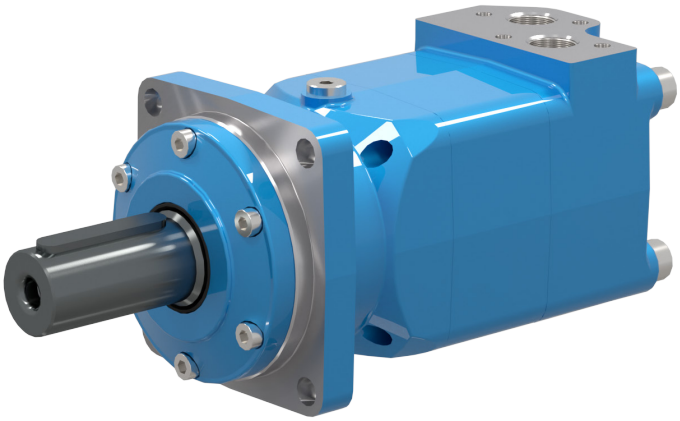
DANA SAMHYDRAULIK™

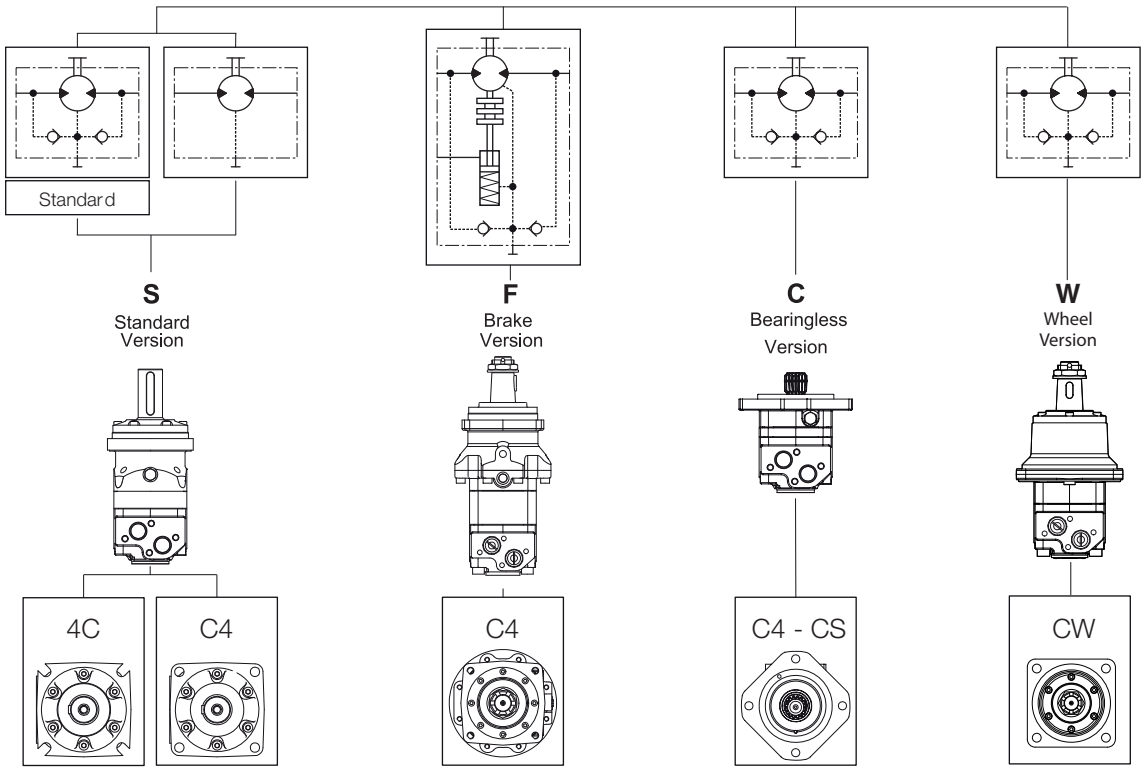


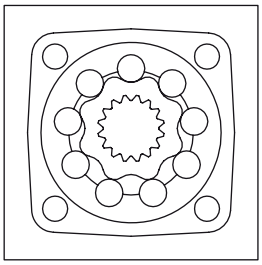
HT
Orbital Motors

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Pressure Data	**G7**
MAx. Permissible Shaft Seal Pressure	**G7**
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Other Informations	**G9**
Ordering Code	**G10**
Dimensions and Weight	**G14**
Brake Feature	**G18**
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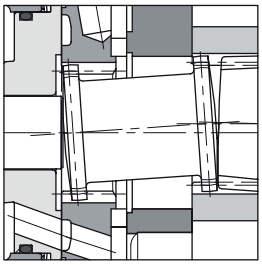
HT

