

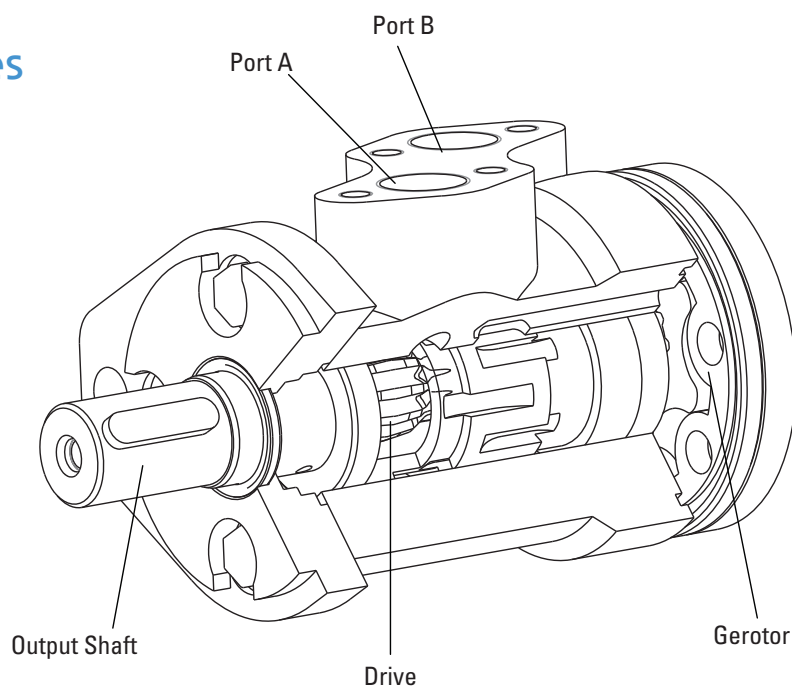


Powering Business Worldwide

XCEL Spool Valve Motors

Product Description, Features

Benefits and Applications



Features

- Proven orbit motor principle
- Hydrodynamic journal bearings
- Three moving components (gerotor-star, drive, and shaft)
- Three –zone pressure design
- Optimized drive running angle
- Variety of displacements and shafts
- Designed for medium and low duty

Benefits

- Compact, powerful package
- High efficiency
- Design flexibility
- Economically tailored solutions
- Long bearing life (at rated loads)

Applications

- Aerial work platform
- Augers
- Conveyors
- Food processing
- Harvesters
- Machine tools
- Spreaders
- Turf care equipment
- Winches
- Many more

Product Description

XCEL spool valve motors distribute pressurized fluid into and out of the orbit gear set via valve slots integrated into the output shaft. The spool valve motors incorporate both valving and hydrodynamic journal bearings into a common shaft design. These motors incorporate the proven orbit motor principle to provide high torque at low speeds. Motor shaft rotation can be instantly reversed by changing direction of input/output flow while generating equal torque in either direction. The displacements available provide a wide variety of speeds and torque.

