



INNOVATIVE ACTUATORS
AND CONTROLS

RACK AND PINION

www.unitorq.com



UniTorq's proven commitment to developing innovative technologies and designs for pneumatic valve actuation products has helped to establish the company as the worldwide leader in pneumatic rack and pinion actuation design.

UniTorq offers pneumatic rack and pinion actuators in various sizes and models to meet all your torque output requirements. For example, at 80 PSI, double acting units will provide between 100 to 37,250 in/lbs of torque output; fail safe, spring return models can provide output torques up to 20,478 in/lbs. All of our units will operate at temperatures between -10° to 195°F and at input pressures from 20 PSIG to 150 PSIG. High and low temp seals and bearings are also available for severe applications.

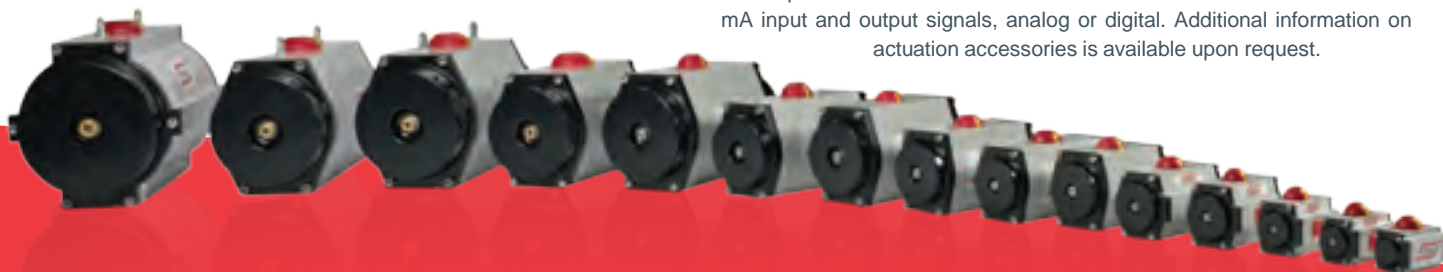
The standard UniTorq rack and pinion actuator body is made of extruded aluminum that is machined to our rigorous specifications. The bodies are then hard anodized both internally and externally and polyester powder epoxy painted for maximum hardness and corrosion protection. Actuator bodies are also available in Teflon impregnated, Autocatalytically Nickel Infused, and Stainless Steel versions; additional coating options are available upon request.

Inside the actuators, the manufacturing process is even more demanding. Our pistons are made from die-cast aluminum and the pinions are made of electroless nickel-plated carbon steel. The pistons incorporate a Delrin 500 wear pad that significantly increases the life of the actuator. Upper and lower Delrin bushings and NBR o-rings minimize wear and increase actuator duty cycle. Furthermore, our Double Limit Stop feature allows travel stop adjustment of +/- 5 degrees in both directions of travel.

Beyond the technological advancements that are readily apparent in the manufacturing of our actuators, our actuators are intelligently designed and easy to use. The actuators can easily be field converted from double acting to spring return simply by inserting the required number of our patented spring cartridges into the actuator body. This simple process eliminates the need for bulky housing extensions, saving the user unnecessary weight, space, and cost. Our patented spring cartridges are preloaded and specially designed to remain self-contained—thereby ensuring the safest installation and removal design in the industry—and our internal porting eliminates the need for any costly external tubing. And our actuators were specifically designed for easy installation: accessory mounting patterns on the actuator body conform to NAMUR standards and the actuator drive shaft meets all ISO 5211 dimensional standards.

Simply put, the UniTorq rack and pinion pneumatic actuator incorporates an uncomplicated, compact design with cutting edge technology that provides unparalleled durability, ease of use, and performance.

UniTorq offers a variety of accessory products designed to be used in conjunction with its rack and pinion actuators. Direct mount solenoid valves are available in NEMA 4, 7, and 9 versions with various voltage options. Limit switches are available as SPDT, DPDT, and proximity type switches, and come in co-polyester, stainless steel, and aluminum housings; explosion proof models are also available. Dec clutchable manual gear overrides are available for use on all of our pneumatic actuators. Positioners are available with 3-15 or 4-20 mA input and output signals, analog or digital. Additional information on actuation accessories is available upon request.



