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APOLLO[®]

valve automation
products

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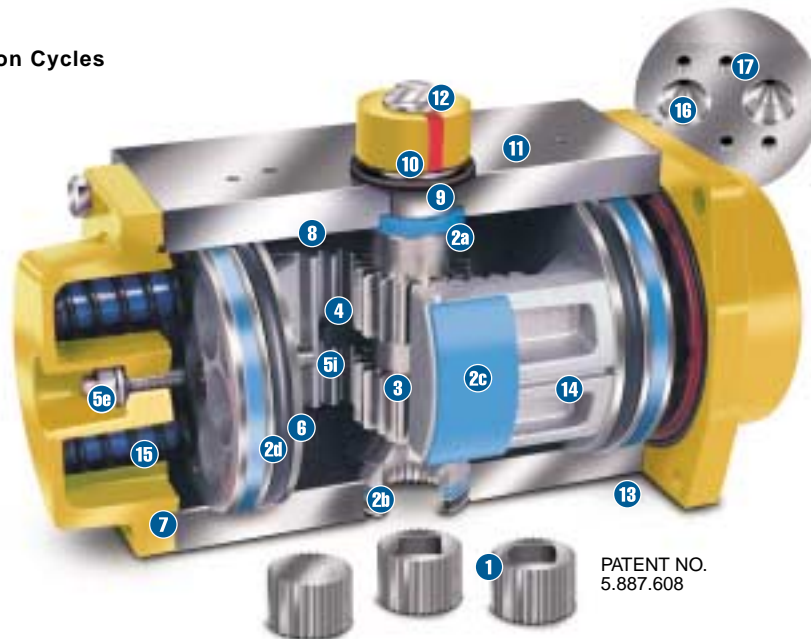
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Pneumatic Actuators

Apollo® CompacTorque™ Rack & Pinion Actuator

2 Year Warranty
Tested to 2 Million Cycles



1. Unique Universal Shaft Adapter

Precision replaceable insert including variable internal geometry configuration meets any custom requirement. Standard insert is high strength FLN-4205. Optional stainless steel insert available. *Size 030 thru 080 only.

2. Bearings

Replaceable top (2a), bottom (2b), body (2c), and piston (2d) are manufactured of nylon 4-6. Benefits include low coefficient of friction, minimal moisture absorption, stability above 400°F, and excellent chemical resistance.

3. Output Shaft and Pinion Gear

One piece high strength alloy steel pinion shaft, precision machined gear teeth for precise fit, efficiency and long life. Standard pinion is electroless nickel coated for corrosion protection and is blowout proof. Optional stainless steel pinion shaft available.

4. Piston Guides

Piston guides maintain optimum piston position and prevent pinion shaft blowout.

5. Travel Stops

Provides for + or - 4 degrees travel adjustment in both directions, internal (5i) and external (5e).

6. Piston Seals

Replaceable pressure containment seals of permanently lubricated nitrile. Also available in fluorocarbon or other compounds for extreme temperature operation.

7. Die Cast Aluminum End Caps

Same end cap serves double acting and spring return models. Cast in spring pockets allow standard double acting actuator conversion to spring return by simply adding unique preloaded spring cartridges. Polyester powder coat is standard with additional protections available.

8. Extruded Aluminum Body

Precision extruded aluminum alloy with hard anodizing inside and out after finish machining. Additional protection coatings are available.

9. Thrust Washers

Double thrust washers of 45% glass reinforced, heat stabilized PPA backed by stainless steel provides extra protection against vertical thrust.

10. Position Indicator

Unique position indicator can be indexed to show alternate position. Plastic indicator inserts can be replaced with metal or magnetic targets for use with various proximity sensors.

11. Accessory Mounting

Manufactured in accordance with international specification VDI/VDE 3845 NAMUR to provide standardized drilled and tapped standard mounting for accessories such as positioners and limit switches.

12. Namur Slotted Shaft

In accordance with the international standard to provide a self-centering positive drive for positioners and switches.

13. Actuator Mounting

Manufactured in accordance with ISO 5211 promoting easy installation of the actuator directly on valves, gearboxes, or with ISO brackets. Conformance with DIN3337 is easily accomplished by rotating the Universal Shaft Adapter 45 degrees.

14. Die Cast Pistons

Precision die cast pistons are multiguided through full face engagement with the pinion and piston guide. Full depth machined piston teeth provide engagement with minimum backlash.

15. Pre-Loaded Spring Cartridges

Converts a standard double acting actuator to a spring return actuator by simply removing end caps and adding the unique spring cartridges.

16. Internal Porting

Large internal ports enhance quick operation and eliminates the cost of external tubing.

17. Namur Solenoid Mounting

Manufactured in accordance with this international standard permitting direct mounting of a wide variety of solenoid valves.