Specifications

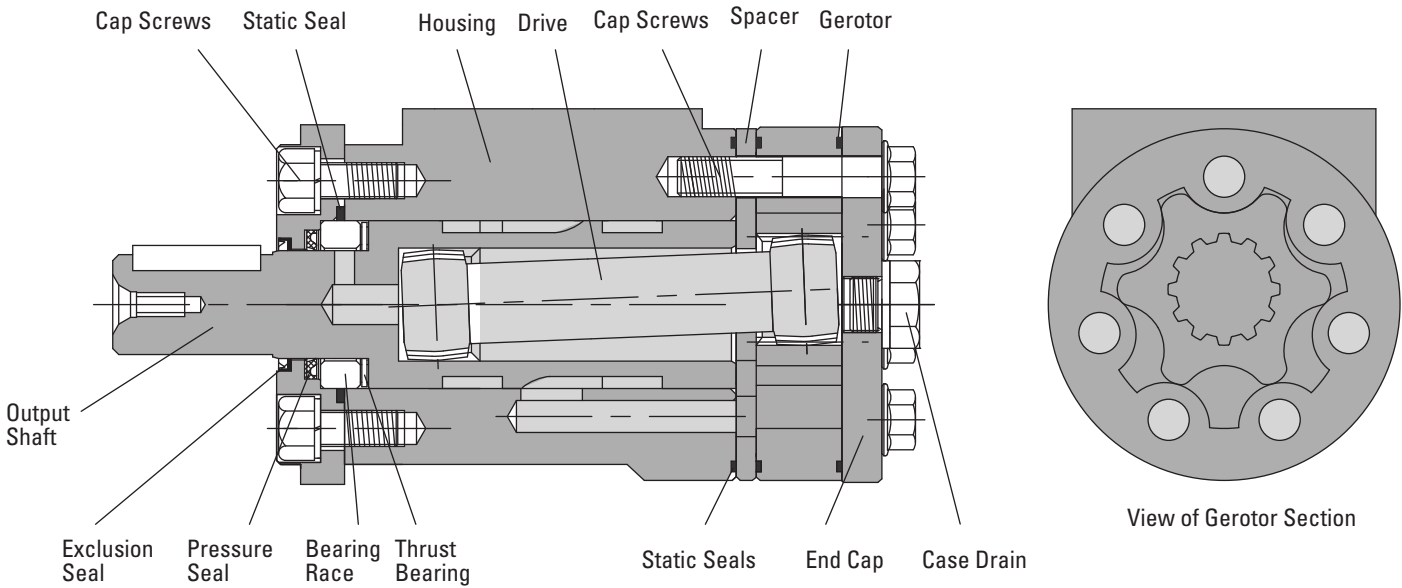
Gerotor Element	11 Displacements
Flow L/min	57 Continuous*** 68 Intermittent**
Speed rpm	Up to 800 rpm inter. **
ΔPressure bar	124 Cont.*** 138 Inter.**
Torque Nm	426 Cont.*** 507 Inter.**

*** Continuous-(Cont.) Continuous rating, motor may be run continuously at these ratings.

** Intermittent-(Inter.) Intermittent operation, 10% of every minute.

XCEL Spool Valve Motors

Specification Data



Displacement	cc/r	53	63	80	100	125	160	200	245	315	390	485
Flow LPM	Continuous	38	45	57	57	57	57	57	57	57	57	57
	Intermittent	45	53	68	68	68	68	68	68	68	68	68
Max. Speed (RPM)	Continuous	721	693	710	568	462	354	286	234	174	144	114
	Intermittent	864	806	848	678	551	421	341	282	209	171	138
ΔPressure Bar	Continuous	124	124	124	124	124	115	110	100	90	83	69
	Intermittent	138	138	138	138	138	124	124	124	124	110	90
Torque Nm	Continuous	83	104	130	162	200	242	287	318	377	419	426
	Intermittent	93	116	145	181	223	260	324	391	508	547	507
Weight kg		5	5.3	5.5	6.1	6.2	6.4	6.7	7.1	7.4	7.7	8

- A simultaneous maximum torque and maximum speed NOT recommended.
- To assure best motor life, run motor for approximately **1 hour at 30%** of rated pressure before application to full load.
- Be sure motor is filled with fluid prior to any load applications.
- Recommended fluids: premium quality, anti-wear type hydraulic oil.
- Minimum oil viscosity (at operating temperature): Never below 20 cSt best viscosity range 20-32 cSt.
- Recommended maximum system operating temp. 82°C.
- Recommended filtration: Per ISO cleanliness code 4406, level 20/18/13.
- Maximum inlet pressure: 150 bar without regard to Δ bar and/or back pressure ratings or combination thereof.

XCEL Spool Valve Motors

XCEL CH Series (016-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area. Performance data is typical at 25 cSt. Actual data may vary slightly from unit to unit in production.

CH-53(52.2cm³/r) Δ Pressure Bar

		Continuous							Max. Cont.	Int.
		28	41	55	69	83	97	110	124	138
Flow lpm	7.6	18 139	27 134	36 128	45 121	55 112	65 102			
	15.1	17 282	26 277	36 270	45 263	55 255	64 246	74 236	83 224	93 209
	22.7	16 428	25 422	35 414	45 406	55 397	65 386	74 376	83 365	93 353
	30.3	14 575	23 570	33 562	43 554	53 546	63 536	72 525	82 512	92 498
Max. Cont.	37.9	14 721	23 719	33 714	43 708	53 702	62 692	71 682	81 670	91 659
Int.	45.4		22 864	31 860	41 852	51 844	61 816	70 826	80 815	90 804