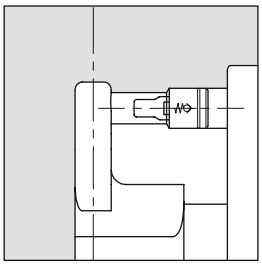




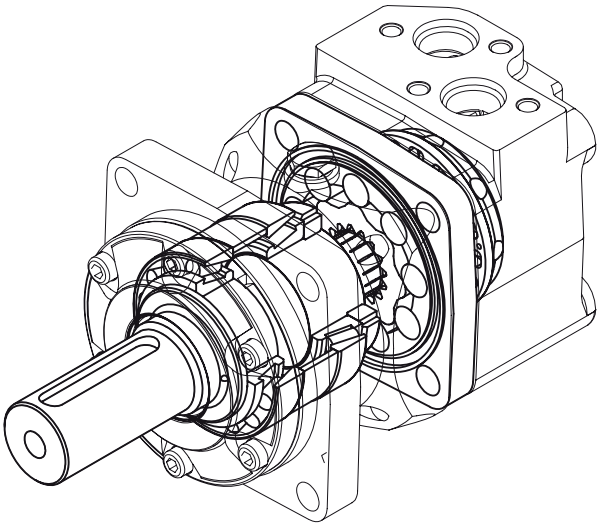
Heavy duty, roller type stator meant to work at high pressure ant to guarantee extra long lasting.

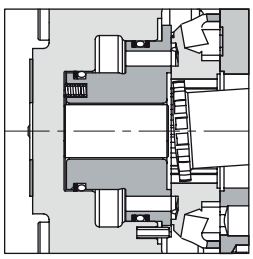
Separate disc valves drive to guarantee sharp phase.





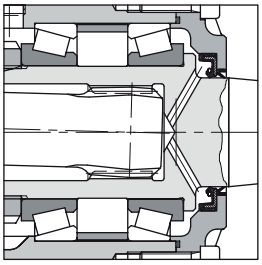
Built-in check valves to recirculate internally drained fluid through return line (standard version).





Disc valve distribution with automatic compensation of backlash done by fluid under pressure: lower drain figures are then guaranteed together with high efficiency. The presence of seals with back-up ring guarantee greater reliability.

Shaft supported by two heavy duty tapered roller bearings that ensure outstanding radial load capacity.



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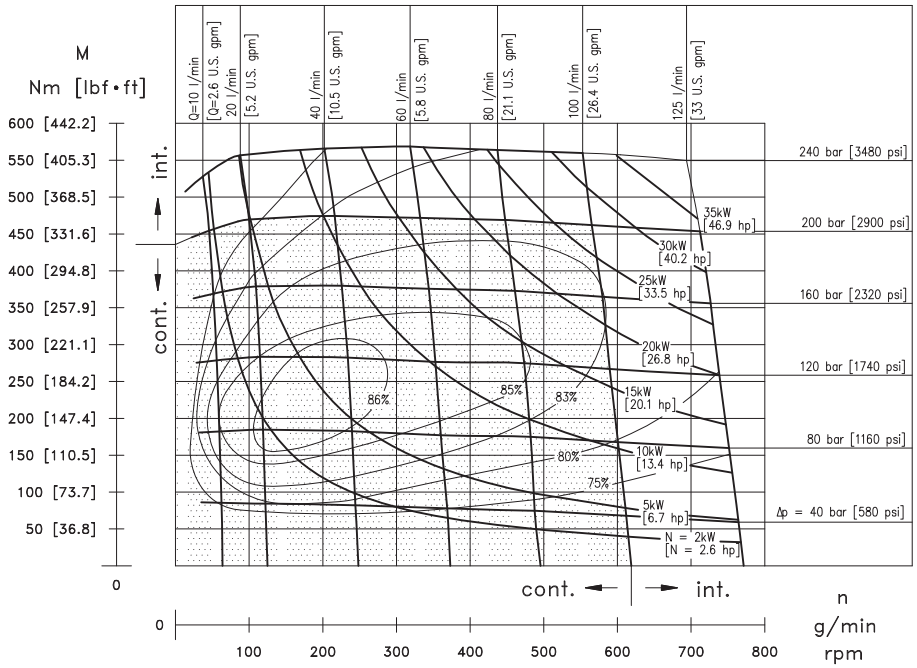
Click *i* button to return to main index