Compactorque Pneumatic Actuators (Corrosion Protection)

Specification

The Apollo® CompacTorque™ actuator is pneumatically operated and travels a minimum of 90 degrees in each direction and has internal and external travel stops to provide for + or - 4 degrees adjustment on a 90 degree stroke. The actuator is totally enclosed with no external moving parts. All pneumatic passageways are integral to the actuator housing so as to eliminate the need for external tubing. All solenoid mounting conforms to NAMUR specifications to permit direct mounting of a wide variety of solenoid valves. CompacTorque™ actuators are rack and pinion design; the output torque is linear throughout the travel and designed for pneumatic operation up to a maximum pressure of 142 psig (10 bar).

CompacTorque™ actuators are able to operate with other media such as hydraulic oil or water. All double acting and spring return units are suitable for both on/off and throttling applications.

Spring return units are dimensionally the same as double acting units, which saves space and weight.

The actuator is supplied with the following as standard:

- External end of travel adjustments integral with the end caps.
- Mechanical visual position indicator and the pinion is designed to allow manual override by simply removing the position indicator.
- One piece output pinion manufactured of high strength steel and electroless nickel coated for corrosion protection.
- NAMUR slotted connection
- Replaceable splined adapter to accommodate custom shaft connections
- Pistons and pinion that have a Nylon 4-6 bearing pad and rings, which extends the life of the actuator and reduces friction
- Corrosion resistant polyester powder coated end caps
- Hard anodized aluminum housing
- All fasteners are high strength stainless steel
- Permanently lubricated nitrile seals
- Self contained spring cartridges, heat treated and polyester powder coated for corrosion protection, that ensure safe disassembly

The Apollo® CompacTorque™ Universal Shaft Adapter (U.S.A.)

Apollo® CompacTorque™ introduces the newest design concept in actuators, the Universal Shaft Adapter (U.S.A.). The universal shaft adapter concept, was designed and manufactured with ease of actuator mounting in mind. The actuator incorporates the use of a replaceable splined adapter instead of a drive shaft connection with a fixed machined dimension and configuration. ISO 5211 - DIN 3337 configuration can be obtained by indexing insert 45 degrees from parallel. Inserts with other shaft connections and configurations are available. Optional stainless steel inserts are available.

Hard Anodized Protection

Hard Anodic oxidation is an electrolytic conversion process which forms an oxide film approximately one half of the total depth of the entire hard anodizing process. Continuation of this process produces the “hard” anodic coating to approximately 2 mils (50 microns). The oxide coating is integral with the base substrate and is one of the hardest materials known with a hardness of corundum (45 to 65 Rockwell C).

EPC 316

EPC 316 is a FDA Epoxy Powder pigmented with 316L stainless steel flakes applied by an electrostatic spray finishing

Apollo® CompacTorque Numbering System						
	0- Std. (Protection A)	Size	Option	Spring Set	Less One Spring Imbalance	Rev. Level
D - Double Acting	1- ENC(Protection C) 2- Seal Kit	1	0-Nitrile (Std.) 0°F to +250°F	0	0	A-Standard B-Without Universal Shaft Adapter*
S - Spring Return	3- Spring Kit 4- Indicator Kit 5- Stop Kit	2 3 4	1-Viton 32°F to +350°F 2-Low Temp. Nitrile -50°F to +250°F	2 3 4	3 4 5	M-Metric* Z-Special**
K - Kit	6- Polyester Powder Coated (Protection B)*** 7- Stainless Steel Epoxy Coated (Protection D) 8- Stainless Steel Epoxy Coated 316 SS Pinion (Protection E) G- Red End Caps (Protection A) H- Blue End Caps (Protection A) J- Black End Caps (Protection A)	5 6 7 8 9 A	3-Neoprene	5 6	6	

* Select one USA (Universal Shaft Adapter) from selection chart
** Select one USA, specify bolt pattern on bottom of Actuator
*** Specify if Polyester Coating is Yellow, Red, Blue or Black

Compactorque Pneumatic Actuators

(Corrosion Protection)

process on a super clean surface. After application the pieces must be cured at 350°F (177°C). With a normal thickness of 3.0 - 4.0 mils (76-102 microns) of EPC 316 coating, resistance to salt spray in accordance with ASTM B-117 exceeds 2000 hours and has a pencil hardness of 2H as per ASTM D-3363.

Electroless Nickel Coating

Nickel deposits are produced by chemical reduction of nickel into catalytic metallic or catalyzed nonmetallic substrates without the use of electricity. Total "as plated" thickness is the same shape of the surface; therefore, close tolerances (within 20 to 30 microns) can be maintained. Normal hardness averages about 49 Rockwell C.

Polyester Powder Coating

Apollo® CompacTorque™ uses only the most modern thermosetting polyester powder coating resin. When subjected to elevated temperatures, these coatings melt, flow, and chemically cross link within themselves or with other reactive components to form a higher molecular weight reaction product. This resin system can produce thin paint like surface coatings in the 1 to 3 mil thickness range (25 to 76 microns) having a 2H pencil hardness as per ASTM D3363 and a salt spray resistance of 1000 hours in accordance with ASTM B117. Unlike epoxy coatings, polyester powder coatings offer excellent resistance to UV rays.