Durable, compact, versatile, safe, and economical – UniTorq's M-Series pneumatic actuators are the best and only choice for your rack and pinion actuation needs.

UNITORQ PNEUMATIC ACTUATOR TORQUE CHART

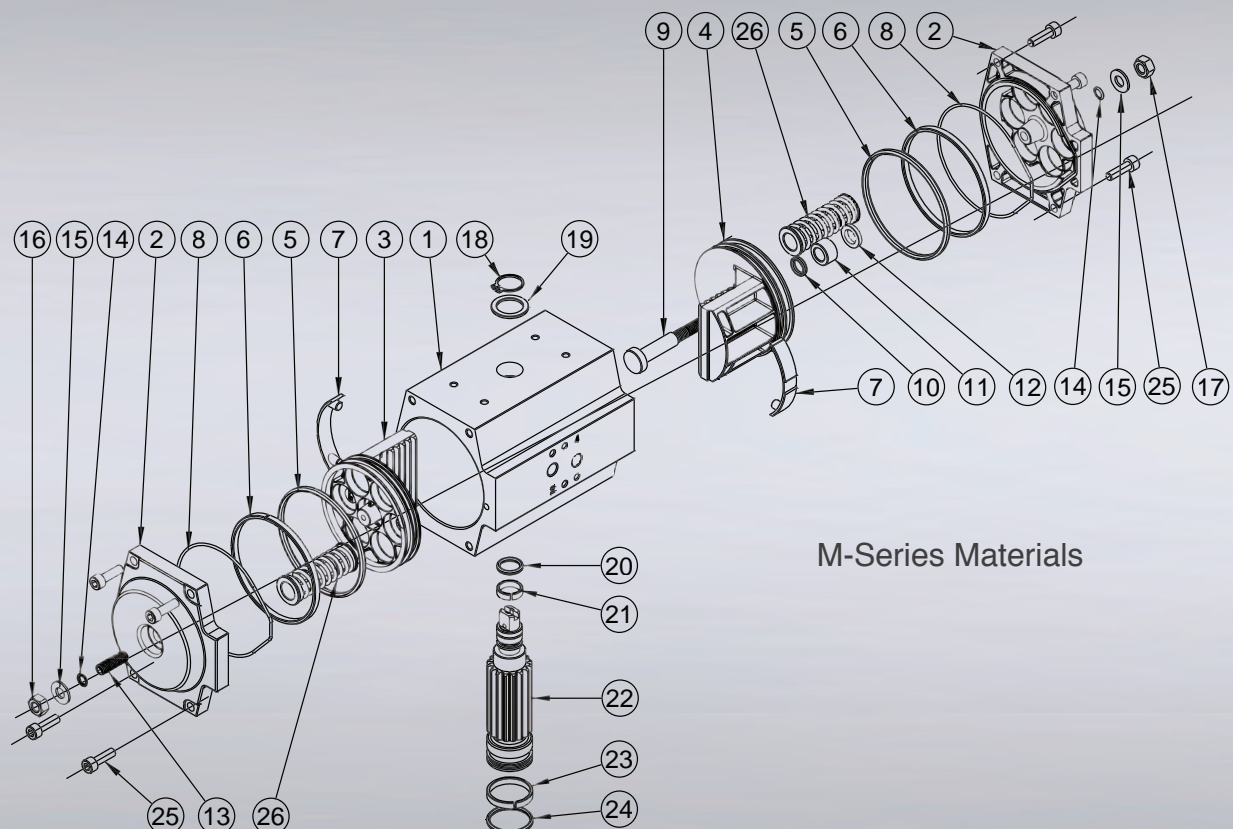
The Following Torque Values Are IN/LB And Represent Air Stroke For The Spring Return Unit.

