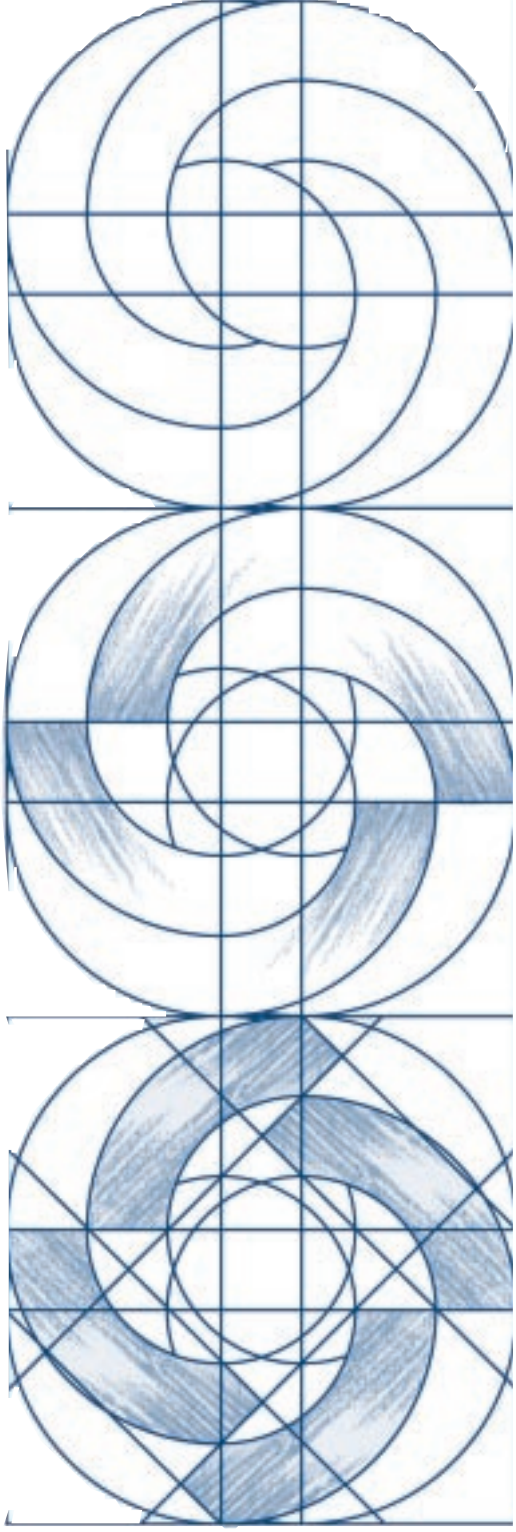


"RPD - RPS" SERIES

PNEUMATIC RACK-PINION ACTUATORS

BIFFI

tyco flow control

Table of Contents

Double Acting Actuator Series RPD

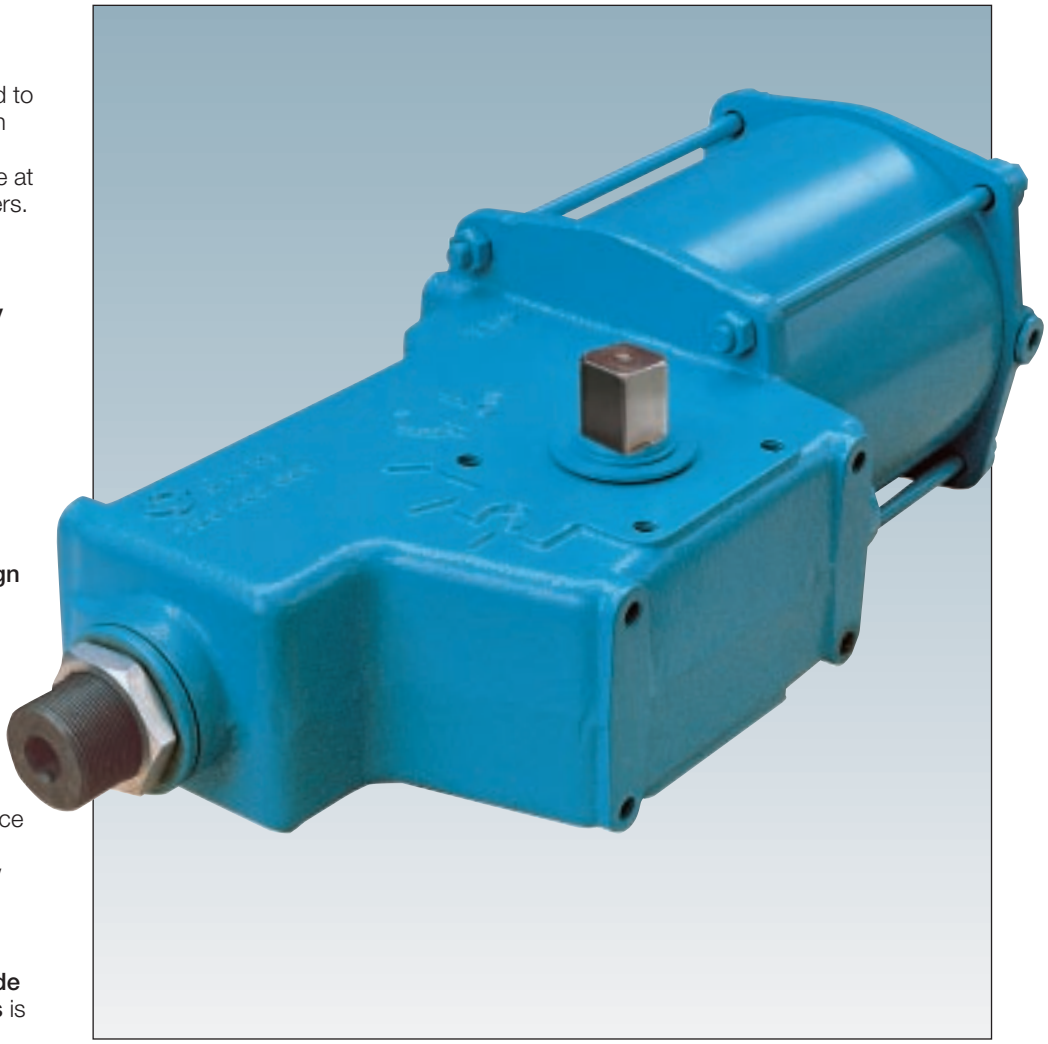
Spring Return Actuator Series RPS

Common features to RPD and RPS actuators

Double acting pneumatic actuator for 90° operation for On-Off and Modulating heavy duty service

General

The **RPD** pneumatic actuator series was engineered and is manufactured to provide maximum torque output with minimum supply pressure.
Simplicity, reliability and economy are at the top of the list of design parameters.
The RPD actuator is suitable for any quarter turn application such as ball, plug, butterfly valves or dampers, in both **On-Off** and **Modulating heavy duty** service.

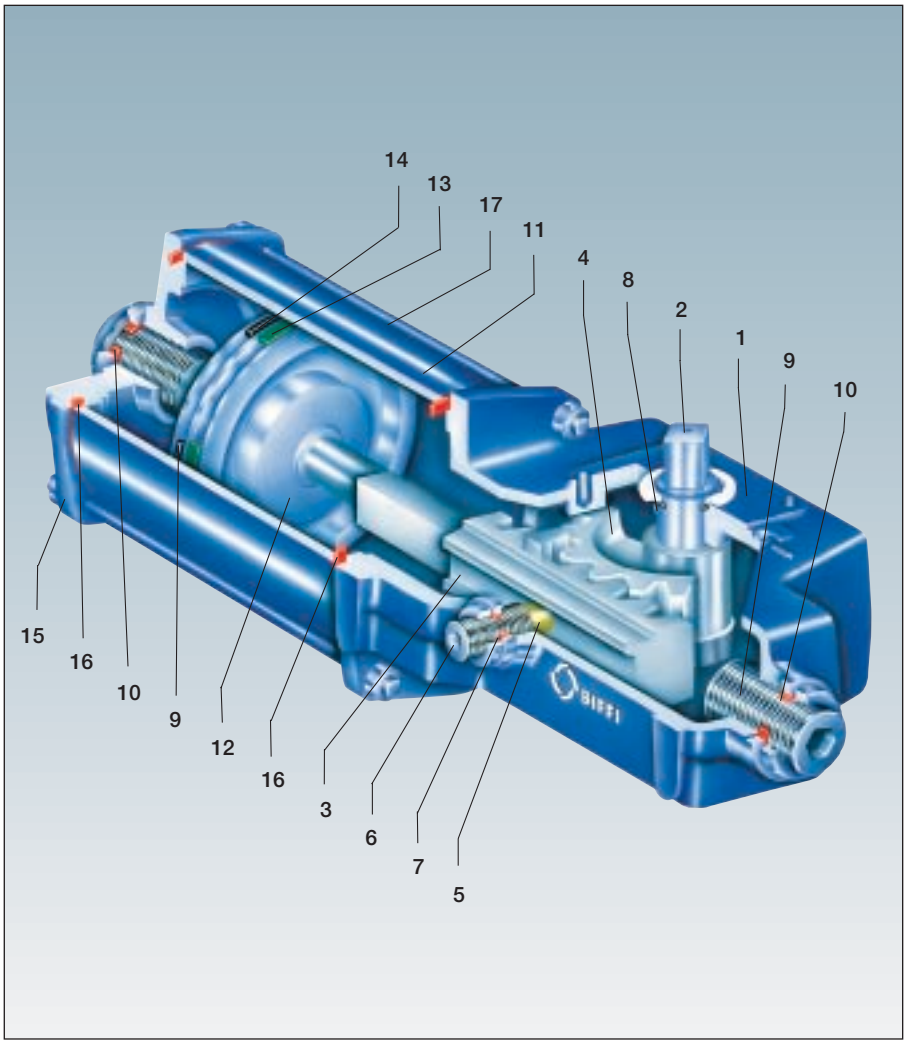


Features

- **Totally enclosed**, **weatherproof housing** in nodular cast iron for maximum strength and suitable for use in hostile environments
- A **compact rack and pinion design** provides simple construction and constant output torque throughout the 90° stroke
- External travel stops for precise **angular stroke adjustment** between **80°** and **100°**
- **Electroless nickel plated** and polished **cylinder** and **square output shaft** for corrosion resistance and minimal friction
- **Floating type piston seals** for low hysteresis and high sensitivity, **preventing sticking problems**
- **Square output shaft**
- Lever or jackscrew **manual override**
- An extensive range of **accessories** is available:
  - **limit switch boxes** - explosionproof, intrinsically safe and/or weatherproof according to ATEX directive 94/9/EC
  - limit switches can be provided in different types according to customer requirements
  - **position transmitters** - explosionproof, intrinsically safe and/or weatherproof
  - **air conditioners**
  - **air storage tanks** according to PED directive 97/23/EC. Tanks in accordance with different codes (ASME VIII, div. 1) on request
  - **solenoid valves** - explosionproof, intrinsically safe and/or weatherproof
  - **control valves, flow regulators, quick exhaust valves**
  - **positioners** - pneumatic or electropneumatic
  - **pressure switches** - pneumatic or electric
  - **terminals enclosures, pushbutton panels** - explosionproof or intrinsically safe and/or weatherproof
- **Special coatings** for offshore or corrosive environments

Technical data

Supply pressure	:	12 bar g maximum
Supply medium	:	air, nitrogen or sweet gas
Ambient temperature	:	-30° C to +100° C Special versions for service outside this range on request
Output torques	:	up to 3500 Nm



Item	Name
1	Housing
2	Shaft
3	Rack
4	Pinion
5	Sliding block
6	Thrust bearing screw
7	Sealing washer
8	Shaft seal ring
9	Travel stop screw
10	Sealing washer
11	Cylinder tube
12	Piston
13	Piston guide sliding ring
14	Piston seal ring
15	End flange
16	Cylinder gasket
17	Tie rod

