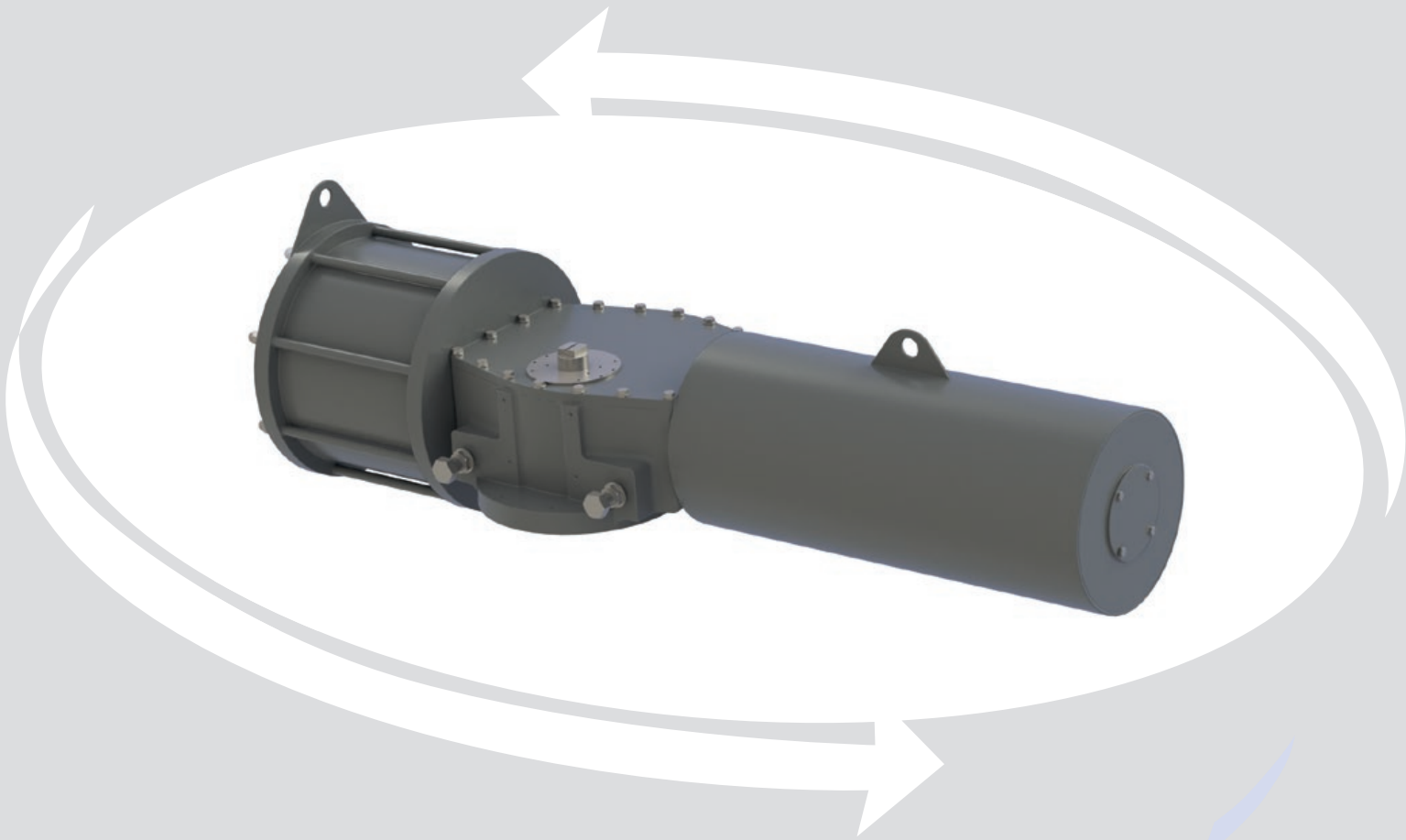




SCOTCH YOKE ACTUATORS

Heavy duty pneumatic actuators
SHD and CHD series



SIL3
Safety Integrity Level



ATEX



GOST-R



Quality system:
ISO 9000



SELECTABLE TORQUE CURVES

SHD (symmetric type) and CHD (canted type) heavy duty scotch yoke actuators are designed to perform in the most demanding applications. They are engineered to automate all types of quarter turn valves (ball, butterfly, plug and damper) with multiple torque profiles available in order to provide a "best fit" for every situation.

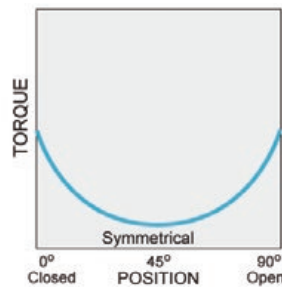
- **Weather proof design** allows the SHD and CHD series to be suitable for installation both indoors and outside. They can be custom fitted for both high and low temperature applications by changing the seals and lubricants to suit the application.
- **Self-lubricating and Wear resistance:** Both the guide rod and piston rod are plated with hard chrome to provide a high level of wear resistance. All SHD and CHD series units are permanently lubricated with materials and lubricants appropriate for the service conditions. No maintenance is required in normal service.
- **Efficiency and High Cycle Bearings:** In addition to assembling these actuators with a long life grease, all bearings in high load areas have been constructed with dry lubricant materials which are impregnated into the load bearing surfaces. This enables the unit to transfer the maximum possible load through the unit to the valve stem resulting in an extremely efficient actuator. The pre-compressed spring pack minimizes transverse load on the piston rod thereby increasing the durability and service life of the actuator.
- **Corrosion Resistance:** A three layer epoxy coating is applied to every SHD and CHD actuator in order to provide maximum protection against environmental corrosion.

DESIGN OF THE YOKE AND TORQUE CURVES

Symmetric Type



Double Acting Actuator

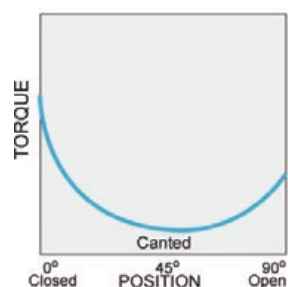


SHD series is equipped with SYMMETRICAL design yoke that produces maximum torques at both ends of the stroke (0° and 90°) and minimal in the middle, therefore this series is the optimal solution for metal seated ball valves, plug valves and for modulating service.

Canted Type



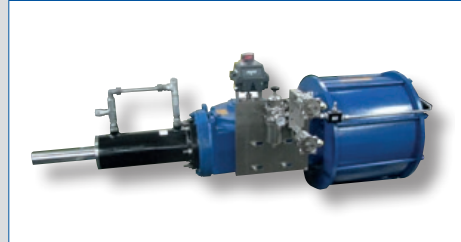
Double Acting Actuator



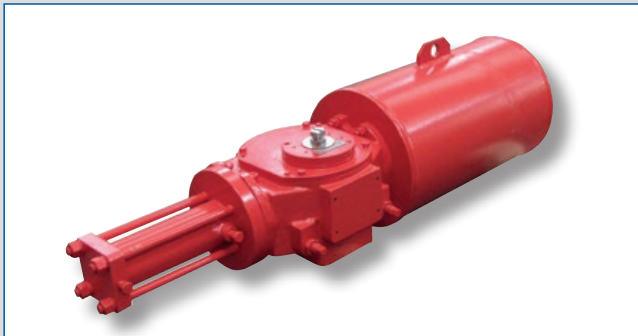
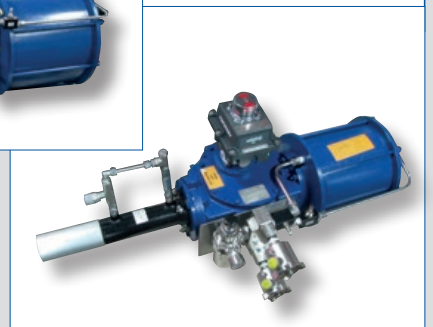
CHD series is equipped with CANTED design yoke that produces maximum torques at the beginning (valve unseating) and at the end of stroke (valve reseating), therefore this series is the optimal solution for butterfly valves.



Spring return SHD actuator equipped with a positioner for modulating service



Double acting CHD actuator with hydraulic damping system for damping of the valve closing stroke.