PSI	40	60	80	100	120		ALL		40		60		80		100		120	
	Double Acting Torque in lbs.					K#	SPRING		AIR		AIR		AIR		AIR		AIR	
							Start	End	End	Start	End	Start	End	Start	End	Start	End	Start
T11	50	75	100	125	150	2	56	38	-	11	18	35	42	60	67	85	92	110
	-	-	-	-	-	3	83	57	-	-	-	16	15	40	40	65	65	90
M21	102	152	203	254	305	2	56	38	44	62	94	112	144	162	194	212	244	262
	-	-	-	-	-	3	83	57	15	42	65	92	115	142	165	192	215	242
	-	-	-	-	-	4	111	76	-	22	36	72	86	122	136	172	186	222
	-	-	-	-	-	5	139	95	-	2	6	52	56	102	106	152	156	202
	-	-	-	-	-	6	167	114	-	-	-	31	26	81	76	132	126	182
M31	151	227	302	378	453	2	80	56	69	93	144	168	218	242	293	317	367	391
	-	-	-	-	-	3	119	83	30	66	104	140	179	215	253	289	328	364
	-	-	-	-	-	4	159	111	-	38	64	112	139	187	213	261	288	336
	-	-	-	-	-	5	199	139	-	10	24	84	99	159	173	233	248	308
	-	-	-	-	-	6	239	167	-	-	-	56	59	131	133	206	208	280
M53	263	395	526	658	789	2	154	104	105	155	235	285	365	415	494	545	624	675
	-	-	-	-	-	3	232	156	28	103	158	233	287	363	417	493	547	623
	-	-	-	-	-	4	309	208	-	51	80	181	210	311	340	441	469	570
	-	-	-	-	-	5	386	260	-	-	3	129	132	259	262	388	392	518
	-	-	-	-	-	6	463	312	-	-	-	76	55	206	185	336	314	466
M74	367	551	734	918	1101	2	199	127	163	235	344	417	525	598	706	779	887	960
	-	-	-	-	-	3	299	190	63	172	244	353	426	534	607	715	788	896
	-	-	-	-	-	4	398	253	-	108	145	290	326	471	507	652	688	833
	-	-	-	-	-	5	498	317	-	45	45	226	226	407	407	588	588	769
	-	-	-	-	-	6	597	380	-	-	-	162	126	343	307	524	488	706
M104	516	774	1032	1290	1548	2	267	189	241	318	495	572	749	826	1002	1080	1256	1334
	-	-	-	-	-	3	400	284	107	223	361	477	615	731	869	985	1123	1239
	-	-	-	-	-	4	533	379	-	128	227	382	481	636	735	890	989	1144
	-	-	-	-	-	5	667	473	-	33	93	287	347	541	601	795	855	1049
	-	-	-	-	-	6	800	568	-	-	-	192	213	446	467	700	721	954
M148	740	1109	1479	1849	2219	2	407	260	321	468	685	832	1049	1196	1413	1560	1777	1924
	-	-	-	-	-	3	611	391	117	337	481	701	845	1065	1209	1429	1573	1793
	-	-	-	-	-	4	814	521	-	207	277	571	641	935	1005	1299	1369	1663
	-	-	-	-	-	5	1018	651	-	76	73	440	437	804	801	1168	1165	1532
	-	-	-	-	-	6	1221	781	-	-	-	309	232	673	596	1037	960	1401
M222	1109	1664	2218	2773	3327	2	550	400	489	645	1018	1174	1548	1704	2077	2233	2607	2763
	-	-	-	-	-	3	826	600	188	426	718	956	1247	1485	1777	2015	2307	2544
	-	-	-	-	-	4	1101	800	-	200	407	729	936	1259	1466	1789	1995	2318
	-	-	-	-	-	5	1376	1000	-	-	84	495	614	1025	1144	1554	1673	2084
	-	-	-	-	-	6	1651	1200	-	-	-	253	281	783	810	1312	1340	1842
M295	1479	2219	2958	3698	4437	2	814	516	641	939	1369	1667	2097	2395	2825	3123	3552	3850
	-	-	-	-	-	3	1222	775	234	681	962	1409	1689	2137	2417	2864	3145	3592