Motor	Displacement cm³/rev [in³/rev]	Max. input pressure bar [psi]		Max. differential pressure bar [psi]		Max. torque Nm [lbf·ft]		Max. flow l/min [U.S. gpm]		Max. speed rpm		Max. power kW [hp]	
HT 160	161.1 [9.8]	Cont Int[1] Peak[2]	210 [3045] 250 [3625] 300 [4350]	Cont Int[1] Peak[2]	200 [2900] 240 [3480] 280 [4060]	Cont Int[1] Peak[2]	470 [346.3] 560 [412.7] 660 [486.4]	Cont Int[1]	100 [26.4] 125 [33]	Cont Int[1]	625 780	Cont Int[1]	27.5 [36.8] 32 [42.8]
HT 200	201.4 [12.2]	Cont Int[1] Peak[2]	210 [3045] 250 [3625] 300 [4350]	Cont Int[1] Peak[2]	200 [2900] 240 [3480] 280 [4060]	Cont Int[1] Peak[2]	590 [434.8] 710 [523.2] 820 [604.3]	Cont Int[1]	125 [33] 150 [39.6]	Cont Int[1]	625 750	Cont Int[1]	33.5 [44.8] 40 [53.6]
HT 250	251.8 [15.3]	Cont Int[1] Peak[2]	210 [3045] 250 [3625] 300 [4350]	Cont Int[1] Peak[2]	200 [2900] 240 [3480] 280 [4060]	Cont Int[1] Peak[2]	730 [538] 880 [648.5] 1020 [751.7]	Cont Int[1]	125 [33] 150 [39.6]	Cont Int[1]	500 600	Cont Int[1]	33.5 [44.8] 40 [53.6]
HT 315	326.3 [19.9]	Cont Int[1] Peak[2]	210 [3045] 250 [3625] 300 [4350]	Cont Int[1] Peak[2]	200 [2900] 240 [3480] 280 [4060]	Cont Int[1] Peak[2]	950 [700.1] 1140 [840.1] 1330 [980.2]	Cont Int[1]	125 [33] 150 [39.6]	Cont Int[1]	380 460	Cont Int[1]	33.5 [44.8] 40 [53.6]
HT 400	410.9 [25.06]	Cont Int[1] Peak[2]	210 [3045] 250 [3625] 300 [4350]	Cont Int[1] Peak[2]	180 [2610] 210 [3045] 240 [3480]	Cont Int[1] Peak[2]	1080 [795.9] 1260 [928.6] 1440 [1061.2]	Cont Int[1]	125 [33] 150 [39.6]	Cont Int[1]	305 365	Cont Int[1]	30 [40.2] 35 [46.9]
HT 500	523.6 [31.9]	Cont Int[1] Peak[2]	210 [3045] 250 [3625] 300 [4350]	Cont Int[1] Peak[2]	160 [2320] 180 [2610] 210 [3045]	Cont Int[1] Peak[2]	1220 [899.1] 1370 [1009.6] 1600 [1179.2]	Cont Int[1]	125 [33] 150 [39.6]	Cont Int[1]	240 285	Cont Int[1]	26.5 [35.5] 30 [40.2]

[1] Intermittent duty must not exceed 10% each minute.
[2] Peak duty must not exceed 1% each minute.
[3] Oil viscosity 35 cSt.