Materials of construction

Item	Name	Material	Equivalence to U.S. standards
1	Housing	Nodular cast iron	ASTM A536 gr 60 - 40 - 18
2	Shaft	Alloy steel (Nickel plated)	AISI SAE 9840
3	Rack	Nodular cast iron	ASTM A536 gr 60 - 40 - 18
4	Pinion	Nodular cast iron	ASTM A536 gr 60 - 40 - 18
5	Sliding block	Bronze	ASTM B427 Alloy UNS No C90800
6	Thrust bearing screw	Carbon steel	AISI SAE 1040
7	Sealing washer	PVC	
8	Shaft seal ring	Nitrile rubber	
9	Travel stop screw	Carbon steel	AISI SAE 1040
10	Sealing washer	PVC	
11	Cylinder tube	Carbon steel (Nickel plated)	API 5LX gr X52
12	Piston	Carbon steel	ASTM A350 LF2
13	Piston guide sliding ring	Teflon + Graphite	
14	Piston seal ring	Nitrile rubber	
15	End flange	Carbon steel	ASTM A350 LF2
16	Cylinder gasket	Nitrile rubber	
17	Tie rod	Alloy steel	ASTM A320 L7

Output torques in Nm

Model	Supply pressure (bar g) 2	2.5	3	3.5	4	5	6	7	8	9	10	10.5
RP 15 D1	46	60	73	86	99	126	152	179	205	232	259	272
RP 15 D2	65	84	102	120	139	175	212	249	286	322	359	378
RP 30 D1	84	108	131	155	179	226	273	320	368	415	462	486
RP 30 D2	157	200	243	286	329	415	501	587	674	760	846	889
RP 60 D1	193	245	298	351	404	510	616	722	827	933	1039	1092
RP 60 D2	329	418	507	596	684	862	1040	1218	1396	1573	1751	1840
RP 120 D1	387	492	596	700	805	1014	1224	1433	1642	1851	2060	2165
RP 120 D2	709	898	1086	1275	1463	1841	2218	2595	2972	3349	-	-

Note

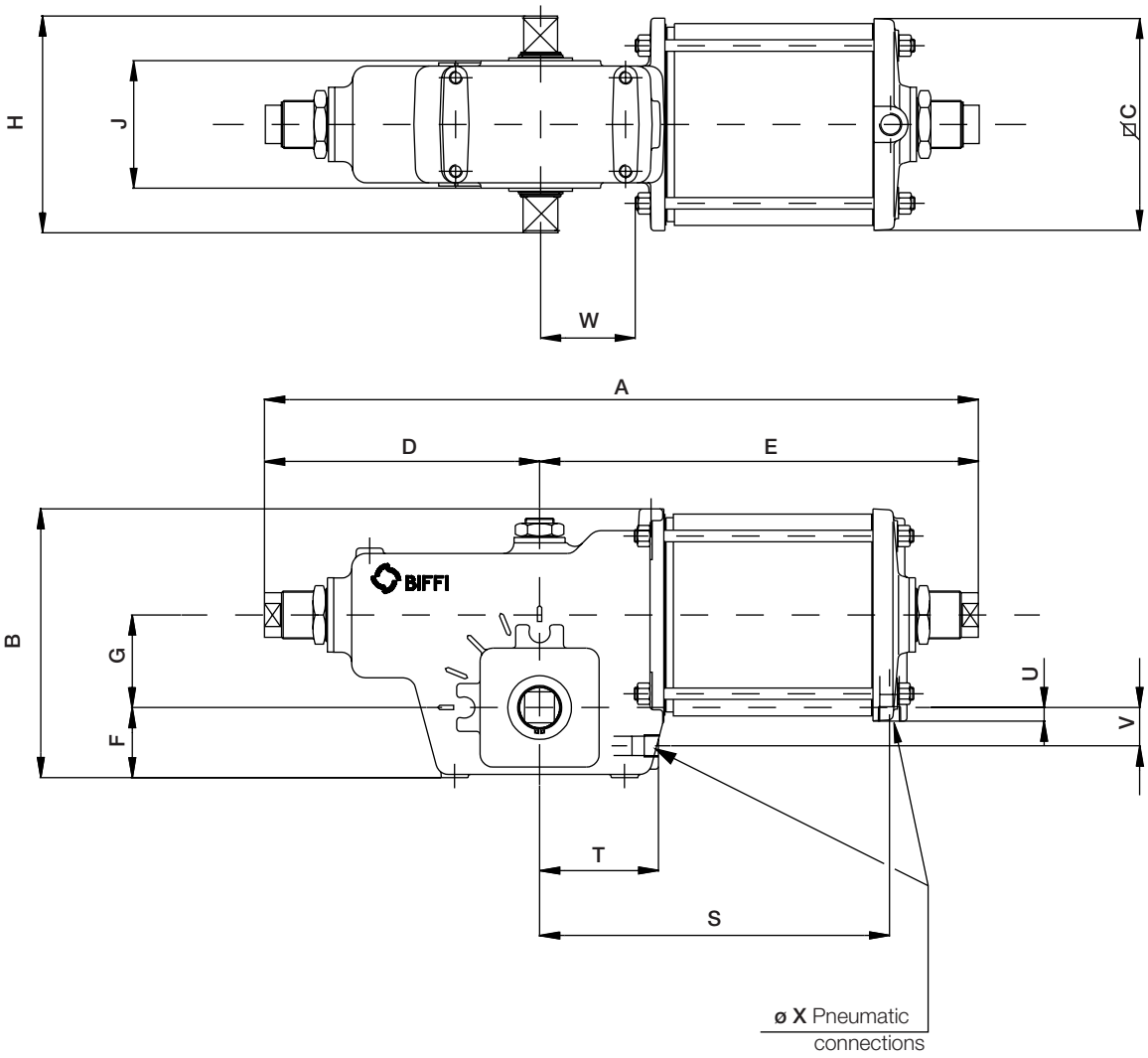
Max allowable pressure of 12 bar g is the static pressure applicable to fully stroked actuator against the travel stops

Output torques in Nm

Model	Supply pressure (bar g) 1.5	2	2.5	3	3.5	4	4.5
RP 120 D3	1073	1456	1839	2223	2606	2989	3372

Note

Max allowable pressure of 5 bar g is the static pressure applicable to fully stroked actuator against the travel stops

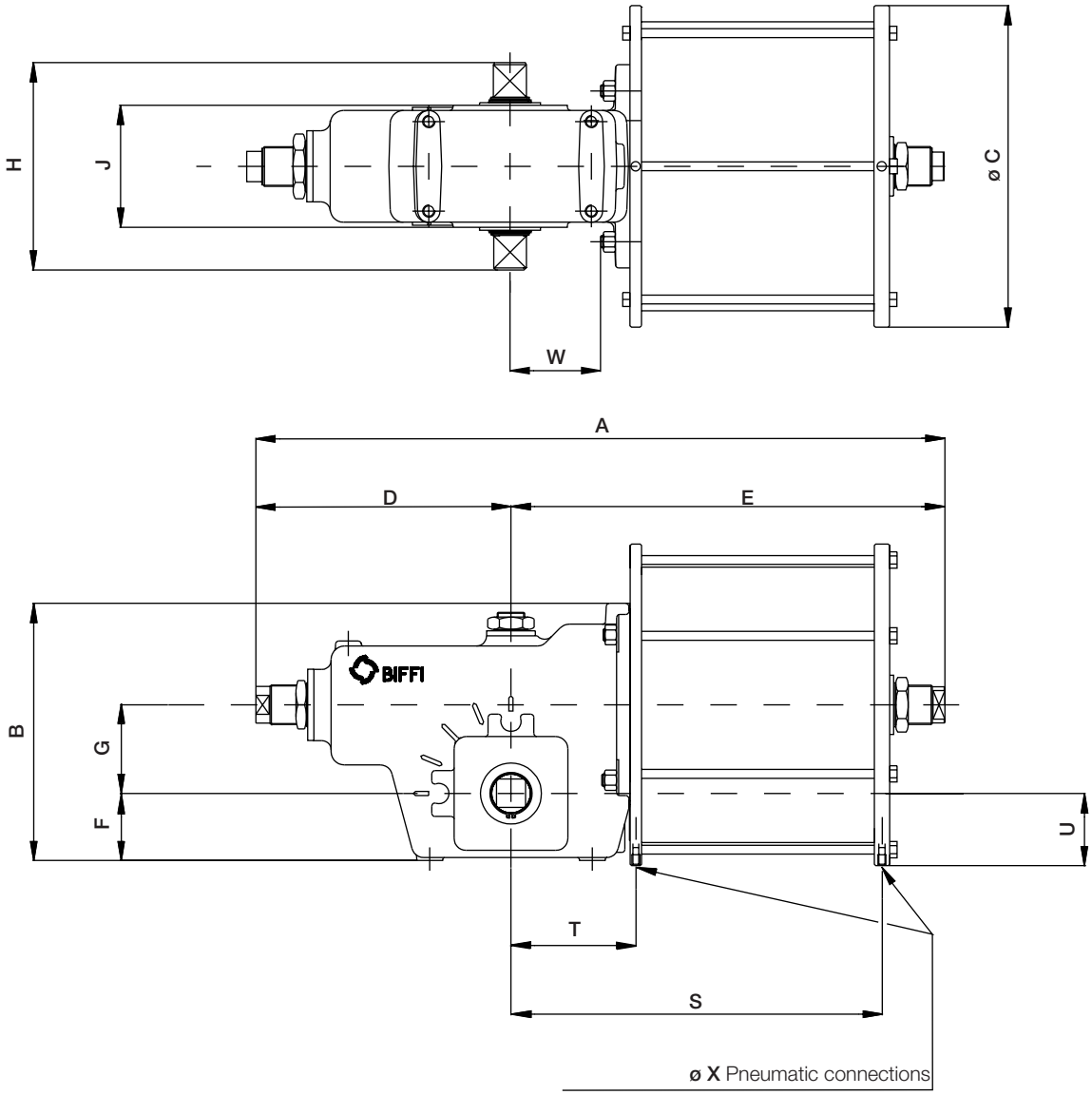


Dimensions in mm

Model	A	B	⌀C	D	E	F	G	H	J	S	T	U	V	W	ø X NPT	Air Consumpt. (litres) Open	Close	Weight (Kg)
RP 15 D1	440	160	120	175	265	41	55	140	80	224	74	5	22	50	1/4	0.8	1.7	12
RP 15 D2	440	160	120	175	265	41	55	140	80	224	74	5	22	50	1/4	0.9	1.8	13
RP 30 D1	531	215	154	206	325	54	70	164	100	274	93	7	36	65	1/4	1.2	3	21
RP 30 D2	531	215	154	206	325	54	70	164	100	274	93	7	36	65	1/4	2	4	25
RP 60 D1	640	255	200	250	390	66	85	204	120	329	112	15	40	85	1/2	2.5	6	38
RP 60 D2	640	255	200	250	390	66	85	204	120	329	112	15	40	85	1/2	4	8	44
RP 120 D1	770	308	260	310	460	82	100	270	160	390	135	28	50	100	1/2	4.5	10	77
RP 120 D1	770	308	260	310	460	82	100	270	160	390	135	28	50	100	1/2	8	15	85

Note

- Dimensions and weights given are without optional bracket
- W = maximum allowable mounting bracket dimensions (pneumatic cylinder side)