3T Series Valve Mounting Configuration

The 3T series actuator family utilizes an ISO 5211 mounting bolt pattern for the attachment of valve mounting brackets. Conbraco has been utilizing ISO 5211 mounting configurations since 1990. Therefore, there exists an extensive selection of engineered stainless steel brackets for the 3T series. The variety of valve and actuator combinations is so extensive that mounting kit identification is provided in a separate document (Mounting Kit Selection Guide). Many of the 3T series actuators have multiple mounting bolt patterns (see dimensions w-w1-w2 on the 3T series dimensional drawings). These alternate bolt patterns may be used as attachment points to brackets that have not been supplied by Conbraco or the automation of other manufacturer's valves. This flexibility of bracket attachment is provided so that the actuator can be used to automate any device that requires 90 degrees or less rotary motion and fits within the torque profile available from the actuator.

Universal Shaft Adapters			
NUMBER	CONBRACO DESCRIPTION	NUMBER	CONBRACO DESCRIPTION
CX01605	ADAPTER, 11MM SQ, 3T030/STD. REV. A	CX01637	ADAPTER, 19MM SQ, 3T060/STD. REV. A
CX01458	ADAPTER, 11MM SQ, 3T030, SS	CX01638	ADAPTER, 22MM SQ, 3T065/STD. REV. A
CX01606	ADAPTER, 14MM SQ, 3T030	CX01696	ADAPTER, 22MM SQ, 3T070/STD. REV. A
CX01614	ADAPTER, 14MM SQ, 3T040/3T050/STD. REV. A	CX01718	ADAPTER, 27MM SQ, 3T080/STD. REV. A
CX01493	ADAPTER, 14MM SQ, 3T040/3T050, SS	CX01604	ADAPTER, BLANK, 3T030
CX01615	ADAPTER, 17MM SQ, 3T040/3T050	CX01486	ADAPTER, BLANK, 3T040/3T050
CX01494	ADAPTER, 17MM SQ, 3T040/3T050, SS	CX01636	ADAPTER, BLANK, 3T060/3T065
CX01616	ADAPTER, 19MM SQ, 3T040/3T050/STD. REV. A	CX01695	ADAPTER, BLANK, 3T070
CX01495	ADAPTER, 19MM SQ, 3T040/3T050, SS	CX01717	ADAPTER, BLANK, 3T080

Butterfly/Actuator Mounting Kit Chart for ISO Drilling (B) - CarbonSteel/Zinc Plated Hardware										
130/132 Series Adapter Numbers										
Size	3T30	3T40	3T50	3T60	3T65	3T70	3T80	3T90	3TA0	
1.5										
2		CX03430	CX03430	CX03433	CX03433					
2.5		CX03430	CX03430	CX03433	CX03433					
3		CX03430	CX03430	CX03433	CX03433					
4		CX03431	CX03431	CX03434	CX03434	CX03438				
5			CX03432	CX03435	CX03435	CX03439				
6			CX03432	CX03435	CX03435	CX03439				
8				CX03437	CX03437	CX03441	CX03444			
10						CX03442	CX03445			
12							CX03446			
140/142 Series Adapter Numbers										
2		CX03430	CX03430	CX03433	CX03433					
2.5		CX03430	CX03430	CX03433	CX03433					
3		CX03430	CX03430	CX03433	CX03433					
4		CX03431	CX03431	CX03434	CX03434	CX03438				
5		CX03431	CX03431	CX03434	CX03434	CX03438				
6		CX03431	CX03431	CX03434	CX03434	CX03438				
8				CX03436	CX03436	CX03440	CX03443			
10				CX03437	CX03437	CX03441	CX03444			
12							CX03446			
141/143 Series Adapter Numbers [Double "D"]										
2		CX03447	CX03447	CX03450	CX03450	CX03454				
2.5		CX03447	CX03447	CX03450	CX03450	CX03454				
3		CX03447	CX03447	CX03450	CX03450	CX03454				
4		CX03448	CX03448	CX03451	CX03451	CX03455				
5			CX03449	CX03452	CX03452	CX03456				
6			CX03449	CX03452	CX03452	CX03456				
8				CX03453	CX03453	CX03457	CX03459			
10						CX03458	CX03460			
12							CX03461			
14							CX03461			

Apollo® Compactorque Pneumatic Actuators Mounting

Accessory Mounting

The 3T series actuator conforms to NAMUR VDI/VDE 3845 dimensional mounting standards. This insures the greatest compatibility with actuator mounted accessories. Mounting brackets for positioners and limit switches will therefore become standardized. This is a significant advantage to the end user in that it reduces the number of unique parts necessary to support an automation program. Eventually all actuator manufacturers will have to provide their products with NAMUR interface compatibility, the 3T series has it now. Proprietary product uniqueness is sacrificed to provide end users with a recognized international standard mounting arrangement.