Performance Curves

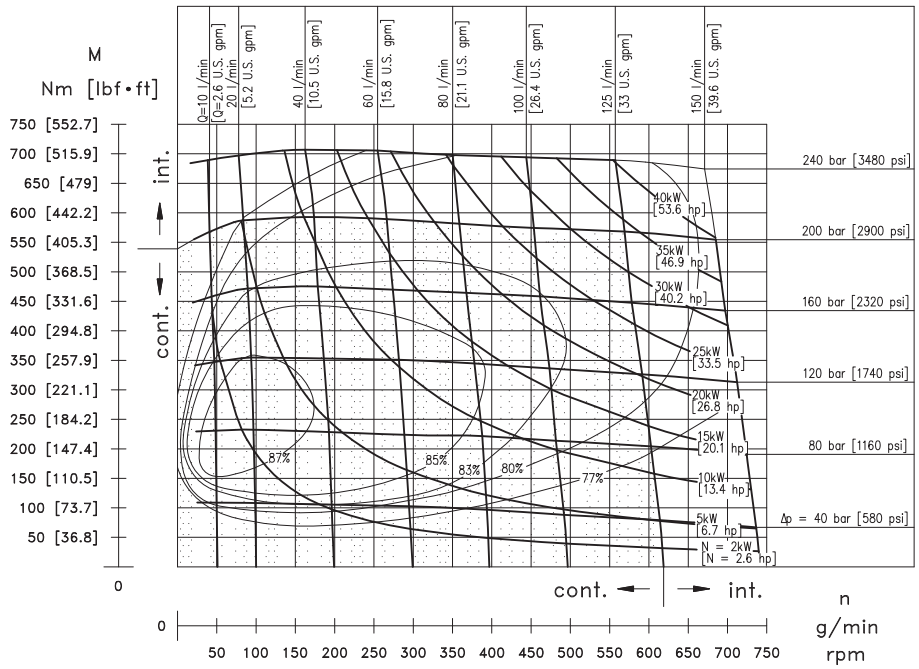
HT 160



Exceeding continuous pressure values or exceeding flow values indicated, must not occur simultaneously.

Note:
Diagram according to tests done with a relevant number of motors and using hydraulic oil with kinematic viscosity of 37 cSt at 45 C° temperature.

HT 200



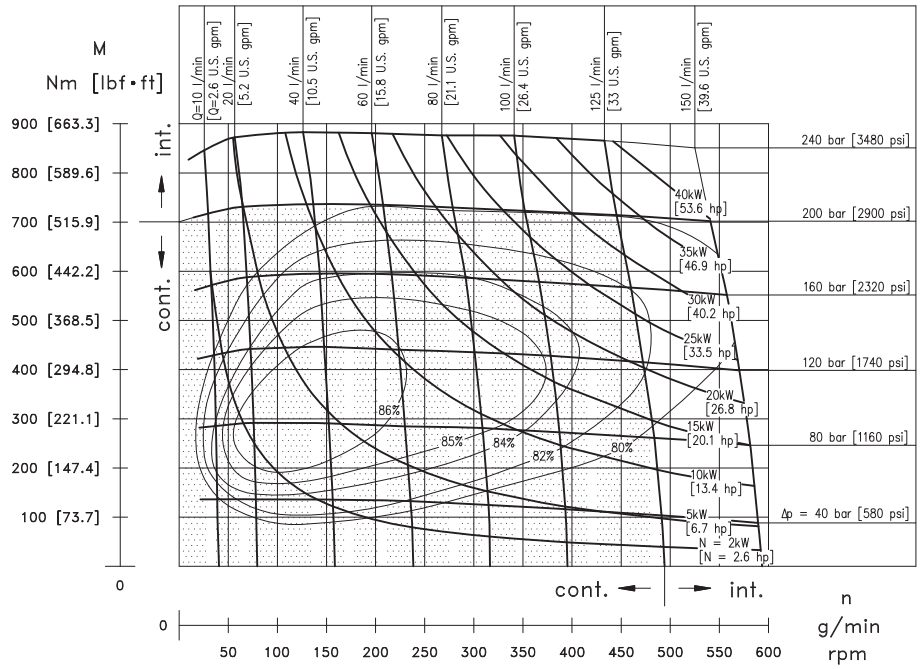
Exceeding continuous pressure values or exceeding flow values indicated, must not occur simultaneously.

Note:
Diagram according to tests done with a relevant number of motors and using hydraulic oil with kinematic viscosity of 37 cSt at 45 C° temperature.

