

## THD/THS COMPACT HYDRAULIC ACTUATORS

### HELICAL SLOT DESIGN

Compact quarter-turn hydraulic actuators for on-off and modulating control of ball, butterfly, plug or damper style valves in heavy duty service. Available with output torques up to 300,000 Nm



### FEATURES

- Customizable helical profile to suit valve-specific torque profile (special execution).
- Totally enclosed, weatherproof housing in fabricated carbon steel provides maximum strength.
- Painting according to corrosion EN 15714-3 with protection level C4 and C5 I/M with Norsok approved paint and on site Frosio and Nace inspector.
- Internal coating and special surface treatment protects against corrosion.
- Hard chrome-plated piston rod for corrosion resistance and minimal friction.
- Electroless nickel-plated cylinder bore provides maximum corrosion resistance and reliability.
- Low hysteresis and high response enhance modulating service.
- Bearings in bronze or sintered bronze impregnated with PTFE provide reliability, smooth operation and extended service life.
- Adjustable end stopper installed below cylinder flange for easy access.
- Position indicator directly connected to output drive.
- Certified IP68 for installation up to 100m water depth

### PRODUCT OVERVIEW

Designed with a unique helical slot design, which transforms the linear movement of a piston into a quarter-turn rotation, generating high break torques to actuate large valves. With its spring integrated into the cylinder, it is very compact with the same dimensions whether for double-acting or spring return; spring to open or spring to close operations.

### APPROVALS

Safety Integrity Level:  
(IEC 61508-1÷7:2010): SIL3 Compliant  
Hazardous area:  
European Directive ATEX  
Enclosure Standards:  
(IEC 60529): IP66, IP67M and IP68M  
Machinery Directive:  
2006/42/EC

### TECHNICAL DATA

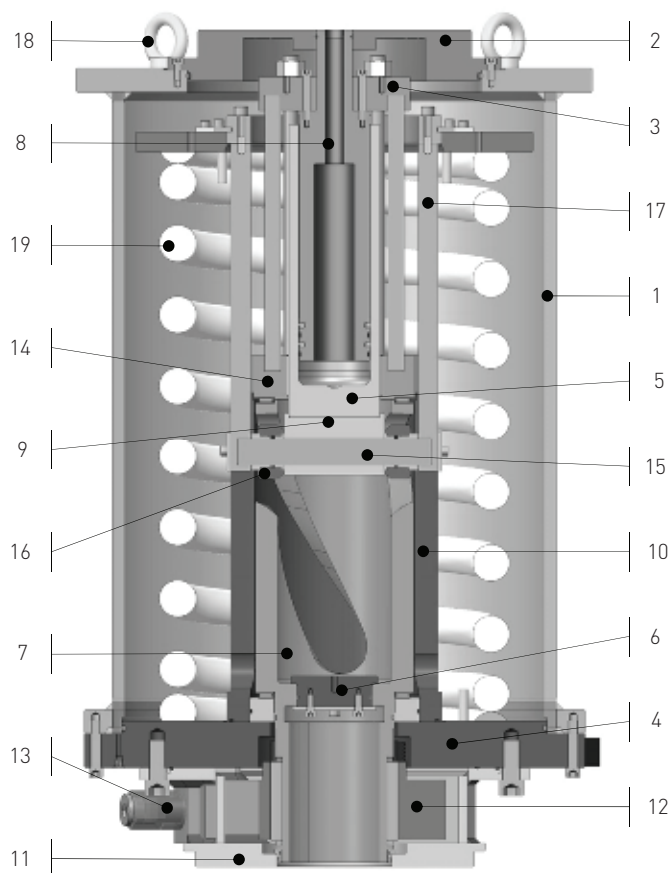
Design pressure:	350 bar g
Supply medium:	Mineral oil
Output torque:	up to 300,000 Nm
Ambient temperature Standard range (PED compliant):	-20°C to +100°C (-4°F to +210°F)
Low temperature range (PED compliant):	-40°C to +100°C (-40°F to +210°F)
Low temperature ranges:	-60°C to +100°C (-76°F to +210°F)
External angular stroke adjustment:	± 5°
Valve attachment interface:	To ISO 5211

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## HELICAL SLOT DESIGN

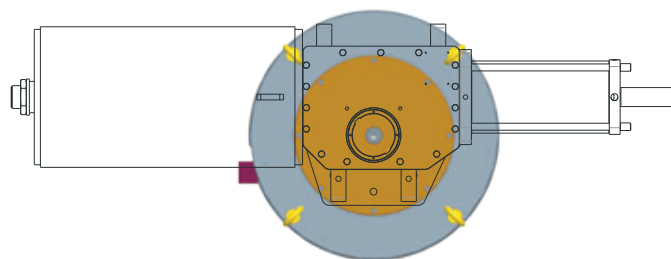
### MATERIALS

Part	Material
1 Enclosure	Carbon steel
2 End flange	Carbon steel
3 Cylinder end flange	Carbon steel
4 Head flange	Carbon steel
5 Cylinder	Carbon steel
6 Closing plug	Carbon steel
7 Output Drive	Alloy steel
8 Piston	Carbon steel
9 Piston rod	Alloy steel hard chrome plated
10 Centrale tube	Carbon steel
11 Base	Carbon steel
12 Adjustment sector	Carbon steel
13 Stopper	Alloy steel (stainless steel AISI 316 optional)
14 Cylinder head flange	Carbon steel
15 Pin	Alloy steel
16 Roller	Alloy steel
17 Bar	Alloy steel
18 Lifting eyebolt	Standard
19 Spring	Alloy steel
<b>Parts not shown</b>	
20 Position indicator	Carbon steel
21 Bushing	Bronze/steel bronze PTFE
22 Seals	Nitrile rubber



### COMPACT DIMENSIONS

The compact helical slot design maximizes efficiency and optimizes overall equipment dimensions compared to a conventional Scotch yoke design.