Solenoid Mounting

The 3T series actuators also utilize NAMUR standard dimensions for this interface. Like the accessory interface this is an international standard set of dimensions. There are two methods of attaching solenoid control valves to the actuator. The most common is to use a NAMUR style solenoid of the correct designation. This solenoid is attached to the actuator with two 5 mm screws with O-Rings providing the required seals. A single pneumatic supply connection to a NPT threaded port is all that

is required to complete the air line assembly. The less common method is to remote mount the solenoid and connect it to the actuator with tubing and fittings. This configuration is necessary for 3TSOAO & 3TDOAO. The ports in the actuator are tapped with standard NPT pipe threads for this option. Electrical connections to the solenoids can be made in a variety of ways.

The 3TD-010 is so compact that the NAMUR mounting pattern had to be rotated 90°. An adapter has been designed that allows the installation of the Conbraco solenoid in the same orientation as the rest of the product family. To do this the adapter has to perform two tasks. First, it adapts the NAMUR mounting pattern to the Conbraco solenoid. Second, it rotates the solenoid so that the air connections are oriented the same as those on the rest of the product family.

Automated valve cycle time is dependent on many factors associated with each specific installation and is almost impossible to predict accurately. Cycle times of less than one second are generally not recommended. Fast cycle times reduce seal life and expose the valve and actuator to shock loads that can reduce service life.

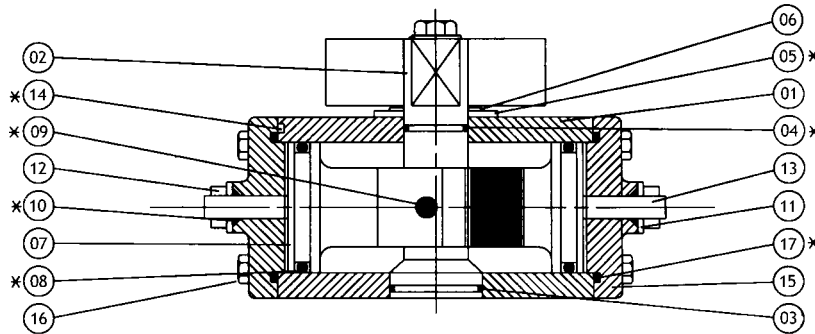
DOUBLE ACTING CHART																																																																																																																																															
AIR SUPPLY IN PSIG	ACTUATOR MODEL																																																																																																																																														
	3T-010		3T-020		3T-030		3T-040		3T-050		3T-060		3T-065		3T-070		3T-080		3T-090		3T-0A0																																																																																																																										
40	30	72	130	274	416	650	1075	1409	2771	5198	12631	45	108	194	411	623	975	1613	2114	4155	7797	18946	60	144	259	548	831	1300	2151	2819	5548	10396	25261	74	180	324	685	1039	1625	2689	3524	6929	12995	31577	89	216	389	822	1247	1950	3226	4228	8310	15594	37892	UNITS	DA	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	DA	SR	VOLUME CU. INCH	3	13.4	7.9	27	10.5	37	14	56	21	98	40	159	61	220	92	483	196	855	366	1343	610	WEIGHT LB.	1	2.3	2.8	3.4	3.9	6.3	6.9	9.1	10.1	13.4	15.2	19.3	22.4	26.9	30.4	50.4	56.5	97	115	198.5	247	ACTUATOR SPEED* OPEN/CLOSE SECONDS		.5/5	.5/5	.5/6	.6/8	.5/6	.6/1	.5/8	.6/1.2	.7/1.8	1/1.2	.8/1	1.1/1.5	1/1	1.2/2	1.2/1.5	2/2.5	3.5/4.5	4.5/6	5/5.5	6/7

*Actuator speed open/close based on 80 psi air at no load condition.