22 Torque nm
864 Speed rpm

 Continuous

 Intermittent

CH-63(63.6cm³/r) Δ Pressure Bar

		Continuous							Max. Cont.	Int.
		28	41	55	69	83	97	110	124	138
Flow lpm	7.6	22 112	33 109	45 105	57 100	69 94	81 88			
	15.1	22 227	32 224	44 219	57 214	69 208	81 202	92 195	104 187	116 178
	22.7	21 344	32 340	43 336	56 330	68 323	80 317	91 310	104 302	116 294
	30.3	20 466	31 464	43 460	55 455	68 450	80 444	90 438	103 430	114 421
	37.9	19 581	30 578	42 573	54 568	67 562	79 554	90 549	102 542	114 536
Max. Cont.	45.4		28 693	39 691	52 684	65 680	77 675	89 667	101 650	113 652
Int.	53			37 806	50 802	62 796	75 791	87 784	98 776	111 769

CH-80(78.7cm³/r) Δ Pressure Bar

		Continuous							Max. Cont.	Int.
		28	41	55	69	83	97	110	124	138
Flow lpm	7.6	28 92	42 89	57 85	71 80	86 74	101 68	114 62		
	15.1	28 185	41 182	56 178	71 173	86 168	101 162	115 155	130 147	145 183
	22.7	26 276	40 277	55 273	70 269	85 263	100 257	113 250	129 242	143 233
	30.3	25 381	39 379	54 375	69 371	84 367	99 362	113 357	127 351	142 342
	37.9	24 478	37 474	53 471	68 466	83 461	98 456	111 451	126 444	141 437
	45.4	21 570	35 568	50 565	66 561	80 557	96 551	110 546	125 540	140 533
	53		33 665	48 661	63 658	78 653	93 647	107 642	122 635	137 629
Max. Cont.	56.8			46 710	61 705	77 701	92 696	106 689	121 683	136 675
Int.	68			41 848	57 846	72 821	87 835	101 829	116 822	

XCEL Spool Valve Motors

XCEL CH Series (016-)

Performance Data

CH-100(97.9cm³/r) Δ Pressure Bar

		Continuous							Max. Cont.	Int.
		28	41	55	69	83	97	110	124	138
Flow lpm	7.6	34 72	51 69	70 64	88 59	107 52	124 44			
	15.1	34 147	51 143	70 138	88 133	107 127	126 120	143 115	162 105	181 95
	22.7	32 223	50 219	68 214	87 209	106 203	125 196	140 189	161 180	180 172
	30.3	32 305	49 303	67 300	86 296	105 292	123 287	141 282	160 275	177 267
	37.9	30 380	47 378	66 374	84 370	104 366	122 361	140 356	158 349	177 342
	45.4	27 454	44 453	63 451	82 448	100 444	120 440	137 433	156 427	174 422
	53	24 531	40 530	60 528	79 525	97 520	116 516	134 510	153 505	171 500
Max. Cont.	56.8		38 568	57 566	76 564	95 560	114 556	132 551	150 545	170 538
Int.	68		34 678	53 677	71 675	91 671	109 667	127 664	145 656	

 Continuous

 Intermittent

CH-125(121cm³/r) Δ Pressure Bar

		Continuous							Max. Cont.	Int.
		28	41	55	69	83	97	110	124	138
Flow lpm	7.6	44 57	64 53	87 49	110 43	131 39	138 30			
	15.1	42 118	64 114	87 109	110 104	134 98	156 88	178 85	200 77	223 68
	22.7	40 181	62 177	86 172	109 166	132 161	155 154	177 147	200 139	223 131
	30.3	41 246	61 243	85 240	108 236	132 231	155 226	177 220	199 212	223 203
	37.9	38 310	60 306	83 303	106 298	130 285	153 287	174 281	198 273	221 266
	45.4	35 371	56 369	79 365	103 361	126 256	150 351	171 344	194 337	218 330
	53	30 432	52 432	75 429	99 424	123 420	146 413	168 408	191 391	215 394
Max. Cont.	56.8		48 462	71 461	97 457	120 452	144 447	165 440	189 434	212 426
Int.	68		43 551	67 550	90 549	114 544	137 539	160 533	183 527	207 520