# THD/THS COMPACT HYDRAULIC ACTUATORS

## OUTPUT TORQUES - MODELS THS 0.A TO 0.9

### OUTPUT TORQUES MODELS 0.A TO 0.9

Actuator type	MOT [Nm]	MOP [bar]	Spring torque (Nm)			Operating supply pressure (bar g)											
						120			135			150			165		
						BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
0.A-RP1-35	500	195,0	302	246	191	238	175	112	294	231	169	351	288	225	408	345	282
0.A-RP2-35	500	180,0	223	187	152	282	242	202	339	299	259	396	356	315	453	412	372
0.A-SY1-35	500	165,0	371	143	239	292	102	141	362	135	211	433	168	282			
0.A-SY2-35	500	165,0	274	109	190	348	141	251	418	174	322	488	207	392			
0.1-RP1-45	1 000	210,0	760	630	500	357	209	60	473	324	176	588	440	292	704	556	407
0.1-RP2-45	1 000	195,0	620	524	429	438	329	221	553	445	336	669	560	452	785	676	568
0.1-SY1-45	1 000	180,0	936	366	624	436	122	81	579	189	224	723	257	367	866	324	510
0.1-SY2-45	1 000	180,0	764	305	535	537	192	277	681	259	421	824	326	564	967	394	707
0.1-RP1-50	1 000	165,0	760	630	500	574	426	277	717	569	420	860	711	563			
0.1-RP2-50	1 000	165,0	620	524	429	655	546	438	797	689	580	940	832	723			
0.1-RP3-50	1 000	180,0	854	712	569	495	333	171	638	476	314	780	619	457	923	762	600
0.1-SY1-50	1 000	150,0	936	366	624	705	248	349	882	331	526						
0.1-SY2-50	1 000	150,0	764	305	535	806	318	546	983	401	723						
0.1-SY3-50	1 000	165,0	1 052	413	711	606	194	218	783	277	395	960	361	572			
0.3-RP1-55	3 000	270,0	1 461	1 187	912	777	465	152	1004	692	379	1231	918	606	1458	1145	833
0.3-RP2-55	3 000	240,0	707	612	518	1226	1118	1010	1452	1345	1237	1679	1572	1464	1906	1799	1691
0.3-SY1-55	3 000	240,0	1 798	689	1 140	950	272	201	1231	404	481	1512	535	762	1793	667	1043
0.3-SY2-55	3 000	210,0	872	356	645	1513	651	1255	1794	783	1536	2075	915	1817	2356	1047	2098
0.3-RP1-60	3 000	225,0	1 461	1 187	912	1122	810	497	1392	1080	767	1662	1350	1037	1932	1619	1307
0.3-RP2-60	3 000	210,0	707	612	518	1571	1463	1355	1841	1733	1625	2110	2003	1895	2380	2273	2165
0.3-RP3-60	3 000	255,0	2 067	1 662	1 258				998	538	78	1268	808	348	1538	1078	618
0.3-SY1-60	3 000	195,0	1 798	689	1 140	1377	472	628	1711	629	962	2046	786	1296	2380	943	1630
0.3-SY2-60	3 000	180,0	872	356	645	1940	851	1682	2275	1008	2017	2609	1165	2351	2943	1322	2685
0.3-SY3-60	3 000	225,0	2 543	965	1 574				1218	315	115	1552	472	449	1886	629	783
0.3-RP1-65	3 000	195,0	1 461	1 187	912	1497	1185	872	1814	1501	1189	2131	1818	1506	2448	2135	1822
0.3-RP2-65	3 000	180,0	707	612	518	1946	1838	1730	2262	2155	2047	2579	2472	2364	2896	2788	2681
0.3-RP3-65	3 000	210,0	2 067	1 662	1 258	1 103	643	183	1 420	960	500	1 737	1 277	817	2 054	1 594	1 134
0.3-SY1-65	3 000	165,0	1 798	689	1 140	1 841	690	1 092	2 234	875	1 484	2 626	1 059	1 877			
0.3-SY2-65	3 000	150,0	872	356	645	2 405	1 069	2 147	2 797	1 254	2 539						
0.3-SY3-65	3 000	195,0	2 543	965	1 574	1 348	376	245	1 740	560	637	2 132	745	1 029	2 525	929	1 422
0.9-RP1-70	9 000	350,0	3 383	2 844	2 305				1472	859	246	1927	1314	701	2382	1769	1155
0.9-RP2-70	9 000	350,0	2 313	2 013	1 713	1691	1349	1008	2146	1804	1463	2601	2259	1918	3056	2714	2373
0.9-SY1-70	9 000	330,0	4 167	1 652	2 875	1235	238		1799	502	328	2362	767	892	2925	1031	1455
0.9-SY2-70	9 000	315,0	2 852	1 169	2 132	2080	786	1262	2643	1051	1825	3206	1316	2388	3770	1580	2951
0.9-RP1-75	9 000	350,0	3 383	2 844	2 305	1556	942	329	2078	1465	851	2600	1987	1374	3123	2509	1896
0.9-RP2-75	9 000	315,0	2 313	2 013	1 713	2229	1888	1547	2751	2410	2069	3274	2932	2591	3796	3455	3113
0.9-RP3-75	9 000	350,0	4 766	3 964	3 162										2148	1235	322
0.9-SY1-75	9 000	285,0	4 167	1 652	2 875	1902	551	432	2549	855	1078	3195	1158	1725	3842	1462	2372
0.9-SY2-75	9 000	270,0	2 852	1 169	2 132	2747	1100	1928	3393	1403	2575	4040	1707	3221	4687	2011	3868
0.9-SY3-75	9 000	315,0	5 869	2 302	3 946										2623	722	435
0.9-RP1-80	9 000	300,0	3 383	2 844	2 305	2131	1518	905	2726	2112	1499	3320	2707	2093	3914	3301	2687
0.9-RP2-80	9 000	285,0	2 313	2 013	1 713	2805	2464	2122	3399	3058	2716	3993	3652	3311	4587	4246	3905
0.9-RP3-80	9 000	330,0	4 766	3 964	3 162							2345	1432	520	2939	2026	1114
0.9-SY1-80	9 000	255,0	4 167	1 652	2 875	2615	886	1144	3351	1231	1880	4086	1577	2616	4822	1922	3351
0.9-SY2-80	9 000	240,0	2 852	1 169	2 132	3459	1434	2641	4195	1780	3377	4931	2126	4112	5666	2471	4848
0.9-SY3-80	9 000	285,0	5 869	2 302	3 946							2867	837	679	3603	1183	1415

