



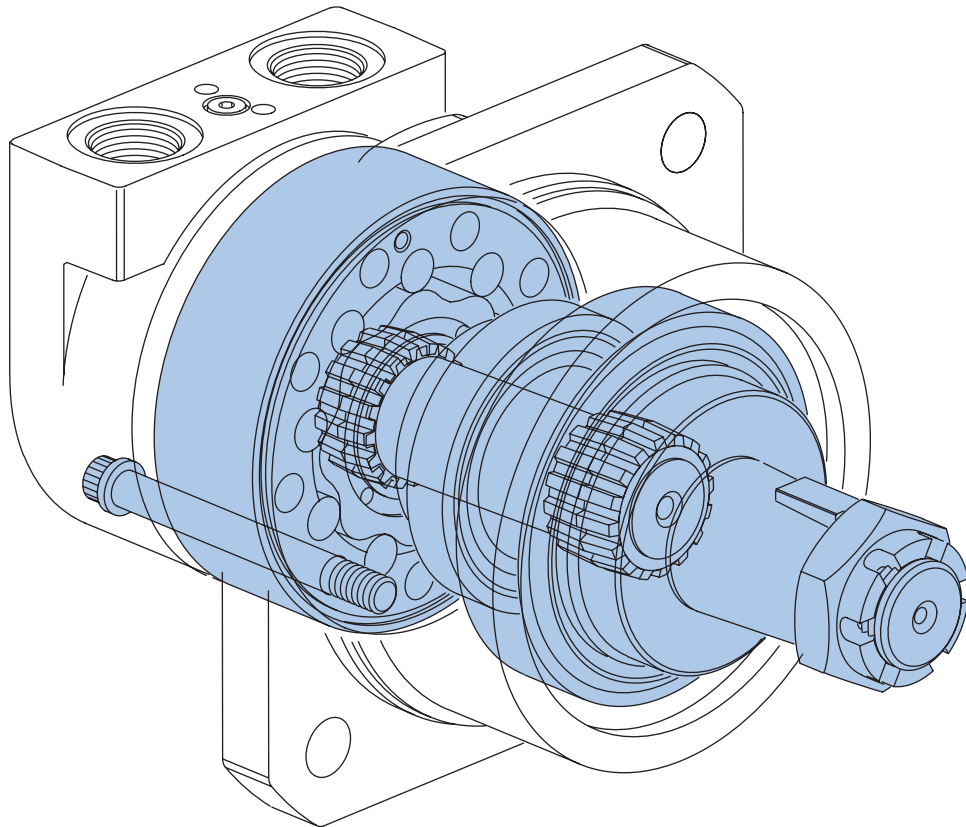
VIS (Valve-In-Star) Hydraulic Motors

The next step in the evolution of low speed high torque (LSHT) hydraulic motors.

VIS 30 Series

VIS 40 Series

VIS 45 Series



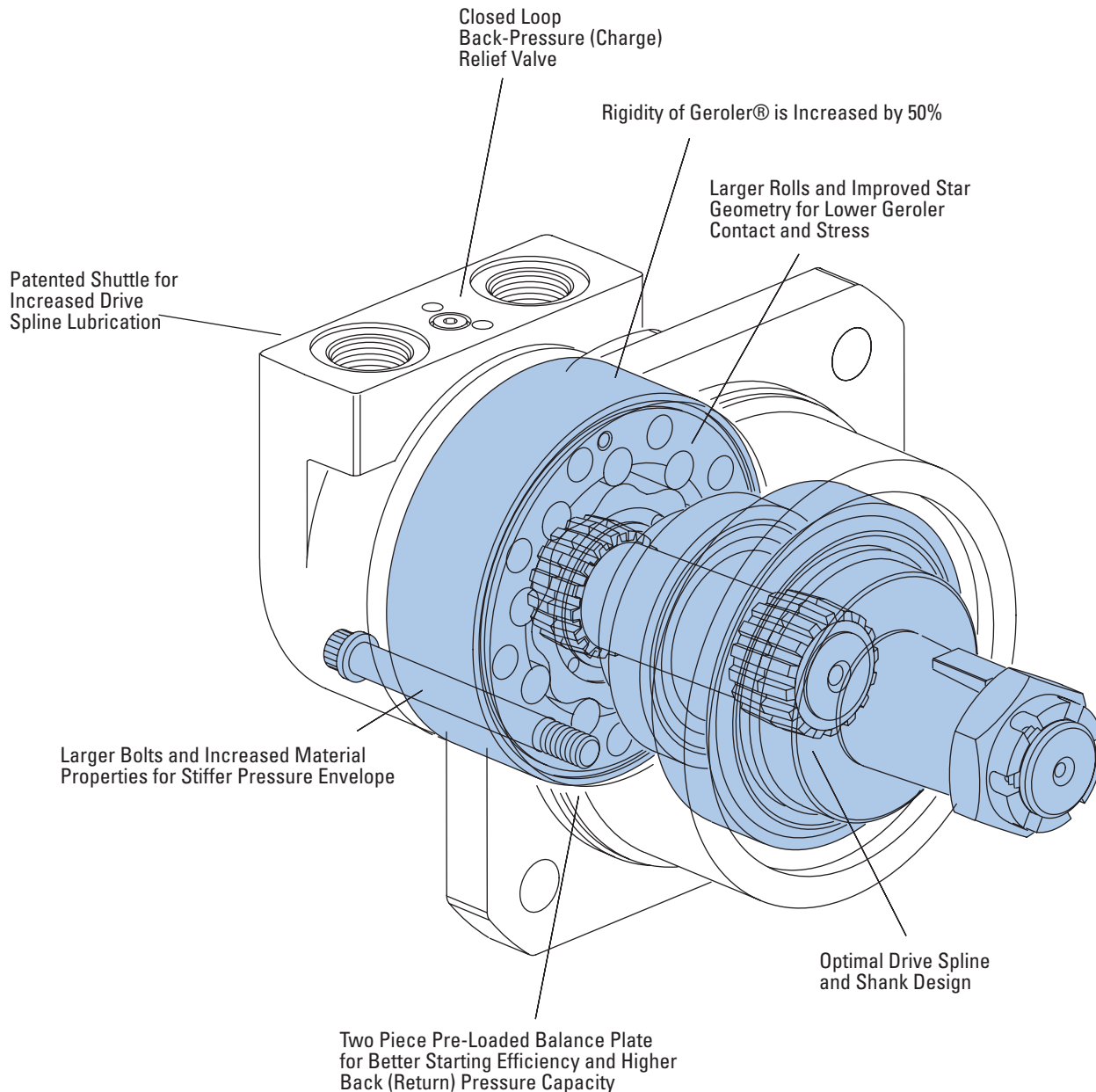
VIS Motors

Highlights

Product Description

The VIS (Valve-in-Star) Motors are the next step in the evolution of the low speed high torque (LSHT) hydraulic motors. The VIS design provides design advantages over other types of LSHT hydraulic motor valving resulting in a more compact package with better efficiency and higher pressure capability. These improvements have shown significant packaging and performance advantages in applications such as skid steer loaders, mini excavators, trenchers and logging equipment.

VIS motors are primarily intended for use in closed loop circuit applications. Consult your Eaton representative for assistance on open loop circuit applications.



Features, Benefits, and Applications

Features

- Patented VIS Geroler technology
- Simplified design - only three moving components:
 - geroler star
 - drive
 - output shaft
- Pressure-balance Geroler - improves efficiency
- Shuttle valve option for reliable internal drive lubrication
- Variety of optional features

Benefits

- Extremely compact powerful package
- Highest output torque in its class
- High efficiency
- Reduced system temperatures
- High horsepower density
- Design flexibility
- Reliable and dependable performance

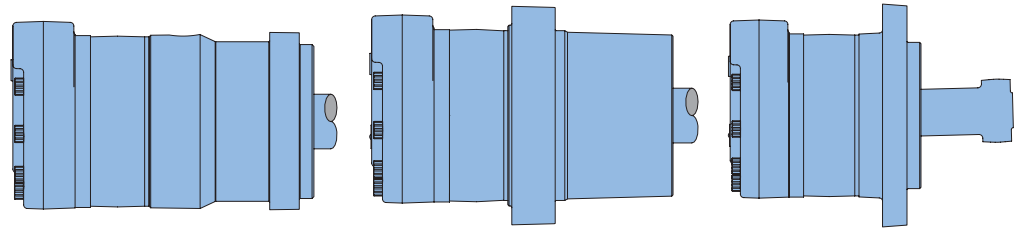
Applications

- Skid steer loaders
- Sprayers
- Underground boring equipment
- Forestry equipment
- Irrigation reels
- Grinders/Mixers
- Material handling equipment
- Augers and skid steer attachments
- Large turf care equipment

Design Features

Eaton hydraulic motors provide design flexibility. All VIS motors are available with various configurations consisting of:

- Displacement (Geroler)
- Output Shaft
- No Shaft (Bearingless Motor)
- Port Configuration
- Mounting Flange
- Park brake
- Other Special Features



Standard Motor

The standard motor mounting flange is located as close to the output shaft as possible. This type of mounting supports the motor close to the shaft load. This mounting flange is also compatible with many standard gear boxes.

Wheel Motor

The wheel motor mounting flange is located near the center of the motor which permits part or all of the motor to be located inside the wheel or roller hub. In traction drive applications, loads can be positioned over the motor bearings for best bearing life. This wheel motor mounting flange provides design flexibility in many applications.

Bearingless Motor

The bearingless motor has the same drive components as the standard and wheel motors with the exception that the motor is assembled without the output shaft, bearings and bearing housing. The bearingless motor is especially suited for applications such as gear boxes, winch drives, reel and roll drives. Bearingless motor applications must be designed with a bearing supported internal spline to mate with the bearingless motor drive. Product designs using these hydraulic motors provide considerable cost savings.

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VIS 45 Series Two-speed

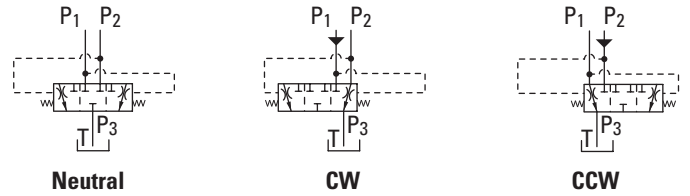
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Product Numbers	D-3-20
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Typical Hydraulic Circuit

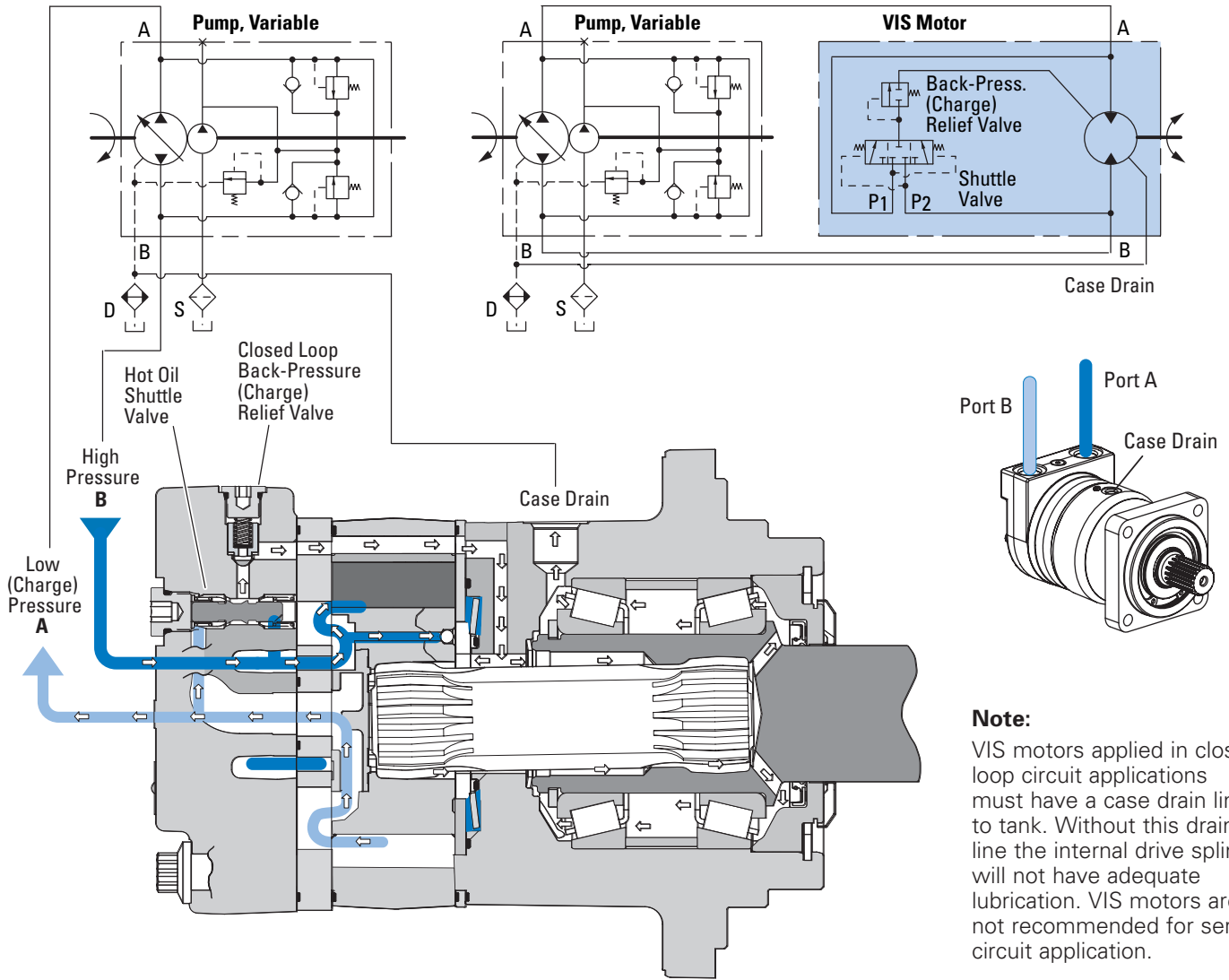
VIS 30, 40 and 45 Series

Shuttle Valve, Two Way (Closed Center) —

Schematic Diagrams

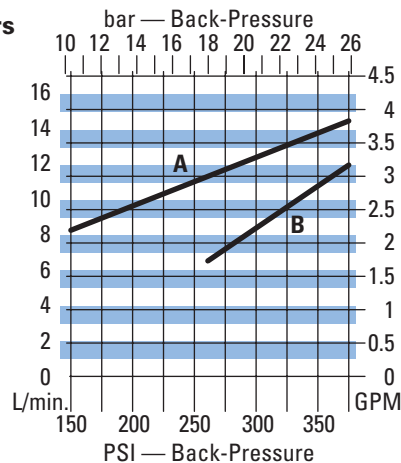


Closed Loop Circuit



Note:
VIS motors applied in closed loop circuit applications must have a case drain line to tank. Without this drain line the internal drive spline will not have adequate lubrication. VIS motors are not recommended for series circuit application.

VIS 30, 40 and 45 Motors Shuttle Flow Charts



A
4,5 bar [65 PSI] @ 60° C [140° F]

Δ Between Back-Pressure and Case Pressure (Typical Data)

B
15,2 bar [220 PSI] @ 60° C [140° F]

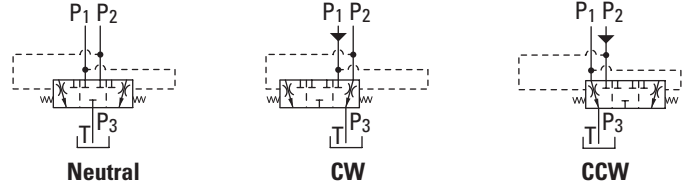
Δ Between Back-Pressure and Case Pressure (Typical Data)

Due to Machining Tolerances, Flow May be More or Less

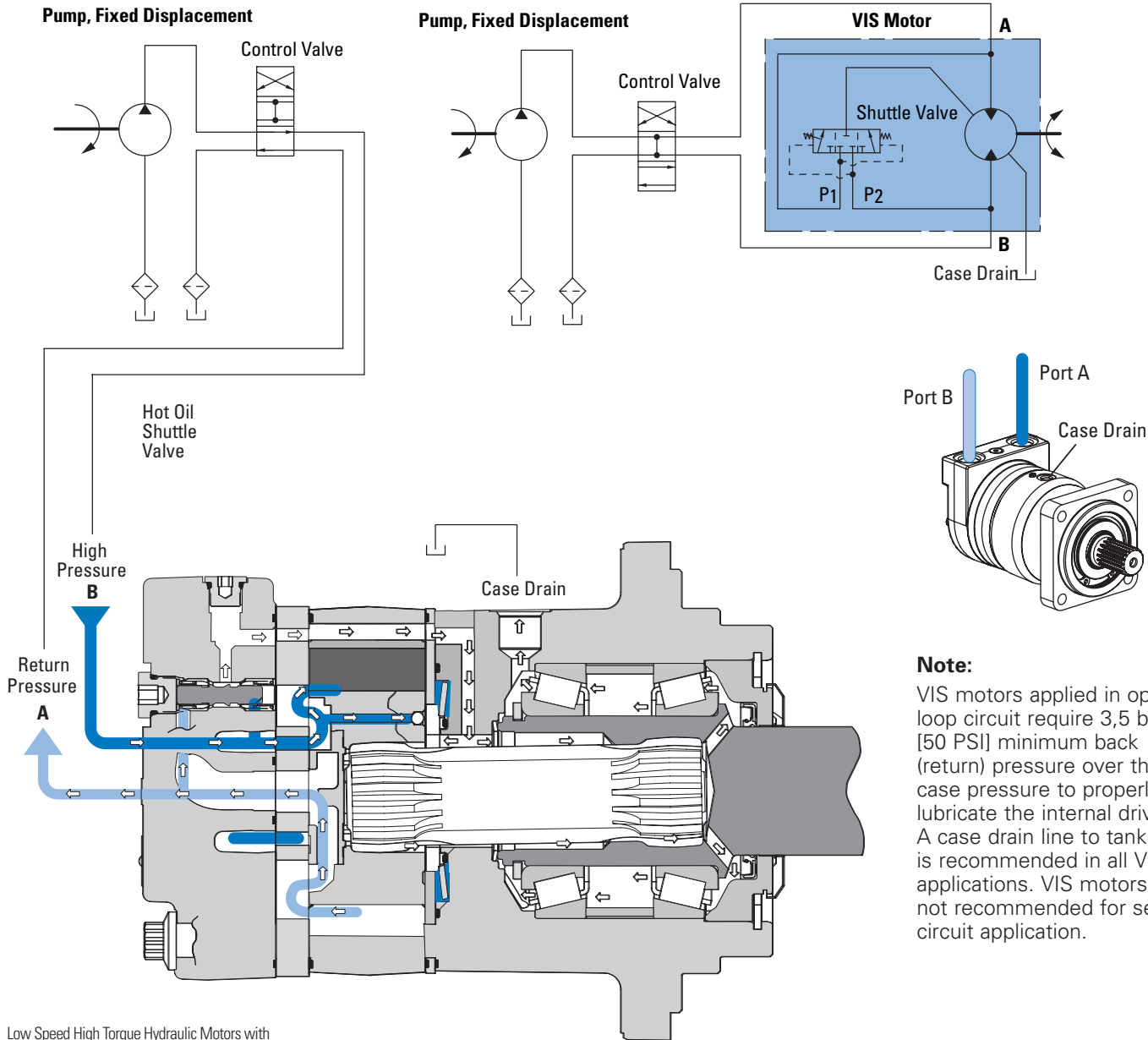
Typical Hydraulic Circuit

VIS 30, 40 and 45 Series

Shuttle Valve, Two Way (Closed Center) — Schematic Diagrams



Open Loop Circuit



Note:

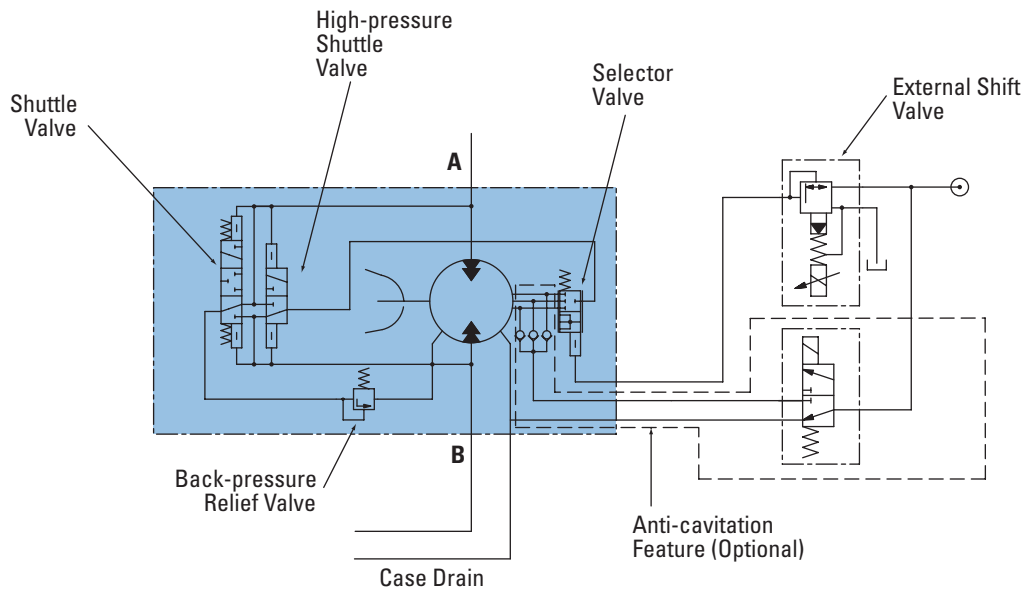
VIS motors applied in open loop circuit require 3,5 bar [50 PSI] minimum back (return) pressure over the case pressure to properly lubricate the internal drive. A case drain line to tank is recommended in all VIS applications. VIS motors are not recommended for series circuit application.

Low Speed High Torque Hydraulic Motors with Shuttle – Patent No. U.S. 4,645,438

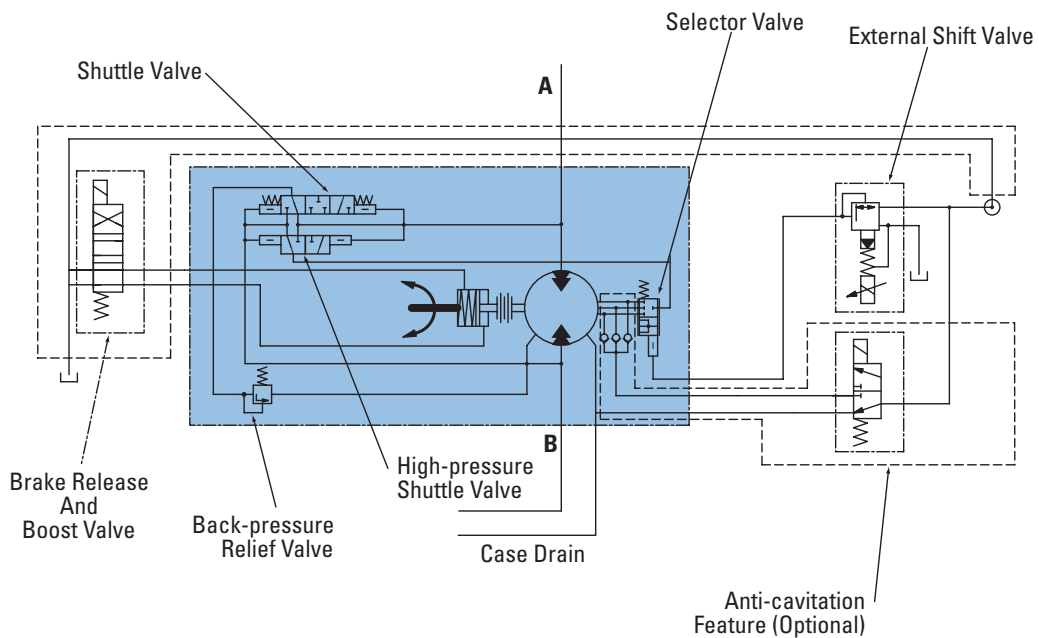
Typical Hydraulic Circuit

VIS 30, 40 and 45 Series

Two-speed Circuit



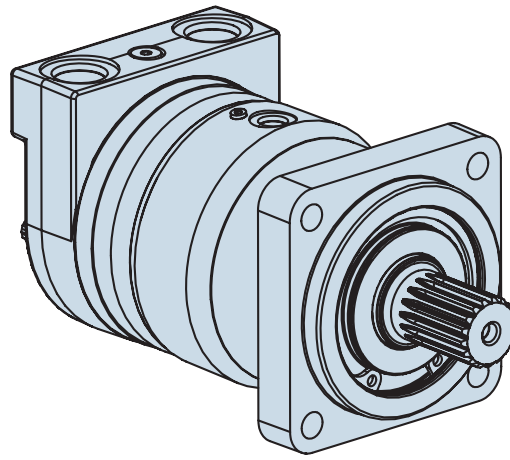
Two-Speed Brake Motor Circuit



Notes

VIS 30 Series

Highlights



Features

- Patented VIS Geroler technology
- Three moving components: (Geroler, star, drive, and output shaft)
- Two-piece pre-loaded pressure balance plate
- Shuttle valve option for reliable internal drive lubrication
- High-pressure capability – ratings compatible with high-pressure piston pumps
- Variety of optional features including two-speed option, brake packages, and case flow solutions for both closed-loop and open-loop applications.

Description

The Eaton VIS 30 motor is the most compact motor in the VIS motor line. It is rated at 151LPM [40 GPM] and pressures to 310 bar [4500 PSI]. Maximum continuous output torque capability is rated to 1632 Nm [14,400 lb-in.]. This motor provides high torque with high efficiency, smooth performance, and quiet operation. The motor utilizes patented VIS technology with improved high-strength Geroler, optimized drive geometry, and two-piece pre-loaded balance plate for increased starting efficiency, reduced leakage and higher back pressure capacity. A wide variety of options are available including two-speed option, brake options and case flow options for both closed-loop and open-loop applications

Specifications

Geroler Element	4 Displacements
Flow l/min [GPM]	151 [40] Continuous*** 170 [45] Intermittent**
Speed	Up to 454 RPM
Pressure bar [PSI]	310 [4500] Cont.*** 345 [5000] Inter.** 380 [5500] Peak.*
Torque Nm [lb - in]	1632 [14440] Cont.*** 2034 [18000] Inter.**

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

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

* Peak—(Peak) Peak operation, 1% of every minute.

Benefits

- Extremely Compact Powerful Package
- Highest Output Torque in its Class
- High Efficiency
- Reliable performance
- Reduced System Temperatures
- Quiet, Smooth Operation
- High Horsepower Density
- Design Flexibility

Applications

- Skid Steer Loaders
- Sprayers
- Underground Boring Equipment
- Forestry Equipment
- Irrigation Reels
- Grinders / Mixers
- Material Handling Equipment
- Augers



Skid Steer



Sprayer



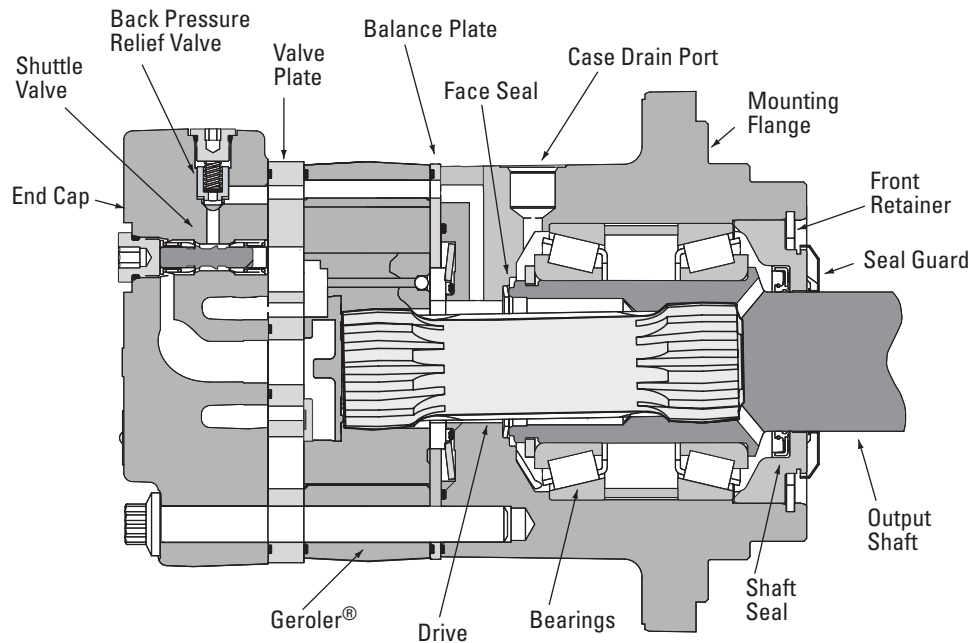
Boring



Injection Molding

VIS 30 Series

Specifications



SPECIFICATION DATA — VIS 30 SERIES MOTORS

Displ. cm ³ /r [in ³ /r]		325 [19.8]	400 [24.4]	505 [30.7]	570 [34.9]
Max. Speed (RPM) @ Flow	Continuous	440	357	284	249
	Intermittent	454	368	293	257
Flow l/min [GPM]	Continuous	151 [40]	151 [40]	151 [40]	151 [40]
	Intermittent	170 [45]	170 [45]	170 [45]	170 [45]
Torque Nm [lb-in]	Continuous	1445 [12789]	1589 [14063]	1632 [14440]	1632 [14440]
	Intermittent	1597 [14137]	1968 [17421]	2034 [18000]	2034 [18000]
Pressure Δ bar [Δ PSI]	Continuous	310 [4500]	255 [3700]	203 [2950]	179 [2600]
	Intermittent	345 [5000]	320 [4635]	254 [3685]	223 [3240]
	Peak	380 [5500]	380 [5500]	305 [4420]	268 [3890]
Weight kg [lb]	Standard or Wheel Mount	28,5 [62.9]	29,1 [64.2]	29,9 [66.0]	30,5 [67.2]
	Bearingless	16,3 [36.0]	16,9 [37.3]	17,7 [39.1]	18,3 [40.3]
Weight kg [lb]	Two-speed Standard or Wheel Mount	32,1 [70.8]	32,7 [72.1]	33,5 [73.9]	34,1 [75.1]
	Two-speed Bearingless	19,9 [43.9]	20,5 [45.2]	21,3 [47.0]	21,9 [48.2]

A simultaneous maximum torque and maximum speed NOT recommended.

Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

Maximum Inlet Pressure:

400 bar [5800 PSI]
Do Not Exceed Pressure Rating (for displacement size see chart above).

Return Pressure (Back-Pressure):

Minimum – 3,5 bar [50 PSI]
Maximum – 21 bar [300 PSI]

Note:

Return (back-pressure) must be 3,5 bar [50 PSI] greater than the case pressure.

Case Pressure:

Minimum – No Pressure
Maximum – 3,5 bar [50 PSI]

Note:

The case must be full when the motor is operating. A case drain is recommended.

Δ Pressure:

The true Δ bar [Δ PSI] between inlet port and outlet port

Continuous Rating:

Motor may be run continuously at these ratings

Intermittent Operation:

10% of every minute

Peak Operation:

1% of every minute

Recommended Fluids:

Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 70 SUS at operating temperature.

Recommended Maximum System Operating Temp.:

82° C [180° F]

Recommended Filtration:

Per ISO Cleanliness Code, 4406: 20/18/13

Shuttle:

Standard

Back-Pressure Relief Valve:




Required for closed loop circuit.

VIS 30 Series

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

-  Continuous
-  Intermittent
-  Will Operate at Reduced Life

325 cm³/r [19.8 in³/r]

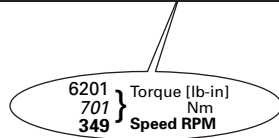
Δ Pressure Bar [PSI]

	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500
	15	35	70	105	140	170	205	240	275	310	345	380
4	668	1399	2834	4251	5583	6924	8258	9528	10387	11637	12659	
	75	158	320	480	631	782	933	1076	1174	1315	1430	
15	46	46	46	44	43	43	42	42	39	37	36	
8	680	1419	2867	4303	5711	7126	8530	9876	11269	12460	13782	14840
	77	160	324	486	645	805	964	1116	1273	1408	1557	1677
8	9	91	90	87	85	84	83	81	78	74	70	66
12	647	1412	2879	4340	5768	7195	8619	10010	11360	12672	14029	15246
	73	160	325	490	652	813	974	1131	1284	1432	1585	1723
45	139	137	133	132	129	129	129	127	126	124	113	109
16	690	1420	2852	4316	5741	7191	8621	10014	11412	12736	14081	15435
	78	160	322	488	649	812	974	1131	1289	1439	1591	1744
61	186	184	181	179	174	170	168	168	166	161	154	151
20	657	1250	2774	4407	5695	7170	8741	9952	11392	12789	14137	15339
	74	141	313	498	643	810	988	1124	1287	1445	1597	1733
76	233	229	226	223	217	214	211	209	208	203	200	197
25	544	1266	2814	4154	5858	7220	8518	9936	11269	12654	14037	15334
	61	143	318	469	662	816	962	1123	1273	1430	1586	1732
95	291	287	283	280	277	269	266	264	260	256	254	248
30	146	1177	2605	3968	5401	6882	8315	9678	11092	12536	13960	15321
	16	133	294	448	610	778	939	1094	1253	1416	1577	1731
114	341	345	340	336	333	325	323	320	316	312	307	303
35	114	1144	2532	3960	5322	6768	8232	9589	11019	12228	13298	15023
	13	129	286	447	601	765	930	1083	1245	1382	1503	1697
132	396	402	396	392	387	378	377	372	369	363	353	354
40	92	557	2047	3574	5032	6507	7944	9282	10687	12112	13439	14938
	10	63	231	404	569	735	898	1049	1207	1368	1518	1688
151	454	452	440	433	430	429	430	428	425	420	413	408

400 cm³/r [24.4 in³/r]

Δ Pressure Bar [PSI]

	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500
	15	35	70	105	140	170	205	240	275	310	345	380
4	823	1724	3493	5239	6880	8532	10177	11741	12800	14340	15600	
	93	195	395	592	777	964	1150	1327	1446	1620	1763	
15	37	37	37	36	35	35	34	34	32	30	29	
8	838	1749	3533	5302	7038	8781	10511	12171	13887	15354	16983	18288
	95	198	399	599	795	992	1188	1375	1569	1735	1919	2066
30	75	74	73	71	69	68	67	66	63	60	57	53
12	797	1740	3548	5349	7108	8866	10622	12335	13999	15616	17289	18788
	90	197	401	604	803	1002	1200	1394	1582	1764	1953	2123
45	113	111	108	107	105	105	105	103	102	101	92	88
16	850	1750	3515	5319	7074	8862	10624	12341	14063	15695	17353	19021
	96	198	397	601	799	1001	1200	1394	1589	1773	1961	2149
61	151	149	147	145	141	138	136	136	135	131	125	123
20	810	1540	3419	5431	7018	8836	10771	12264	14039	15760	17421	18902
	92	174	386	614	793	998	1217	1386	1586	1781	1968	2136
76	189	186	183	181	176	174	171	170	169	165	163	160
25	670	1560	3467	5118	7219	8897	10497	12244	13887	15594	17299	18896
	76	176	392	578	816	1005	1186	1383	1569	1762	1954	2135
95	236	233	230	227	225	218	216	215	211	208	206	202
30	180	1450	3210	4890	6656	8480	10246	11927	13669	15448	17203	18881
	20	164	363	552	752	958	1158	1348	1544	1745	1944	2133
114	277	280	276	273	270	264	262	259	256	253	250	246
35	140	1410	3120	4880	6559	8341	10144	11817	13579	15068	16388	18514
	16	159	353	551	741	942	1146	1335	1534	1702	1852	2092
132	321	326	321	318	314	307	306	302	299	295	287	287
40	113	687	2522	4405	6201	8019	9789	11438	13170	14926	16561	18409
	13	78	285	498	701	906	1106	1292	1488	1686	1871	2080
151	368	367	357	352	349	348	348	349	347	345	341	335






VIS 30 Series

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

-  Continuous
-  Intermittent
-  Will Operate at Reduced Life

505 cm³/r [30.7 in³/r]
 Δ Pressure Bar [PSI]

	250 15	500 35	1000 70	1500 105	2000 140	2500 170	3000 205	3500 240	4000 275	4500 310	5000 345
4	1035 117	2169 245	4395 497	6592 745	8656 978	10735 1213	12804 1447	14773 1669	16105 1820	18043 2039	19628 2218
15	29	29	29	29	28	28	27	27	25	24	23
8	1055 119	2200 249	4445 502	6671 754	8855 1000	11049 1248	13225 1494	15313 1730	17473 1974	19319 2183	21368 2414
30	60	59	58	56	55	54	53	52	50	48	45
12	1003 113	2190 247	4464 504	6730 760	8944 1011	11155 1260	13364 1510	15520 1754	17614 1990	19648 2220	21753 2458
45	90	88	86	85	83	83	83	82	81	80	73
16	1069 121	2202 249	4422 500	6692 756	8901 1006	11150 1260	13367 1510	15527 1754	17694 1999	19747 2231	21833 2467
61	120	118	117	115	112	110	108	108	107	104	100
20	1019 115	1938 219	4301 486	6833 772	8830 998	11117 1256	13552 1531	15431 1743	17663 1996	19829 2240	21919 2476
76	150	148	145	144	140	138	136	135	134	131	129
25	843 95	1963 222	4363 493	6440 728	9083 1026	11194 1265	13207 1492	15406 1741	17473 1974	19620 2217	21765 2459
95	188	185	183	180	179	173	172	171	168	165	164
30	226 26	1824 206	4039 456	6153 695	8375 946	10670 1206	12892 1457	15006 1695	17199 1943	19437 2196	21645 2446
114	220	223	219	217	215	210	208	206	204	201	198
35	176 20	1774 200	3926 444	6140 694	8252 932	10494 1186	12763 1442	14868 1680	17086 1930	18959 2142	20619 2330
132	255	259	255	253	250	244	243	240	238	234	228
40	142 16	864 98	3174 359	5542 626	7803 882	10089 1140	12317 1392	14391 1626	16570 1872	18779 2122	20837 2354
151	293	292	284	279	277	277	277	276	274	271	267

570 cm³/r [34.9 in³/r]
 Δ Pressure Bar [PSI]

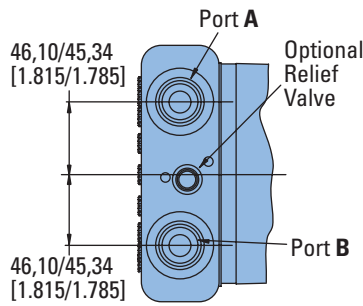
	250 15	500 35	1000 70	1500 105	2000 140	2500 170	3000 205	3500 240	4000 275	4500 310
4	1177 133	2466 279	4996 564	7494 847	9841 1112	12204 1379	14556 1645	16794 1897	18308 2069	20511 2317
15	26	26	26	25	24	24	24	24	22	21
8	1199 135	2501 283	5053 571	7584 857	10067 1137	12560 1419	15034 1699	17408 1967	19864 2244	21962 2481
30	52	52	51	50	48	48	47	46	44	42
12	1140 129	2489 281	5074 573	7650 864	10167 1149	12681 1433	15193 1717	17644 1993	20024 2262	22336 2524
45	79	78	76	75	73	73	73	72	71	71
16	1216 137	2503 283	5027 568	7608 860	10119 1143	12675 1432	15195 1717	17652 1994	20115 2273	22449 2536
61	106	104	103	101	99	96	95	95	94	92
20	1159 131	2203 249	4890 552	7768 878	10038 1134	12638 1428	15407 1741	17542 1982	20080 2269	22542 2547
76	132	130	128	127	123	121	120	119	118	115
25	958 108	2231 252	4960 560	7321 827	10325 1167	12725 1438	15014 1696	17513 1979	19863 2244	22305 2520
95	165	163	161	159	157	152	151	150	148	145
30	257 29	2074 234	4591 519	6994 790	9520 1076	12130 1370	14656 1656	17059 1927	19552 2209	22096 2496
114	193	196	193	191	189	184	183	181	179	177
35	200 23	2017 228	4463 504	6980 789	9381 1060	11930 1348	14509 1639	16902 1910	19423 2195	21553 2435
132	225	228	224	222	220	214	214	211	209	206
40	162 18	983 111	3608 408	6300 712	8870 1002	11469 1296	14002 1582	16360 1848	18837 2128	21348 2412
151	257	257	249	246	244	243	244	243	241	238

8870 } Torque [lb-in]
 1002 } Nm
 244 } Speed RPM

VIS 30 Series

Dimensions

Standard and Wheel Mount
- SAE



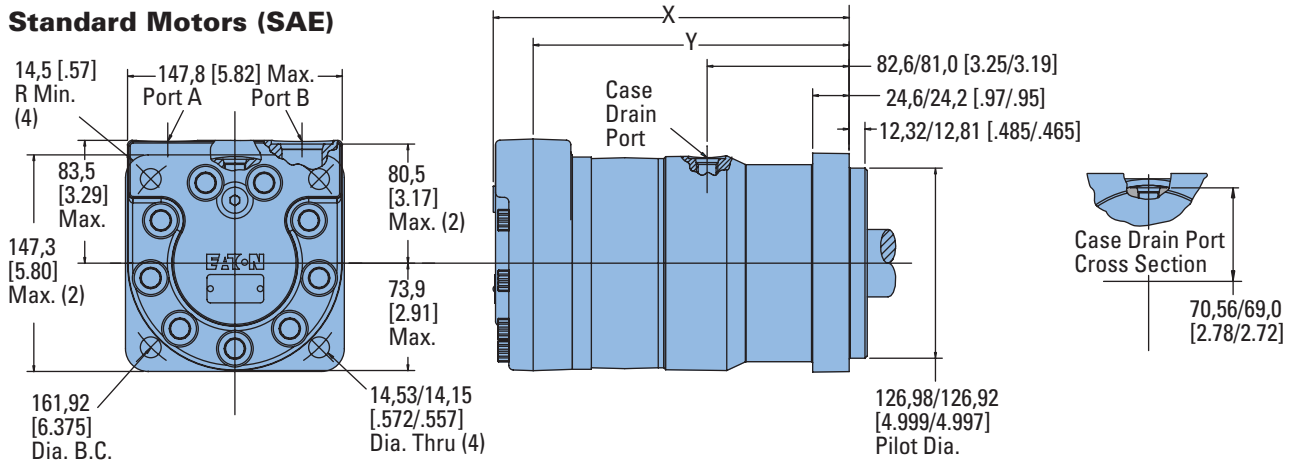
Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW

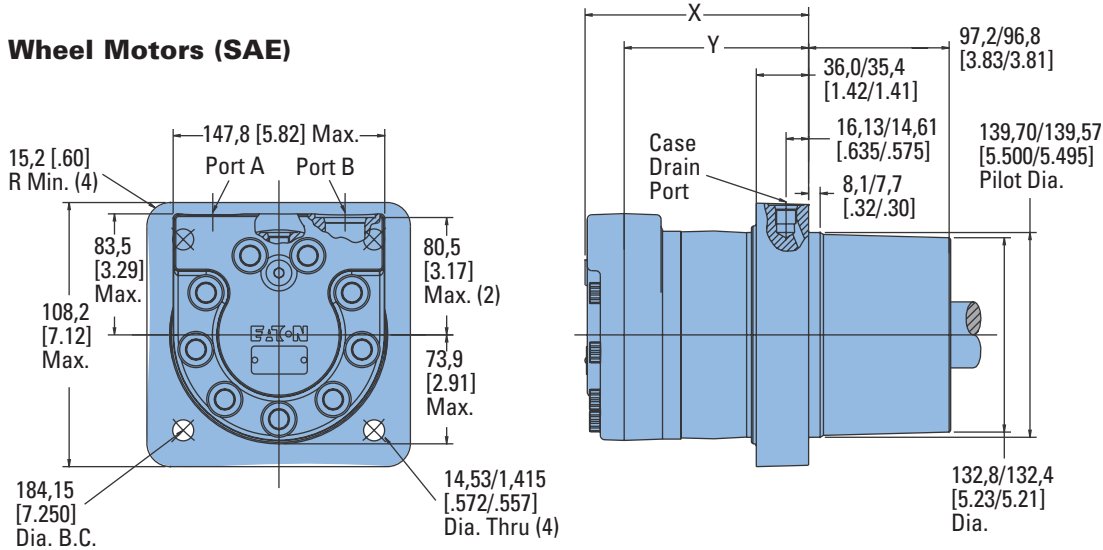
Standard Motors (SAE)



STANDARD MOTORS (SAE)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
325 [19.8]	223,5 [8.80]	195,3 [7.69]
400 [24.4]	230,4 [9.07]	201,9 [7.95]
505 [30.7]	239,3 [9.42]	211,1 [8.31]
570 [34.9]	245,4 [9.66]	217,2 [8.55]

Wheel Motors (SAE)



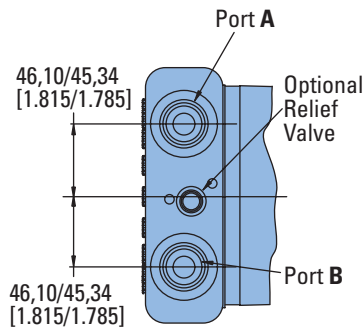
WHEEL MOTORS (SAE)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
325 [19.8]	138,7 [5.46]	110,5 [4.35]
400 [24.4]	145,5 [5.73]	117,1 [4.61]
505 [30.7]	154,5 [6.08]	126,2 [4.97]
570 [34.9]	160,5 [6.32]	132,3 [5.21]

VIS 30 Series

Dimensions

Standard and Wheel Mount
- ISO



Ports

G 3/4 (BSP) O-ring Ports (2)

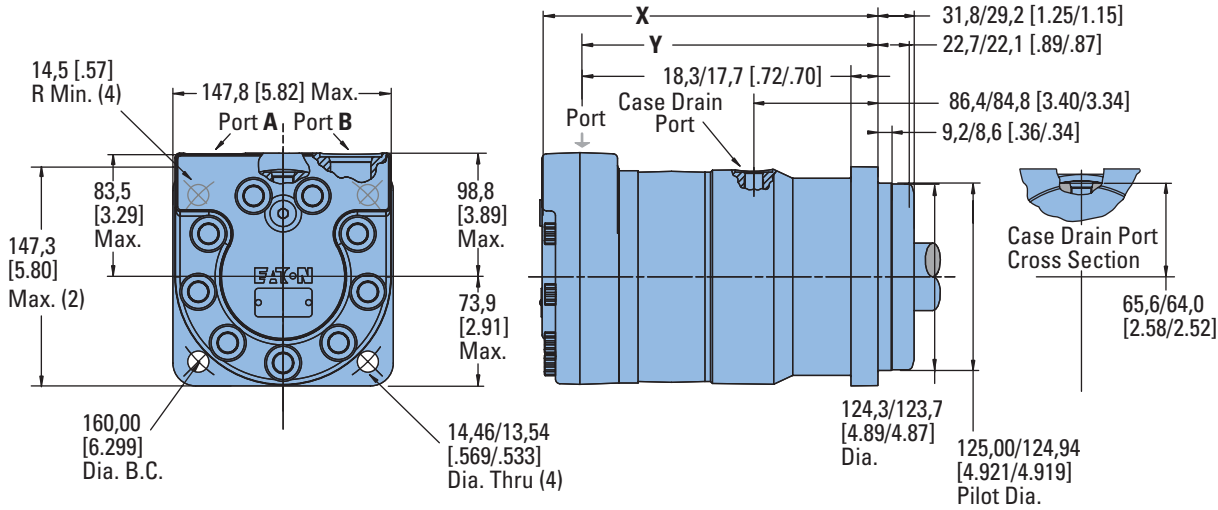
G 1/4 (BSP) O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW

Port B Pressurized — CCW

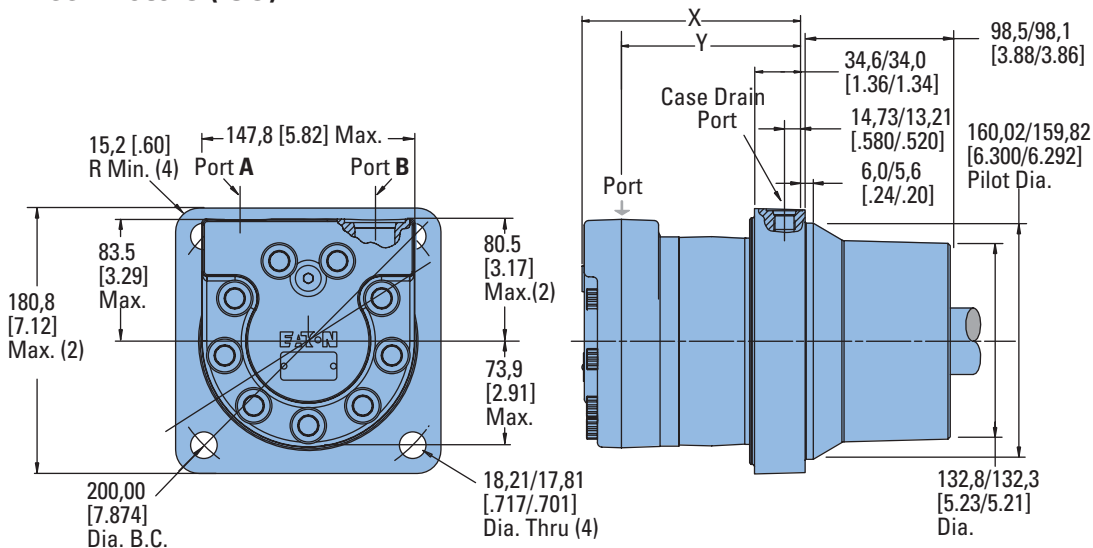
Standard Motors (ISO)



STANDARD MOTORS (ISO)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
325 [19.8]	211,6 [8.33]	183,1 [7.21]
400 [24.4]	218,2 [8.59]	190,0 [7.48]
505 [30.7]	227,3 [8.95]	198,9 [7.83]
570 [34.9]	233,4 [9.19]	205,2 [8.08]

Wheel Motors (ISO)



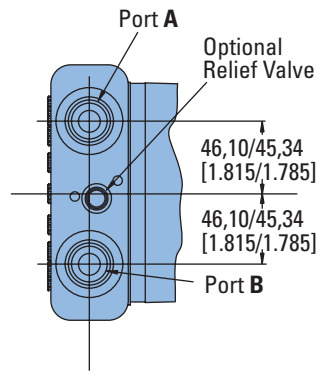
WHEEL MOTORS (ISO)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
325 [19.8]	137,4 [5.41]	109,0 [4.29]
400 [24.4]	144,0 [5.67]	115,8 [4.56]
505 [30.7]	153,2 [6.03]	124,7 [4.91]
570 [34.9]	159,3 [6.27]	131,1 [5.16]

VIS 30 Series

Dimensions

Bearingless

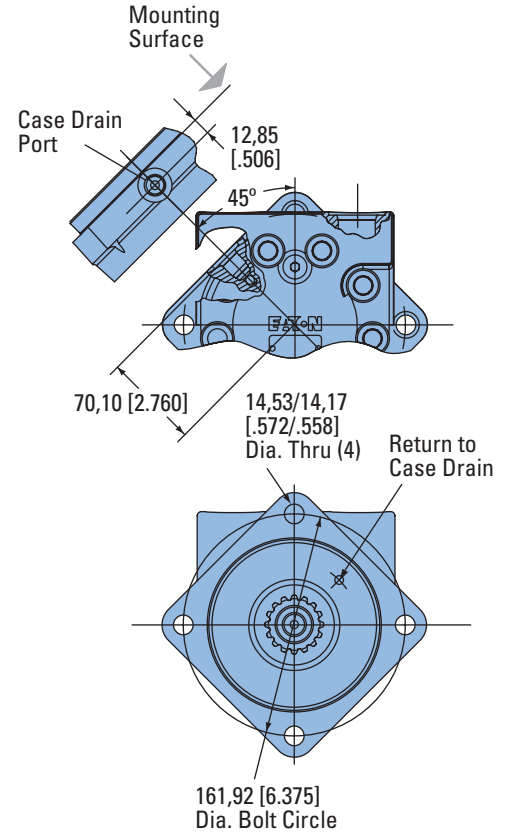
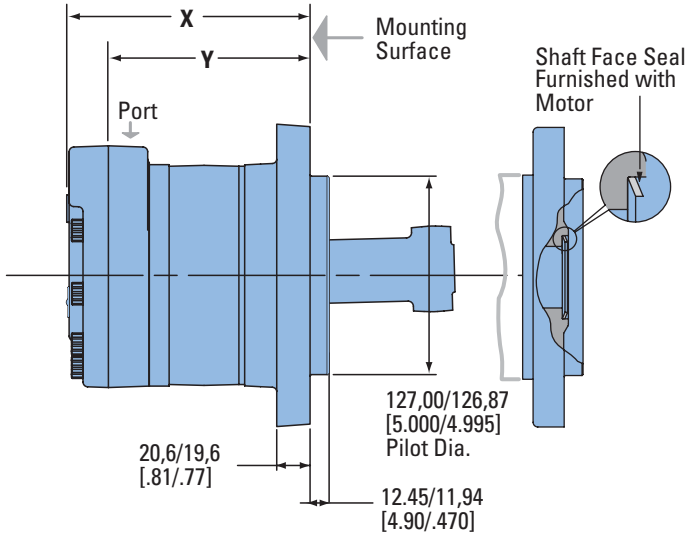


Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- Or
- G 3/4 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)

Standard Rotation Viewed from Drive End

- Port A Pressurized — CW
- Port B Pressurized — CCW

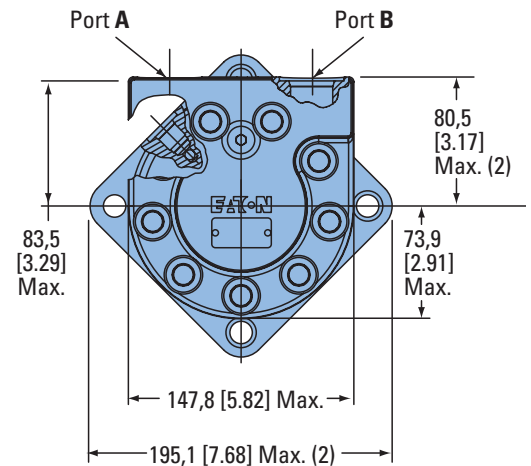
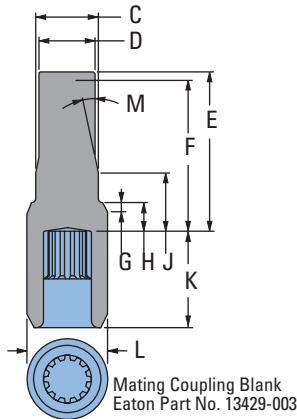


For VIS 30 bearingless motor application information, contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

Note:

After machining blank, part must be hardened per Eaton specification.

- C 52,80 [2.08] Dia.
- D 49,00 [1.93] Dia.
- E 147,57 [5.81] Max.
- F 142,49 [5.61] Min.
- Full Form Dia.
- G 7,87 [.310] Max.
- H 17,27 [.680]
- J 33,30 [1.31]
- K 84,20 [3.315]
- Full Form Dia.
- L 69,60 [2.74]
- M 15



BEARINGLESS MOTORS

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
325 [19.8]	141,2 [5.56]	113,3 [4.46]
400 [24.4]	148,1 [5.83]	120,1 [4.73]
505 [30.7]	157,2 [6.19]	129,0 [5.08]
570 [34.9]	163,3 [6.43]	135,1 [5.32]

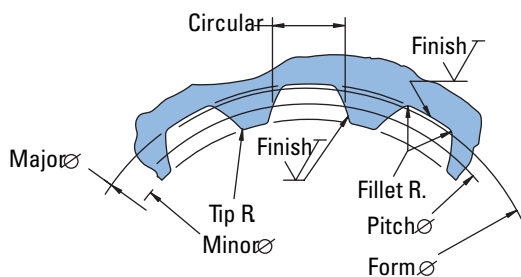
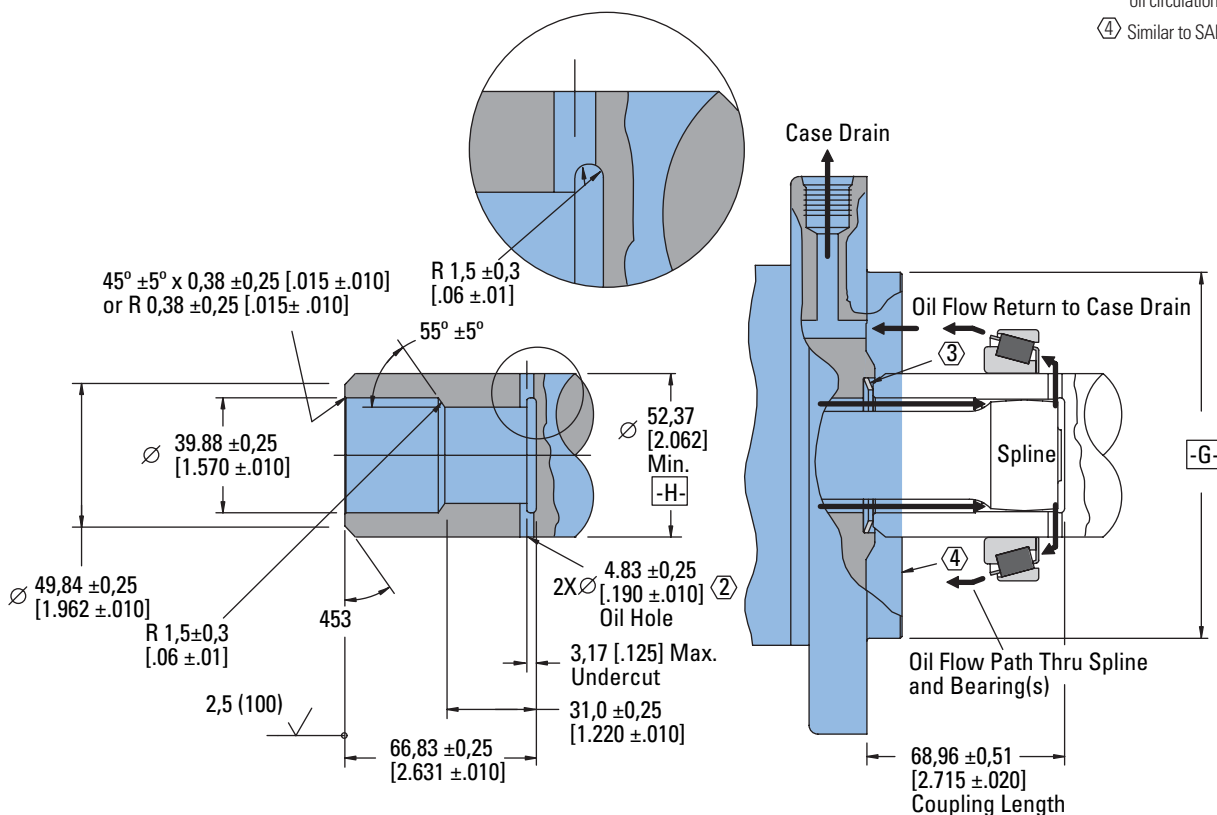
VIS 30 Series

Installation Information

Bearingless

1 Internal spline in mating part to be per spline data. Specification material to be ASTM A304, 8620H carburize to a hardness of 60-64 HRC with case depth (to 50HRC) of 0,076 -1,27 [.030 -.050]. Dimensions apply after heat treat.

- ② Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.
- ③ Seal to be furnished with motor for proper oil circulation thru splines.
- ④ Similar to SAE "C" Four Bolt Flange.



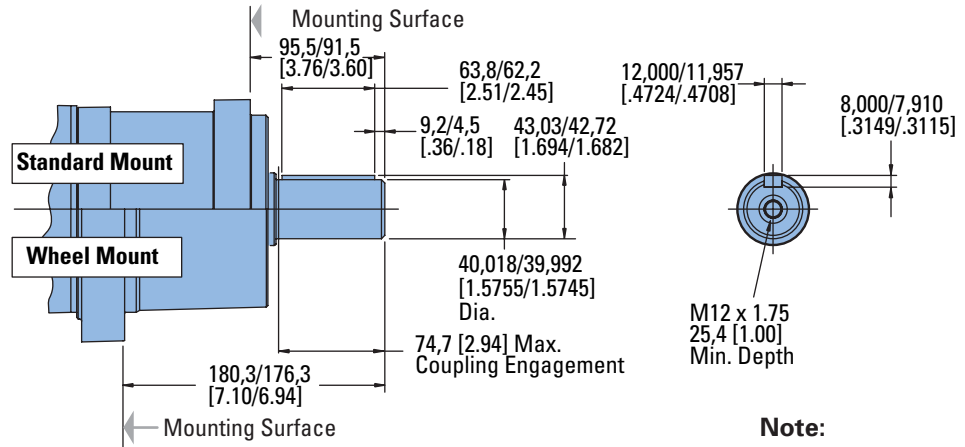
Spline Pitch.....	8.5/17
Pressure Angle.....	30°
Number of teeth.....	12
Class of Fit.....	Ref. 5
Type of Fit.....	Side
Pitch Diameter.....	Ref. 35,858823 [1.4117647] $\text{Ⓞ}0,20$ [.008] H
Base Diameter.....	Ref. 31,054652 [1.2226241]
Major Diameter.....	39,17 [1.542] Max. 38,97 [1.534] Min.
Minor Diameter.....	33,30 -33,48 [1.311 -1.318]
Form Diameter, Min.....	38,33 [1.509]
Fillet Radius.....	0,64 -0,76 [.025 -.030]
Tip Radius.....	0,25 -0,51 [.010 -.020]
Finish.....	1,6 (63)
Involute Profile Variation.....	+0,000 -0,025 [+0.0000 -.0010]
Total Index Variation.....	0,038 [.0015]
Lead Variation.....	0,013 [.0005]
Circular Space Width:	
Maximum Actual.....	5,898 [.2322]
Minimum Effective.....	5,804 [.2285]
Maximum Effective.....	Ref. 5,857 [.2306]
Minimum Actual.....	Ref. 5,834 [.2297]
Dimension Between Two Pins.....	Ref. 26,929 -27,084 [1.0602 -1.0663]
Pin Diameter.....	6,223 [.2450] Pins to Have 4,0 [.160]
Wide Flat for Root Clearance	

VIS 30 Series

Dimensions Shafts

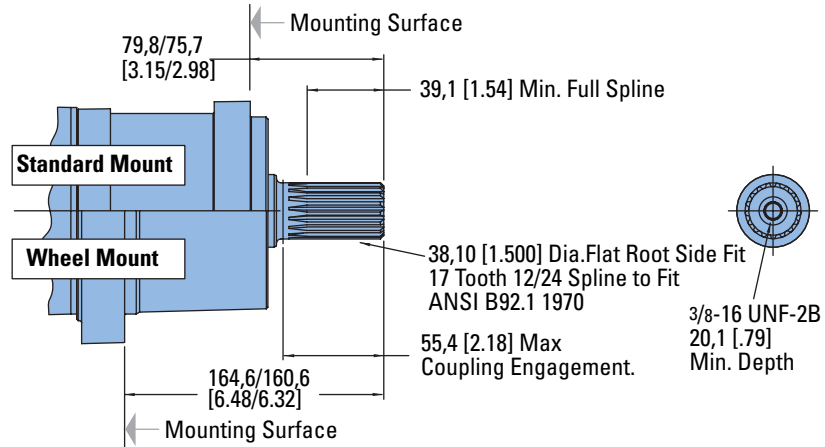
SAE

40 mm Straight

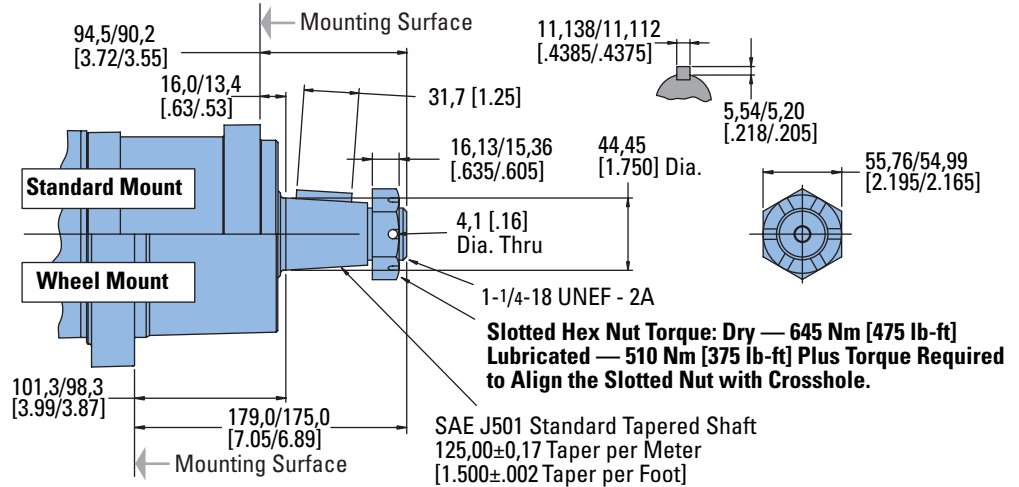


Note:
For motor torque ratings above 875 Nm [7750 lb - in] use split coupler.

1-1/2 Inch 17 Tooth Splined



1-3/4 Inch Tapered



VIS 30 Series

Shaft Side Load Capacity

SAE

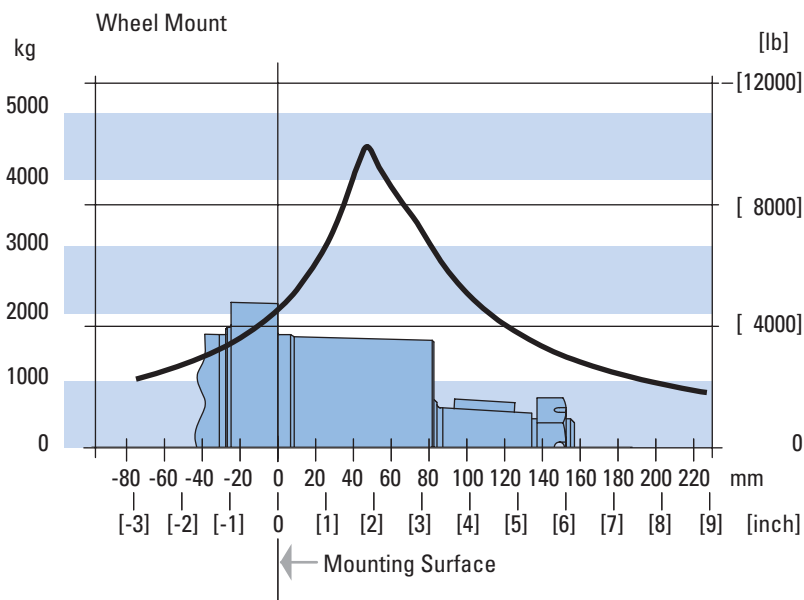
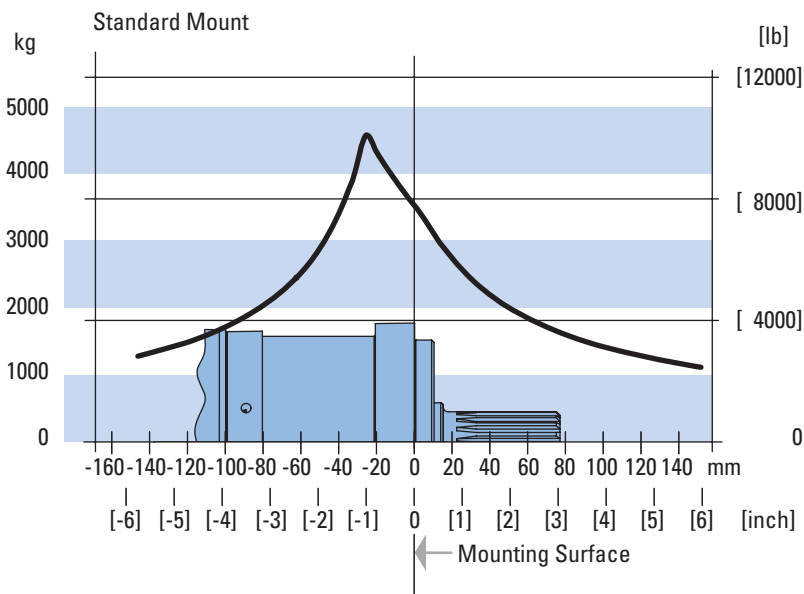
These curves indicate the radial load capacity on the motor shaft(s) at various locations.

The curve is based on B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.

To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

For 3,000,000 shaft revolutions or 500 hours — Increase these shaft loads 52%.

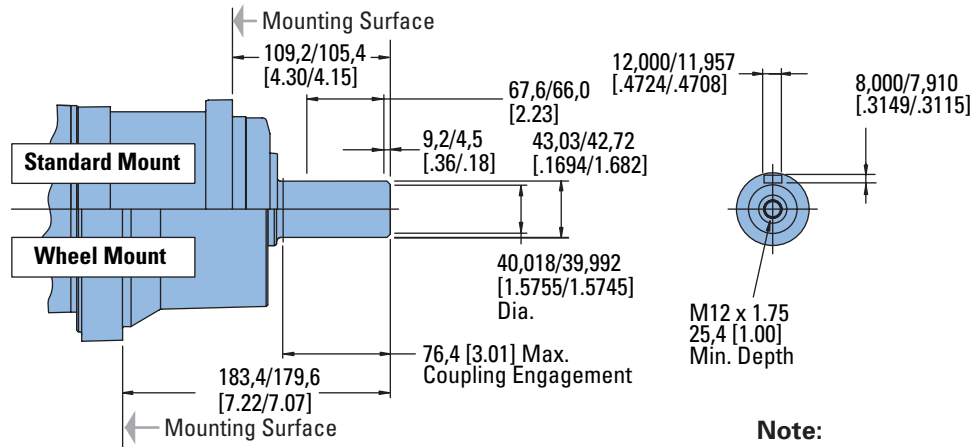


VIS 30 Series

Dimensions Shafts

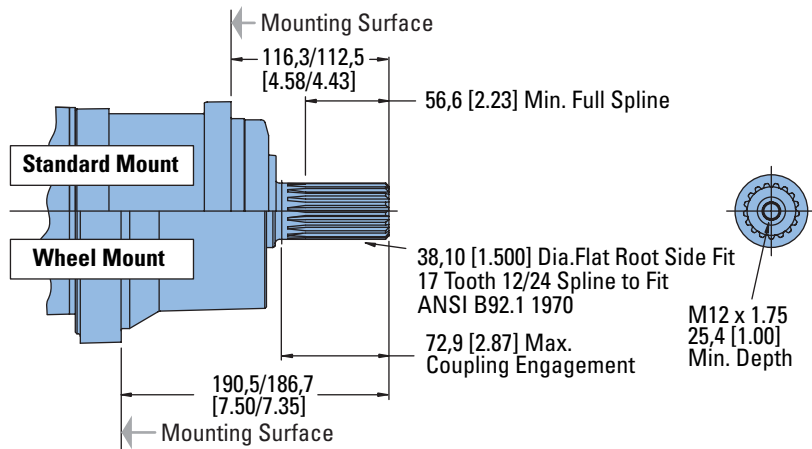
ISO

40 mm Straight

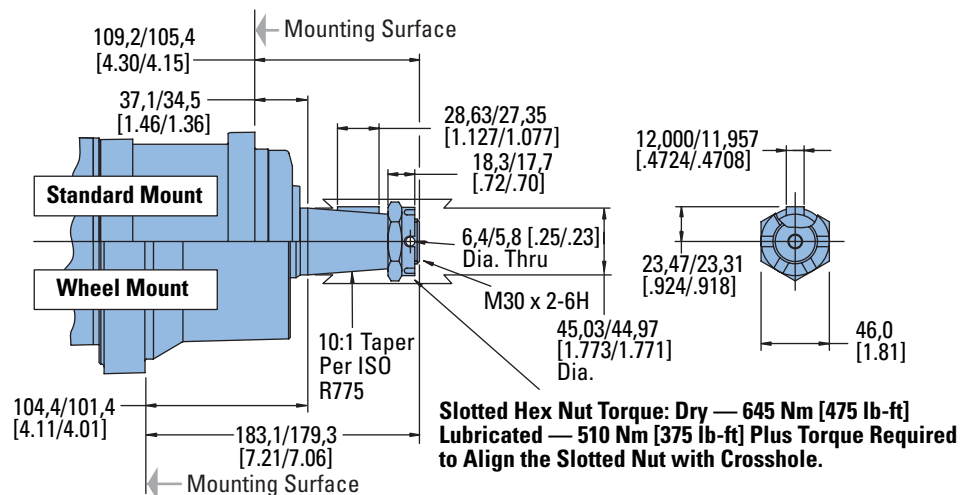


Note:
For motor torque ratings above 875 Nm [7750 lb - in] use split coupler.

38,1 mm [1-1/2 Inch] 17 Tooth Splined



45 mm Tapered



VIS 30 Series

Shaft Side Load Capacity

ISO

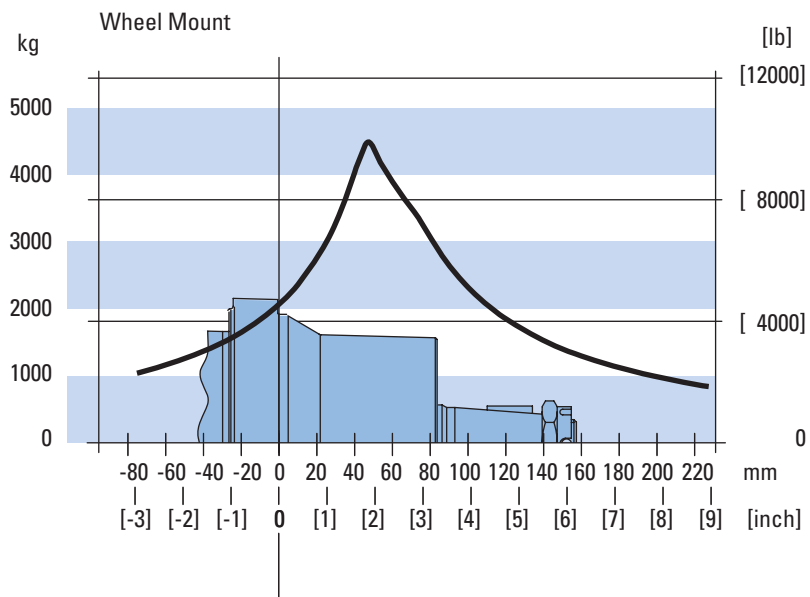
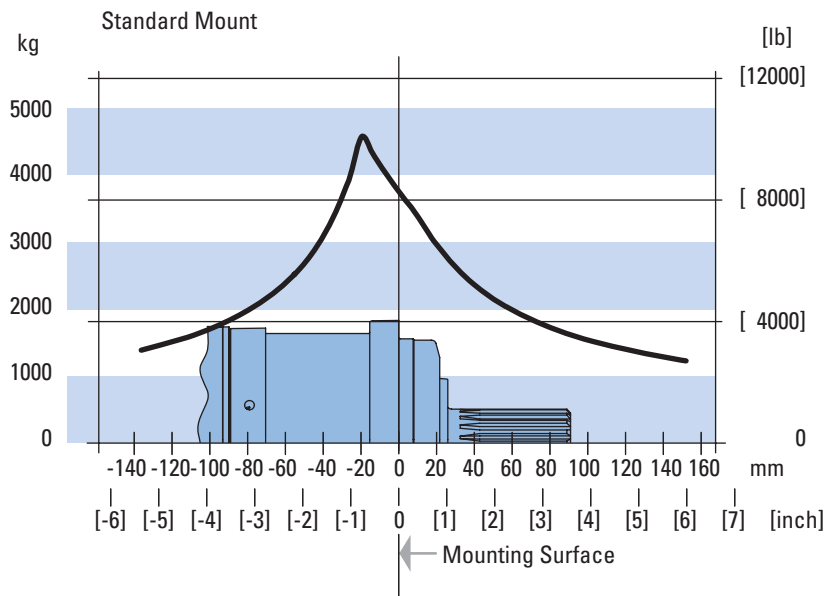
These curves indicate the radial load capacity on the motor shaft(s) at various locations.

The curve is based on B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.

To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

For 3,000,000 shaft revolutions or 500 hours — Increase these shaft loads 52%.



VIS 30 Series

Product Numbers

Closed Loop

Use digit prefix — 159-, 160-, or 161- plus four digit number from charts for complete product number— Example 161-0064.

Orders will not be accepted without three digit prefix.

SAE

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER			
			325 [19.8]	400 [24.4]	505 [30.7]	570 [34.9]
Standard	40 mm Straight	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	159-0103	-0094	-0104	-0105
	1-1/2 inch 17 Tooth Splined	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	159-0107	-0108	-0109	-0110
	1-3/4 inch Tapered	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	159-0112	-0113	-0114	-0115
Wheel	40 mm Straight	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	160-0054	-0055	-0056	-0057
	1-1/2 inch 17 Tooth Splined	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	160-0059	-0060	-0061	-0062
	1-3/4 inch Tapered	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	160-0064	-0065	-0066	-0067
Bearingless		1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	161-0045	-0064	-0065	-0090

161-0064

ISO

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER			
			325 [19.8]	400 [24.4]	505 [30.7]	570 [34.9]
Standard	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	159-0117	-0118	-0119	-0120
	1-1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	159-0122	-0123	-0124	-0125
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	159-0127	-0128	-0129	-0130
Wheel	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	160-0069	-0070	-0071	-0072
	1-1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	160-0074	-0075	-0076	-0077
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	160-0079	-0080	-0081	-0092
Bearingless		G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	161-0067	-0068	-0069	-0070

161-0068

Note:

The product numbers on this page are for motors used in closed loop circuits. They include a back-pressure relief valve that is set at 4,5 bar [65 PSI].

- A case drain is required for all closed loop VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].

VIS 30 Series

Product Numbers

Open Loop

Use digit prefix — 159-, 160-, or 161- plus four digit number from charts for complete product number— Example 161-0064.

Orders will not be accepted without three digit prefix.

SAE

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER			
			325 [19.8]	400 [24.4]	505 [30.7]	570 [34.9]
Standard	40 mm Straight	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	159-0035	-0038	-0041	-0131
	1-1/2 inch 17 Tooth Splined	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	159-0036	-0039	-0042	-0132
	1-3/4 inch Tapered	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	159-0034	-0037	-0040	-0133
Wheel	40 mm Straight	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	160-0021	-0024	-0027	-0083
	1-1/2 inch 17 Tooth Splined	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	160-0022	-0025	-0028	-0084
	1-3/4 inch Tapered	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	160-0020	-0023	-0026	-0085
Bearingless		1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	161-0030	-0034	-0020	-0077

161-0034

ISO

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER			
			325 [19.8]	400 [24.4]	505 [30.7]	570 [34.9]
Standard	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	159-0051	-0054	-0057	-0134
	1-1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	159-0050	-0053	-0056	-0135
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	159-0049	-0052	-0055	-0136
Wheel	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	160-0037	-0040	-0043	-0086
	1-1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	160-0036	-0039	-0042	-0087
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	160-0035	-0038	-0041	-0088
Bearingless		G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	161-0035	-0036	-0037	-0078

161-0036

Note:

All product numbers in the charts (above) are for motors **without** a back-pressure relief valve. These motors would generally be used in open loop circuits.

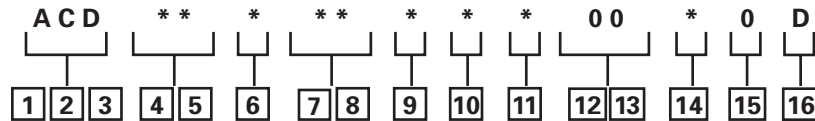
For closed loop circuits a motor **with** a back-pressure relief valve is required.

- A case drain is recommended for all VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].
- In open loop circuits, return pressure must be 3,5 bar [50 PSI] greater than case pressure to properly lubricate the internal drive.

VIS 30 Series

Model Code

The following 16 - digit coding system has been developed to identify all of the configuration options for the VIS 30 motor. Use this model code to specify a motor with the desired features. All 16 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.



1, 2, 3 Product Series
ACD – VIS 30 Motor

4, 5 Displacement
cm³/r [in³/r]

- 20 – 325 [19.8]
- 24 – 400 [24.4]
- 31 – 505 [30.7]
- 35 – 570 [34.9]

6 Mounting Type

A – 4 Bolt Bearingless
127,00 [5.000] Pilot Dia.
with 12,19 [.480] Pilot
Length and 14,35 [.565] Dia.
Holes on 161,92 [6.375] Dia.
Bolt Circle

B – 4 Bolt Wheel Mount
160 [6.3] Pilot Dia. with 5,8
[.23] Pilot Length and 18,00
[.709] Dia. Holes on 200,00
[7.874] Dia. Bolt Circle (ISO
Compatible)

F – 4 Bolt Standard Mount
(SAE CC) 127,00 [5.000]
Pilot Dia. with 12,2 [.48]
Pilot Length and 14,32 [.564]
Dia. Holes on 161,92 [6.375]
Dia. Bolt Circle

G – 4 Bolt Wheel Mount
139,7 [5.50] Pilot Dia. with
7,9 [.31] Pilot Length and
14,32 [.564] Dia. Holes on
184,15 [7.250] Dia. Bolt
Circle (SAE Compatible)

H – 4 Bolt Standard Mount
125,0 [4.92] Pilot Dia. with
8,9 [.35] Pilot Length and
14,00 [.551] Dia. Holes on
160,00 [6.299] Dia. Bolt
Circle (ISO Compatible)

7, 8 Output Shaft

00 – None (Bearingless)

01 – 45 mm Dia. 10:1
Tapered Shaft Per ISO R775
with M30 x 2- 6H Threaded
Shaft End, 12W x 8H x 28L
[.472W x .313H x 1.102L]
Key

02 – 1-3/4 inch Dia. .125:1
Tapered Shaft Per SAE J
501 with 1-1/4-18 UNEF - 2A
Threaded Shaft End, 11,11
[.4375] Square x 31,8 [1.25]
Straight Key

07 – 40 mm Dia. Straight
Shaft with M12 x 1,75 - 6H
Thread in End, 12W x 8H
x 63L [.472W x .313H x
2.480L] Key
(SAE Compatible)

08 – 1-1/2 inch Dia. Flat
Root Side Fit, 17 Tooth,
12/24 DP 30 Degree
Involute Spline, 39,1 [1.54]
Minimum Full Spline with
3/8 -16 UNC - 2B Thread in
End
(SAE Compatible)

09 – 1-1/2 inch Dia. Flat
Root Side Fit, 17 Tooth,
12/24 DP30 Degree Involute
Spline, 56,6 [2.23] Minimum
Full Spline with M12 x 1,75
- 6H Thread in End
(ISO Compatible)

10 – 40 mm Dia. Straight
Shaft with M12 x 1,75 - 6H
Thread in End, 12W x 8H
x 67L [.472W x .313H x
2.630L] Key
(ISO Compatible)

9 Ports

A – 1-1/16-12 UN-2B Size 12
O-ring Port, Accepts Fittings
for SAE J1926

B – G 3/4 (BSP) Straight

Thread Port

10 Case Flow Options

A – Shuttle Valve with 9/16-
18 UNF-2B, Size 6 O-ring
Port Case Drain, Accepts
Fittings for SAE J1926

B – Shuttle Valve with G 1/4
(BSP) Straight Thread Port
Case Drain

11 Back-Pressure Relief

0 – None (for Open Loop
Only)

1 – Set at 4,5 bar [65 PSI]
(for Manual Pumps)

2 – Set at 15,2 bar [220 PSI]
(for Servo Pumps)

4 – Set at 15,2 bar [300 PSI]
(for high charge Servo Pumps)

12, 13 Special Features

00 – None

**14 Paint/ Special
Packaging**

0 – No Paint, Individual Box

A – Painted Low Gloss
Black, Individual Box

B – No Paint, Bulk Box
Option

C – Painted Low Gloss
Black, Bulk Box Option

**15 Eaton Assigned
Code when Applicable**

0 – Assigned Code

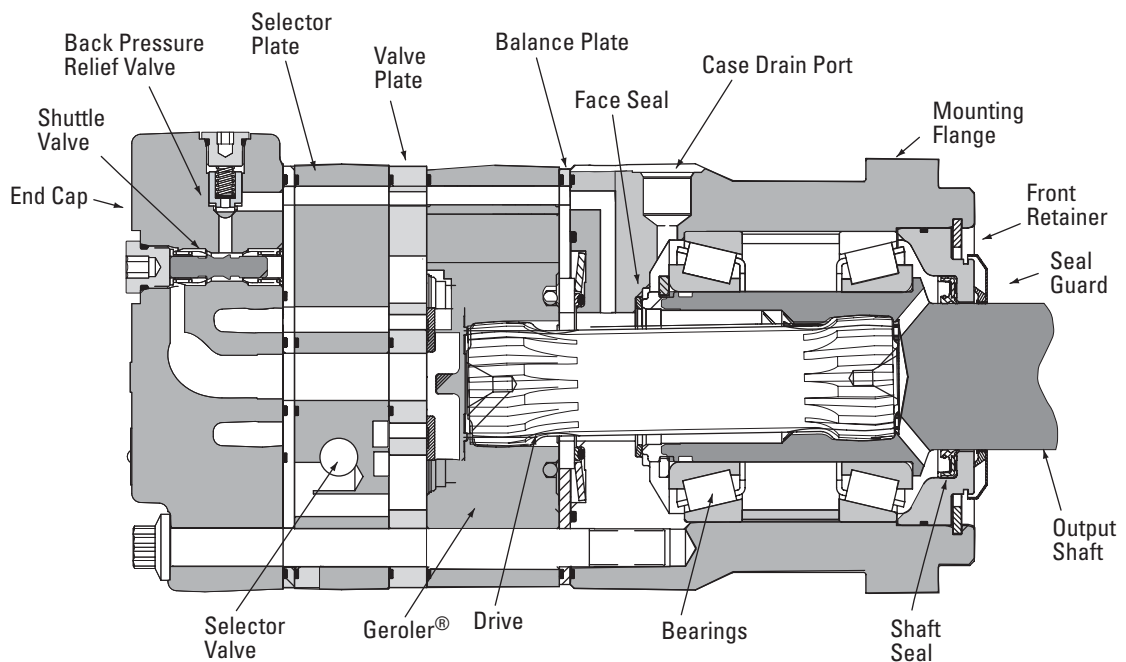
**16 Eaton Assigned
Design Code**

E – Assigned Design Code

- A case drain is recommended for all VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].
- In open loop circuits, return pressure must be 3,5 bar [50 PSI] greater than case pressure to properly lubricate the internal drive.

