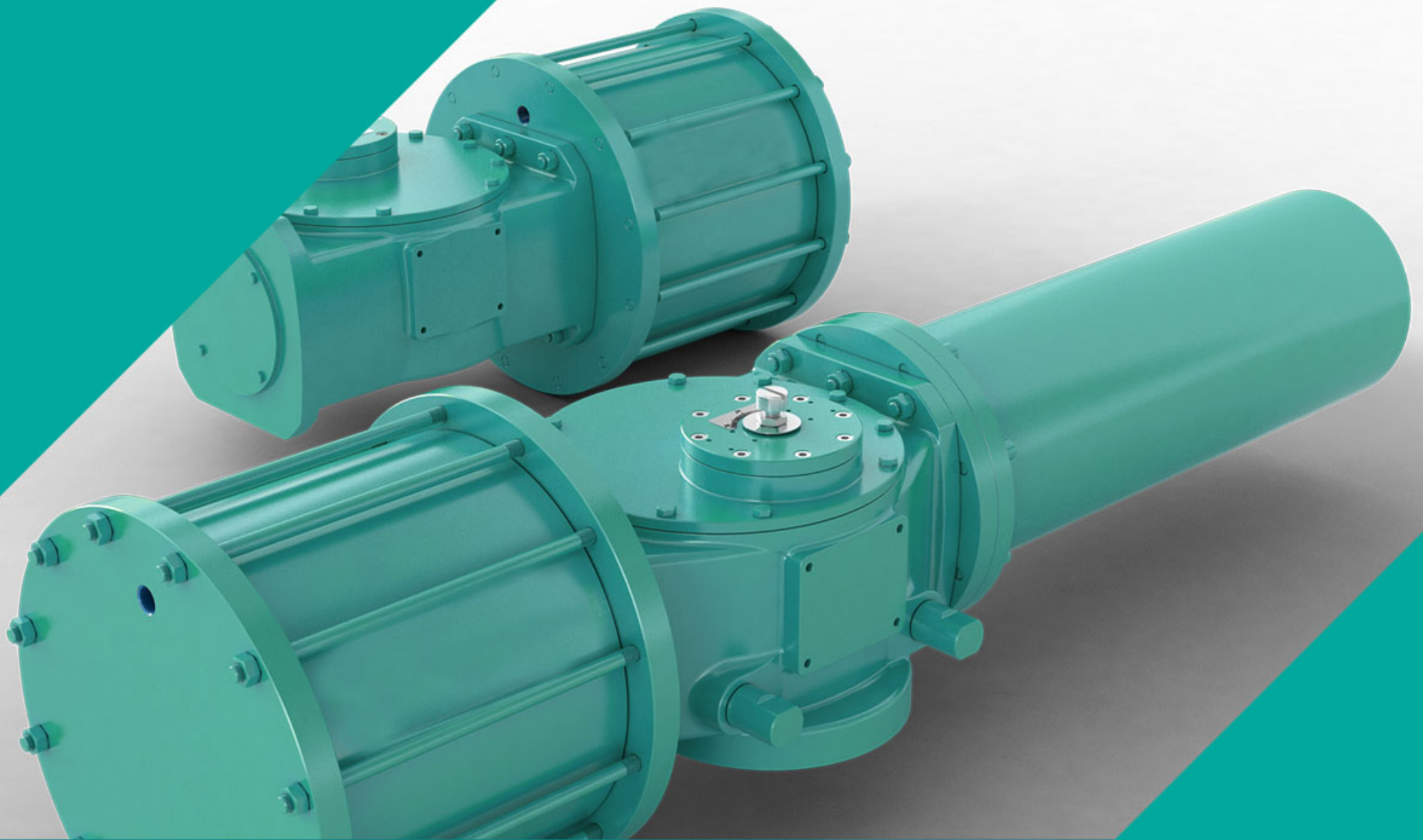


SCOTCH YOKE ACTUATOR



CREATIVE • INNOVATION • PROCESS



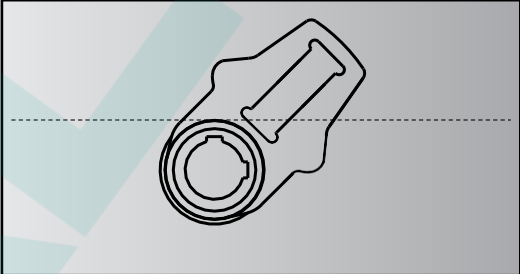
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SCOTCH YOKE HEAVY DUTY ACTUATOR

Description

PAC-SH Series Heavy-duty Pneumatic Actuator is designed suitable for general purpose of valves and damper automation and offer a wide range of torques enable to operate ball, butterfly, plug valves, dampers or any device that requires a quarter turn operation for on-off or modulating service. Asymmetric yoke provide more constant torque throughout - at both the break points and end positions.