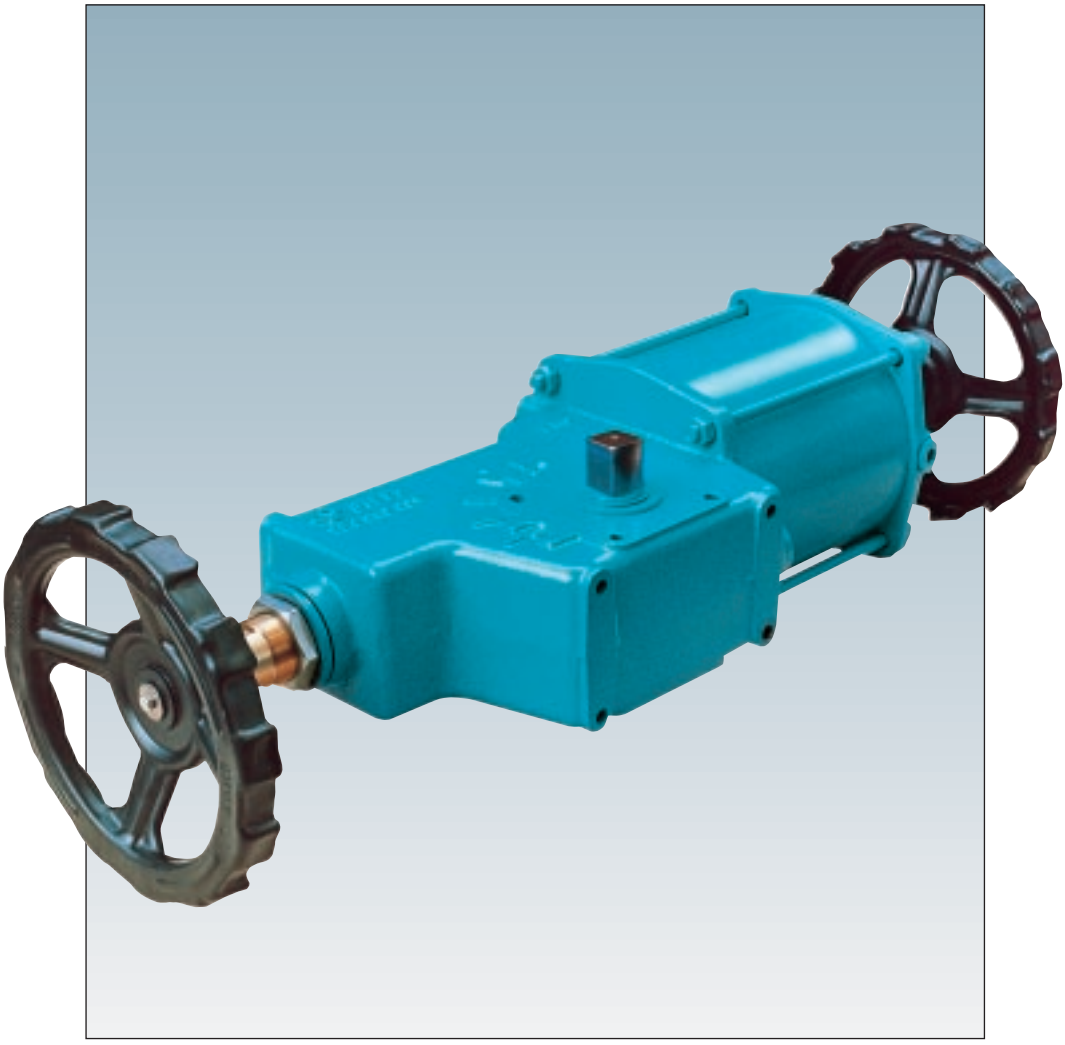
Dimensions in mm

Model	A	B	ø C	D	E	F	G	H	J	S	T	U	W	ø X NPT	Air Consumpt. (litres) Open	Air Consumpt. (litres) Close	Weight (Kg)
RP 120 D3	815	308	400	310	505	82	100	270	160	449	156	100	100	1/2	16	23	150

Note

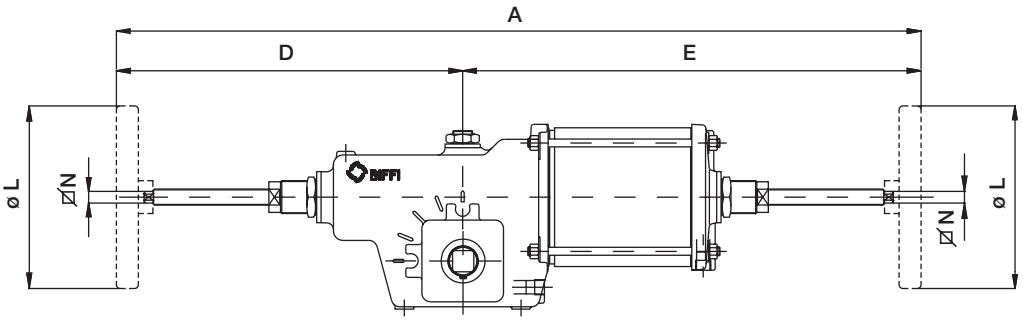
- Dimensions and weight given are without optional bracket
- W = maximum allowable mounting bracket dimension (pneumatic cylinder side)

Jackscrew or lever type manual overrides are the easy solution for emergency operations



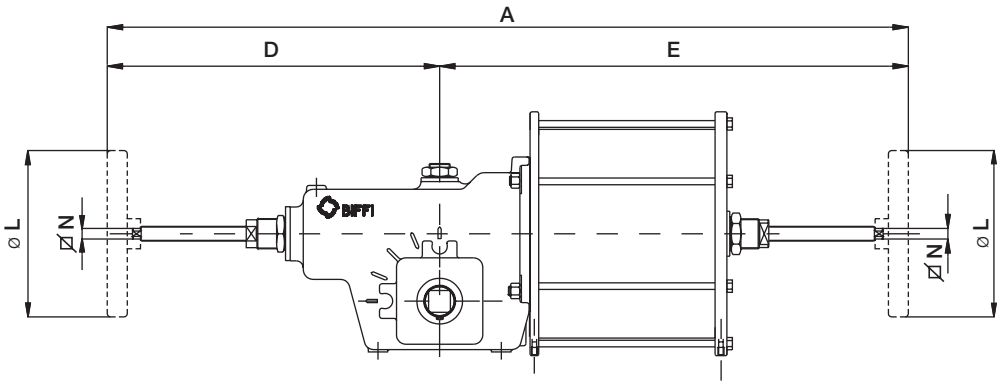
Manual override for RPD double acting pneumatic actuator

Actuator manual emergency operation is performed by rotating one of the two jackscrews by a wrench or by a handwheel (available on request).
In standard configuration operating the screw mounted in the cylinder end flange results in valve opening while operating the screw mounted in the housing side wall results in the valve closing.
To achieve a desidered manual manoeuvre, prior to operate the proper jackscrew, the opposite one must be backed off.
A lever manual override is available only for small models.



Dimensions in mm

Model	A	D	E	⌀N	øL	Jackscrew turns per stroke	Weight (Kg)
RP 15D1	740	323	417	13	200	43	15
RP 15D2	740	323	417	13	200	43	16
RP 30D1	915	398	517	16	250	37	25
RP 30D2	915	398	517	16	250	37	29
RP 60D1	1080	472	608	16	250	45	43
RP 60D2	1080	472	608	16	250	45	49
RP 120D1	1263	557	706	16	250	52	82
RP 120D2	1263	557	706	16	250	52	90



Dimensions in mm

Model	A	D	E	⌀N	øL	Jackscrew turns per stroke	Weight (Kg)
RP 120D3	1309	557	752	16	250	52	155

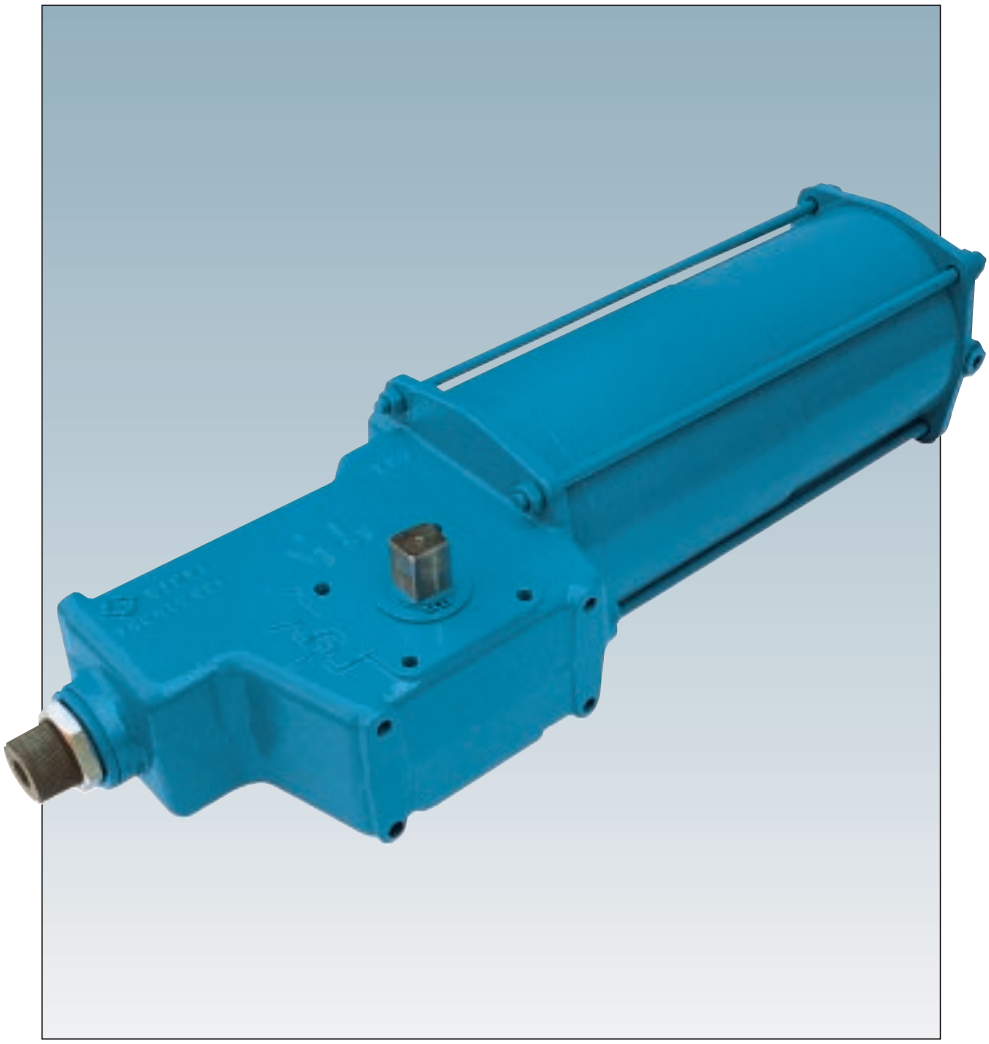
Notes

- Dimensions and weights given are without optional bracket

Spring return pneumatic actuator for 90° operation for On-Off and Modulating heavy duty service

General

The **RPS** pneumatic spring return actuator series was engineered and is manufactured to provide fail safe operation for any quarter turn application such as ball, plug, butterfly valves or dampers, in both **On-Off** and **Modulating heavy-duty** service. Simplicity, reliability and economy are at the top of the list of design parameters. The spring module incorporates one or two springs in series, depending on the model, and is fully encapsulated. This ensures safety to personnel and ease of assembly.

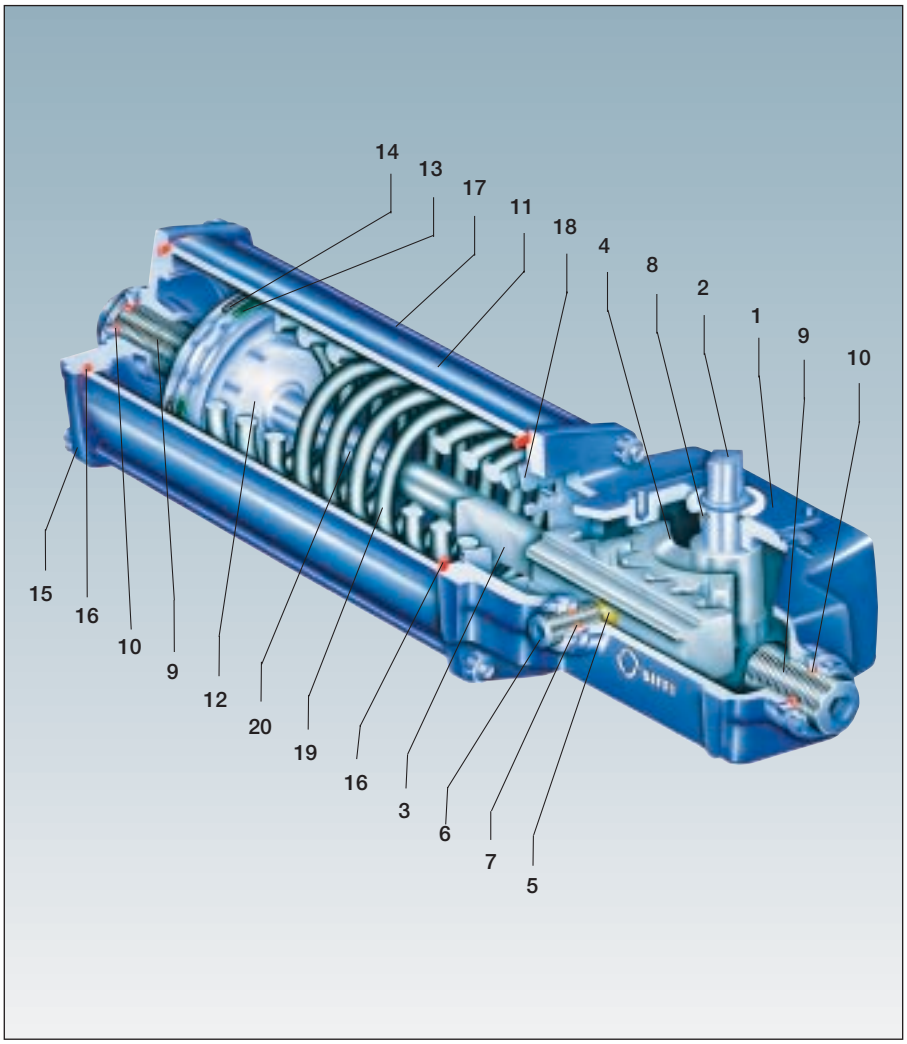


Features

- **Totally enclosed**, **weatherproof housing** in nodular cast iron for maximum strength and suitable for use in hostile environments
- The mounting flange is identical on both faces of the housing, the shaft output drives have the same dimensions but are positioned at 90°. This allows **the actuator to be used as spring to close or spring to open without modifications**
- A **compact rack and pinion design** provides simple construction
- External travel stops for precise **angular stroke adjustment** between **80°** and **100°**
- **Electroless nickel plated** and polished **cylinder** and **square output shaft** for corrosion resistance and minimal friction
- **Floating type piston seals** for low hysteresis and high sensitivity, **preventing sticking problems**
- **Square output shaft**
- Jackscrew **manual override**
- An extensive range of **accessories** is available:
  - **limit switch boxes** - explosionproof, intrinsically safe and/or weatherproof
  - limit switches can be provided in different types according to customer requirements
  - **position transmitters** - explosionproof, intrinsically safe and/or weatherproof
  - **air conditioners**
  - **solenoid valves** - explosionproof, intrinsically safe and/or weatherproof
  - **control valves**, **flow regulators**, **quick exhaust valves**
  - **positioners** - pneumatic or electropneumatic
  - **pressure switches** - pneumatic or electric
  - **terminals enclosures**, **pushbutton panels** - explosionproof or intrinsically safe and/or weatherproof
- **Special coatings** for offshore or corrosive environments