	-	-	-	-	-	4	1629	1033	-	423	554	1150	1282	1878	2010	2606	2738	3334
	-	-	-	-	-	5	2036	1291	-	164	147	892	874	1620	1602	2348	2330	3075
	-	-	-	-	-	6	2443	1549	-	-	-	634	467	1361	1195	2089	1922	2817
M470	2071	3106	4142	5177	6213	2	1133	681	938	1390	1974	2425	3009	3461	4045	4496	5080	5532
	-	-	-	-	-	3	1699	1022	371	1049	1407	2084	2443	3120	3478	4155	4514	5191
	-	-	-	-	-	4	2266	1363	-	708	840	1743	1876	2779	2911	3841	3947	4850
	-	-	-	-	-	5	2832	1704	-	367	273	1402	1309	2438	2344	3473	3380	4509
	-	-	-	-	-	6	3398	2044	-	26	-	1061	742	2097	1777	3132	2813	4168
M586	2933	4399	5865	7331	8798	2	1542	1052	1344	1834	2787	3277	4320	4720	5673	6163	7117	7606
	-	-	-	-	-	3	2312	1578	573	1308	2016	2751	3459	4194	4902	5637	6345	7080
	-	-	-	-	-	4	3083	2104	-	781	1245	2224	2688	3667	4131	5111	5574	6554
	-	-	-	-	-	5	3854	2630	-	255	473	1698	1916	3141	3359	4584	4802	6027
	-	-	-	-	-	6	4625	3156	-	-	-	1171	1145	2614	2588	4058	4031	5501
M900	4550	6825	9100	11375	13650	2	2251	1619	2227	2859	4466	5098	6705	7337	8944	9576	11183	11815
	-	-	-	-	-	3	3376	2428	1101	2049	3340	4288	5579	6527	7818	8766	10057	11005
	-	-	-	-	-	4	4501	3238	-	1239	2214	3478	4453	5717	6692	7956	8931	10195
	-	-	-	-	-	5	5627	4047	-	429	1088	2668	3327	4907	5566	7146	7805	9385
	-	-	-	-	-	6	6752	4856	-	-	-	1858	2200	4097	4439	6336	6678	8575
M1213	6066	9099	12132	15165	18198	2	3000	2159	2969	3811	5954	6796	8939	9781	11924	12766	14910	15751
	-	-	-	-	-	3	4501	3238	1468	2731	4453	5716	7438	8701	10424	11686	13409	14672
	-	-	-	-	-	4	6001	4317	-	1651	2952	4636	5937	7621	8922	10606	11907	13591
	-	-	-	-	-	5	7501	5397	-	571	1451	3556	4436	6541	7421	9526	10406	12511
	-	-	-	-	-	6	9001	6476	-	-	-	2475	2934	5460	5919	8446	8904	11431
M2366	11833	17749	23665	29581	35498	2	6832	4573	4812	7072	10635	12895	16457	18718	22280	24540	28103	30363
	-	-	-	-	-	3	10249	6859	1394	4785	7217	10607	13040	16430	18862	22253	24685	28076
	-	-	-	-	-	4	13665	9145	-	2497	3798	8319	9621	14142	15444	19965	21267	25788
	-	-	-	-	-	5	17081	11432	-	208	379	6031	6202	11854	12025	17677	17847	23499
	-	-	-	-	-	6	20497	13718	-	-	-	3742	2782	9565	8605	15388	14427	21210
M2958	14790	22186	29581	36976	44371	2	8540	5015	6015	9541	13293	16819	20571	24097	27850	31376	35128	38654
	-	-	-	-	-	3	12811	7523	1742	7032	9021	14310	16299	21589	23577	28867	30856	36145
	-	-	-	-	-	4	17081	10030	-	4523	4748	11801	12026	19079	19304	26358	26583	33636
	-	-	-	-	-	5	21351	12538	-	2013	474	9291	7752	16570	15030	23848	22309	31126
	-	-	-	-	-	6	25621	15045	-	-	-	6781	3477	14059	10755	21338	18034	28616
M3720	18625	27938	37250	46562	55875	2	8148	5119	11098	14127	20721	237						