Features

- **Wear Resistance** : tension rod is a high strength alloy steel treated to provide a highly corrosion and wear resistant finish. The superior surface finishes, and self-lubricating bearings maximise the transfer of input energy directly to the valve stem. The tension loaded spring minimises radial loads on the piston rod, further enhancing efficiency.
- **Service Rated** : qualified by accelerated wear testing. The actual service life may be predicted based upon specific application parameters and environmental conditions. Proper actuator selection, enhanced by proprietary data analysis methods, allows optimum performance and operating economy
- **Replaceable Bearings** : Low friction, permanently lubricated, high performance bearings protect sliding and rotating components, significantly extending actuator life.
- **Two Year Warranty** : backed by the industry’s strongest materials and workmanship warranty.
- **Corrosion Resistance** : incorporate protective internal and external coatings, assuring the actuator’s reliable operation in the harshest of environments. The air cylinder is PTFE lined for further corrosion resistance and also reduce friction. The actuator exhibits excellent corrosion resistance, confirmed by Salt Spray Testing. Construction features prevent water ingress, allowing to meet IP 66 and IP 67M specifications. The cylinder case is PTFE lined for improved corrosion resistance and ease/smoothness of operation.
- **Safety** : facilitates safe installation and removal of the spring module. It allows for the removal of the spring module in a manner that eliminates accidental release of the spring force.
- **Interchangeability** : The ease of interchanging the power and spring modules allows quick reversal of the “fail-safe” mode, while providing for the addition of over-rides, accessories and other modules.
- **Design** : modular design features field serviceable modules. The available modules include the drive, power, spring and over-ride. These modules are removable, serviceable and interchangeable without removing the actuator from the valve. This procedure does not require special tools or disassembly of any module. This unique feature reduces required plant shutdown time for service. Modules may be replaced as an assembly or serviced at your maintenance facility.
- **Modular Inventory** : All modules may be purchased separately or in any combination. This features allows reduced parts and spares inventory at the distribution facility, while substantially increasing the availability of different model configurations.
- **Namur** : The shaft driven accessory interface conforms to the NAMUR standard and is identical on all actuators, allowing for standardisation of accessory mounting hardware and installation practices.
- **MSS and ISO Mounting** : Actuator desing meets the dimensional requirements of MSS SP-101 or ISO 5211 defined for each torque range.
- **Compact** : The actuator design optimises the centre of gravity location, is significantly lighter, and requires less space than other actuators of equal or lesser torque output

Application

- | | |
|------------------------------|------------------------------------|
| • Chemical and Petrochemical | • Oil and Gas |
| • Food and Beverage | • Pulp and Paper |
| • HVAC | • Semiconductor |
| • Marine | • Water and Wastewater |
| • Mining | • Original Equipment Manufacturing |

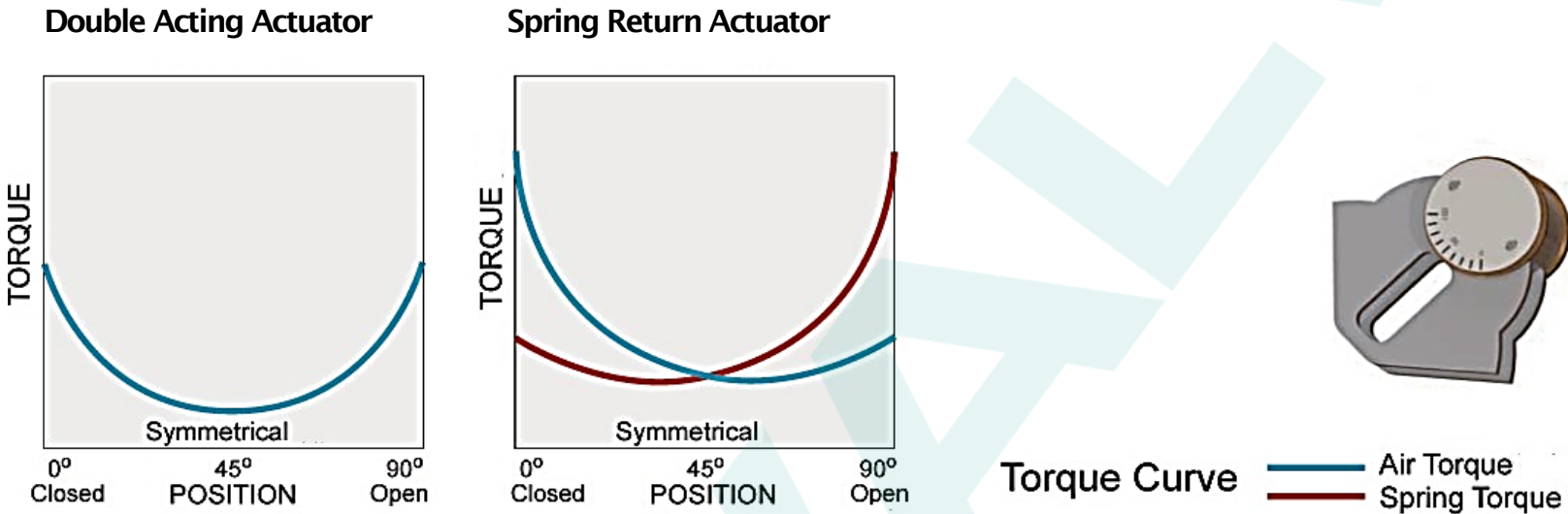
Temperature

Suitable Environment Temperature

- For standard pneumatic actuator: -20°C~80°C
- For low temperature pneumatic actuator: -40°C~80°C
- For high temperature pneumatic actuator: -20°C~120°C

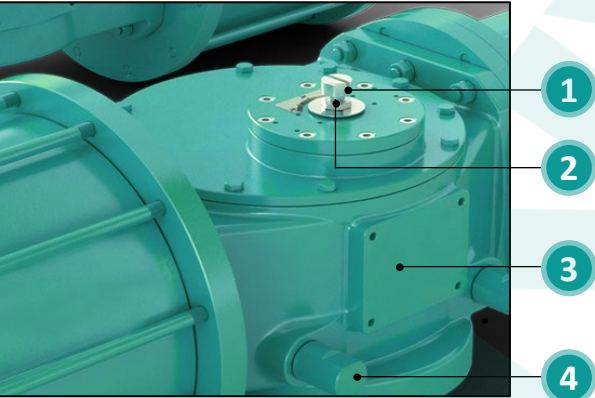
Mechanism

Symmetric Yoke Mechanism



Structure

ACTUATOR BODY



1

2

3

4

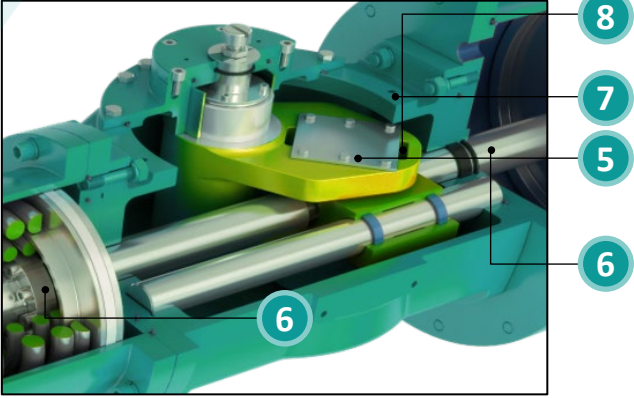
1. Internal O-Rings to ensure water ingress protection.