Hydraulic actuator

FLEXIBLE CONFIGURATIONS

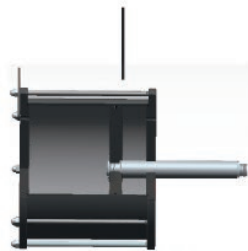


Manual Handwheel



Manual Handwheel

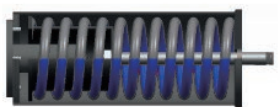
Provides maximized operational flexibility in selection and combination of power cylinder, body and spring pack depending on project requirement.



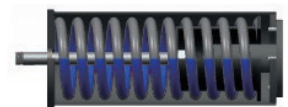
Hydraulic Cylinder



Hydraulic Cylinder



Spring Cartridge



Spring Cartridge



Hydraulic Cylinder & Pump



Hydraulic Cylinder & Pump



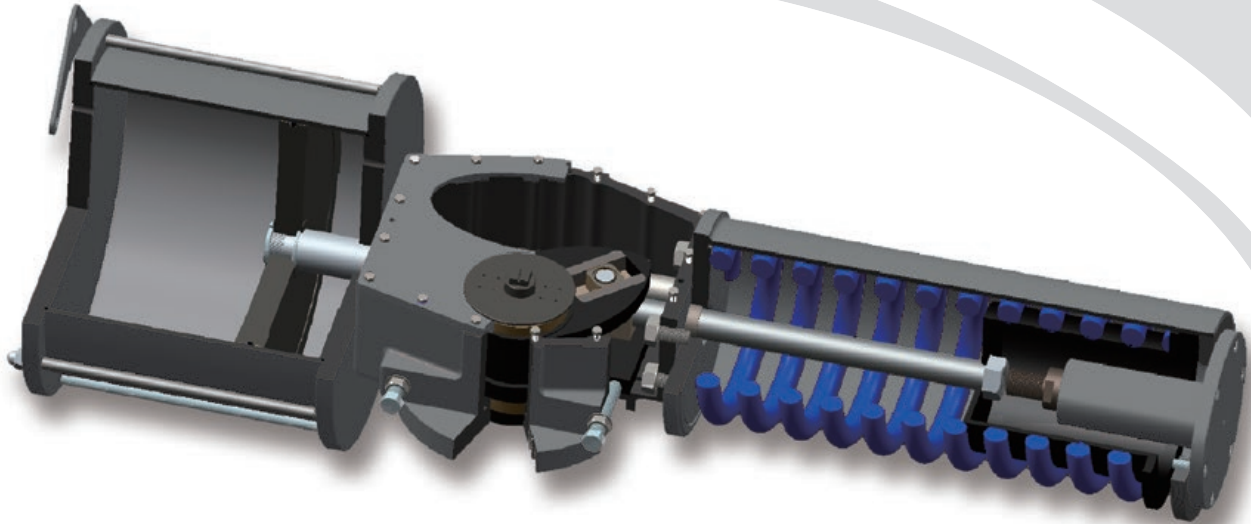
Center Body



Symmetric Yoke



Canted Yoke



CYLINDER



Cylinder: The internal wall of the cylinder is hard chrome plated in order to maximize wear and corrosion resistance.

ISO AND NAMUR STANDARD



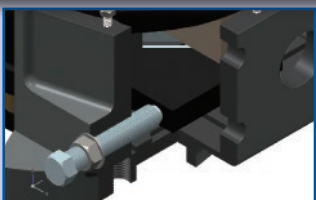
ISO and Namur Standard: Both series have a bottom interface in accordance with the ISO 5211 standard. This helps provide for easy valve to actuator connection. The top-works dimensions, both for shaft height and mounting pattern are according to NAMUR standards allowing for easy and standard accessory attachment.

SLIDE BLOCK TECHNOLOGY



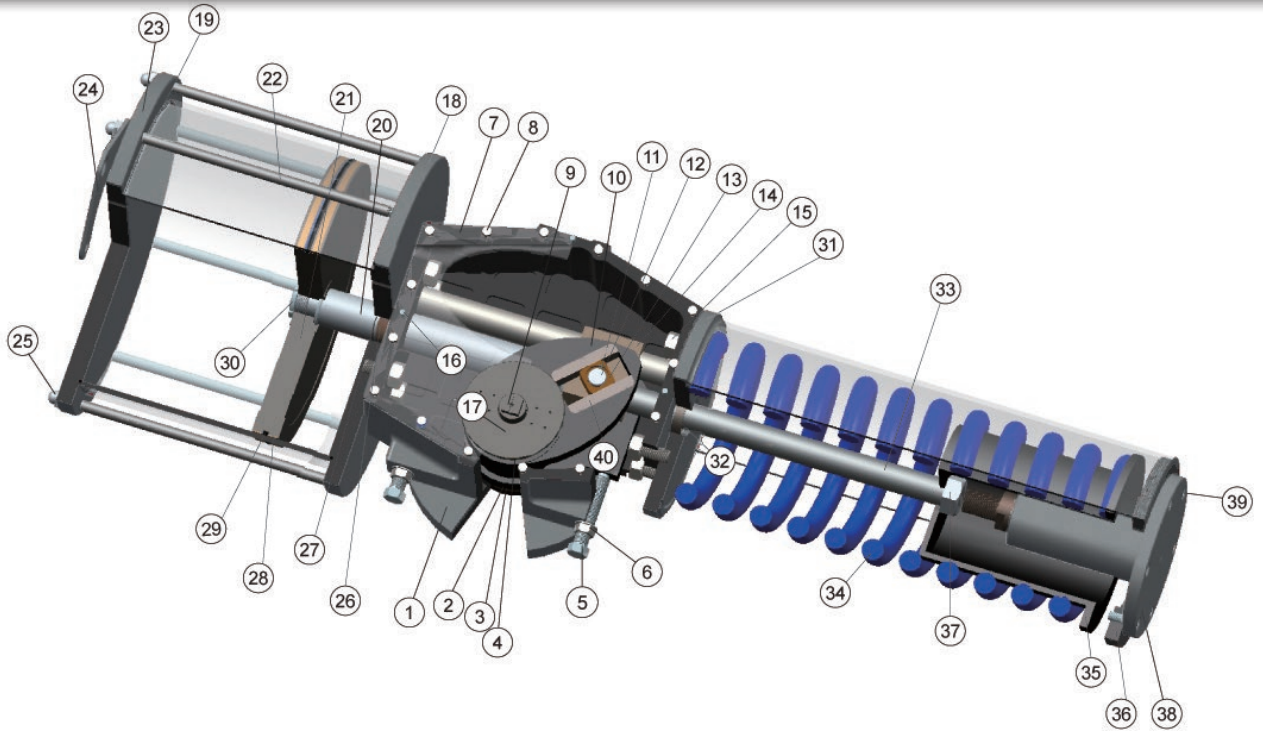
Slide Block Technology: The slide block has a wide surface contact area, impregnated with PTFE, that assures lower contact forces and smoother operation and is designed to withstand higher forces through load distribution, thereby protecting process critical equipment.

DOUBLE TRAVEL STOP



Double Travel Stop: The SHD and SHD actuators are all provided with bi-directional travel stops to allow for open and closed position location adjustments of +/- 6 degrees.