Technical data

Supply pressure	:	12 bar g maximum
Supply medium	:	air, nitrogen or sweet gas
Ambient temperature	:	-30° C to +100° C Special versions for service outside this range on request
Spring ending torques	:	up to 940 Nm



Materials of construction

Item	Name	Material	Equivalence to U.S. standards
1	Housing	Nodular cast iron	ASTM A536 gr 60 - 40 - 18
2	Shaft	Alloy steel (Nickel plated)	AISI SAE 9840
3	Rack	Nodular cast iron	ASTM A536 gr 60 - 40 - 18
4	Pinion	Nodular cast iron	ASTM A536 gr 60 - 40 - 18
5	Sliding block	Bronze	ASTM B427 Alloy UNS No C90800
6	Thrust bearing screw	Carbon steel	AISI SAE 1040
7	Sealing washer	PVC	
8	Shaft seal ring	Nitrile rubber	
9	Travel stop screw	Carbon steel	AISI SAE 1040
10	Sealing washer	PVC	
11	Cylinder tube	Carbon steel (Nickel plated)	API 5LX gr X52
12	Piston	Carbon steel	ASTM A350 LF2
13	Piston guide sliding ring	Teflon + Graphite	
14	Piston seal ring	Nitrile rubber	
15	End flange	Carbon steel	ASTM A A350 LF2
16	Cylinder gasket	Nitrile rubber	
17	Tie rod	Alloy steel	ASTM A320 L7
18	Spring retainer disk	Carbon steel	ASTM A283 gr D
19	Spring	Carbon steel	ASTM A29 gr 9254
20	Rack spacer rod	Carbon steel	AISI SAE 1040

Output torques in Nm

Model	Spring torque SST	Spring torque SET	Supply pressure (bar g) 3 AST	3 AET	3.5 AST	3.5 AET	4 AST	4 AET	5 AST	5 AET	6 AST	6 AET	7 AST	7 AET	8 AST	8 AET	9 AST	9 AET	10 AST	10 AET	10.5 AST	10.5 AET
RP 15S2A1	51	32	62	41	80	59	99	77	135	114	172	151	209	188	245	224	282	261	319	298	337	316
RP 15S2B1	89	51					77	36	114	72	151	109	188	146	224	183	261	219	298	256	316	274
RP 15S2C1	117	66							98	42	135	79	171	116	208	152	245	189	282	226	300	244
RP 15S2A2	51	42	51	41	70	59	88	77	125	114	161	151	198	188	235	224	272	261	308	298	327	316
RP 15S2B2	89	70					57	36	93	72	130	109	167	146	203	183	240	219	277	256	295	274
RP 15S2C2	117	91							70	42	107	79	143	116	180	152	217	189	254	226	272	244
RP 30S2A1	156	99	125	62	169	105	212	148	298	234	384	320	470	406	556	493	642	579	729	665	772	708
RP 30S2B1	241	127					180	55	266	141	352	227	439	313	525	399	611	485	697	571	740	614
RP 30S2C1	290	156							234	87	320	173	406	259	492	345	579	431	665	517	708	560
RP 30S2A2	156	127	94	62	137	105	180	148	266	234	352	320	439	406	525	493	611	579	697	665	740	708
RP 30S2B2	241	184					117	55	204	141	290	227	376	313	462	399	548	485	634	571	678	614
RP 30S2C2	290	223							160	87	246	173	332	259	418	345	505	431	591	517	634	560
RP 60S2A1	317	209	261	142	350	230	439	319	617	497	794	675	972	853	1150	1030	1330	1210	1510	1390	1600	1480
RP 60S2B1	482	268					374	138	552	316	730	494	908	671	1090	849	1260	1030	1440	1210	1530	1290
RP 60S2C1	588	318							497	198	675	376	853	554	1030	732	1210	910	1390	1090	1480	1180
RP 60S2A2	317	263	201	142	290	230	379	319	557	497	735	675	912	853	1090	1030	1270	1210	1450	1390	1540	1480
RP 60S2B2	482	374					256	138	434	316	612	494	790	671	968	849	1150	1030	1320	1210	1410	1290
RP 60S2C2	588	452							348	198	526	376	704	554	881	732	1060	910	1240	1090	1330	1180
RP 120S2A1	706	420	597	281	786	470	974	659	1352	1036	1730	1410	2110	1790	2480	2170	2860	2550	3240	2920	3430	3110
RP 120S2B1	949	531			663	201	852	390	1229	767	1610	1150	1980	1520	2360	1900	2740	2280	3120	2650	3310	2840
RP 120S2C1	1240	643							1106	449	1480	826	1860	1200	2240	1580	2620	1960	2990	2340	3180	2520
RP 120S2A2	706	563	439	281	628	470	816	659	1194	1036	1570	1410	1950	1790	2330	2170	2700	2550	3080	2920	3270	3110
RP 120S2B2	949	740			432	201	621	390	998	767	1380	1150	1750	1520	2130	1900	2510	2280	2890	2650	3070	2840
RP 120S2C2	1240	940							777	449	1160	826	1530	1200	1910	1580	2290	1960	2660	2340	2850	2520

Note

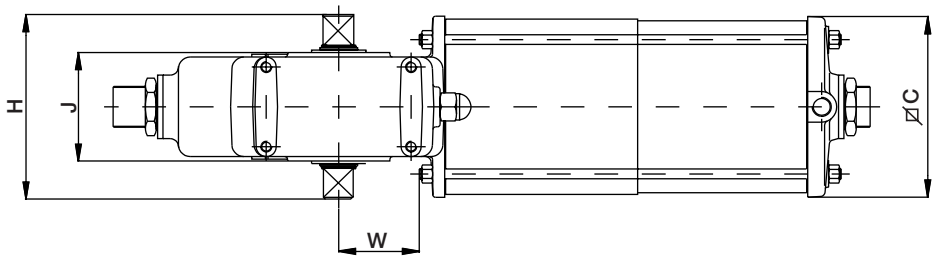
- Max allowable pressure 12 bar g (static pressure applicable to fully stroked actuator against the travel stop)
- SET: Spring Ending Torque
  SST: Spring Starting Torque
  AST: Air Starting Torque
  AET: Air Ending Torque

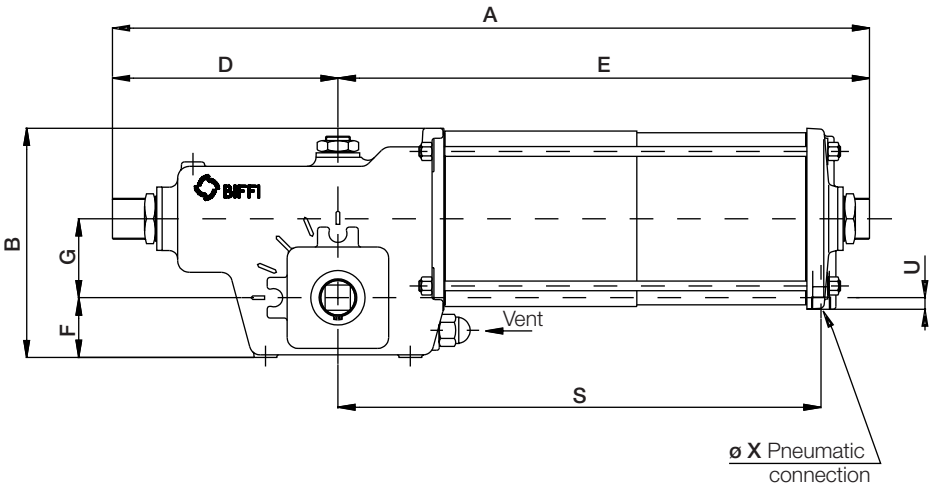
Output torques in Nm

Model	Spring torque SST	Spring torque SET	Supply pressure (bar g) 1.5 AST	1.5 AET	2 AST	2 AET	2.5 AST	2.5 AET	3 AST	3 AET	3.5 AST	3.5 AET	4 AST	4 AET	5 AST	5 AET
RP 120S3A1	690	405	584	268	967	652	1350	1040	1730	1420	2120	1800	2500	2190	3270	2950
RP 120S3B1	933	515			845	383	1230	766	1610	1150	2000	1530	2380	1920	3150	2680
RP 120S3C1	1220	627					1110	448	1490	831	1870	1210	2260	1600	3020	2370
RP 120S3A2	690	548	426	268	809	652	1190	1040	1580	1420	1960	1800	2340	2190	3110	2950
RP 120S3B2	933	725			614	383	997	766	1380	1150	1760	1530	2150	1920	2910	2680
RP 120S3C2	1220	925					776	448	1160	831	1540	1210	1930	1600	2690	2370

Notes

- Max allowable pressure 5 bar g (static pressure applicable to fully stroked actuator against the travel stop)
- SET: Spring Ending Torque
  SST: Spring Starting Torque
  AST: Air Starting Torque
  AET: Air Ending Torque