Apollo® CompactTorque™ Spring Return (Start Stroke) Torque Ratings

Actuator Model	No. Springs per Piston	SIZING INFORMATION, START TORQUE (LB.-IN.)												Spring Stroke												
		AIR SUPPLY AVAILABLE AT ACTUATOR																								
		120 (psig)		110		100		90		80		70			60		50		40							
3TS-020-XX	2	Start	194	177	160	143	125	106	86	69	52	47	42	59	75	90	110	127	144	161	178	183	189	37	30	
	2/3	Start	189	172	155	137	120	100	81	64	47	42	59	75	90	110	127	144	161	178	183	189	37	30	44	
	3	Start	183	166	149	132	115	95	75	59	42	42	59	75	90	110	127	144	161	178	183	189	37	30	51	
	3/4	Start	178	161	144	127	110	90	70	54	42	42	59	75	90	110	127	144	161	178	183	189	37	30	58	
	4	Start	172	156	139	122	105	85	64	48	42	42	59	75	90	110	127	144	161	178	183	189	37	30	66	
	4/5	Start	167	150	134	117	100	80	64	48	42	42	59	75	90	110	127	144	161	178	183	189	37	30	74	
3TS-030-XX	2	Start	350	319	287	256	225	191	157	127	96	88	109	129	157	191	225	256	287	319	350	341	311	281	211	
	2/3	Start	341	309	278	248	217	182	148	118	88	88	109	129	157	182	217	248	278	309	341	311	281	211	68	
	3	Start	331	300	269	239	209	174	138	109	80	80	109	129	157	174	209	239	269	300	331	311	281	211	81	
	3/4	Start	322	291	261	231	201	165	129	100	80	80	109	129	157	165	201	231	261	291	322	311	281	211	94	
	4	Start	313	283	252	223	193	157	120	90	80	80	109	129	157	157	193	223	252	283	313	311	281	211	107	
	4/5	Start	304	274	244	214	185	148	111	81	80	80	109	129	157	148	185	214	244	274	304	311	281	211	121	
3TS-040-XX	2	Start	635	571	507	445	382	319	256	191	127	96	88	109	129	157	191	225	256	287	319	350	341	311	281	
	2/3	Start	617	553	490	428	366	302	239	176	127	96	88	109	129	157	191	225	256	287	319	350	341	311	281	118
	3	Start	598	535	472	410	348	285	222	159	110	80	80	109	129	157	191	225	256	287	319	350	341	311	281	148
	3/4	Start	579	516	453	391	329	266	203	140	91	80	80	109	129	157	191	225	256	287	319	350	341	311	281	207
	4	Start	560	497	434	372	310	247	184	121	72	80	80	109	129	157	191	225	256	287	319	350	341	311	281	236
	4/5	Start	542	479	416	354	292	229	166	103	54	80	80	109	129	157	191	225	256	287	319	350	341	311	281	266
3TS-050-XX	2	Start	1031	932	833	736	638	542	446	350	254	208	174	140	106	72	39	2	208	273	337	401	465	531	596	
	2/3	Start	1004	905	806	709	612	515	419	323	227	191	157	123	89	55	19	2	208	273	337	401	465	531	596	662
	3	Start	986	887	788	691	594	497	400	303	206	170	136	102	68	34	14	2	208	273	337	401	465	531	596	662
	3/4	Start	959	860	761	664	567	470	373	276	179	143	109	75	43	20	10	2	208	273	337	401	465	531	596	662
	4	Start	932	833	734	637	540	443	346	249	152	96	88	109	129	157	191	225	256	287	319	350	341	311	281	118
	4/5	Start	905	806	707	610	513	416	319	222	125	89	80	109	129	157	191	225	256	287	319	350	341	311	281	148
3TS-060-XX	2	Start	1410	1263	1116	969	822	675	528	381	234	188	142	96	50	4	2	234	299	364	429	494	559	624	689	
	2/3	Start	1352	1205	1058	911	764	617	470	323	208	172	138	104	60	14	2	234	299	364	429	494	559	624	689	
	3	Start	1308	1161	1014	867	720	573	426	279	194	158	124	89	43	10	2	234	299	364	429	494	559	624	689	
	3/4	Start	1263	1116	969	822	675	528	381	234	188	142	96	50	4	2	234	299	364	429	494	559	624	689	767	
	4	Start	1174	1027	880	733	586	439	292	145	89	80	109	129	157	191	225	256	287	319	350	341	311	281	836	
	4/5	Start	1141	994	847	700	553	406	259	112	60	80	109	129	157	191	225	256	287	319	350	341	311	281	67	

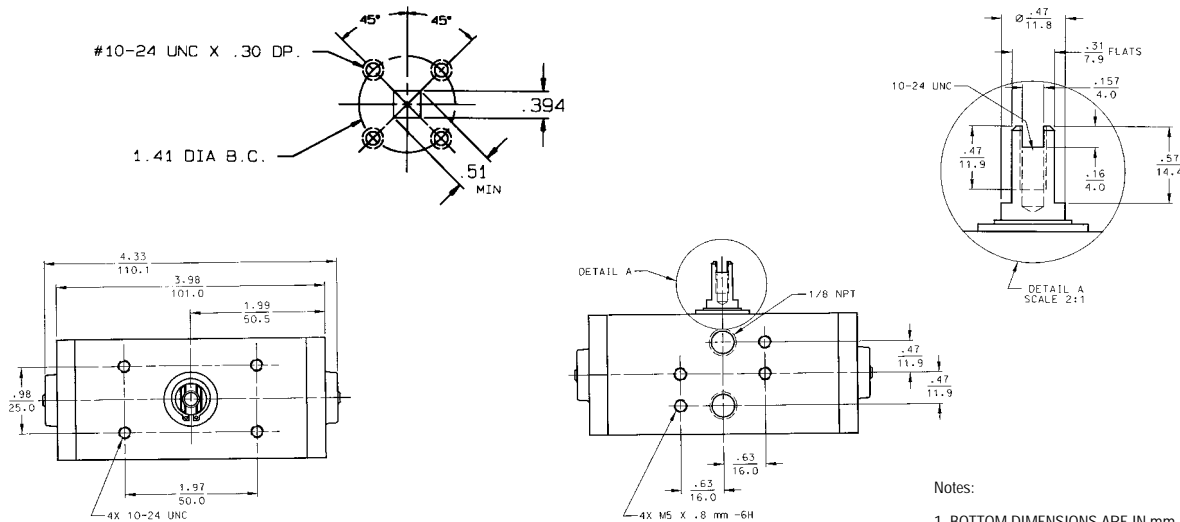
Apollo® CompacTorque™ 3TD-010-00



** Suggested spare parts; Included in repair kit
Factory lubricated with IMSCO poly U-II grease
Rebuild with High temp, disk brake, wheel bearing grease*

