Pneumatic Spring **Diaphragm Actuators**

Series UA - 11 & 12

Revolutionizing Flow Control

Contents

1. Introduction

Series UA-11 and 12, Single acting pneumatic actuator is a linear actuated type, that provides accurate throttling or on-off operation for valve element. These actuators are used in throttle valves for open-close positioning where fast action is required.

Direct Acting Type

UA11- Single acting direct actuator, Air to close action(ATC)

In this series, air pressure is applied to the top of the upper diaphragm case, which extends the actuator stem and allows the valve to close. If the supply or signal air pressure is interrupted, the actuator will retract its stem by means of spring action and allowing the valve to open.

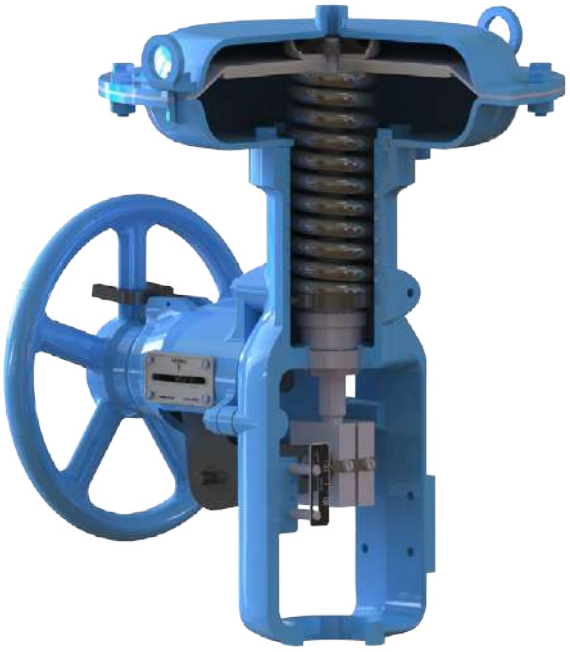
Reverse Acting Type

UA12- single acting reverse actuator, Air to open action(ATO)

In this series, air pressure is applied to the bottom of the lower diaphragm case, the stem retracts and the valve opens. If the supply or signal air pressure is interrupted, the actuator moves its stem to the extended position by means of spring action, allowing the valve to close.

2. Main Features

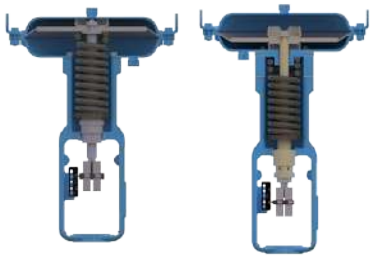
- Diaphragms provide linear performance and increased travels
- Inherent fail safe action in either air fail open or close orientation
- Single spring configuration
- Powerful thrust at high stroking speed and low friction
- Design validated by cyclic operational and load test
- Perfect sealing
- Stem protective gaiters also available
- Upper and lower diaphragm/ limit stops available for adjusting the travel
- Reliable and ease maintenance
- Optional handwheel for manual operation



3. Model Numbering Method

Series UA-11 & 12 Actuator Code

UA-11 / UA-12	1st 2nd	3rd 4th 5th	6th
Series Pneumatic Spring Diaphragm Type	Actuator Size	Max.Stroke(mm)	Manual Override
	30	19.05	SM1
	35	38.1	SM2
	40	50.8	SM3
	45	63	SM3
	50	101.8	SM4