VIS 30 Series Two-speed

Specifications



VIS 30 Series motors are available with an integral two-speed feature that allows the operator to shift the motor between low speed high torque (LSHT) mode and high speed low torque (HSLT) mode.

In the LSHT mode, output torque and rotation speed values are equal to those of the conventional VIS 30 motor. In the HSLT mode motor displacement is reduced by one third, resulting in a fifty percent increase in rotation speed and a torque output reduction of one third.

The VIS 30 two-speed motor is bidirectional. It will function with equal shaft

output in either rotation direction (CW or CCW) in both LSHT and HSLT modes. Shift on the fly technology allows full-power operation throughout the full duration of the shift.

Changing between modes is accomplished by changing the displacement in a ratio of 1 to 1.5. An external two-position three-way control valve is required for shifting pressure to the pilot port between low pressure (LSHT mode) and pilot signal pressure (HSLT mode).

An integral selector valve shifts the motor from LSHT mode to HSLT mode. Initially, low pressure is supplied to the pilot port. The selector valve is biased to LSHT mode by a return

spring. When pilot signal pressure is supplied to the pilot port and 3,5 Δ bar [50 PSI] is reached, the selector valve overcomes return spring force and the shifts the spool to select HSLT mode.

Oil on the opposite side of the spool is drained to tank via the drain port. The pressure difference between the pilot port and drain port must be maintained to keep the motor in the high speed mode. When pilot pressure is removed from the pilot port, the pressure in the pilot end of the spool valve is relieved and drained back through the control valve and the return spring forces the spool valve to LSHT position.

Pilot pressure may come from any source that will provide uninterrupted pressure during the high-speed mode operation. Allowable pilot pressure must be at least 3,5 Δ bar [50 PSI] and may be as high as full operating pressure of the motor.

All VIS 30 Series two-speed motors are equipped with a return line shuttle for closed circuit applications as standard equipment. All options available on the conventional VIS 30 are also available on VIS 30 two-speed motors.

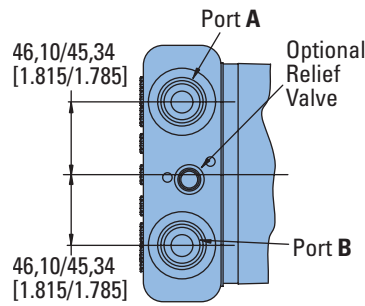
Performance Data

In the LSHT mode, torque and speed values are equal to those of the conventional VIS 30 motor (refer to single speed motor performance data.) In the HSLT mode, rotation speed is increased by fifty percent and torque output is reduced by one third. The VIS 30 Two-speed motor will function with equal shaft output in either rotation direction (CW or CCW) in both LSHT and HSLT modes.

VIS 30 Series Two-speed

Dimensions

Standard and Wheel Mount
– SAE



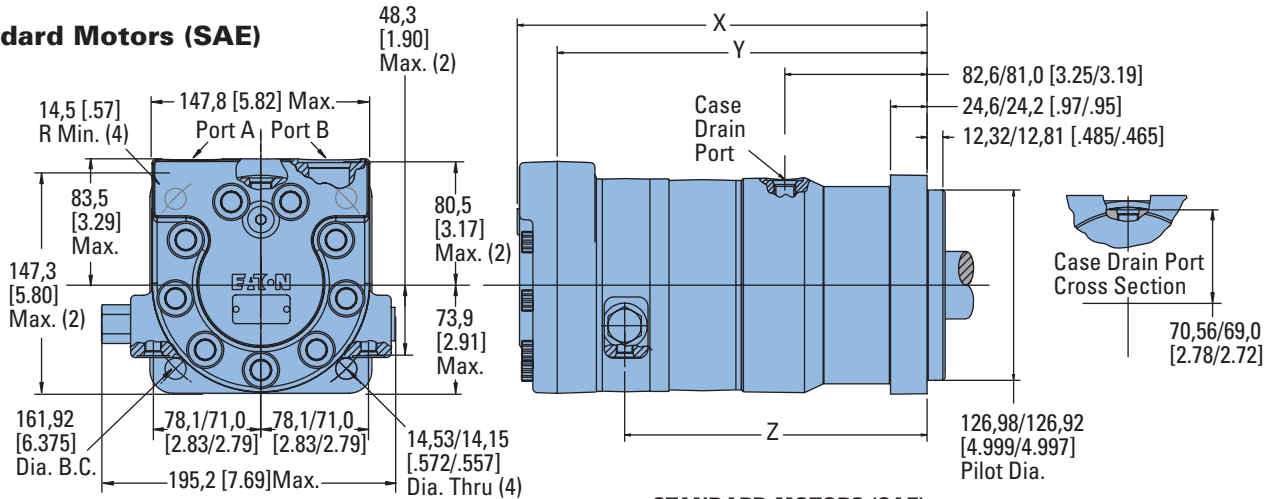
Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF -2B SAE O-ring Case Drain Port (1)
- 7/16-20 UNF -2B SAE O-ring Shift Ports (2)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW

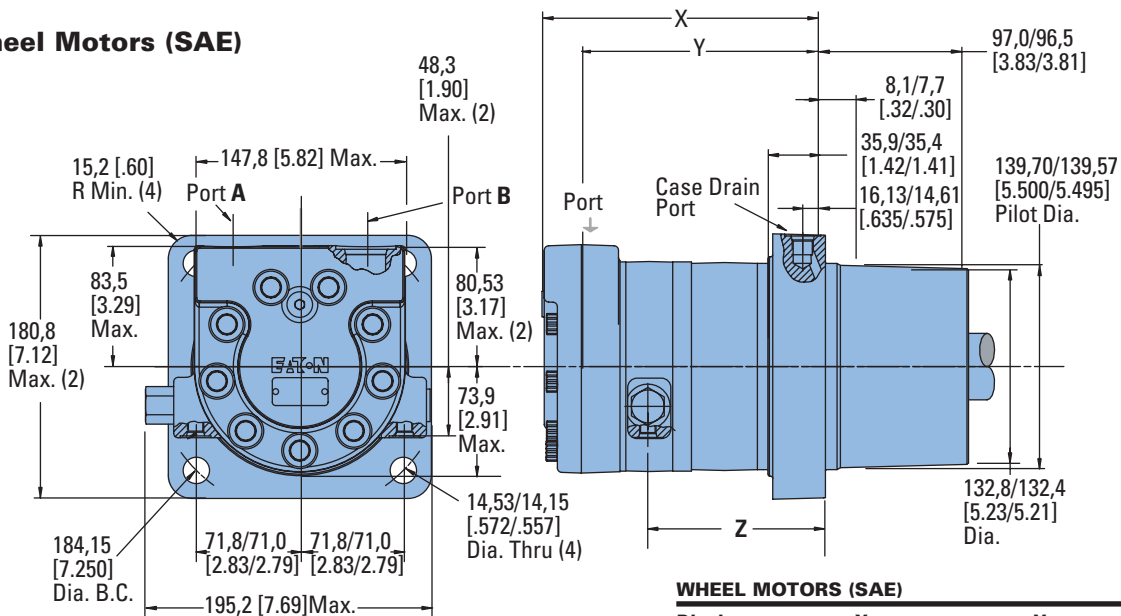
Standard Motors (SAE)



STANDARD MOTORS (SAE)

Displacement	X	Y	Z
cm ³ /r [in ³ /r]	mm [inch]	mm [inch]	mm [inch]
325 [19.8]	259,3 [10.21]	231,4 [9.11]	186,2 [7.33]
400 [24.4]	265,9 [10.47]	238,0 [9.37]	193,0 [7.60]
505 [30.7]	275,1 [10.83]	246,9 [9.72]	201,7 [7.94]
570 [34.9]	281,2 [11.07]	253,0 [9.96]	208,0 [8.19]

Wheel Motors (SAE)



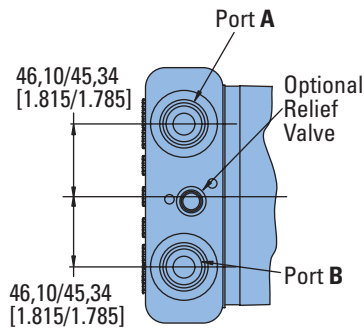
WHEEL MOTORS (SAE)

Displacement	X	Y	Z
cm ³ /r [in ³ /r]	mm [inch]	mm [inch]	mm [inch]
325 [19.8]	174,5 [6.87]	146,6 [5.77]	101,3 [3.99]
400 [24.4]	181,1 [7.13]	153,2 [6.03]	108,2 [4.26]
505 [30.7]	190,2 [7.49]	162,1 [6.38]	116,8 [4.60]
570 [34.9]	196,3 [7.73]	168,1 [6.62]	123,2 [4.85]

VIS 30 Series Two-speed

Dimensions

Standard and Wheel Mount
- ISO



Ports

G 3/4 (BSP) O-ring Ports (2)

G 1/4 (BSP) O-ring Case Drain Port (1)

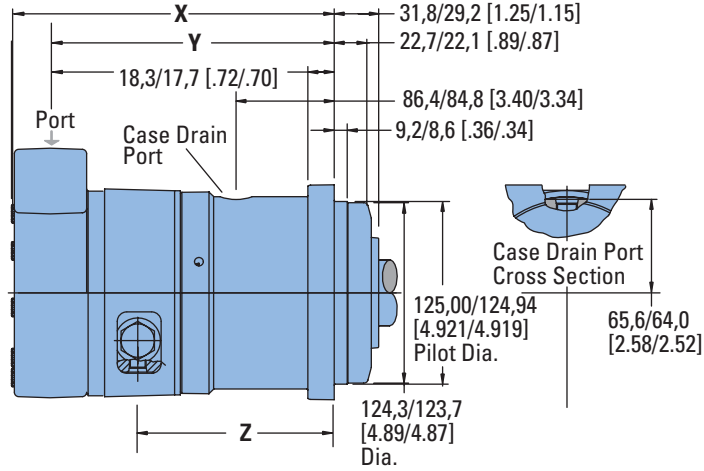
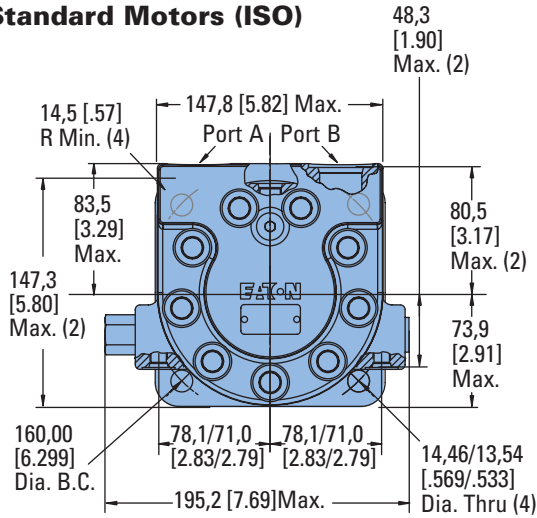
7/16 -20 UNF -2B SAE O-ring Shift Ports (2)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW

Port B Pressurized — CCW

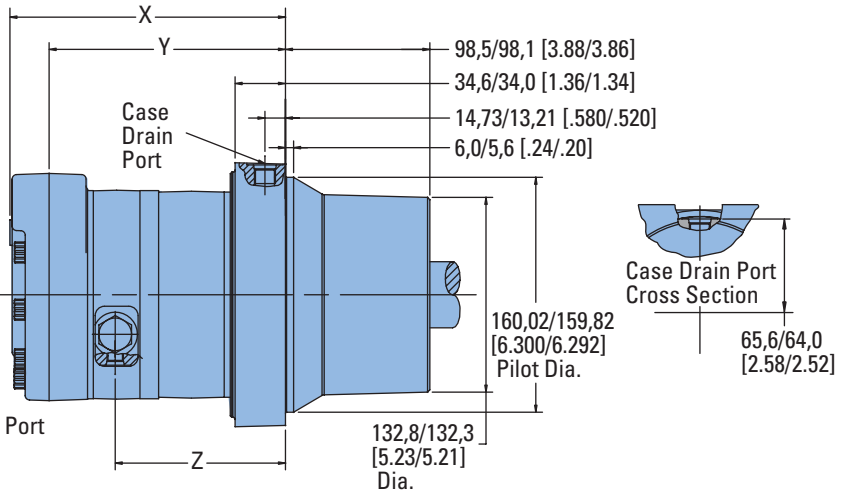
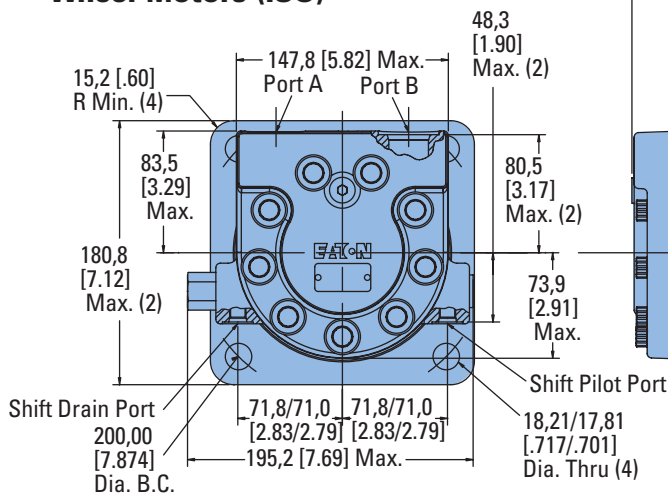
Standard Motors (ISO)



STANDARD MOTORS (ISO)

Displacement	X	Y	Z
cm ³ /r [in ³ /r]	mm [inch]	mm [inch]	mm [inch]
325 [19.8]	247,4 [9.74]	219,5 [8.64]	174,2 [6.86]
400 [24.4]	253,7 [9.99]	225,8 [8.89]	180,8 [7.12]
505 [30.7]	263,1 [10.36]	235,0 [9.25]	189,7 [7.47]
570 [34.9]	269,2 [10.60]	241,0 [9.49]	196,1 [7.72]

Wheel Motors (ISO)



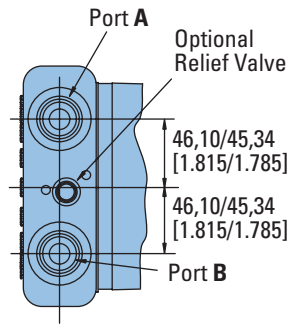
WHEEL MOTORS (ISO)

Displacement	X	Y	Z
cm ³ /r [in ³ /r]	mm [inch]	mm [inch]	mm [inch]
325 [19.8]	173,2 [6.82]	145,3 [5.72]	100,1 [3.94]
400 [24.4]	179,6 [7.07]	151,6 [5.97]	106,7 [4.20]
505 [30.7]	189,0 [7.44]	160,8 [6.33]	115,6 [4.55]
570 [34.9]	195,1 [7.68]	166,9 [6.57]	121,9 [4.80]

VIS 30 Series Two-speed

Dimensions

Bearingless

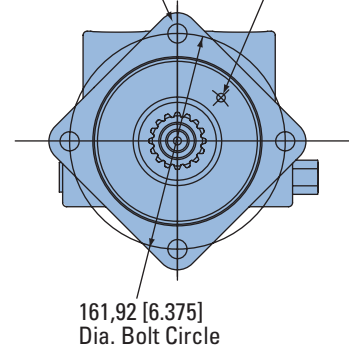
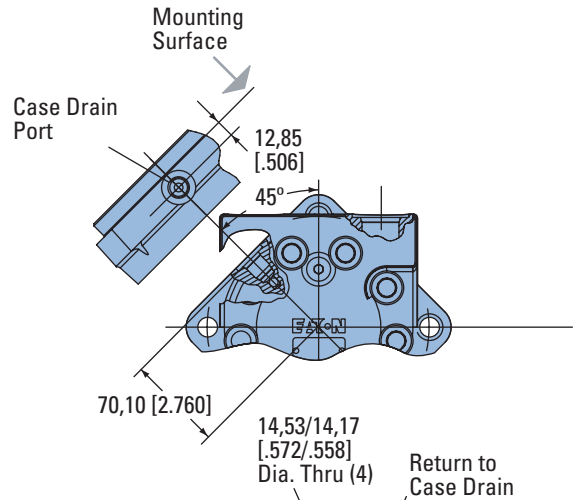
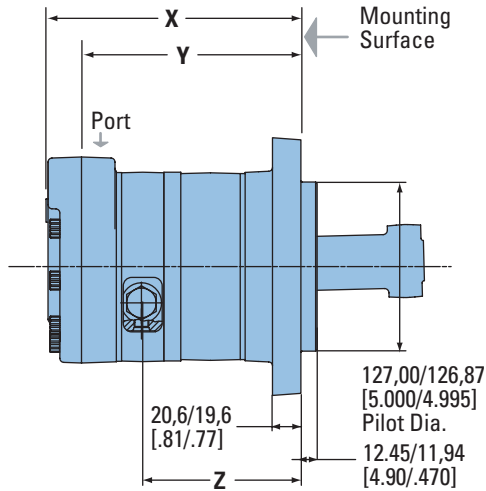


Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16-20 UNF -2B SAE O-ring Shift Ports (2)
- Or
- G 3/4 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)
- 7/16-20 UNF -2B SAE O-ring Shift Ports (2)

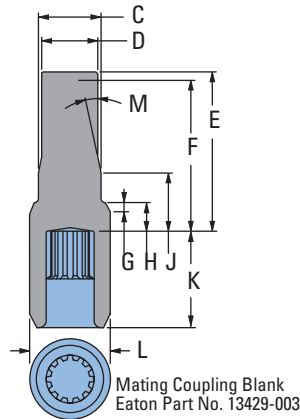
Standard Rotation Viewed from Drive End

- Port A Pressurized — CW
- Port B Pressurized — CCW



For VIS 30 bearingless motor application information, contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

- C 52,80 [2.08] Dia.
- D 49,00 [1.93] Dia.
- E 147,57 [5.81] Max.
- F 142,49 [5.61] Min. Full Form Dia.
- G 7,87 [.310] Max.
- H 17,27 [.680]
- J 33,30 [1.31]
- K 84,20 [3.315] Full Form Dia.
- L 69,60 [2.74]
- M 15

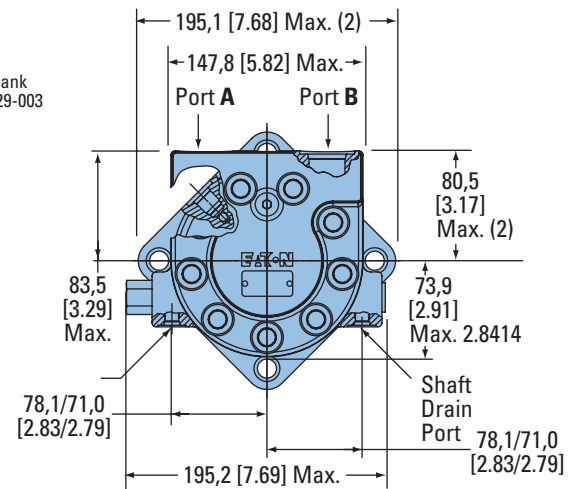


Note:

After machining blank, part must be hardened per Eaton specification.

BEARINGLESS MOTORS

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
325 [19.8]	177,0 [6.97]	149,1 [5.87]	103,9 [4.09]
400 [24.4]	183,6 [7.23]	155,7 [6.13]	110,7 [4.36]
505 [30.7]	193,0 [7.60]	164,8 [6.49]	119,6 [4.71]
570 [34.9]	199,1 [7.84]	170,9 [6.73]	126,0 [4.96]



VIS 30 Series Two-speed

Installation Information

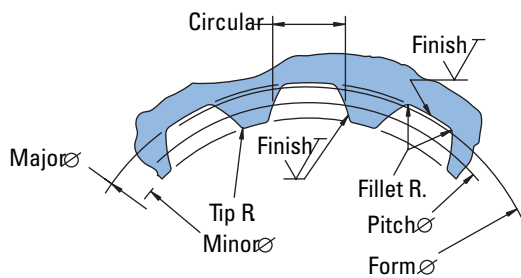
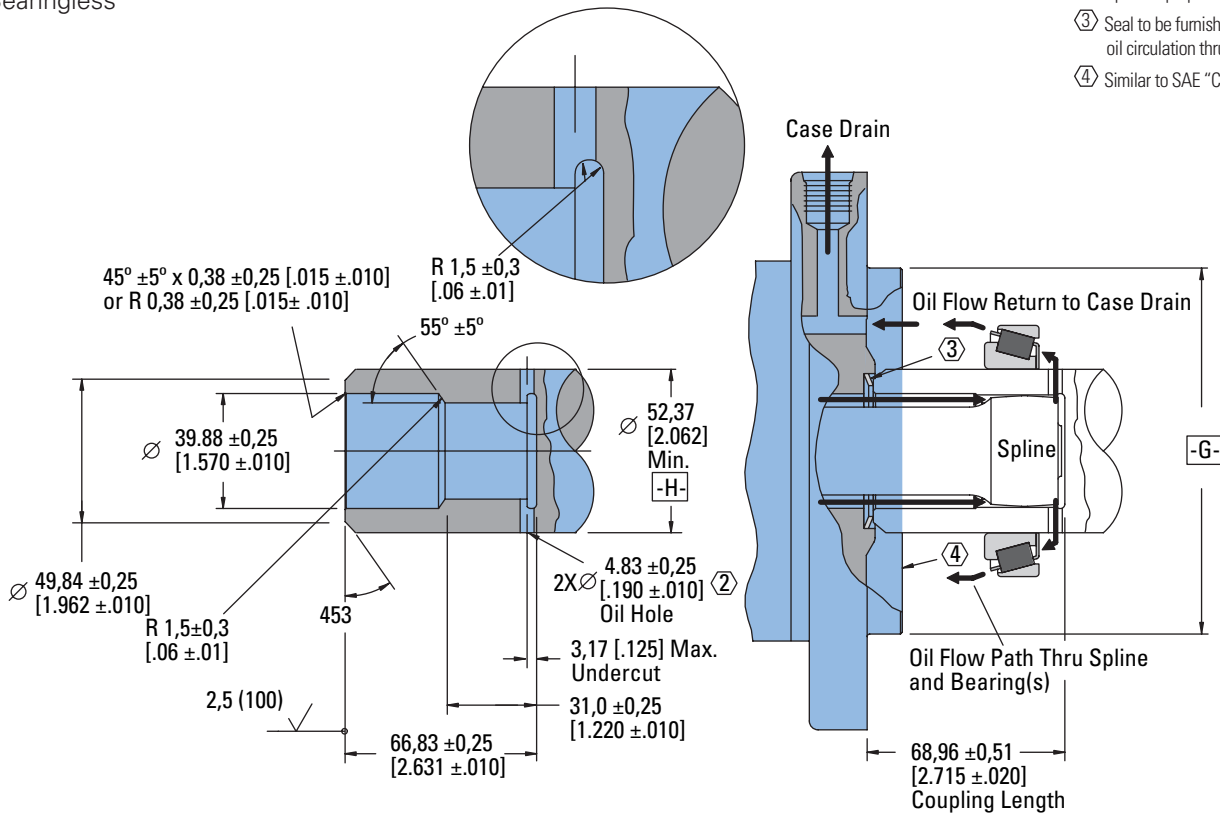
Bearingless

1 Internal spline in mating part to be per spline data. Specification material to be ASTM A304, 8620H carburize to a hardness of 60-64 HRC with case depth (to 50HRC) of 0,076 -1,27 [.030 -.050]. Dimensions apply after heat treat.

② Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.

③ Seal to be furnished with motor for proper oil circulation thru splines.

④ Similar to SAE "C" Four Bolt Flange.



Spline Pitch.....	8.5/17
Pressure Angle.....	30°
Number of teeth.....	12
Class of Fit.....	Ref. 5
Type of Fit.....	Side
Pitch Diameter.....	Ref. 35,858823 [1.4117647] $\text{C} \text{ } 0,20 \text{ } [0.008] \text{ } H$
Base Diameter.....	Ref. 31,054652 [1.2226241]
Major Diameter.....	39,17 [1.542] Max. 38,97 [1.534] Min.
Minor Diameter.....	33,30 -33,48 [1.311 -1.318]
Form Diameter, Min.....	38,33 [1.509]
Fillet Radius.....	0,64 -0,76 [0.025 -0.030]
Tip Radius.....	0,25 -0,51 [0.010 -0.020]
Finish.....	1,6 (63)
Involute Profile Variation.....	+0,000 -0,025 [+0.0000 -0.0010]
Total Index Variation.....	0,038 [0.0015]
Lead Variation.....	0,013 [0.0005]
Circular Space Width:	
Maximum Actual.....	5,898 [0.2322]
Minimum Effective.....	5,804 [0.2285]
Maximum Effective.....	Ref. 5,857 [0.2306]
Minimum Actual.....	Ref. 5,834 [0.2297]
Dimension Between Two Pins.....	Ref. 26,929 -27,084 [1.0602 -1.0663]
Pin Diameter.....	6,223 [0.2450] Pins to Have 4,0 [0.160]
Wide Flat for Root Clearance	

VIS 30 Series Two-speed

Product Numbers

Closed Loop

Use digit prefix —
171-, 172-, or 181- plus four
digit number from charts for
complete product number—
Example 171-0016.

**Orders will not be accepted
without three digit prefix.**

SAE

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER			
			325 [19.8]	400 [24.4]	505 [30.7]	570 [34.9]
Standard	40 mm Straight	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	172-0017	-0018	-0019	-0020
	1-1/2 inch 17 Tooth Splined	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	172-0021	-0022	-0023	-0024
	1-3/4 inch Tapered	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	172-0025	-0026	-0027	-0028
Wheel	40 mm Straight	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	181-0001	-0002	-0003	-0004
	1-1/2 inch 17 Tooth Splined	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	181-0005	-0006	-0007	-0008
	1-3/4 inch Tapered	1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	181-0009	-0010	-0011	-0012
Bearingless		1-1/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	171-0015	-0016	-0017	-0018

171-0016

ISO

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER			
			325 [19.8]	400 [24.4]	505 [30.7]	570 [34.9]
Standard	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	172-0029	-0030	-0031	-0032
	1-1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	172-0033	-0034	-0035	-0036
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	172-0037	-0038	-0039	-0040
Wheel	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	181-0013	-0014	-0015	-0016
	1-1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	181-0017	-0018	-0019	-0020
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	181-0021	-0022	-0023	-0024
Bearingless		G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	171-0019	-0020	-0021	-0022

171-0020

Note:

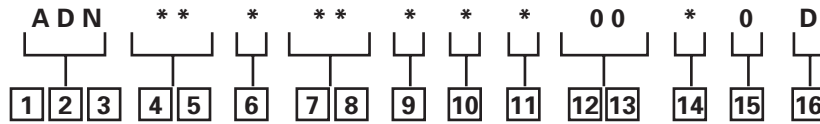
The product numbers on this page are for motors used in closed loop circuits. They include a back-pressure relief valve that is set at 4,5 bar [65 PSI].

- A case drain is required for all closed loop VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].

VIS 30 Series Two-speed

Model Code

The following 16-digit coding system has been developed to identify all of the configuration options for the VIS 30 two-speed motor. Use this model code to specify a motor with the desired features. All 16 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.



1, 2, 3 Product Series
ADN – VIS 30- Two-speed Motor

4, 5 Displacement
cm³/r [in³/r]

20 – 325 [19.8]
24 – 400 [24.4]
31 – 505 [30.7]
35 – 570 [34.9]

6 Mounting Type

A – 4 Bolt Bearingless 127,00 [5.000] Pilot Dia. with 12,19 [.480] Pilot Length and 14,35 [.565] Dia. Holes on 161,92 [6.375] Dia. Bolt Circle

B – 4 Bolt Wheel Mount 160 [6.3] Pilot Dia. with 5,8 [.23] Pilot Length and 18,00 [.709] Dia. Holes on 200,00 [7.874] Dia. Bolt Circle (ISO Compatible)

F – 4 Bolt Standard Mount (SAE CC) 127,00 [5.000] Pilot Dia. with 12,2 [.48] Pilot Length and 14,32 [.564] Dia. Holes on 161,92 [6.375] Dia. Bolt Circle

G – 4 Bolt Wheel Mount 139,7 [5.50] Pilot Dia. with 7,9 [.31] Pilot Length and 14,32 [.564] Dia. Holes on 184,15 [7.250] Dia. Bolt Circle (SAE Compatible)

H – 4 Bolt Standard Mount 125,0 [4.92] Pilot Dia. with 8,9 [.35] Pilot Length and 14,00 [.551] Dia. Holes on 160,00 [6.299] Dia. Bolt Circle (ISO Compatible)

7, 8 Output Shaft

00 – None (Bearingless)

01 – 45 mm Dia. 10:1 Tapered Shaft Per ISO R775 with M30 x 2- 6H Threaded Shaft End, 12W x 8H x 28L [.472W x .313H x 1.102L] Key

02 – 1-3/4 inch Dia. .125:1 Tapered Shaft Per SAE J 501 with 1-1/4-18 UNEF - 2A Threaded Shaft End, 11,11 [.4375] Square x 31,8 [1.25] Straight Key

07 – 40 mm Dia. Straight Shaft with M12 x 1,75 - 6H Thread in End, 12W x 8H x 63L [.472W x .313H x 2.480L] Key (SAE Compatible)

08 – 1-1/2 inch Dia. Flat Root Side Fit, 17 Tooth, 12/24 DP 30 Degree Involute Spline, 39,1 [1.54] Minimum Full Spline with 3/8-16 UNC - 2B Thread in End (SAE Compatible)

09 – 1-1/2 inch Dia. Flat Root Side Fit, 17 Tooth, 12/24 DP30 Degree Involute Spline, 56,6 [2.23] Minimum Full Spline with M12 x 1,75 - 6H Thread in End (ISO Compatible)

10 – 40 mm Dia. Straight Shaft with M12 x 1,75 - 6H Thread in End, 12W x 8H x 67L [.472W x .313H x 2.630L] Key (ISO Compatible)

9 Ports

A – 1-1/16-12 UN-2B Size 12 O-ring Port, Accepts Fittings for SAE J1926

B – G 3/4 (BSP) Straight Thread Port

10 Case Flow Options

A – Shuttle Valve with 9/16-18 UNF-2B, Size 6 O-ring Port Case Drain, Accepts Fittings for SAE J1926

B – Shuttle Valve with G 1/4 (BSP) Straight Thread Port Case Drain

11 Back-Pressure Relief

1 – Set at 4,5 bar [65 PSI] (for Manual Pumps)

2 – Set at 15,2 bar [220 PSI] (for Servo Pumps)

4 – Set at 15,2 bar [300 PSI] (for high charge Servo Pumps)

12, 13 Special Features

00 – None

14 Paint/ Special Packaging

0 – No Paint, Individual Box

A – Painted Low Gloss Black, Individual Box

B – No Paint, Bulk Box Option

C – Painted Low Gloss Black, Bulk Box Option

15 Eaton Assigned Code when Applicable

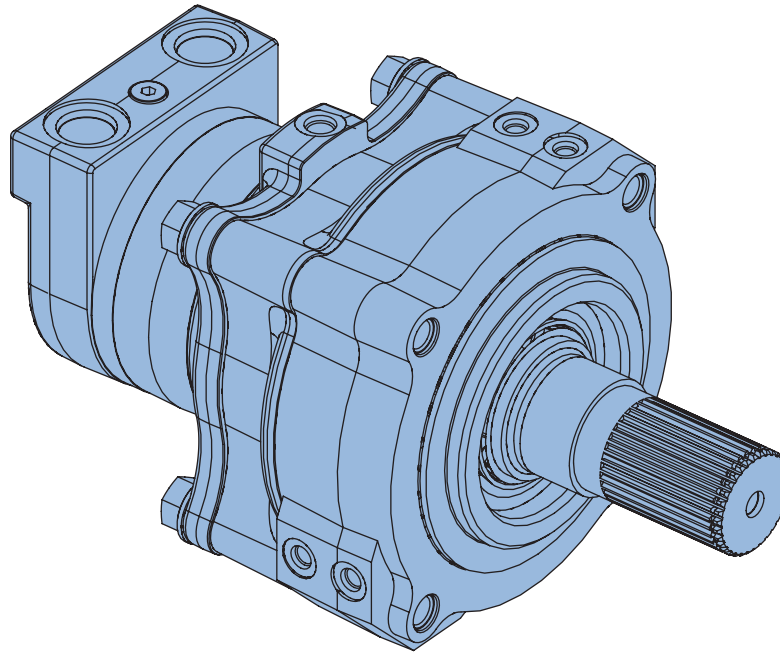
0 – Assigned Code

16 Eaton Assigned Design Code

E – Assigned Design Code

VIS 30 Series

Brake Description



Features

- Spring-Applied/ Hydraulically Released Multi-Disc Brake
- Spring automatically applies brake when hydrostatic pressure is absent
- Environmentally Protected
- Integral Design – Motor and brake as a single package to minimize length and cost.
- Infinite Braking – Eliminates machine creep associated with park pawl mechanisms
- Boost Feature – Increases holding capacity to match full motor output torque
- No adjustments needed
- Two Sets of Release and Boost Ports – Allows for multiple plumbing options and facilitates bleeding

Applications

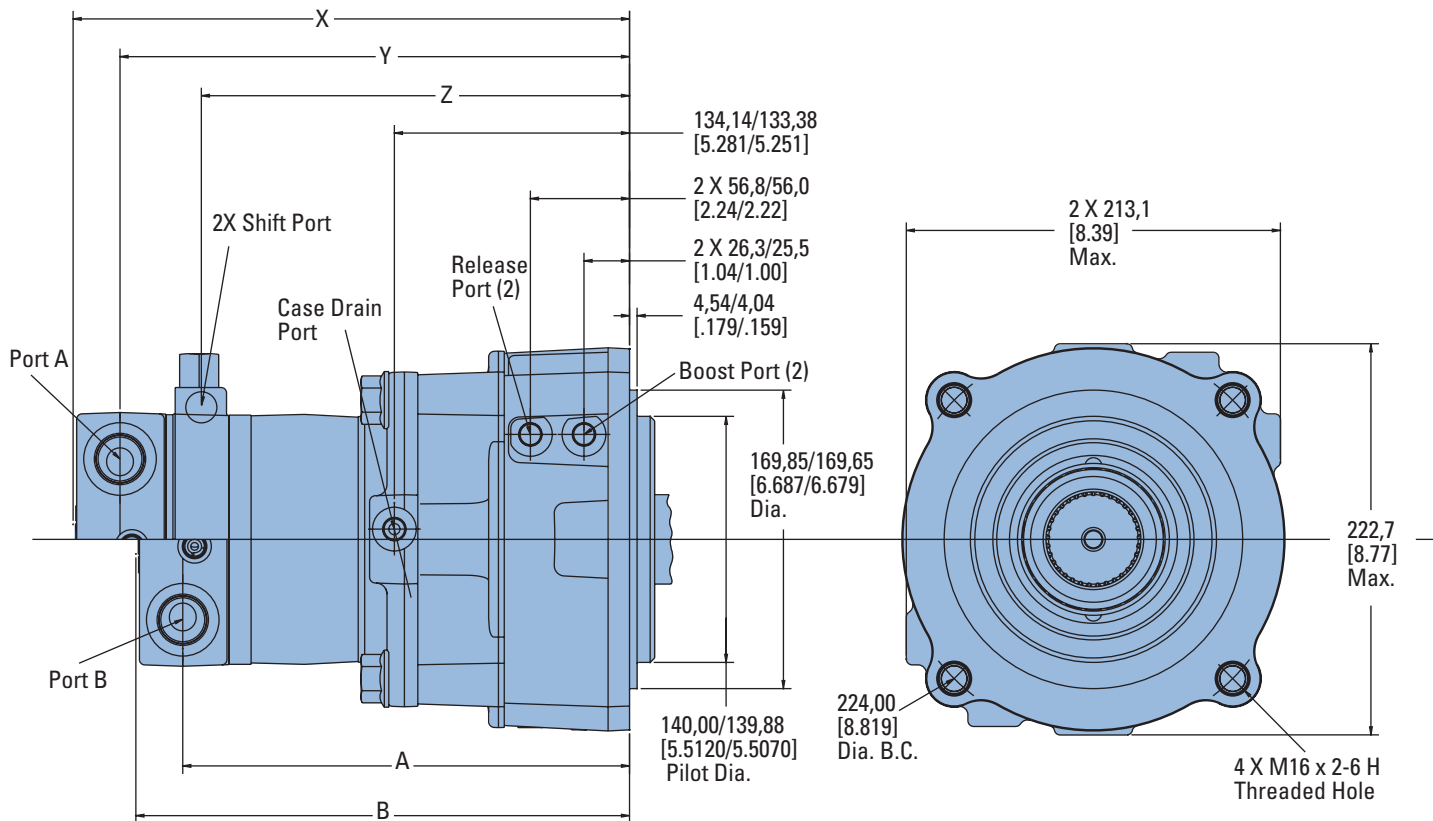
- Skid Steer Loaders
- Mini Excavators
- Trenchers
- Road Rollers
- Anywhere load-holding is needed on a Low-Speed High-Torque drive system

Specifications

- Static Holding Torque – 780 N-m [6900 lb-in] minimum (spring only - no boost) 2621 N-m [23200 lb-in] minimum (@ 10,3 bar [150 PSI] boost) 3570 N-m [31600 lb-in] minimum (@ 15,2 bar [220 PSI] boost)
- Release Pressure – 10,3 bar [150 PSI] minimum for full release 68,9 bar [1000 PSI] maximum allowed at release port
- Case Pressure – 1,4 bar [20 PSI] continuous 3,5 bar [50 PSI] maximum
- Boost Pressure – 15,2 bar [220 PSI] continuous 34,5 bar [500 PSI] maximum
- Speed – 360 RPM maximum
- Emergency – After 3 consecutive stops, brake to still meet parking requirement

VIS 30 Series

Brake Dimensions



BRAKE MOTORS (SINGLE-SPEED)

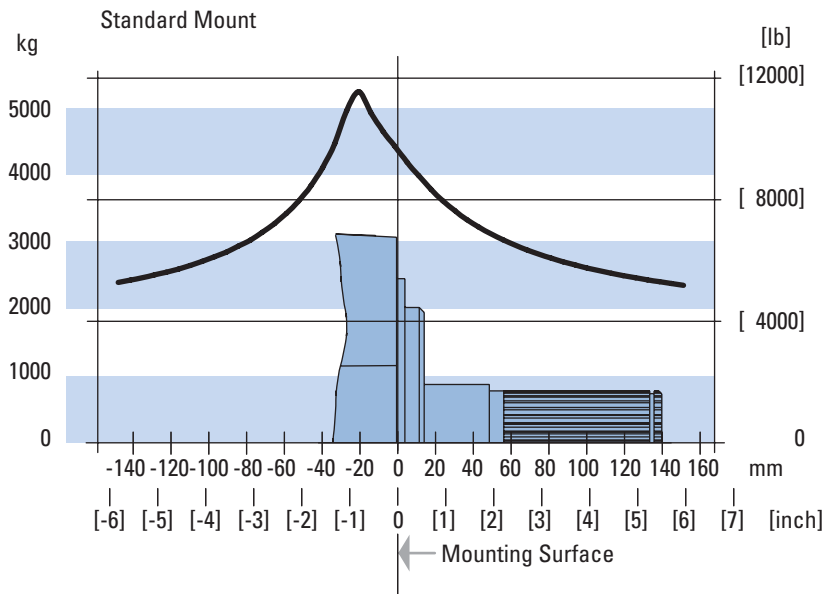
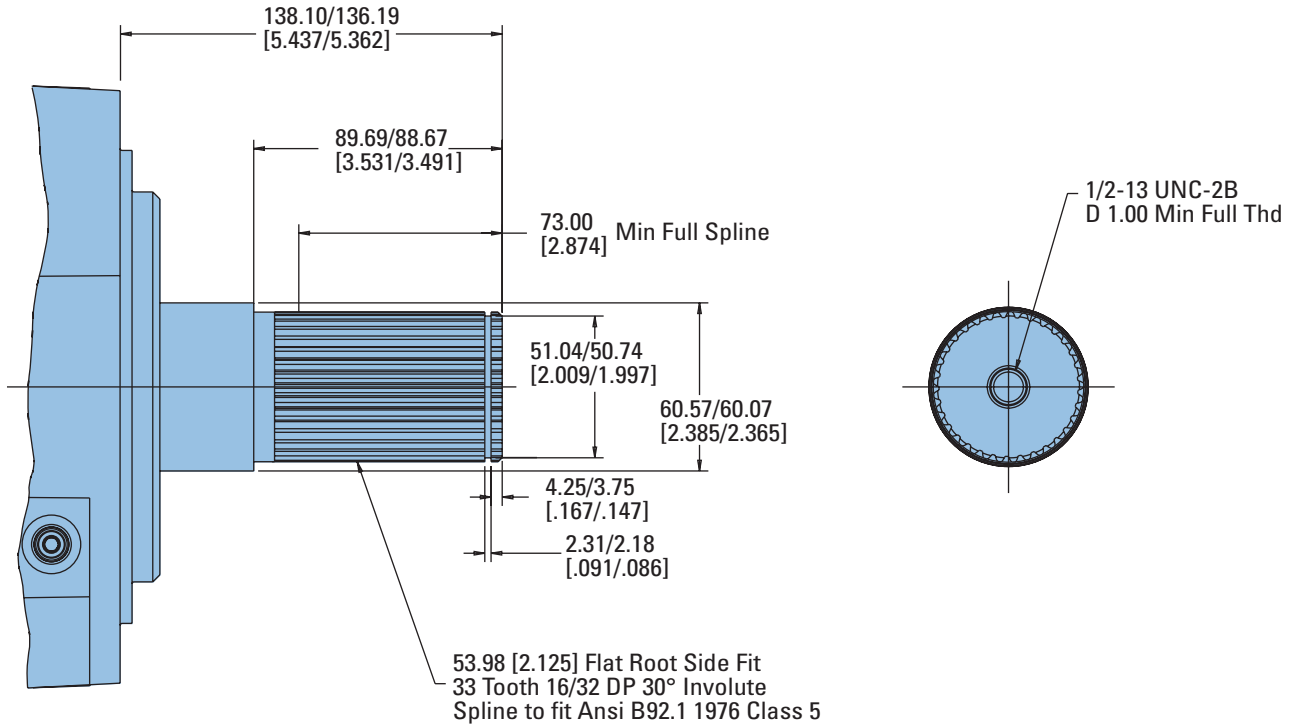
Displacement cm ³ /r [in ³ /r]	A mm [inch]	B mm [inch]
325 [19.8]	220,9 [8.78]	250,2 [9.85]
400 [24.4]	229,7 [9.05]	256,9 [10.11]
505 [30.7]	238,7 [9.40]	265,9 [10.47]
570 [34.9]	244,9 [9.64]	272,1 [10.71]

BRAKE MOTORS (TWO-SPEED)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
325 [19.8]	286,1 [11.26]	258,9 [10.20]	213,5 [8.41]
400 [24.4]	292,7 [11.52]	265,7 [10.46]	220,3 [8.67]
505 [30.7]	301,9 [11.88]	274,7 [10.82]	229,3 [9.03]
570 [34.9]	308,0 [12.12]	280,9 [11.06]	235,5 [9.27]

VIS 30 Series

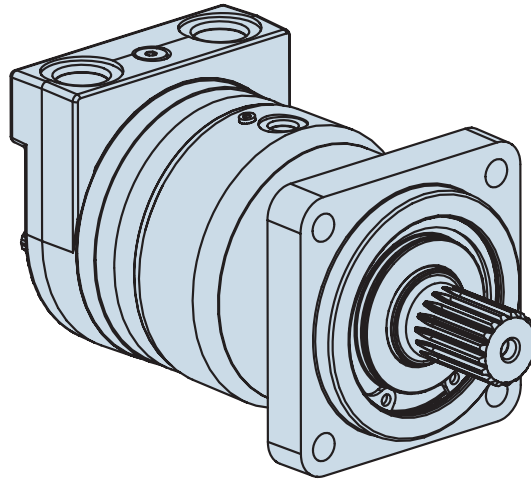
Brake Shaft Dimensions and Sideload Curves



Notes

VIS 40 Series

Highlights



Features

- Patented VIS Geroler technology
- Three moving components: (Geroler, star, drive, and output shaft)
- Maximized drive strength in compact package size
- Compact package size similar to VIS 30 Series.
- Two-piece pre-loaded pressure balance plate
- Variety of optional features including two-speed option, brake packages, and case flow solutions for both closed-loop and open-loop applications.