2. NAMUR Standard for all sizes for assembly of switch boxes and positioners.

3. Threaded parts in front and the back side of the body for easy assembly of a pneumatic control panel.

4. Body while preventing the ingress of gas, corrosive elements and water.

INTERNAL BODY PARTS



8

7

5

6

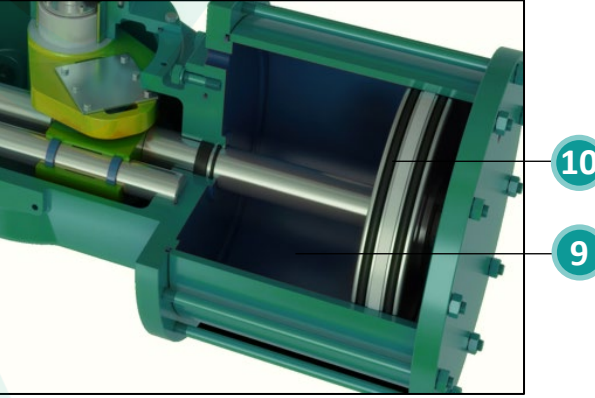
5. Dual roller type pinion reduces the friction between the yoke arm and pin, minimizing the wear.

6. Sintered Teflon metallic bearings protect the sliding and rotating components, suitable for either dry or lubricated working conditions.

7. PTFE thrust bar prevents yoke pin axial movement, transferring axial loads directly to the drive module case.

8. Guide block connects the piston rod with the pinion, and compensates for side load deflection thereby reducing wear on rod, bearings and seals.

PNEUMATIC CYLINDER



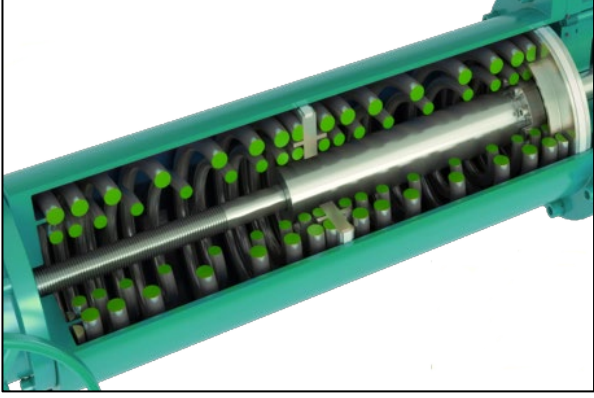
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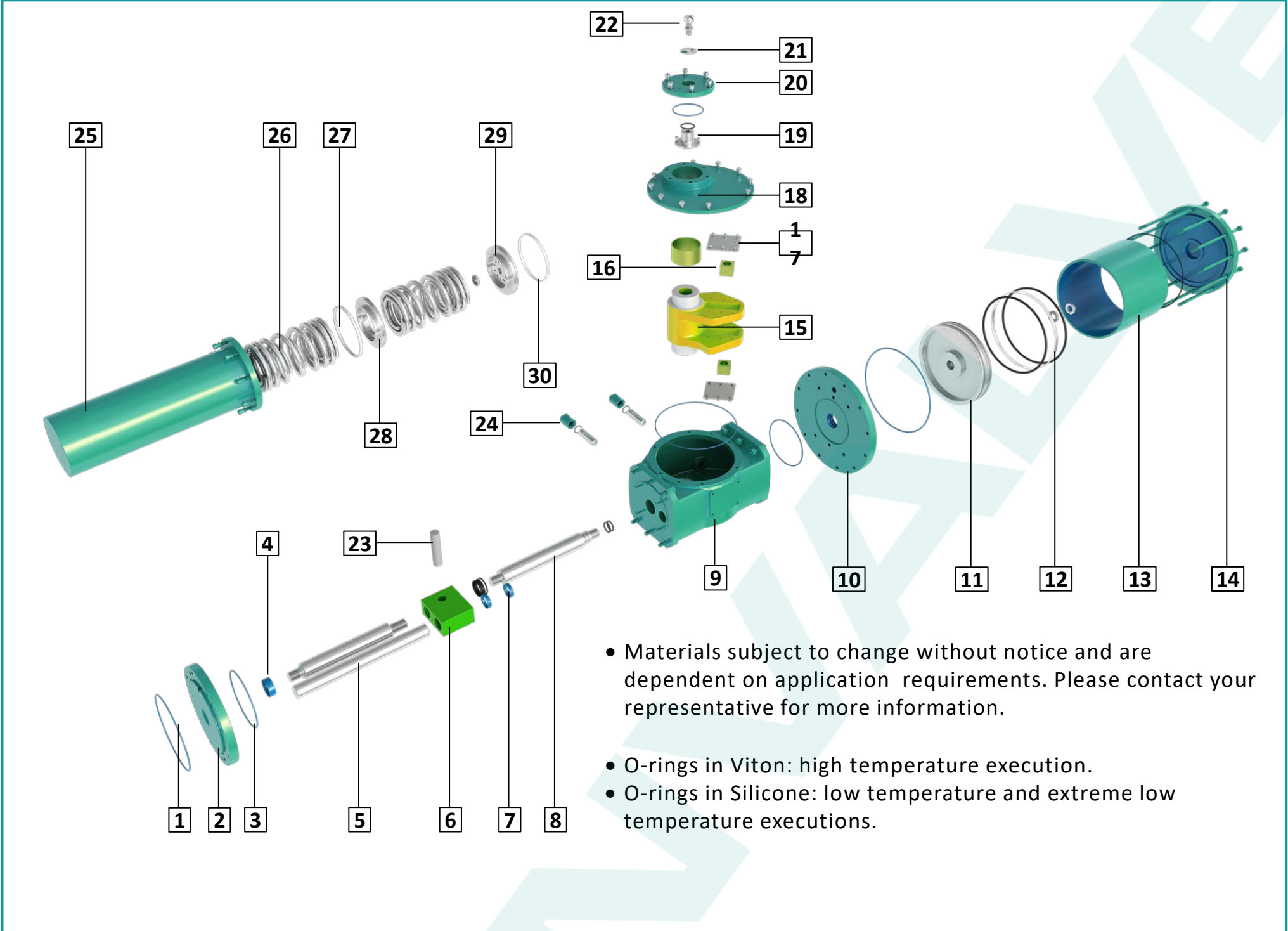
9. PNEUMATIC CYLINDER
The inner surface of cylinder is coated with Sintered Teflon to reduce friction.