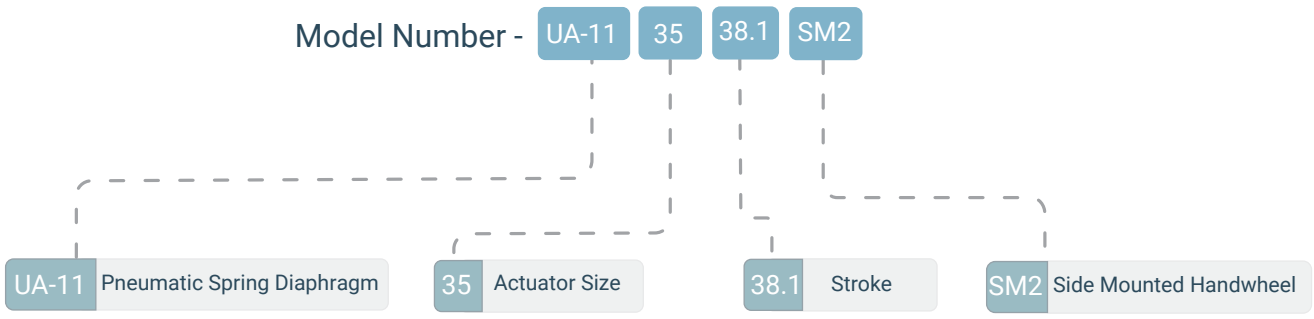


UA-11 UA-12

UA-11 Direct actuator

UA-12 Reverse actuator

Sample Model Numbering



4. General Description

Actuator Size	Refer table - 1
Operating Spring Range	0.2 - 1 Barg (3 - 15 psig)
	0.4 - 2 Barg (6 - 30 psig), 0.7 - 2.3 Barg (10 - 34 psig)
Maximum Supply Pressure(1)	4.5 Barg (65 psig)
Maximum design Pressure(2	10 barg (145 psig) for diaphragm case and its bolting.
	6.2 Barg (90 psig) for internal parts of actuator.
Maximum Allowable Thrust	Refer table - 2
Effective Diaphragm Area	Refer table - 3
Diaphragm	Molded neoprene with a cloth fabric(Rayon) insert.
Workinng Temperature limits	Minimum -40 °C to Maximum 90 °C
compression spring	High strength, Nickel - chromium - silicium steel and is protected by a corrosion resistant coating.
Fail-safe action	Actuator stem extends or Actuator stem retracts
Maximum Travel / Stroke	4"(101.6mm) and 0.75"(19.05mm) (Refer table-1)
Handwheels	Side mounted and Top mounted
Operating Supply Medium	Compressed air
Service	On-Off and Regulating service
Pneumatic Connection(3)	¼" NPT (F) and ½" NPT (F)
Special Applications	Marine, Offshore services
Actuator Dimensions	Refer table-2 in page no-9

Notes :

1. Maximum Supply pressure of 4.5 bar for throttling service. In on/off service, the supply pressure must be limited.
2. The diaphragm case and its joints can withstand max. design pressure of 10 barg. To prevent internal deformation of actuator parts, the design pressure is limited to 6.2 Barg.
3. Other NPT sizes available on request.

5. Technical Data

Thrust for Direct Action | Table-1

Actuator Size	Stroke	Effective Area	Spring Ranges (bar)		Single / Compo	Actuator Spring Range	Direct Action - ATC (Air To Close)									
							Actual Air Supply (bar) / Thrust (N)									
	(mm)	(mm²)	Initial	Final		N/mm	1.4	1.6	1.8	2	2.2	2.5	2.8	3.2	3.6	4.1
30	19.05	51472	0.2	1.0	Single	216	2059	3088	4118	5147	6177	7721	9265	11324	13383	15956
	19.05	51472	0.4	2.0	Single	432					1029	2574	4118	6177	8235	10809
	25.40	51472	0.4	2.0	Single	324					1029	2574	4118	6177	8235	10809
35	19.05	75477	0.4	2.0	Single	634					1510	3774	6038	9057	12076	15850
	38.1	75477	0.4	2.0	Single	317					1510	3774	6038	9057	12076	15850
	38.1	75477	0.2	1.0	Single	158	3019	4529	6038	7548	9057	11322	13586	16605	19624	23398
	38.1	75477	0.8	2.0	Single	238					1510	3774	6038	9057	12076	15850
	50.8	75477	0.4	2.0	Single	238					1510	3774	6038	9057	12076	15850
40	38.1	101788	0.4	2.0	Single	427					2036	5089	8143	12215	16286	21375
	50.8	101788	0.4	2.0	Single	321					2036	5089	8143	12215	16286	21375
	50.8	101788	0.2	1.0	Single	160	4072	6107	8143	10179	12215	15268	18322	22393	26465	31554
	50.8	101788	0.7	2.0	Single	260					2036	5089	8143	12215	16286	21375
45	50.8	141863	0.4	2.0	Single	447					2837	7093	11349	17024	22698	29791
	63.5	141863	0.2	1.0	Single	179	5675	8512	11349	14186	17024	21279	25535	31210	36884	43977
	63.5	141863	0.4	2.0	Compo	357					2837	7093	11349	17024	22698	29791
	63.5	141863									2837	7093	11349	17024	22698	29791
50	101.6	141863	0.7	2.3	Single	223						2837	7093	12768	18442	25535
	63.5	141863	1.2	2.2	Single	223						4256	8512	14186	19861	26954
	88.9	141863	0.8	2.3	Single	239						2837	7093	12768	18442	25535
	76.2	141863	0.2	0.6	Compo	74	11349	14186	17024	19861	22698	26954	31210	36884	42559	49652
		141863						22698	25535	28373	31210	35466	39722	45396	51071	58164
	109.2	141863	0.4	2.0	Compo	208					2837	7093	11349	17024	22698	29791
		141863					19861	22698	25535	28373	31210	35466	39722	45396	51071	58164