Description

The VIS 40 Series is the newest addition to the VIS product line. The VIS 40 is very close in size to the VIS 30, but with increased drive train strength, it has even greater torque capability. Maximum continuous output torque capability is rated to 2531 Nm [22,400 lb-in] with a displacement range from 505cc to 940cc per revolution. VIS 40 motors can be run up to 151 LPM [40 GPM] with pressure capability up to 310 bar (4500 PSI). The motor utilizes patented VIS technology with improved high-strength Geroler, optimized drive geometry, and two-piece pre-loaded balance plate for increased starting efficiency, reduced leakage and higher back pressure capacity. A wide variety of options are available including two-speed option, brake options and case flow options for both closed-loop and open loop applications.

Specifications

Geroler Element	6 Displacements
Flow l/min [GPM]	151 [40] Continuous*** 170 [45] Intermittent**
Speed	Up to 293 RPM
Pressure bar [PSI]	310 [4500] Cont.*** 345 [5000] Inter.** 380 [5500] Peak.*
Torque Nm [lb - in]	2531 [22400] Cont.*** 3165 [28000] Inter.**

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

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

* Peak— (Peak) Peak operation, 1% of every minute.

Benefits

- Extremely compact powerful package
- Increased torque capability
- Greatest horsepower density in the VIS motor line
- High efficiency
- Quiet, smooth operation
- Reliable, trouble-free performance
- Design Flexibility

Applications

- Skid Steer Loaders and Attachments
- Snow Removal Equipment
- Trenchers
- Grapples
- Rough Terrain Forklifts
- Wood Processing – Saw Mills & Chippers
- Metal Forming
- Entertainment / Amusement Rides
- Industrial Processing
- Harvesters



Skid Steer



Trencher



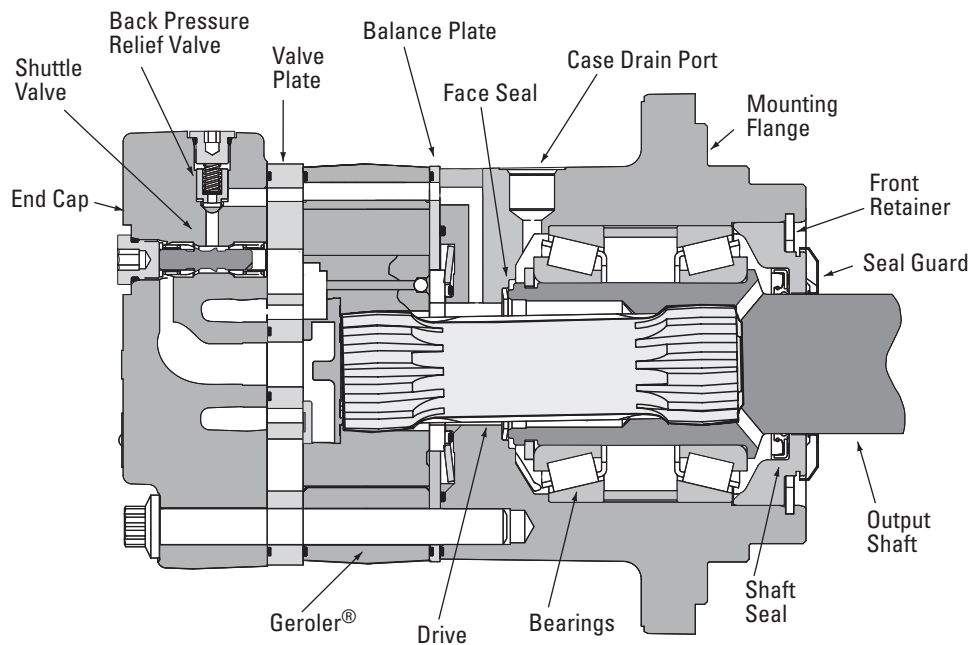
Digger



Port Equipment

VIS 40 Series

Specifications



SPECIFICATION DATA — VIS 40 MOTORS

Displ. cm ³ /r [in ³ /r]		505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Max. Speed (RPM) @ Flow	Continuous	279	244	221	204	177	148
	Intermittent	293	257	233	215	187	148
Flow l/min [GPM]	Continuous	151 [40]	151 [40]	151 [40]	151 [40]	151 [40]	151 [40]
	Intermittent	170 [45]	170 [45]	170 [45]	170 [45]	170 [45]	170 [45]
Torque Nm [lb - in]	Continuous	2240 [19829]	2531 [22400]	2531 [22400]	2531 [22400]	2531 [22400]	2531 [22400]
	Intermittent	2746 [21919]	2815 [24918]	3165 [28000]	3165 [28000]	3165 [28000]	3165 [28000]
Pressure Δ bar [Δ PSI]	Continuous	310 [4500]	279 [4040]	254 [3686]	235 [3389]	208 [3012]	171 [2489]
	Intermittent	345 [5000]	309 [4486]	315 [4574]	290 [4212]	254 [3682]	214 [3100]
	Peak	380 [5500]	380 [5500]	380 [5500]	380 [5500]	300 [4355]	250 [3621]
Weight kg [lb]	Standard or Wheel Mount	29,9 [66.0]	30,5 [67.2]	31,4 [68.2]	31,4 [69.2]	32,2 [71.0]	33,4 [73.6]
	Bearingless	17,7 [39.1]	18,3 [40.3]	18,7 [41.3]	19,2 [42.3]	20,0 [44.1]	21,2 [46.7]
Weight kg [lb]	Two-speed Standard or Wheel Mount	33,5 [73.9]	34,1 [75.1]	34,5 [76.1]	35,0 [77.1]	35,8 [78.9]	37,0 [81.5]
	Two-speed Bearingless	21,3 [47.0]	21,9 [48.2]	22,3 [49.2]	22,8 [50.2]	23,6 [52]	24,8 [54.6]

A simultaneous maximum torque and maximum speed NOT recommended.

Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

Maximum Inlet Pressure:

400 bar [5800 PSI]
Do Not Exceed A Pressure Rating (for displacement size see chart above).

Return Pressure (Back-Pressure):

Minimum – 3,5 bar [50 PSI]
Maximum – 21 bar [300 PSI]

Note:

Return (back-pressure) must be 3,5 bar [50 PSI] greater than the case pressure.

Δ Pressure:

The true Δ bar [Δ PSI] between inlet port and outlet port

Case Pressure:

Minimum – No Pressure
Maximum – 3,5 bar [50 PSI]

Note:

The case must be full when the motor is operating. A case drain is recommended.

Continuous Rating:

Motor may be run continuously at these ratings

Intermittent Operation:

10% of every minute

Peak Operation:

1% of every minute

Recommended Fluids:

Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 70 SUS at operating temperature.

Recommended Maximum System Operating Temp.:

82° C [180° F]

Recommended Filtration:

Per ISO Cleanliness Code, 4406: 20/18/13

Shuttle:

Standard

Back-Pressure Relief Valve:

Required for closed loop circuit.

VIS 40 Series

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

	Continuous
	Intermittent
	Will Operate at Reduced Life

505 cm³/r [30.7 in³/r]

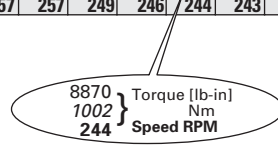
Δ Pressure Bar [PSI]

	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500
	15	35	70	105	140	170	205	240	275	310	345	380
4	1035	2169	4395	6592	8656	10735	12804	14773	16105	18043	19628	
	117	245	497	745	978	1213	1447	1669	1820	2039	2218	
15	29	29	29	29	28	28	27	27	25	24	23	
8	1055	2200	4445	6671	8855	11049	13225	15313	17473	19319	21368	23010
	119	249	502	754	1000	1248	1494	1730	1974	2183	2414	2600
30	60	59	58	56	55	54	53	52	50	48	45	42
12	1003	2190	4464	6730	8944	11155	13364	15520	17614	19648	21753	23640
	113	247	504	760	1011	1260	1510	1754	1990	2220	2458	2671
45	90	88	86	85	83	83	83	82	81	80	73	70
16	1069	2202	4422	6692	8901	11150	13367	15527	17694	19747	21833	23932
	121	249	500	756	1006	1260	1510	1754	1999	2231	2467	2704
61	120	118	117	115	112	110	108	108	107	104	100	98
20	1019	1938	4301	6833	8830	11117	13552	15431	17663	19829	21919	23783
	115	219	486	772	998	1256	1531	1743	1996	2240	2476	2687
76	150	148	145	144	140	138	136	135	134	131	129	127
25	843	1963	4363	6440	9083	11194	13207	15406	17473	19620	21765	23775
	95	222	493	728	1026	1265	1492	1741	1974	2217	2459	2686
95	188	185	183	180	179	173	172	171	168	165	164	160
30	226	1824	4039	6153	8375	10670	12892	15006	17199	19437	21645	23756
	26	206	456	695	946	1206	1457	1695	1943	2196	2446	2684
114	220	223	219	217	215	210	208	206	204	201	198	195
35	176	1774	3926	6140	8252	10494	12763	14868	17086	18959	20619	23294
	20	200	444	694	932	1186	1442	1680	1930	2142	2330	2632
132	255	259	255	253	250	244	243	240	238	234	228	228
40	142	864	3174	5542	7803	10089	12317	14391	16570	18779	20837	23162
	16	98	359	626	882	1140	1392	1626	1872	2122	2354	2617
151	293	292	284	279	277	277	277	276	274	271	267	263

570 cm³/r [34.9 in³/r]

Δ Pressure Bar [PSI]

	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500
	15	35	70	105	140	170	205	240	275	310	345	380
4	1177	2466	4996	7494	9841	12204	14556	16794	18308	20511	22313	
	133	279	564	847	1112	1379	1645	1897	2069	2317	2521	
15	26	26	26	25	24	24	24	24	22	21	20	
8	1199	2501	5053	7584	10067	12560	15034	17408	19864	21962	24292	26158
	135	283	571	857	1137	1419	1699	1967	2244	2481	2745	2955
30	52	52	51	50	48	48	47	46	44	42	40	37
12	1140	2489	5074	7650	10167	12681	15193	17644	20024	22336	24729	26874
	129	281	573	864	1149	1433	1717	1993	2262	2524	2794	3036
45	79	78	76	75	73	73	73	72	71	71	64	62
16	1216	2503	5027	7608	10119	12675	15195	17652	20115	22449	24820	27206
	137	283	568	860	1143	1432	1717	1994	2273	2536	2804	3074
61	106	104	103	101	99	96	95	95	94	92	88	86
20	1159	2203	4890	7768	10038	12638	15407	17542	20080	22542	24918	27037
	131	249	552	878	1134	1428	1741	1982	2269	2547	2815	3055
76	132	130	128	127	123	121	120	119	118	115	114	112
25	958	2231	4960	7321	10325	12725	15014	17513	19863	22305	24743	27027
	108	252	560	827	1167	1438	1696	1979	2244	2520	2796	3054
95	165	163	161	159	157	152	151	150	148	145	144	141
30	257	2074	4591	6994	9520	12130	14656	17059	19552	22096	24606	27006
	29	234	519	790	1076	1370	1656	1927	2209	2496	2780	3051
114	193	196	193	191	189	184	183	181	179	177	174	172
35	200	2017	4463	6980	9381	11930	14509	16902	19423	21553	23440	26481
	23	228	504	789	1060	1348	1639	1910	2195	2435	2648	2992
132	225	228	224	222	220	214	214	211	209	206	201	201
40	162	983	3608	6300	8870	11469	14002	16360	18837	21348	23688	26331
	18	111	408	712	1002	1296	1582	1848	2128	2412	2676	2975
151	257	257	249	246	244	243	244	243	241	238	234	232






VIS 40 Series

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

-  Continuous
-  Intermittent
-  Will Operate at Reduced Life

630 cm³/r [38.5 in³/r]
 Δ Pressure Bar [PSI]

Flow LPM [GPM]	630 cm³/r [38.5 in³/r] Δ Pressure Bar [PSI]													
	250 15	500 35	1000 70	1500 105	2000 140	2500 170	3000 205	3500 240	4000 275	4500 310	5000 345	5500 380		
4	1298 147 15	2720 307 23	5511 623 23	8267 934 23	10856 1227 22	13463 1521 22	16058 1814 22	18526 2093 22	20197 2282 20	22627 2556 19	24615 2781 18			
8	1323 149 30	2759 312 47	5575 630 46	8366 945 45	11105 1255 44	13856 1565 43	16585 1874 42	19204 2170 42	21913 2476 40	24227 2737 38	26797 3028 36	28856 3260 34		
12	1257 142 45	2746 310 70	5598 632 68	8439 954 68	11216 1267 67	13990 1581 67	16760 1894 67	19464 2199 65	22089 2496 65	24640 2784 64	27279 3082 58	29646 3350 56		
16	1341 152 61	2761 312 94	5546 627 93	8393 948 92	11163 1261 89	13982 1580 87	16763 1894 86	19472 2200 86	22190 2507 86	24765 2798 83	27381 3094 79	30012 3391 78		
20	1278 144 76	2430 275 118	5394 609 116	8569 968 115	11073 1251 112	13942 1575 110	16996 1920 108	19352 2186 108	22151 2503 107	24867 2810 104	27488 3106 103	29825 3370 102		
25	1057 119 95	2461 278 150	5471 618 148	8076 912 146	11390 1287 144	14038 1586 143	16563 1871 138	19320 2183 137	21912 2476 136	24605 2780 134	27295 3084 132	29815 3369 130		
30	283 32 114	2288 258 175	5065 572 177	7716 872 173	10502 1187 171	13381 1512 167	16167 1827 166	18819 2126 164	21569 2437 163	24375 2754 160	27145 3067 158	29792 3366 156		
35	221 25 132	2225 251 204	4923 556 207	7700 870 203	10349 1169 199	13160 1487 194	16006 1808 194	18646 2107 191	21427 2421 190	23776 2686 187	25858 2922 182	29212 3301 182		
40	178 20 151	1084 122 233	3980 450 233	6950 785 223	9785 1106 221	12652 1430 221	15446 1745 221	18048 2039 220	20780 2348 219	23551 2661 216	26132 2952 213	29047 3282 210		

685 cm³/r [41.7 in³/r]
 Δ Pressure Bar [PSI]

Flow LPM [GPM]	685 cm³/r [41.7 in³/r] Δ Pressure Bar [PSI]													
	250 15	500 35	1000 70	1500 105	2000 140	2500 170	3000 205	3500 240	4000 275	4500 310	5000 345	5500 380		
4	1406 159 15	2947 333 22	5969 674 22	8954 1012 21	11758 1328 20	14582 1647 20	17392 1965 20	20066 2267 20	21875 2472 19	24507 2769 18	26661 3012 17			
8	1433 162 30	2989 338 43	6038 682 43	9062 1024 42	12028 1359 40	15007 1696 40	17964 2030 39	20800 2350 39	23734 2682 37	26241 2965 35	29025 3279 33	31254 3531 31		
12	1362 154 45	2974 336 65	6063 685 63	9141 1033 63	12148 1373 61	15152 1712 61	18153 2051 61	21082 2382 60	23925 2703 60	26688 3015 59	29547 3338 54	32110 3628 52		
16	1453 164 61	2991 338 88	6007 679 87	9090 1027 86	12090 1366 85	15145 1711 83	18156 2051 81	21091 2383 80	24034 2715 80	26823 3031 79	29656 3351 77	32506 3673 73		
20	1384 156 76	2632 297 109	5842 660 107	9281 1049 106	11994 1355 103	15100 1706 102	18408 2080 100	20960 2368 99	23992 2711 99	26934 3043 96	29773 3364 95	32304 3650 94		
25	1145 129 95	2666 301 136	5926 670 135	8748 988 133	12337 1394 132	15205 1718 128	17939 2027 126	20926 2364 126	23733 2681 124	26650 3011 122	29563 3340 120	32293 3649 118		
30	307 35 114	2478 280 164	5486 620 161	8357 944 160	11375 1285 158	14493 1637 154	17511 1978 153	20383 2303 152	23361 2639 150	26401 2983 148	29401 3322 146	32268 3646 144		
35	239 27 132	2410 272 188	5332 602 188	8340 942 186	11209 1266 184	14254 1610 179	17337 1959 179	20196 2282 177	23207 2622 175	25752 2910 172	28007 3164 168	31640 3575 168		
40	193 22 151	1174 133 215	4311 487 209	7527 850 206	10598 1197 204	13704 1548 204	16730 1890 204	19548 2209 203	22507 2543 202	25508 2882 199	28304 3198 196	31461 3555 194		

10598
1197
204 } Torque [lb-in]
Nm
Speed RPM




VIS 40 Series

785 cm³/r [48.0 in³/r]
 Δ Pressure Bar [PSI]

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

-  Continuous
-  Intermittent
-  Will Operate at Reduced Life

	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
	15	35	70	105	140	170	205	240	275	310	345
4	1618	3392	6871	10306	13535	16784	20020	23097	25180	28210	30689
	183	383	776	1164	1529	1896	2262	2610	2845	3187	3467
15	19	19	19	18	18	18	17	17	16	15	15
8	1649	3440	6950	10431	13845	17275	20678	23942	27320	30205	33410
	186	389	785	1178	1564	1952	2336	2705	3087	3413	3775
30	38	38	37	36	35	35	34	34	32	31	29
12	1568	3423	6979	10522	13984	17441	20895	24267	27540	30720	34011
	177	387	789	1189	1580	1971	2361	2742	3112	3471	3843
45	57	56	55	54	53	53	53	52	52	51	47
16	1672	3443	6914	10464	13917	17433	20899	24277	27665	30876	34137
	189	389	781	1182	1572	1970	2361	2743	3126	3488	3857
61	77	76	75	74	72	70	69	69	69	67	64
20	1593	3030	6725	10683	13805	17382	21190	24127	27617	31003	34271
	180	342	760	1207	1560	1964	2394	2726	3120	3503	3872
76	96	95	93	92	89	88	87	86	86	84	83
25	1318	3069	6821	10069	14201	17502	20649	24087	27319	30677	34030
	149	347	771	1138	1604	1977	2333	2721	3087	3466	3845
95	120	118	117	115	114	111	110	109	107	106	105
30	353	2852	6315	9620	13094	16683	20157	23463	26891	30390	33843
	40	322	713	1087	1479	1885	2277	2651	3038	3434	3824
114	141	142	140	139	137	134	133	132	130	129	127
35	275	2774	6138	9600	12903	16408	19956	23247	26714	29643	32238
	31	313	693	1085	1458	1854	2255	2627	3018	3349	3642
132	163	166	163	162	160	156	155	154	152	150	146
40	222	1351	4962	8665	12200	15774	19257	22501	25908	29362	32580
	25	153	561	979	1378	1782	2176	2542	2927	3317	3681
151	187	187	181	179	177	177	177	177	175	173	170

940 cm³/r [57.4 in³/r]
 Δ Pressure Bar [PSI]

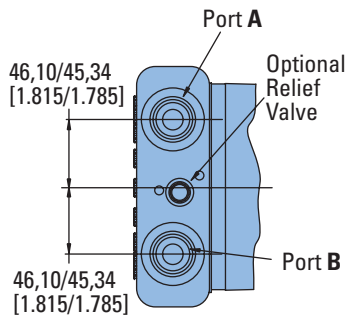
	250	500	1000	1500	2000	2500	3000	3500	4000
	15	35	70	105	140	170	205	240	275
4	1935	4056	8216	12325	16185	20071	23940	27620	30111
	219	458	928	1393	1829	2268	2705	3121	3402
15	16	16	16	16	15	15	15	14	14
8	1972	4114	8311	12473	16557	20658	24727	28631	32670
	223	465	939	1409	1871	2334	2794	3235	3691
30	32	31	31	30	29	29	28	28	27
12	1875	4094	8346	12582	16722	20857	24987	29019	32933
	212	463	943	1422	1889	2357	2823	3279	3721
45	48	47	46	45	45	45	45	44	43
16	2000	4117	8268	12513	16642	20846	24992	29032	33083
	226	465	934	1414	1880	2355	2824	3280	3738
61	64	63	62	62	60	59	58	58	57
20	1905	3623	8042	12776	16509	20786	25339	28851	33025
	215	409	909	1443	1865	2348	2863	3260	3731
76	80	79	78	77	75	74	73	72	72
25	1576	3670	8157	12041	16982	20929	24693	28804	32669
	178	415	922	1360	1919	2365	2790	3254	3691
95	100	99	98	96	96	93	92	91	90
30	423	3411	7551	11504	15658	19950	24104	28057	32157
	48	385	853	1300	1769	2254	2723	3170	3633
114	118	119	117	116	115	112	111	110	109
35	329	3317	7340	11480	15429	19621	23864	27799	31945
	37	375	829	1297	1743	2217	2696	3141	3609
132	137	139	136	135	133	130	130	128	127
40	266	1616	5934	10361	14589	18863	23029	26907	30982
	30	183	670	1171	1648	2131	2602	3040	3500
151	156	156	152	149	148	148	148	148	147

5934 } Torque [lb-in]
 670 } Nm
 152 } Speed RPM

VIS 40 Series

Dimensions

Standard and Wheel Mount
- SAE



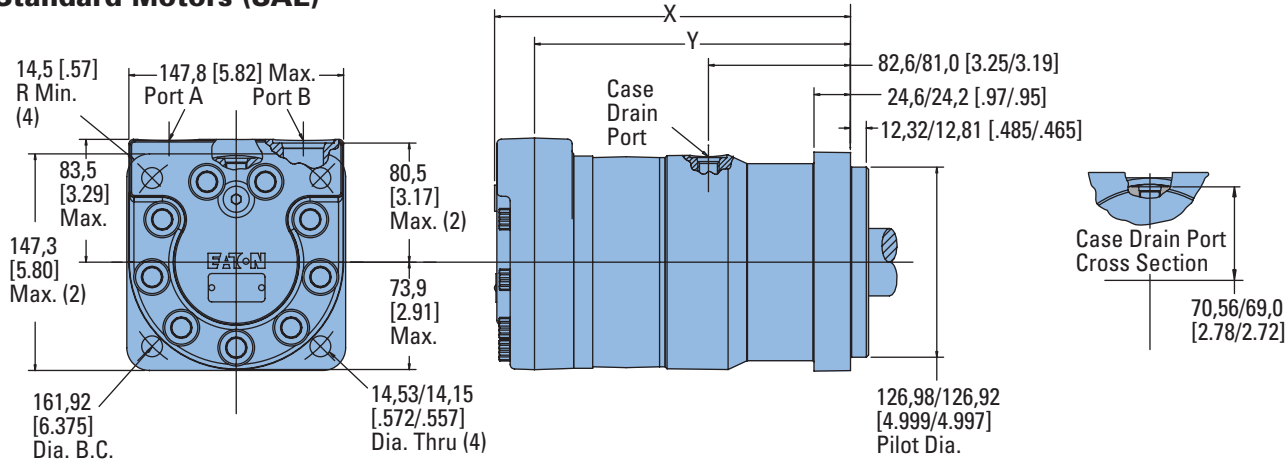
Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW

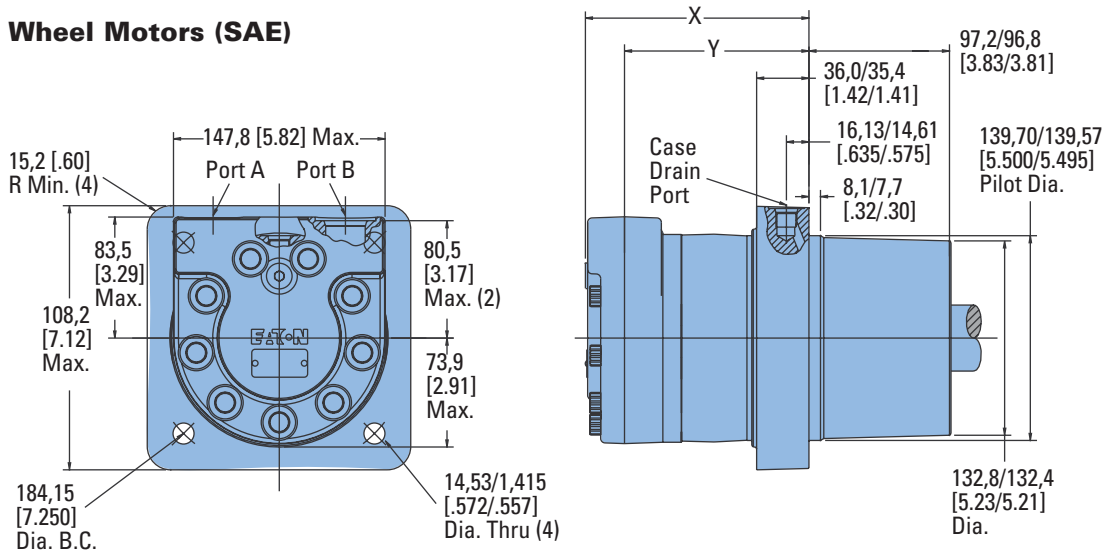
Standard Motors (SAE)



STANDARD MOTORS (SAE)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
505 [30.7]	239,3 [9.42]	211,1 [8.31]
570 [34.9]	245,4 [9.66]	217,2 [8.55]
630 [38.5]	250,7 [9.87]	222,5 [8.76]
685 [41.7]	255,3 [10.05]	227,1 [8.94]
785 [48.0]	264,7 [10.42]	236,2 [9.30]
940 [57.4]	278,4 [10.96]	249,9 [9.84]

Wheel Motors (SAE)



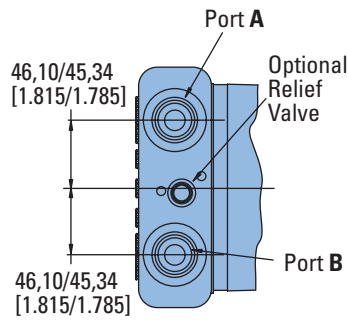
WHEEL MOTORS (SAE)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
505 [30.7]	154,4 [6.08]	126,2 [4.97]
570 [34.9]	160,5 [6.32]	132,3 [5.21]
630 [38.5]	165,9 [6.53]	137,7 [5.42]
685 [41.7]	170,4 [6.71]	142,2 [5.60]
785 [48.0]	179,8 [7.08]	151,4 [5.96]
940 [57.4]	193,5 [7.62]	165,1 [6.50]

VIS 40 Series

Dimensions

Oversize Flange
224,0 [8.82] B.C.

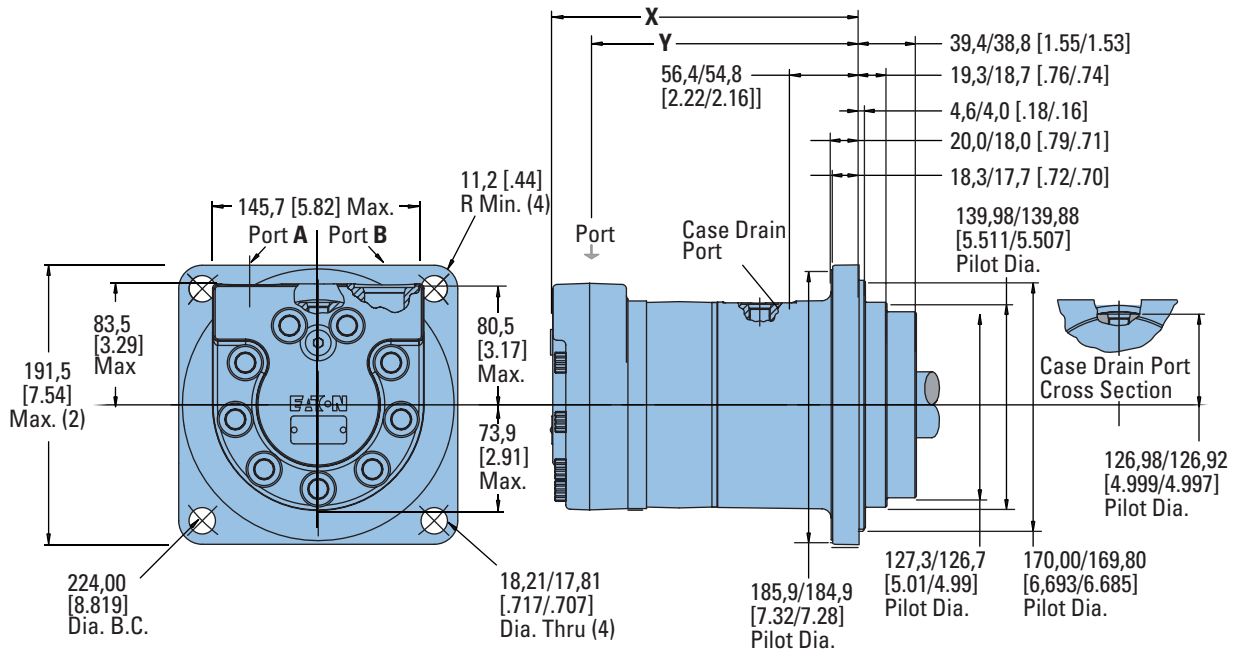


Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW



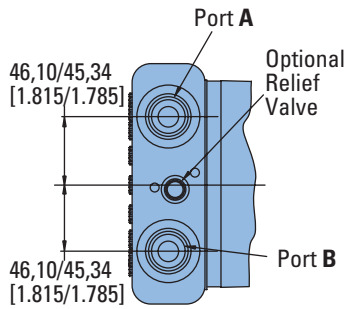
STANDARD MOTORS (OVERSIZE)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
505 [30.7]	213,1 [8.39]	181,4 [8.36]
570 [34.9]	219,2 [8.63]	187,4 [8.60]
630 [38.5]	224,5 [8.84]	192,5 [8.81]
685 [41.7]	229,1 [9.02]	197,6 [8.99]
785 [48.0]	238,5 [9.39]	206,8 [9.35]
940 [57.4]	252,0 [9.92]	220,5 [9.89]

VIS 40 Series

Dimensions

Standard and Wheel Mount
- ISO



Ports

G 3/4 (BSP) O-ring Ports (2)

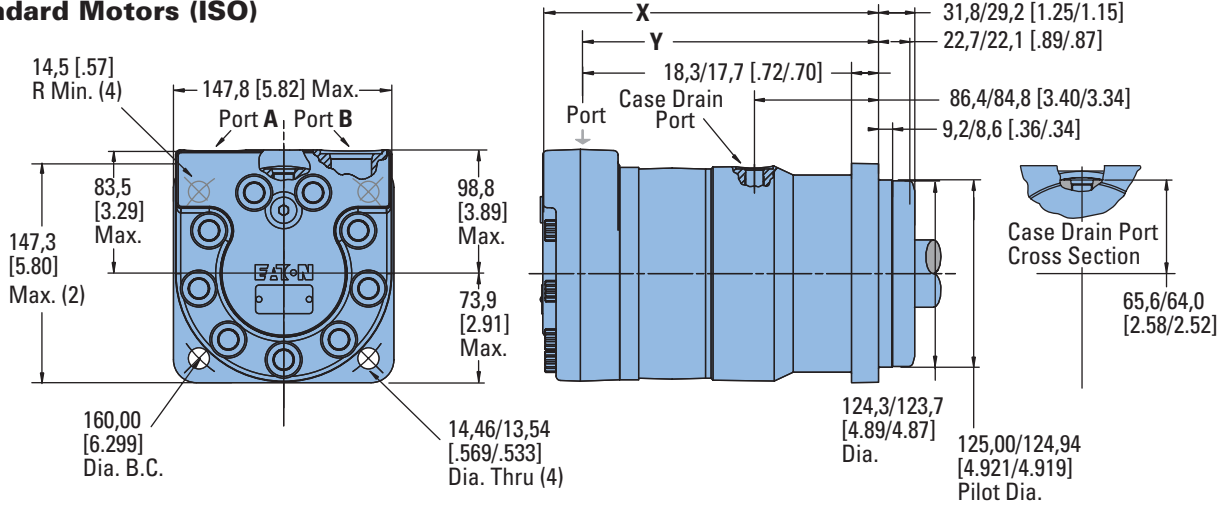
G 1/4 (BSP) O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW

Port B Pressurized — CCW

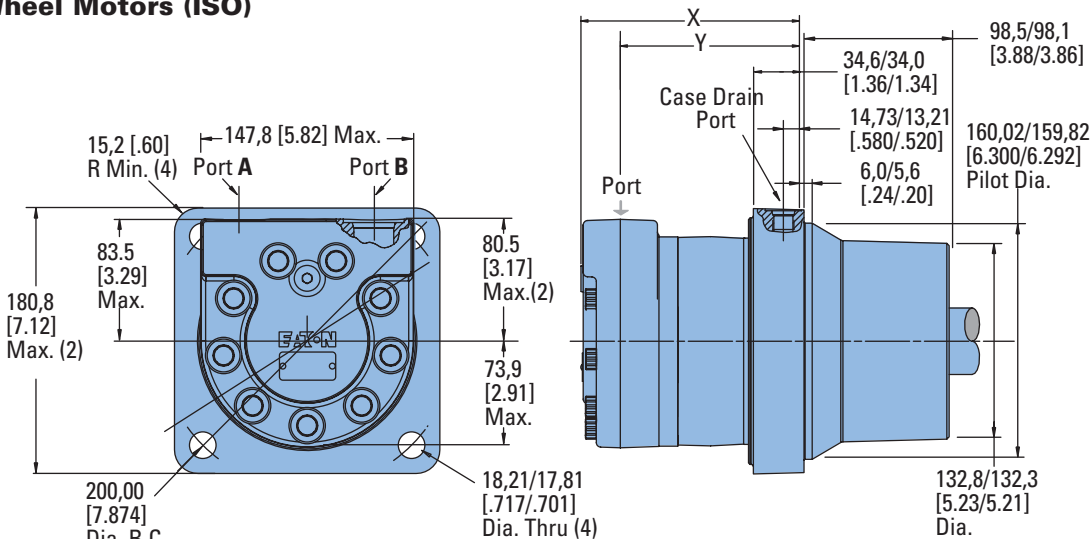
Standard Motors (ISO)



STANDARD MOTORS (ISO)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
505 [30.7]	227,3 [8.95]	198,9 [7.83]
570 [34.9]	233,4 [9.19]	205,2 [8.08]
630 [38.5]	238,8 [9.40]	210,3 [8.28]
685 [41.7]	243,3 [9.58]	214,9 [8.46]
785 [48.0]	252,5 [9.94]	224,3 [8.83]
940 [57.4]	266,2 [10.48]	238,0 [9.37]

Wheel Motors (ISO)



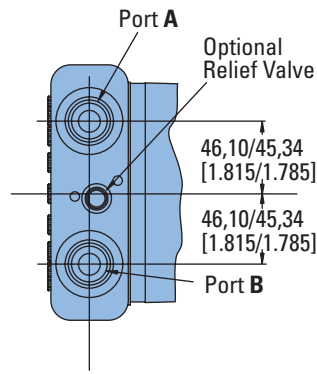
WHEEL MOTORS (ISO)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
505 [30.7]	153,2 [6.03]	124,7 [4.91]
570 [34.9]	159,3 [6.27]	131,1 [5.16]
630 [38.5]	164,6 [6.48]	136,1 [5.36]
685 [41.7]	169,2 [6.66]	140,7 [5.54]
785 [48.0]	178,3 [7.02]	150,1 [5.91]
940 [57.4]	192,0 [7.56]	163,8 [6.45]

VIS 40 Series

Dimensions

Bearingless

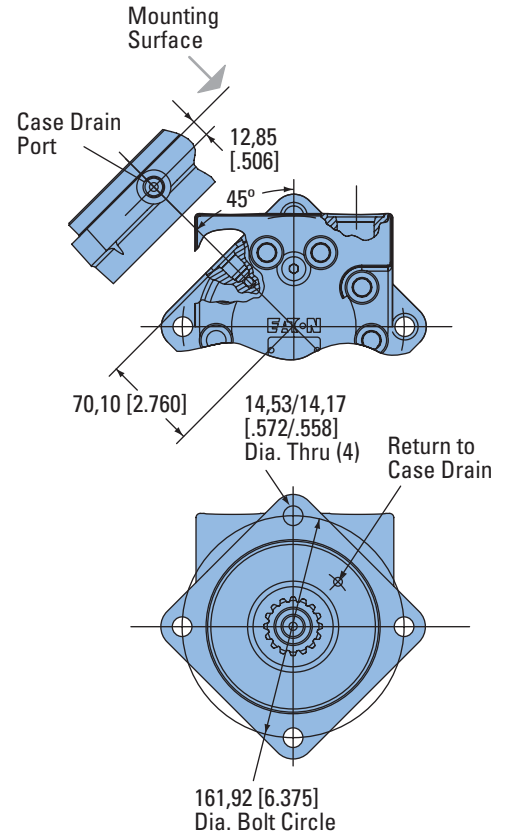
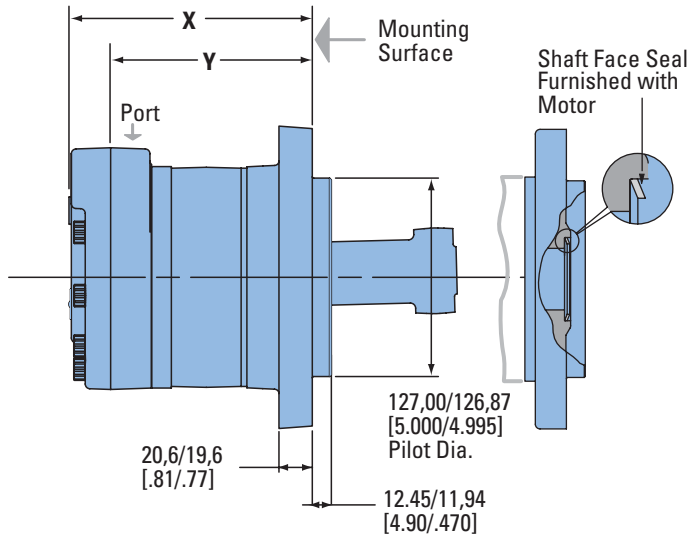


Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- Or
- G 3/4 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)

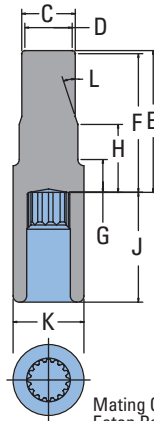
Standard Rotation Viewed from Drive End

- Port A Pressurized — CW
- Port B Pressurized — CCW



For VIS 40 bearingless motor application information, contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

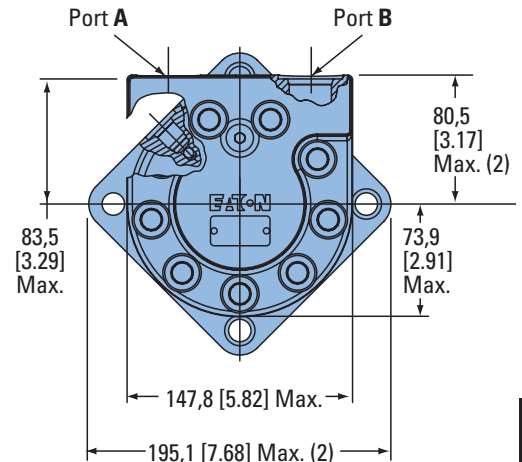
- C 59,94 [2.36] Dia.
- D 49,00 [1.93] Dia.
- E 155,86 [6.14] Max.
- F 150,88 [5.94] Min.
- Full Form Dia.
- G 26,92 [1.06]
- H 33,30 [1.21]
- J 106,43 [4.19]
- Full Form Dia.
- K 72,64 [2.86]
- L 15



Mating Coupling Blank
Eaton Part No. 13280-002

Note:

After machining blank, part must be hardened per Eaton specification.



BEARINGLESS MOTORS

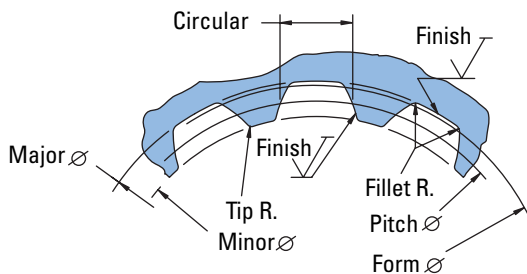
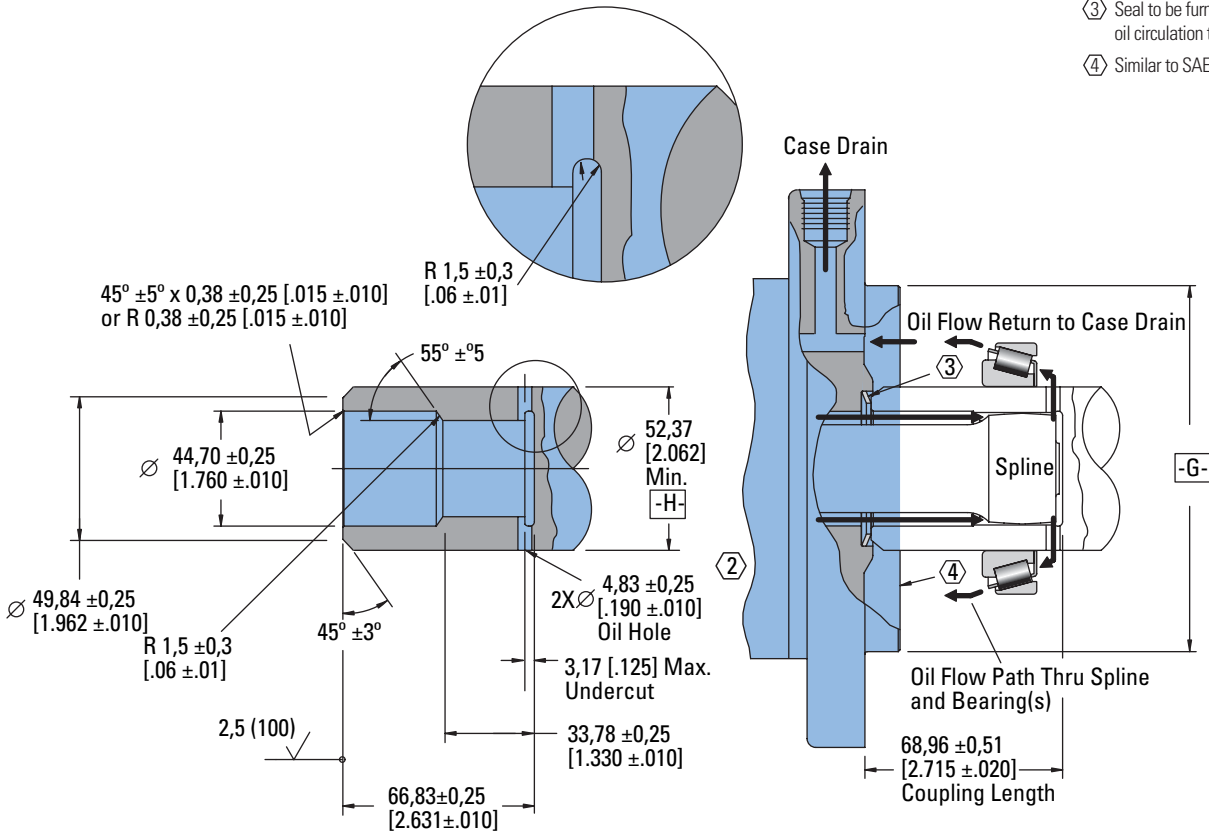
Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
505 [30.7]	157,2 [6.19]	129,0 [5.08]
570 [34.9]	163,3 [6.43]	135,1 [5.32]
630 [38.5]	168,4 [6.63]	140,5 [5.53]
685 [41.7]	173,2 [6.82]	145,3 [5.72]
785 [48.0]	182,2 [7.18]	154,4 [6.08]
940 [57.4]	196,1 [7.72]	168,1 [6.62]

VIS 40 Series

Installation Information

Bearingless

- 1 Internal spline in mating part to be per spline data. Specification material to be ASTM A304, 8620H carburize to a hardness of 60-64 HRc with case depth (to 50HRc) of 0,076 -1,27 [.030 -.050]. Dimensions apply after heat treat.
- 2 Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.
- 3 Seal to be furnished with motor for proper oil circulation thru splines.
- 4 Similar to SAE "C" Four Bolt Flange.