10. PISTONS SEALS
Double sealing, with O-Ring and dynamic ring to prevent metal to metal contact between the piston and the cylinder.

SPRING MODULE



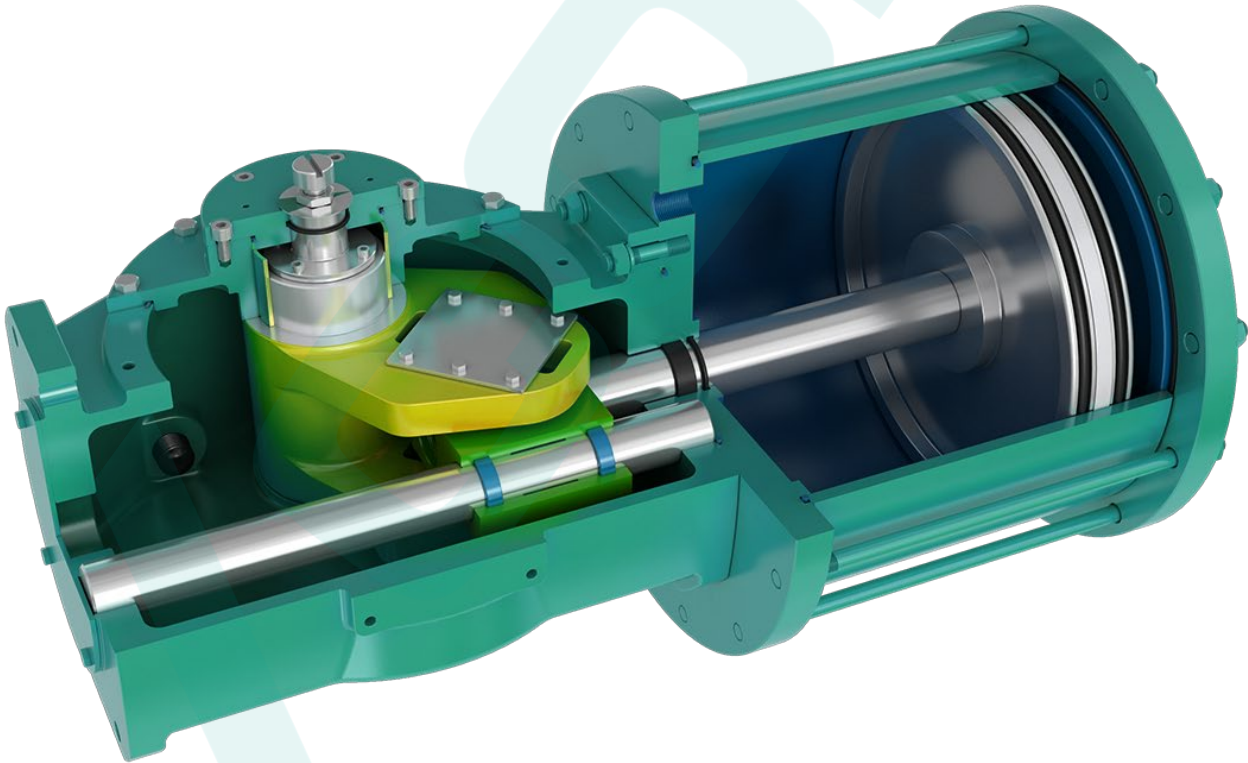
Parts & Materials :



No	Part name	Materials	No	Part name	Materials
1	O-Ring	Viton	16	Slide block	Copper
2	End Cap	Carbon Steel	17	Plate	Metal
3	O-Ring	Viton	18	Body Cover	Ductil iron
4	Bearing	PTFE	19	Drive Shaft	Stainless steel
5	Center Guide bar	Alloy Steel Chromium Plated	20	Shaft Cover	Ductil iron
6	Guide Block	Ductil iron	21	Indicator	Metal
7	Bearing	PTFE	22	Nut	Stainless Steel
8	Tension rod	Alloy steel chromium plated	23	Yoke Pin	
9	Body	Ductil iron	24	Adjustment screw	Stainless Steel
10	Guide Plate	Carbon steel	25	Spring Can	Carbon steel
11	Piston	Carbon steel	26	Spring	Alloy steel
12	O-Ring	Nylon	27	O-ring	Nylon
13	Pneumatic Cylinder	Carbon steel	28	Hydraulic cylinder	Carbon steel (LF6)
14	End Cap	Carbon steel	29	Piston	Carbon steel
15	Yoke	Carbon steel	30	O-ring	Nylon