5. Technical Data

Thrust for Reverse Action | Table-2

Actuator Size	Stroke	Effective Area	Spring Ranges (bar)		Single/ Compo	Actuator Spring Range	Reverse Action	
							ATO(Air To Open)	
	(mm)	(mm²)	Initial	Final		N/mm	Air Supply (bar)	Thrust (N)
30	19.05	51472	0.2	1.0	Single	216	1.3	1029
	19.05	51472	0.4	2.0	Single	432	2.3	2059
	25.40	51472	0.4	2.0	Single	324	2.3	2059
35	19.05	75477	0.4	2.0	Single	634	2.3	3019
	38.1	75477	0.4	2.0	Single	317	2.3	3019
	38.1	75477	0.2	1.0	Single	158	1.3	1510
	38.1	75477	0.8	2.0	Single	238	2.3	6038
	50.8	75477	0.4	2.0	Single	238	2.3	3019
40	38.1	101788	0.4	2.0	Single	427	2.3	4072
	50.8	101788	0.4	2.0	Single	321	2.3	4072
	50.8	101788	0.2	1.0	Single	160	1.3	2036
	50.8	101788	0.7	2.0	Single	260	2.3	7125
45	50.8	141863	0.4	2.0	Single	447	2.3	5675
	63.5	141863	0.2	1.0	Single	179	1.3	2837
	63.5	141863	0.4	2.0	Compo	357	2.3	5675
	63.5	141863						
50	101.6	141863	0.7	2.3	Single	223.4	2.6	9930
	63.5	141863	1.2	2.2	Single	223.4	2.5	17024
	88.9	141863	0.8	2.3	Single	239.4	2.6	11349
	76.2	141863	0.2	0.6	Compo	74	0.9	2837
		141863						
	109.2	141863	0.4	2.0	Compo	208	2.3	5675
		141863						