### NOTES

- Maximum operating torque is maximum rating of helical slot mechanism.
- Design pressure: 350 bar g (maximum allowable pressure is according to selected model).
- Maximum operating pressure (MOP) is the pressure required to produce the maximum operating torque (MOT) of the actuator.
- BTC: Break to close
  - RTC: Running to close
  - ETC: End to close
  - BTO: Break to open
  - RTO: Running to open
  - ETO: End to open

# THD/THS COMPACT HYDRAULIC ACTUATORS

## OUTPUT TORQUES - MODELS THS 0.A TO 0.9

### OUTPUT TORQUES MODELS 0.A TO 0.9

Actuator type	MOT [Nm]	MOP [bar]	Spring torque (Nm)			Operating supply pressure (bar g)											
						180			195			210			225		
			BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
0.A-RP1-35	500	195,0	302	246	191	465	402	339									
0.A-RP2-35	500	180,0	223	187	152												
0.A-SY1-35	500	165,0	371	143	239												
0.A-SY2-35	500	165,0	274	109	190												
0.1-RP1-45	1 000	210,0	760	630	500	820	671	523	935	787	639						
0.1-RP2-45	1 000	195,0	620	524	429	900	792	683									
0.1-SY1-45	1 000	180,0	936	366	624												
0.1-SY2-45	1 000	180,0	764	305	535												
0.1-RP1-50	1 000	165,0	760	630	500												
0.1-RP2-50	1 000	165,0	620	524	429												
0.1-RP3-50	1 000	180,0	854	712	569												
0.1-SY1-50	1 000	150,0	936	366	624												
0.1-SY2-50	1 000	150,0	764	305	535												
0.1-SY3-50	1 000	165,0	1 052	413	711												
0.3-RP1-55	3 000	270,0	1 461	1 187	912	1685	1372	1059	1911	1599	1286	2138	1826	1513	2365	2053	1740
0.3-RP2-55	3 000	240,0	707	612	518	2133	2025	1918	2360	2252	2145	2587	2479	2371	2814	2706	2598
0.3-SY1-55	3 000	240,0	1 798	689	1 140	2073	799	1324	2354	931	1605	2635	1063	1886	2916	1195	2167
0.3-SY2-55	3 000	210,0	872	356	645	2637	1178	2379	2918	1310	2659						
0.3-RP1-60	3 000	225,0	1 461	1 187	912	2202	1889	1577	2472	2159	1847	2742	2429	2117			
0.3-RP2-60	3 000	210,0	707	612	518	2650	2543	2435	2920	2813	2705						
0.3-RP3-60	3 000	255,0	2 067	1 662	1 258	1808	1348	888	2078	1618	1158	2348	1888	1428	2618	2158	1698
0.3-SY1-60	3 000	195,0	1 798	689	1 140	2714	1100	1965									
0.3-SY2-60	3 000	180,0	872	356	645												
0.3-SY3-60	3 000	225,0	2 543	965	1 574	2221	786	1118	2555	943	1452	2889	1100	1786			
0.3-RP1-65	3 000	195,0	1 461	1 187	912	2764	2452	2139									
0.3-RP2-65	3 000	180,0	707	612	518												
0.3-RP3-65	3 000	210,0	2 067	1 662	1 258	2 370	1 911	1 451	2 687	2 227	1 767						
0.3-SY1-65	3 000	165,0	1 798	689	1 140												
0.3-SY2-65	3 000	150,0	872	356	645												
0.3-SY3-65	3 000	195,0	2 543	965	1 574	2 917	1 113	1 814									
0.9-RP1-70	9 000	350,0	3 383	2 844	2 305	2837	2224	1610	3292	2679	2065	3747	3134	2520	4202	3589	2975
0.9-RP2-70	9 000	350,0	2 313	2 013	1 713	3510	3169	2828	3965	3624	3283	4420	4079	3738	4875	4534	4193
0.9-SY1-70	9 000	330,0	4 167	1 652	2 875	3489	1296	2018	4052	1561	2581	4615	1825	3145	5178	2090	3708
0.9-SY2-70	9 000	315,0	2 852	1 169	2 132	4333	1845	3515	4896	2109	4078	5460	2374	4641	6023	2639	5204
0.9-RP1-75	9 000	350,0	3 383	2 844	2 305	3645	3031	2418	4167	3554	2940	4689	4076	3463	5212	4598	3985
0.9-RP2-75	9 000	315,0	2 313	2 013	1 713	4318	3977	3636	4840	4499	4158	5363	5021	4680	5885	5544	5202
0.9-RP3-75	9 000	350,0	4 766	3 964	3 162	2670	1757	844	3192	2279	1367	3714	2802	1889	4237	3324	2411
0.9-SY1-75	9 000	285,0	4 167	1 652	2 875	4489	1766	3018	5135	2070	3665	5782	2373	4311	6428	2677	4958
0.9-SY2-75	9 000	270,0	2 852	1 169	2 132	5333	2315	4515	5980	2618	5161	6626	2922	5808	7273	3226	6455
0.9-SY3-75	9 000	315,0	5 869	2 302	3 946	3270	1026	1081	3916	1330	1728	4563	1633	2375	5210	1937	3021
0.9-RP1-80	9 000	300,0	3 383	2 844	2 305	4508	3895	3282	5102	4489	3876	5697	5083	4470	6291	5678	5064
0.9-RP2-80	9 000	285,0	2 313	2 013	1 713	5182	4840	4499	5776	5435	5093	6370	6029	5687	6964	6623	6282
0.9-RP3-80	9 000	330,0	4 766	3 964	3 162	3533	2621	1708	4127	3215	2302	4722	3809	2896	5316	4403	3491
0.9-SY1-80	9 000	255,0	4 167	1 652	2 875	5558	2268	4087	6293	2614	4823	7029	2959	5559	7765	3305	6294
0.9-SY2-80	9 000	240,0	2 852	1 169	2 132	6402	2817	5584	7138	3162	6319	7874	3508	7055	8609	3854	7791
0.9-SY3-80	9 000	285,0	5 869	2 302	3 946	4339	1528	2151	5074	1874	2886	5810	2219	3622	6546	2565	4358