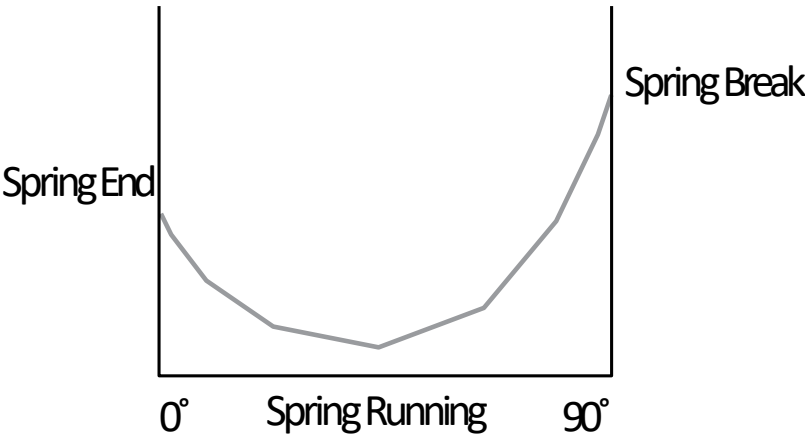
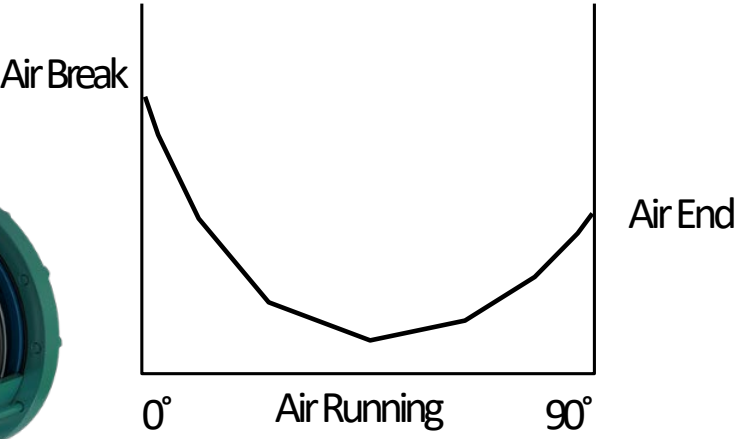
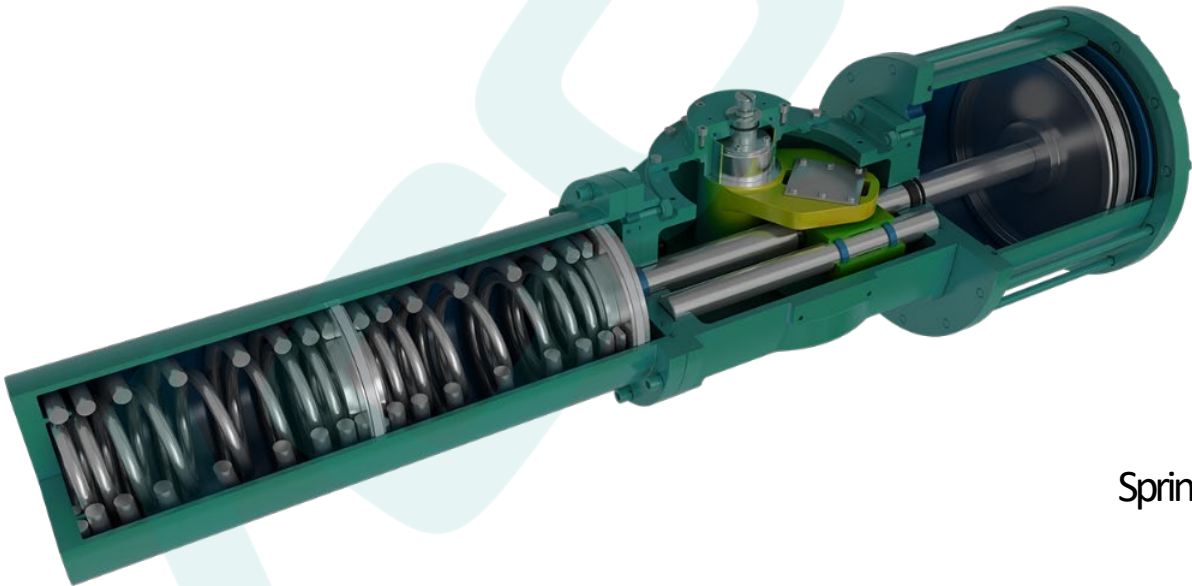
Double Acting Actuator Torque Output

Model	Operating Air Supply Pressure (Bar)														
	3bar			4bar			5bar			6bar			7bar		
	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
PAC-SH17DA-250	1326	862	1326	1768	1149	1768	2210	1437	2210	2705	1758	2705	3093	2010	3093
PAC-SH17DA-280	1663	1081	1663	2217	1441	2217	2772	1802	2772	3326	2162	3326			
PAC-SH20DA-300	2496	1622	2496	3329	2164	3329	4161	2705	4161	4993	3245	4993	5825	3786	5825
PAC-SH20DA-320	2840	1846	2840	3787	2462	3787	4734	3077	4734	5681	3693	5681			
PAC-SH22DA-320	3342	2172	3342	4456	2896	4456	5569	3620	5569	6683	4344	6683	7797	5068	7797
PAC-SH22DA-360	4229	2749	4229	5639	3665	5639	7049	4582	7049	8459	5498	8459			
PAC-SH25DA-360	4652	3024	4652	6203	4032	6203	7754	5040	7754	9305	6048	9305	10855	7056	10855
PAC-SH25DA-400	5744	3734	5744	7658	4978	7658	9573	6222	9573	11487	7467	11487			
PAC-SH28DA-400	6527	4243	6527	8702	5656	8702	10878	7071	10878	13053	8484	13053	15229	9899	15229
PAC-SH28DA-450	8260	5369	8260	11014	7159	11014	13767	8949	13767	16521	10739	16521			
PAC-SH32DA-450	8921	5799	8921	11895	7732	11895	14869	9665	14869	17842	11597	17842	20817	13531	20817
PAC-SH32DA-500	11013	7158	11013	14685	9545	14685	18356	11931	18356	22028	14318	22028			
PAC-SH35DA-500	12237	7954	12237	16317	10606	16317	20396	13257	20396	24475	15909	24475	28554	18560	28554
PAC-SH40DA-550	14808	9625	14808	19743	12833	19743	24679	16041	24679	29615	19250	29615	34551	22458	34551
PAC-SH45DA-600	17622	11454	17622	23496	15272	23496	29370	19091	29370	35244	22909	35244	41118	26727	41118
PAC-SH50DA-700	28783	18709	28783	38377	24945	38377	47972	31182	47972	57568	37419	57568	67160	43654	67160
PAC-SH55DA-800	37594	24436	37594	50125	32581	50125	62657	40727	62657	75188	48872	75188	87720	57018	87720
PAC-SH60DA-800	51871	33716	51871	69162	44955	69162	86452	56194	86452	103750	67438	103750	121033	78671	121033

