ENTECH CONTROLS

'M' SERIES

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Everything About Actuation...

Introduction:

Entech M-series Multi spring single acting spring return diaphragm actuator is linear actuator type, that can be used for On/Off & modulating controls valve applications. If required can be used along with handwheel.

General Features:

1. Wide range of travel and Spring ranges
2. Quick response
3. Smooth functioning, excellent linearity between pressure & Travel
4. Long life
5. Reliable & ease maintenance
6. Optional handwheel for manual operation
   SMH- Side mounted handwheel
   TMH- Top mounted handwheel*

(*) TMH – Top mounted handwheel is only applicable for M174, M230, M320 and M385 actuators

Actuator Models : M174, M230, M320, M385, M700, M960, M1400, M1920.
Actuator Area : 174cm² to 1920cm² (27-inch² to 300-inch²)
Travel : 5mm to 100mm (1/4 inch to 4 inch)
Spring range : Refer the table
Minimum & Maximum Working Pressure : 2.5 kg/cm² to 6 kg/cm²
Operating temperature range :
Standard Construction (NBR Diaphragm): -20 to 80°C
Optional Construction (EPDM Diaphragm): - 20 to 80°C
Optional Construction (Silicone Diaphragm): - 45 to 80°C

Certifications for actuators:

CE marking
IP65
ATEX II 2 G Ex h IIC T6…T1 Gb X

Construction Materials:

Diaphragm Casing: Hot Roll carbon Steel.
Diaphragm: NBR with Nylon (STD), EPDM with Nylon, Silicone with Nomex.
Actuator Spring: Gr.3 / EN-47 / 50CrV4 / 51 CrV4.
Actuator Shaft: AISI 304/ AISI 431/ 410.
Diaphragm Disc: Hot Roll carbon Steel.
O-Ring & Seals: NBR(STD), EPDM, Silicone.
Yoke: S.G. Iron (STD), Carbon Steel.
Anti Rotation Coupling: CA-15C(STD), AISI 304 (CF8).
Casing hardware: B7 bolts with Zinc Nickel plating & 2H nuts Zinc Nickel plating.
Painting: As the extremal C.S. components are Epoxy painted. (Other painting system can be optional)

- For any other material spec. please contact Entech controls.

Actuator Weight & Volume details

Sr. No.	Actuator Model	Area of Actuator	Max. Travel in mm	Air Connection Size	Swept Volume of actuator per stroke	Bare Actuator weight (Kg)	Actuator Along with TMH (Kgs)	Actuator Along with SMH (Kgs)
1	M174	174 cm²	20	1/4" NPT-F	1.0 Liters	15	30	35
2	M230	230 cm²	25	1/4" NPT-F	1.4 Liters	18	32	38
3	M320	320 cm²	30	1/4" NPT-F	2.0 Liters	22	26	44
4	M385	385 cm²	38	1/4" NPT-F	2.8 Liters	25	45	45
5	M700	700 cm²	50	1/2" NPT-F	6.5 Liters	50	NA	110
6	M960	960 cm²	60	1/2" NPT-F	10 Liters	90	NA	160
7	M1400	1400cm²	100	1/2" NPT-F	22 Liters	130	NA	200
8	M1920	1920 cm²	100	3/4" NPT-F	29 Liters	150	NA	220

(*) Above weight & volume is subjected to standard max stroke. It can be change with respect to the change in parameters.

Type of Actions

1. **Reverse Action:**

Applying air pressure to the lower diaphragm casing forces the actuator stem upward against the opposing spring force. When this loading pressure is reduced, the spring moves the actuator stem downward. Should the loading pressure fail, the spring forces the stem to the extreme downward position. The actuators provide fail-closed action for push-down-to-close valves and fail-open action for push-down-to-open valves.