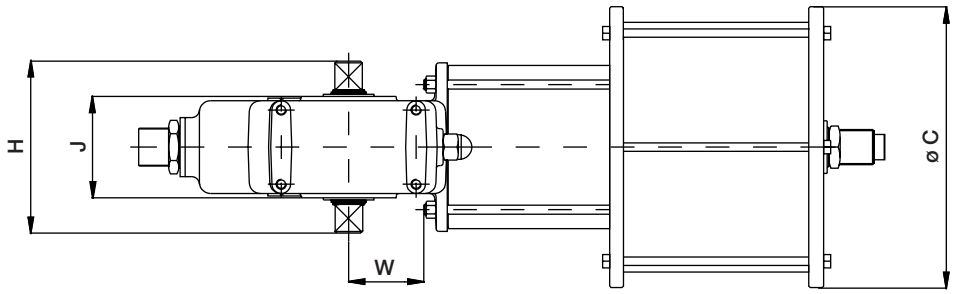


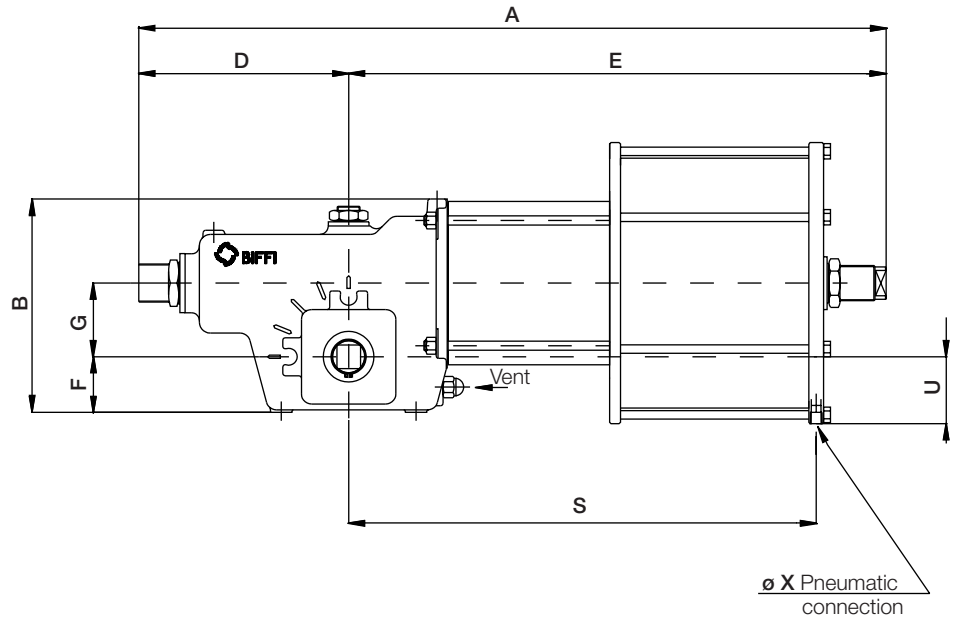
Dimensions in mm

Model	A	B	øC	D	E	F	G	H	J	S	U	W	ø X NPT	Air Consumpt. (litres)	Weight (Kg)
RP 15S2A1	569	160	120	175	394	41	55	140	80	353	5	50	1/4	0.9	18
RP 15S2B1	569	160	120	175	394	41	55	140	80	353	5	50	1/4	0.9	18
RP 15S2C1	569	160	120	175	394	41	55	140	80	353	5	50	1/4	0.9	18
RP 15S2A2	730	160	120	175	555	41	55	140	80	514	5	50	1/4	0.9	25
RP 15S2B2	730	160	120	175	555	41	55	140	80	514	5	50	1/4	0.9	25
RP 15S2C2	730	160	120	175	555	41	55	140	80	514	5	50	1/4	0.9	25
RP 30S2A1	717	215	154	206	511	54	70	164	100	460	7	65	1/4	2	36
RP 30S2B1	717	215	154	206	511	54	70	164	100	460	7	65	1/4	2	36
RP 30S2C1	717	215	154	206	511	54	70	164	100	460	7	65	1/4	2	36
RP 30S2A2	938	215	154	206	732	54	70	164	100	681	7	65	1/4	2	51
RP 30S2B2	938	215	154	206	732	54	70	164	100	681	7	65	1/4	2	51
RP 30S2C2	938	215	154	206	732	54	70	164	100	681	7	65	1/4	2	51
RP 60S2A1	858	255	200	250	608	66	85	204	120	548	15	85	1/2	4	65
RP 60S2B1	858	255	200	250	608	66	85	204	120	548	15	85	1/2	4	65
RP 60S2C1	858	255	200	250	608	66	85	204	120	548	15	85	1/2	4	65
RP 60S2A2	1111	255	200	250	861	66	85	204	120	801	15	85	1/2	4	86
RP 60S2B2	1111	255	200	250	861	66	85	204	120	801	15	85	1/2	4	86
RP 60S2C2	1111	255	200	250	861	66	85	204	120	801	15	85	1/2	4	86
RP 120S2A1	1015	308	260	310	705	82	100	270	160	635	28	100	1/2	8	127
RP 120S2B1	1015	308	260	310	705	82	100	270	160	635	28	100	1/2	8	127
RP 120S2C1	1015	308	260	310	705	82	100	270	160	635	28	100	1/2	8	127
RP 120S2A2	1300	308	260	310	990	82	100	270	160	920	28	100	1/2	8	174
RP 120S2B2	1300	308	260	310	990	82	100	270	160	920	28	100	1/2	8	174
RP 120S2C2	1300	308	260	310	990	82	100	270	160	920	28	100	1/2	8	174

Notes

- Dimensions and weights given are without optional bracket
- W = maximum allowable mounting bracket dimensions (pneumatic cylinder side)



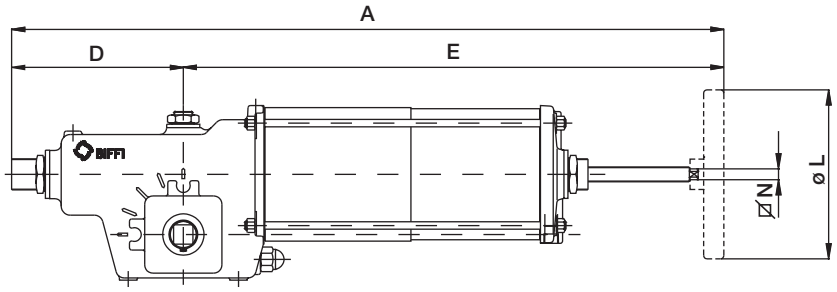


Dimensions in mm

Model	A	B	ø C	D	E	F	G	H	J	S	U	W	ø X NPT	Air Consumpt. (litres)	Weight (Kg)
RP 120S3A1	1013	308	400	310	703	82	100	270	160	647	100	100	1/2	16	172
RP 120S3B1	1013	308	400	310	703	82	100	270	160	647	100	100	1/2	16	172
RP 120S3C1	1013	308	400	310	703	82	100	270	160	647	100	100	1/2	16	172
RP 120S3A2	1299	308	400	310	989	82	100	270	160	933	100	100	1/2	16	207
RP 120S3B2	1299	308	400	310	989	82	100	270	160	933	100	100	1/2	16	207
RP 120S3C2	1299	308	400	310	989	82	100	270	160	933	100	100	1/2	16	207

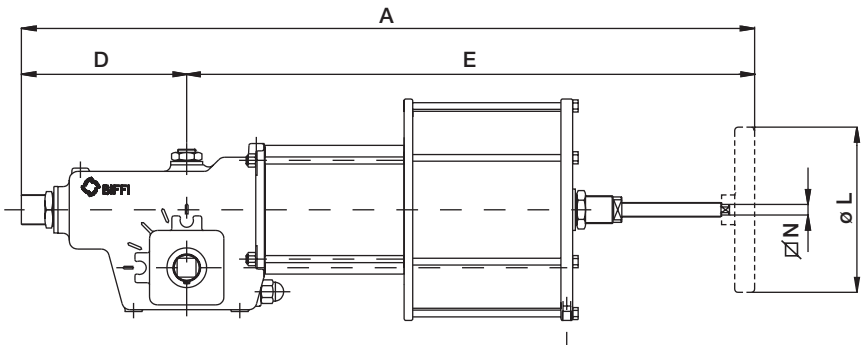
Notes

- Dimensions and weights given are without optional bracket
- W = maximum allowable mounting bracket dimensions (pneumatic cylinder side)



Dimensions in mm

Model	A	D	E	⌀N	øL	Jackscrew turns per stroke	Weight (Kg)
RP 15S2A1	721	175	546	13	200	43	19
RP 15S2B1	721	175	546	13	200	43	19
RP 15S2C1	721	175	546	13	200	43	19
RP 15S2A2	882	175	707	13	200	43	26
RP 15S2B2	882	175	707	13	200	43	26
RP 15S2C2	882	175	707	13	200	43	26
RP 30S2A1	909	206	703	16	250	37	38
RP 30S2B1	909	206	703	16	250	37	38
RP 30S2C1	909	206	703	16	250	37	38
RP 30S2A2	1130	206	924	16	250	37	53
RP 30S2B2	1130	206	924	16	250	37	53
RP 30S2C2	1130	206	924	16	250	37	53
RP 60S2A1	1077	250	827	16	250	45	68
RP 60S2B1	1077	250	827	16	250	45	68
RP 60S2C1	1077	250	827	16	250	45	68
RP 60S2A2	1330	250	1080	16	250	45	89
RP 60S2B2	1330	250	1080	16	250	45	89
RP 60S2C2	1330	250	1080	16	250	45	89
RP 120S2A1	1261	310	951	16	250	52	130
RP 120S2B1	1261	310	951	16	250	52	130
RP 120S2C1	1261	310	951	16	250	52	130
RP 120S2A2	1546	310	1236	16	250	52	177
RP 120S2B2	1546	310	1236	16	250	52	177
RP 120S2C2	1546	310	1236	16	250	52	177



Dimensions in mm

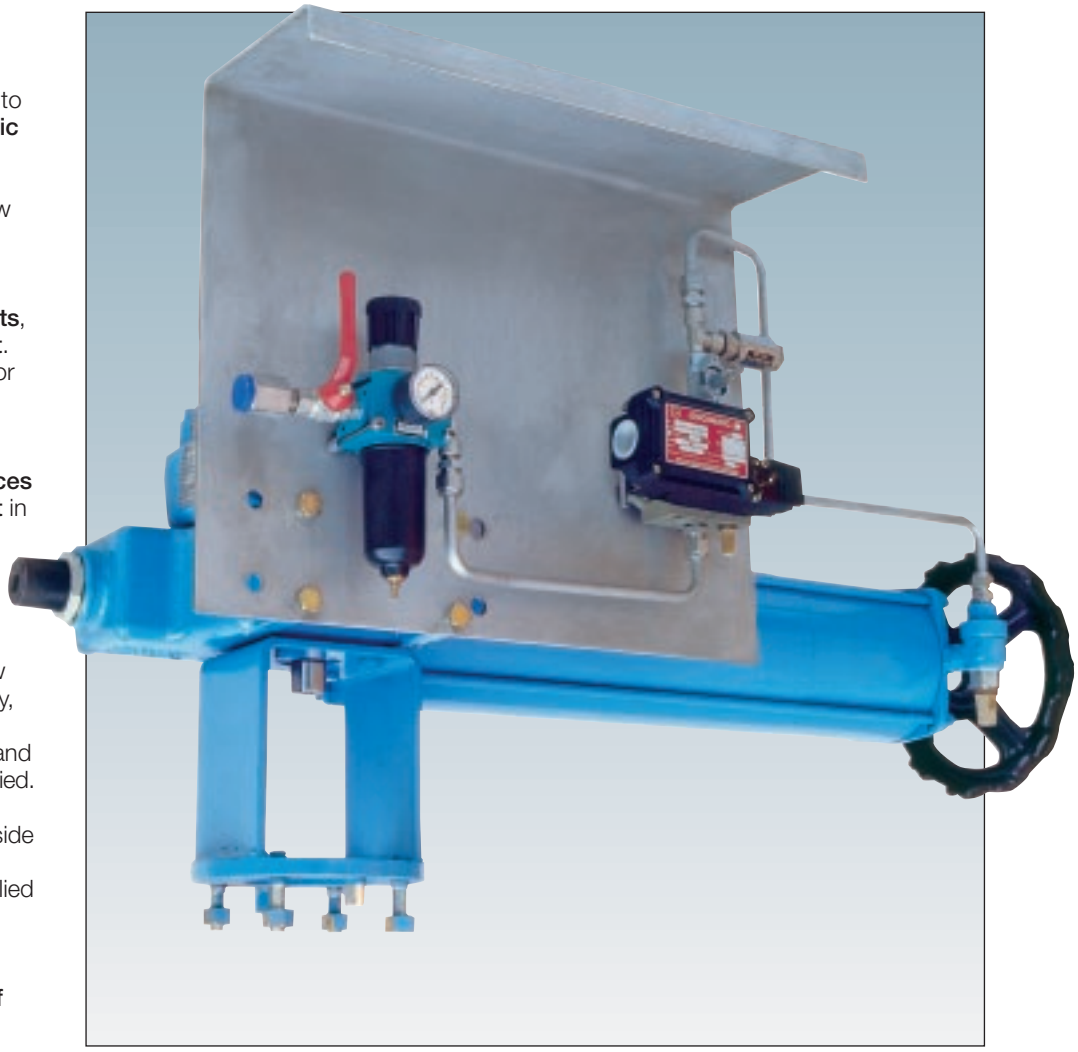
Model	A	D	E	⌀N	øL	Jackscrew turns per stroke	Weight (Kg)
RP 120S3A1	1259	310	949	16	250	52	175
RP 120S3B1	1259	310	949	16	250	52	175
RP 120S3C1	1259	310	949	16	250	52	175
RP 120S3A2	1544	310	1234	16	250	52	210
RP 120S3B2	1544	310	1234	16	250	52	210
RP 120S3C2	1544	310	1234	16	250	52	210

Notes

- Dimensions and weights given are without optional bracket

General

BIFFI has the ability to apply **advanced engineering technology** to design and manufacture of **pneumatic controls and accessories**.
The **experience** and **knowledge** acquired in the actuator industry allow BIFFI to meet with the highest requirements for control modes and operating conditions by **correct selection of schematics**, **components**, **materials and protection treatment**.
The actuator service can be **On-Off** or **Modulating**. Actuator control can be **local or remote** by electric or pneumatic signals.
The control system can include **devices for automatic operation** or **stay put** in case of **emergency** (electric or pneumatic supply failure, high temperature, low or high pipeline pressure etc.).
For **heavy duty service** or **special working conditions** (for example low working temperature, sour gas supply, special emergency operation, etc.), **control valves specially designed** and **manufactured by BIFFI** can be supplied.
Control systems can either be **mounted on a panel** or enclosed inside a **weatherproof cabinet**.
Control systems can either be supplied **separately or assembled on the actuator**.
The actuator housing has **dedicated threaded holes for the mounting of control systems and accessories**.