6. Standard Construction

Series UA - 11 | Air To Close

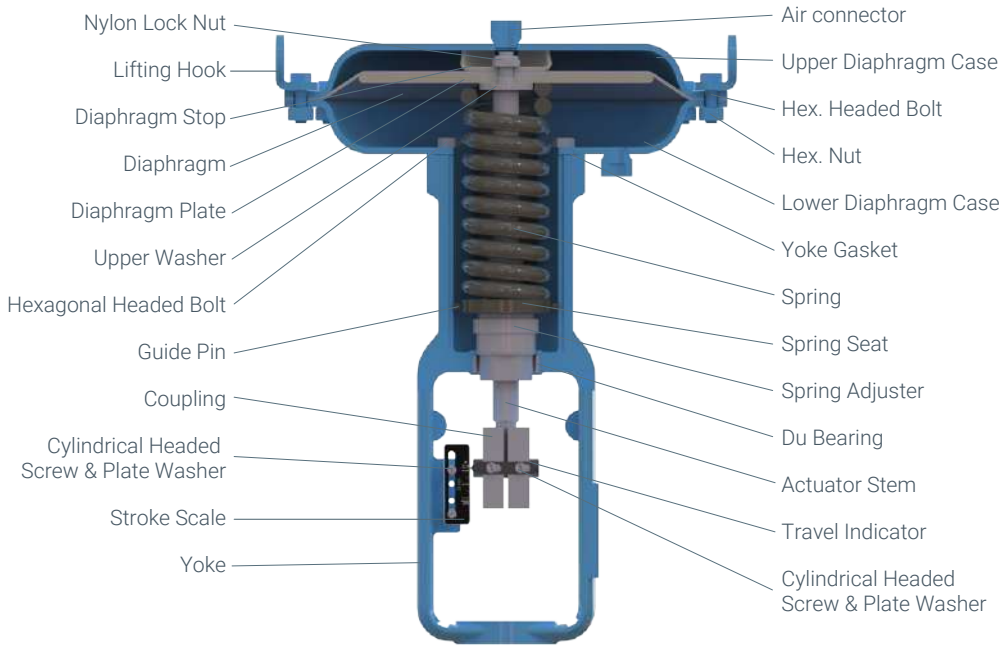


Figure-1

Series UA 12 | Air To Open

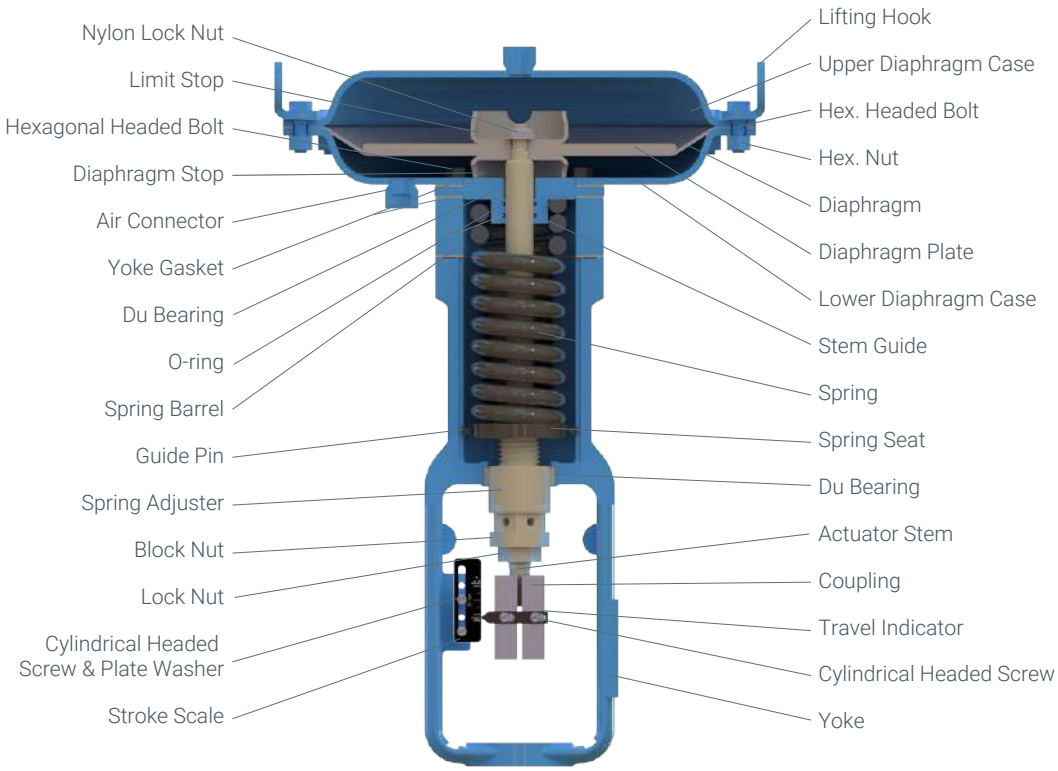


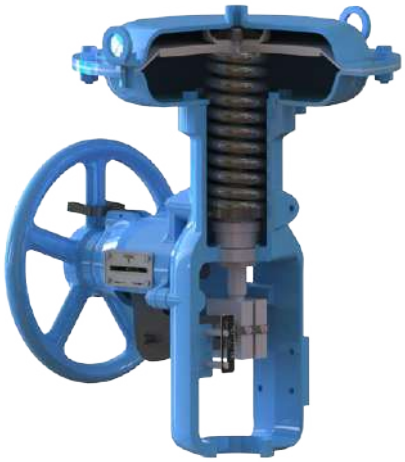
Figure-2

7. Manual override

Side Mounted Handwheel

Handwheels are designed to give an override facility to the operator to bypass the control signal that is controlling the valve therefore allowing manual intervention in the control system. This can sometimes be useful in such things as plant start-up to preposition the valve to a given flow.

