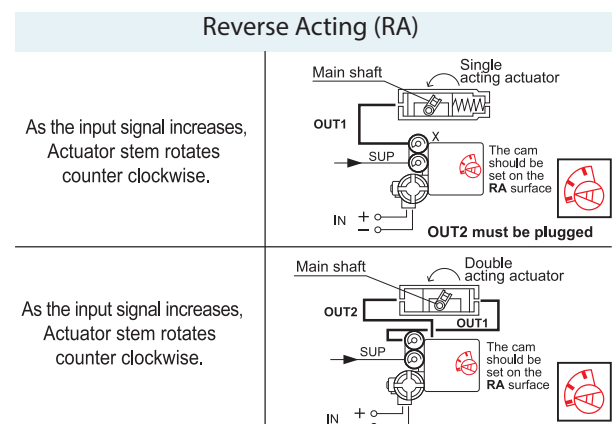
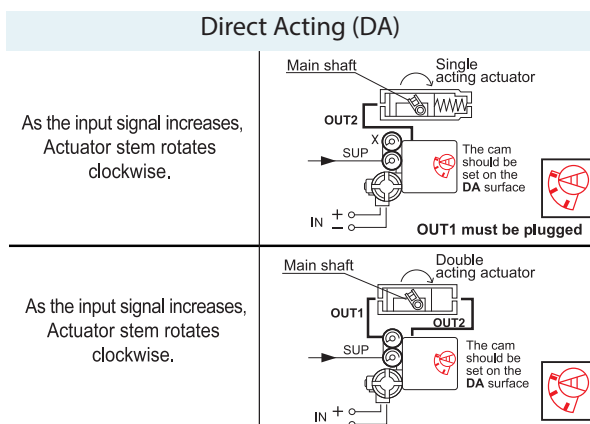


Multi-size Bracket

TYPE	H
80 x 30 x 20H	41
80 x 30 x 30H	51
130 x 30 x 20H	41
130 x 30 x 30H	51
130 x 30 x 50H	71



Air Connections



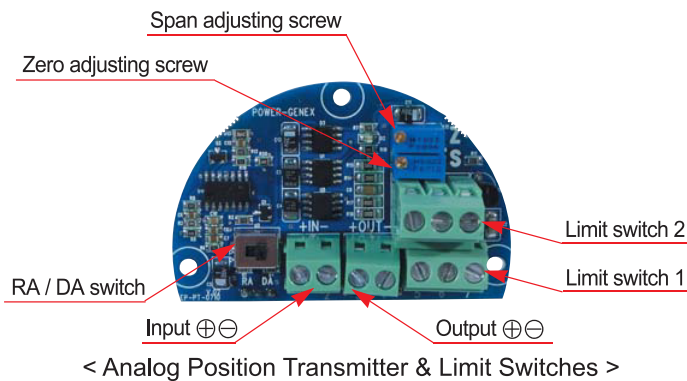
Frese Rotary Actuators

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Electro-Pneumatic Rotary Positioner

Position Transmitter

1. Board View

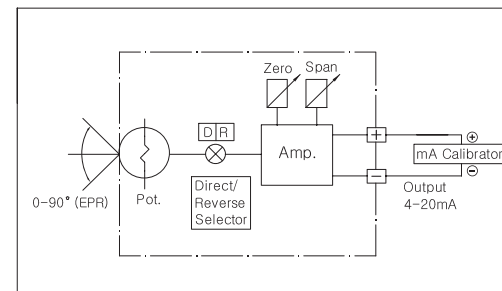


2. Position Transmitter (4-20mA output signal)

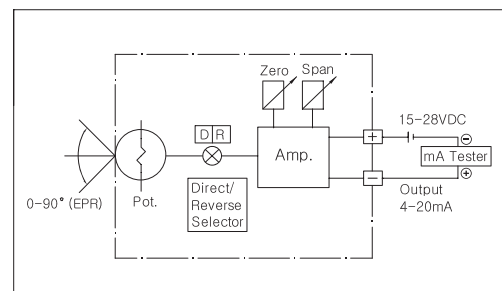
a. Specifications

Power Supply Rating	5.5-30 VDC loop power
Recommended Power Supply	24 VDC
Output Signal	4 - 20 mA, 2-wire
Operating Temperature	-20 °C ~ +85 °C
Load Impedance	0 ~ 600 ohms
Max. Output	30 mA DC
Linearity	±1.0 %
Hysteresis	1.0 % of full scale
Repeatability	±0.5 % of full scale
Adjustment	Zero and Span in terminal box