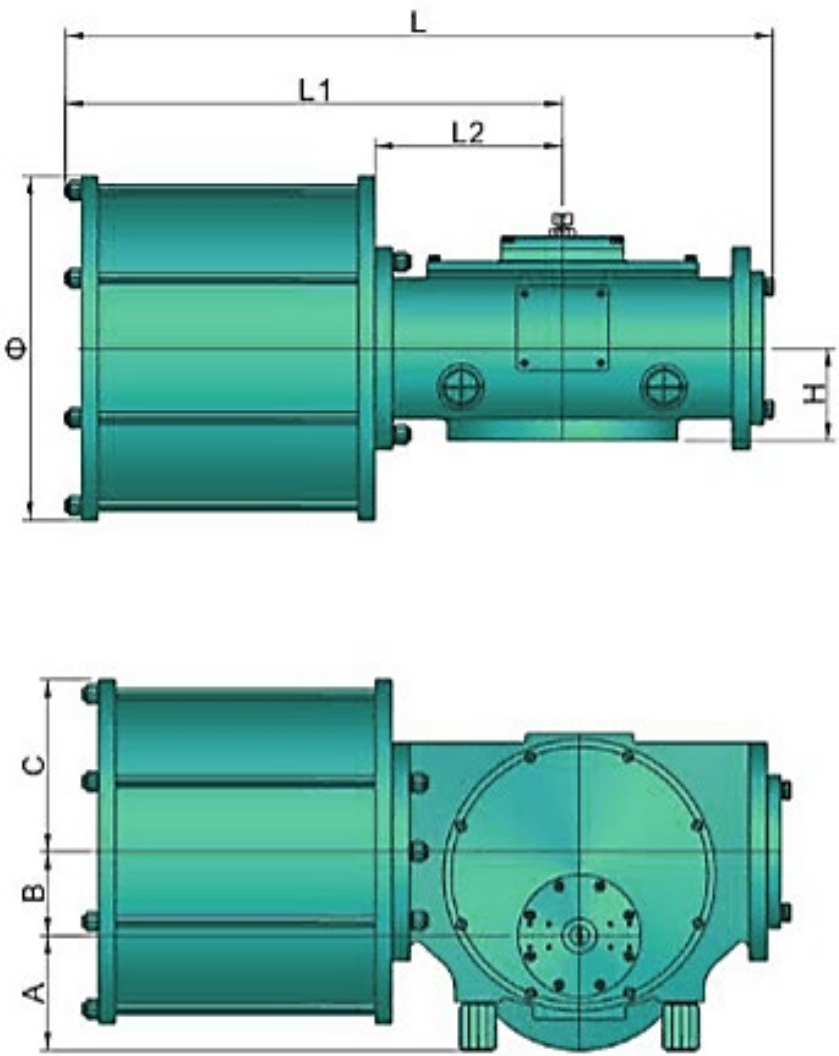


Spring Return Actuator Torque Output

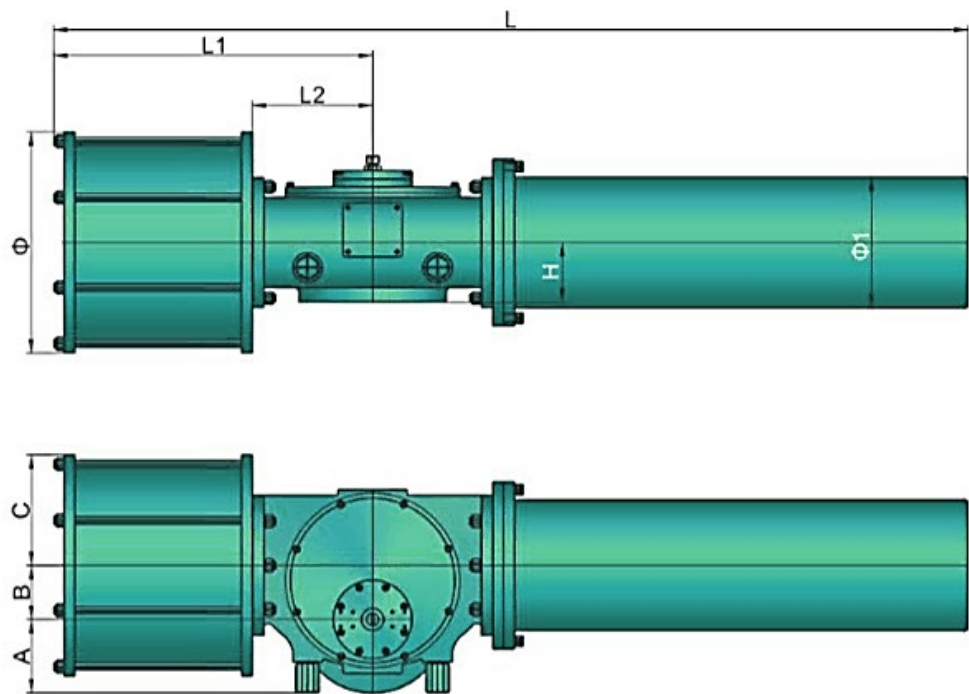
Model	Spring Torque (Nm)			Operating Air Supply Pressure (Bar)								
				4bar			5bar			6bar		
	Start	Run	End	Start	Run	End	Start	Run	End	Start	Run	End
PAC-SH17SR-250	1298	507	715	1053	745	470	1495	1007	912	1990	1407	1407
PAC-SH17SR-280	1298	507	715	1502	1062	919	2057	1455	1474	-	-	-
PAC-SH20SR-300	1438	590	835	2494	1764	1891	3326	2352	2723	4158	2940	3555
PAC-SH20SR-320	1438	590	835	2952	2087	2349	3899	3899	3296	-	-	-
PAC-SH22SR-320	1944	884	1250	3206	2267	2512	4319	4319	3625	5433	3842	4739
PAC-SH22SR-360	3125	1404	1985	3654	2584	2514	5064	5064	3924	-	-	-
PAC-SH25SR-360	3797	1908	2698	3505	2478	2406	5056	5056	3957	6607	4672	5508
PAC-SH25SR-400	3797	1908	2698	4960	3507	3861	6875	6875	5776	-	-	-
PAC-SH28SR-400	5328	2407	3418	5284	3717	3374	7460	7460	5550	9635	6814	7725
PAC-SH28SR-450	5328	2407	3418	7596	5372	5686	10349	10349	8439	-	-	-
PAC-SH32SR-450	6069	3007	4280	7615	5385	5826	10589	10589	8800	13562	9591	11773
PAC-SH32SR-500	6069	3007	4280	10405	7359	8616	14076	14076	12287	-	-	-
PAC-SH35SR-500	7679	3885	5494	10823	7654	8638	14902	14902	12717	18981	13403	16796
PAC-SH40SR-550	11500	5828	7958	11785	8115	8243	16721	16721	13179	-	-	-
PAC-SH45SR-600	15789	7836	11080	12866	9099	8157	18290	18290	13581	-	-	-
PAC-SH50SR-700	28195	12185	17230	21147	14955	10182	30742	30742	19777	40338	28528	29373
PAC-SH55SR-800	28195	12185	17230	32895	23264	21930	45427	45427	34462	-	-	-
PAC-SH60SR-800	37350	17684	25005	44157	31227	31812	61447	61447	49102	-	-	-