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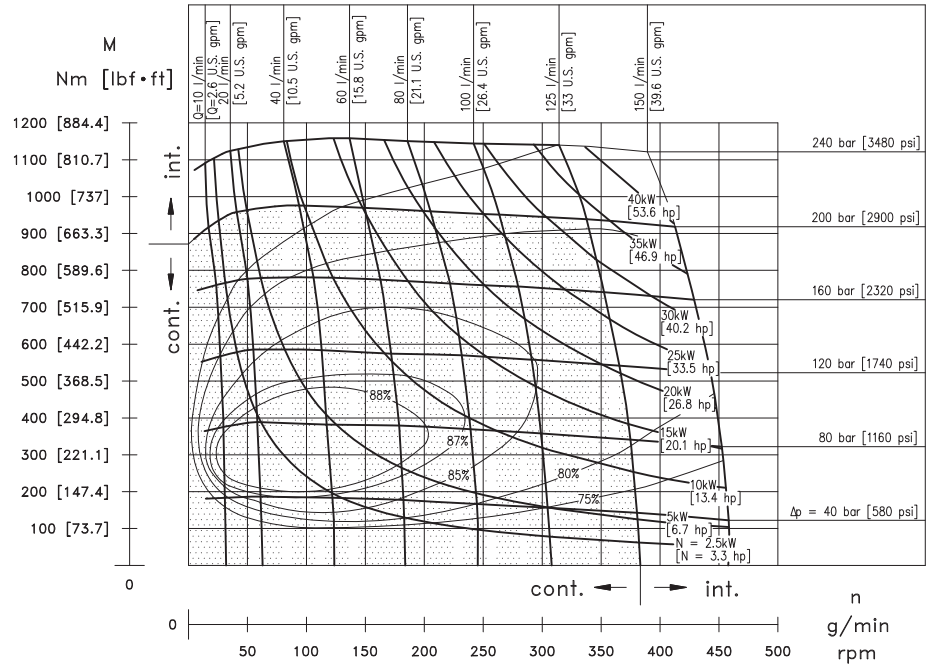
HT 250



Exceeding continuous pressure values or exceeding flow values indicated, must not occur simultaneously.

Note:
Diagram according to tests done with a relevant number of motors and using hydraulic oil with kinematic viscosity of 37 cSt at 45 C° temperature.

HT 315

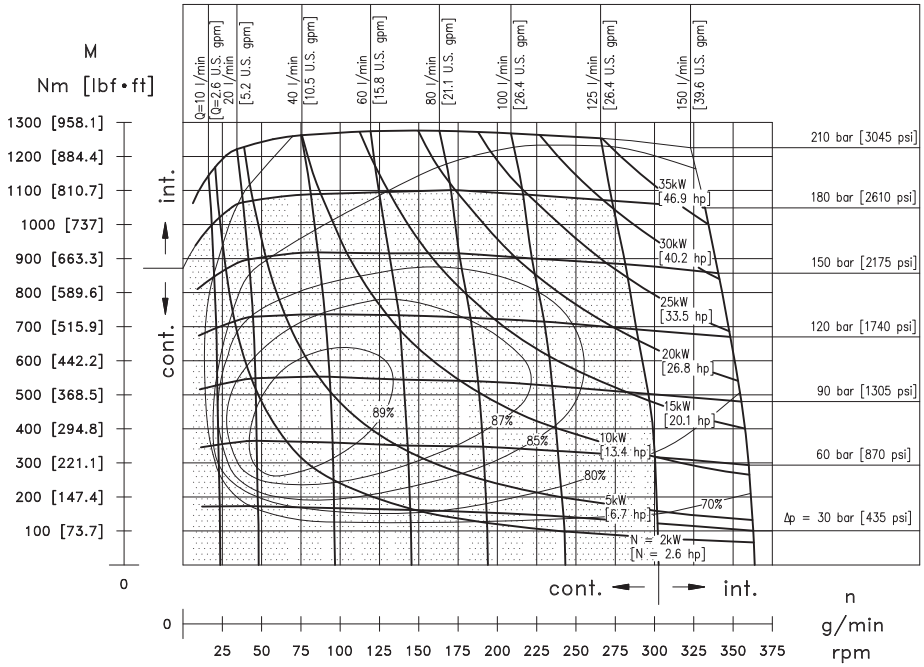


Exceeding continuous pressure values or exceeding flow values indicated, must not occur simultaneously.

Note:
Diagram according to tests done with a relevant number of motors and using hydraulic oil with kinematic viscosity of 37 cSt at 45 C° temperature.