CH-160(158cm³/r) Δ Pressure Bar

		Continuous						Max. Cont.	Int.
		28	41	55	69	83	97	115	124
Flow lpm	7.6	57 45	85 43	115 38	141 34	175 29	204 27		
	15.1	56 91	83 89	114 85	144 81	175 76	205 70		
	22.7	53 139	82 136	112 132	142 128	172 124	203 118	242 109	260 104
	30.3	52 190	81 188	111 185	142 182	172 178	202 173	241 165	260 158
	37.9	50 237	78 234	108 231	138 228	169 223	199 219	237 212	257 207
	45.4	45 284	73 283	103 279	134 276	165 272	194 267	233 259	253 253
	53	40 331	68 329	98 327	129 324	159 320	189 315	228 308	248 303
Max. Cont.	56.8		65 354	95 352	125 349	156 345	186 341	225 333	245 318
Int.	68		57 421	87 420	118 418	148 415	178 411	218 404	237 399

XCEL Spool Valve Motors

XCEL CH Series (016-)

Performance Data

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 Continuous

 Intermittent

CH-200(195.cm³/r) Δ Pressure Bar

		Continuous						Max. Cont.	Int.
		28	41	55	69	83	97	110	124
Flow lpm	7.6	70 36	104 33	141 29	178 27				
	15.1	69 74	103 70	141 67	178 63	216 58	253 52	287 47	324 38
	22.7	65 111	100 109	137 105	175 101	213 96	249 91	284 85	321 77
	30.3	63 153	99 151	137 148	174 146	212 142	260 137	283 132	319 125
	37.9	61 191	96 189	133 186	169 182	207 178	243 174	277 170	314 164
	45.4	56 229	90 227	127 225	164 222	201 219	238 214	272 210	308 204
	53		83 266	122 263	158 260	205 256	231 252	266 248	302 242
Max. Cont.	56.8		79 286	117 284	155 281	192 277	229 273	263 269	299 263
Int.	68		69 341	106 340	143 338	180 335	217 331	251 328	286 323

CH-245(240.cm³/r) Δ Pressure Bar

		Continuous						Max. Cont.	Int.
		28	41	55	69	83	100	124	
Flow lpm	7.6	86 29	128 28	173 24	219 22				
	15.1	84 60	127 58	173 55	218 52	264 47	318 44		
	22.7	80 92	123 89	168 86	214 83	260 78	314 75	391 60	
	30.3	79 124	121 123	167 122	213 119	258 116	310 114	379 99	
	37.9	75 156	118 155	163 153	208 151	254 174	306 145	382 132	
	45.4	68 188	110 186	156 185	197 182	246 179	297 177	375 164	
	53	60 219	102 218	148 216	193 214	238 211	288 209	367 196	
Max. Cont.	56.8		98 234	143 232	189 230	234 227	285 224	363 212	
Int.	68		84 282	130 280	174 277	220 273	269 271	351 259	

CH-315(317cm³/r) Δ Pressure Bar

		Continuous						Max. Cont.	Int.
		28	41	55	69	83	90	124	
Flow lpm	7.6	115 22	170 19	228 15					
	15.1	111 45	166 43	228 40	285 34	346 29	377 26		
	22.7	107 69	163 66	223 62	282 58	342 53	371 49		
	30.3	105 94	161 91	222 87	282 82	340 76	370 72	508 51	
	37.9	100 116	155 114	215 111	276 106	334 101	363 97	502 76	
	45.4	92 140	147 138	207 135	250 145	324 124	353 121	492 100	
	53	81 164	136 162	196 159	255 155	312 150	342 146	481 126	
Max. Cont.	56.8		130 174	190 171	249 167	307 162	337 159	477 138	
Int.	68		114 209	172 207	232 203	292 197	321 194	459 175	

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XCEL CH Series (016-)

Performance Data

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 Continuous

 Intermittent

CH-390(390.8cm³/r) Δ Pressure Bar

		Continuous				Max. Cont.	Int.
		28	41	55	69	83	110
Flow lpm	7.6	139 18	209 16	280 13			
	15.1	137 37	207 35	280 31	353 28		
	22.7	131 57	200 54	274 51	349 46	417 38	
	30.3	132 76	201 74	273 71	348 66	419 59	547 42
	37.9	125 95	191 93	265 89	335 85	403 78	539 63
	45.4	115 115	183 113	246 110	328 105	399 99	521 83
	53	101 135	169 132	241 129	313 124	385 118	514 103
Max. Cont.	56.8	95 144	162 143	234 139	306 135	379 129	512 114
Int.	68		142 171	216 168	288 163	360 158	492 144