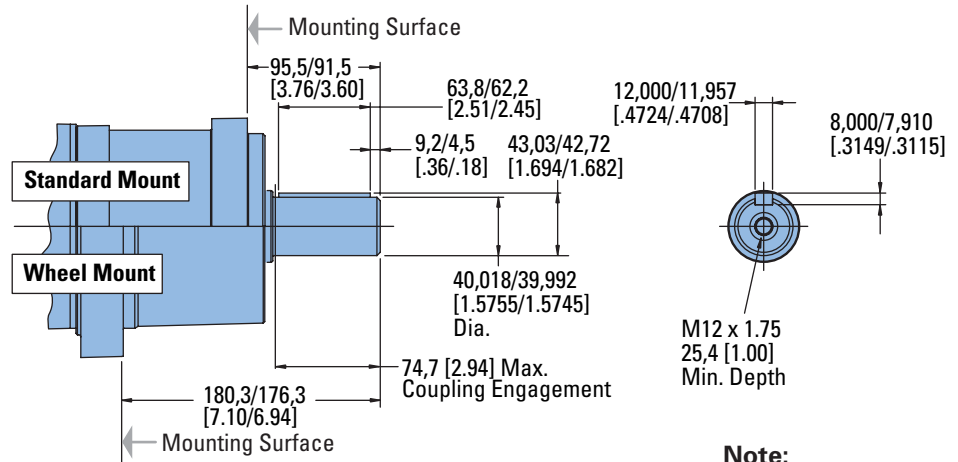
Spline Pitch.....	10/20
Pressure Angle.....	30°
Number of teeth.....	16
Class of Fit.....	Ref. 5
Type of Fit.....	Side
Pitch Diameter.....	Ref. 40,640000 [1.6000000] $\text{Ⓢ} 0,20 [0.008] H$
Base Diameter.....	Ref. 35,195272 [1.3856406]
Major Diameter.....	43,56 [1.715] Max. 43,18 [1.700]
Min. Minor Diameter.....	36,83 -37,08 [1.450 -1.460]
Form Diameter, Min.	42.47 [1.672]
Fillet Radius.....	0,64 -0,76 [.025 -.030]
Tip Radius.....	0,25 -0,51 [.010 -.020]
Finish.....	1,6 (63)
Involute Profile Variation.....	+0,000 -0,025 [+0.0000 -.0010]
Total Index Variation.....	0,040 [.0016]
Lead Variation.....	0,013 [.0005]
Circular Space Width:	
Maximum Actual.....	4.105 [.1616]
Minimum Effective.....	3,995 [.1573]
Maximum Effective.....	Ref. 4,056 [.1597]
Minimum Actual.....	Ref. 4,081 [.1582]
Dimension Between Two Pins.....	Ref. 34,272 -34,450 [1.3493 -1.3563]
Pin Diameter.....	4,389 [.1728]

VIS 40 Series

Dimensions Shafts

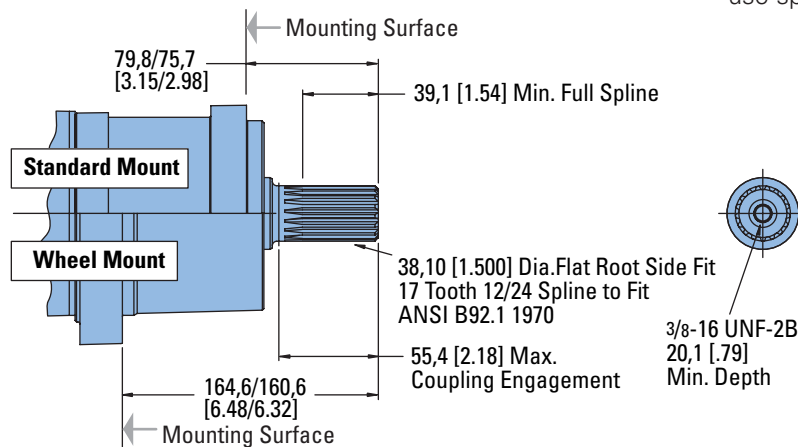
SAE

40 mm Straight

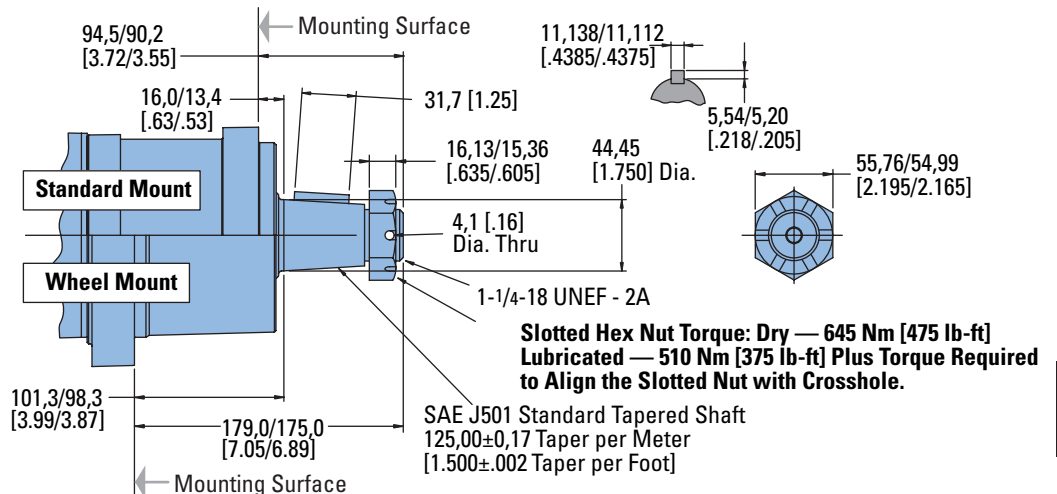


Note:
For motor torque ratings above 875 Nm [7750 lb - in] use split coupler.

1-1/2 Inch 17 Tooth Splined



1-3/4 Inch Tapered



VIS 40 Series

Side Load Capacity

SAE

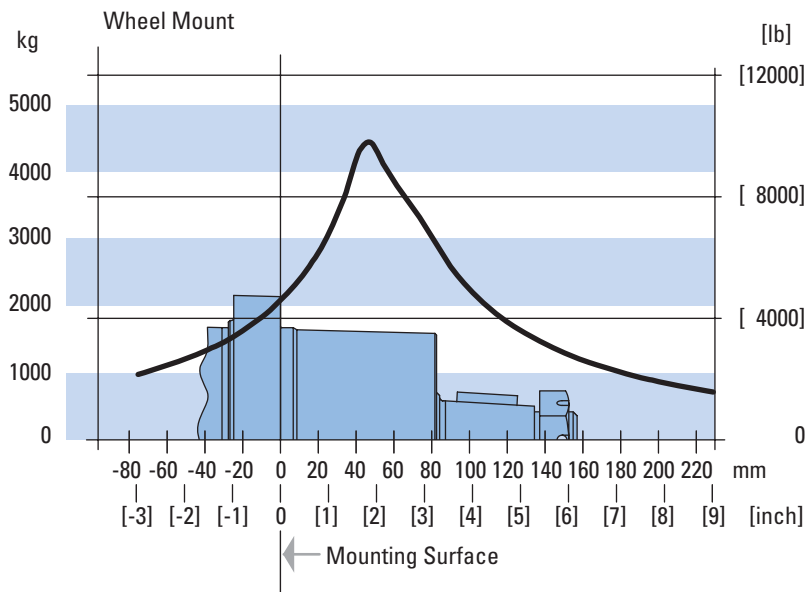
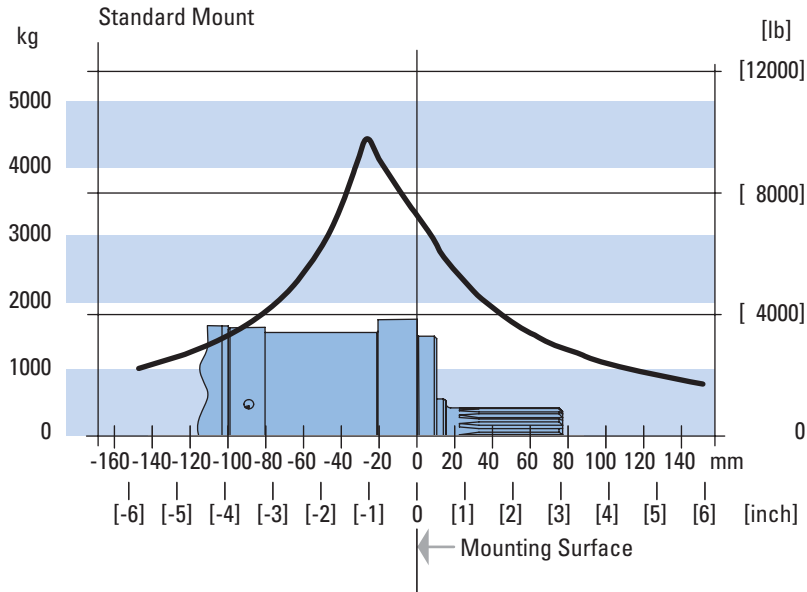
These curves indicate the radial load capacity on the motor shaft(s) at various locations.

The curve is based on B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.

To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

For 3,000,000 shaft revolutions or 500 hours — Increase these shaft loads 52%.

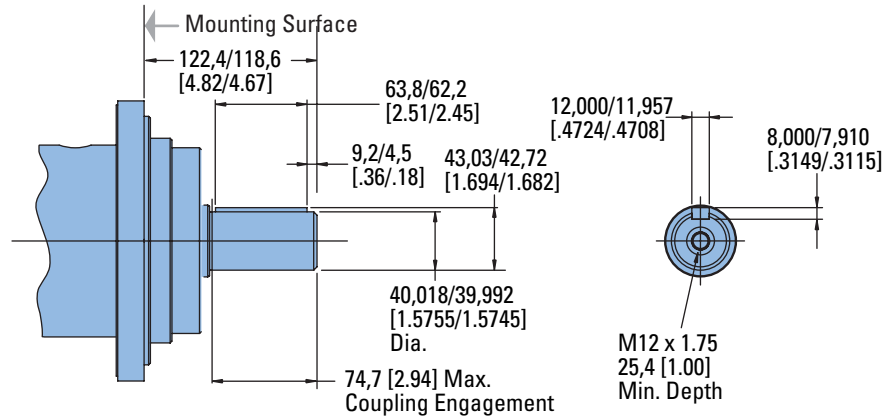


VIS 40 Series

Dimensions Shafts

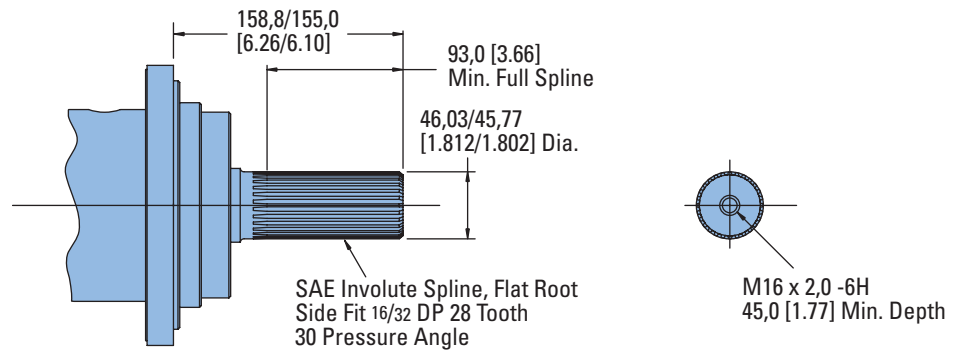
Oversize Flange
224,0 [8.82] B.C.

40 mm Straight

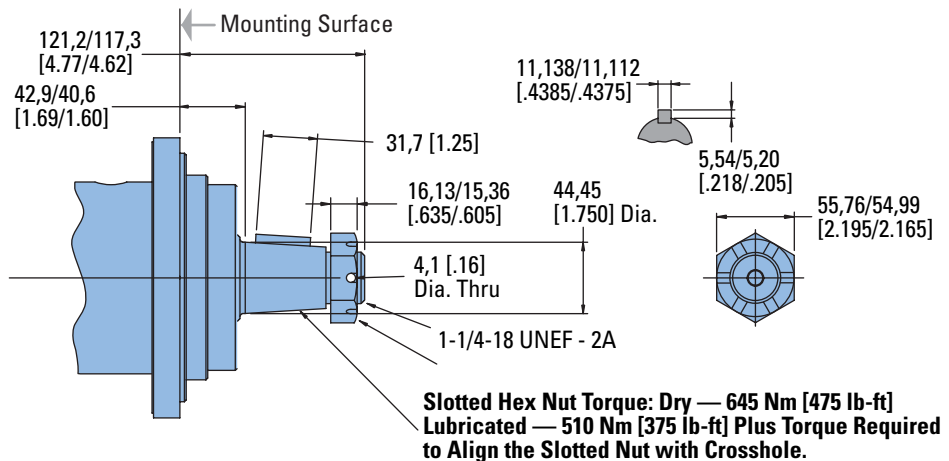


Note:
For motor torque ratings above 875 Nm [7750 lb - in] use split coupler.

46 mm 28 Tooth Splined



1-3/4 Inch Tapered



SAE J501 Standard Tapered Shaft
125,00±0,17 Taper per Meter
[1.500±.002 Taper per Foot]

VIS 40 Series

Side Load Capacity

Oversize Flange
224,0 [8.82] B.C.

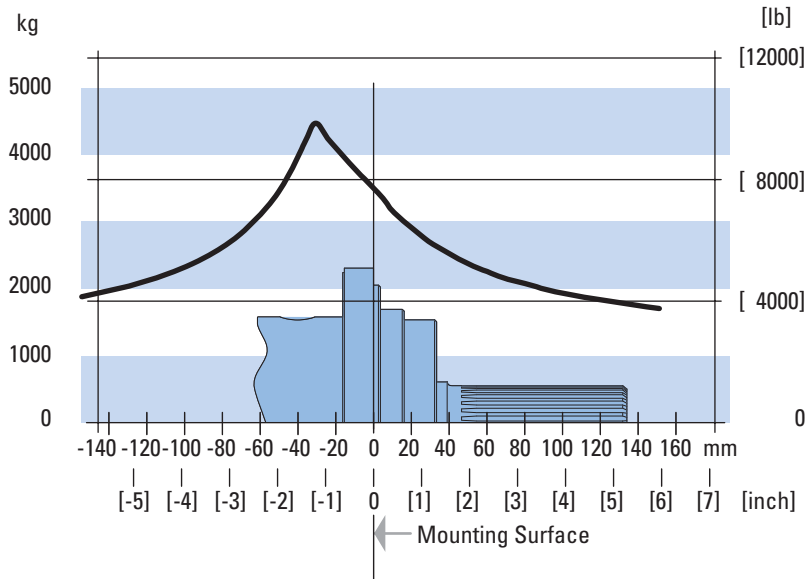
These curves indicate the radial load capacity on the motor shaft(s) at various locations.

The curve is based on B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.

To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

For 3,000,000 shaft revolutions or 500 hours — Increase these shaft loads 52%.

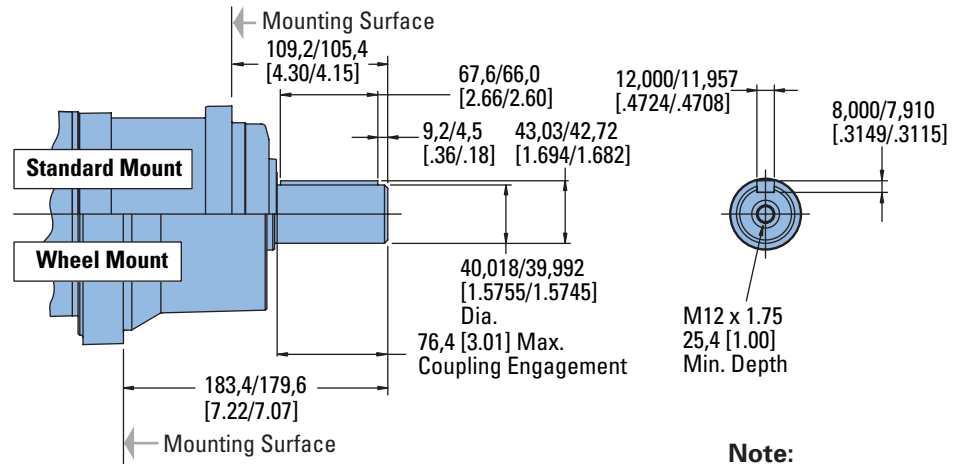


VIS 40 Series

Dimensions Shafts

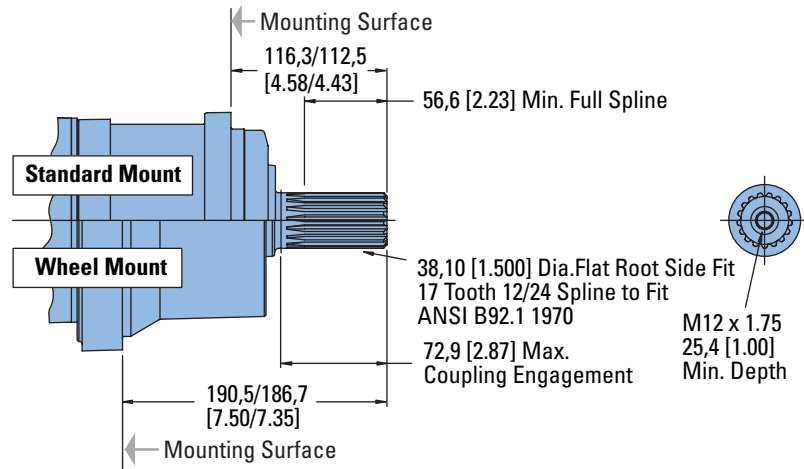
ISO

40 mm Straight

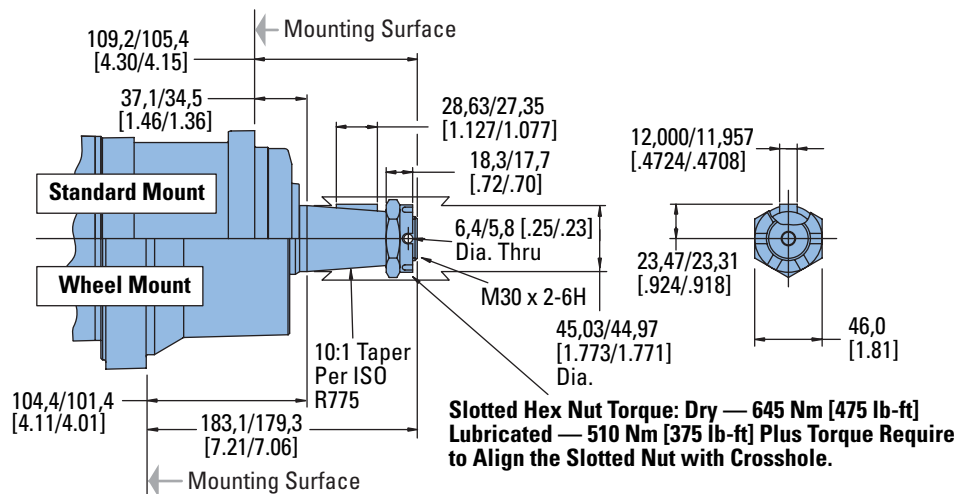


Note:
For motor torque ratings above 875 Nm [7750 lb - in] use split coupler.

38,1 mm [1-1/2 inch] 17 Tooth Splined



45 mm Tapered



VIS 40 Series

Side Load Capacity

ISO

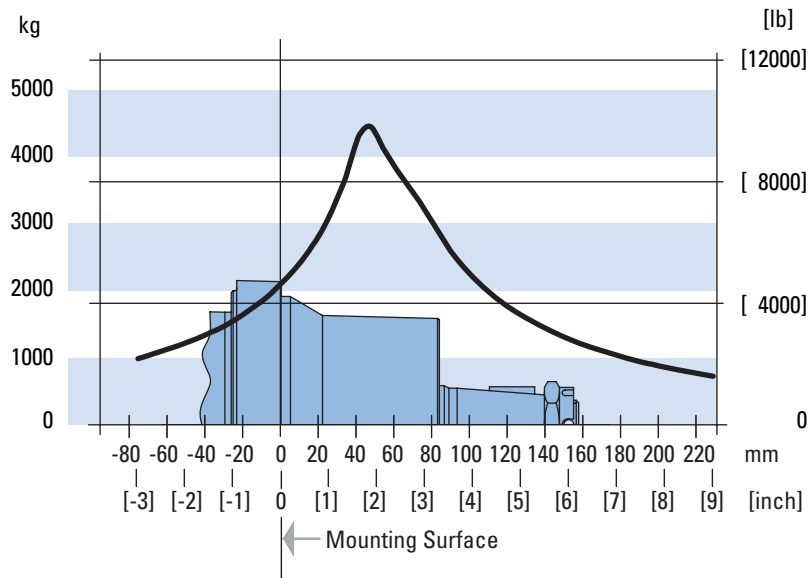
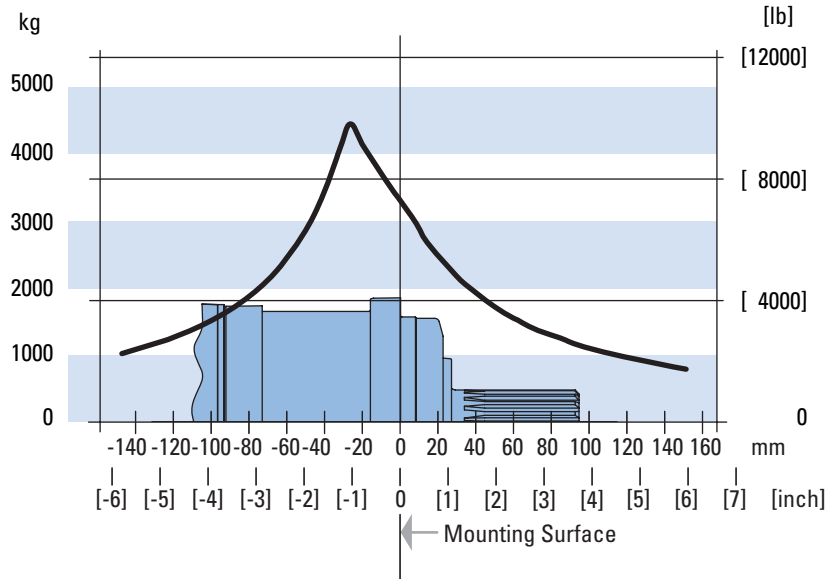
These curves indicate the radial load capacity on the motor shaft(s) at various locations.

The curve is based on B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.

To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

For 3,000,000 shaft revolutions or 500 hours — Increase these shaft loads 52%.



VIS 40 Series

Product Numbers

Closed Loop

Use digit prefix — 168-, 177-, or 180- plus four digit number from charts for complete product number— Example: 168-0018.

Orders will not be accepted without three digit prefix.

SAE

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER					
			505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Standard	40 mm Straight	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0032	-0022	-0033	-0034	-0035	-0036
	1 1/2 inch 17 Tooth Splined	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0024	-0026	-0037	-0038	-0039	-0040
	1 3/4 inch Tapered	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0041	-0042	-0043	-0044	-0045	-0046
Wheel	40 mm Straight	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	180-0007	-0008	-0009	-0010	-0011	-0012
	1 1/2 inch 17 Tooth Splined	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	180-0013	-0014	-0015	-0016	-0017	-0018
	1 3/4 inch Tapered	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	180-0019	-0020	-0021	-0022	-0023	-0024
Bearingless		1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	168-0015	-0016	-0017	-0018	-0019	-0020

168-0018

Oversize

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER					
			505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Standard	40 mm Straight	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0047	-0048	-0049	-0050	-0051	-0052
	46 mm 28 Tooth Splined	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0053	-0054	-0055	-0056	-0057	-0058
	1 3/4 inch Tapered	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0059	-0060	-0061	-0062	-0063	-0064

ISO

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER					
			505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Standard	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	177-0065	-0066	-0067	-0068	-0069	-0070
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	177-0071	-0072	-0073	-0074	-0075	-0076
	1 1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	177-0077	-0078	-0079	-0080	-0081	-0082
Wheel	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	180-0025	-0026	-0027	-0028	-0029	-0030
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	180-0031	-0032	-0033	-0034	-0035	-0036
	1 1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	180-0037	-0038	-0039	-0040	-0041	-0042
Bearingless		G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	168-0021	-0022	-0023	-0024	-0025	-0026

168-0024

Note:

The product numbers on this page are for motors used in closed loop circuits. They include a back-pressure relief valve that is set at 4,5 bar [65 PSI].

- A case drain is required for all closed loop VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].

VIS 40 Series

Product Numbers

Open Loop

Use digit prefix —
168-, 177-, or 180- plus four
digit number from charts for
complete product number—
Example 168-0029.

**Orders will not be accepted
without three digit prefix.**

SAE

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER					
			505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Standard	40 mm Straight	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0083	-0084	-0085	-0086	-0087	-0088
	1 1/2 inch 17 Tooth Splined	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0089	-0090	-0091	-0092	-0093	-0094
	1 3/4 inch Tapered	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0095	-0096	-0097	-0098	-0099	-0100
Wheel	40 mm Straight	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	180-0043	-0044	-0045	-0046	-0047	-0048
	1 1/2 inch 17 Tooth Splined	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	180-0049	-0050	-0051	-0052	-0053	-0054
	1 3/4 inch Tapered	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	180-0055	-0056	-0006	-0057	-0058	-0059
Bearingless		1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	168-0027	-0028	-0010	-0029	-0030	-0031

168-0029

Oversize

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER					
			505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Standard	40 mm Straight	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0101	-0102	-0103	-0104	-0105	-0106
	46 mm 28 Tooth Splined	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0107	-0108	-0109	-0110	-0111	-0112
	1 3/4 inch Tapered	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	177-0113	-0114	-0115	-0116	-0117	-0118

ISO

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER					
			505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Standard	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	177-0119	-0120	-0121	-0122	-0029	-0124
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	177-0125	-0126	-0127	-0128	-0129	-0130
	1 1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	177-0131	-0132	-0133	-0134	-0135	-0136
Wheel	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	180-0060	-0061	-0062	-0063	-0064	-0065
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	180-0066	-0067	-0068	-0069	-0070	-0071
	1 1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	180-0072	-0073	-0074	-0075	-0076	-0077
Bearingless		G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	168-0032	-0033	-0034	-0035	-0036	-0037

168-0035

Note:

All product numbers in the charts (above) are for motors **without** a back-pressure relief valve. These motors would generally be used in open loop circuits.

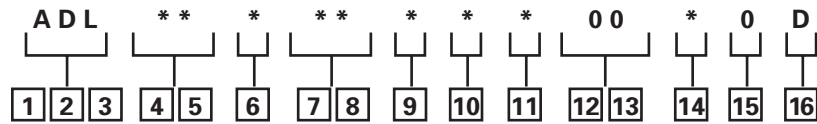
For closed loop circuits a motor with a back-pressure relief valve is required.

- A case drain is recommended for all VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].
- In open loop circuits, return pressure must be 3,5 bar [50 PSI] greater than case pressure to properly lubricate the internal drive.

VIS 40 Series

Model Code

The following 16 - digit coding system has been developed to identify all of the configuration options for the VIS 40 motor. Use this model code to specify a motor with the desired features. All 16 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.



1, 2, 3 Product Series

ADL – VIS 40 Motor

4, 5 Displacement

cm³/r [in³/r]

- 31** – 505 [30.7]
- 35** – 570 [34.9]
- 38** – 630 [38.5]
- 42** – 685 [41.7]
- 48** – 785 [48.0]
- 57** – 940 [57.4]

6 Mounting Type

A – 4 Bolt Bearingless 127,00 [5.000] Pilot Dia. with 12,19 [.480] Pilot Length and 14,35 [.565] Dia holes on 161,92 [6.375] Dia. Bolt Circle

B – 4 Bolt Wheel Mount 160,00 [6.3] Pilot Dia. With 5,8 [.23] Pilot Length and 18,00 [.709] Dia. Holes on 200,00 [7.874] Dia. Bolt Circle (ISO Compatible)

C – 4 Bolt Oversize Flange 185,4 [7.30] Rear Pilot Dia., 169,90 [6.689], 139,93 [5.509], 127,0 [5.00] Dia (Front Pilots) and 18,01 [.709] Dia. Holes on 224,00 [8.819] Dia. Bolt Circle

F – 4 Bolt Standard Mount (SAE CC) 127,00 [5.000] Pilot Dia. With 12,2 [.48] Pilot Length and 14,32 [.564] Dia. Holes on 161,92 [6.375] Dia. Bolt Circle

G – 4 Bolt Wheel Mount 139,7 [5.50] Pilot Dia. with 7,9 [.31] Pilot Length and 14,32 [.564] Dia. Holes on 184,15 [7.250] Dia. Bolt Circle (SAE Compatible)

H – 4 Bolt Standard Mount 125,00 [4.92] Pilot Dia. with 8,9 [.35] Pilot Length and 14,00 [.551] Dia. Holes on 160,00 [6.299] Dia. Bolt Circle (ISO Compatible)

7, 8 Output Shaft

- 00** – None (Bearingless)
- 01** – 45 mm Dia. 10:1 Tapered Shaft Per ISO R775 with M30 x 2- 6H Threaded Shaft End, 12W x 8H X 28L [.472W x .313H x 1.102L] Key
- 02** – 1-3/4 inch Dia. .125:1 Tapered Shaft Per SAE J 501 with 1 1/4 - 18 UNEF - 2A Threaded Shaft End, 11,11 [.4375] Square x 31,8 [1.25] Straight Key
- 04** – 46 mm Dia. Flat Root Side Fit, 28 Tooth, 16/32 DP 30 Degree Involute Spline, 93,0 [3.66] Minimum Full Spline with M16 X 2,0-6H Thread in End
- 07** – 40 mm Dia. Straight Shaft with M12 x 1,75 - 6H Thread in End, 12W x 8H x 63L [.472W x .313H x 2.480L] Key (SAE Compatible)
- 08** – 1-1/2 inch Dia. Flat Root Side Fit, 17 Tooth, 12/24 DP 30 Degree Involute Spline, 39,1 [1.54] Minimum Full Spline with 3/8-16 UNC - 2B Thread in End (SAE Compatible)
- 09** – 1-1/2 inch Dia. Flat Root Side Fit, 17 Tooth, 12/24 DP 30 Degree Involute Spline, 56,6 [2.23] Minimum Full Spline with M12 x 1.75 - 6H Thread in End (ISO Compatible)
- 10** – 40 mm Dia. Straight Shaft with M12 x 1,75 - 6H Thread in End, 12W x 8H x 67L [.472W x .313H x 2.630L] Key (ISO Compatible)

9 Ports

- A** – 1-1/16-12 UN-2B Size 12 O-ring Port, Accepts Fittings for SAE J1926
- B** – G 3/4 (BSP) Straight Thread Port

10 Case Flow Options

- A** – Shuttle Valve with 9/16-18 UNF-2B, Size 6 O-ring Port Case Drain, Accepts Fittings for SAE J1926
- B** – Shuttle Valve with G 1/4 (BSP) Straight Thread Port Case Drain

11 Back-Pressure Relief

- 0** – None (for Open Loop Only)
- 1** – Set at 4,5 bar [65 PSI] (for Manual Pumps)
- 2** – Set at 15,2 bar [220 PSI] (for Servo Pumps)
- 4** – Set at 15,2 bar [300 PSI] (for high charge Servo Pumps)

12, 13 Special Features

- 00** – None

14 Paint/ Special Packaging

- 0** – No Paint, Individual Box
- A** – Painted Low Gloss Black, Individual Box
- B** – No Paint, Bulk Box Option
- C** – Painted Low Gloss Black, Bulk Box Option

15 Eaton Assigned Code when Applicable

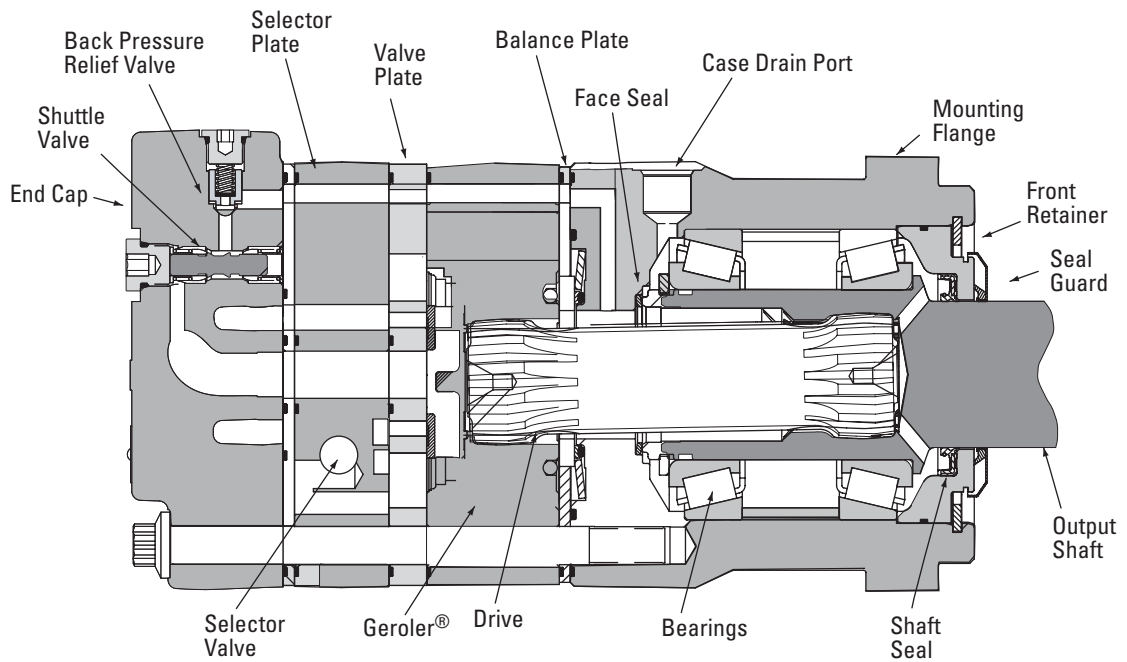
- 0** – Assigned Code

16 Eaton Assigned Design Code

- D** – Assigned Design Code

VIS 40 Series Two-speed

Specifications



VIS 40 Series motors are available with an integral two-speed feature that allows the operator to shift the motor between low speed high torque (LSHT) mode and high speed low torque (HSLT) mode.

In the LSHT mode, output torque and rotation speed values are equal to those of the conventional VIS 40 motor. In the HSLT mode motor displacement is reduced by one third, resulting in a fifty percent increase in rotation speed and a torque output reduction of one third.

The VIS 40 two-speed motor is bidirectional. It will function with equal shaft output in either rotation

direction (CW or CCW) in both LSHT and HSLT modes. Shift on the fly technology allows full-power operation throughout the full duration of the shift.

Changing between modes is accomplished by changing the displacement in a ratio of 1 to 1.5. An external two-position three-way control valve is required for shifting pressure to the pilot port between low pressure (LSHT mode) and pilot signal pressure (HSLT mode).

An integral selector valve shifts the motor from LSHT mode to HSLT mode. Initially, low pressure is supplied to the pilot port. The selector valve is biased to LSHT mode by a return spring. When pilot signal pressure is supplied to the

pilot port and 3,5 Δ bar [50 PSI] is reached, the selector valve overcomes return spring force and the shifts the spool to select HSLT mode.

Oil on the opposite side of the spool is drained to tank via the drain port. The pressure difference between the pilot port and drain port must be maintained to keep the motor in the high speed mode. When pilot pressure is removed from the pilot port, the pressure in the pilot end of the spool valve is relieved and drained back through the control valve and the return spring forces the spool valve to LSHT position.

Pilot pressure may come from any source that will provide uninterrupted pressure during the high-speed mode operation. Allowable pilot pressure must be at least 3,5 Δ bar [50 PSI] and may be as high as full operating pressure of the motor.

All VIS 40 Series two-speed motors are equipped with a return line shuttle for closed circuit applications as standard equipment. All options available on the conventional VIS 40 are also available on VIS 40 two-speed motors.

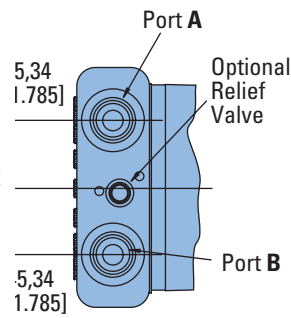
Performance Data

In the LSHT mode, torque and speed values are equal to those of the conventional VIS 40 motor. In the HSLT mode, rotation speed is increased by fifty percent and torque output is reduced by one third. The VIS 40 two-speed motor will function with equal shaft output in either rotation direction (CW or CCW) in both LSHT and HSLT modes.

VIS 40 Series Two-speed

Dimensions

Standard and Wheel Mount
– SAE



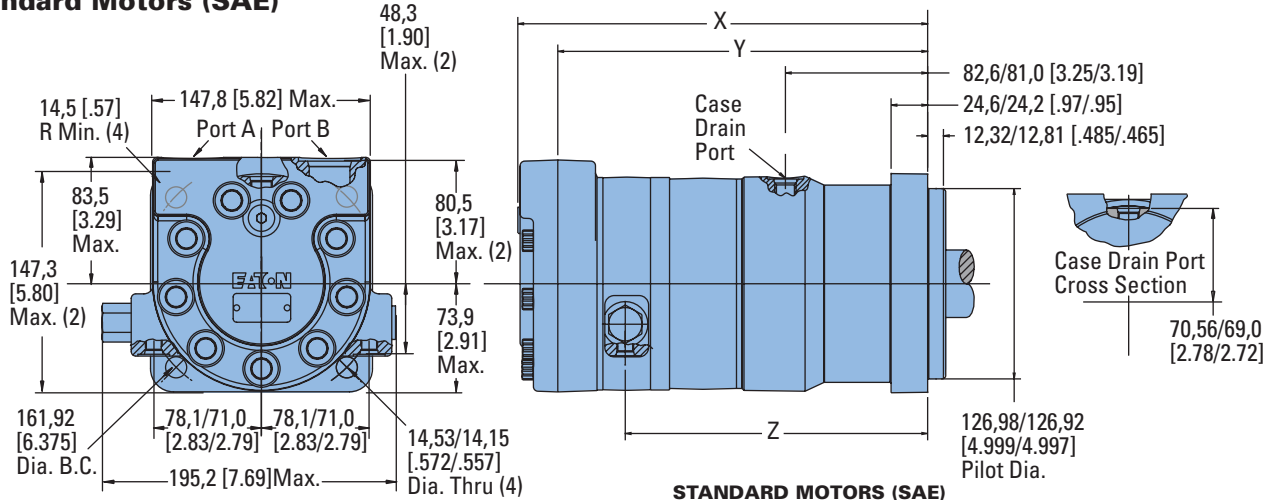
Ports

- 1–1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16-20 UNF -2B SAE O-ring Shift Ports (2)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW

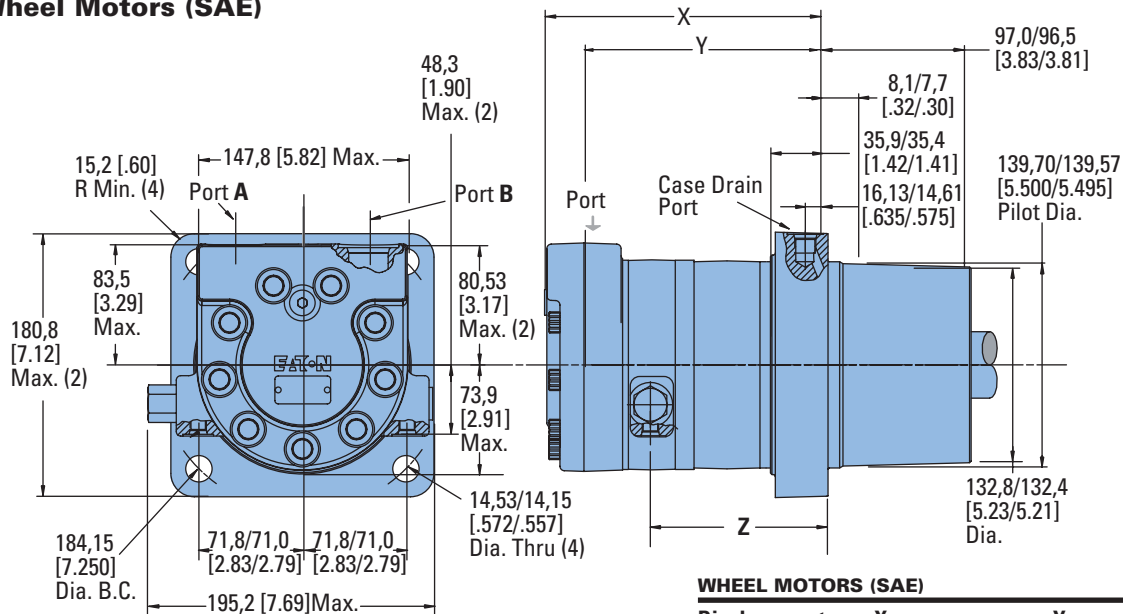
Standard Motors (SAE)



STANDARD MOTORS (SAE)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
505 [30.7]	275,1 [10.83]	246,9 [9.72]	201,7 [7.94]
570 [34.9]	281,2 [11.07]	253,0 [9.96]	208,0 [8.19]
630 [38.5]	286,3 [11.27]	258,3 [10.17]	213,4 [8.40]
685 [41.7]	290,8 [11.45]	262,9 [10.35]	217,7 [8.57]
785 [48.0]	300,2 [11.82]	272,3 [10.72]	227,3 [8.95]
940 [57.4]	313,9 [12.36]	286,0 [11.26]	241,0 [9.49]

Wheel Motors (SAE)



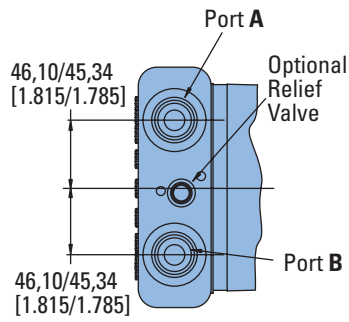
WHEEL MOTORS (SAE)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
505 [30.7]	190,2 [7.49]	162,1 [6.38]	116,8 [4.60]
570 [34.9]	196,3 [7.73]	168,1 [6.62]	123,2 [4.85]
630 [38.5]	201,4 [7.93]	173,5 [6.83]	128,5 [5.06]
685 [41.7]	206,0 [8.11]	178,1 [7.01]	132,8 [5.23]
785 [48.0]	215,4 [8.48]	187,5 [7.38]	142,5 [5.61]
940 [57.4]	229,1 [9.02]	201,2 [7.92]	156,2 [6.15]

VIS 40 Series Two-speed

Dimensions

Oversize Flange
224,0 [8.82] B.C.

