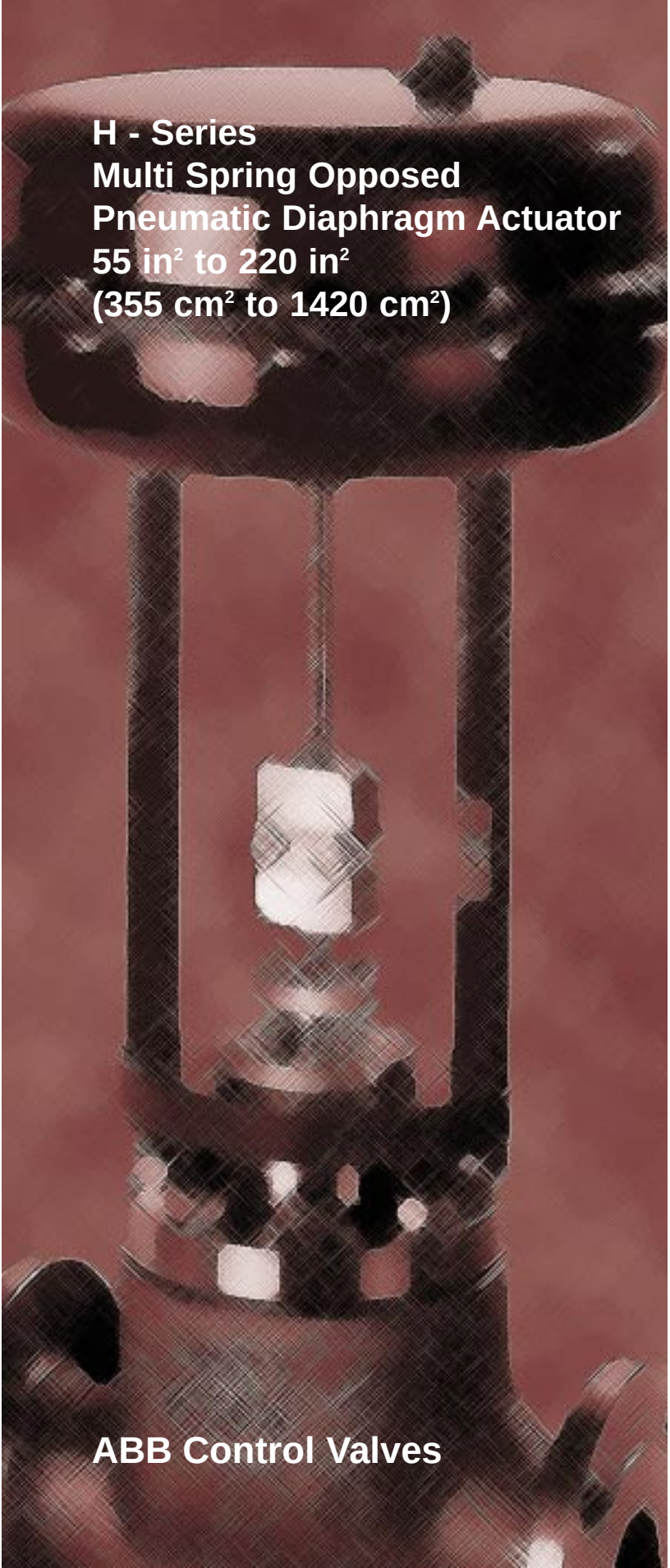

H - Series
Multi Spring Opposed Pneumatic Diaphragm Actuator
55 in² to 220 in² (355 cm² to 1420 cm²)

ABB Control Valves

Technical Bulletin T38

T38 - Features

General

- Low hysteresis - fast response.
- High power and enhanced reliability
- Easy coupling to valve plug stem.
- Copper-free construction with surfaces protection for use in corrosive atmospheres.
- Stainless steel (Si - Cr) range spring guarantees repeatability and long life.

Description

The H Series multispring diaphragm actuator is of the non reversible type. This has been designed with an improved mechanical structure which makes the product extremely competitive for price as well as suitable for application with critical operating conditions.
The actuators use selected materials (carbon steel) to guarantee robustness and withstand thermal drifts and mechanical shoots; appropriate protective finish allows application in aggressive environments.
The actuators may be supplied with a series of options which have been developed to offer all facilities for operations and easy access for maintenance, once fitted by a simplified mounting/installation.