### NOTES

- Maximum operating torque is maximum rating of helical slot mechanism.
- Design pressure: 350 bar g (maximum allowable pressure is according to selected model).
- Maximum operating pressure (MOP) is the pressure required to produce the maximum operating torque (MOT) of the actuator.
- BTC: Break to close  
 RTC: Running to close  
 ETC: End to close  
 BTO: Break to open  
 RTO: Running to open  
 ETO: End to open

# THD/THS COMPACT HYDRAULIC ACTUATORS

## OUTPUT TORQUES - MODELS THS 0.A TO 0.9

### OUTPUT TORQUES MODELS 0.A TO 0.9

Actuator type	MOT [Nm]	MOP [bar]	Spring torque (Nm)			Operating supply pressure (bar g)											
						240			255			270			285		
			BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
0.A-RP1-35	500	195,0	302	246	191												
0.A-RP2-35	500	180,0	223	187	152												
0.A-SY1-35	500	165,0	371	143	239												
0.A-SY2-35	500	165,0	274	109	190												
0.1-RP1-45	1 000	210,0	760	630	500												
0.1-RP2-45	1 000	195,0	620	524	429												
0.1-SY1-45	1 000	180,0	936	366	624												
0.1-SY2-45	1 000	180,0	764	305	535												
0.1-RP1-50	1 000	165,0	760	630	500												
0.1-RP2-50	1 000	165,0	620	524	429												
0.1-RP3-50	1 000	180,0	854	712	569												
0.1-SY1-50	1 000	150,0	936	366	624												
0.1-SY2-50	1 000	150,0	764	305	535												
0.1-SY3-50	1 000	165,0	1 052	413	711												
0.3-RP1-55	3 000	270,0	1 461	1 187	912	2592	2279	1967	2819	2506	2194						
0.3-RP2-55	3 000	240,0	707	612	518												
0.3-SY1-55	3 000	240,0	1 798	689	1 140												
0.3-SY2-55	3 000	210,0	872	356	645												
0.3-RP1-60	3 000	225,0	1 461	1 187	912												
0.3-RP2-60	3 000	210,0	707	612	518												
0.3-RP3-60	3 000	255,0	2 067	1 662	1 258	2888	2428	1968									
0.3-SY1-60	3 000	195,0	1 798	689	1 140												
0.3-SY2-60	3 000	180,0	872	356	645												
0.3-SY3-60	3 000	225,0	2 543	965	1 574												
0.3-RP1-65	3 000	195,0	1 461	1 187	912												
0.3-RP2-65	3 000	180,0	707	612	518												
0.3-RP3-65	3 000	210,0	2 067	1 662	1 258												
0.3-SY1-65	3 000	165,0	1 798	689	1 140												
0.3-SY2-65	3 000	150,0	872	356	645												
0.3-SY3-65	3 000	195,0	2 543	965	1 574												
0.9-RP1-70	9 000	350,0	3 383	2 844	2 305	4657	4043	3430	5112	4498	3885	5567	4953	4340	6022	5408	4795
0.9-RP2-70	9 000	350,0	2 313	2 013	1 713	5330	4989	4648	5785	5444	5102	6240	5899	5557	6695	6354	6012
0.9-SY1-70	9 000	330,0	4 167	1 652	2 875	5742	2354	4271	6305	2619	4834	6868	2884	5398	7431	3148	5961
0.9-SY2-70	9 000	315,0	2 852	1 169	2 132	6586	2903	5768	7149	3168	6331	7713	3432	6894	8276	3697	7458
0.9-RP1-75	9 000	350,0	3 383	2 844	2 305	5734	5120	4507	6256	5643	5029	6778	6165	5552	7301	6687	6074
0.9-RP2-75	9 000	315,0	2 313	2 013	1 713	6407	6066	5725	6929	6588	6247	7452	7110	6769	7974	7633	7291
0.9-RP3-75	9 000	350,0	4 766	3 964	3 162	4759	3846	2933	5281	4368	3456	5803	4891	3978	6326	5413	4500
0.9-SY1-75	9 000	285,0	4 167	1 652	2 875	7075	2981	5605	7722	3285	6251	8368	3588	6898			
0.9-SY2-75	9 000	270,0	2 852	1 169	2 132	7920	3530	7101	8566	3833	7748						
0.9-SY3-75	9 000	315,0	5 869	2 302	3 946	5856	2241	3668	6503	2545	4315	7149	2848	4961	7796	3152	5608
0.9-RP1-80	9 000	300,0	3 383	2 844	2 305	6885	6272	5658	7479	6866	6253	8073	7460	6847	8668	8054	7441
0.9-RP2-80	9 000	285,0	2 313	2 013	1 713	7558	7217	6876	8153	7811	7470	8747	8406	8064			
0.9-RP3-80	9 000	330,0	4 766	3 964	3 162	5910	4997	4085	6504	5592	4679	7098	6186	5273	7693	6780	5867
0.9-SY1-80	9 000	255,0	4 167	1 652	2 875	8500	3651	7030									
0.9-SY2-80	9 000	240,0	2 852	1 169	2 132												
0.9-SY3-80	9 000	285,0	5 869	2 302	3 946	7282	2911	5093	8017	3256	5829	8753	3602	6565			

### NOTES

- Maximum operating torque is maximum rating of helical slot mechanism.
- Design pressure: 350 bar g (maximum allowable pressure is according to selected mode).
- Maximum operating pressure (MOP) is the pressure required to produce the maximum operating torque (MOT) of the actuator.
- BTC: Break to close  
 RTC: Running to close  
 ETC: End to close  
 BTO: Break to open  
 RTO: Running to open  
 ETO: End to open