CH-485(482.5cm³/r) Δ Pressure Bar

		Continuous				Max. Cont.	Int.
		28	41	55	69	83	
Flow lpm	7.6	176 14	256 12				
	15.1	170 30	251 27	342 24			
	22.7	165 46	248 43	337 39	423 35	507 29	
	30.3	163 61	248 59	337 55	426 50	509 42	
	37.9	153 77	237 74	328 71	415 66	501 58	
	45.4	139 93	222 90	314 87	400 81	487 74	
	53	123 108	206 106	295 103	384 98	469 91	
Max. Cont.	56.8		198 114	287 111	375 106	460 99	
Int.	68		174 138	264 134	352 129	438 123	

XCEL Spool Valve Motors

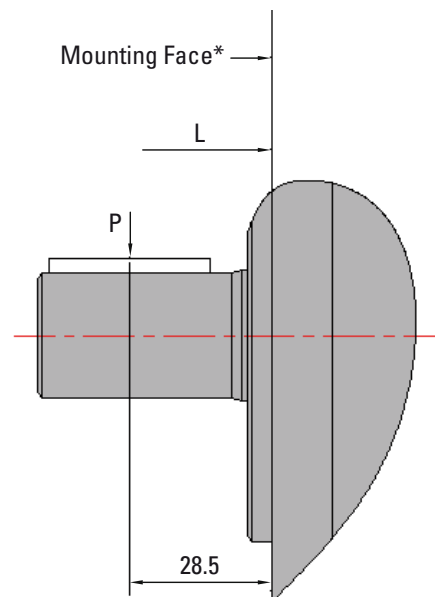
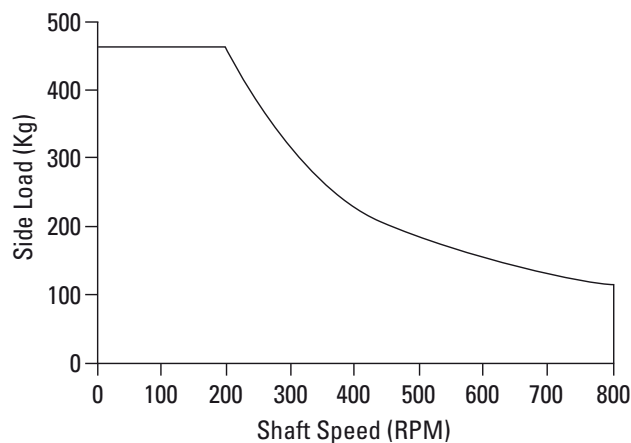
Shaft Side Load Capacity

Side Load P (Kg) = $\frac{800}{N} \left(\frac{15000}{L+100} \right)$ from 200-800 RPM

Where N = Shaft Speed (RPM)

L = Distance from Mounting Surface (mm)

P = Side Load (Kg)



Case Pressure/Shaft Seal

Refer to the case pressure/shaft seal chart below. Allowable case pressure is highest at low shaft speeds. Motor life will be shortened if case pressure exceeds recommended ratings (acceptability may vary with application).

Case pressure is as follows:

$$P_c = 0.6\Delta P + P_2 \quad \Delta P = P_1 - P_2$$

P_c = Case Pressure,

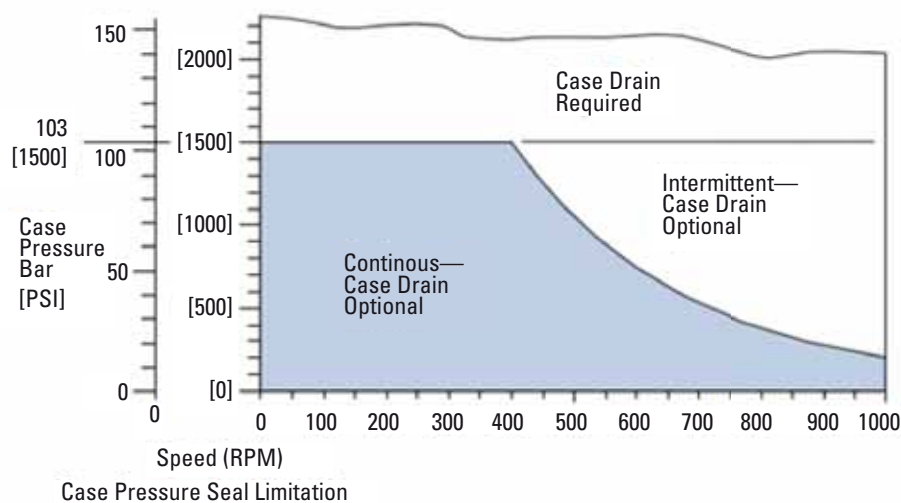
P_1 = Inlet Line Pressure

P_2 = Back Pressure

The motor life is benefited from a case drain line.

- Contamination control – flushing the motor case
- Motor cooler – exiting oil draws motor heat away.
- Extend motor seal life – maintain low case pressure with a preset restriction installed in the case drain line.

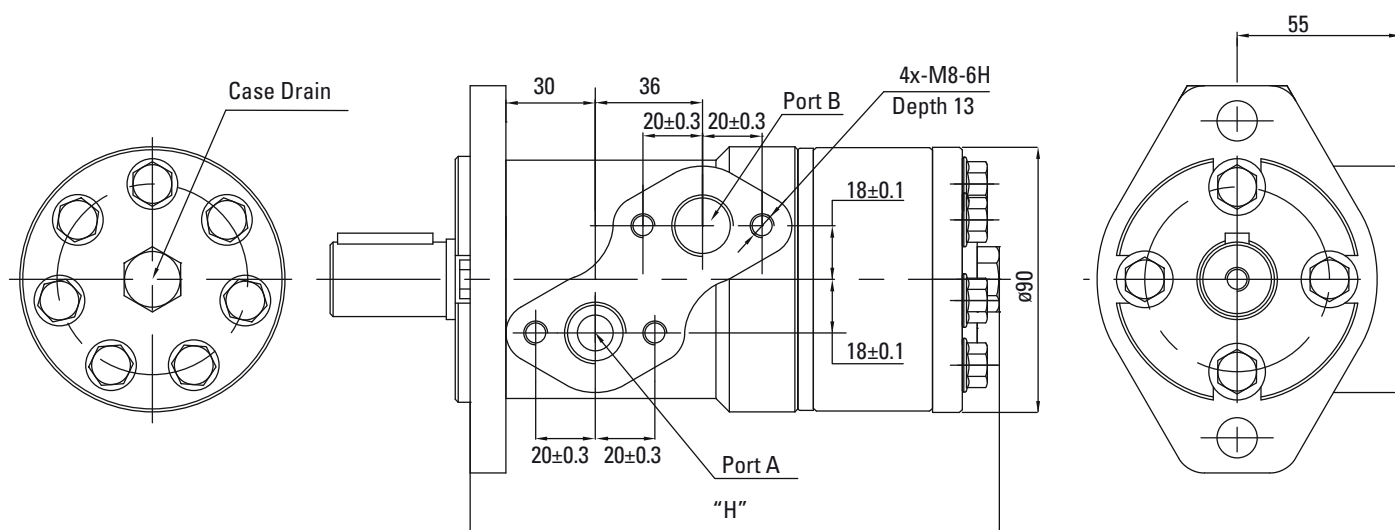
When case drain line is used, make sure the motor is always filled with oil.



XCEL Spool Valve Motors

Dimensions XCEL CH Series (016-)

Outline



Disp. cc/r	53	63	80	100	125	160	200	245	315	390	485
H mm	142	144	146	148	151	157	161	167	177	187	199

Standard Direction of Rotation: CW – When A Port Pressurized

(Viewed from the shaft end)