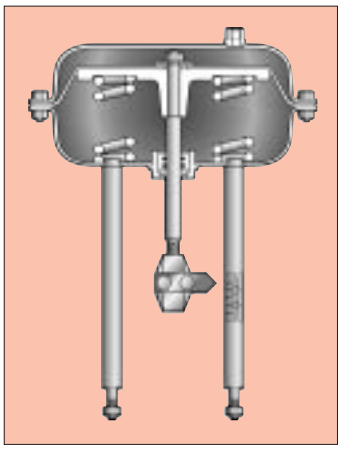

Figure 1. Direct Action Actuator.

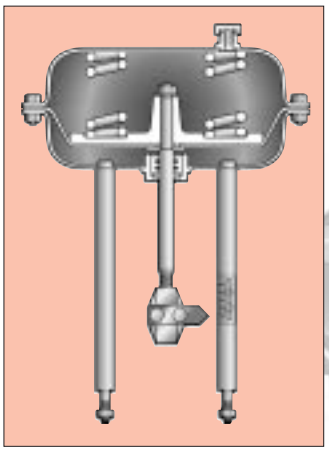

Figure 2. Reverse Action Actuator.

Characteristics

The actuator is suitable for continuous control and on/off application and can be equipped with top handwheels as shown in figure 3 and 4.

The stroking times for the multispring H Series diaphragm actuator depend on the application. The factors which influence this characteristic are the stroke, air supply pressure, size of pipework connection, spring rate, operation action (air to open, air to close) and type of the possible associated positioner.
Actuator stroking time of less than one second can be obtained by using boosters.

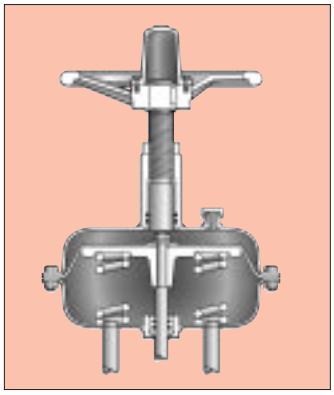

Figure 3. Direct Action Top Handwheel.

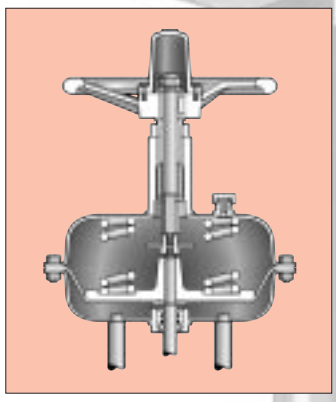

Figure 4. Reverse Action Top Handwheel.

Table 1 Actuator characteristics.

Actuator size		Travel		Volume in³ (cm³)					
in²	cm²	in	mm	0 Travel		Full Travel		Swept	
55	355	3/4	19	79	(1300)	125	(2050)	46	(750)
		1 1/8	28	67	(1100)	137	(2250)	70	(1150)
110	710	3/4	19	201	(3300)	299	(4900)	98	(1600)
		1 1/8	28	177	(2900)	323	(5300)	146	(2400)
		1 1/2	38	152	(2500)	248	(5700)	196	(3200)
220	1420	1 1/8	28	619	(10150)	918	(15050)	299	(4900)
		1 1/2	38	567	(9300)	967	(15850)	400	(6550)
		2 1/4	57	470	(7700)	1068	(17500)	598	(9800)

Technical Data

Diaphragm housing:	Carbon steel
Yoke:	Carbon steel
Stem:	AISI 400 Series
Diaphragm:	Reinforced Neoprene
Gaskets:	BUNA
Springs:	Steel (60 Si Cr 8)
Bolts/nuts:	Carbon steel

Table 2. Operating conditions

Maximum continuous working pressure			Minimum working temperature	Minimum storage temperature	Maximum storage temperature
psi	bar	kpa	°C (°F)	°C (°F)	°C (°F)
60	4.2	400	-40 (-40)	55 (-67)	90 (194)