# THD/THS COMPACT HYDRAULIC ACTUATORS

## OUTPUT TORQUES - MODELS THS 1.5 TO 6

### OUTPUT TORQUES MODELS 1.5 TO 6

Actuator type	MOT [Nm]	MOP [bar]	Spring torque [Nm]			Operating supply pressure [bar g]											
						120			135			150			165		
			BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
1.5-RP1-90	15 000	315,0	6577	5443	4309	2964	1674	384	3948	2658	1368	4931	3641	2351	5915	4625	3335
1.5-RP2-90	15 000	300,0	5704	4724	3745	3607	2492	1377	4590	3476	2361	5574	4459	3344	6557	5442	4328
1.5-SY1-90	15 000	270,0	8099	3161	5380	3620	979	527	4837	1551	1744	6055	2123	2962	7272	2695	4179
1.5-SY2-90	15 000	255,0	7024	2744	4675	4422	1454	1749	5640	2026	2967	6857	2598	4184	8075	3170	5402
1.5-RP1-100	15 000	255,0	6577	5443	4309	4810	3520	2230	6024	4734	3444	7238	5948	4658	8452	7162	5872
1.5-RP2-100	15 000	240,0	5704	4724	3745	5452	4338	3223	6666	5552	4437	7881	6766	5651	9095	7980	6865
1.5-RP3-100	15 000	270,0	8341	6705	5069	3946	2084	222	5160	3298	1436	6374	4512	2650	7588	5726	3865
1.5-SY1-100	15 000	225,0	8099	3161	5380	5905	2053	2812	7408	2759	4315	8911	3465	5818	10414	4171	7321
1.5-SY2-100	15 000	210,0	7024	2744	4675	6707	2528	4034	8210	3234	5537	9713	3940	7041	11217	4646	8544
1.5-SY3-100	15 000	225,0	10263	3893	6340	4812	1220	348	6316	1926	1852	7819	2632	3355	9322	3339	4858
1.5-RP1-110	15 000	210,0	6577	5443	4309	6850	5560	4270	8319	7029	5739	9788	8498	7208	11257	9967	8677
1.5-RP2-110	15 000	210,0	5704	4724	3745	7492	6377	5263	8961	7846	6732	10430	9315	8201	11899	10785	9670
1.5-RP3-110	15 000	225,0	8341	6705	5069	5986	4124	2262	7455	5593	3731	8924	7062	5200	10393	8531	6669
1.5-SY1-110	15 000	180,0	8099	3161	5380	8430	3239	5337	10249	4094	7156	12068	4948	8975	13887	5803	10794
1.5-SY2-110	15 000	180,0	7024	2744	4675	9232	3714	6560	11051	4568	8378	12870	5423	10197	14689	6277	12016
1.5-SY3-110	15 000	195,0	10263	3893	6340	7338	2406	2874	9157	3261	4693	10976	4115	6512	12795	4970	8331
3-RP1-110	30 000	315,0	11505	9382	7259	6604	4189	1774	8462	6047	3632	10320	7905	5490	12178	9763	7348
3-RP2-110	30 000	300,0	8895	7409	5924	8124	6433	4743	9982	8291	6601	11840	10149	8459	13698	12007	10317
3-SY1-110	30 000	270,0	14161	5448	9072	8082	2447	2291	10382	3528	4592	12683	4608	6892	14983	5689	9192
3-SY2-110	30 000	255,0	10955	4303	7393	9992	3749	5939	12292	4830	8239	14593	5911	10540	16893	6991	12840
3-RP1-120	30 000	270,0	11505	9382	7259	9429	7014	4599	11640	9225	6810	13852	11437	9021	16063	13648	11233
3-RP2-120	30 000	255,0	8895	7409	5924	10949	9259	7568	13160	11470	9779	15371	13681	11990	17583	15892	14202
3-RP3-120	30 000	285,0	14706	11788	8869	7598	4277	957	9809	6488	3168	12020	8699	5379	14231	10911	7590
3-SY1-120	30 000	225,0	14161	5448	9072	11580	4090	5789	14318	5376	8527	17055	6662	11265	19793	7949	14002
3-SY2-120	30 000	225,0	10955	4303	7393	13490	5393	9437	16228	6679	12174	18965	7965	14912	21703	9251	17650
3-SY3-120	30 000	240,0	18094	6844	11096	9277	2502	1315	12014	3788	4052	14752	5074	6790	17490	6360	9528
3-RP1-125	30 000	240,0	11505	9382	7259	10934	8519	6104	13333	10918	8503	15733	13318	10902	18132	15717	13302
3-RP2-125	30 000	240,0	8895	7409	5924	12454	10763	9073	14853	13163	11472	17252	15562	13871	19652	17961	16271
3-RP3-125	30 000	255,0	14706	11788	8869	9103	5782	2461	11502	8181	4861	13901	10580	7260	16300	12980	9659
3-SY1-125	30 000	210,0	14161	5448	9072	13443	4965	7653	16414	6361	10623	19384	7757	13594	22355	9152	16564
3-SY2-125	30 000	195,0	10955	4303	7393	15353	6268	11300	18324	7663	14271	21294	9059	17241	24265	10454	20212
3-SY3-125	30 000	225,0	18094	6844	11096	11140	3377	3178	14110	4773	6149	17081	6168	9119	20051	7564	12090
6-RP1-135	60 000	315,0	22798	18184	13570	13612	8362	3113	17243	11994	6744	20875	15625	10376	24506	19257	14007
6-RP2-135	60 000	315,0	22033	17536	13038	14217	9100	3983	17849	12732	7615	21480	16363	11246	25112	19995	14878
6-SY1-135	60 000	270,0	28045	10557	16983	16647	4886	4061	21143	6998	8557	25639	9111	13053	30135	11223	17549
6-SY2-135	60 000	270,0	27103	10180	16320	17402	5315	5133	21898	7427	9629	26394	9539	14125	30890	11651	18622
6-RP1-145	60 000	270,0	22798	18184	13570	18075	12826	7576	22264	17015	11766	26454	21204	15955	30643	25394	20144
6-RP2-145	60 000	270,0	22033	17536	13038	18681	13564	8447	22870	17753	12636	27059	21942	16825	31249	26132	21015
6-RP3-145	60 000	285,0	27269	21072	14874	16592	9540	2489	20781	13730	6678	24970	17919	10868	29160	22108	15057
6-SY1-145	60 000	240,0	28045	10557	16983	22173	7482	9587	27360	9919	14774	32547	12356	19961	37734	14792	25148
6-SY2-145	60 000	225,0	27103	10180	16320	22928	7911	10659	28115	10348	15846	33302	12784	21033	38489	15221	26220
6-SY3-145	60 000	240,0	33519	12230	18660	20265	5579	3359	25452	8016	8546	30639	10452	13733	35826	12889	18920
6-RP1-155	60 000	240,0	22798	18184	13570	22857	17608	12358	27644	22395	17146	32432	27182	21933	37219	31969	26720
6-RP2-155	60 000	240,0	22033	17536	13038	23463	18346	13229	28250	23133	18016	33037	27920	22803	37824	32707	27590
6-RP3-155	60 000	240,0	27269	21072	14874	21374	14322	7271	26161	19110	12058	30948	23897	16845	35735	28684	21632
6-SY1-155	60 000	210,0	28045	10557	16983	28094	10264	15508	34021	13048	21435	39948	15833	27362	45875	18617	33289
6-SY2-155	60 000	210,0	27103	10180	16320	28849	10692	16580	34776	13477	22507	40703	16261	28434	46630	19046	34362
6-SY3-155	60 000	210,0	33519	12230	18660	26186	8360	9280	32114	11145	15207	38041	13929	21134	43968	16714	27061