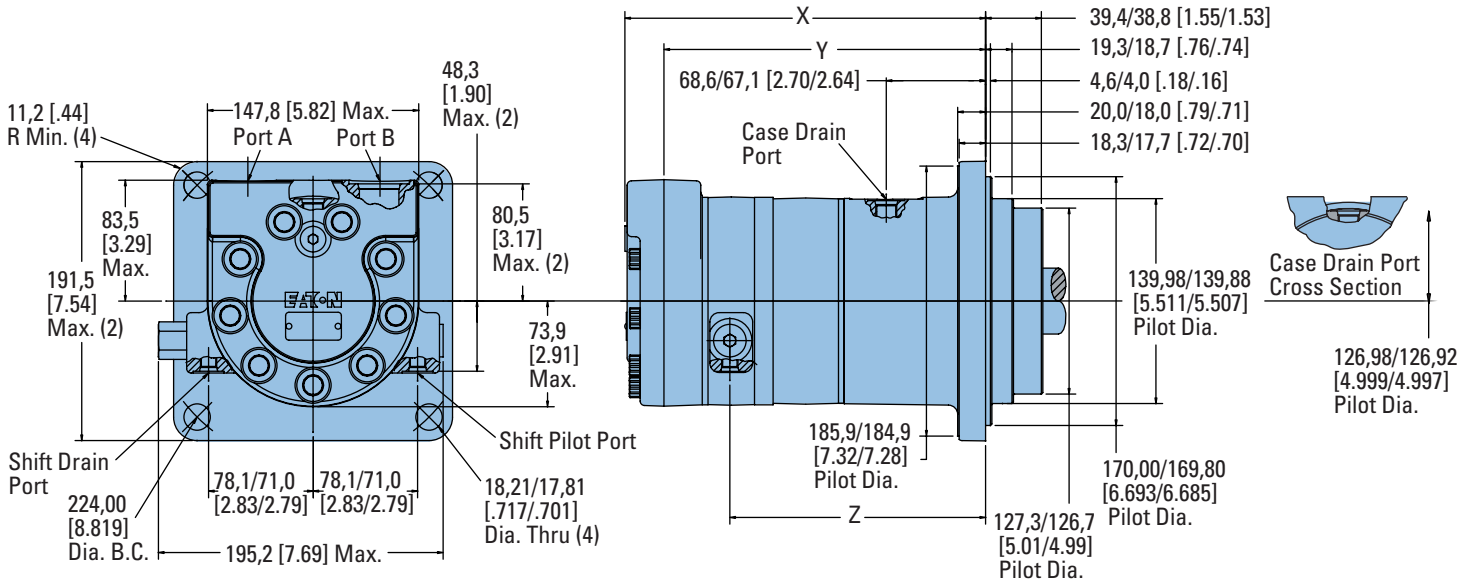


Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16 -20 UNF -2B SAE O-ring Shift Ports (2)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW



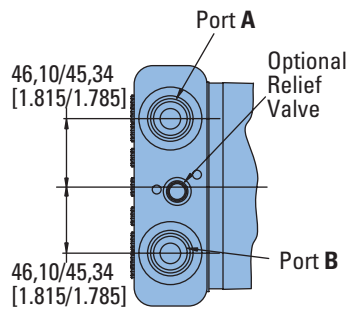
OVERSIZE MOTORS

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
505 [30.7]	248,2 [9.77]	220,0 [8.66]	174,8 [6.88]
570 [34.9]	254,3 [10.01]	226,1 [8.90]	181,1 [7.13]
630 [38.5]	259,3 [10.21]	231,4 [9.11]	186,4 [7.34]
685 [41.7]	263,9 [10.39]	236,0 [9.29]	190,8 [7.51]
785 [48.0]	273,1 [10.75]	245,1 [9.65]	200,2 [7.88]
940 [57.4]	286,8 [11.29]	258,8 [10.19]	213,9 [8.42]

VIS 40 Series Two-speed

Dimensions

Standard and Wheel Mount
– ISO



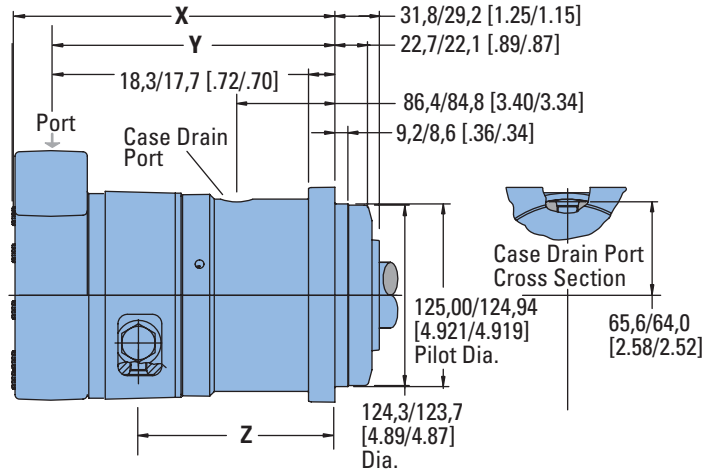
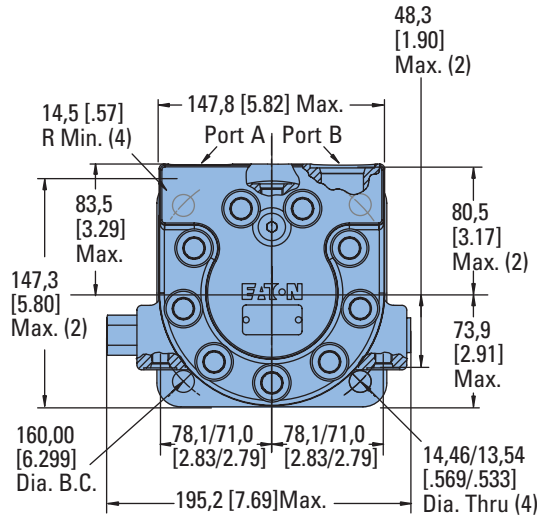
Ports

- G 3/4 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)
- 7/16 -20 UNF -2B SAE O-ring Shift Ports (2)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW

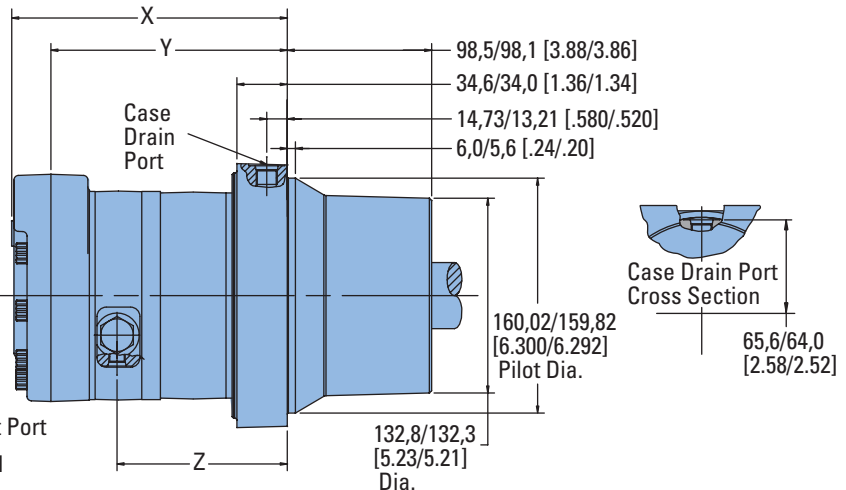
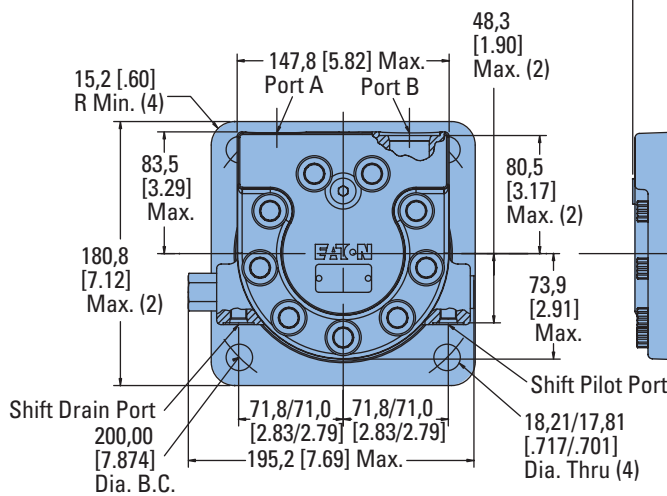
Standard Motors (ISO)



STANDARD MOTORS (ISO)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
505 [30.7]	263,1 [10.36]	235,0 [9.25]	189,7 [7.47]
570 [34.9]	269,2 [10.60]	241,0 [9.49]	196,1 [7.72]
630 [38.5]	274,3 [10.80]	246,4 [9.70]	201,4 [7.93]
685 [41.7]	278,9 [10.98]	251,0 [9.88]	205,7 [8.10]
785 [48.0]	288,0 [11.34]	260,1 [10.24]	215,1 [8.47]
940 [57.4]	301,8 [11.88]	273,8 [10.78]	228,9 [9.01]

Wheel Motors (ISO)



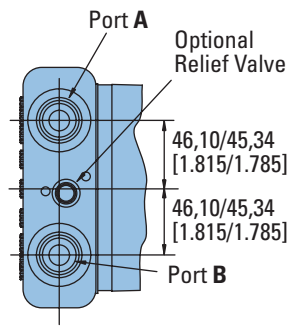
WHEEL MOTORS (ISO)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
505 [30.7]	189,0 [7.44]	160,8 [6.33]	115,6 [4.55]
570 [34.9]	195,1 [7.68]	166,9 [6.57]	121,9 [4.80]
630 [38.5]	200,2 [7.88]	172,2 [6.78]	127,3 [5.01]
685 [41.7]	204,7 [8.06]	176,8 [6.96]	131,6 [5.18]
785 [48.0]	213,9 [8.42]	185,9 [7.32]	141,0 [5.55]
940 [57.4]	227,6 [8.96]	199,6 [7.86]	154,7 [6.09]

VIS 40 Series Two-speed

Dimensions

Bearingless

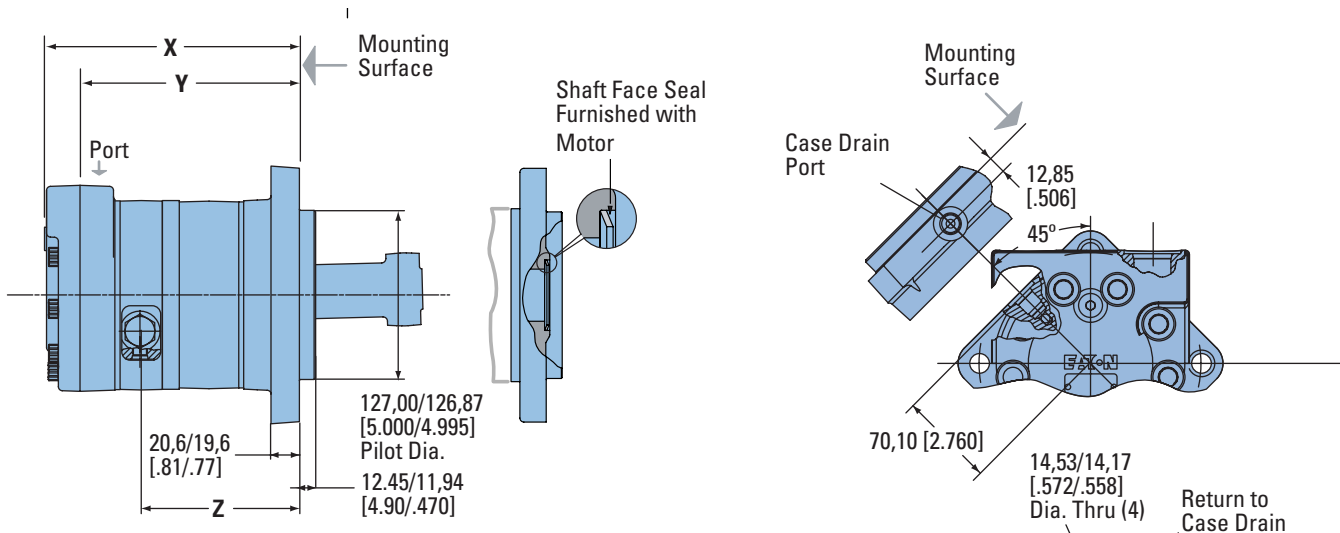


Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16 -20 UNF -2B SAE O-ring Shift Ports (2)
- or G 3/4 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)
- 7/16 -20 UNF -2B SAE O-ring Shift Ports (2)

Standard Rotation Viewed from Drive End

- Port A Pressurized — CW
- Port B Pressurized — CCW

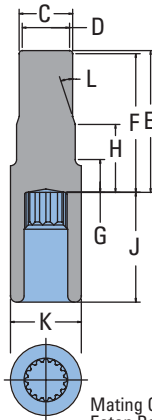


For VIS 40 bearingless motor application information, contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

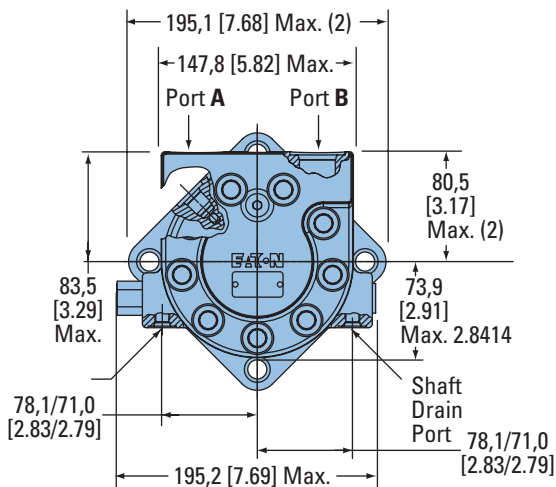
Note:

After machining blank, part must be hardened per Eaton specification.

- C 59,94 [2.36] Dia.
- D 49,00 [1.93] Dia.
- E 155,86 [6.14] Max.
- F 150,88 [5.94] Min.
- G 26,92 [1.06] Full Form Dia.
- H 33,30 [1.21]
- J 106,43 [4.19] Full Form Dia.
- K 72,64 [2.86]
- L 15



Mating Coupling Blank
Eaton Part No. 13280-002



BEARINGLESS MOTORS

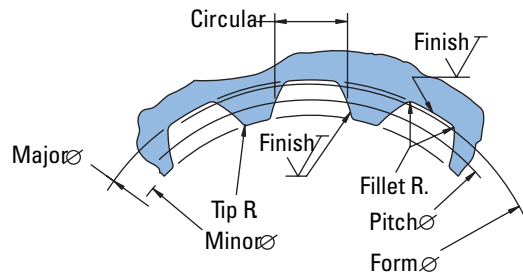
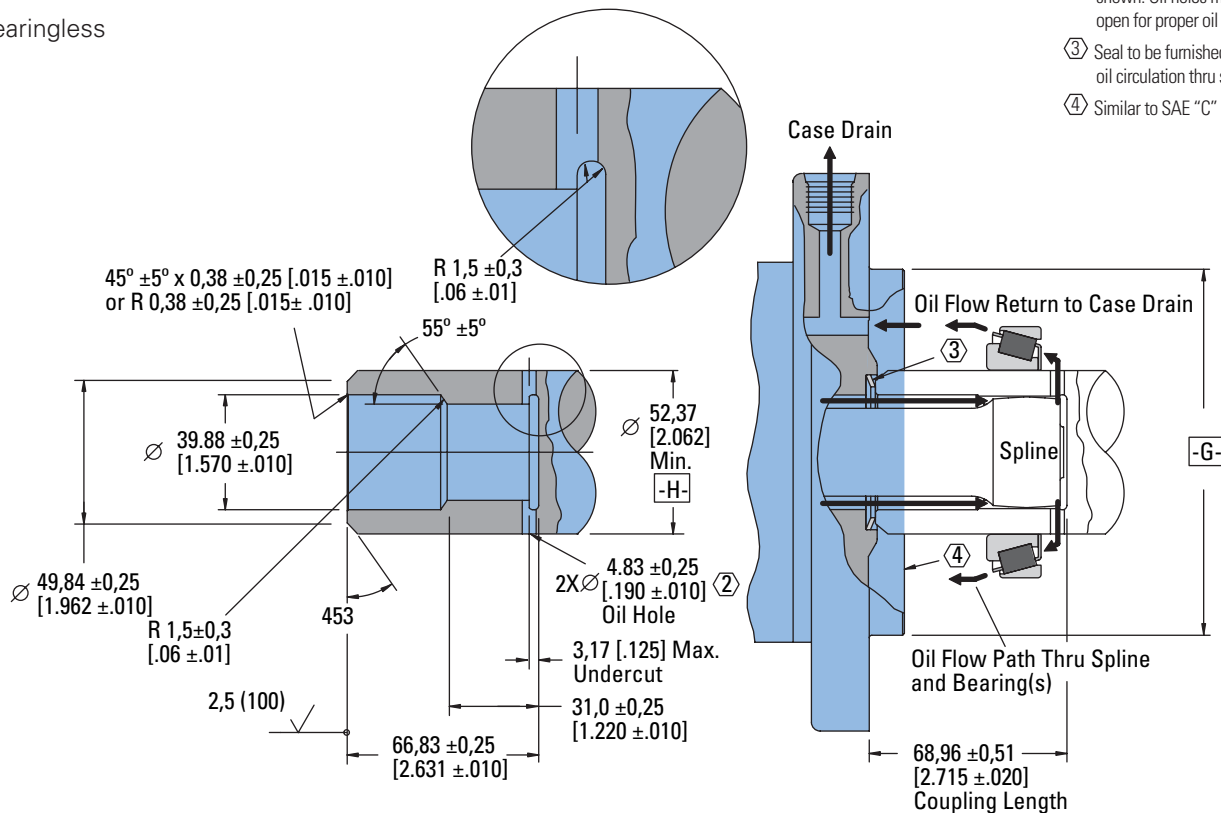
Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
505 [30.7]	193,0 [7.60]	164,8 [6.49]	119,6 [4.71]
570 [34.9]	199,1 [7.84]	170,9 [6.73]	126,0 [4.96]
630 [38.5]	204,0 [8.03]	176,0 [6.93]	131,1 [5.16]
685 [41.7]	208,8 [8.22]	180,8 [7.12]	135,6 [5.34]
785 [48.0]	217,9 [8.58]	190,0 [7.48]	145,0 [5.71]
940 [57.4]	231,6 [9.12]	203,7 [8.02]	158,8 [6.25]

VIS 40 Series Two-speed

Installation Information

Bearingless

- 1 Internal spline in mating part to be per spline data. Specification material to be ASTM A304, 8620H carburize to a hardness of 60-64 HRc with case depth (to 50HRc) of 0,076 -1,27 [.030 -.050]. Dimensions apply after heat treat.
- ② Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.
- ③ Seal to be furnished with motor for proper oil circulation thru splines.
- ④ Similar to SAE "C" Four Bolt Flange.



Spline Pitch.....	8.5/17
Pressure Angle.....	30°
Number of teeth.....	12
Class of Fit.....	Ref. 5
Type of Fit.....	Side
Side Pitch Diameter.....	Ref. 35,858823 [1.4117647] $\text{Ⓞ} 0,20 [0.008] H$
Base Diameter.....	Ref. 31,054652 [1.2226241]
Major Diameter.....	39,17 [1.542] Max. 38,97 [1.534] Min.
Minor Diameter.....	33,30 -33,48 [1.311 -1.318]
Form Diameter, Min.....	38,33 [1.509]
Fillet Radius.....	0,64 -0,76 [.025 -.030]
Tip Radius.....	0,25 -0,51 [.010 -.020]
Finish.....	1,6 (63)
Involute Profile Variation.....	+0,000 -0,025 [+0.0000 -.0010]
Total Index Variation.....	0,038 [.0015]
Lead Variation.....	0,013 [.0005]
Circular Space Width:	
Maximum Actual.....	5,898 [.2322]
Minimum Effective.....	5,804 [.2285]
Maximum Effective.....	Ref. 5,857 [.2306]
Minimum Actual.....	Ref. 5,834 [.2297]
Dimension Between Two Pins.....	Ref. 26,929 -27,084 [1.0602 -1.0663]
Pin Diameter.....	6,223 [.2450] Pins to Have 4,0 [.160]
Wide Flat for Root Clearance	

VIS 40 Series Two-speed

Product Numbers

Closed Loop

Use digit prefix —
176-, 178-, or 182- plus four
digit number from charts for
complete product number—
Example 176-0022.

**Orders will not be accepted
without three digit prefix.**

SAE

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r[in ³ /r] / PRODUCT NUMBER					
			505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Standard	40 mm Straight	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	178-0021	-0022	-0023	-0024	-0025	-0026
	1 1/2 inch 17 Tooth Splined	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	178-0027	-0028	-0029	-0030	-0031	-0032
	1 3/4 inch Tapered	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	178-0033	-0034	-0035	-0036	-0037	-0038
Wheel	40 mm Straight	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	182-0002	-0003	-0004	-0005	-0006	-0007
	1 1/2 inch 17 Tooth Splined	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	182-0008	-0009	-0010	-0011	-0012	-0013
	1 3/4 inch Tapered	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	182-0014	-0015	-0016	-0017	-0018	-0019
Bearingless		1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	176-0019	-0020	-0021	-0022	-0023	-0024

176-0022

Oversize

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r[in ³ /r] / PRODUCT NUMBER					
			505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Standard	40 mm Straight	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	178-0039	-0040	-0041	-0042	-0043	-0044
	46 mm 28 Tooth Splined	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	1178-0045	-0046	-0047	-0048	-0049	-0050
	1 3/4 inch Tapered	1 1/16 -12 UNF O-ring (2) 9/16 -18 UNC Drain Port (1)	178-0051	-0052	-0053	-0054	-0055	-0056

ISO

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r[in ³ /r] / PRODUCT NUMBER					
			505 [30.7]	570 [34.9]	630 [38.5]	685 [41.7]	785 [48.0]	940 [57.4]
Standard	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	178-0057	-0058	-0059	-0060	-0061	-0062
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	178-0063	-0064	-0065	-0066	-0067	-0068
	1 1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	178-0069	-0070	-0071	-0072	-0073	-0074
Wheel	40 mm Straight	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	182-0020	-0021	-0022	-0023	-0024	-0025
	45 mm Tapered	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	182-0026	-0027	-0028	-0029	-0030	-0031
	1 1/2 inch 17 Tooth Splined	G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	182-0032	-0033	-0034	-0035	-0036	-0037
Bearingless		G 3/4 (BSP) (2) G 1/4 (BSP) Drain Port (1)	176-0025	-0026	-0027	-0028	-0029	-0030

176-0028

Note:

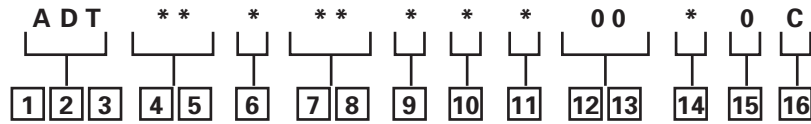
The product numbers on this page are for motors used in closed loop circuits. They include a back-pressure relief valve that is set at 4,5 bar [65 PSI].

- A case drain is required for all closed loop VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].

VIS 40 Series Two-speed

Model Code

The following 16 - digit coding system has been developed to identify all of the configuration options for the VIS 40 two-speed motor. Use this model code to specify a motor with the desired features. All 16 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.



1, 2, 3 Product Series
ADT – VIS 40- Two-speed Motor

4, 5 Displacement
 – cm³/r [in³/r]

- 20** – 325 [19.8]
- 31** – 505 [30.7]
- 35** – 570 [34.9]
- 38** – 630 [38.5]
- 42** – 685 [41.7]
- 48** – 785 [48.0]
- 57** – 940 [57.4]

6 Mounting Type

A – 4 Bolt Bearingless
 127,00 [5.000] Pilot Dia. with
 12,19 [4.80] Pilot Length
 and 14,35 [5.65] Dia holes
 on 161,92 [6.375] Dia. Bolt
 Circle

B – 4 Bolt Wheel Mount
 160,00 [6.3] Pilot Dia. With
 5,8 [.23] Pilot Length and
 18,00 [.709] Dia. Holes on
 200,00 [7.874] Dia. Bolt
 Circle (ISO Compatible)

C – 4 Bolt Oversize Flange
 185,4 [7.30] Rear Pilot Dia.,
 169,90 [6.689], 139,93
 [5.509], 127,0 [5.00] Dia
 (Front Pilots) and 18,01
 [.709] Dia. Holes on 224,00
 [8.819] Dia. Bolt Circle

F – 4 Bolt Standard Mount
 (SAE CC) 127,00 [5.000]
 Pilot Dia. With 12,2 [.48]
 Pilot Length and 14,32 [.564]
 Dia. Holes on 161,92 [6.375]
 Dia. Bolt Circle

G – 4 Bolt Wheel Mount
 139,7 [5.50] Pilot Dia. with
 7,9 [.31] Pilot Length and
 14,32 [.564] Dia. Holes on
 184,15 [7.250] Dia. Bolt
 Circle (SAE Compatible)

H – 4 Bolt Standard Mount
 125,00 [4.92] Pilot Dia. With
 8,9 [.35] Pilot Length and
 14,00 [.551] Dia. Holes on
 160,00 [6.299] Dia. Bolt
 Circle (ISO Compatible)

7, 8 Output Shaft

00 – None (Bearingless)

01 – 45 mm Dia. 10:1
 Tapered Shaft Per ISO R775
 with M30X2-6H Threaded
 Shaft End, 12W X 8H X 28L
 [.472W X .313H X 1.102L]
 Key

02 – 1-3/4 inch Dia. .125:1
 Tapered Shaft Per SAE J501
 with 1-1/4 - 18 UNEF-2A
 Threaded Shaft End, 11,11
 [.4375] Square X 31,8 [1.25]
 Straight Key

04 – 46 mm Dia. Flat Root
 Side Fit, 28 Tooth, 16/32 DP
 30 Degree Involute Spline,
 93,0 [3.66] Minimum Ful
 Spline with M16 X 2,0-6H
 Thread in End

07 – 40 mm Dia. Straight
 Shaft with M12 X 1,75-
 6H Thread in End, 12W
 X 8H X 63L [.472W X
 .313H X 2.480L] Key (SAE
 Compatible)

08 – 1-1/2 inch Dia. Flat
 Root Side Fit, 17 Tooth,
 12/24 DP 30 Degree
 Involute Spline, 39,1 [1.54]
 Minimum Full Spline with
 3/8-16 UNC-2B Thread in
 End (SAE Compatible)

09 – 1-1/2 inch Dia. Flat
 Root Side Fit, 17 Tooth,
 12/24 DP 30 Degree
 Involute Spline, 56,6 [2.23]
 Minimum Full Spline with
 M12 X 1.75-6H Thread in
 End (ISO Compatible)

10 – 40 mm Dia. Straight
 Shaft with M12 X 1,75-
 6H Thread in End, 12W
 X 8H X 67L [.472W X
 .313H X 2.630L] Key (ISO
 Compatible)

9 Ports

A – 1-1/16-12 UN-2B Size 12
 O-ring Port, Accepts Fittings
 for SAE J1926

B – G 3/4 (BSP) Straight
 Thread Port

10 Case Flow Options

A – Shuttle Valve with 9/16-
 18 UNF-2B, Size 6 O-ring
 Port Case Drain, Accepts
 Fittings for SAE J1926

B – Shuttle Valve with G 1/4
 (BSP) Straight Thread Port
 Case Drain

11 Back-Pressure Relief

1 – Set at 4,5 bar [65 PSI]
 (for Manual Pumps)

2 – Set at 15,2 bar [220 PSI]
 (for Servo Pumps)

4 – Set at 15,2 bar [300 PSI]
 (for high charge Servo Pumps)

12, 13 Special Features

00 – None

14 _ Paint/ Special Packaging

0 – No Paint, Individual Box

A – Painted Low Gloss
 Black, Individual Box

B – No Paint, Bulk Box
 Option

C – Painted Low Gloss
 Black, Bulk Box Option

15 _ Eaton Assigned Code when Applicable

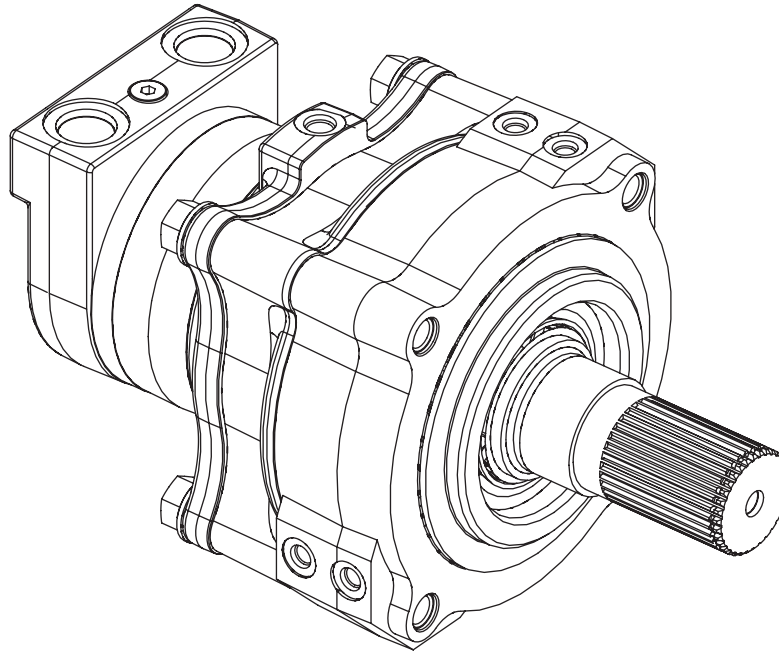
0 – Assigned Code

16 _ Eaton Assigned Design Code

C – Assigned Design Code

VIS 40 Series

Brake Description



Features

- Spring-Applied/
Hydraulically Released
Multi-Disc Brake
- Spring automatically
applies brake when hydro-
static pressure is absent
- Environmentally Protected
- Integral Design –
Motor and brake as a sin-
gle package to minimize
length and cost.
- Infinite Braking –
Eliminates machine creep
associated with park pawl
mechanisms
- Boost Feature –
Increases holding capacity
to match full motor output
torque
- No adjustments needed
- Two Sets of Release
and Boost Ports –
Allows for multiple plumb-
ing options and facilitates
bleeding

Applications

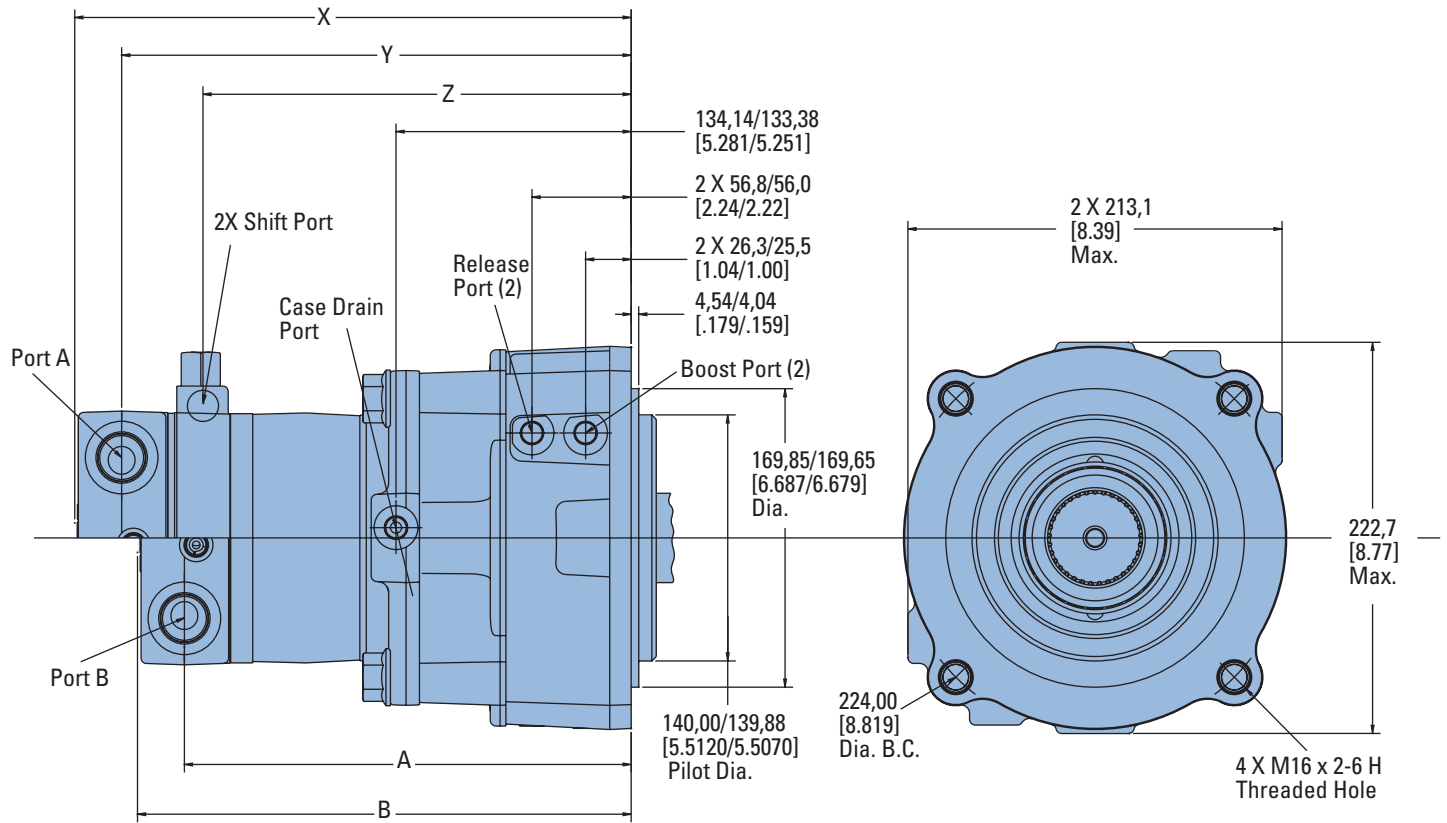
- Skid Steer Loaders
- Mini Excavators
- Trenchers
- Road Rollers
- Anywhere load-holding is
needed on a Low-Speed
High-Torque drive system

Specifications

- Static Holding Torque – 780 N-m [6900 lb-in] minimum
(spring only - no boost)
2621 N-m [23200 lb-in] minimum
(@ 10,3 bar [150 PSI] boost)
3570 N-m [31600 lb-in] minimum
(@ 15,2 bar [220 PSI] boost)
- Release Pressure – 10,3 bar [150 PSI] minimum
for full release
68,9 bar [1000 PSI] maximum
allowed at release port
- Case Pressure – 1,4 bar [20 PSI] continuous
3,5 bar [50 PSI] maximum
- Boost Pressure – 15,2 bar [220 PSI] continuous
34,5 bar [500 PSI] maximum
- Speed – 360 RPM maximum
- Emergency – After 3 consecutive stops,
brake to still meet parking
requirement

VIS 40 Series

Brake Dimensions



BRAKE MOTORS (SINGLE-SPEED)

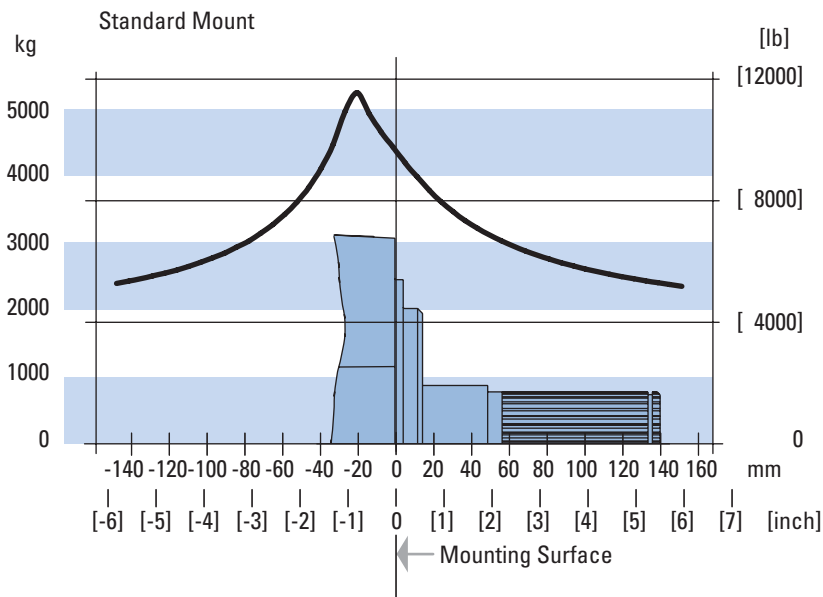
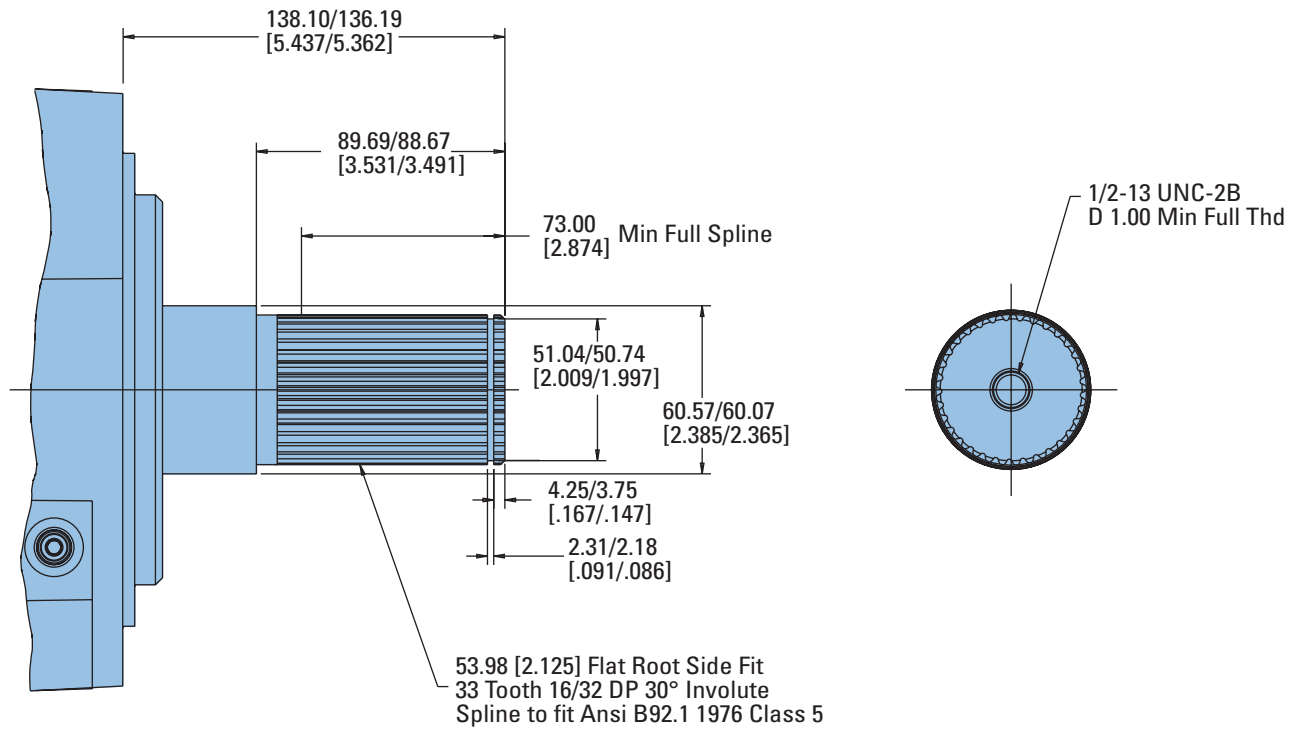
Displacement cm ³ /r [in ³ /r]	A mm [inch]	B mm [inch]
505 [30.7]	238,7 [9.40]	265,9 [10.47]
570 [34.9]	244,9 [9.64]	272,1 [10.71]
630 [38.5]	250,1 [9.85]	277,3 [10.92]
685 [41.7]	254,7 [10.04]	281,9 [11.10]
785 [48.0]	264,0 [10.40]	291,2 [11.46]
940 [57.4]	277,7 [10.94]	304,9 [12.00]

BRAKE MOTORS (TWO-SPEED)

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
505 [30.7]	301,9 [11.88]	274,7 [10.82]	229,3 [9.03]
570 [34.9]	308,0 [12.12]	280,9 [11.06]	235,5 [9.27]
630 [38.5]	313,1 [12.32]	285,9 [11.27]	238,5 [9.27]
685 [41.7]	317,9 [12.52]	290,7 [11.45]	245,3 [9.66]
785 [48.0]	327,0 [12.88]	300,0 [11.80]	254,6 [10.02]
940 [57.4]	340,7 [13.42]	313,7 [12.35]	268,3 [10.56]

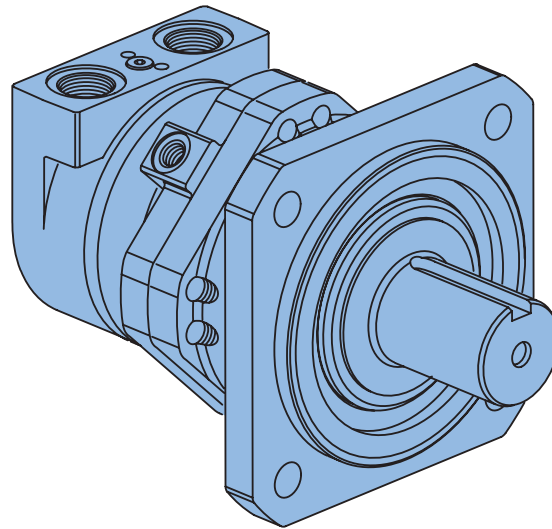
VIS 40 Series

Brake Shaft Dimensions/ Sideload Curves



VIS 45 Series

Highlights



Description

The VIS 45 is the most powerful motor in the VIS Series product line. Maximum continuous output torque capability is rated to 4520 Nm [40,000 lb-in.] with a displacement range from 630cc to 1560cc per revolution. VIS 45 motors can be run up to 170 LPM [45 GPM] with pressure capability up to 310 bar [4500 PSI]. The motor utilizes patented VIS technology with improved high-strength Geroler, optimized drive geometry, and two-piece pre-loaded balance plate for increased starting efficiency, reduced leakage and higher back pressure capacity.