MATERIALS OF CONSTRUCTION

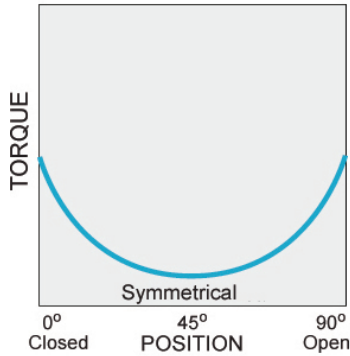


	DESCRIPTION	MATERIALS
1	Body	Ductile Iron
2	Lower Bushing	Low Carbon Steel
3	Bushing O-Ring	Nbr
4	Upper Bushing	Low Carbon Steel
5	Stopper Bolt	Alloy Steel
6	Stopper Unt	Alloy Steel
7	Body Cover	Alloy Steel
8	Body Cover Bolt	Alloy Steel
9	Position Indicator	Alloy Steel
10	Yoke	Alloy Steel
11	Snap Ring	Alloy Steel
12	Slide Pin	Alloy Steel
13	Sliding Block	High strength copper alloy, PTFE impregnated
14	Slide Block	Alloy Steel
15	Front Cover Bolt	Alloy Steel
16	Cover Fixed Pin	Alloy Steel
17	The Mounting Plate	Alloy Steel
18	Cylinder Front Cover	Alloy Steel
19	Cover O-Ring-O	Seals for High and Low temp available
20	Piston Rod	Alloy Steel
21	Piston	Alloy Steel
22	Tie Bolt	Alloy Steel
23	Cylinder End Cover	Alloy Steel
24	Lift Plate	Alloy Steel
25	Tie Bolt Nut	Alloy Steel
26	Front Cover Bushing	Alloy Steel
27	O-Ring	Seals for High and Low temp available
28	Back-Up Ring	Seals for High and Low temp available
29	Piston O-Ring	Seals for High and Low temp available
30	Piston Lock Bolt	Alloy Steel
31	Spring Case Front Cover	Alloy Steel
32	Spring Rod Guide Bushing	Alloy Steel
33	Spring Rod	Alloy Steel
34	Spring	Alloy Steel
35	Spring Retainer	Alloy Steel
36	Spring Case End Cover	Alloy Steel
37	Spring Rod Lock Nut	Alloy Steel
38	Hydraulic Cylinder	Alloy Steel
39	Cover Bolt	Alloy Steel
40	Orbital Module	Ductile Cast Iron

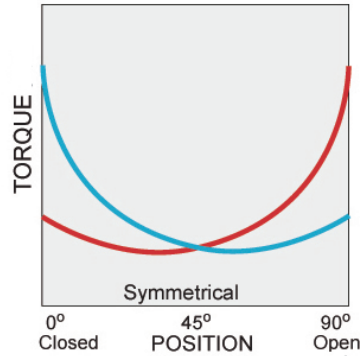
SYMMETRIC TORQUE VALUES

SHD SERIES - SYMMETRIC DESIGN

Double Acting Actuator



Spring Return Actuator



Torque Curve — Air Torque — Spring Torque

DOUBLE ACTING

Values in in-lbs

MODEL	60 PSI			80 PSI			100 PSI		
	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°
SHD16-U020000	13,367	8,311	12,844	17,841	11,082	17,135	22,304	13,852	21,415
SHD16-U025000	20,907	12,988	20,376	27,876	17,313	27,170	34,845	21,642	33,960
SHD16-U030000	30,106	18,701	29,575	40,143	24,933	39,437	50,179	31,165	49,294
SHD16-U035000	40,980	25,456	40,450	54,637	33,938	53,932	68,298	42,420	67,414
SHD25-U035000	49,603	30,811	48,165	66,141	41,083	64,219	82,678	51,351	80,277
SHD25-U038000	58,473	36,321	57,035	77,964	48,428	76,042	97,459	60,536	95,053
SHD25-U043000	74,876	46,509	73,430	99,835	62,009	97,913	124,794	77,513	122,392
SHD30-U043000	96,039	59,653	93,523	128,052	79,535	124,701	160,065	99,417	155,876
SHD30-U048000	119,673	74,327	117,157	159,558	99,103	156,212	199,447	123,882	195,267
SHD30-U053000	145,899	90,620	143,390	194,535	120,827	191,184	243,167	151,034	238,982
SHD35-U053000	179,282	111,354	175,226	239,044	148,476	233,630	298,807	185,595	292,038
SHD35-U058000	214,706	133,358	210,651	286,275	177,812	280,865	357,843	222,266	351,078
SHD35-U063000	253,324	157,340	249,261	337,761	209,789	332,351	422,202	262,237	415,437
SHD40-U063000	316,218	196,408	308,310	421,619	261,874	411,078	527,023	327,344	513,850
SHD40-U068000	368,402	228,820	360,494	491,199	305,092	480,654	613,999	381,368	600,822
SHD40-U073000	424,569	263,705	416,661	566,087	351,608	555,547	707,610	439,511	694,432
SHD48-U068000	501,759	311,295	491,727	669,007	414,253	655,631	836,269	519,434	819,549
SHD48-U073000	687,799	427,214	674,033	917,065	569,616	898,713	1,146,331	712,025	1,091,709
SHD48-U080000	825,356	512,636	808,843	1,100,469	683,515	1,078,452	1,375,597	854,393	1,348,075
SHD60-U080000	1,072,944	666,417	1,051,487	1,430,592	888,559	1,401,980	1,788,240	1,110,693	1,752,480
SHD60-U090000	1,358,352	843,701	1,331,184	1,811,136	1,124,932	1,774,912	2,263,920	1,406,170	2,218,640
SHD60-U100000	1,676,932	1,041,567	1,643,394	2,235,910	1,388,758	2,191,192	2,794,887	1,735,942	2,738,990

SYMMETRIC TORQUE VALUES

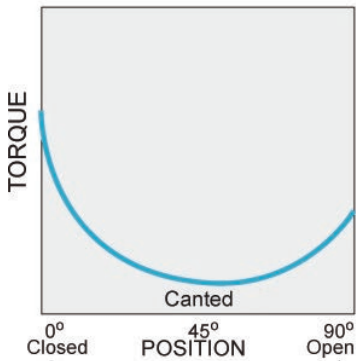
SPRING RETURN

Values in in-lbs

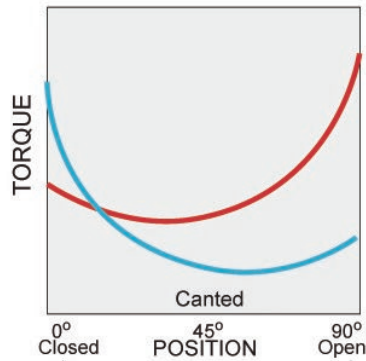
MODEL		SPRING TORQUE			AIR TORQUE AIR SUPPLY PRESSURE								
					60 PSI			80 PSI			100 PSI		
		0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°
SHD16-U020*01	A	5,328	4,381	8,629	8,038	3,930	4,214	12,513	6,701	8,506			
	B	6,992	5,753	11,329				10,849	5,329	5,807	15,312	8,099	10,086
SHD16-U025*01	A	8,081	6,647	13,090	12,826	6,341	7,286	19,795	10,666	14,080			
	B	10,966	9,019	17,763				16,910	9,664	9,406	23,878	14,090	16,196
SHD16-U030*01	A	11,515	9,559	18,949	18,591	9,142	10,626	28,628	15,374	20,487			
	B	15,816	13,002	25,614				24,326	11,931	13,823	34,363	18,164	23,680
SHD16-U035*01	A	14,409	11,966	23,711	26,571	13,490	16,739	40,228	21,972	30,220			
	B	18,941	15,568	30,677				35,697	18,370	23,255	49,358	26,852	36,737
SHD25-U035*01	A	15,958	13,621	27,420	33,646	17,190	20,746	50,183	27,462	36,800			
	B	22,711	18,764	37,076				43,430	22,320	27,143	59,967	32,588	43,201
SHD25-U038*01	A	21,950	18,135	35,828	36,523	18,186	21,207	56,014	30,293	40,214			
	B	29,234	24,154	47,714				48,730	24,275	28,328	68,225	36,382	47,339
SHD25-U043*01	A	26,986	22,295	44,050	47,890	24,214	29,380	72,849	39,714	53,863			
	B	36,262	31,456	63,929				63,573	30,553	33,984	88,532	46,057	58,463
SHD30-U043*01	A	36,881	31,588	63,743	59,158	28,065	29,780	91,171	47,947	60,958			
	B	48,113	41,209	83,153				79,940	38,326	41,549	111,953	58,207	72,724
SHD30-U048*01	A	45,360	38,855	78,391	74,313	35,472	38,766	114,198	60,248	77,821			
	B	56,698	49,405	100,651				102,860	49,698	55,561	142,749	74,477	94,616
SHD30-U053*01	A	54,999	47,113	95,101	90,900	43,508	48,289	139,536	73,714	96,083			
	B	72,895	62,433	125,982				121,640	58,394	65,203	170,272	88,601	113,000
SHD35-U053*01	A	67,717	57,574	115,679	111,565	53,780	59,546	171,327	90,902	117,951			
	B	90,313	76,780	154,277				148,731	71,696	79,353	208,494	108,815	137,761
SHD35-U058*01	A	82,277	68,443	137,523	132,429	64,915	73,128	203,998	109,369	143,342			
	B	107,306	91,233	183,299				178,968	86,579	97,566	250,537	131,033	167,779
SHD35-U063*01	A	97,102	82,560	165,881	156,222	74,780	83,380	240,659	127,229	166,470			
	B	125,034	106,297	213,586				212,726	103,491	118,765	297,167	155,939	201,851
SHD40-U063*01	A	119,096	102,739	208,125	197,123	93,668	100,184	302,523	159,134	202,953			
	B	151,277	130,495	264,363				270,342	131,242	146,715	375,746	196,702	249,487
SHD40-U068*01	A	134,912	116,378	235,757	233,491	112,442	124,736	356,287	188,714	244,897			
	B	181,210	156,322	316,671				309,989	148,770	163,983	432,789	225,046	284,151
SHD40-U073*01	A	157,685	136,018	275,559	266,884	127,686	141,102	408,402	215,590	279,988			
	B	204,974	176,820	358,199				361,113	174,788	197,348	502,635	262,690	336,234
SHD48-U068*01	A	195,929	168,899	326,539	305,830	142,396	165,187	473,078	245,354	329,091			
	B	254,707	219,569	424,499				414,300	194,684	231,131	581,563	299,865	395,049
SHD48-U073*01	A	268,576	231,518	447,626	419,223	195,696	226,406	648,489	338,098	451,087			
	B	349,144	300,978	581,919				576,771	268,637	316,794	806,038	411,047	509,790
SHD48-U080*01	A	322,282	277,825	537,134	503,074	234,811	271,709	778,187	405,690	541,318			
	B	418,968	361,172	698,280				681,502	322,342	380,172	956,629	493,221	649,796
SHD60-U080*01	A	418,968	361,181	698,280	653,976	305,236	353,207	1,011,624	527,378	703,700			
	B	544,657	469,532	907,759				885,935	419,027	494,221	1,243,583	641,161	844,721
SHD60-U090*01	A	530,416	457,256	884,030	827,935	386,445	447,154	1,280,720	667,676	890,882			
	B	689,544	594,434	1,149,243				1,121,592	530,498	625,669	1,574,376	811,736	1,069,397
SHD60-U100*01	A	654,822	564,492	1,091,368	1,022,110	477,075	552,026	1,581,088	824,267	1,099,824			
	B	851,265	733,842	1,418,775				1,384,645	654,916	772,417	1,943,623	1,002,100	1,320,215