### NOTES

1. Maximum operating torque is maximum rating of helical slot mechanism.
2. Design pressure: 350 bar g (maximum allowable pressure is according to selected mode).
3. Maximum operating pressure (MOP) is the pressure required to produce the maximum operating torque (MOT) of the actuator.
4. BTC: Break to close  
RTC: Running to close  
ETC: End to close  
BTO: Break to open  
RTO: Running to open  
ETO: End to open
5. More models are available, please contact factory

# THD/THS COMPACT HYDRAULIC ACTUATORS

## OUTPUT TORQUES - MODELS THS 1.5 TO 6

### OUTPUT TORQUES MODELS 1.5 TO 6

Actuator type	MOT [Nm]	MOP [bar]	Spring torque [Nm]			Operating supply pressure (bar g)											
						180			195			210			225		
			BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
1.5-RP1-90	15 000	315,0	6577	5443	4309	6898	5608	4318	7882	6592	5302	8865	7575	6285	9848	8558	7268
1.5-RP2-90	15 000	300,0	5704	4724	3745	7541	6426	5311	8524	7409	6295	9507	8393	7278	10491	9376	8261
1.5-SY1-90	15 000	270,0	8099	3161	5380	8490	3267	5397	9708	3839	6615	10925	4411	7832	12143	4983	9050
1.5-SY2-90	15 000	255,0	7024	2744	4675	9292	3742	6620	10510	4314	7837	11728	4886	9055	12945	5458	10273
1.5-RP1-100	15 000	255,0	6577	5443	4309	9666	8376	7086	10880	9590	8300	12095	10804	9514	13309	12019	10729
1.5-RP2-100	15 000	240,0	5704	4724	3745	10309	9194	8079	11523	10408	9293	12737	11622	10508	13951	12836	11722
1.5-RP3-100	15 000	270,0	8341	6705	5069	8802	6941	5079	10017	8155	6293	11231	9369	7507	12445	10583	8721
1.5-SY1-100	15 000	225,0	8099	3161	5380	11917	4877	8824	13421	5584	10328	14924	6290	11831			
1.5-SY2-100	15 000	210,0	7024	2744	4675	12720	5352	10047	14223	6059	11550						
1.5-SY3-100	15 000	225,0	10263	3893	6340	10825	4045	6361	12329	4751	7865	13832	5457	9368			
1.5-RP1-110	15 000	210,0	6577	5443	4309	12726	11436	10146	14195	12905	11615						
1.5-RP2-110	15 000	210,0	5704	4724	3745	13368	12254	11139	14837	13723	12608						
1.5-RP3-110	15 000	225,0	8341	6705	5069	11862	10000	8138	13331	11469	9607	14800	12938	11076			
1.5-SY1-110	15 000	180,0	8099	3161	5380												
1.5-SY2-110	15 000	180,0	7024	2744	4675												
1.5-SY3-110	15 000	195,0	10263	3893	6340	14613	5824	10149									
3-RP1-110	30 000	315,0	11505	9382	7259	14036	11621	9206	15894	13479	11064	17752	15337	12922	19610	17195	14780
3-RP2-110	30 000	300,0	8895	7409	5924	15556	13865	12175	17414	15723	14033	19272	17581	15891	21130	19439	17748
3-SY1-110	30 000	270,0	14161	5448	9072	17283	6770	11493	19584	7850	13793	21884	8931	16094	24184	10012	18394
3-SY2-110	30 000	255,0	10955	4303	7393	19194	8072	15140	21494	9153	17441	23794	10233	19741	26095	11314	22041
3-RP1-120	30 000	270,0	11505	9382	7259	18274	15859	13444	20485	18070	15655	22696	20281	17866	24907	22492	20077
3-RP2-120	30 000	255,0	8895	7409	5924	19794	18103	16413	22005	20314	18624	24216	22525	20835	26427	24736	23046
3-RP3-120	30 000	285,0	14706	11788	8869	16442	13122	9801	18654	15333	12012	20865	17544	14223	23076	19755	16434
3-SY1-120	30 000	225,0	14161	5448	9072	22530	9235	16740	25268	10521	19478	28006	11807	22215			
3-SY2-120	30 000	225,0	10955	4303	7393	24441	10537	20387	27178	11823	23125	29916	13109	25863			
3-SY3-120	30 000	240,0	18094	6844	11096	20227	7646	12265	22965	8933	15003	25703	10219	17741	28440	11505	20478
3-RP1-125	30 000	240,0	11505	9382	7259	20531	18116	15701	22930	20515	18100	25329	22914	20499	27729	25314	22899
3-RP2-125	30 000	240,0	8895	7409	5924	22051	20360	18670	24450	22760	21069	26849	25159	23468	29249	27558	25867
3-RP3-125	30 000	255,0	14706	11788	8869	18700	15379	12058	21099	17778	14457	23498	20177	16857	25897	22576	19256
3-SY1-125	30 000	210,0	14161	5448	9072	25325	10548	19535	28296	11943	22505						
3-SY2-125	30 000	195,0	10955	4303	7393	27235	11850	23182									
3-SY3-125	30 000	225,0	18094	6844	11096	23022	8959	15060	25993	10355	18031	28963	11750	21001			
6-RP1-135	60 000	315,0	22798	18184	13570	28138	22888	17639	31769	26520	21270	35400	30151	24902	39032	33783	28533
6-RP2-135	60 000	315,0	22033	17536	13038	28743	23626	18509	32374	27257	22141	36006	30889	25772	39637	34520	29403
6-SY1-135	60 000	270,0	28045	10557	16983	34632	13335	22046	39128	15447	26542	43624	17559	31038	48120	19672	35534
6-SY2-135	60 000	270,0	27103	10180	16320	35386	13764	23118	39883	15876	27614	44379	17988	32110	48875	20100	36607
6-RP1-145	60 000	270,0	22798	18184	13570	34833	29583	24334	39022	33773	28523	43211	37962	32713	47401	42151	36902
6-RP2-145	60 000	270,0	22033	17536	13038	35438	30321	25204	39627	34510	29393	43817	38700	33583	48006	42889	37772
6-RP3-145	60 000	285,0	27269	21072	14874	33349	26298	19246	37539	30487	23436	41728	34677	27625	45917	38866	31814
6-SY1-145	60 000	240,0	28045	10557	16983	42921	17229	30335	48108	19666	35522	53295	22103	40709	58482	24539	45896
6-SY2-145	60 000	225,0	27103	10180	16320	43676	17658	31407	48863	20094	36594	54050	22531	41781			
6-SY3-145	60 000	240,0	33519	12230	18660	41013	15326	24107	46200	17763	29294	51387	20199	34481	56574	22636	39668
6-RP1-155	60 000	240,0	22798	18184	13570	42006	36756	31507	46793	41544	36294	51580	46331	41081	56367	51118	45869
6-RP2-155	60 000	240,0	22033	17536	13038	42611	37494	32377	47398	42281	37165	52186	47069	41952	56973	51856	46739
6-RP3-155	60 000	240,0	27269	21072	14874	40522	33471	26420	45310	38258	31207	50097	43045	35994	54884	47832	40781
6-SY1-155	60 000	210,0	28045	10557	16983	51802	21401	39216	57730	24186	45143						
6-SY2-155	60 000	210,0	27103	10180	16320	52557	21830	40289	58484	24614	46216						
6-SY3-155	60 000	210,0	33519	12230	18660	49895	19498	32988	55822	22282	38915						