Main components of the control system

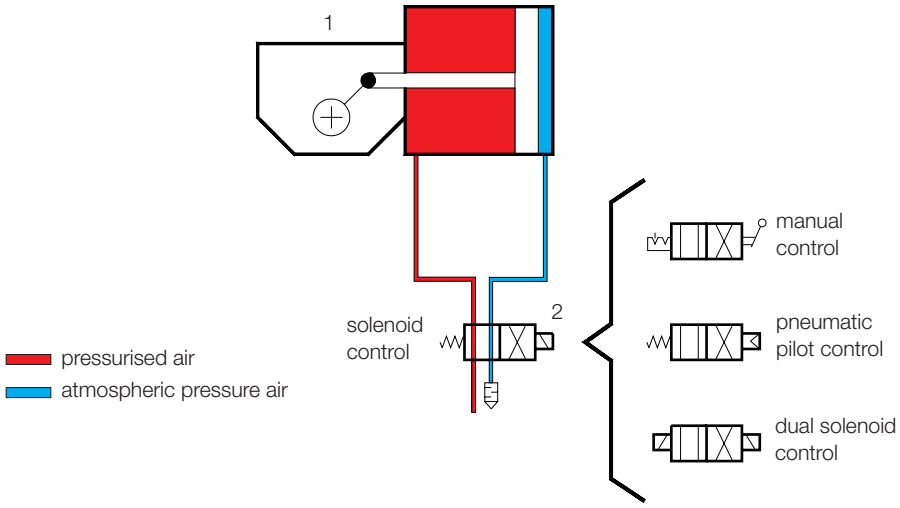
- **Stop valves, check valves**
- **Air conditioners** (filter, pressure regulator with pressure gauge, lubricator)
- **Air storage tanks** with accessories (relief valve, pressure gauge with stop valve, drain plug). **Standard air tanks** are designed, manufactured and tested **according to ISPESL Standard**. If required the tank can be supplied in accordance with different codes like ASME VIII DIV. 1, SNCT/France, BS/UK, TÜV/Germany, etc.
- **Solenoid** valves, **manual** valves, **pneumatic pilot valves**
- **Flow regulators**
- **Quick exhaust valves**
- **Pressure switches** - pneumatic or electric
- **Terminal enclosures**
- **Positioners** - pneumatic or electropneumatic
- **I/P converters**

Features

- The standard **components** have the **body in aluminium**.
  Brass and stainless steel versions **can be supplied**
- The **standard directional control valves** are **spool type**.
  Poppet type valves are **available**
- The **standard solenoid valves** are **air pilot operated**. Direct solenoid operated valves are available
- **Manual override** for solenoid valves is available
- **Manual reset** is available for solenoid valves and for pneumatic pilot valves
- **The electrical component enclosures** can have **explosionproof** and/or **weatherproof** protection.
  The **explosionproof** enclosures are in accordance with **CENELEC Standards** EN 50014 and EN 50018. Enclosures in accordance with **UL or CSA Standards can be supplied**. Components suitable for use in **intrinsically safe** circuits are **available**
- Terminals enclosures with **increased safety** protection are **available**
- The **pneumatic connections** are in **copper pipe and brass fittings as standard**; stainless steel can be supplied on request
- **Standard weatherproof cabinets** for control systems are in **carbon steel**. **Glass reinforced polyester** and the **stainless steel on request**

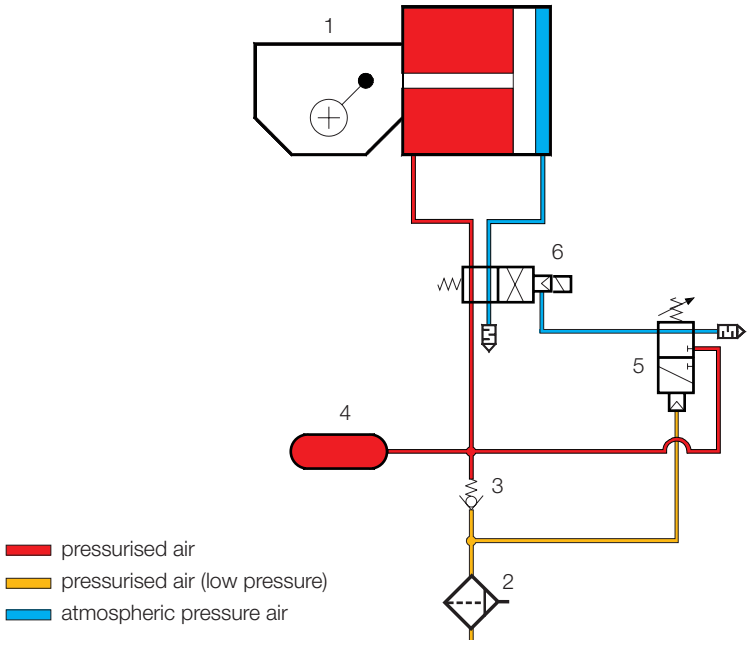
On-Off service: four way control valve

The diagram shows the simplest On-Off control. The gas supply pressure is applied to one side of the cylinder and exhausted from the opposite side.
When the control valve (2) is actuated the connections of supply and exhaust to the cylinder chambers are reversed.
The control valve can have many types of actuating devices (solenoid, manual control, pneumatic pilot, spring, etc.).
The spring return control valves allow "fail safe" operation.



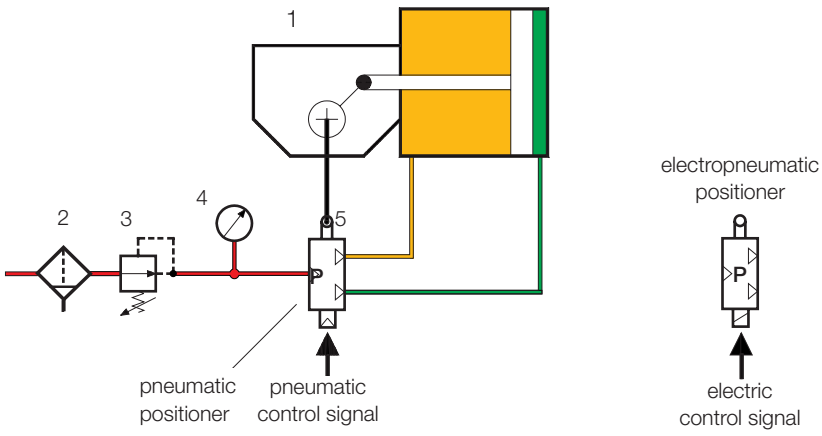
On-Off service: air fail safe system

This system allows "fail safe" operation when the pressure in the gas supply line drops below a set value.
The diagram shows the actuator (1) in the "fail safe" condition.
When the gas supply pressure drops below the pressure switch (5) set point, the pneumatic supply to the solenoid valve (6) pilot is exhausted and the actuator moves to the "fail safe" position by using the gas stored in the tank (4).
The tank is connected to the gas supply through the check valve (3).



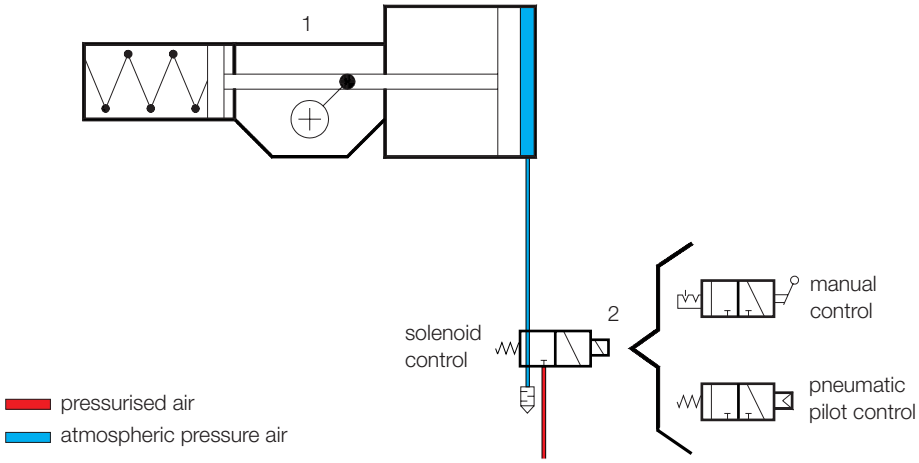
Modulating service

When modulating control is required as a function of a pneumatic or electric control signal, a positioner (5) is used, which controls the supply to the actuator cylinder to keep the valve in the required angular position.
The positioner has a mechanical linkage to the actuator, for a feedback of the valve position.



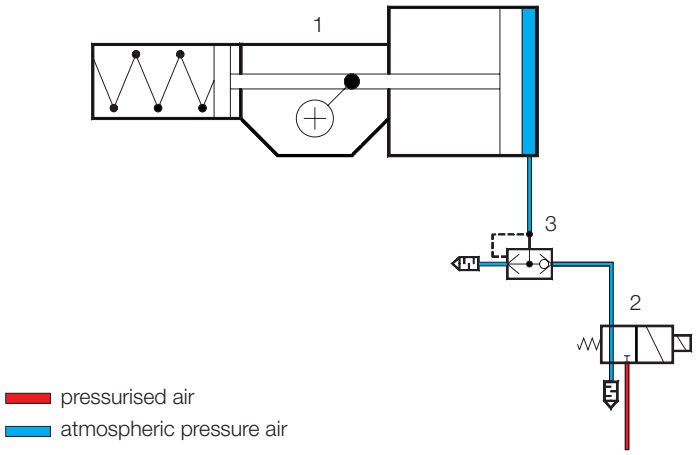
On-Off service: three way control valve

The diagram shows the simplest On-Off control. The control valve (2) has two positions. In one position the gas supply pressure is connected to the cylinder chamber, and the actuator performs the "pneumatic" operation. In the other position the cylinder is connected to the exhaust and the actuator moves under the operation of the spring.
The control valve can have many types of actuating devices (solenoid, manual control, pneumatic pilot, spring, etc.).
Spring return control valves allow "fail safe" operation.



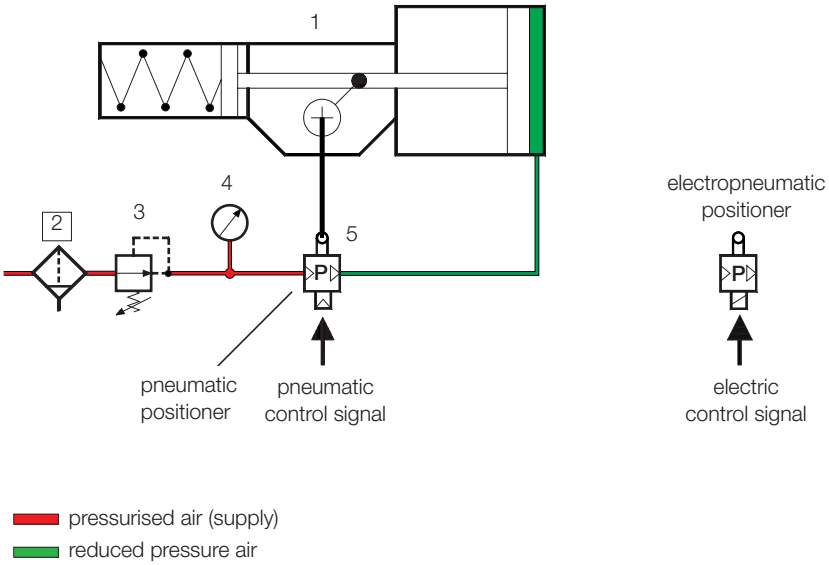
On-Off service: quick spring operation

When fast action is required under spring operation, a quick exhaust valve (3) is installed in the cylinder port to exhaust the gas from the cylinder directly to the atmosphere.
When the control valve (2) opens to the atmosphere a differential pressure is created across the quick exhaust valve (3) causing it to open.
The resultant high flow capacity from cylinder to atmosphere allows quick spring operation of the actuator.