Table 3. Spring Features and Actuators Power

Actuator Size		Spring					Power					
		Travel		Range			Thrust Gross		Thrust Nett		Spring Extended	
in²	cm²			psi	bar	kpa	Lbf	(kgf)	Lbf	(kgf)	Lbf	(kgf)
55	355	3/4	19	3 - 15	0.2 - 1.0	20 - 100	3310	(1500)	2480	(1125)	165	(75)
				6 - 30	0.4 - 2.0	40 - 200			1655	(750)	330	(150)
				7 - 15	0.49 - 1.0	48 - 100			2480	(1125)	385	(175)
				14 - 30	0.98 - 2.0	96 - 200			1655	(750)	770	(350)
		1 1/8	28	3 - 15	0.2 - 1.0	20 - 100			2480	(1125)	165	(75)
				6 - 30	0.4 - 2.0	40 - 200			1655	(750)	330	(150)
110	710	3/4	19	3 - 15	0.2 - 1.0	20 - 100	6620	(3000)	4960	(2250)	330	(150)
				6 - 30	0.4 - 2.0	40 - 200			3305	(1500)	660	(300)
		1 1/8	28	3 - 15	0.2 - 1.0	20 - 100			4960	(2250)	330	(150)
				6 - 30	0.4 - 2.0	40 - 200			3305	(1500)	660	(300)
				6 - 15	0.4 - 1.0	40 - 100			4960	(2250)	660	(300)
				12 - 30	0.8 - 2.0	80 - 200			3305	(1500)	1320	(600)
		1 1/2	38	3 - 15	0.2 - 1.0	20 - 100			4960	(2250)	330	(150)
				6 - 30	0.4 - 2.0	40 - 200			3305	(1500)	660	(300)
220	1420	1 1/8	28	3 - 15	0.2 - 1.0	20 - 100	13240	(6000)	9920	(4500)	660	(300)
				6 - 30	0.4 - 2.0	40 - 200			6610	(3000)	1320	(600)
				6 - 15	0.4 - 1.0	40 - 100			9920	(4500)	1320	(600)
				12 - 30	0.8 - 2.0	80 - 200			6610	(3000)	2640	(1200)
		1 1/2	38	3 - 15	0.2 - 1.0	20 - 100			9920	(4500)	660	(300)
				6 - 30	0.4 - 2.0	40 - 200			6610	(3000)	1320	(600)
				7 - 15	0.49 - 1.0	48 - 100			9920	(4500)	1540	(700)
				14 - 30	0.98 - 2.0	96 - 200			6610	(3000)	3080	(1400)
		2 1/4	57	3 - 15	0.2 - 1.0	20 - 100			9920	(4500)	660	(300)
				6 - 30	0.4 - 2.0	40 - 200			6610	(3000)	1320	(600)

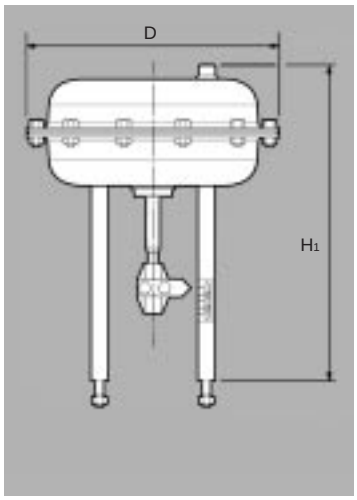

Figure 5. Actuator Dimensions

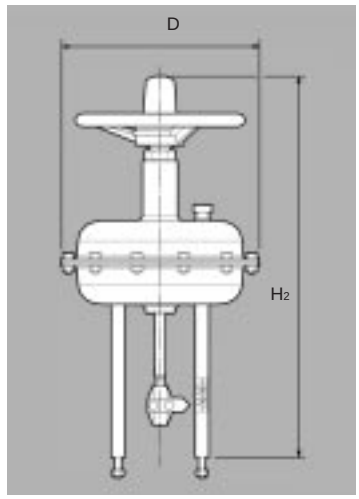

Figure 6. Actuator with Top Handwheel Dimensions.

Table 4. Actuator dimensions.

Actuator size		Travel		D		H_1		H_2	
in^2	cm^2	in	mm	in	mm	in	mm	in	mm
55	355	3/4	19	11.80	300	14.96	380	24.00	610
		1 1/8	28						
110	710	3/4	19	15.43	393	15.75	400	28.54	725
		1 1/8	28						
		1 1/2	38			16.42	417	30.70	780
220	1420	1 1/8	28	21.65	550	18.43	468	31.50	800
		1 1/2	38			19.10	485	33.66	855
		2 1/4	57			20.47	520	38.44	965

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