### NOTES

- Maximum operating torque is maximum rating of helical slot mechanism.
- Design pressure: 350 bar g (maximum allowable pressure is according to selected mode).
- Maximum operating pressure (MOP) is the pressure required to produce the maximum operating torque (MOT) of the actuator.
- BTC: Break to close  
RTC: Running to close  
ETC: End to close  
BTO: Break to open  
RTO: Running to open  
ETO: End to open
- More models are available, please contact factory

# THD/THS COMPACT HYDRAULIC ACTUATORS

## OUTPUT TORQUES - MODELS THS 1.5 TO 6

### OUTPUT TORQUES MODELS 1.5 TO 6

Actuator type	MOT [Nm]	MOP [bar]	Spring torque (Nm)			Operating supply pressure (bar g)											
						240			255			270			285		
			BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
1.5-RP1-90	15 000	315,0	6577	5443	4309	10832	9542	8252	11815	10525	9235	12799	11509	10219	13782	12492	11202
1.5-RP2-90	15 000	300,0	5704	4724	3745	11474	10360	9245	12458	11343	10228	13441	12326	11212	14425	13310	12195
1.5-SY1-90	15 000	270,0	8099	3161	5380	13361	5555	10268	14578	6127	11485						
1.5-SY2-90	15 000	255,0	7024	2744	4675	14163	6030	11490									
1.5-RP1-100	15 000	255,0	6577	5443	4309	14523	13233	11943									
1.5-RP2-100	15 000	240,0	5704	4724	3745												
1.5-RP3-100	15 000	270,0	8341	6705	5069	13659	11797	9935	14873	13011	11149						
1.5-SY1-100	15 000	225,0	8099	3161	5380												
1.5-SY2-100	15 000	210,0	7024	2744	4675												
1.5-SY3-100	15 000	225,0	10263	3893	6340												
1.5-RP1-110	15 000	210,0	6577	5443	4309												
1.5-RP2-110	15 000	210,0	5704	4724	3745												
1.5-RP3-110	15 000	225,0	8341	6705	5069												
1.5-SY1-110	15 000	180,0	8099	3161	5380												
1.5-SY2-110	15 000	180,0	7024	2744	4675												
1.5-SY3-110	15 000	195,0	10263	3893	6340												
3-RP1-110	30 000	315,0	11505	9382	7259	21468	19053	16638	23326	20911	18495	25184	22768	20353	27041	24626	22211
3-RP2-110	30 000	300,0	8895	7409	5924	22988	21297	19606	24845	23155	21464	26703	25013	23322	28561	26871	25180
3-SY1-110	30 000	270,0	14161	5448	9072	26485	11092	20694	28785	12173	22995						
3-SY2-110	30 000	255,0	10955	4303	7393	28395	12395	24342									
3-RP1-120	30 000	270,0	11505	9382	7259	27118	24703	22288	29329	26914	24499						
3-RP2-120	30 000	255,0	8895	7409	5924	28638	26948	25257									
3-RP3-120	30 000	285,0	14706	11788	8869	25287	21966	18645	27498	24177	20857	29709	26388	23068			
3-SY1-120	30 000	225,0	14161	5448	9072												
3-SY2-120	30 000	225,0	10955	4303	7393												
3-SY3-120	30 000	240,0	18094	6844	11096												
3-RP1-125	30 000	240,0	11505	9382	7259												
3-RP2-125	30 000	240,0	8895	7409	5924												
3-RP3-125	30 000	255,0	14706	11788	8869	28296	24976	21655									
3-SY1-125	30 000	210,0	14161	5448	9072												
3-SY2-125	30 000	195,0	10955	4303	7393												
3-SY3-125	30 000	225,0	18094	6844	11096												
6-RP1-135	60 000	315,0	22798	18184	13570	42663	37414	32165	46295	41045	35796	49926	44677	39428	53558	48308	43059
6-RP2-135	60 000	315,0	22033	17536	13038	43269	38152	33035	46900	41783	36666	50532	45415	40298	54163	49046	43929
6-SY1-135	60 000	270,0	28045	10557	16983	52617	21784	40030	57113	23896	44527						
6-SY2-135	60 000	270,0	27103	10180	16320	53371	22212	41103	57868	24325	45599						
6-RP1-145	60 000	270,0	22798	18184	13570	51590	46341	41091	55779	50530	45281						
6-RP2-145	60 000	270,0	22033	17536	13038	52196	47079	41962	56385	51268	46151						
6-RP3-145	60 000	285,0	27269	21072	14874	50107	43055	36004	54296	47245	40193	58485	51434	44383			
6-SY1-145	60 000	240,0	28045	10557	16983												
6-SY2-145	60 000	225,0	27103	10180	16320												
6-SY3-145	60 000	240,0	33519	12230	18660												
6-RP1-155	60 000	240,0	22798	18184	13570												
6-RP2-155	60 000	240,0	22033	17536	13038												
6-RP3-155	60 000	240,0	27269	21072	14874												
6-SY1-155	60 000	210,0	28045	10557	16983												
6-SY2-155	60 000	210,0	27103	10180	16320												
6-SY3-155	60 000	210,0	33519	12230	18660												