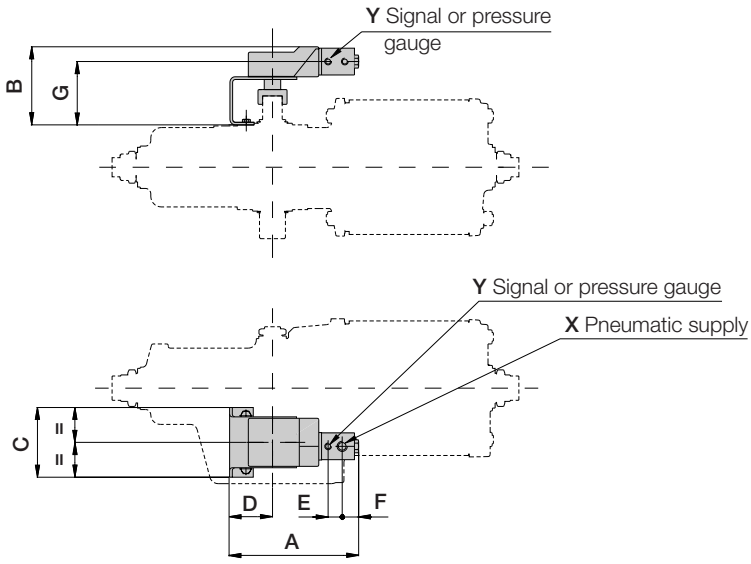


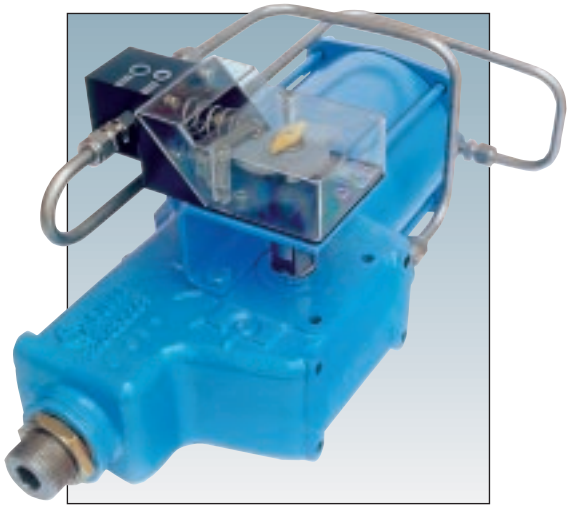
Modulating service

When modulating control is required as a function of a pneumatic or electric control signal, a positioner (5) is used, which controls the supply to the actuator cylinder to keep the valve in the required angular position.
The positioner has a mechanical linkage to the actuator, for a feedback of the valve position.



Overall dimensions



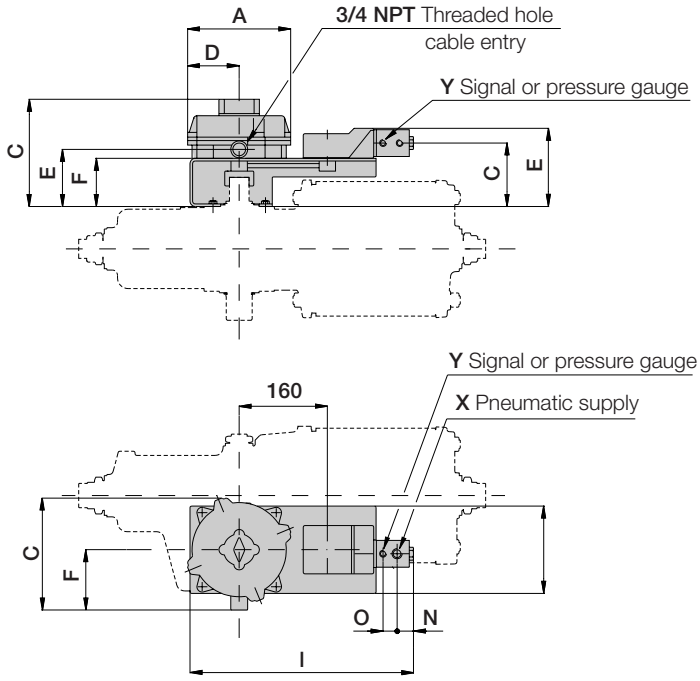


Dimensions in mm

Model	A	B	C	D	E	F	G	X NPT	Y NPT
RP 15	203	123	90	50	18	34	96	1/4	1/8
RP 30	210	121	95	57	18	34	94	1/4	1/8
RP 60	223	131	95	70	18	34	104	1/4	1/8
RP 120	233	146	95	80	18	34	119	1/4	1/8

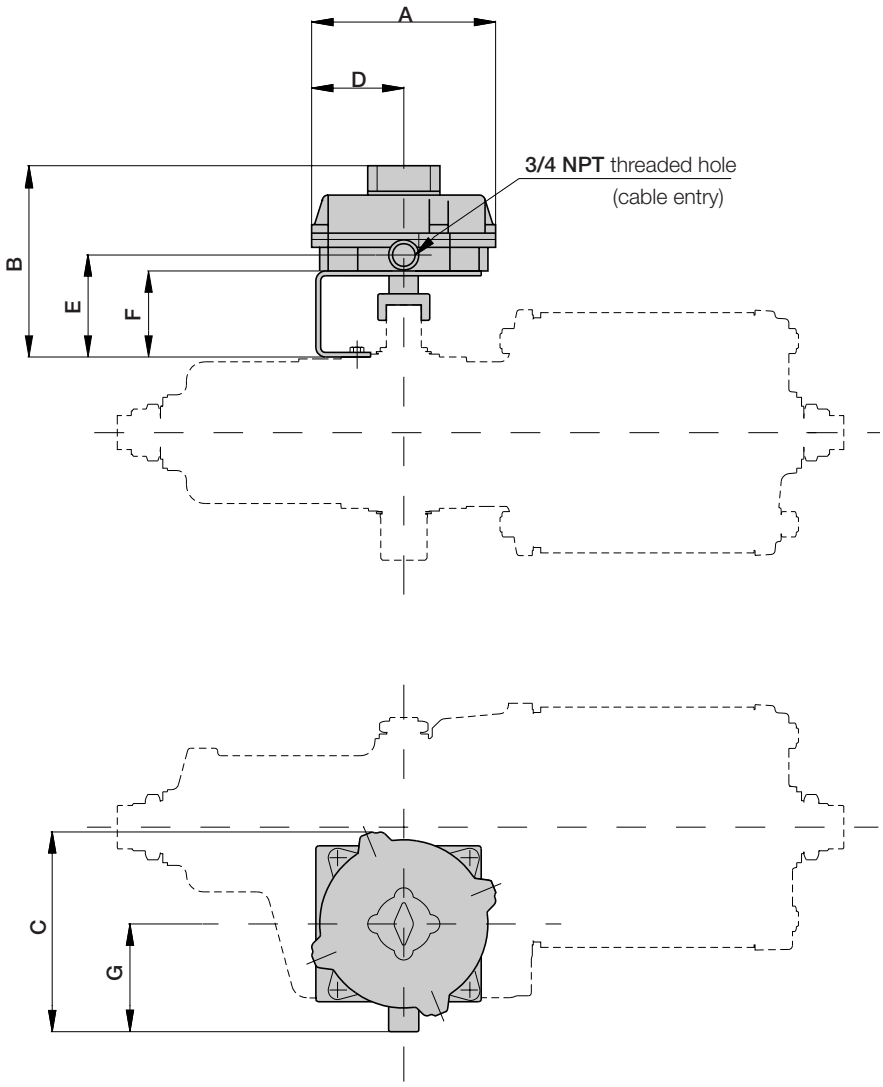
Overall dimensions

Actuator with pneumatic positioner and limitswitch box



Dimensions in mm

Model	A	B	C	D	E	F	G	H	I	L	M	N	O	X NPT	Y NPT
RP 15	194	219	210	97	102	85	114	114	141	410	110	34	18	1/4	1/8
RP 30	194	219	210	97	102	85	114	114	141	410	110	34	18	1/4	1/8
RP 60	194	219	210	97	102	85	114	114	141	410	110	34	18	1/4	1/8
RP 120	194	225	210	97	108	91	114	120	147	410	165	34	18	1/4	1/8

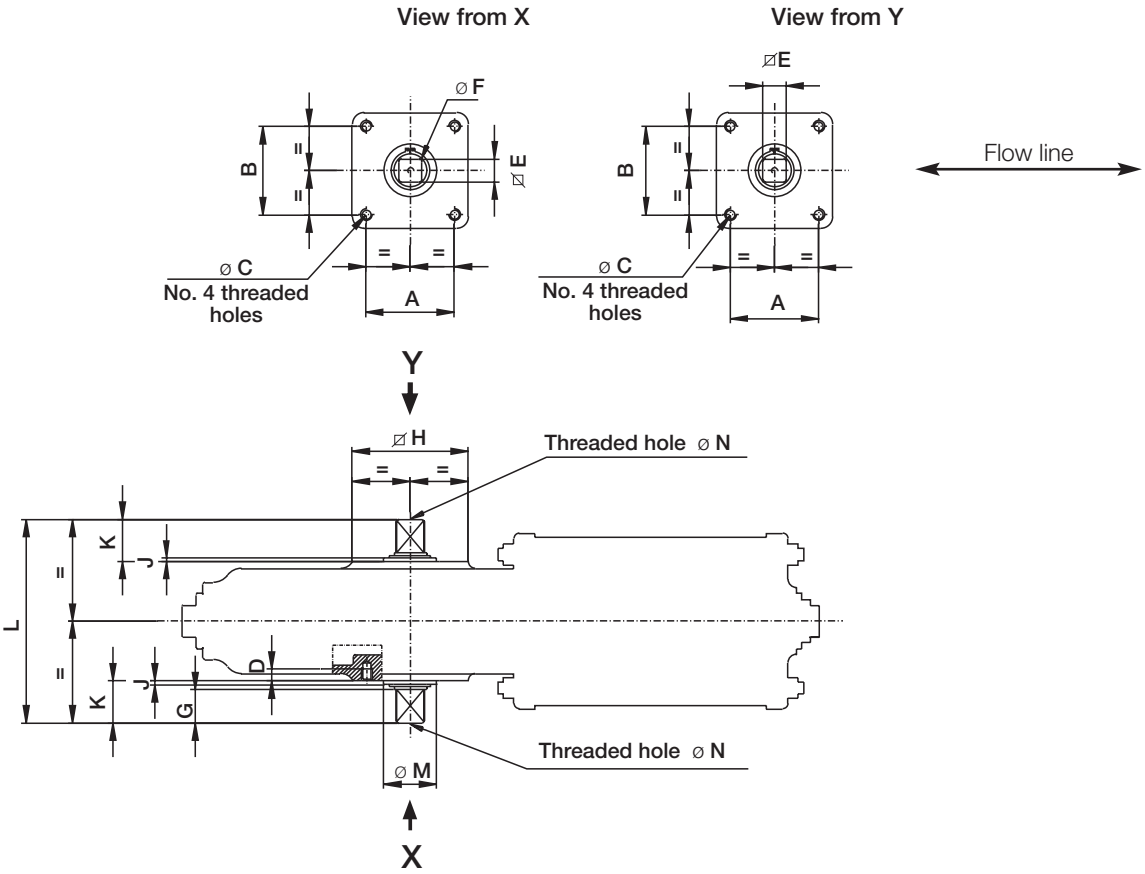


Dimensions in mm

Model	A	B	C	D	E	F	G
RP 15	194	200	210	97	83	66	114
RP 30	194	203	210	97	85	68	114
RP 60	194	213	210	97	95	78	114
RP 120	194	225	210	97	108	91	114

Note

- The limit switch box is shown in its standard position on the actuator (cable entry on the actuator front). If required, the box can be rotated 90° by 90°.