Actuator Temperature Limits

Nitrile (Buna) seals: -20°F to +200°F



Notes:
1. BOTTOM DIMENSIONS ARE IN mm

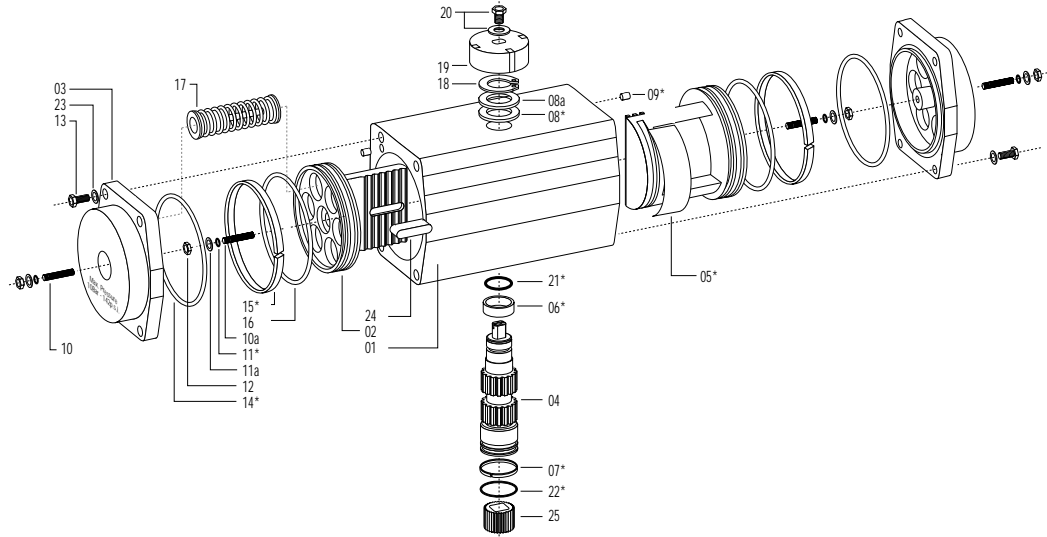
AIR SUPPLY PSIG	40	50	60	70	80	90	100	120
TORQUE Lb. In.	29.3	36.6	44	51.3	58.6	66	73.3	88

3TD-010-00 Parts List

ITEM	DESCRIPTION	MATERIAL	TREATMENT	UNIT QTY.
1	Body	Extruded Aluminum Alloy	Hard Anodized	1
2	Pinion	High Strength Alloy Steel	Nickel Plated	1
*3	O-Ring (Lower Pinion)	Nitrile (Buna-N)	N/A	1
*4	O-Ring (Upper Pinion)	Nitrile (Buna-N)	N/A	1
*5	Thrust Bearing (Pinion)	Nylon 4-6	N/A	1
6	Retaining Ring (Pinion)	Stainless Steel	N/A	1
7	Piston	Die Cast Aluminum	N/A	2
*8	O-Ring (Piston)	Nitrile (Buna-N)	N/A	2
*9	Bearing (Piston)	Nylon 4-6	N/A	2
*10	O-Ring (Adjustment Screw)	Nitrile (Buna-N)	N/A	2
11	Washer (Adjustment Screw)	Stainless Steel	N/A	2
12	Nut (Adjustment Screw)	Stainless Steel	N/A	2
13	Adjustment Screw	Stainless Steel	N/A	2
14	Left End Cap	Die Cast Aluminum	Powder Coat	1
15	Right End Cap	Die Cast Aluminum	Powder Coat	1
16	Screw (End Cap)	Stainless Steel	N/A	8
*17	O-Ring (End Cap)	Nitrile (Buna-N)	N/A	2

*Suggested spare parts; Included in repair kit (3TK-210-00).