Dimensions: mm

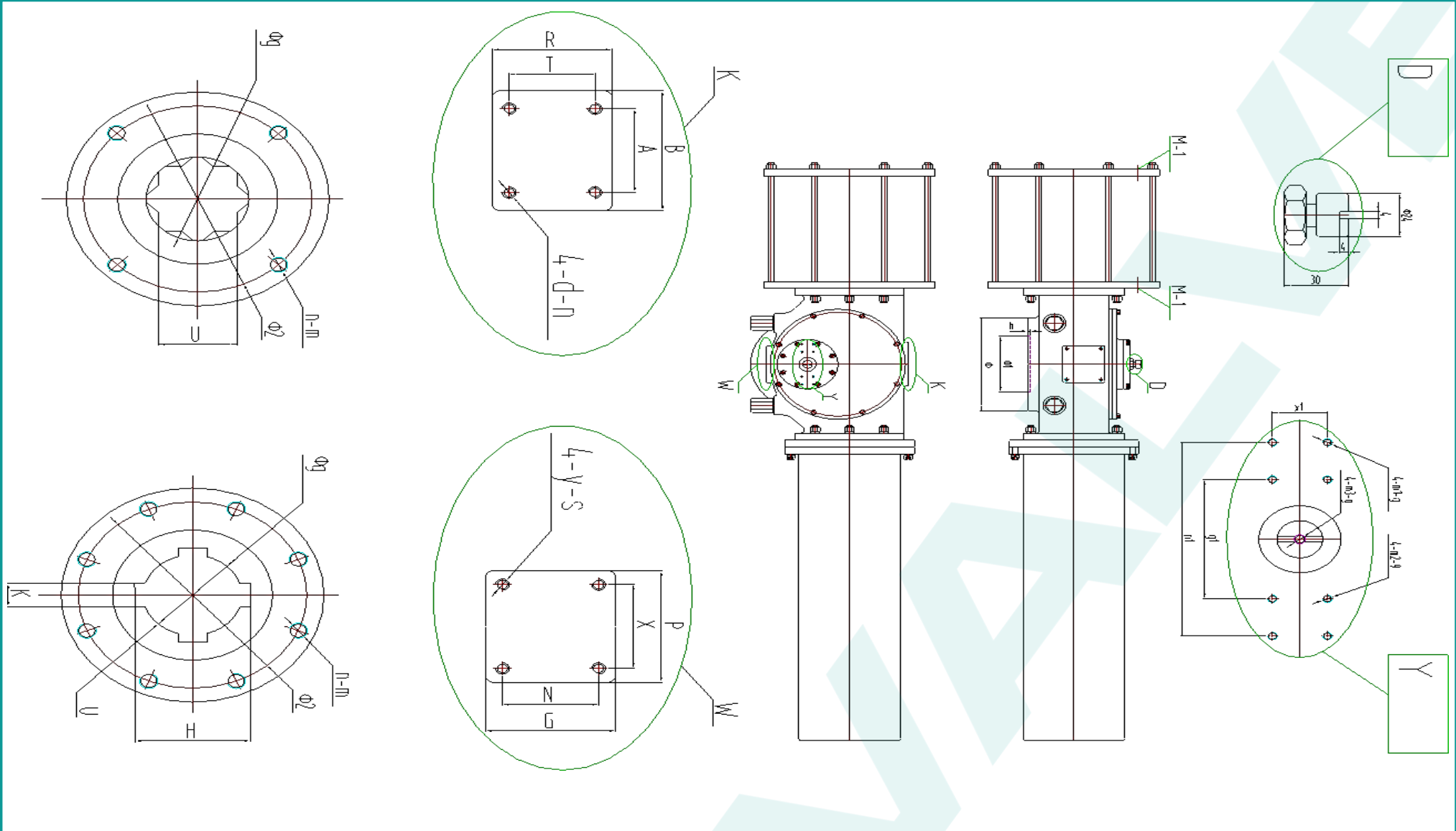


Model	L	L1	L2	Ø	H	A	B	C
PAC-SH17DA-250	606	428	159	325	90	120	65	163
PAC-SH17DA-280				355				178
PAC-SH17DA-300	738	522	192	395	106	130	85	198
PAC-SH20DA-320				415				208
PAC-SH22DA-320	812	576	211	415	114	130	100	208
PAC-SH22DA-360				445				223
PAC-SH25DA-360	925	650	245	445	121	150	110	223
PAC-SH25DA-400				495				248
PAC-SH28DA-400	994	699	264	495	131	195	125	248
PAC-SH28DA-450				545				273
PAC-SH32DA-450	1054	746	275	545	134	208	135	273
PAC-SH32DA-500				600				300
PAC-SH35DA-500	1148	806	305	600	136	226	150	300
PAC-SH40DA-550				650				325
PAC-SH45DA-600				700				350
PAC-SH50DA-700	1340	946	355	800	158	254	180	400
PAC-SH55DA-800				910				455
PAC-SH60DA-800	1660	1160	456	970	190	312	220	485



Model	L	L1	L2	∅	H	A	B	C	∅1	WEIGHT (KG)
PAC-SH17SR-250	1086	428	159	325	90	120	65	163	192	150
PAC-SH17SR-280				355				178		170
PAC-SH20SR-300	1400	522	192	395	106	130	85	198	213	250
PAC-SH20SR-320				415				208		280
PAC-SH22SR-320	1508	576	211	415	114	130	100	208	234	300
PAC-SH22SR-360				445				223		350
PAC-SH25SR-360	1862	650	245	445	121	150	110	223	266	360
PAC-SH25SR-400				495				248		410
PAC-SH28SR-400	1950	699	264	495	131	195	125	248	300	600
PAC-SH28SR-450				545				273		660
PAC-SH32SR-450	2075	746	275	545	134	208	135	273	320	750
PAC-SH32SR-500				600				300		820
PAC-SH35SR-500	2275	806	305	600	136	226	150	300	340	950
PAC-SH40SR-550	2400			650				325	1200	
PAC-SH45SR-600				700				350	1280	
PAC-SH50SR-700	2820	950	355	800	158	254	180	300	400	1600
PAC-SH55SR-800				910				325		1700
PAC-SH60SR-800	3810	1160	454	970	191	315	220	485	505	2300

Dimensions: mm



Model	g1	n1	x1	4-m1-g	4-m2-g	4-m6-g	M-1	A	B	T	R	4-d-n	X	P	N	G	4-y-s	ø	ø1	h	ø2	n-m	U	H	K	øg	depth	Flange