CHD SERIES - CANTED DESIGN

Double Acting Actuator



Spring Return Actuator



Torque Curve — Air Torque — Spring Torque

DOUBLE ACTING

Values in in-lbs

MODEL	60 PSI			80 PSI			100 PSI		
	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°
CHD16-U020000	16,806	8,311	11,708	22,408	11,082	15,613	28,010	13,852	19,519
CHD16-U025000	26,261	12,988	18,298	35,012	17,313	24,396	43,763	21,642	30,494
CHD16-U030000	37,814	18,701	26,352	50,417	24,933	35,132	63,020	31,165	43,915
CHD16-U035000	51,470	25,456	35,864	68,622	33,938	47,820	85,778	42,420	59,773
CHD25-U035000	62,300	30,811	43,416	83,068	41,083	57,886	103,848	51,351	72,356
CHD25-U038000	73,439	36,321	51,177	97,922	48,428	68,231	122,401	60,536	85,293
CHD25-U043000	94,035	46,509	65,531	125,385	62,009	87,373	156,731	77,513	109,215
CHD30-U043000	120,616	59,653	84,047	160,819	79,535	112,062	201,021	99,417	140,080
CHD30-U048000	150,293	74,327	104,727	200,393	99,103	139,640	250,490	123,882	174,550
CHD30-U053000	183,237	90,620	127,760	244,317	120,827	170,250	305,393	151,034	212,811
CHD35-U053000	225,160	111,354	156,901	300,219	148,476	209,203	375,274	185,595	261,504
CHD35-U058000	269,654	133,358	187,904	359,534	177,812	250,539	449,418	222,266	313,170
CHD35-U063000	318,150	157,340	221,698	424,197	209,789	295,590	530,244	262,237	393,339
CHD40-U063000	397,136	196,408	276,739	529,513	261,874	368,983	661,890	327,344	461,226
CHD40-U068000	462,675	228,820	322,406	616,895	305,092	429,874	771,118	381,368	537,345
CHD40-U073000	533,213	263,705	371,561	710,951	351,608	495,415	888,689	439,511	619,269
CHD48-U068000	602,110	311,295	427,589	802,811	414,253	570,117	1,003,523	519,434	712,653
CHD48-U073000	825,358	427,214	586,113	1,100,478	569,616	781,490	1,375,597	712,025	949,312
CHD48-U080000	990,431	512,636	703,339	1,320,563	683,515	937,782	1,650,714	854,393	1,172,240
CHD60-U080000	1,287,531	666,417	914,331	1,716,711	888,559	1,219,113	2,145,887	1,110,693	1,523,894
CHD60-U090000	1,630,021	843,701	1,157,550	2,173,364	1,124,932	1,543,404	2,716,703	1,406,170	1,929,253
CHD60-U100000	2,012,319	1,041,567	1,429,036	2,683,092	1,388,758	1,905,383	3,353,865	1,735,942	2,381,730