TECHNICAL INFORMATION

M-SERIES MATERIALS

#	Part	Description
1	Actuator Body	Extruded aluminum alloy astm 6063 anodized 10681
2	Actuator End Cap	Die-cast aluminum alloy EN AC-46100 UNI EN 1706:1999
3	Piston	Die-cast aluminum alloy EN AC-46100 UNI EN 1706:1999
4	DLS Piston	Die-cast aluminum alloy EN AC-46100 UNI EN 1706:1999
5	Piston O-Ring	BUNA N Nitrile Rubber / Viton, Silicone Available.
6	Piston Guide Ring	Low friction acetalic resin Delrin
7	Piston Guide Bearing	Low friction acetalic resin Delrin
8	End Cap O-Ring	BUNA N Nitrile Rubber / Viton, Silicone Available.
9	DLS Travel Stop Shaft	Stainless steel AISI 304
10	DLS Travel Shaft Sealing O-Ring	BUNA N Nitrile Rubber / Viton, Silicone Available.
11	DLS Travel Shaft Bushing	PTFE (Teflon)
12	DLS Shaft Guide Washer	Aluminum alloy 11S Lega 2011 EN AW-2011 UNI EN 573-3
13	External Travel Stop Screw	Stainless steel AISI 304
14	External Travel Stop O-Ring	BUNA N Nitrile Rubber / Viton, Silicone Available.
15	External Travel O-Ring Washer	Stainless steel AISI 304
16	External Stop Nut	Stainless steel AISI 304
17	External DLS Stop Nut (gold)	Stainless steel AISI 304
18	Pinion Circlip	Stainless steel UNI 7435
19	Upper Pinion Bearing	Low friction acetalic resin Delrin
20	Upper Pinion O-Ring	BUNA N Nitrile Rubber / Viton, Silicone Available.
21	Upper Pinion Guide Bearing	Low friction acetalic resin Delrin
22	Pinion	Steel 11SMNPB37 electroless nickel plated / SS AISI 304 Available
23	Lower Pinion Guide Bearing	Low friction acetalic resin Delrin
24	Lower Pinion O-Ring	BUNA N Nitrile Rubber / Viton, Silicone Available.
25	End Cap Screws	Stainless steel AISI 304
26	Spring Cartridges	Steel DIN 17224 powder epoxy painted +PA6 GF 30% NATURAL

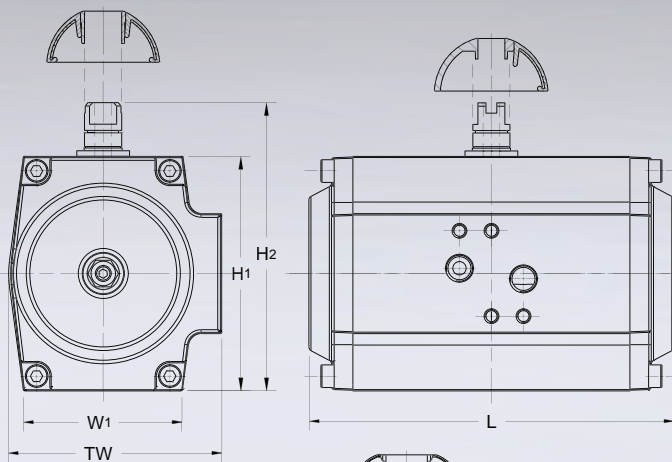


M-Series Materials

TECHNICAL DIMENSIONS

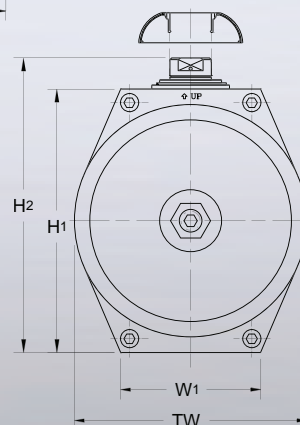
DIMENSIONS

MODEL	W1	TW	L	H1	H2
T11	1.81	2.42	4.57	2.56	3.35
M21	1.97	2.70	5.23	2.91	3.70
M31	2.36	3.15	5.39	3.46	4.25
M53	2.56	3.64	6.34	3.94	4.72
M74	2.64	3.92	7.09	4.25	5.04
M104	2.76	4.35	8.23	4.61	5.39
M148	3.54	4.72	8.70	5.51	6.30
M222	3.54	4.72	11.46	5.51	6.30
M295	4.06	5.39	11.73	6.30	7.09
M470	4.33	6.77	13.07	7.80	8.58
M586	4.33	6.77	14.72	7.80	8.98
M900	5.31	8.82	16.61	10.04	11.22
M1213	5.31	8.82	18.27	10.04	11.22
M2366	6.30	10.71	23.74	11.89	13.07
M2958	6.30	10.71	26.89	11.89	13.07
M3720	6.30	14.17	26.89	14.17	15.35