Performance Curves

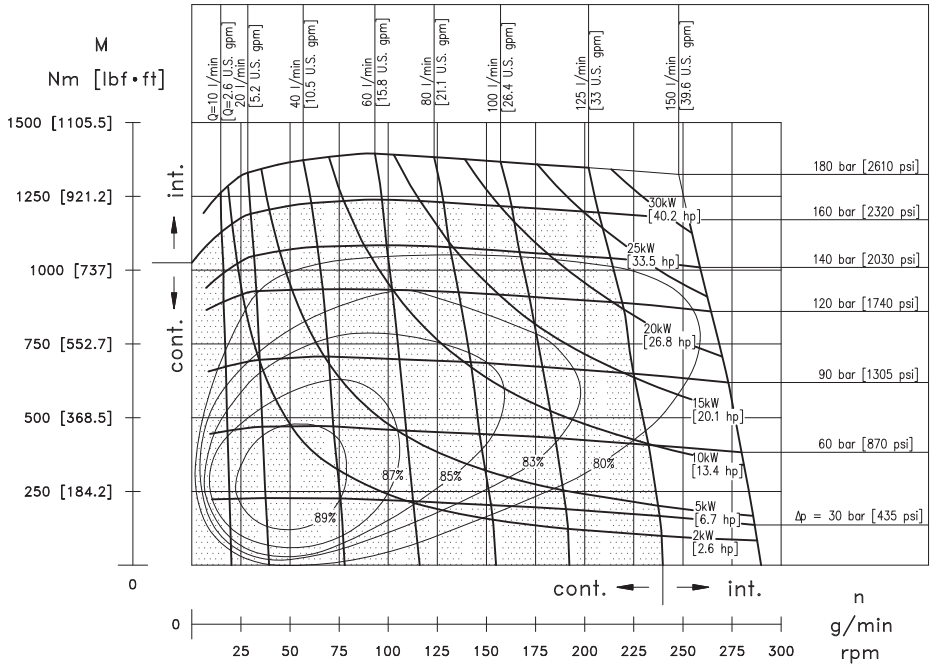
HT 400



Exceeding continuous pressure values or exceeding flow values indicated, must not occur simultaneously.

Note:
Diagram according to tests done with a relevant number of motors and using hydraulic oil with kinematic viscosity of 37 cSt at 45 C° temperature.

HT 500



Exceeding continuous pressure values or exceeding flow values indicated, must not occur simultaneously.

Note:
Diagram according to tests done with a relevant number of motors and using hydraulic oil with kinematic viscosity of 37 cSt at 45 C° temperature.

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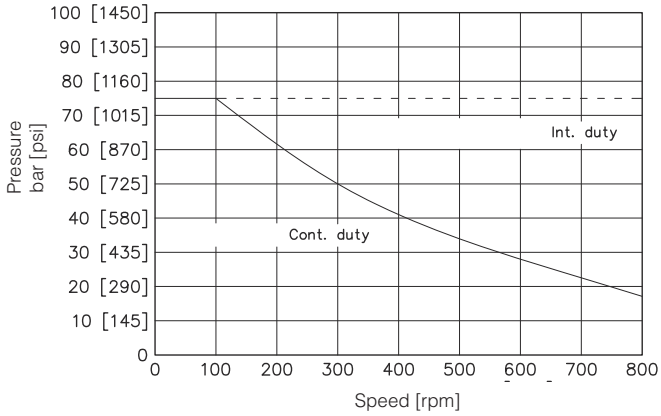
Motor	Max. Outlet pressure whit Drain line (cont.) bar [psi]		Max. starting pressure with no load bar [psi]	Min. starting torque Nm [lbf·ft]			Min. speed rpm
HT 160	Cont Int[1] Peak[2]	140 [2030] 175 [2537] 210 [3045]	10 [145]	A Δp max. At max. Δp	Cont Int[1]	340 [250.5] 410 [302.1]	10
HT 200	Cont Int[1] Peak[2]	140 [2030] 175 [2537] 210 [3045]	10 [145]	A Δp max. At max. Δp	Cont Int[1]	430 [316.9] 520 [383.2]	9
HT 250	Cont Int* Peak[2]	140 [2030] 175 [2537] 210 [3045]	10 [145]	A Δp max. At max. Δp	Cont Int[1]	530 [390.6] 630 [464.3]	8
HT 315	Cont Int[1] Peak[2]	140 [2030] 175 [2537] 210 [3045]	10 [145]	A Δp max. At max. Δp	Cont Int[1]	740 [545.3] 890 [655.9]	7
HT 400	Cont Int[1] Peak[2]	140 [2030] 175 [2537] 210 [3045]	10 [145]	A Δp max. At max. Δp	Cont Int[1]	840 [619] 970 [714.8]	6
HT 500	Cont Int[1] Peak[2]	140 [2030] 175 [2537] 210 [3045]	10 [145]	A Δp max. At max. Δp	Cont Int[1]	950 [700.1] 1060 [781.2]	5