CANTED TORQUE VALUES

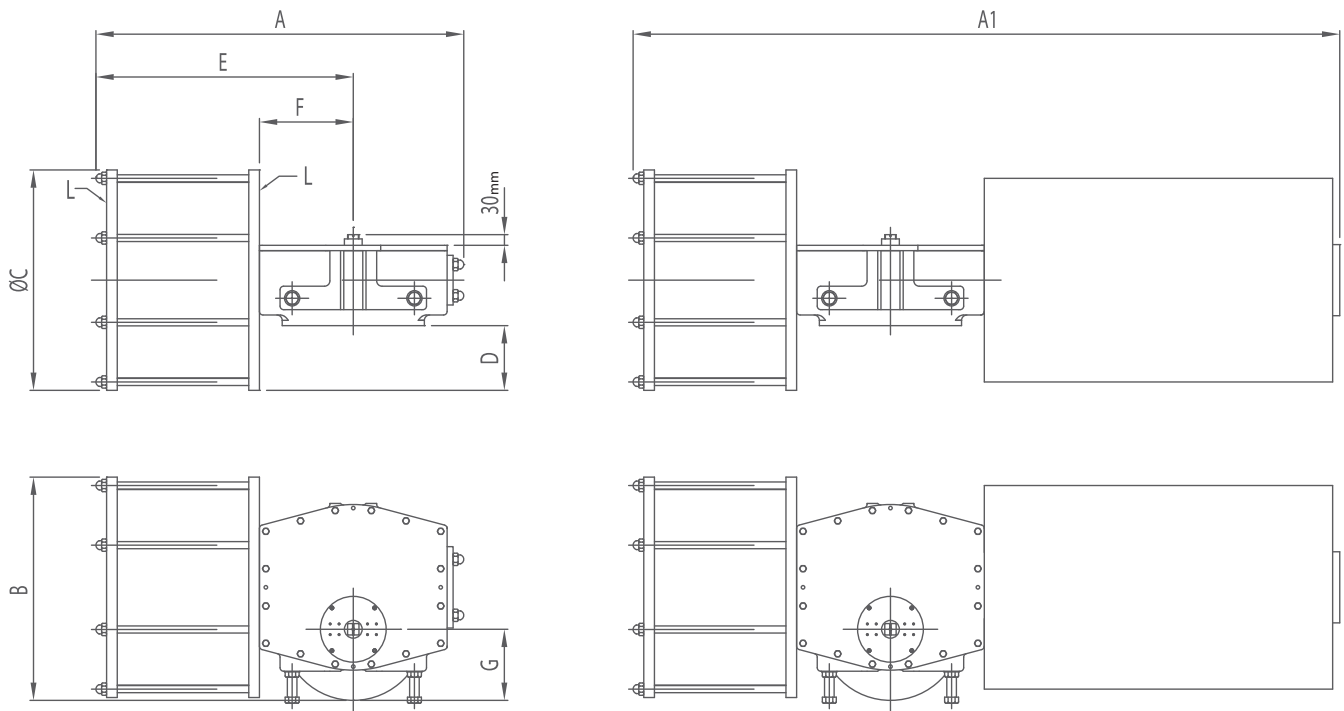
SPRING RETURN

Values in in-lbs

MODEL		SPRING TORQUE			AIR TORQUE AIR SUPPLY PRESSURE								
					60 PSI			80 PSI			100 PSI		
		0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°
CHD16-U020*01	A	5,930	4,001	7,151	10,876	4,311	4,556	16,478	7,081	8,462			
	B	7,753	5,231	9,346				14,655	5,851	6,267	20,257	8,622	10,172
CHD16-U025*01	A	9,408	6,346	11,347	16,853	6,642	6,952	25,604	10,967	13,049			
	B	12,356	8,337	14,896				22,656	8,976	9,500	31,407	13,304	15,598
CHD16-U030*01	A	13,241	9,028	16,232	24,573	9,673	10,120	37,176	15,905	18,900			
	B	18,224	12,426	22,339				32,193	12,507	12,793	44,796	18,739	21,576
CHD16-U035*01	A	15,993	11,170	20,348	35,476	14,286	15,516	52,629	22,768	27,472			
	B	22,507	15,356	27,597				46,114	18,582	20,224	63,270	27,064	32,176
CHD25-U035*01	A	18,117	12,957	23,897	44,182	17,854	19,519	64,950	28,126	33,989			
	B	27,375	18,569	33,270				55,692	22,514	24,616	76,460	32,783	39,087
CHD25-U038*01	A	24,419	17,463	32,226	49,020	18,859	18,951	73,503	30,966	36,006			
	B	34,633	23,490	42,103				63,289	24,939	26,128	87,768	37,046	43,190
CHD25-U043*01	A	32,190	21,835	39,129	61,845	24,674	26,401	93,195	40,174	48,243			
	B	44,404	30,119	53,981				80,981	31,890	33,392	112,326	47,394	55,234
CHD30-U043*01	A	41,908	29,561	54,149	78,708	30,092	29,899	118,910	49,974	57,913			
	B	53,972	38,067	69,726				106,847	41,468	42,336	147,049	61,349	70,354
CHD30-U048*01	A	52,104	36,748	67,310	98,188	37,579	37,417	148,289	62,354	72,330			
	B	68,629	48,405	88,658				131,764	50,698	50,982	181,861	75,477	85,892
CHD30-U053*01	A	62,265	43,917	80,436	120,972	46,703	47,248	182,052	76,910	89,814			
	B	81,577	57,548	105,395				162,739	63,279	64,855	223,816	93,486	107,417
CHD35-U053*01	A	78,365	54,777	99,890	146,795	56,577	57,011	221,855	93,699	109,313			
	B	104,173	72,886	132,921				196,046	75,590	76,282	271,101	112,709	128,584
CHD35-U058*01	A	90,233	63,132	115,131	179,420	70,226	72,774	269,301	114,680	135,409			
	B	127,052	88,897	162,110				232,482	88,915	88,429	322,366	133,369	151,060
CHD35-U063*01	A	108,793	76,125	138,815	209,357	81,215	82,883	315,404	133,663	156,775			
	B	143,010	100,067	182,476				281,187	109,722	113,114	387,234	162,170	187,014
CHD40-U063*01	A	128,159	91,092	167,527	268,977	105,316	109,212	401,354	170,782	201,456			
	B	167,872	124,158	233,084				361,641	137,716	135,898	494,018	203,186	228,142
CHD40-U068*01	A	156,791	111,440	204,948	305,884	117,380	117,458	460,104	193,652	224,926			
	B	195,734	144,772	271,789				421,160	160,321	158,085	575,383	236,596	265,556
CHD40-U073*01	A	176,944	125,760	231,288	356,269	137,944	140,274	534,007	225,848	264,127			
	B	221,525	163,845	307,590				489,426	187,763	187,825	667,163	275,666	311,679
CHD48-U068*01	A	232,934	160,092	337,789	369,176	151,202	89,800	569,877	254,161	232,329			
	B	302,819	208,125	439,139				499,992	206,128	130,979	700,703	311,309	273,514
CHD48-U073*01	A	319,300	219,454	463,044	506,059	207,760	123,069	781,178	350,162	318,445			
	B	415,091	285,286	601,948				685,387	284,330	179,542	960,506	426,739	347,364
CHD48-U080*01	A	383,149	263,336	555,632	607,282	249,300	147,707	937,414	420,179	382,150			
	B	498,093	342,338	722,327				822,470	341,177	215,455	1,152,620	512,055	449,912
CHD60-U080*01	A	498,111	342,347	722,345	789,420	324,070	191,994	1,218,600	546,212	496,768			
	B	647,556	445,060	939,073				1,069,155	443,499	280,040	1,498,331	665,633	584,821
CHD60-U090*01	A	630,607	433,412	914,494	999,414	410,289	243,056	1,542,757	691,520	628,909			
	B	819,800	563,438	1,188,850				1,353,564	561,493	354,554	1,896,903	842,732	740,403
CHD60-U100*01	A	778,529	535,072	1,129,001	1,233,790	506,495	300,035	1,904,563	853,686	776,382			
	B	1,012,065	695,580	1,467,666				1,671,027	693,178	437,717	2,341,800	1,040,362	914,064

* = spring type A or B in the model number indicates the selection of either the "A" or "B" spring from the tables below.

OVERALL DIMENSIONS



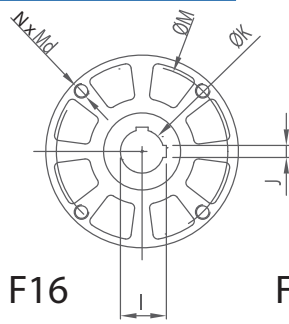
Dimensions in inches

OVERALL DIMENSIONS

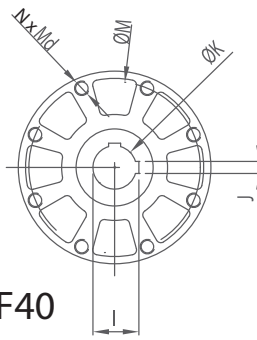
MODEL	A	A1	B	C	D	E	f	G	L
aHD16-U020***	31.5	52.2	14.6	10.7	1.89	20.3	7.72	5.71	1/2" NPT
aHD16-U025***	31.5	52.2	15.6	12.7	2.87	20.3	7.72	5.71	1/2" NPT
aHD16-U030***	31.5	52.2	16.5	14.7	3.86	20.3	7.72	5.71	1/2" NPT
aHD16-U035***	31.5	52.2	17.5	16.1	4.61	20.3	7.72	5.71	1/2" NPT
aHD25-U035***	38.8	59.4	19.3	16.1	3.62	25.7	9.29	6.89	3/4" NPT
aHD25-U038***	38.8	59.4	19.9	18.1	4.65	25.7	9.29	6.89	3/4" NPT
aHD25-U043***	38.8	59.4	20.9	20.2	5.63	25.7	9.29	6.89	3/4" NPT
aHD30-U043***	47.8	76.2	25.2	20.2	5.04	30.0	11.3	7.48	1" NPT
aHD30-U048***	47.8	76.2	25.9	22.2	6.02	30.0	11.3	7.48	1" NPT
aHD30-U053***	47.8	76.2	26.9	24.6	7.24	30.0	11.3	7.48	1" NPT
aHD35-U053***	56.5	91.3	28.0	24.6	6.18	35.6	13.5	9.06	1" NPT
aHD35-U058***	56.5	91.3	28.8	26.6	7.20	35.6	13.5	9.06	1" NPT
aHD35-U063***	56.5	91.3	29.9	28.7	8.27	35.6	13.5	9.06	1" NPT
aHD40-U063***	67.3	108.3	32.7	29.3	7.56	44.3	16.3	10.2	1-1/4" NPT
aHD40-U068***	67.3	108.3	33.5	31.3	8.54	44.3	16.3	10.2	1-1/4" NPT
aHD40-U073***	67.3	108.3	34.4	33.3	9.57	44.3	16.3	10.2	1-1/4" NPT