PAC-SH17DA/SR-250	80		30	4-M5-15mm	4-M5-15mm	4-M6-15mm	NPT3/8"	60	86	50	70	4-M8-8mm	60	86	50	70	4-M8-8mm	175	100	4	140	4-M16-24mm	27x27			K	65	F14
PAC-SH17DA/SR-280							NPT1/2"																					
PAC-SH20DA/SR-300	80		30	4-M5-15mm	4-M5-15mm	4-M6-15mm	NPT1/2"	100	120	60	80	4-M8-12mm	80	100	80	100	4-M8-12mm	210	130	4	165	4-M20-30mm	36x36				80	F16
PAC-SH20DA/SR-320							NPT1/2"																					
PAC-SH22DA/SR-320	80		30	4-M5-15mm	4-M5-15mm	4-M6-15mm	NPT1/2"	100	120	60	80	4-M8-12mm	80	100	80	100	4-M8-12mm	210	130	4	165	4-M20-30mm	46x46				80	F16
PAC-SH22DA/SR-360							NPT1/2"																					
PAC-SH25DA/SR-360	80	30	30	4-M5-15mm	4-M5-15mm	4-M6-15mm	NPT1/2"	120	140	80	100	4-M8-12mm	100	120	90	110	4-M8-12mm	300	200	5	254	8-M16-24mm	55x55				90	F25
PAC-SH25DA/SR-400							NPT3/4"																					
PAC-SH28DA/SR-400	80	30	30	4-M5-15mm	4-M5-15mm	4-M6-15mm	NPT3/4"	130	160	90	115	4-M8-15mm	110	140	95	120	4-M8-15mm	350	230	5	298	8-M20-30mm	60x60				100	F30
PAC-SH28DA/SR-450							NPT3/4"																					
PAC-SH32DA/SR-450	80	30	30	4-M5-15mm	4-M5-15mm	4-M6-15mm	NPT3/4"	130	160	90	115	4-M8-15mm	110	140	95	120	4-M8-15mm	350	230	5	298	8-M20-30mm	90	101	4-25		160	F30
PAC-SH32DA/SR-500							NPT1"																					
PAC-SH35DA/SR-500	80	30	30	4-M5-15mm	4-M5-15mm	4-M6-15mm	NPT1"	130	160	90	115	4-M8-15mm	110	140	95	120	4-M8-15mm	350	230	5	298	8-M20-30mm	105	118	4-28		160	F30
PAC-SH40DA/SR-550							NPT1"																					
PAC-SH45DA/SR-600	80	30	30	4-M5-15mm	4-M5-15mm	4-M6-15mm	NPT1-1/2"	130	160	90	115	4-M8-15mm	110	140	95	120	4-M8-15mm	415	260	8	356	8-M30-45mm	120	135	4-32		200	F35
PAC-SH50DA/SR-700							NPT1-1/2"																					
PAC-SH55DA/SR-800	80	30	30	4-M5-15mm	4-M5-15mm	4-M6-15mm	NPT1-1/2"	200	250	180	200	4-M12-20mm	180	220	140	180	4-M12-20mm	475	300	8	406	8-M36-54mm	160	179	4-40		250	F40
PAC-SH60DA/SR-800							NPT1-1/2"																					