VIS 45 Motors

Geroler Element	5 Displacements
Flow l/min [GPM]	170 [45] Continuous*** 189 [50] Intermittent**
Speed	Up to 284 RPM
Pressure bar [PSI]	310 [4500] Cont.*** 345 [5000] Inter.** 380 [5500] Peak*
Torque Nm [lb - in]	4520 [40000] Cont.*** 5650 [50000] Inter.**

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

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

* Peak— (Peak) Peak operation, 1% of every minute.

Features

- Patented VIS Geroler technology
- Three moving components: (Geroler, star, drive, and output shaft)
- Two-piece pre-loaded pressure balance plate
- Variety of optional features including two-speed option, and case flow solutions for both closed-loop and open-loop applications.

Benefits

- Extremely compact powerful package
- Increased torque capability
- Greatest horsepower density in the VIS motor line
- High efficiency
- Quiet, smooth operation
- Reliable performance
- Design Flexibility

Applications

- Traction Drives
- Skid Steer loaders
- Grapples
- Excavator Swing Drives
- Marine & Military Winches
- Utility Reels
- Harvesters
- Snow Grooming Equipment
- Trenchers
- Piggy-back Forklifts
- Industrial Machine Tools
- Truck Grapples
- Wood Processing – Saw Mills
- Augers



Auger



Skid Steer



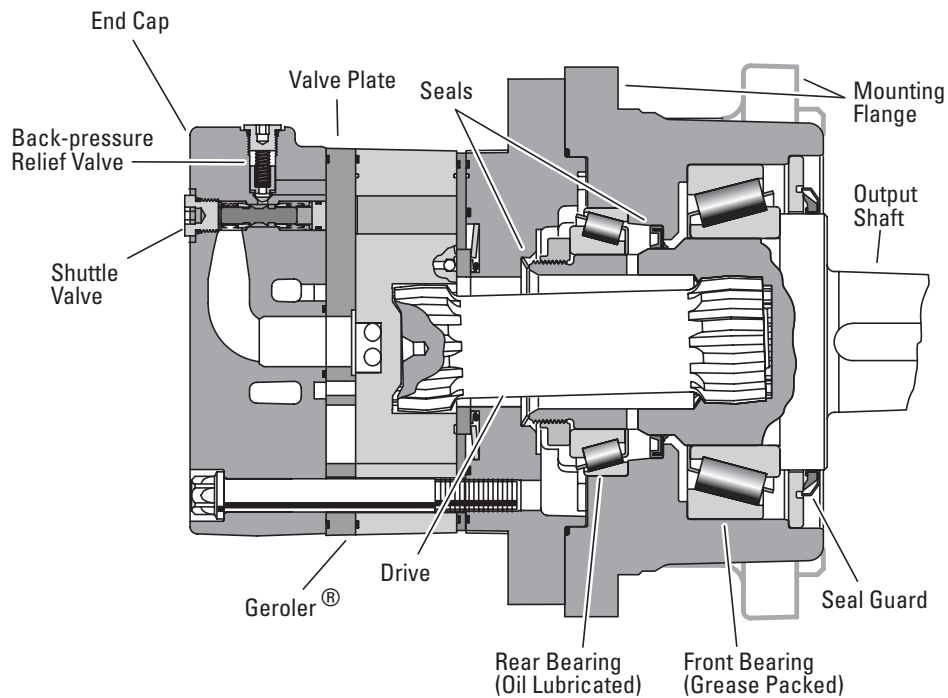
Injector



Port Equipment

VIS 45 Series

Specifications



SPECIFICATION DATA — VIS 45 SERIES MOTORS

Displ. cm ³ /r [in ³ /r]		630 [38.6]	805 [48.6]	990 [60.5]	1245 [76.0]	1560 [95.0]
Max. Speed (RPM)	Continuous	256	198	164	129	104
	Intermittent	284	220	183	143	115
@ Flow						
Flow l/min [GPM]	Continuous	170 [45]	170 [45]	170 [45]	170 [45]	170 [45]
	Intermittent	189 [50]	189 [50]	189 [50]	189 [50]	189 [50]
Torque Nm [lb-in]	Continuous	2963 [26080]	3555 [31460]	4052 [35860]	4520 [40000]	4520 [40000]
	Intermittent	3111 [27530]	3722 [32940]	4549 [40269]	5376 [47592]	5650 [50000]
Pressure Δ bar [Δ PSI]	Continuous	310 [4500]	310 [4500]	258 [3740]	205 [2975]	164 [2380]
	Intermittent	345 [5000]	345 [5000]	322 [4675]	256 [3720]	205 [2975]
	Peak	379 [5500]	379 [5500]	379 [5500]	308 [4465]	246 [3570]
Weight kg [lb]	Standard or Wheel Mount	53,8 [118.7]	55,2 [121.6]	56,7 [125.0]	58,7 [129.4]	61,2 [134.9]
	Bearingless	28,3 [62.3]	29,6 [65.2]	31,1 [68.6]	33,1 [73.0]	35,6 [78.5]
Weight kg [lb]	Two-speed Standard or Wheel Mount	58,5 [128.9]	59,8 [131.8]	61,3 [135.2]	63,3 [139.6]	65,8 [145.1]
	Two-speed Bearingless	32,9 [72.5]	34,2 [75.4]	35,7 [78.8]	37,7 [83.2]	40,2 [88.7]

A simultaneous maximum torque and maximum speed NOT recommended.

Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

Maximum Inlet Pressure:

400 bar [5800 PSI]
Do Not Exceed A Pressure Rating (for displacement size see chart above).

Return Pressure (Back-Pressure):

Minimum – 3,5 bar [50 PSI]
Maximum – 21 bar [300 PSI]

Note:

Return (back-pressure) must be 3,5 bar [50 PSI] greater than the case pressure.

Δ Pressure:

The true Δ bar [Δ PSI] between inlet port and outlet port

Case Pressure:

Minimum – No Pressure
Maximum – 3,5 bar [50 PSI]

Note:

The case must be full when the motor is operating. A case drain is recommended.

Continuous Rating:

Motor may be run continuously at these ratings

Intermittent Operation:

10% of every minute

Peak Operation:

1% of every minute

Recommended Fluids:

Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 70 SUS at operating temperature.

Recommended Maximum System Operating Temp.:

82° C [180° F]

Recommended Filtration:

Per ISO Cleanliness Code, 4406: 20/18/13

Shuttle:

Standard

Back-Pressure Relief Valve:

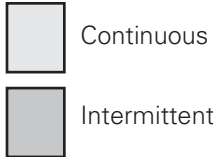
Required for closed loop circuit.

VIS 45 Series

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.



805 cm³/r [48.6 in³/r]
Δ Pressure Bar [PSI]

	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
	15	35	70	105	140	170	205	240	275	310	345
4	1600	3350	7180	10670	13480	16640	19680	21740	25860	28500	31720
15	181	379	811	1206	1523	1880	2224	2457	2922	3221	3584
8	1620	3380	7240	10730	13740	16920	19950	22160	25920	28970	32200
30	183	382	818	1212	1553	1912	2254	2504	2929	3274	3639
12	1640	3310	7180	10770	14170	17290	20730	23270	26340	29420	32470
45	185	374	811	1217	1601	1954	2342	2630	2976	3324	3669
16	1660	3220	7010	10680	14290	17710	21240	24170	26830	30340	32940
61	188	364	792	1207	1615	2001	2400	2731	3032	3428	3722
20	1600	3110	6840	10380	14000	17290	20990	24490	27270	31390	
76	181	351	773	1173	1582	1954	2372	2767	3082	3547	
24	1560	3030	6750	10250	13830	17340	21110	24450	27620	31460	
91	176	342	763	1158	1563	1959	2385	2763	3121	3555	
28		2720	6560	10190	13780	17390	21090	24360	27420	31238	
106		307	741	1151	1557	1965	2383	2753	3098	3529	
32		2620	6330	10000	13480	17070	20730	24180	27270	31064	
121		296	715	1130	1523	1929	2342	2732	3082	3509	
36		2620	5910	9480	13140	16640	20200	23570	26910	30646	
136		296	668	1071	1485	1880	2283	2663	3041	3462	
40			5390	9220	12790	16120	19700	23080	26343	30019	
151			609	1042	1445	1822	2226	2608	2976	3391	
45			5150	8970	12450	15780	19420	22650	25848	29462	
170			582	1014	1407	1783	2194	2559	2920	3328	
50			4770	8610	12140	15380	19180	22440			
189			539	973	1372	1738	2167	2536			
			220	217	215	215	212	212			

630 cm³/r [38.6 in³/r]
Δ Pressure Bar [PSI]

	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
	15	35	70	105	140	170	205	240	275	310	345
4	1270	2710	5530	8250	10300	12900	15540	17720	20820	23640	25740
15	144	306	625	932	1164	1458	1756	2002	2353	2671	2909
8	1290	2720	5580	8290	10490	13110	15760	18070	21000	24100	26070
30	146	307	631	937	1185	1481	1781	2042	2373	2723	2946
12	1310	2670	5440	8320	10820	13400	16370	18970	21230	24540	26840
45	148	302	615	940	1223	1514	1850	2144	2399	2773	3033
16	1320	2600	5400	8250	10910	13730	16780	19710	21970	24870	27530
61	149	294	610	932	1233	1551	1896	2227	2483	2810	3111
20	1290	2500	5270	8020	10690	13400	16730	20020	22320	25420	
76	146	283	596	906	1208	1514	1890	2262	2522	2872	
24	1240	2440	5200	7920	10560	13430	16700	19970	22610	25730	
91	140	276	588	895	1193	1518	1887	2257	2555	2907	
28		2190	5050	7870	10520	13480	16660	19860	22450	26080	
106		247	571	889	1189	1523	1883	2244	2537	2963	
32		2110	4870	7720	10300	13230	16370	19720	22320	25986	
121		238	550	872	1164	1495	1850	2228	2522	2936	
36		2090	4550	7330	10030	12890	15960	19220	22040	25655	
136		236	514	828	1133	1457	1803	2172	2491	2898	
40			4150	7120	9760	12490	15560	18820	21600	25185	
151			469	805	1103	1411	1758	2127	2441	2845	
45			3970	6930	9500	12230	15340	18470	21207	24742	
170			449	783	1074	1382	1733	2087	2396	2795	
50			3680	6660	9270	11920	15150	18300			
189			416	753	1048	1347	1712	2068			
			284	280	280	276	268	259			

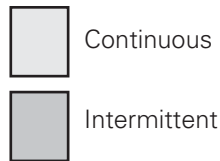
[9270] Torque [lb-in]
1048 Nm
280 Speed RPM

VIS 45 Series

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.



1245 cm³/r [76.0 in³/r]
Δ Pressure Bar [PSI]

	250	500	1000	1500	2000	2500	3000	3500	4000	4250
	15	35	70	105	140	170	205	240	275	295
4	2160	4800	9960	15150	20200	26450	30670	39180	42800	43220
15	244	542	1125	1712	2283	2989	3466	4427	4836	4884
8	2250	4830	10370	15760	22010	27180	33330	39840	43660	44400
30	254	546	1172	1781	2487	3071	3766	4502	4934	5017
12	2400	5390	10910	17290	22780	28470	34170	40140	44160	47220
45	271	609	1233	1954	2574	3217	3861	4536	4990	5336
16	2410	5150	10930	16970	22880	28600	33900	39500	44510	47592
61	272	582	1235	1918	2585	3232	3831	4464	5030	5376
20	2350	4890	10650	16470	21960	27450	33130	37710	43890	46933
76	266	553	1203	1861	2481	3102	3744	4261	4960	5302
24	2190	4760	10460	15920	21230	26530	32320	37680	42670	45673
91	247	538	1182	1799	2399	2998	3652	4258	4822	5156
28	1990	4260	10070	15860	21200	26420	32480	37500	42464	45418
106	225	481	1138	1792	2396	2985	3670	4238	4797	5131
32		4100	9770	15410	20770	26300	31920	37240	42167	45103
121		463	1104	1741	2347	2972	3607	4208	4764	5095
36		4090	9060	14650	20060	25670	31110	36295	41087	43955
136		462	1024	1655	2267	2901	3515	4100	4642	4966
40			8300	14150	19570	24900	30320	35373	40034	42836
151			938	1599	2211	2814	3426	3996	4523	4839
45			8100	13970	19310	24610	29972	34967	39570	42343
170			915	1579	2182	2781	3686	3950	4470	4783
50			7900	13790	19050	24310				
189			893	1558	2153	2747				

990 cm³/r [60.5 in³/r]
Δ Pressure Bar [PSI]

	250	500	1000	1500	2000	2500	3000	3500	4000	4500	4750
	15	35	70	105	140	170	205	240	275	310	330
4	2000	4100	8630	12620	16050	20080	24150	28320	32590	35150	37040
15	226	463	975	1426	1814	2269	2729	3200	3683	3972	4186
8	2020	4130	8700	12740	16350	20420	24480	28400	32850	35670	37250
30	228	467	983	1440	1848	2307	2766	3209	3712	4031	4209
12	2050	4050	8630	12780	16870	20860	25440	28550	32920	35860	37630
45	232	458	975	1444	1906	2357	2875	3226	3720	4052	4252
16	2070	3940	8420	12680	17010	21380	26070	29660	33020	36620	38439
61	234	445	951	1433	1922	2416	2946	3352	3731	4138	4342
20	2000	3800	8220	12330	16660	20860	25760	30060	33550	37880	39766
76	226	429	929	1393	1883	2357	2911	3397	3791	4280	4492
24	1950	3700	8120	12180	16460	20890	25820	30090	33990	38366	40269
91	220	418	918	1376	1860	2361	2918	3400	3841	4334	4549
28		3320	7880	12100	16400	20990	25890	29900	33750	39106	39995
106		375	890	1367	1853	2372	2926	3379	3814	4280	4518
32		3210	7610	11870	16050	20600	25440	29680	33550	37890	39766
121		363	860	1341	1814	2328	2875	3354	3791	4280	4492
36		3200	7100	11260	15640	20080	24800	28930	32716	36936	38759
136		362	802	1272	1767	2269	2802	3269	3696	4173	4379
40			6480	10950	15220	19460	24170	28330	32023	36155	37935
151			732	1237	1720	2199	2731	3201	3618	4084	4286
45			6190	10650	14810	19040	23830	27952	31599	35679	37432
170			699	1203	1674	2152	2693	3158	3570	4031	4229
50			5740	10230	14450	18570	23540				
189			649	1156	1633	2098	2660				

[18570] Torque [lb-in]
2098 } Nm
178 Speed RPM

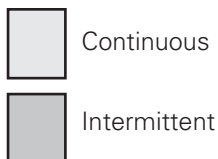
VIS 45 Series

1560 cm³/r [95.0 in³/r]

Performance Data

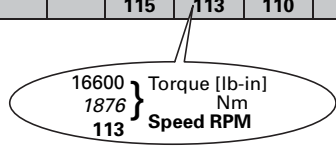
Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.



Δ Pressure Bar [PSI]

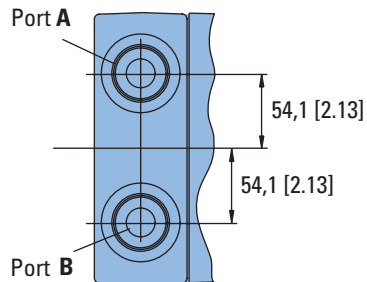
	250	500	1000	1500	2000	2500	3000	3500	4000
	15	35	70	105	140	170	205	240	275
4	2700	5670	11910	18520	24910	30860	37610	42320	48366
15	305	641	1346	2093	2815	3487	4250	4782	5464
8	2810	5910	12400	19260	25590	31740	39310	44150	50457
30	318	668	1401	2176	2892	3587	4442	4989	5700
12	3010	6300	13040	20490	26600	33070	39880	46670	53337
45	340	712	1474	2315	3006	3737	4506	5274	6025
16	3020	6300	13360	20740	27270	33950	40450	48630	55577
61	341	712	1510	2344	3082	3836	4571	5495	6279
20	2930	6150	13200	20490	27110	34830	39820	47662	54470
76	331	695	1492	2315	3063	3936	4500	5384	6154
24	2780	5910	12880	19750	26930	34390	39310	47300	54057
91	314	668	1455	2232	3043	3886	4442	5343	6107
28		5310	12500	19630	26600	33950	38740	46635	53297
106		600	1413	2218	3006	3836	4378	5268	6021
32		5120	12070	19260	26260	33510	38180	45982	52550
121		579	1364	2176	2967	3787	4314	5195	5937
36		5100	11270	18270	25590	33070	37652	45366	
136		576	1274	2065	2892	3737	4254	5125	
40			10280	17760	24910	32630	37124	44750	
151			1162	2007	2815	3687	4194	5055	
45			9820	17280	24240	31793	36119	43577	
170			1110	1953	2739	3592	4080	4923	
50			9100	16600	23650				
189			1028	1876	2672				
			115	113	110				



VIS 45 Series

Dimensions

Standard Mount

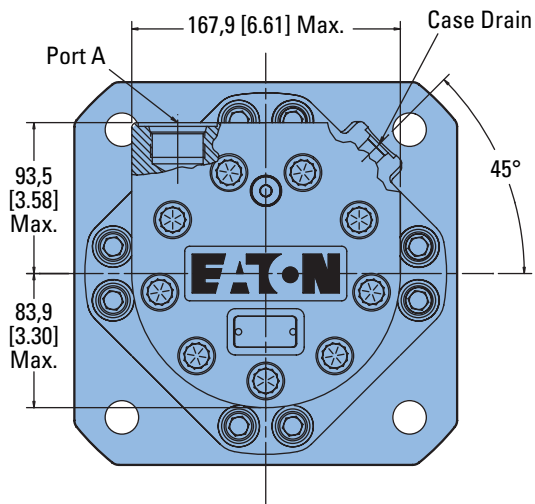
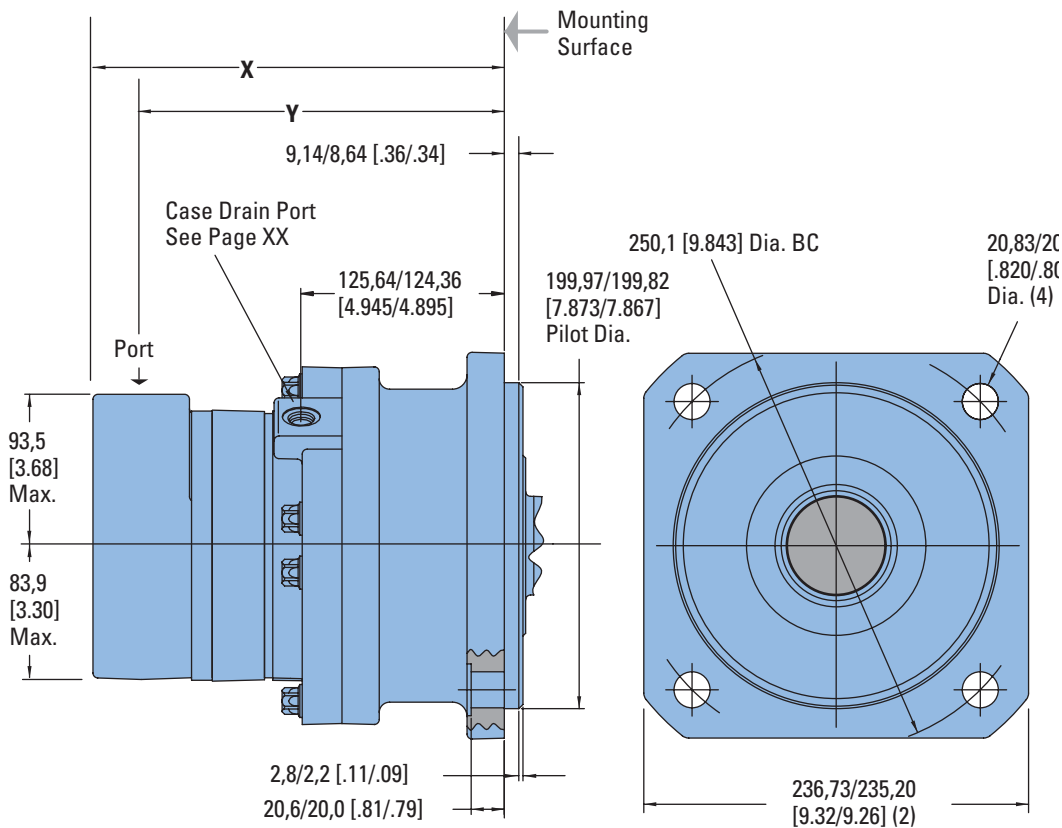


Ports

- 1-5/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- Or G 1 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW



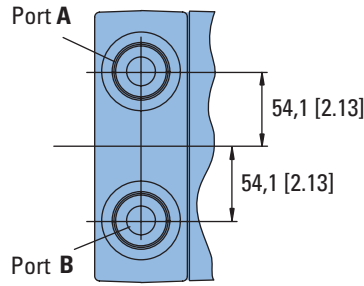
STANDARD MOTORS

Displacement cm ³ /r [in ³ /r]	X Max. mm [inch]	Y mm [inch]
630 [38.6]	260,9 [10.27]	228,6 [9.00]
805 [48.6]	271,3 [10.68]	239,0 [9.41]
990 [60.5]	283,7 [11.17]	251,5 [9.90]
1245 [76.0]	299,7 [11.80]	267,7 [10.54]
1560 [95.0]	319,5 [12.58]	287,5 [11.32]

VIS 45 Series

Dimensions

Wheel Mount

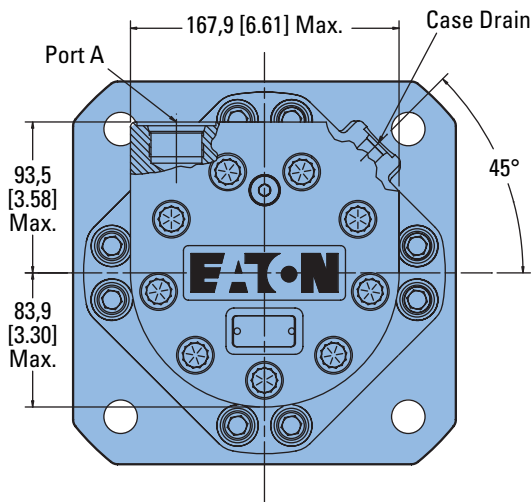
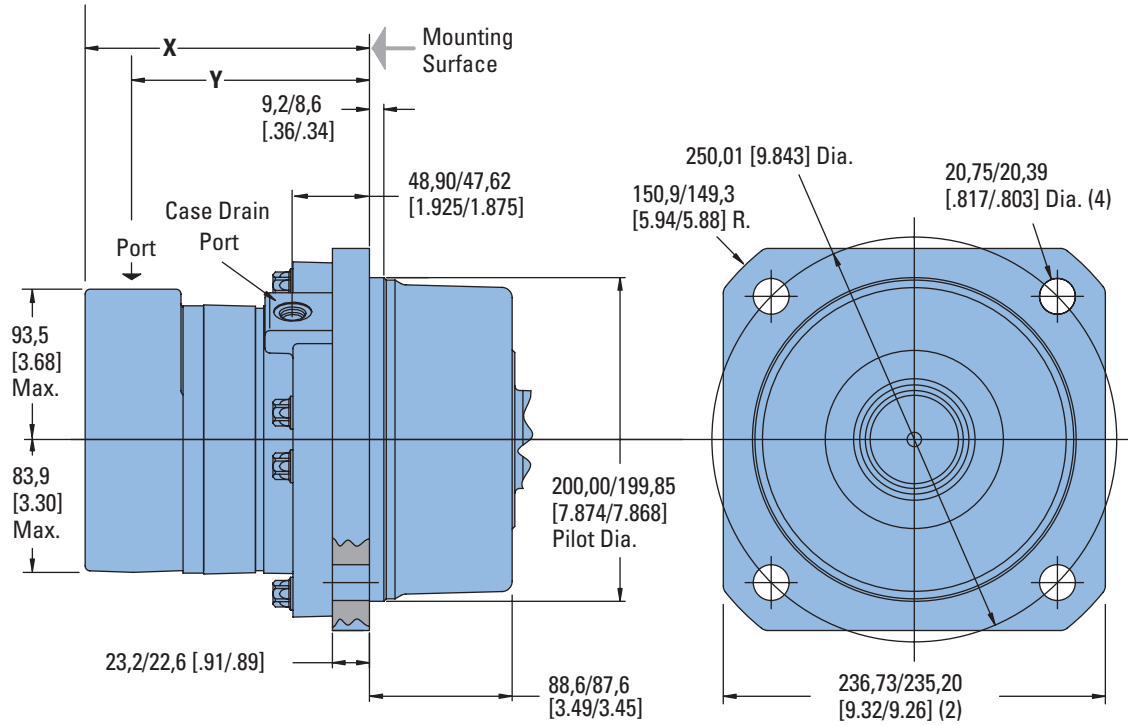


Ports

- 1-5/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- Or G 1 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW



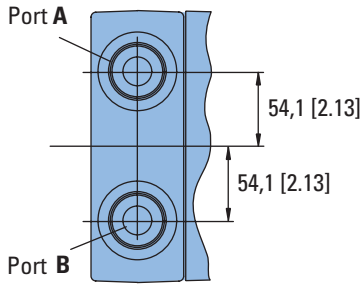
WHEEL MOTORS

Displacement cm ³ /r [in ³ /r]	X Max. mm [inch]	Y mm [inch]
630 [38.6]	184,2 [7.25]	151,9 [5.98]
805 [48.6]	194,6 [7.66]	162,3 [6.39]
990 [60.5]	207,0 [8.15]	174,8 [6.88]
1245 [76.0]	223,0 [8.78]	191,0 [7.52]
1560 [95.0]	242,8 [9.56]	210,8 [8.30]

VIS 45 Series

Dimensions

Bearingless



Ports

- 1-5/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- Or G 1 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)

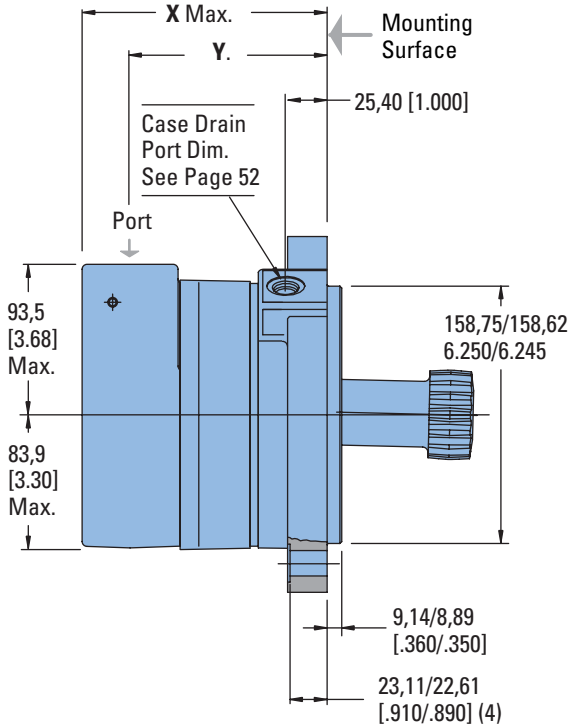
Standard Rotation Viewed from Drive End

- Port A Pressurized — CW
- Port B Pressurized — CCW

For VIS 45 bearingless motor application information, contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

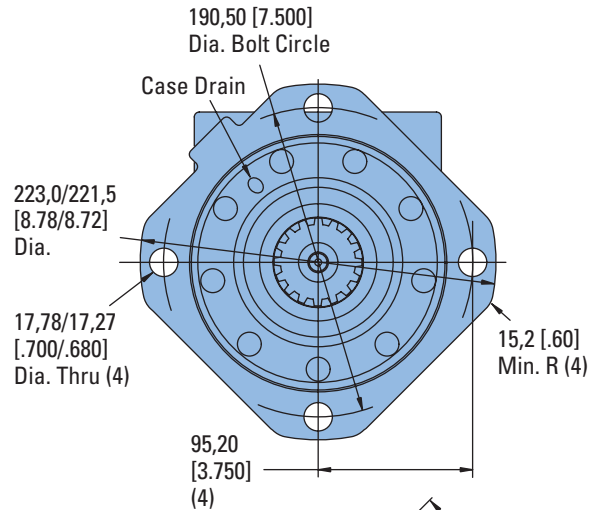
Note:

After machining blank, part must be hardened per Eaton specification.



Shaft Face Seal
Furnished with Motor

223,0/221,5
[8.78/8.72]
Dia.



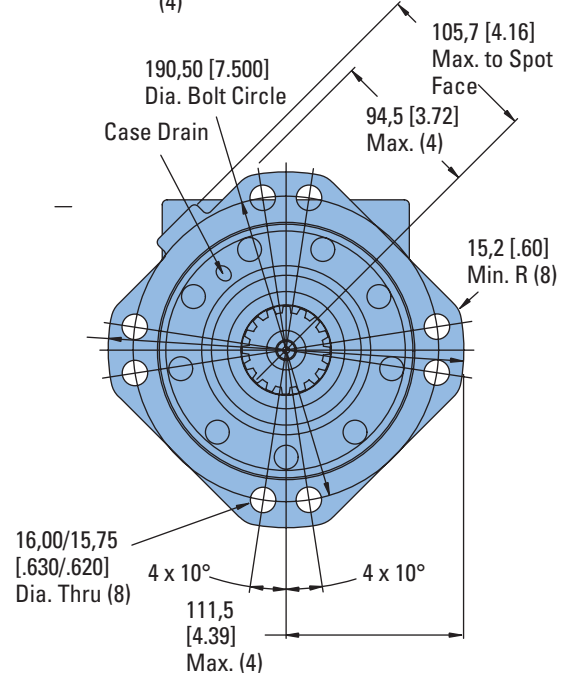
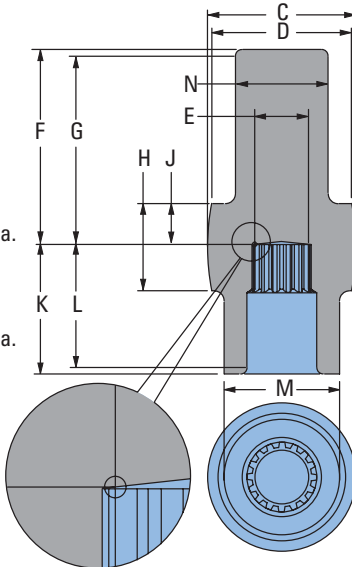
223,0/221,5
[8.78/8.72]
Dia.

17,78/17,27
[.700/.680]
Dia. Thru (4)

15,2 [.60]
Min. R (4)

Mating Coupling Blank
Eaton Part No. 13521-003

- C 116,3 [4.58] Dia. Max.
- D 111,8 [4.40] Dia. Min.
- E 37,64 [1.482] Dia.
- F 136,7 [5.38] Max.
- G 131,6 [5.18] Min. Full Form Dia.
- H 64,8 [2.55]
- J 26,4 [1.04]
- K 109,7 [4.32] Max.
- L 104,6 [4.12] Min. Full Form Dia.
- M 92,58 [3.645] Dia.
- N 73,28 [2.885] Dia.



16,00/15,75
[.630/.620]
Dia. Thru (8)

111,5
[4.39]
Max. (4)

BEARINGLESS MOTORS

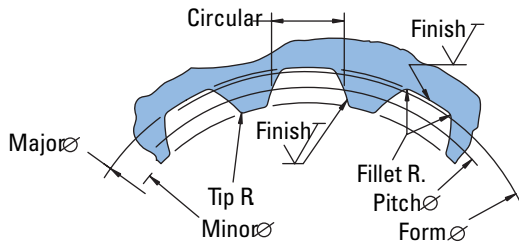
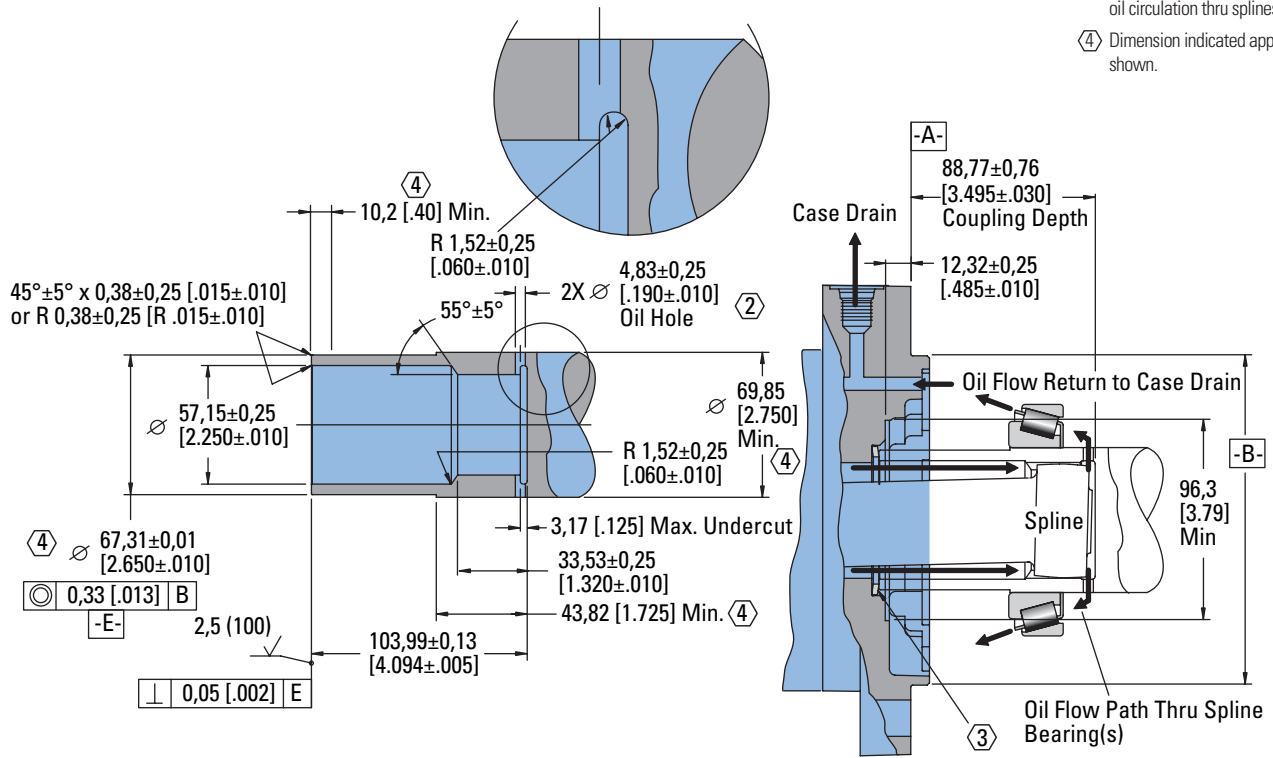
Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
630 [38.6]	161,5 [6.36]	130,3 [5.13]
805 [48.6]	172,5 [6.79]	141,2 [5.56]
990 [60.5]	184,4 [7.26]	153,4 [6.04]
1245 [76.0]	200,7 [7.90]	169,7 [6.68]
1560 [95.0]	220,5 [8.68]	189,5 [7.46]

VIS 45 Series

Installation Information

Bearingless

- 1 Internal spline in mating part to be per spline data. Specification material to be ASTM A304, 8620H carburize to a hardness of 59-62 HRC with case depth (to 50HRC) of 0,76 -1,27 [.030 -.050]. Dimensions apply after heat treat.
- 2 Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.
- 3 Seal to be furnished with motor for proper oil circulation thru splines.
- 4 Dimension indicated applies within area shown.



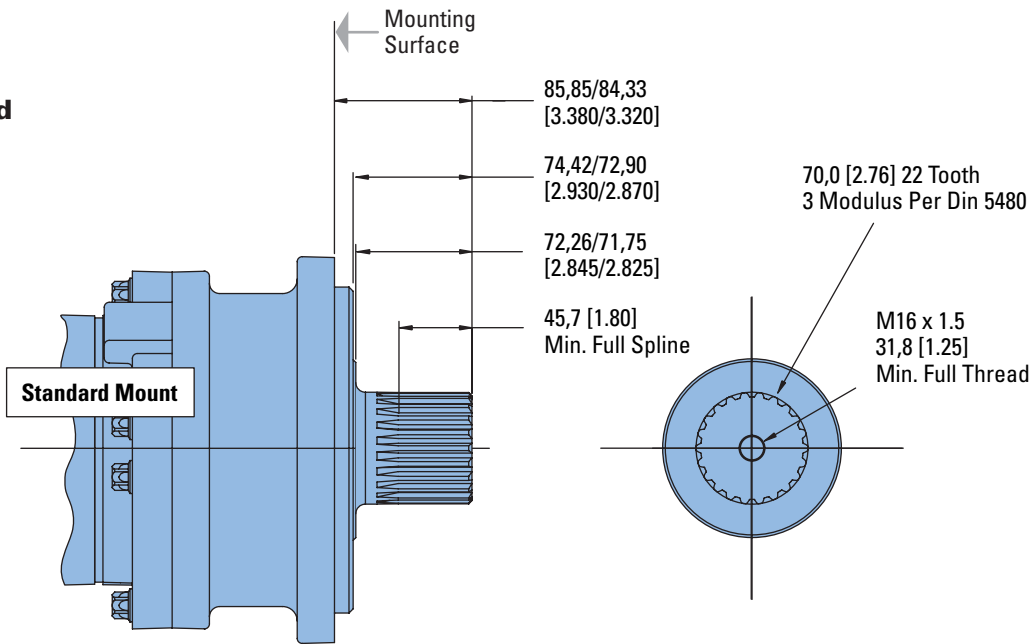
Spline Pitch.....	8/16
Pressure Angle.....	30°
Number of teeth.....	16
Class of Fit.....	Ref. 5
Type of Fit.....	Side
Pitch Diameter.....	Ref. 50,80000 [2.0000000] $\text{\textcircled{0,33}}$ [0.013] B
Base Diameter.....	Ref. 43,994090032 [1.7320508]
Major Diameter.....	56,34±0,15 [2.218±.006]
Min. Minor Diameter.....	48,44±0,08 [1.907±.003]
Form Diameter, Min.....	55,22 [2.174]
Fillet Radius.....	1,02±0,25 [.040±.010]
Tip Radius.....	0,38±0,13 [.015±.005]
Finish.....	1,6 (63)
Involute Profile Variation.....	+0,000 -0,025 [+0.0000 -0.0010]
Total Index Variation.....	0,041 [.0016]
Lead Variation.....	0,015 [.0006]
Circular Space Width:	
Maximum Actual.....	6,180 [.2433]
Minimum Effective.....	6,048 [.2381]
Maximum Effective.....	Ref. 6,099 [.2401]
Minimum Actual.....	Ref. 6,114 [.2407]
Dimension Between Two Pins.....	Ref. 42,659 ±0,05 [1.6795±.0020]
Pin Diameter.....	6,223 [.2450]