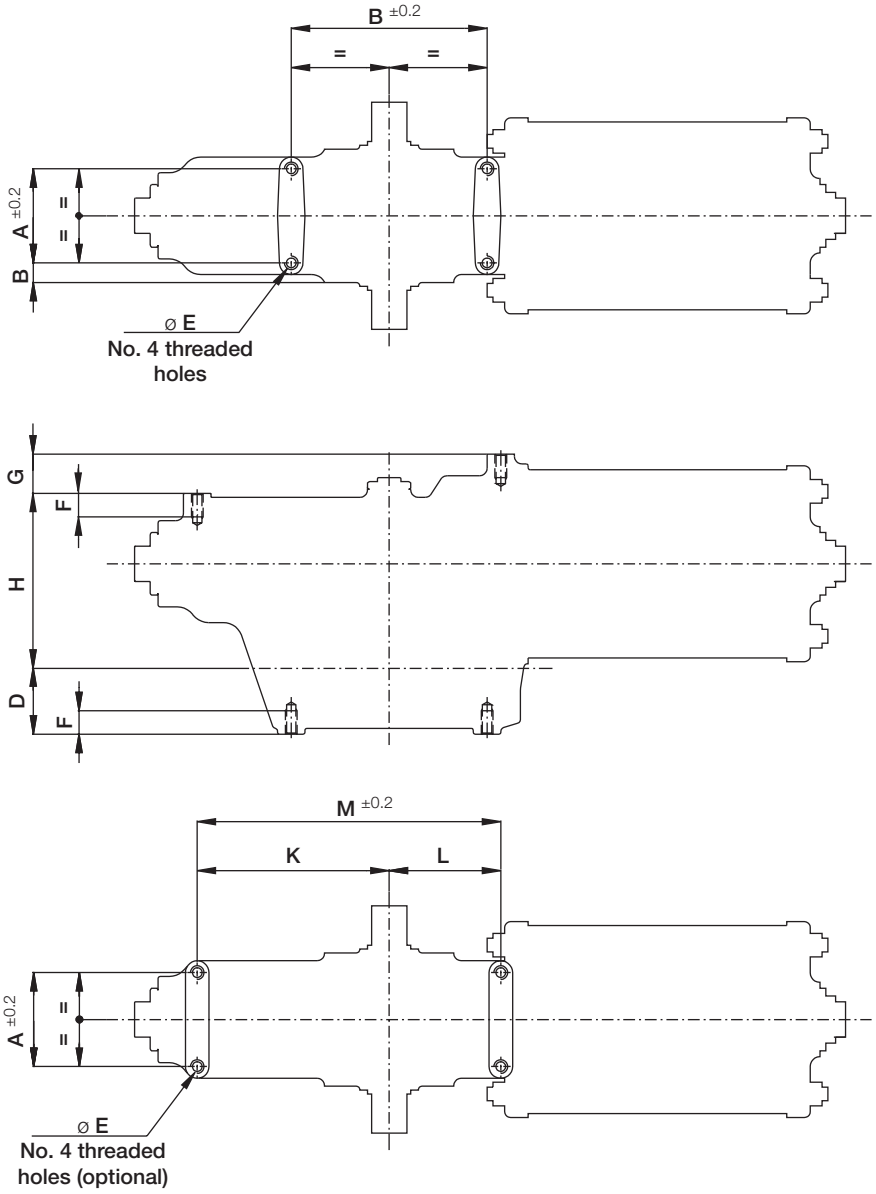


Dimensions in mm

Model	A	B	ø C	D	ØE	ø F	G	ØH	K	J	L	ø M
15	49.5	49.5	M8	10	16	21	23	66	30	3	140	40
30	72.1	72.1	M10	12	22	29	25	92	32	3	164	50
60	88.4	88.4	M12	15	28	37	34	112	42	3	204	60
120	99	99	M16	23	37	49	45	132	55	3	270	75

Notes

- Both actuator flanges can be used for either mounting on the valve or ancillary equipment (positioner, limit switch box, etc.)



Dimensions in mm

Model	A	B	C	D	ø E	F	G	H	K	L	M
15	55	110	12.5	43	M8	14	17	98	114	67	181
30	70	125	15	56	M10	16	35	120	136	80	216
60	88	160	16	68	M12	19	35	150	160	105	265
120	124	190	18	82	M16	23	50	183	210	124	334

Your enquiries for pneumatic actuators can be efficiently processed when you supply the information requested on this page.
Please use this page as guidance when sending your enquiries; if you need assistance, directly contact our offices.

Applicable documents

Customer requisition n° .....

Data sheet .....

Specification .....

Valve data

Manufacturer .....
Model .....Type .....
Size: ND ..... ☐ mm ☐ inches
Class .....
Max diff. pressure ..... ☐ bar ☐ PSI
Medium .....
Service ☐ on-off ☐ modulating
☐ .....

Valve required torques
☐ Nm ☐ Lbs-in
safety factor: included ..... % ☐ not incl.
break to open (0°) .....
break to close (90°) .....
end to close (0°) .....
end to open (90°) .....
running .....
dynamic torque (at.....°) .....
max allowable .....

Stem size
diameter/square side .....mm
height .....mm
key dimension ..... x .....mm
Coupling dimensions
customer's drawing .....
Installation
pipe axis: ☐ vertical ☐ horizontal
valve stem: ☐ vertical ☐ horizontal
cylinder axis: ☐ parallel ☐ perpendicular to the pipe axis

notes .....
.....
.....
.....
.....

Actuator data

Actuator type
☐ double acting
☐ single acting spring to close
☐ single acting spring to open

Gas supply
☐ air ☐ natural gas ☐ nitrogen
☐ .....
connections size: ..... ☐ ISO 7/1 Rp
☐ NPT
☐ .....
Gas supply pressure: ☐ bar ☐ PSI
min ..... normal ..... max .....

Operating time (sec)
opening: from ..... to .....
closing: from ..... to .....
Ambient temperature
min ..... max ..... ☐ °C ☐ °F
Environment conditions .....
Required painting cycle .....
Manual override:
☐ no ☐ jackscrew ☐ hand pump
☐ .....

Notes

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Valve position signaling

Electric limit switches
open q.ty ..... closed q.ty .....
intermediate q.ty .....
Supply voltage ..... ☐ DC
..... ☐ AC ..... Hz
load:
resistive ..... Amps
lamps ..... Amps
inductive ..... Amps
Cam actuated
☐ SPDT ☐ sealed ☐ sealed under inert gas
☐ gold contact ☐ DPDT ☐ .....
Proximity
☐ inductive
☐ magnetic ☐ NO ☐ NC ☐ SPDT
type/manufacturer .....
.....

Pneumatic limit switches
open q.ty ..... closed q.ty .....
intermediate q.ty .....
Supply pressure ..... ☐ bar
..... ☐ PSI
pneum. connection size ..... ☐ ISO7/1RP
☐ NPT
☐ .....

Electric position transmitter
☐ 4-20 mA output signal ☐ contact type
☐ contactless type ☐ .....
☐ resistive from ..... to ..... Ohm
☐ .....
type/manufacturer .....
notes .....
.....

Local position indicator
☐ standard
☐ special .....
Enclosure
Protection degree
☐ weatherproof IP.....
☐ explosionproof .....
.....
☐ intrinsically safe .....
code: ☐ ATEX ☐ .....
Material
☐ alum. (std) ☐ cast iron ☐ .....
Cable entries
q.ty ..... size .....

Customer wiring diagram .....
.....

Control system

On-off service
☐ by electric signal
☐ by pneumatic signal
☐ by local manual control
☐ .....
1 signal ☐ to close ☐ to open
2 signals ☐ to close ☐ to open
Control signal:
voltage ..... ☐ DC
..... ☐ AC ..... Hz
pressure ..... ☐ bar ..... PSI
notes .....
.....
.....

Modulating service
☐ by electric signal ..... mA (closed valve)
..... mA (open valve)
☐ by pneum. signal ..... (closed valve)
☐ bar ☐ PSI ..... (open valve)
☐ .....

Control system reset
☐ automatic ☐ local manual
☐ remote .....
☐ after any closing operation
☐ after any opening operation
☐ after emergency operation only
☐ .....

Emergency action
☐ closing operation
☐ opening operation
☐ stay in position
☐ for pneumatic supply failure
☐ for low pressure in the storage tank
☐ for low pressure in the process line
☐ for high pressure in the process line
☐ for electric supply failure
for ☐ electric ☐ pneumatic control signal
☐ failure
☐ present from rem. control room
☐ for high rate of pressure drop in the process line

Control system components

Solenoid valves
Body material
☐ aluminium/brass
☐ stainless steel
☐ .....
Action
☐ direct ☐ servopiloted
Coil enclosure protection
☐ weatherproof IP .....
☐ explosionproof .....
.....
☐ intrinsically safe .....
code: ☐ ATEX ☐ .....
Coil enclosure material
☐ aluminium ☐ cast iron/steel
☐ .....
Function
☐ universal ☐ NC ☐ NO
Supply voltage ..... ☐ DC
..... ☐ AC ..... Hz
Max consumed power ..... ☐ W ☐ VA
notes .....
.....
.....

Pipe and fittings
☐ copper pipe and brass nickel plated fittings
☐ carbon steel
☐ 316 stainless steel
☐ .....
notes .....
.....

Junction box
Protection degree
☐ weatherproof IP .....
☐ explosionproof .....
☐ intrinsically safe .....
☐ increased safety .....
code: ☐ ATEX ☐ .....
Material
☐ aluminium ☐ cast iron ☐ GRP
☐ stainless steel ☐ .....
Cable entries
☐ q.ty ..... size .....

Customer operating diagram .....
Customer wiring diagram .....

Control system valves
Body material
☐ aluminium/brass
☐ stainless steel
☐ .....
notes .....
.....

Control system assembling
☐ on panel:
panel material ☐ carbon steel (std)
☐ stainless steel
☐ into cabinet:
cabinet material ☐ carbon steel (std)
☐ GRP
☐ stainless steel
notes .....
.....
.....
.....
.....
.....
.....
.....

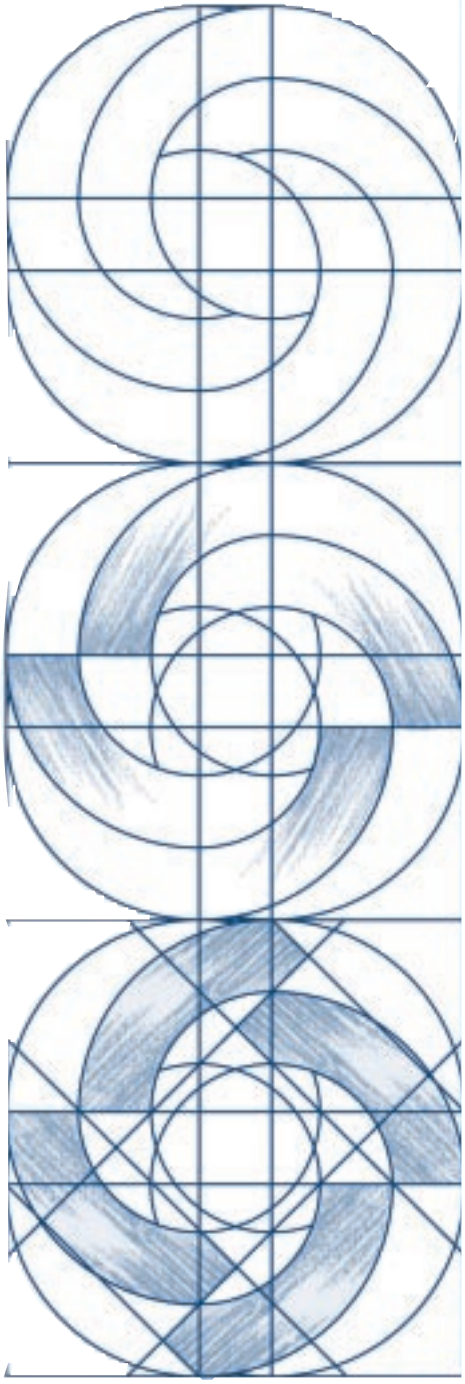
Storage tank

no of strokes .....
starting pressure ..... ☐ bar ☐ PSI
assembling: ☐ on actuator ☐ separate
code: ☐ PED
☐ ASME VIII Div.1 not stamped
☐ .....
.....
.....

design pressure ..... ☐ bar ☐ PSI
design temperature ..... ☐ °C ☐ °F
required non destructive test .....
.....
.....
.....
.....
.....

Safety valve:
☐ yes ☐ no code .....
set at ..... ☐ bar ☐ PSI
body material ☐ brass
☐ carbon steel ☐ stainless steel
notes .....
Other accessories .....
.....

Notes



BIFFI

tyco flow control

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e_mail: biffi_italia@biffi.it