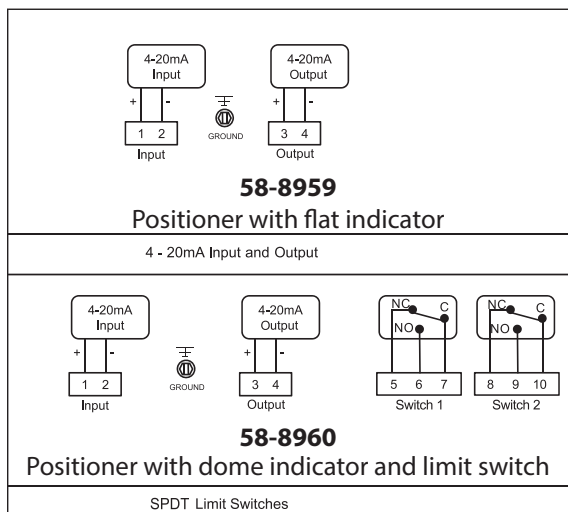
b. with mA calibrator



c. with multimeter



3. Wiring Diagram

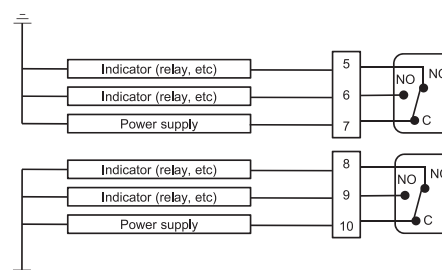


4. SPDT Limit Switches

a. Specifications

Contacts	SPDT Form C
AC Rating	16 A 1/2 HP 125/250 VAC
DC Rating	0.6 A 125 VDC / 0.3 A 250 VDC
Adjustment	Cams with set screws (L-wrench included for setting)

b. Wiring and Application



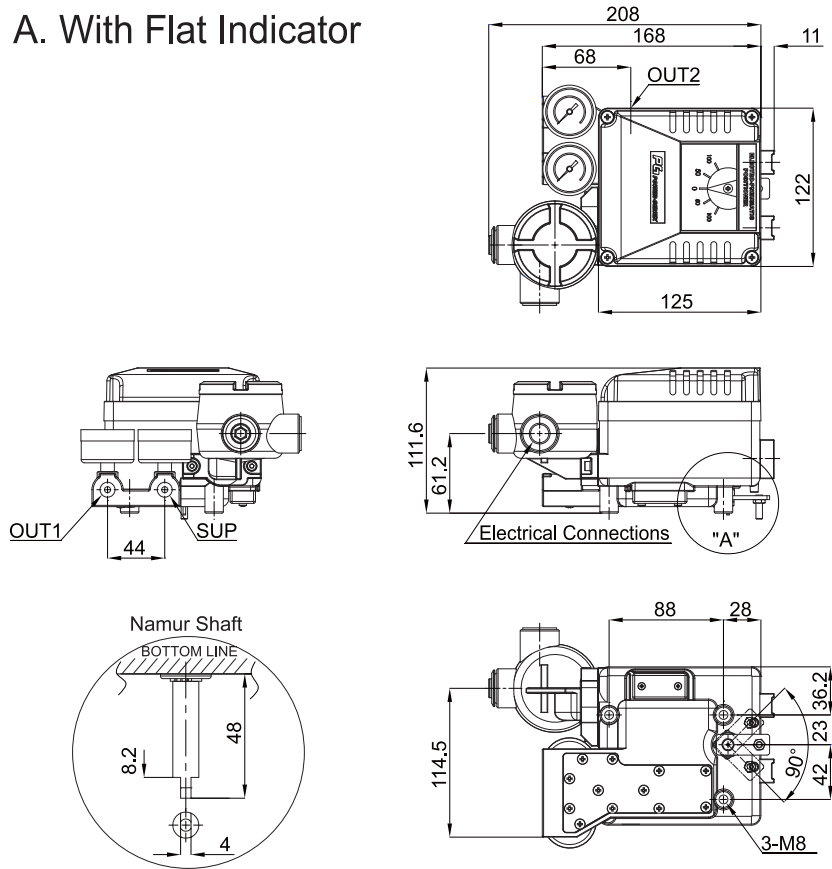
Frese Rotary Actuators

ROP-series

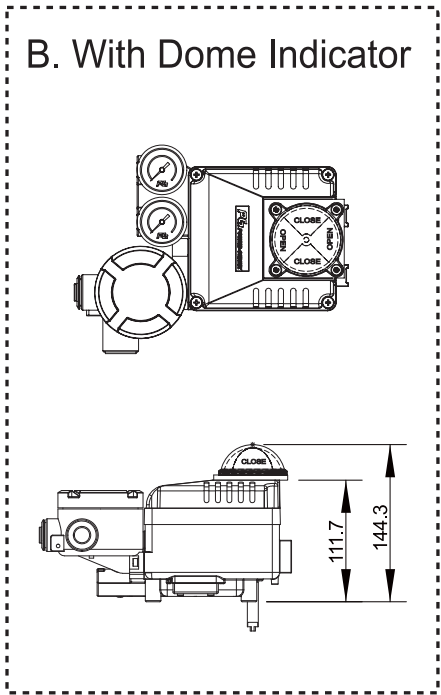
Electro-Pneumatic Rotary Positioner

Dimensions

A. With Flat Indicator



B. With Dome Indicator



Mounting kit

	Description	Item no.
	Kit with air hoses and fittings between actuator, positioner and filter regulator	58-8970

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