Mounting Flange

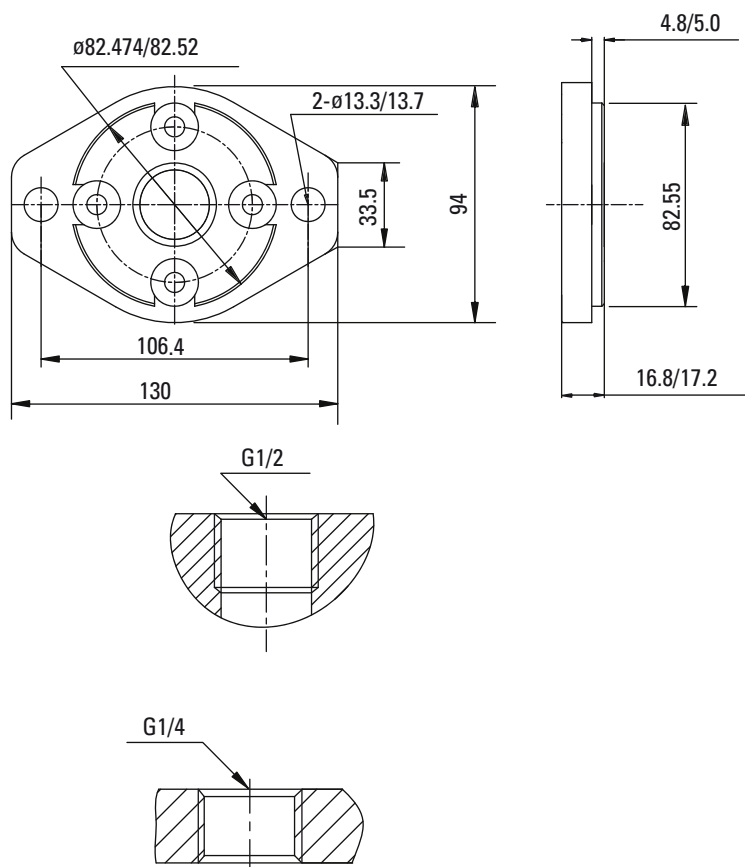
Code AA
SAE A
2- $\varnothing 13.5$
 $\varnothing 82.55 \times 5$ pilot

Main Port Thread

Code 01
G main port
ISO228/1 G1/2

Drain Port Thread

Code 1
G drain port
ISO228/1
G1/4



XCEL Spool Valve Motors

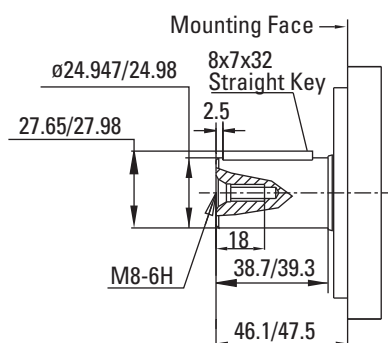
Dimensions XCEL CH Series (016-)

Output Shaft

SAE 6B splined shaft (Code 04) recommended whenever operation above 260Nm of torque, especially for those applications subject to frequent reversals.

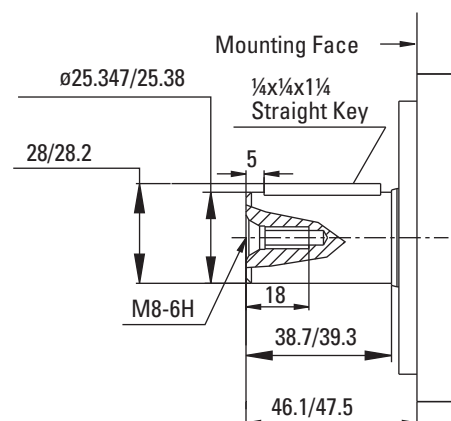
Code 01

Standard straight
25mm Dia.,
Parallel key
8x7x32
DIN 6885



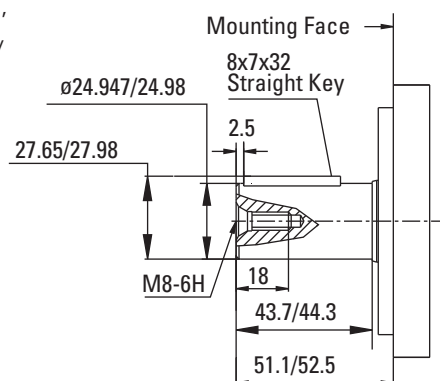
Code 03

Standard straight
1 in Dia.,
Parallel key
BS 46
 $\frac{1}{4} \times \frac{1}{4} \times 1 \frac{1}{4}$