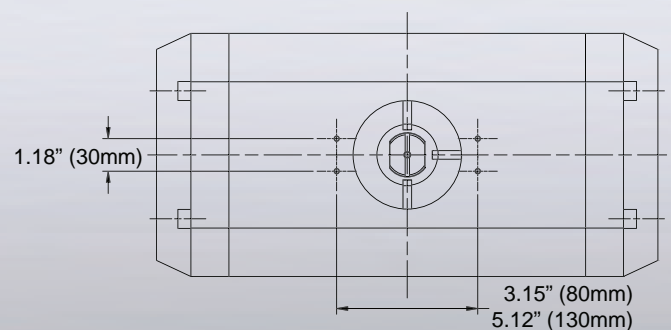


Body Styles
T11 Thru M104 Actuators

Body Styles
M148 Thru M2958
Actuators



3.15" (80mm) - Fits Actuator Sizes T11-M470
5.12" (130mm) - Fits Actuator Sizes M586-M3720



"M" SERIES RACK & PINION

DRIVE DIMENSIONS

ISO SQUARE 8-POINT

SIZE	A (mm)	A (inch)	B	C	D
T11 (F03)	9	0.354	.512	.996	.079
T11 (F04)	11	0.433	.512	.996	.079
M21	14	0.551	.709	.996	.079
M31	14	0.551	.787	.996	.079
M53	17	0.669	.787	1.154	.079
M74	17	0.669	.787	1.272	.079
M104	17	0.669	.827	1.469	.079
M148	22	0.866	1.004	1.587	.098
M222	22	0.866	.984	2.098	.098
M295	22	0.866	.984	2.098	.118
M470	27	1.063	1.300	2.098	.118
M586	27	1.063	1.535	2.610	.118
M900	36	1.417	1.614	2.610	.157
M1213	36	1.417	1.575	3.122	.157
M2366	46	1.811	1.969	4.146	.157
M2958	46	1.811	1.969	5.276	.157
M3720	46	1.811	1.969	5.276	.157

MOUNTING DIMENSIONS

ISO

SIZE	X	Y	Z
T11 (F03)	F03	-	F05
T11 (F04)	-	F04*	-
M21	F03	F05	-
M31	F05	F07	-
M53	F05	F07	-
M74	F05	F07	-
M104	F05	F07	-
M148	F07	F10	-
M222	F07	F10	-
M295	F07	F10	F12
M470	-	F10	F12
M586	-	F10	F12
M900	-	F12	F16*
M1213	-	-	F14
M2366	-	-	F16
M2958	-	-	F16
M3720	-	-	F16**

*M900 has 5/8" - 11UNC on F16

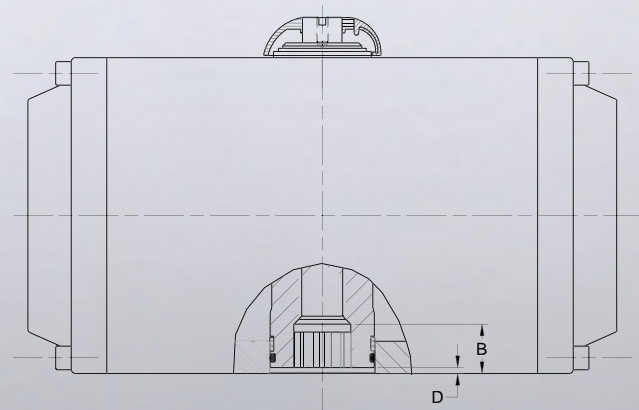
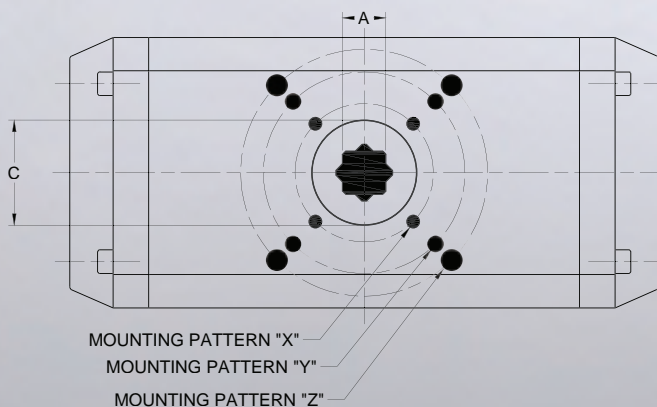
**M3720 also includes a 4.59 x 12.87 rectangular pattern