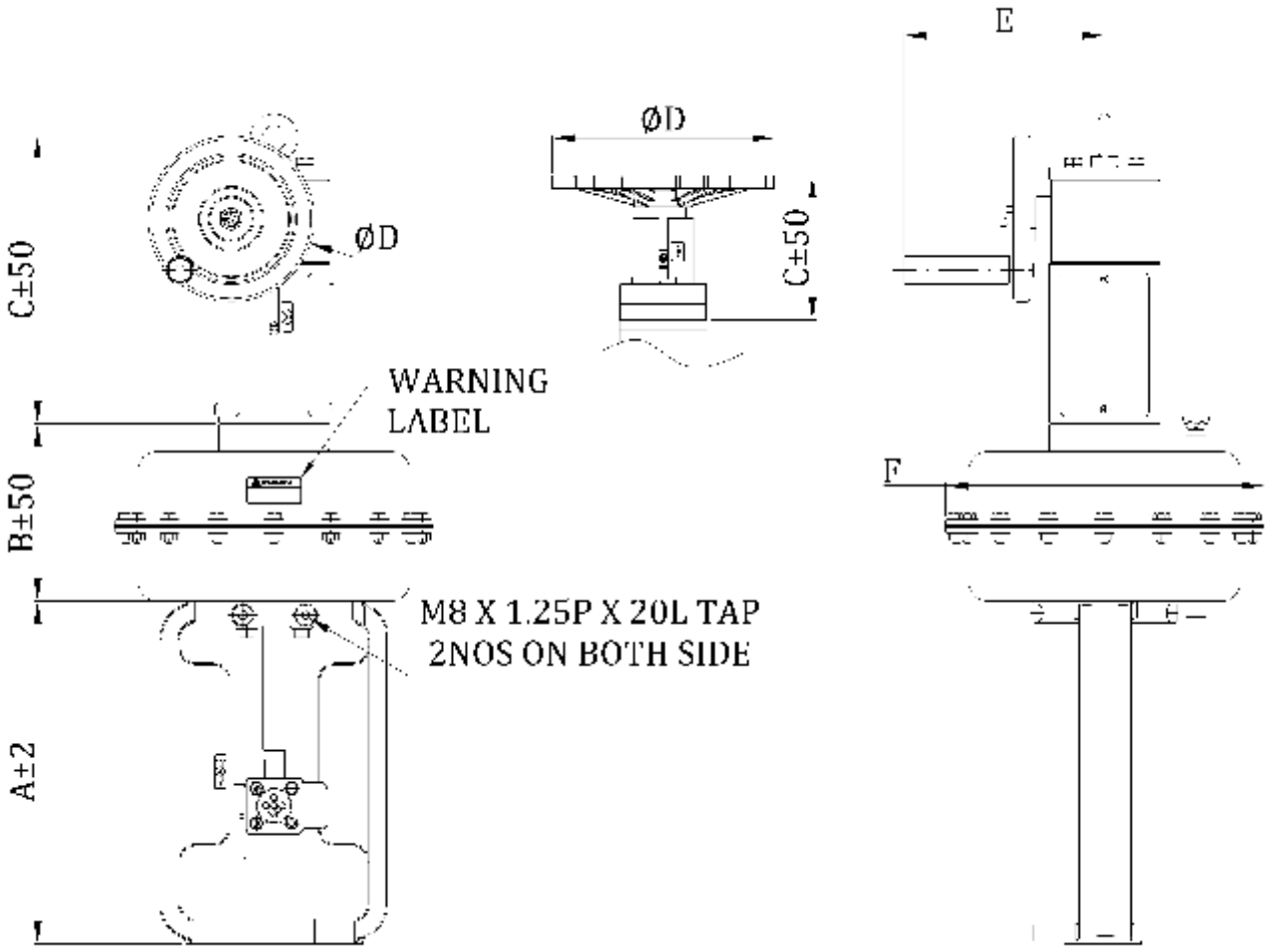
2. **Direct Action:**

Applying air pressure to the upper diaphragm casing forces the actuator stem downward. When this pressure is reduced, the opposing spring force moves the actuator stem upward. Should the loading pressure fail, the spring forces the stem to the extreme upward position. This provides fail-open action for push-down-to-close valves and fail-closed action for push-down-to-open valves.