Materials of Construction and Operation

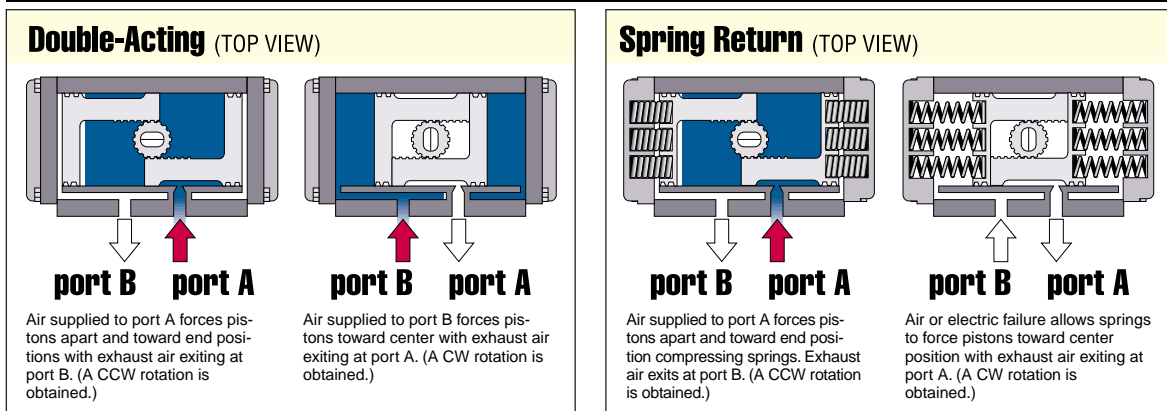


CompacTorque Part Number Designations

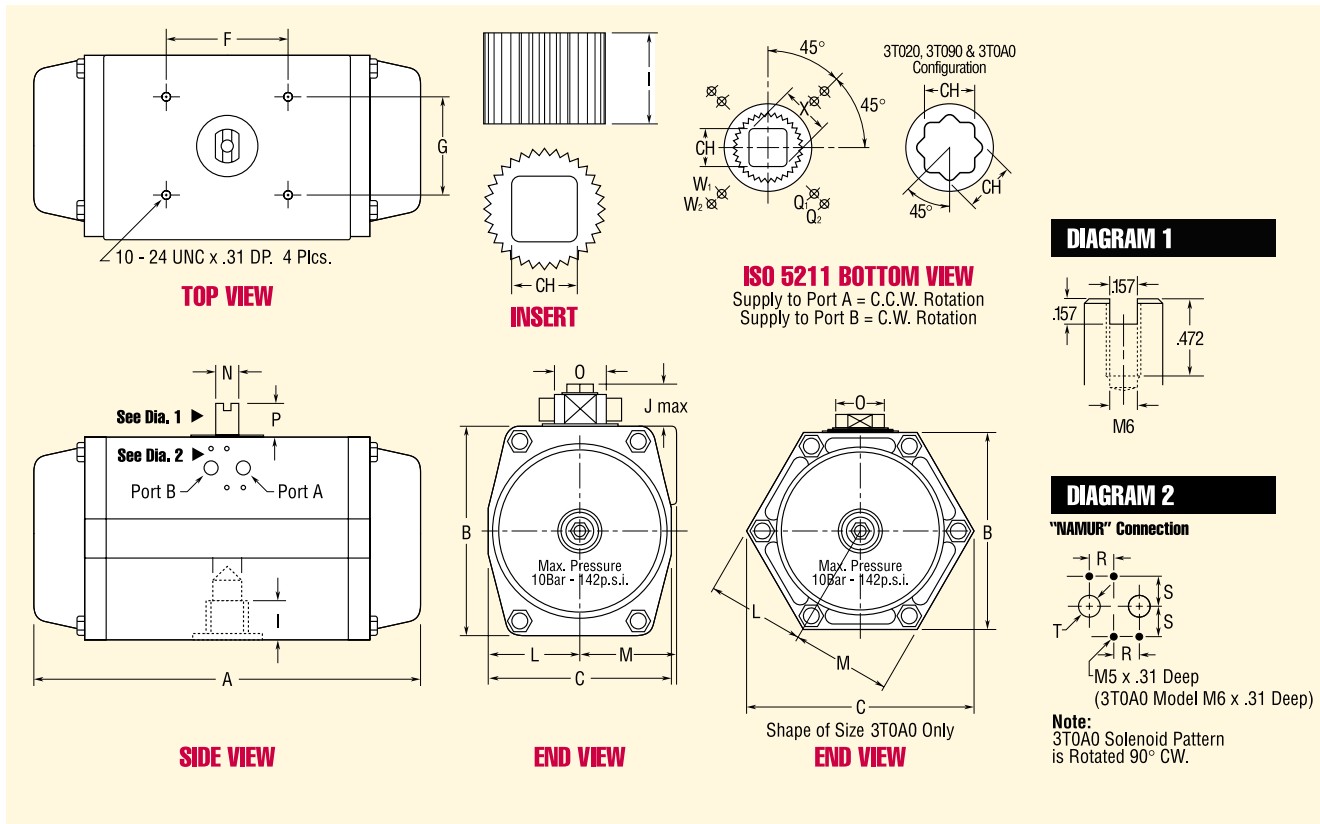
Part #	Unit Qty.	Part Description	Material	Specifications	Optional Materials	Protection
01	1	Body	Extruded aluminum alloy	ASTM 6063 T6		A, B, C, D, E, F
02	2	Piston	Aluminum	ASTM B179-DIN 1725/5		
03	2	End caps	Aluminum alloy	ASTM B179-DIN 1725/5		C, D, E, F
04	1	Drive shaft	Steel alloy	AISI 1144	SS	Nickel plated
05*	2	Bearing (piston back)	Nylon 46			
06*	1	Bearing (pinion top)	Nylon 46			
07*	1	Bearing (pinion bottom)	Nylon 46			
08*	1	Thrust bearing (pinion)	Polyphthalamide (PPA)			
08a	1	Thrust washer (pinion)	SS	AISI 304		
09*	2	Plug (transfer port)	Nitrile (NBR)		For extreme temperature	
10	2	Screw (ext. stroke adj.)	SS	18-8		
10a	1	Screw (int. stroke adj.)	SS	18-8		
11*	4	O-Ring (screw seal)	Nitrile (NBR)		For extreme temperature	
11a	4	Washer (seal)	SS	AISI 304		
12	4	Nut (stop adjustment)	SS	18-8		
13	8	Cap screw (end cap)	SS	18-8		
14*	2	O-Ring (end cap)	Nitrile (NBR)		For extreme temperature	
15*	2	Bearing (piston head)	Nylon 46			
16*	2	O-Ring (piston head)	Nitrile (NBR)		For extreme temperature	
17	12 (max)	Spring (cartridge)	High alloy spring steel			Polyester powder coating Nickel plated
18	1	Spring clip (pinion)	High alloy spring steel			
19**	1	Position indicator	Polyamide			
20**	1	Cap screw/washer	SS	18-8		
21*	1	O-Ring (pinion top)	Nitrile (NBR)		For extreme temperature	
22*	1	O-Ring (pinion bottom)	Nitrile (NBR)		For extreme temperature	
23	8	Washer (cap screw)	SS	18-8		
24***	2	Piston guide	Polyphthalamide (PPA)			
25	1	Universal shaft adapter	Sintered metal	FLN-4205-40	SS	