Replace "a" with "C" (for CHD series) or "S" (for SHD series)

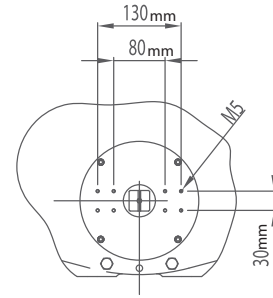
FLANGE CONNECTION



F16



F25 - F40



ISO & NAMUR connections

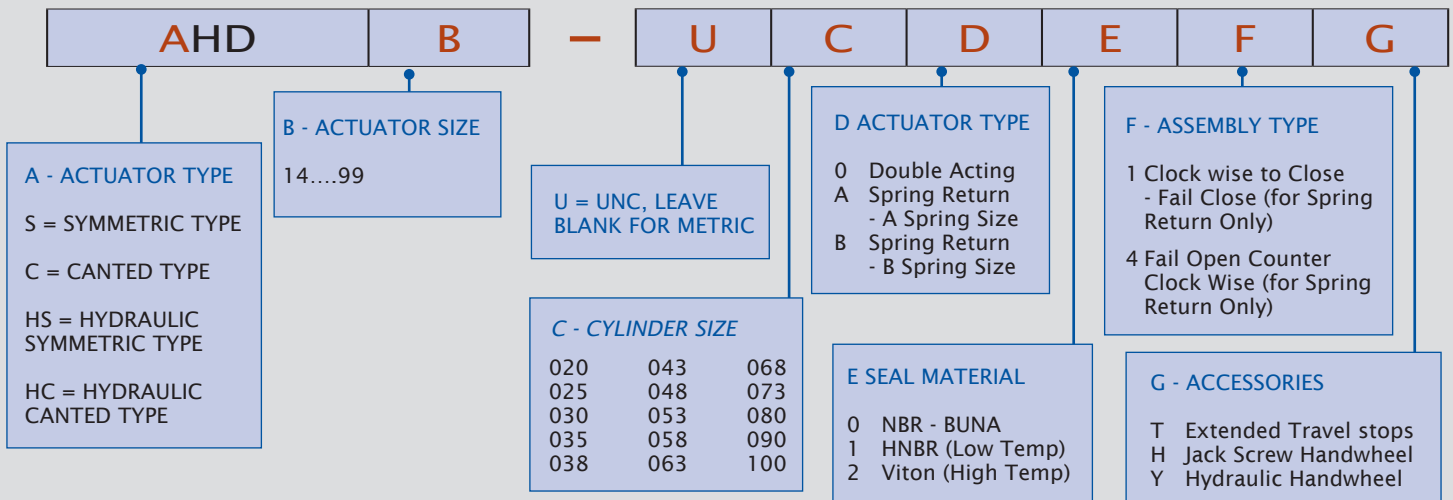
Dimensions in inches

CONNECTING DIMENSIONS

MODEL	THREADS					I	J	MAIN BORE	
	ØM	N	Md	Depth	ISO			ØK	Depth
aHD16-U020***	6.50	4	M20	0.98	F16	2.13	0.551	1.969	6.14
aHD16-U025***	6.50	4	M20	0.98	F16	2.13	0.551	1.969	6.14
aHD16-U030***	6.50	4	M20	0.98	F16	2.13	0.551	1.969	6.14
aHD16-U035***	6.50	4	M20	0.98	F16	2.13	0.551	1.969	6.14
aHD25-U035***	10.00	8	M16	0.67	F25	3.35	0.787	3.150	8.03
aHD25-U038***	10.00	8	M16	0.67	F25	3.35	0.787	3.150	8.03
aHD25-U043***	10.00	8	M16	0.67	F25	3.35	0.787	3.150	8.03
aHD30-U043***	11.73	8	M20	1.34	F30	4.58	1.102	4.331	9.21
aHD30-U048***	11.73	8	M20	1.34	F30	4.58	1.102	4.331	9.21
aHD30-U053***	11.73	8	M20	1.34	F30	4.58	1.102	4.331	9.21
aHD35-U053***	14.02	8	M30	1.69	F35	5.41	1.260	5.118	10.98
aHD35-U058***	14.02	8	M30	1.69	F35	5.41	1.260	5.118	10.98
aHD35-U063***	14.02	8	M30	1.69	F35	5.41	1.260	5.118	10.98
aHD40-U063***	15.98	8	M36	1.38	F40	6.20	1.260	5.906	12.83
aHD40-U068***	15.98	8	M36	1.38	F40	6.20	1.260	5.906	12.83
aHD40-U073***	15.98	8	M36	1.38	F40	6.20	1.260	5.906	12.83

Replace "a" with "C" (for CHD series) or "S" (for SHD series)

ORDERING CODE



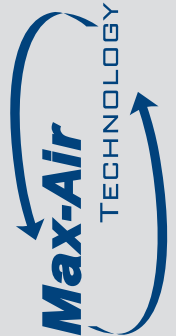
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DETAILED TORQUE TABLE REFERENCE

Values in in-lbs

SHD SERIES - DOUBLE ACTING

MODEL	60 PSI (4.1 BAR)			70 PSI (4.8 BAR)			80 PSI (5.5 BAR)			90 PSI (6.2 BAR)			100 PSI (6.9 BAR)		
	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°
SHD16-U020000	13,367	8,311	12,844	15,606	9,697	14,992	17,841	11,082	17,135	20,074	12,467	19,276	22,304	13,852	21,415
SHD16-U025000	20,907	12,988	20,376	24,391	15,148	23,775	27,876	17,313	27,170	31,360	19,478	30,564	34,845	21,642	33,960
SHD16-U030000	30,106	18,701	29,575	35,122	21,819	34,506	40,143	24,933	39,437	45,163	28,047	44,367	50,179	31,165	49,294
SHD16-U035000	40,980	25,456	40,450	47,809	29,697	47,193	54,637	33,938	53,932	61,467	38,179	60,670	68,298	42,420	67,414
SHD25-U035000	49,603	30,811	48,165	57,872	35,950	56,190	66,141	41,083	64,219	74,410	46,216	72,249	82,678	51,351	80,277
SHD25-U038000	58,473	36,321	57,035	68,218	42,375	66,536	77,964	48,428	76,042	87,710	54,482	85,549	97,459	60,536	95,053
SHD25-U043000	74,876	46,509	73,430	87,355	54,259	85,672	99,835	62,009	97,913	112,314	69,760	110,154	124,794	77,513	122,392
SHD30-U043000	96,039	59,653	93,523	112,046	69,594	109,114	128,052	79,535	124,701	144,059	89,476	140,288	160,065	99,417	155,876
SHD30-U048000	119,673	74,327	117,157	139,616	86,715	136,684	159,558	99,103	156,212	179,502	111,491	175,740	199,447	123,882	195,267
SHD30-U053000	145,899	90,620	143,390	170,217	105,724	167,287	194,535	120,827	191,184	218,852	135,930	215,082	243,167	151,034	238,982
SHD35-U053000	179,282	111,354	175,226	209,166	129,917	204,426	239,044	148,476	233,630	268,923	167,034	262,835	298,807	185,595	292,038
SHD35-U058000	214,706	133,358	210,651	250,490	155,583	245,758	286,275	177,812	280,865	322,059	200,041	315,971	357,843	222,266	351,078
SHD35-U063000	253,324	157,340	249,261	295,540	183,562	290,806	337,761	209,789	332,351	379,982	236,015	373,895	422,202	262,237	415,437
SHD40-U063000	316,218	196,408	308,310	368,918	229,141	359,692	421,619	261,874	411,078	474,320	294,608	462,465	527,023	327,344	513,850
SHD40-U068000	368,402	228,820	360,494	429,798	266,954	420,572	491,199	305,092	480,654	552,600	343,231	540,738	613,999	381,368	600,822
SHD40-U073000	424,569	263,705	416,661	495,326	307,654	486,106	566,087	351,608	555,547	636,850	395,561	624,987	707,610	439,511	694,432
SHD48-U068000	501,759	311,295	491,727	585,374	361,395	573,670	669,007	414,253	655,631	752,642	467,491	737,594	836,269	519,434	819,549
SHD48-U073000	687,799	427,214	674,033	802,432	498,410	786,378	917,065	569,616	898,713	1,031,698	640,822	1,003,780	1,146,331	712,025	1,091,709
SHD48-U080000	825,356	512,636	808,843	962,903	598,075	943,638	1,100,469	683,515	1,078,452	1,238,037	768,954	1,213,268	1,375,597	854,393	1,348,075
SHD60-U080000	1,072,944	666,417	1,051,487	1,251,768	777,493	1,226,729	1,430,592	888,559	1,401,980	1,609,416	999,624	1,577,232	1,788,240	1,110,693	1,752,480
SHD60-U090000	1,358,352	843,701	1,331,184	1,584,744	984,312	1,553,048	1,811,136	1,124,932	1,774,912	2,037,528	1,265,553	1,996,776	2,263,920	1,406,170	2,218,640
SHD60-U100000	1,676,932	1,041,567	1,643,394	1,956,421	1,215,167	1,917,293	2,235,910	1,388,758	2,191,192	2,515,399	1,562,348	2,465,091	2,794,887	1,735,942	2,738,990