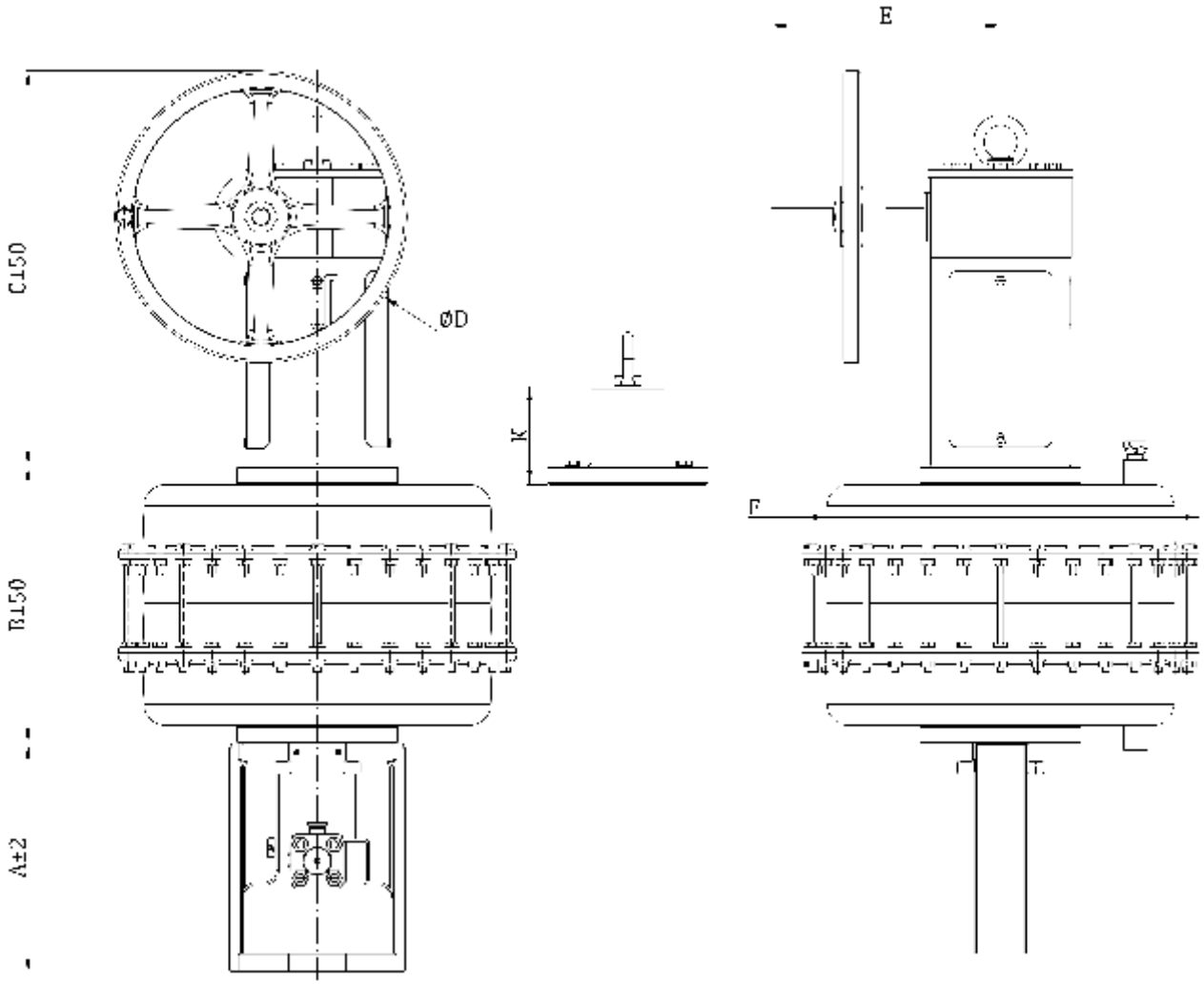
"Actuator Model"		Spring				Power & Thrust Details		
		Travel		Range		Thrust gross (Air) @ 4 kg/cm²(g)	Thrust Net By Air	Spring Extended (Initial Load)
Cm²	Inch²	Inch	mm	psi(g)	kg/cm²(g)	kgf	kgf	kgf
M174	35	1/2	12	3-15	0.2-1.0	696	35	522
				6-30	0.4-2.0		70	348
				12-20	0.8-1.4		139	452
				18-32	1.2-2.2		209	313
				20-43	1.4-3.0		244	174
		3/4	20	3-15	0.2-1.0		35	522
				6-30	0.4-2.0		70	348
				12-30	0.8-2.0		139	348
				18-40	1.2-2.8		209	209
M230	40	1/2	12	3-15	0.2-1.0	920	46	690
				6-30	0.4-2.0		92	460
				6-16	0.4-1.1		92	667
				20-31	1.4-2.1		322	437
		3/4	20	3-15	0.2-1.0		46	690
				6-30	0.4-2.0		92	460
				6-23	0.4-1.6		92	552
				20-36	1.4-2.5		322	345
		1	25	3-15	0.2-1.0		46	690
				6-30	0.4-2.0		92	460
				6-26	0.4-1.8		92	506
				20-39	1.4-2.7		322	299
M320	50	1/2	12	3-15	0.2-1.0	1280	64	960
				6-30	0.4-2.0		128	640
				12-18	0.8-1.2		256	896
		3/4	20	3-15	0.2-1.0		64	960
				6-30	0.4-2.0		128	640
				12-22	0.8-1.5		256	800
				12-30	0.8-2.0		256	640
		1	25	3-15	0.2-1.0		64	960
				6-30	0.4-2.0		128	640
				12-25	0.8-1.7		256	736
				12-30	0.8-2.0		256	640
M385	85	3/4	20	3-15	0.2-1.0	1540	77	1155
				6-30	0.4-2.0		154	770
				6-15	0.4-1.0		154	1155
				20-35	1.4-2.4		539	616
		1	25	3-15	0.2-1.0		77	1155
				6-30	0.4-2.0		154	770
				6-18	0.4-1.2		154	1078
				20-37	1.4-2.6		539	539
		1.5	38	3-15	0.2-1.0		77	1155
				6-30	0.4-2.0		154	770
				6-22	0.4-1.5		154	963
				20-46	1.4-3.2		539	308