NOTES: (1) *Suggested spare parts; included in repair kit. Factory lubricated w/IMSCO poly U-11 grease. Rebuild w/ high temperature disc brake wheel bearing grease. Actuator temp. limits: Nitrile (BUNA) seals: -20°F to +200°F (2) ** Optional. (3) Model OAO Part No. 23 and 13 unit quantity is 12 pieces. (3) *** 3T 010 thru 3T 060 is cast onto piston

Diagram 3



Engineering



Dimensions										
	3T-20	3T-30	3T-40	3T-50	3T-60	3T-65	3T-70	3T-80	3T-90	3T-0A
A	5.30	5.98	7.95	9.05	10.66	12.13	14.17	18.18	22.60	26.93
B	2.63	3.26	3.93	4.33	4.92	5.59	6.10	7.70	9.44	13.00
C	2.28	2.87	3.34	3.85	4.33	5.04	5.51	6.92	8.66	13.78
F	1.97	3.15	3.15	3.15	3.15	5.12	5.12	5.12	5.12	5.12
G	.98	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
I	.51	.59	.748	.94	1.18	1.18	1.18	1.45	1.96	1.97
J	1.00	1.00	1.00	1.00	1.00	1.38	1.42	1.42	1.42	1.42
L	1.14	1.44	1.67	1.93	2.16	2.68	2.75	3.46	4.33	6.04
M	1.45	1.61	1.81	2.08	2.36	2.52	2.87	3.58	4.33	6.32
N	.31	.31	.55	.55	.55	1.06	1.06	1.06	1.26	2.16
O	.47	.47	.70	.70	.70	1.42	1.42	1.42	1.66	3.15
P	.78	.78	.78	.78	.78	1.18	1.18	1.18	1.18	1.18
R	.47	.47	.47	.47	.47	.47	.47	.47	.47	.65
S	.63	.63	.63	.63	.63	.63	.63	.63	.63	.75
T-NPT	1/8"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/2"
Q1-Q2 DIA B.C.	1.65	1.97	1.97-2.75	1.97-2.75	2.75-4.01	2.75-4.01	2.75-4.01	4.01-4.92	5.51	6.50
CH	.43/11mm	.43/11mm	.55/14mm	.748/19mm	.748/19mm	.86/22mm	.86/22mm	1.06/27mm	1.41/36mm	1.81
X MIN.	.55	.55	.71	.87	.87	1.11	1.11	1.42	1.89	2.46
'W1' THD x 'Y' DEEP	1/4-20X.31	1/4-20X.33	1/4-20X.39	1/4-20X.35	5/16-18X.39	5/16-18X.39	5/16-18X.39	3/8-16X.47	5/8-11X.78	3/4-10X.90
'W2' THD x 'Y' DEEP	-----	-----	5/16-18X.47	5/16-18X.47	3/8-16X.47	3/8-16X.47	3/8-16X.47	1/2-13X.59	-----	-----
ISO 5211	F04*	F05*	F05*-F07	F05-F07*	F07*-F10	F07-F10*	F07-F10*	F10-F12*	F14*	F16*

* F pattern Consistent with Conbraco's Mounting Bracket
 ** Alternate ISO 5211 Dimension Utilized
 *** Rev. B = 4.921/4.015 Dia. B.C.