Technical Documents Available at
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 Automate Your Process

DETAILED TORQUE TABLE REFERENCE

Values in in-lbs

SHD SERIES - SPRING RETURN

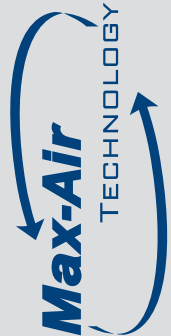
MODEL	AIR TORQUE AIR SUPPLY PRESSURE																	
	SPRING TORQUE						60 PSI (4.1 BAR)		70 PSI (4.8 BAR)		80 PSI (5.5 BAR)		90 PSI (6.2 BAR)		100 PSI (6.9 BAR)			
	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°
A	5,328	4,381	8,629	8,038	3,930	4,214	10,278	5,316	6,363	12,513	6,701	8,506						
B	6,992	5,753	11,329							10,849	5,329	5,807	13,082	6,714	7,948	15,312	8,099	10,086
A	8,081	6,647	13,090	12,826	6,341	7,286	16,310	8,501	10,685	19,795	10,666	14,080						
B	10,966	9,019	17,763							16,910	9,664	9,406	20,394	12,842	12,800	23,878	14,090	16,196
A	11,515	9,559	18,949	18,591	9,142	10,626	23,607	12,261	15,557	28,628	15,374	20,487						
B	15,816	13,002	25,614							24,326	11,931	13,823	29,347	15,045	18,753	34,363	18,164	23,680
A	14,409	11,966	23,711	26,571	13,490	16,739	33,400	17,731	23,482	40,228	21,972	30,220						
B	18,941	15,568	30,677							35,697	18,370	23,255	42,526	22,611	29,994	49,358	26,852	36,737
A	15,958	13,621	27,420	33,646	17,190	20,746	41,914	22,328	28,770	50,183	27,462	36,800						
B	22,711	18,764	37,076							43,430	22,320	27,143	51,699	27,453	35,173	59,967	32,588	43,201
A	21,950	18,135	35,828	36,523	18,186	21,207	46,269	24,240	30,709	56,014	30,293	40,214						
B	29,234	24,154	47,714							48,730	24,275	28,328	58,476	30,328	37,835	68,225	36,382	47,339
A	26,986	22,295	44,050	47,890	24,214	29,380	60,370	31,964	41,622	72,849	39,714	53,863						
B	36,262	31,456	63,929							63,573	30,553	33,984	76,053	38,304	46,225	88,532	46,057	58,463
A	36,881	31,588	63,743	59,158	28,065	29,780	75,165	38,006	45,371	91,171	47,947	60,958						
B	48,113	41,209	83,153							79,940	38,326	41,549	95,946	48,267	57,135	111,953	58,207	72,724
A	45,360	38,855	78,391	74,313	35,472	38,766	94,256	47,860	58,293	114,198	60,248	77,821						
B	56,698	49,405	100,651							102,860	49,698	55,561	122,804	62,086	75,089	142,749	74,477	94,616
A	54,999	47,113	95,101	90,900	43,508	48,289	115,218	58,611	72,186	139,536	73,714	96,083						
B	72,895	62,433	125,982							121,640	58,394	65,203	145,957	73,497	89,100	170,272	88,601	113,000
A	67,717	57,574	115,679	111,565	53,780	59,546	141,449	72,343	88,746	171,327	90,902	117,951						
B	90,313	76,780	154,277							148,731	71,696	79,353	178,610	90,254	108,558	208,494	108,815	137,761
A	82,277	68,443	137,523	132,429	64,915	73,128	168,214	87,140	108,235	203,998	109,369	143,342						
B	107,306	91,233	183,299							178,968	86,579	97,566	214,752	108,808	132,673	250,537	131,033	167,779
A	97,102	82,560	165,881	156,222	74,780	83,380	198,439	101,002	124,925	240,659	127,229	166,470						
B	125,034	106,297	213,586							212,726	103,491	118,765	254,948	129,717	160,309	297,167	155,939	201,851
A	119,096	102,739	208,125	197,123	93,668	100,184	249,823	126,401	151,566	302,523	159,134	202,953						
B	151,277	130,495	264,363							270,342	131,242	146,715	323,043	163,874	198,102	375,746	196,702	249,487
A	134,912	116,378	235,757	233,491	112,442	124,736	294,887	150,575	184,814	356,287	188,714	244,897						
B	181,210	156,322	316,671							309,989	148,770	163,983	371,390	186,909	224,067	432,789	225,046	284,151
A	157,685	136,018	275,559	266,884	127,686	141,102	337,641	171,636	210,547	408,402	215,590	279,988						
B	204,974	176,820	358,199							361,113	174,788	197,348	431,875	218,741	266,789	502,635	262,690	336,234
A	195,929	168,899	326,539	305,830	142,396	165,187	389,445	192,496	247,130	473,078	245,354	329,091						
B	254,707	219,569	424,499							414,300	194,684	231,131	497,936	247,921	313,094	581,563	299,865	395,049
A	268,576	231,518	447,626	419,223	195,696	226,406	533,856	266,892	338,751	648,489	338,098	451,087						
B	349,144	300,978	581,919							576,771	268,637	316,794	691,404	339,844	421,861	806,038	411,047	509,790
A	322,282	277,825	537,134	503,074	234,811	271,709	640,621	320,250	406,504	778,187	405,690	541,318						
B	418,968	361,172	698,280							681,502	322,342	380,172	819,070	407,782	514,988	956,629	493,221	649,796
A	418,968	361,181	698,280	653,976	305,236	353,207	832,800	416,311	528,449	1,011,624	527,378	703,700						
B	544,657	469,532	907,759							885,935	419,027	494,221	1,064,758	530,092	669,473	1,243,583	641,161	844,721
A	530,416	457,256	884,030	827,935	386,445	447,154	1,054,328	527,056	669,018	1,280,720	667,676	890,882						
B	689,544	594,434	1,149,243							1,121,592	530,498	625,669	1,347,984	671,119	847,533	1,574,376	811,736	1,069,397
A	654,822	564,492	1,091,368	1,022,110	477,075	552,026	1,301,599	650,675	825,925	1,581,088	824,267	1,099,824						
B	851,265	733,842	1,418,775							1,384,645	654,916	772,417	1,664,134	828,506	1,046,316	1,943,623	1,002,100	1,320,215