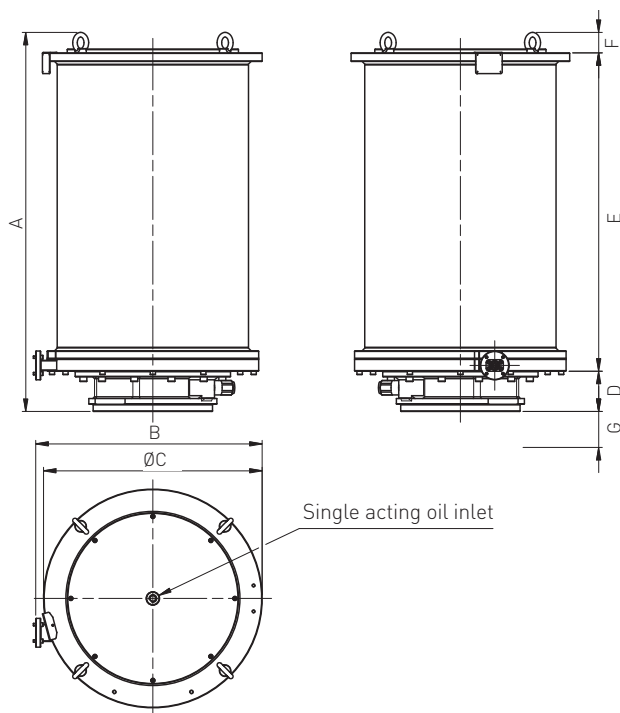
### NOTES

- Maximum operating torque is maximum rating of helical slot mechanism.
- Design pressure: 350 bar g (maximum allowable pressure is according to selected mode).
- Maximum operating pressure (MOP) is the pressure required to produce the maximum operating torque (MOT) of the actuator.
- BTC: Break to close  
RTC: Running to close  
ETC: End to close  
BTO: Break to open  
RTO: Running to open  
ETO: End to open
- More models are available, please contact factory



# THD/THS COMPACT HYDRAULIC ACTUATORS

## OVERALL DIMENSIONS - ACTUATOR



Note about G dimension:  
Space for spool piece ONLY if  
requested or necessary

### DIMENSIONS

Model	Dimension (mm)							Weight (kg)				Oil inlet connection (NPT)		Oil consumption (litres)	
	A	B	ØC	D	E	F	G	Single acting			Double acting RP/SY	SA	DA	SA	DA
								RP1/SY1	RP2/SY2	RP3/SY3					
0.A XXK 35	445	315	250	20	380	45	110	70	65	70	60	1/4"	1/4"	0,1	0,1
0.1 XXK 45	600	393	365	50	497	53	110	160	155	160	150	3/8"	3/8"	0,2	0,2
0.1 XXK 50	600	393	365	50	497	53	110	165	160	165	150	3/8"	3/8"	0,2	0,2
0.3 XXK 55	670	445	415	60	558	52	110	240	235	240	230	1/2"	1/2"	0,4	0,4
0.3 XXK 60	670	445	415	60	558	52	110	250	245	250	240	1/2"	1/2"	0,5	0,5
0.3 XXK 65	670	445	415	60	558	52	110	260	255	260	250	1/2"	1/2"	0,5	0,5
0.9 XXK 70	915	550	515	122	740	53	210	470	460	470	450	3/4"	3/4"	0,8	0,8
0.9 XXK 75	915	550	515	122	740	53	210	480	470	480	490	3/4"	3/4"	0,9	0,9
0.9 XXK 80	915	550	515	122	740	53	210	490	480	490	470	3/4"	3/4"	1,0	1,0
1.5 XXK 90	1083	659	560	125	886	72	245	830	820	830	810	3/4"	3/4"	1,7	1,7
1.5 XXK 100	1083	659	560	125	886	72	245	840	830	840	820	3/4"	3/4"	2,1	2,1
1.5 XXK 110	1083	659	560	125	886	72	245	850	840	850	830	3/4"	3/4"	2,5	2,5
3 XXK 110	1317	769	700	140	1106	71	265	1380	1370	1380	1360	3/4"	3/4"	3,2	3,2
3 XXK 120	1317	769	700	140	1106	71	265	1400	1390	1400	1380	3/4"	3/4"	3,7	3,7
3 XXK 125	1317	769	700	140	1106	71	265	1420	1410	1420	1400	3/4"	3/4"	4,1	4,1
6 XXK 135	1688	911	910	170	1425	93	280	2505	2480	2505	2450	3/4"	3/4"	5,8	5,8
6 XXK 145	1688	911	910	170	1425	93	280	2555	2530	2555	2450	3/4"	3/4"	6,7	6,7
6 XXK 155	1688	911	910	170	1425	93	280	2605	2580	2605	2500	3/4"	3/4"	7,7	7,7

N/A = Not applicable    SA = Single acting    DA = Double acting

### NOTES

- Overall dimensions and weights given are without optional brackets, adaptor flange and any kind of accessories (limit switch box, manual override device or others).
- For mounting flange details see separate coupling dimensions leaflet.
- Oil inlet thread according to NPT standard (BSPP optional)
- Oil consumption (oil volume required for one stroke).
- More models are available, please contact factory



Biffi reserve the the right to change product designs and specifications without notice.

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