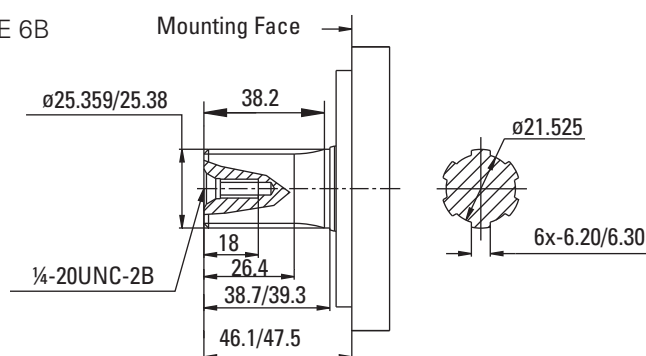
Code 02

Straight
5mm extra length
25mm Dia.,
Parallel key
8x7x32
DIN 6885



Code 04

Splined shaft
1 in.
BS 2059
SAE 6B



XCEL Spool Valve Motors (016-) Part Numbers

Use digit prefix —016- plus four digit number from charts for complete product number—Example 016-0020. Orders will not be accepted without three digit prefix.

Port	Flange & Pilot	Output Shaft	Displacement cc/rr										
			53	63	80	100	125	160	200	245	315	390	485
Staggered Port G1/2" BSP, G1/4" BSP	5mm Pilot ø82.55 Length 5mm	Straight shaft	016-										
		Standard ø 25	0010	-0011	-0012	-0013	-0020	-0014	-0015	-0016	-0017	-0018	-0019
		Key 8x7x32											
		Straight shaft	016-										
		Standard ø 25	0044	-0045	-0046	-0047	-0048	-0049	-0050	-0051	-0052	-0053	-0054
		Key 8x7x32											
		5mm extra length											
		Straight shaft	016-										
		Standard ø 1 in	0055	-0056	-0057	-0058	-0059	-0060	-0061	-0062	-0063	-0064	-0065
		Key											
		1/4x1/4x11/4											
		Splined shaft	016-										
		1 in	0021	-0022	-0023	-0024	-0025	-0026	-0027	-0028	-0029	-0030	-0031
		SAE 6B											

016-0022

XCEL Spool Valve Motors

Model Code

The following 26-digit coding system has been developed to identify all of the configuration options for the CH motor. Use this model code to specify a motor with the desired features. All 26-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.

M	CH	***	**	**	**	*	*	*	**	*	*	**	*	*	**	*	*	**	*
1	2, 3	4, 5, 6	7, 8	9, 10	11, 12	13	14	15	16, 17	18	19	20, 21	22	23	24, 25	26			

1 Product

M – Motor

2, 3 Product Series

CH – CH Series Motor

4, 5, 6 Displacement cc/r

053 – 53 cc/r
063 – 63 cc/r
080 – 80 cc/r
100 – 100 cc/r
125 – 125 cc/r
160 – 160 cc/r
200 – 200 cc/r
245 – 245 cc/r
315 – 315 cc/r
390 – 390 cc/r
485 – 485 cc/r

7, 8 Mounting Flange

AA – Two bolt SAE A.
2-Ø13.5 diamond flange,
pilot Ø82.55x5

9, 10 Output Shaft

01 – 25 dia. Standard straight,
parallel key A8x7x32,
M8 hole in shaft end.
DIN 6885
02 – 25 dia. Straight, 5mm
extra length. Parallel key
A8x7x32, M8 hole in
shaft end. DIN 6885
03 – 25.4 (1") dia. Standard
straight, parallel key
1/4x1/4x11/4, M8 hole
in shaft end .BS 46
04 – 25.4 dia. Splined shaft,
SAE 6B, 1/4-20UNC-2B
hole in shaft end

11, 12 Main Ports

AA – Staggered port 2-G1/2
ISO228/1

13 Case Drain Options

0 – None
1 – G1/4 ISO228/1

14 Gerotor Options

1 – Standard Gerotor

15 Shaft Options

0 – Standard Shaft

16, 17 Seal Options

00 – Standard Seals

18 Speed Sensor Options

0 – None

19 Manifold Block Options

A – None

20, 21 Special Features (Hardware)

00 – None

22 Special Assembly Instructions

0 – None
1 – Reverse Rotation

23 Paint

A – No Paint
B – Blue Primer
C – Black Primer

24, 25 Assigned Code When Applicable

00 – None

26 Design Code

B – Second (2)

Notes:

Notes:

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Powering Business Worldwide

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