ISO MOUNTING PATTERN TABLE

ISO	ØB.C. in.	ØB.C. mm	THREAD	DEPTH
F03	1.417	36	#10-32UNC	0.43
F04	1.654	42	#10-32UNC	0.43
F05	1.969	50	1/4-20UNC	0.35
F07	2.756	70	5/16-18UNC	0.47
F10	4.016	102	3/8-16UNC	0.59
F12	4.921	125	1/2-13UNC	0.71
F14	5.512	140	5/8-11UNC	0.94
F16	6.496	165	3/4-10UNC	1.18

UniTorq's pneumatic rack and pinion actuators are manufactured in compliance with the following agency standards and approvals:

- UL & CSA approved
- Safety Integrity Level (SIL) 3 certified under IEC Standards 61508 and 61511
- ISO 9001:2008
- ATEX certified under Directive 94/9/CE



TECHNICAL DIMENSIONS

WEIGHT IN POUNDS

MODEL	90°	120°	180°	K6
T11	1	-	-	1.2
M21	1.98	2.2	2.65	2.2
M31	2.98	3.26	3.97	3.42
M53	4.3	4.74	5.59	5.07
M74	5.51	5.95	7.94	6.39
M104	7.39	8.16	11.25	8.38
M148	10.58	11.47	13.56	12.76
M222	14.99	16.9	20.68	17.86
M295	18.74	20.73	26.02	22.49
M470	31	-	-	39.8
M586	34.4	39.69	55.79	42.78
M900	61.5	-	-	83.1
M1213	68.8	81.14	106.94	86.68
M2366	132.32	146.63	173.6	180.81
M2958	160.97	177.6	-	209.48
M3720	205	-	-	267

AIR CONSUMPTION - Cubic Inches Per Cycle (Open/Close)

MODEL	90°	120°	180°	K6
T11	12.8	-	-	6.7
M21	15.3	17.1	28.1	7.3
M31	22	24.4	41.5	9.2
M53	36.6	42.7	68.3	15.3
M74	52.5	61	99.5	22
M104	67.1	82.4	131.2	27.5
M148	112.9	137.3	189.2	41.5
M222	152.6	176.9	341.7	67.1
M295	218.5	241	415	86.7
M470	335.6	-	-	174.5
M586	416.2	476	790.2	174.5
M900	762.8	-	-	396.7
M1213	872.6	1013	1293.7	360
M2366	1586.6	1861.2	2471.5	701.8
M2958	1922.2	2288.4	-	1037.4
M3720	2955	-	-	1594

Please refer to the UniTorq Engineering Manual at www.unitorq.com for certified drawings and dimensions.

UniTorq.
Providing one source—
from the valve up.

RACK & PINION

INNOVATIVE ACTUATORS AND CONTROLS

Established in 1991, UniTorq has consistently provided its customers with reliable, affordable actuators and accessories for 20 years.

With a continued focus on the latest and emerging trends in technology and manufacturing, we have expanded our product line to include a wider selection of quarter turn actuation products designed to meet the varying needs of customers in today's markets. Our recognition of these trends led to the introduction of a line of electric actuators in 1999, and resulted in the expansion and innovation of our existing product line of pneumatic actuators and accessories.

UniTorq is committed to meeting our customers' requirements while adhering to the standards set by the quality management system and continual process improvement driven throughout the entire company. UniTorq's goals for quality are established through management review and are continuously monitored for effectiveness and improvement.



Call To Order
770.446.7074

or email us at sales@unitorq.com
For additional information visit us online at unitorq.com



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