"Actuator Model"		Spring				Power & Thrust Details		
		Travel		Range		Thrust gross (Air) @ 4 kg/cm²(g)	Thrust Net By Air	Spring Extended (Initial Load)
Cm²	Inch²	Inch	mm	psi(g)	kg/cm²(g)	kgf	kgf	kgf
M700	108	1	25	3-15	0.2-1.0	2800	980	2100
				6-30	0.4-2.0		140	1400
				6-12	0.4-0.8		280	2240
				20-32	1.4-2.2		980	1260
		1.5	38	3-15	0.2-1.0		140	2100
				6-30	0.4-2.0		280	1400
				6-15	0.4-1.0		280	2100
				20-39	1.4-2.7		980	910
		2	50	3-15	0.2-1.0		140	2100
				6-30	0.4-2.0		280	1400
				6-16	0.4-1.1		280	2030
				20-43	1.4-3.0		980	700
M960	148	1	25	3-15	0.2-1.0	3840	192	2880
				6-30	0.4-2.0		384	1920
				6-15	0.4-1.0		384	2880
				20-26	1.4-1.8		1344	2112
		1.5	38	3-15	0.2-1.0		192	2880
				6-30	0.4-2.0		384	1920
				6-18	0.4-1.2		384	2688
				20-30	1.4-2.0		1344	1920
		2	50	3-15	0.2-1.0		192	2880
				6-30	0.4-2.0		384	1920
				6-20	0.4-1.4		384	2496
				20-32	1.4-2.2		1344	1728
M1400	218	1	25	3-15	0.2-1.0	5600	280	4200
				6-30	0.4-2.0		560	2800
				6-13	0.4-0.9		560	4340
				20-30	1.4-2.0		1960	2800
		2	50	3-15	0.2-1.0		280	4200
				6-30	0.4-2.0		560	2800
				6-19	0.4-1.3		560	3780
				20-37	1.4-2.6		1960	1960
		3	75	3-15	0.2-1.0		280	4200
				6-30	0.4-2.0		560	2800
				6-25	0.4-1.7		560	3220
				20-46	1.4-3.1		1960	1260
		4	100	3-15	0.2-1.0		280	4200
				6-30	0.4-2.0		560	2800
				20-53	1.4-3.7		1960	420
M1920	298	2	50	3-15	0.2-1.0	7680	384	5760
				6-30	0.4-2.0		768	3840
				20-36	1.4-2.5		2688	2880
		3	75	3-15	0.2-1.0		384	5760
				6-30	0.4-2.0		768	3840
				20-43	1.4-3.0		2688	1920
		4	100	'3-15	0.2-1.0		384	5760
				6-30	0.4-2.0		768	3840
				20-50	1.4-3.5		2688	960

General Arrangement Drawings



General Arrangement Drawings



Sr. No.	Actuator Model	Area of Actuator	Max. Travel in mm	Air Connection Size	A	B	C (For SMH)	D (For SMH)	F	E
1	M174	174 cm²	20	1/4" NPT-F	260	115	300	150	210	190
2	M230	230 cm²	25	1/4" NPT-F	260	115	300	150	235	190
3	M320	320 cm²	30	1/4" NPT-F	320	170	300	150	275	190
4	M385	385 cm²	38	1/4" NPT-F	320	170	300	150	288	190
5	M700	700 cm²	50	1/2" NPT-F	355	240	450	320	392	260
6	M960	960 cm²	60	1/2" NPT-F	440	320	550	400	457	320
7	M1400	1400cm²	100	1/2" NPT-F	440	380	670	400	545	320
8	M1920	1920 cm²	100	3/4" NPT-F	440	450	670	400	620	320

Sr. No.	Actuator Model	Area of Actuator	Max. Travel in mm	Air Connection Size	A	B	C (For TMH)	D (For TMH)	K (For Bare act w/o H/W)
1	M174	174 cm²	20	1/4" NPT-F	260	100		200	NA
2	M230	230 cm²	25	1/4" NPT-F	260	90	180	250	NA
3	M320	320 cm²	30	1/4" NPT-F	320	150	220	350	NA
4	M385	385 cm²	38	1/4" NPT-F	320	150	220	350	NA
5	M700	700 cm²	50	1/2" NPT-F	355	240	NA	NA	120
6	M960	960 cm²	60	1/2" NPT-F	440	320	NA	NA	130
7	M1400	1400cm²	100	1/2" NPT-F	440	380	NA	NA	160
8	M1920	1920 cm²	100	3/4" NPT-F	440	450	NA	NA	160

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