Side mounted handwheels can also be used to limit travel in either direction (though not at the same time). The handwheel may be set in the neutral position for automatic operation through the full valve travel. In any other position the valve travel is restricted.

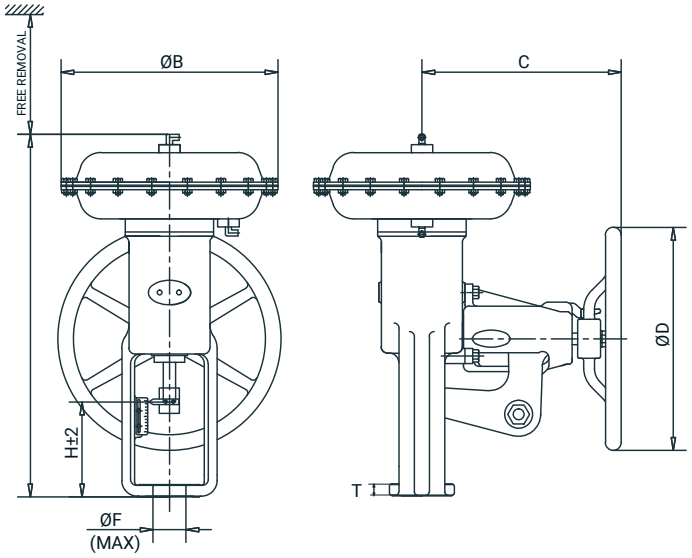


8. Accessories

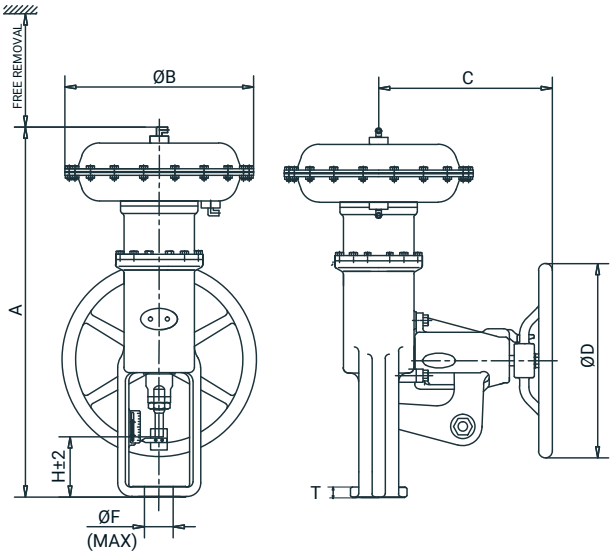
- Positioner
- Limit switch
- Air pressure regulator
- Air lock relay
- Volume booster
- Quick exhaust valve
- Flow restrictor
- Back-up system with tank
- Junction Box for electrical terminations
- Solenoid valve
- Safety relief valve

9. Dimensions

Actuator UA-11



Actuator UA-12



Actuator Model	Actuator Size	Max. Stroke (Inches)	Max. Stroke (mm)	A	ØB	C	ØF (Max.)	T	ØD	Handwheel Size	STEM DIA	STEM THREAD	THREAD LENGTH	H±2
UA-11	30	0.75	19.05	462.9	335	230	60.5	17.5	250	SM1	20	M16X2	26	135
UA-12	30	0.75	19.05	512.9	335	230			250		20		26	116
UA-11	35	1.5	38.1	568.2	386	265	60.5	17.5	300	SM2	22		28.5	152
UA-12	35	1.5	38.1	638.2	386	265			300		22		28.5	120
UA-11	40	2	50.8	730.5	452	380	96	25	450	SM3	25	M20X2.5	32	219
UA-12	40	2	50.8	834	452	380			450		25		32	173
UA-11	45	2.5	63.5	764.5	532	380			450		25		32	228
UA-12	45	2.5	63.5	878	532	380			450		25		32	166
UA-11	50	4	101.6	941.5	532	485	96	25	570	SM4	25		32	261
UA-12	50	4	101.6	1256	532	485			570		25		32	155

Notes:

UNICORN VALVES

Revolutionizing Flow Control

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With continual development of our products, Unicorn Valves reserve thre right to amend and change the design and/or specification without prior notice.

contact us

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