VIS 45 Series

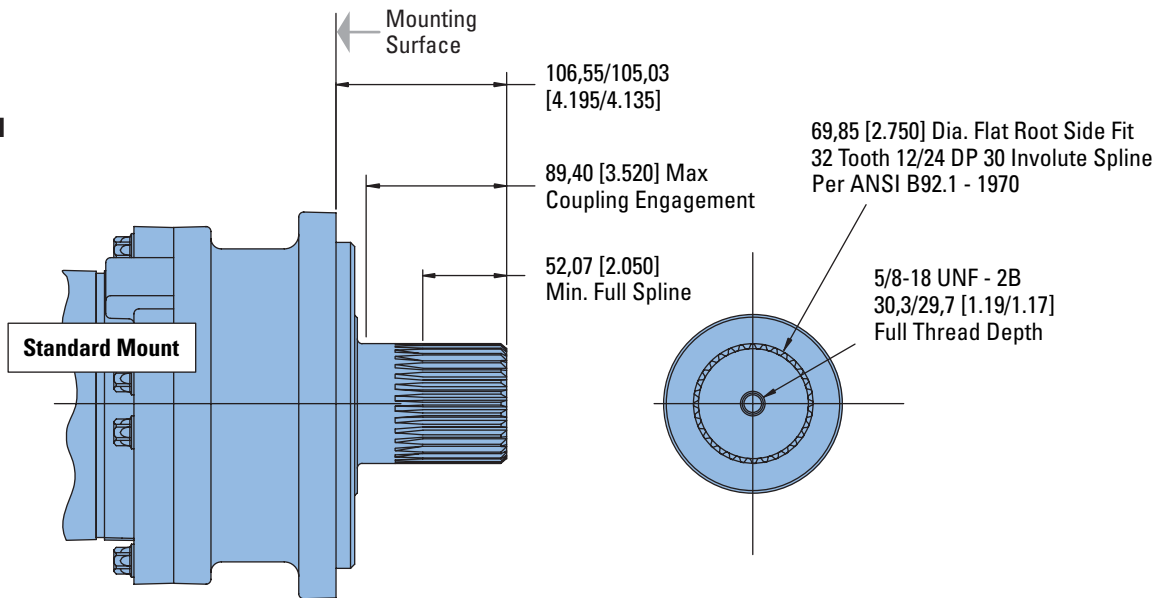
Dimensions Shafts

Splined

70 mm 22 Tooth Splined



2-3/4 Inch 32 Tooth Splined

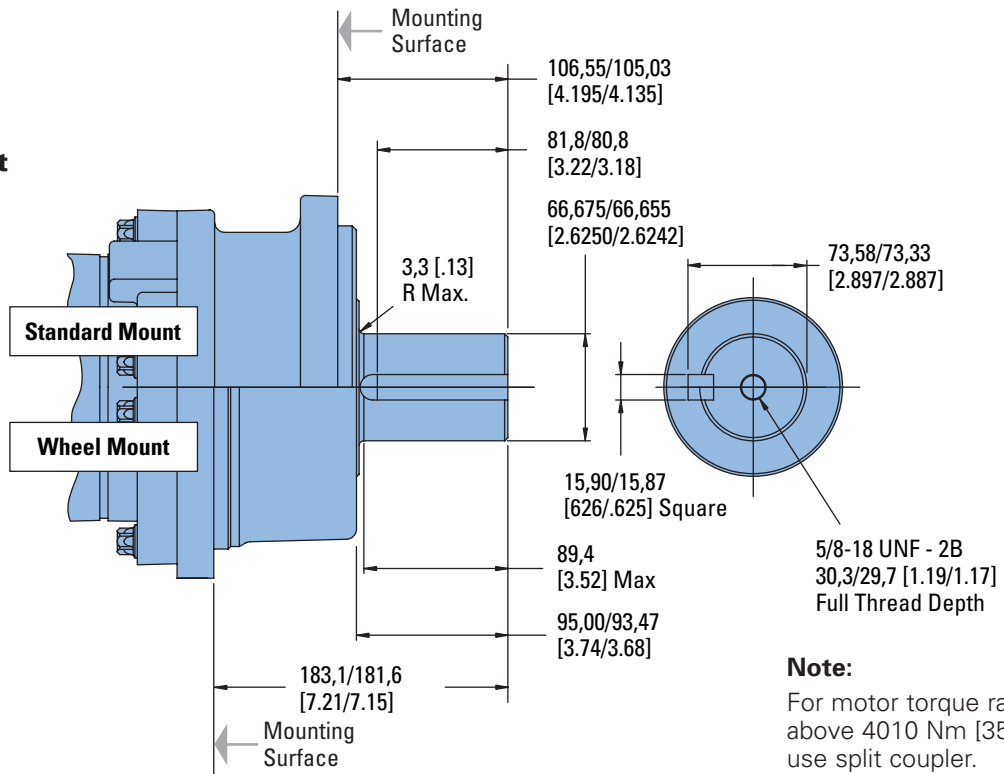


VIS 45 Series

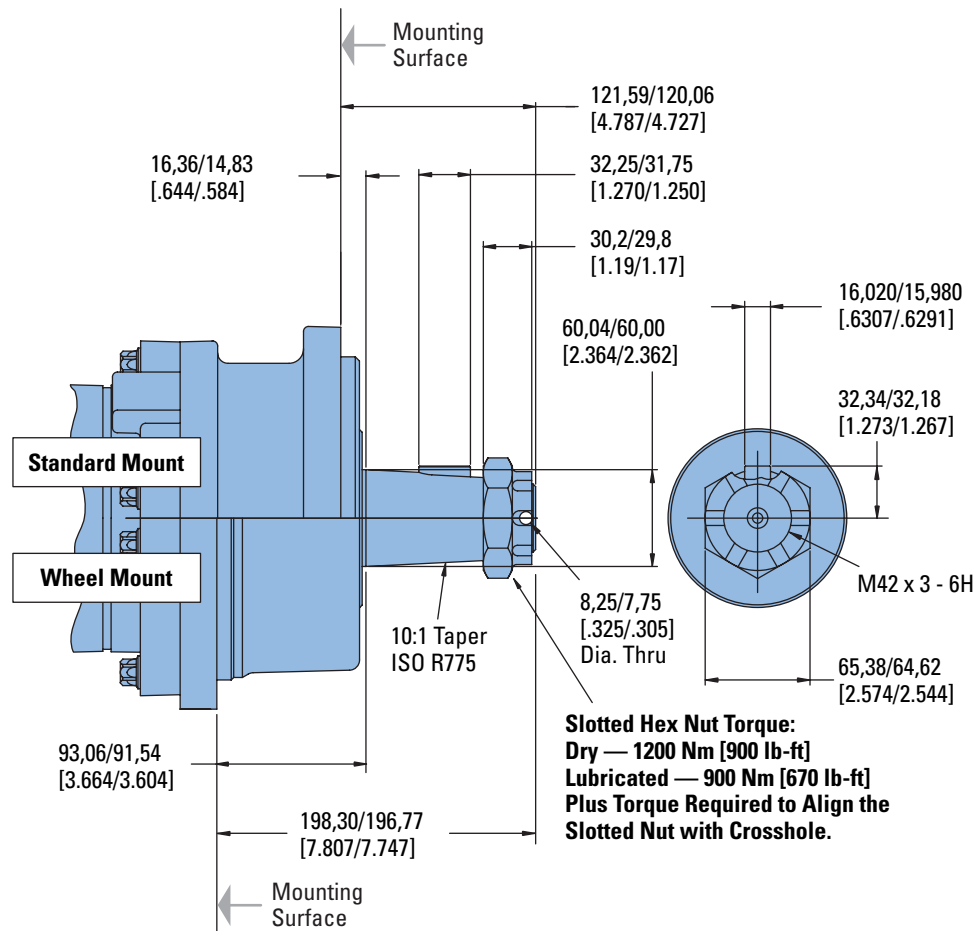
Dimensions Shafts

Keyed

2-5/8 Inch Straight



60 mm Tapered



VIS 45 Series

Side Load Capacity

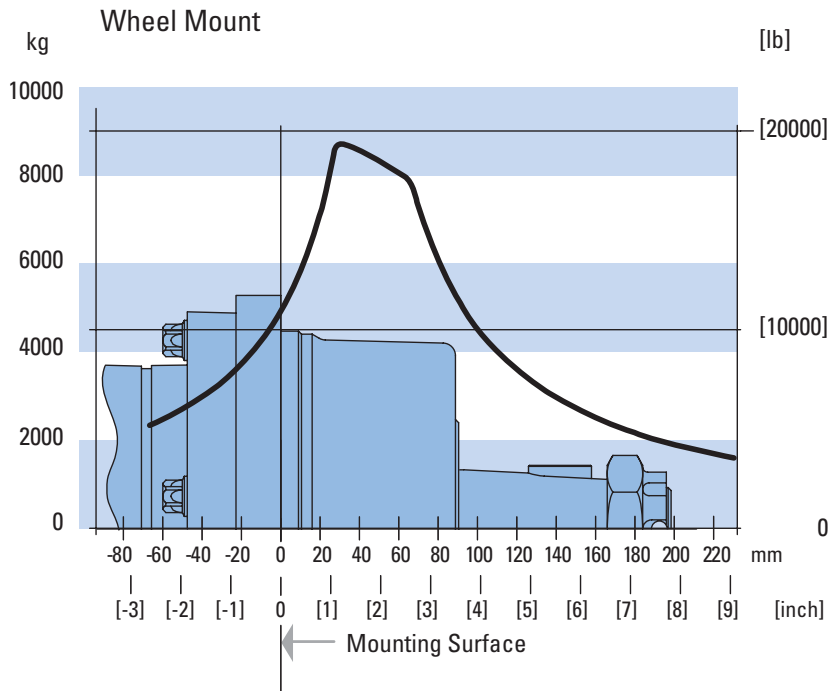
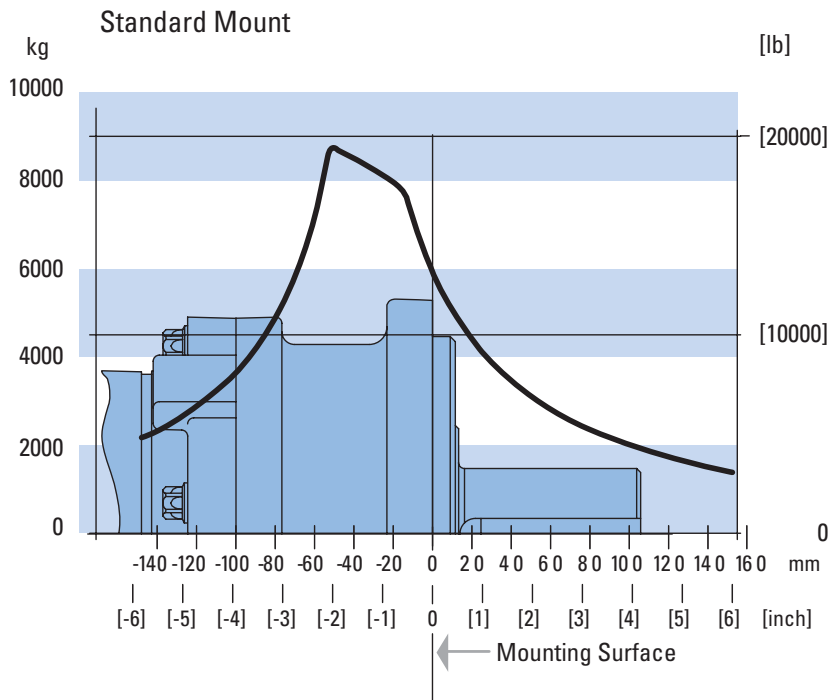
These curves indicate the radial load capacity on the motor shaft(s) at various locations.

The curve is based on B 10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 RPM) at rated output torque.

To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

For 3,000,000 shaft revolutions or 500 hours — Increase these shaft loads 52%.



VIS 45 Series

Product Numbers

Closed Loop

Use three-digit prefix (155-, 156-, or 157-) plus four-digit number from charts for complete product number (ex: 157-0034).

Orders will not be accepted without the three-digit prefix.

SAE

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER				
			630 [38.6]	805 [48.6]	990 [60.5]	1245 [76.0]	1560 [95.0]
Standard	2-5/8 inch Straight	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	155-0107	-0108	-0109	-0110	-0111
	60 mm Tapered	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	155-0114	-0115	-0116	-0117	-0118
	70 mm 22 Tooth Splined	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	155-0121	-0122	-0123	-0124	-0125
Wheel	2-3/4 inch 32 Tooth Splined	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	155-0128	-0085	-0129	-0130	-0131
	2-5/8 inch Straight	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	156-0039	-0040	-0041	-0042	-0043
	60 mm Tapered	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	156-0046	-0047	-0048	-0049	-0050
Bearingless	(8 Bolt)	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	157-0066	-0067	-0068	-0069	-0070
	(4 Bolt)	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	157-0004	-	-	-	-

157-0004

ISO

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER				
			630 [38.6]	805 [48.6]	990 [60.5]	1245 [76.0]	1560 [95.0]
Standard	2-5/8 inch Straight	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	155-0134	-0135	-0136	-0137	-0138
	60 mm Tapered	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	155-0141	-0142	-0143	-0144	-0145
	70 mm 22 Tooth Splined	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	155-0148	-0149	-0150	-0151	-0152
Wheel	2-3/4 inch 32 Tooth Splined	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	155-0155	-0156	-0157	-0158	-0159
	2-5/8 inch Straight	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	156-0053	-0054	-0055	-0056	-0057
	60 mm Tapered	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	156-0060	-0061	-0062	-0063	-0064
Bearingless	(8 Bolt)	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	157-0074	-0075	-0076	-0077	-0078
	(4 Bolt)	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	157-0081	-	-	-	-

157-0081

Note:

The product numbers on this page are for motors used in closed loop circuits. They include a back-pressure relief valve that is set at 15,2 bar [220 PSI].

- A case drain is required for all closed loop VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].

VIS 45 Series

Product Numbers

Open Loop

Use three-digit prefix (155-, 156-, or 157-) plus four-digit number from charts for complete product number (ex: 157-0038).

Orders will not be accepted without three digit prefix.

SAE

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER				
			630 [38.6]	805 [48.6]	990 [60.5]	1245 [76.0]	1560 [95.0]
Standard	2-5/8 inch Straight	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	155-0029	-0030	-0031	-0032	-0033
	60 mm Tapered	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	155-0043	-0044	-0045	-0046	-0047
	70 mm 22 Tooth Splined	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	155-0014	-0057	-0058	-0059	-0060
	2-3/4 inch 32 Tooth Splined	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	155-0070	-0071	-0072	-0073	-0074
Wheel	2-5/8 inch Straight	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	156-0011	-0012	-0013	-0014	-0015
	60 mm Tapered	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	155-0025	-0026	-0027	-0028	-0029
Bearingless	(8 Bolt)	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	157-0050	-0040	-0042	-0044	-0046
	(4 Bolt)	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	157-0038	-	-	-	-

157-0038

ISO

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER				
			630 [38.6]	805 [48.6]	990 [60.5]	1245 [76.0]	1560 [95.0]
Standard	2-5/8 inch Straight	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	155-0036	-0037	-0038	-0039	-0040
	60 mm Tapered	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	155-0050	-0051	-0052	-0053	-0054
	70 mm 22 Tooth Splined	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	155-0063	-0064	-0065	-0066	-0067
	2-3/4 inch 32 Tooth Splined	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	155-0077	-0078	-0079	-0080	-0081
Wheel	2-5/8 inch Straight	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	156-0018	-0019	-0020	-0021	-0022
	60 mm Tapered	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	156-0032	-0033	-0034	-0035	-0036
Bearingless	(8 Bolt)	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	155-0053	-0041	-0043	-0045	-0047
	(4 Bolt)	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	157-0039	-0036	-0037	-0078	

157-0036

Note:

All product numbers in the charts (above) are for motors **without** a back-pressure relief valve. These motors would generally be used in open loop circuits.

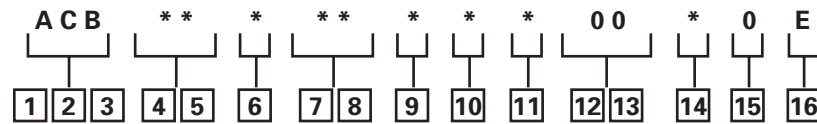
For closed loop circuits a motor **with** a back-pressure relief valve is required.

- A case drain is recommended for all VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].
- In open loop circuits, return pressure must be 3,5 bar [50 PSI] greater than case pressure to properly lubricate the internal drive.

VIS 45 Series

Model Code

The following 16 - digit coding system has been developed to identify all of the configuration options for the VIS 45 motor. Use this model code to specify a motor with the desired features. All 16 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.



1, 2, 3 Product Series
ACB – VIS 45 Motor

4, 5 Displacement
cm³/r [in³/r]

- 31** – 520 [31.7]*
- 35** – 572 [34.9]*
- 39** – 630 [38.6]
- 44** – 720 [43.9]*
- 49** – 805 [48.6]
- 60** – 990 [60.5]
- 76** – 1245 [76.0]
- 95** – 1560 [95.0]

* For performance and dimension data contact your Eaton Hydraulics representative.

6 Mounting Type

- A** – 4 Bolt Bearingless 158,70 [6.250] Pilot Dia. With 9,07 [.355] Pilot Length and 17,53 [.690] Dia holes on 190,50 [7.500] Dia. B. C. - Max. Torque Allowed 3615 Nm [32000 lb - in] (Displ. Code 32, 35, 39 Only)
- C** – 8 Bolt Bearingless 158,70 [6.250] Pilot Dia. With 9,07 [.355] Pilot Length and 17,53 [.690] Dia holes on 190,50 [7.500] Dia. Bolt Circle
- D** – 4 Bolt Wheel Mount 200,0 [7.87] Pilot Dia. With 9,0 [.35] Pilot Length and 20,57 [.810] Dia. Holes on 250,0 [9.84] Dia. Bolt Circle
- H** – 4 Bolt Standard Mount 200,0 [7.87] Pilot Dia. With 9,0 [.35] Pilot Length and 20,57 [.810] Dia. Holes on 250,00 [9.84] Dia. Bolt Circle

7, 8 Output Shaft

- 00** – None (Bearingless)
- 05** – 2-5/8 inch Dia. Straight Shaft with 5/8-18 UNF-2B Thread in End and 15,88 [.625] Sq. X 81,3 [3.20] Straight Key
- 06** – 70 mm Dia. 22 Tooth 3 Modulus Splined Shaft Per DIN 5480 with M16 X 1,5 Thread in End
- 08** – 2-3/4 inch Dia. Flat Root Side Fit 32 Tooth 12/24 DP 30°. Involute Spline with 5/8-18 UNF-2B Thread in End
- 09** – 60 mm Dia. 10:1 Tapered Shaft Per ISO R775 with M42 x 3 - 6H Threaded Shaft End, 16W x 10H x 32L [.630W x .394H x 1.260L]

9 Ports

- A** – 1-5/16-12 UN-2B O-ring Port, Accepts Fittings for SAE J1926/1
- B** – G 1 (BSP) Ports, Accepts Fittings with Elastomeric or Deformable Metallic Sealing Member Per DIN 3852

10 Case Flow Options

- A** – Shuttle Valve with Side Facing 9/16-18 UNF-2B, O-ring Port Case Drain, Accepts Fittings for SAE J1926/1, Case Drain Required
- B** – Shuttle Valve with Side Facing G 1/4 (BSP) Port Case Drain, Case Drain Required

11 Back-Pressure Relief

- 0** – None (for Open Loop Only)
- 1** – Set at 15,2 bar [220 psi] (for Servo Pumps)
- 3** – Set at 4,5 bar [65 psi] (for Manual Pumps)
- 4** – Set at 20,7 bar [300 PSI] (for High Pressure Servo Pumps)

12, 13 Special Features

- 00** – None

14 Paint/ Special Packaging

- 0** – No Paint, Individual Box
- A** – Painted Low Gloss Black, Individual Box
- B** – No Paint, Bulk Box Option
- C** – Painted Low Gloss Black, Bulk Box Option

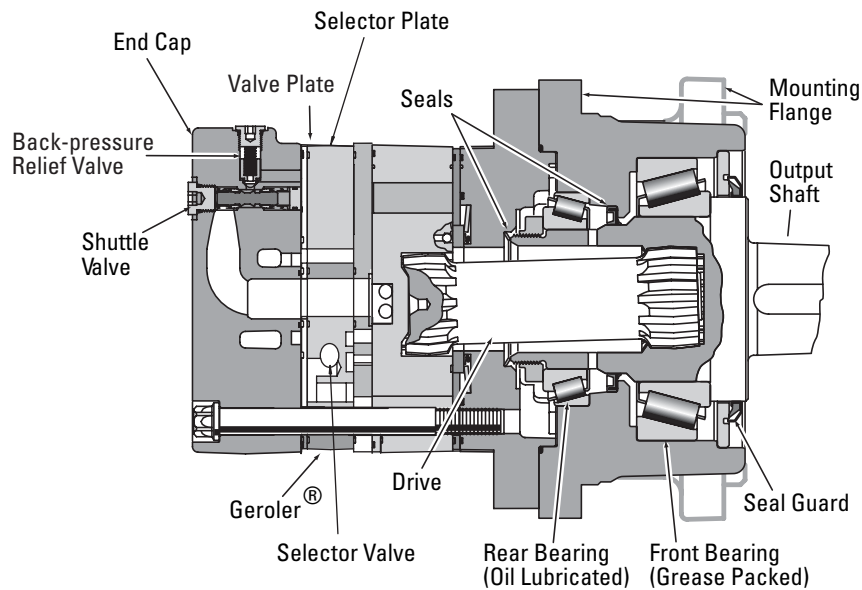
15 Eaton Assigned Code when Applicable

- 0** – Assigned Code

16 Eaton Assigned Design Code

- E** – Assigned Design Code

VIS 45 Series Two-speed



Specifications

VIS 45 Series motors are available with an integral two-speed feature that allows the operator to shift the motor between low speed high torque (LSHT) mode and high speed low torque (HSLT) mode. In the LSHT mode, output torque and rotation speed values are equal to those of the conventional VIS 45 motor. In the HSLT mode motor displacement is reduced by one third, resulting in a fifty percent increase in rotation speed and a torque output reduction of one third. The VIS 45 two speed motor is bidirectional. It will function with equal shaft output in either rotation direction (CW or CCW) in both LSHT and HSLT modes. Shift on the fly technology allows full-power operation throughout the full duration of the shift.

Changing between modes is accomplished by changing the displacement in a ratio of 1 to 1.5. An external two-position three-way control valve is required for shifting pressure between low pressure (LSHT mode) and pilot signal pressure (HSLT mode). An integral selector valve shifts the motor from LSHT mode to HSLT mode. Initially, low pressure is supplied to the pilot port. The selector valve is biased to LSHT mode by a return spring. When pilot signal pressure is supplied to the pilot port and 3,5 Δbar [50 ΔPSI] is reached, the selector valve overcomes return spring force and shifts the spool to select HSLT mode. Oil on the opposite side of the spool is drained to tank via the drain port. The pressure difference between the pilot port and drain port must be maintained to keep the motor in the high speed mode. When pilot pressure

is removed from the pilot port, the pressure in the pilot end of the spool valve is relieved and drained back through the control valve and the return spring forces the spool valve to LSHT position.

Pilot pressure may come from any source that will provide uninterrupted pressure during the high-speed mode operation. Allowable pilot pressure must be at least 3,5 Δbar [50 ΔPSI] and may be as high as full operating pressure of the motor.

All VIS 45 Series two speed motors are equipped with a return line shuttle for closed circuit applications as standard equipment. All options available on the conventional VIS 45 are also available on VIS 45 two speed motors.

Performance Data

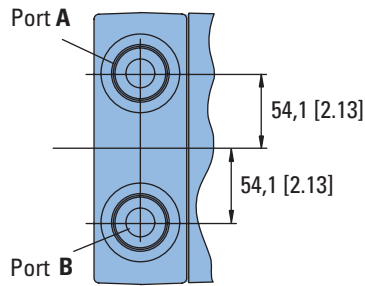
In the LSHT mode, torque and speed values are equal to those of the conventional VIS 45 motor. In the HSLT mode, rotation speed is increased by fifty percent and torque output is reduced by one third.

The VIS 45 two speed motor will function with equal shaft output in either rotation direction (CW or CCW) in both LSHT and HSLT modes.

VIS 45 Series Two-speed

Dimensions

Standard Mount

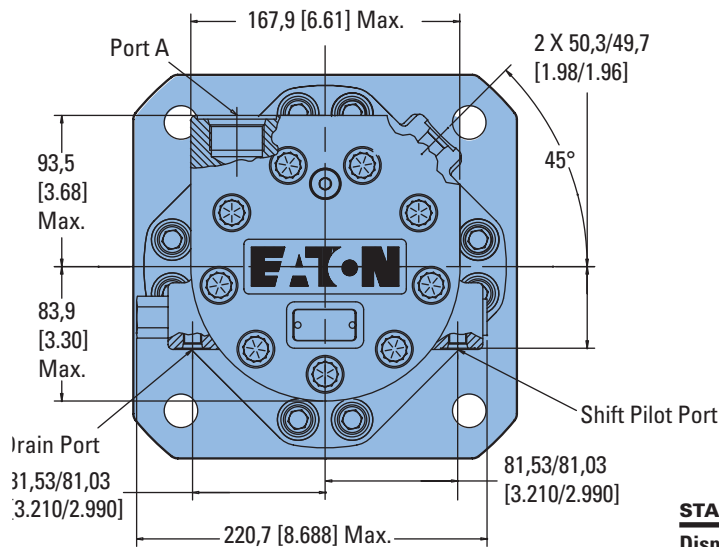
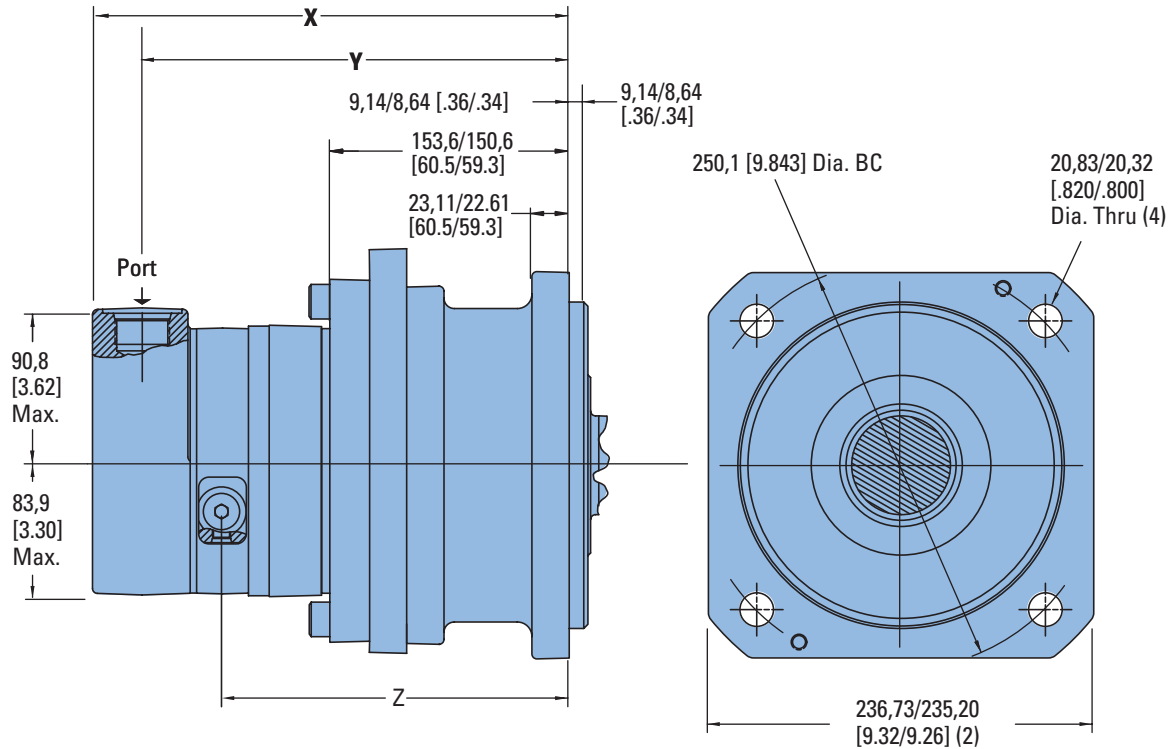


Ports

- 1-5/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16-20 UNF -2B SAE O-ring Shift Ports (2)
- or
- G 1 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)
- 7/16-20 UNF -2B SAE O-ring Shift Ports (2)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW



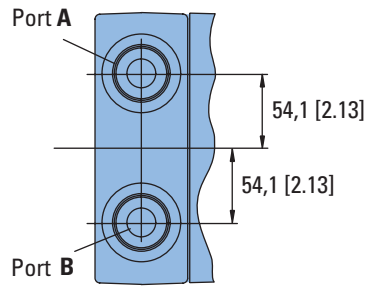
STANDARD MOUNT

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
630 [38.6]	295,5 [11.63]	263,2 [10.36]	216,3 [8.51]
805 [48.6]	305,9 [12.04]	273,6 [10.77]	226,7 [8.92]
990 [60.5]	318,3 [12.53]	286,0 [11.26]	239,1 [9.41]
1245 [76.0]	334,3 [13.16]	302,0 [11.89]	255,1 [10.04]
1560 [95.0]	353,3 [13.94]	321,0 [12.67]	274,1 [10.82]

VIS 45 Series Two-speed

Dimensions

Wheel Mount

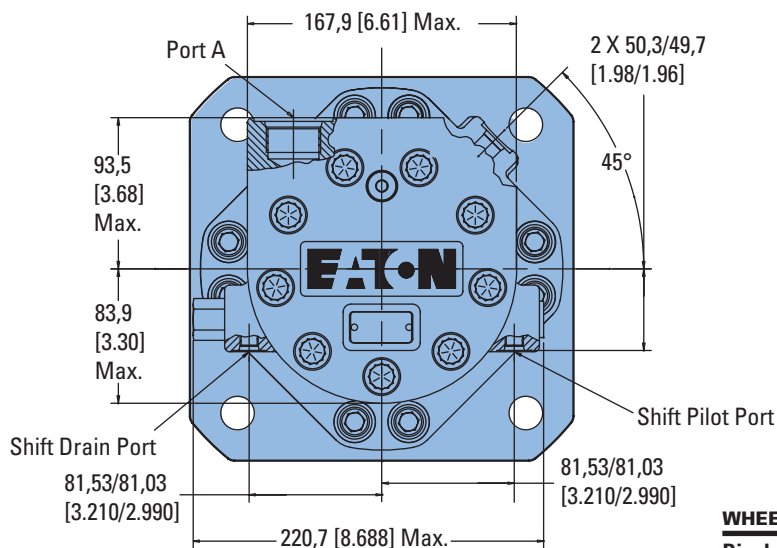
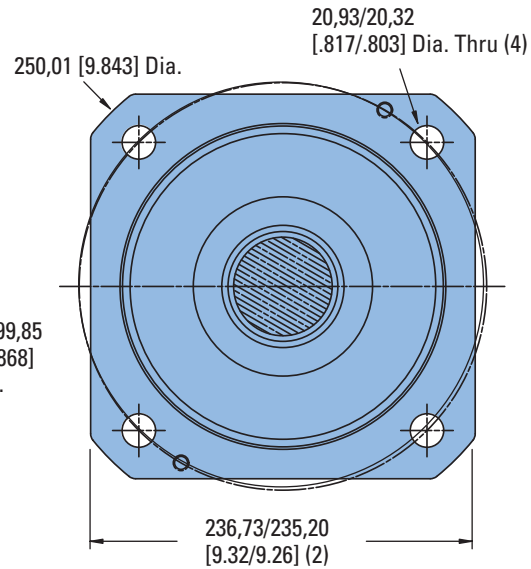
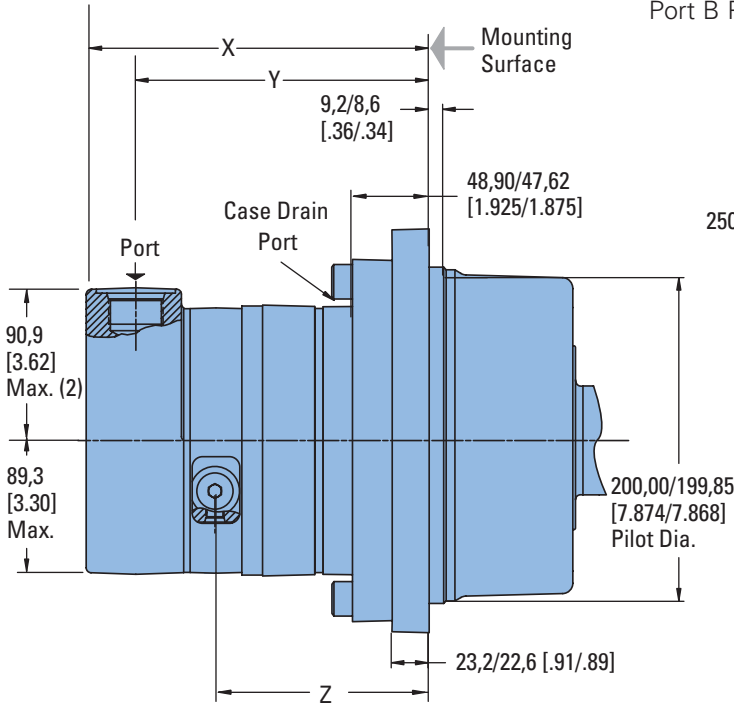


Ports

- 1-5/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16 -20 UNF -2B SAE O-ring Shift Ports (2)
- or
- G 1 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)
- 7/16 -20 UNF -2B SAE O-ring Shift Ports (2)

Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW



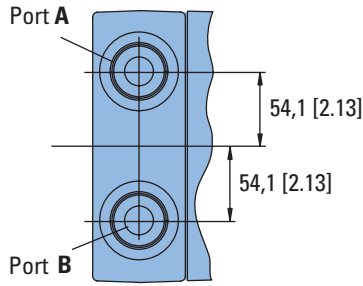
WHEEL MOUNT

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
630 [38.6]	218,8 [8.61]	186,5 [7.34]	139,6 [5.49]
805 [48.6]	229,2 [9.02]	196,9 [7.75]	150,0 [5.90]
990 [60.5]	241,6 [9.51]	209,4 [8.24]	162,4 [6.39]
1245 [76.0]	257,6 [10.14]	225,6 [8.88]	178,4 [7.02]
1560 [95.0]	276,6 [10.92]	245,4 [9.66]	197,4 [7.80]

VIS 45 Series Two-speed

Dimensions

Bearingless



Ports

- 1-1/16-12 UN-2B SAE O-ring Ports (2)
- 9/16-18 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16-20 UNF -2B SAE O-ring Shift Ports (2)
- Or
- G 3/4 (BSP) O-ring Ports (2)
- G 1/4 (BSP) O-ring Case Drain Port (1)
- 7/16-20 UNF -2B SAE O-ring Shift Ports (2)

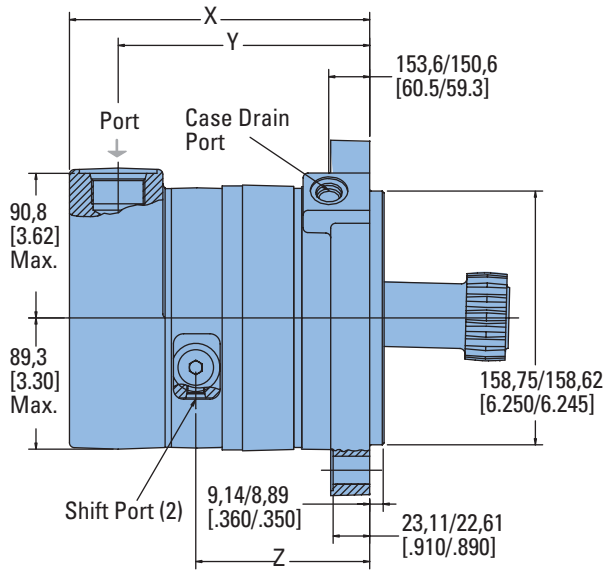
Standard Rotation Viewed from Drive End

- Port A Pressurized — CW
- Port B Pressurized — CCW

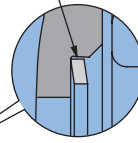
For VIS 45 two-speed bearingless motor application information, contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

Note:

After machining blank, part must be hardened per Eaton specification.



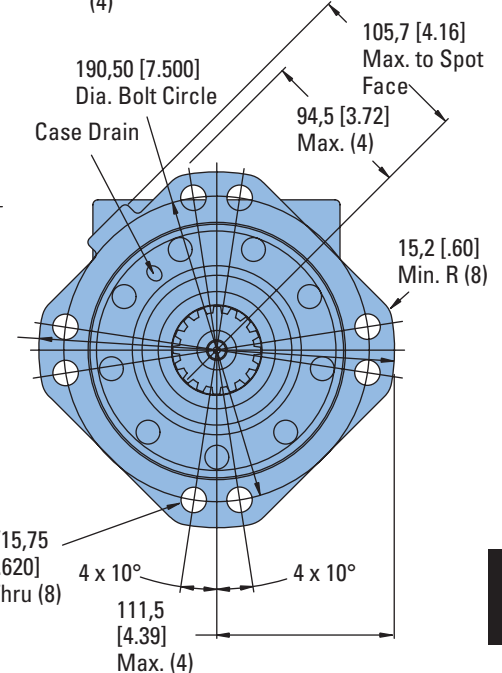
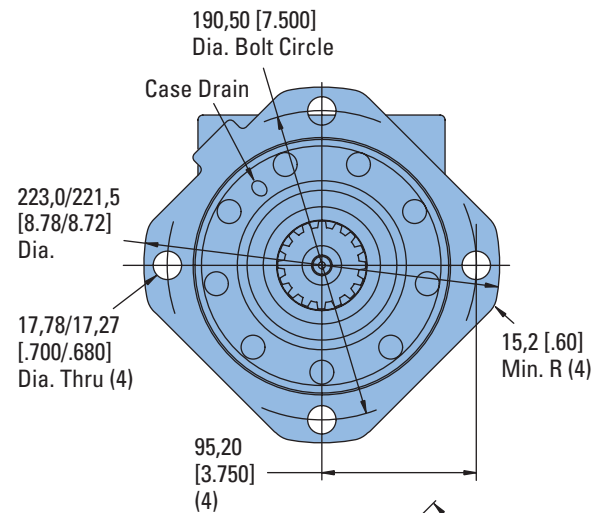
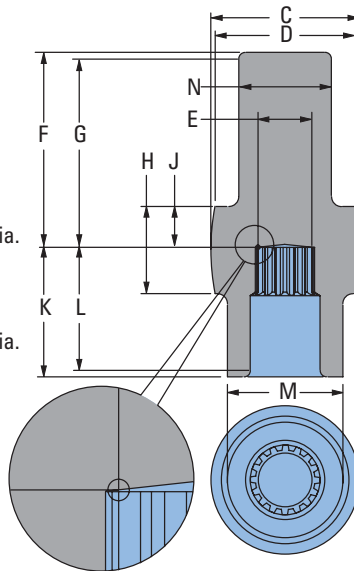
Shaft Face Seal
Furnished with Motor



223,0/221,5
[8.78/8.72]
Dia.

Mating Coupling Blank
Eaton Part No. 13521-003

- C 116,3 [4.58] Dia. Max.
- D 111,8 [4.40] Dia. Min.
- E 37,64 [1.482] Dia.
- F 136,7 [5.38] Max.
- G 131,6 [5.18] Min. Full Form Dia.
- H 64,8 [2.55]
- J 26,4 [1.04]
- K 109,7 [4.32] Max.
- L 104,6 [4.12] Min. Full Form Dia.
- M 92,58 [3.645] Dia.
- N 73,28 [2.885] Dia.



BEARINGLESS MOTORS

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
630 [38.6]	196,1 [7.72]	165,9 [6.53]	116,9 [4.60]
805 [48.6]	206,5 [8.13]	176,3 [6.94]	127,3 [5.01]
990 [60.5]	218,9 [8.62]	188,8 [7.43]	139,7 [5.50]
1245 [76.0]	235,2 [9.26]	205,0 [8.07]	156,0 [6.14]
1560 [95.0]	255,0 [10.04]	224,8 [8.85]	175,8 [6.92]

VIS 45 Series Two-speed

Product Numbers

(Closed Loop)

Use digit prefix—173-,174- or 183- plus four digit number from charts for complete product number—

Example: 173-0013.

Orders will not be accepted without three digit prefix.

SAE

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER				
			630 [38.6]	805 [48.6]	990 [60.5]	1245 [76.0]	1560 [95.0]
Standard	2-5/8 inch Straight	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	174-0006	-0007	-0008	-0009	-0010
	60 mm Tapered	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	174-0011	-0012	-0013	-0014	-0015
	70 mm 22 Tooth Splined	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	174-0016	-0017	-0018	-0019	-0020
Wheel	2-3/4 inch 32 Tooth Splined	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	174-0021	-0022	-0023	-0024	-0025
	2-5/8 inch Straight	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	183-0006	-0007	-0008	-0009	-0010
	60 mm Tapered	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	183-0011	-0012	-0013	-0014	-0015
Bearingless	(8 Bolt)	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	173-0008	-0009	-0010	-0011	-0012
	(4 Bolt)	1-5/16-12 UNF O-ring (2) 9/16-18 UNC Drain Port (1)	173-0013	-	-	-	-

173-0013

ISO

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER				
			630 [38.6]	805 [48.6]	990 [60.5]	1245 [76.0]	1560 [95.0]
Standard	2-5/8 inch Straight	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	174-0026	-0027	-0028	-0029	-0030
	60 mm Tapered	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	174-0031	-0032	-0033	-0034	-0035
	70 mm 22 Tooth Splined	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	174-0036	-0037	-0038	-0039	-0040
Wheel	2-3/4 inch 32 Tooth Splined	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	174-0041	-0042	-0043	-0044	-0045
	2-5/8 inch Straight	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	183-0016	-0017	-0018	-0019	-0020
	60 mm Tapered	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	183-0021	-0022	-0023	-0024	-0025
Bearingless	(8 Bolt)	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	173-0014	-0015	-0016	-0017	-0018
	(4 Bolt)	G 1 (BSP) (2) G 1/4 (BSP) Drain Port (1)	173-0019	-	-	-	-

173-0019

Note:

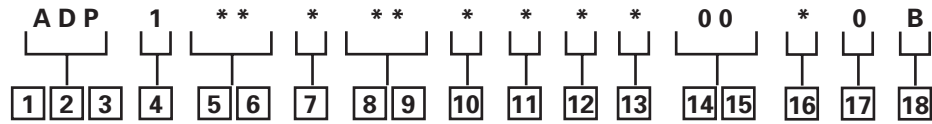
The product numbers on this page are for motors used in closed loop circuits. They include a back-pressure relief valve that is set at 15,2 bar [220 PSI].

- A case drain is required for all closed loop VIS motor applications.
- The maximum case pressure for the VIS motor is 3,5 bar [50 PSI].

VIS 45 Series Two-speed

Model Code

The following 18-digit coding system has been developed to identify all of the configuration options for the VIS 45 Two-Speed motor. Use this model code to specify a motor with the desired features. All 18 digits of the code must be present when ordering. You may want to photocopy the matrix below to endure that each number is entered in the correct box.



1, 2, 3 Product Series
ADP – VIS 45 Two-speed Motor

4 Eaton Assigned Code

1 – Assigned Code

5, 6 Displacement
cm³/r [in³/r]

32 – 520 [31.7]*

35 – 572 [34.9]*

39 – 630 [38.6]

44 – 720 [43.9]*

49 – 805 [48.6]

60 – 990 [60.5]

76 – 1245 [76.0]

95 – 1560 [95.0]

* For performance and dimension data, contact your Eaton Hydraulics representative.

7 Mounting Type

A – 4 Bolt Bearingless
158,70 [6.250] Pilot Dia.
With 9,07 [.355] Pilot Length
and 17,53 [.690] Dia holes
on 190,50 [7.500] Dia. B. C.
- Max. Torque Allowed 3615
Nm [32000 lb-in] (Displ.
Code 32, 35, 39 Only)

C – 8 Bolt Bearingless
158,70 [6.250] Pilot Dia.
With 9,07 [.355] Pilot Length
and 17,53 [.690] Dia holes
on 190,50 [7.500] Dia. Bolt
Circle

D – 4 Bolt Wheel Mount
200,0 [7.87] Pilot Dia. With
9,0 [.35] Pilot Length and
20,57 [.810] Dia. Holes on
250,0 [9.84] Dia. Bolt Circle

H – 4 Bolt Standard Mount
200,0 [7.87] Pilot Dia. With
9,0 [.35] Pilot Length and
20,57 [.810] Dia. Holes on
250,00 [9.84] Dia. Bolt Circle

8, 9 Output Shaft

00 – None (Bearingless)

05 – 2-5/8 inch Dia. Straight
Shaft with 5/8-18 UNF-2B
Thread in End and 15,88
[.625] Sq. X 81,3 [3.20]
Straight Key

06 – 70 mm Dia. 22 Tooth
3 Modulus Splined Shaft Per
DIN 5480 with M16 X 1,5
Thread in End

08 – 2-3/4 inch Dia. Flat
Root Side Fit 32 Tooth 12/24
DP 30°. Involute Spline with
5/8-18 UNF-2B Thread in End

09 – 60 mm Dia. 10:1
Tapered Shaft Per ISO R775
with M42 x 3 - 6H Threaded
Shaft End, 16W x 10H x 32L
[.630W x .394H x 1.260L]

10 Ports

A – 1-5/16-12 UN-2B O-ring
Port, Accepts Fittings for
SAE J1926/1

B – G 1 (BSP) Straight
Thread Ports

11 Case Flow Options

D – Shuttle Valve with
Side Facing 9/16-18 UNF-
2B, O-ring Port Case
Drain, Accepts Fittings for
SAE J1926/1, Case Drain
Required

F – Shuttle Valve with Side
Facing G 1/4 (BSP) Port
Case Drain, Case Drain
Required

12 Back-Pressure Relief

1 – Set at 15,2 bar [220 psi]
(for Servo Pumps)

3 – Set at 4,5 bar [65 psi]
(for Manual Pumps)

4 – Set at 20,7 bar [300 PSI]
(for High Pressure Servo
Pumps)

13 Eaton Assigned Code

0 – Assigned Code

14, 15 Special Features

00 – None

**16 Paint/ Special
Packaging**

0 – No Paint, Individual Box

A – Painted Low Gloss
Black, Individual Box

B – No Paint, Bulk Box
Option

C – Painted Low Gloss
Black, Bulk Box Option

**17 Eaton Assigned
Code when Applicable**

0 – Assigned Code

**18 Eaton Assigned
Design Code**

B – Assigned Design Code