DETAILED TORQUE TABLE REFERENCE

Values in in-lbs

CHD SERIES - DOUBLE ACTING

MODEL	60 PSI (4.1 BAR)			70 PSI (4.8 BAR)			80 PSI (5.5 BAR)			90 PSI (6.2 BAR)			100 PSI (6.9 BAR)		
	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°
CHD16-U020000	16,806	8,311	11,708	19,607	9,697	13,660	22,408	11,082	15,613	25,209	12,467	17,566	28,010	13,852	19,519
CHD16-U025000	26,261	12,988	18,298	30,637	15,148	21,349	35,012	17,313	24,396	39,387	19,478	27,443	43,763	21,642	30,494
CHD16-U030000	37,814	18,701	26,352	44,117	21,819	30,740	50,417	24,933	35,132	56,716	28,047	39,525	63,020	31,165	43,915
CHD16-U035000	51,470	25,456	35,864	60,043	29,697	41,845	68,622	33,938	47,820	77,201	38,179	53,795	85,778	42,420	59,773
CHD25-U035000	62,300	30,811	43,416	72,686	35,950	50,653	83,068	41,083	57,886	93,452	46,216	65,119	103,848	51,351	72,356
CHD25-U038000	73,439	36,321	51,177	85,681	42,375	59,702	97,922	48,428	68,231	110,162	54,482	76,762	122,401	60,536	85,293
CHD25-U043000	94,035	46,509	65,531	109,712	54,259	76,454	125,385	62,009	87,373	141,057	69,760	98,292	156,731	77,513	109,215
CHD30-U043000	120,616	59,653	84,047	140,717	69,594	98,052	160,819	79,535	112,062	180,920	89,476	126,072	201,021	99,417	140,080
CHD30-U048000	150,293	74,327	104,727	175,343	86,715	122,186	200,393	99,103	139,640	225,442	111,491	157,094	250,490	123,882	174,550
CHD30-U053000	183,237	90,620	127,760	213,779	105,724	148,984	244,317	120,827	170,250	274,854	135,930	191,529	305,393	151,034	212,811
CHD35-U053000	225,160	111,354	156,901	262,690	129,917	183,050	300,219	148,476	209,203	337,748	167,034	235,356	375,274	185,595	261,504
CHD35-U058000	269,654	133,358	187,904	314,592	155,583	219,222	359,534	177,812	250,539	404,477	200,041	281,856	449,418	222,266	313,170
CHD35-U063000	318,150	157,340	221,698	371,174	183,562	258,642	424,197	209,789	295,590	477,221	236,015	338,012	530,244	262,237	393,339
CHD40-U063000	397,136	196,408	276,739	463,322	229,141	322,861	529,513	261,874	368,983	595,704	294,608	415,105	661,890	327,344	461,226
CHD40-U068000	462,675	228,820	322,406	539,785	266,954	376,138	616,895	305,092	429,874	694,005	343,231	483,610	771,118	381,368	537,345
CHD40-U073000	533,213	263,705	371,561	622,082	307,654	433,488	710,951	351,608	495,415	799,820	395,561	557,342	888,689	439,511	619,269
CHD48-U068000	602,110	311,295	427,589	702,451	361,395	498,846	802,811	414,253	570,117	903,172	467,491	641,389	1,003,523	519,434	712,653
CHD48-U073000	825,358	427,214	586,113	962,918	498,410	683,806	1,100,478	569,616	781,490	1,238,037	640,822	872,852	1,375,597	712,025	949,312
CHD48-U080000	990,431	512,636	703,339	1,155,488	598,075	820,554	1,320,563	683,515	937,782	1,485,642	768,954	1,055,013	1,650,714	854,393	1,172,240
CHD60-U080000	1,287,531	666,417	914,331	1,502,121	777,493	1,066,719	1,716,711	888,559	1,219,113	1,931,300	999,624	1,371,505	2,145,887	1,110,693	1,523,894
CHD60-U090000	1,630,021	843,701	1,157,550	1,901,692	984,312	1,350,477	2,173,364	1,124,932	1,543,404	2,445,034	1,265,553	1,736,329	2,716,703	1,406,170	1,929,253
CHD60-U100000	2,012,319	1,041,567	1,429,036	2,347,705	1,215,167	1,667,212	2,683,092	1,388,758	1,905,383	3,018,478	1,562,348	2,143,554	3,353,865	1,735,942	2,381,730



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DETAILED TORQUE TABLE REFERENCE

Values in in-lbs

CHD SERIES - SPRING RETURN

MODEL	SPRING TORQUE						AIR TORQUE AIR SUPPLY PRESSURE																										
	60 PSI (4.1 BAR)			70 PSI (4.8 BAR)			80 PSI (5.5 BAR)			90 PSI (6.2 BAR)			100 PSI (6.9 BAR)			0°			90°			0°			90°								
	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°	0°	RUN	90°						
A	5,930	4,001	7,151	10,876	4,311	4,556	13,677	5,696	6,509	16,478	7,081	8,462																					
B	7,753	5,231	9,346																														
A	9,408	6,346	11,347	16,853	6,642	6,952	21,228	8,802	10,003	25,604	10,967	13,049																					
B	12,356	8,337	14,896																														
A	13,241	9,028	16,232	24,573	9,673	10,120	30,877	12,792	14,508	37,176	15,905	18,900																					
B	18,224	12,426	22,339																														
A	15,993	11,170	20,348	35,476	14,286	15,516	44,050	18,527	21,497	52,629	22,768	27,472																					
B	22,507	15,356	27,597																														
A	18,117	12,957	23,897	44,182	17,854	19,519	54,569	22,992	26,756	64,950	28,126	33,989																					
B	27,375	18,569	33,270																														
A	24,419	17,463	32,226	49,020	18,859	18,951	61,261	24,912	27,476	73,503	30,966	36,006																					
B	34,633	23,490	42,103																														
A	32,190	21,835	39,129	61,845	24,674	26,401	77,522	32,424	37,325	93,195	40,174	48,243																					
B	44,404	30,119	53,981																														
A	41,908	29,561	54,149	78,708	30,092	29,899	98,809	40,033	43,903	118,910	49,974	57,913																					
B	53,972	38,067	69,726																														
A	52,104	36,748	67,310	98,188	37,579	37,417	123,239	49,966	54,876	148,289	62,354	72,330																					
B	68,629	48,405	88,658																														
A	62,265	43,917	80,436	120,972	46,703	47,248	151,514	61,806	68,533	182,052	76,910	89,814																					
B	81,577	57,548	105,395																														
A	78,365	54,777	99,890	146,795	56,577	57,011	184,325	75,140	83,160	221,855	93,699	109,313																					
B	104,173	72,886	132,921																														
A	90,233	63,132	115,131	179,420	70,226	72,774	224,358	92,450	104,091	269,301	114,680	135,409																					
B	127,052	88,897	162,110																														
A	108,793	76,125	138,815	209,357	81,215	82,883	262,380	107,437	119,827	315,404	133,663	156,775																					
B	143,010	100,067	182,476																														
A	128,159	91,092	167,527	268,977	105,316	109,212	335,163	138,049	155,334	401,354	170,782	201,456																					
B	167,872	124,158	233,084																														
A	156,791	111,440	204,948	305,884	117,380	117,458	382,994	155,514	171,190	460,104	193,652	224,926																					
B	195,734	144,772	271,789																														
A	176,944	125,760	231,288	356,269	137,944	140,274	445,138	181,894	202,201	534,007	225,848	264,127																					
B	221,525	163,845	307,590																														
A	232,934	160,092	337,789	369,176	151,202	89,800	469,517	201,303	161,058	569,877	254,161	232,329																					
B	302,819	208,125	439,139																														
A	319,300	219,454	463,044	506,059	207,760	123,069	643,619	278,956	220,762	781,178	350,162	318,445																					
B	415,091	285,286	601,948																														
A	383,149	263,336	555,632	607,282	249,300	147,707	772,339	334,739	264,922	937,414	420,179	382,150																					
B	498,093	342,338	722,327																														
A	498,111	342,347	722,345	789,420	324,070	191,994	1,004,010	435,146	344,376	1,218,600	546,212	496,768																					
B	647,556	445,060	939,073																														
A	630,607	433,412	914,494	999,414	410,289	243,056	1,271,086	550,900	435,983	1,542,757	691,520	628,909																					
B	819,800	563,438	1,188,850																														
A	778,529	535,072	1,129,001	1,233,790	506,495	300,035	1,569,176	680,095	538,211	1,904,563	853,686	776,382																					
B	1,012,065	695,580	1,467,666																														



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