[1] Intermittent duty must not exceed 10% each minute.
[2] Peak duty must not exceed 1% each minute.
[3] Oil viscosity 35 cSt.

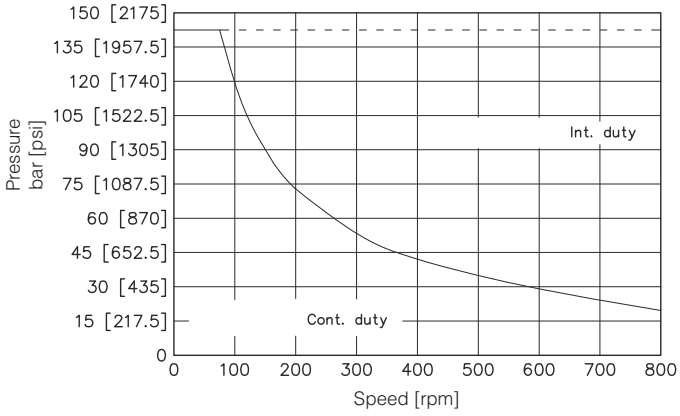
Max. Permissible Shaft Seal Pressure

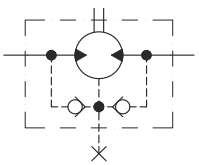
Max. return pressure without drain line or max. pressure in the drain line. Motor are supplied in standard seal version (Standard chart) or in HPS seal version (HPS chart).
For pressure and speeds not showed in the curve below, please contact Dana SamHydraulik

STANDARD



HPS





Pressure Loss

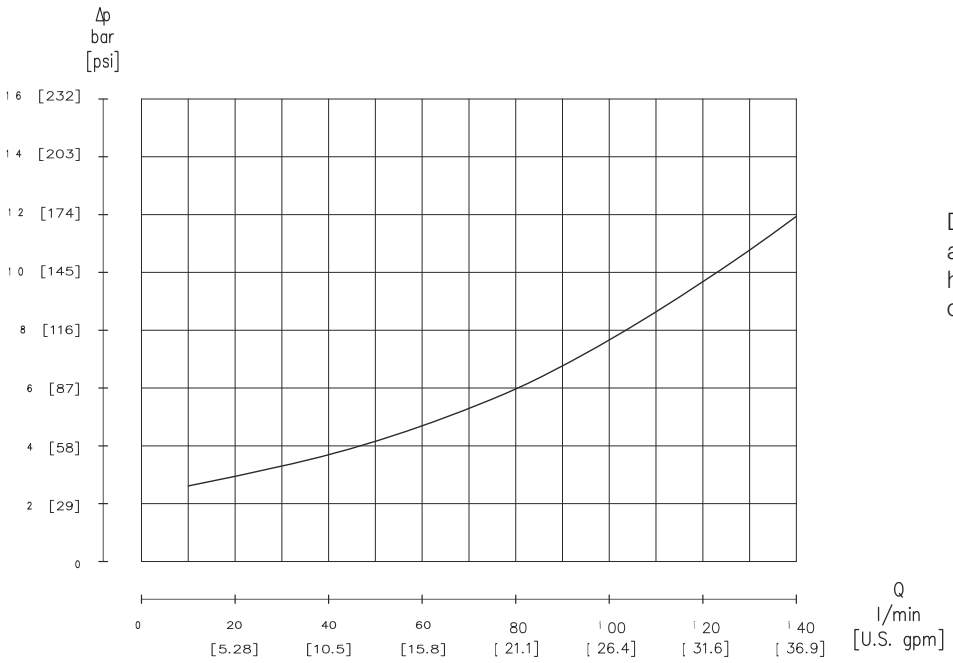
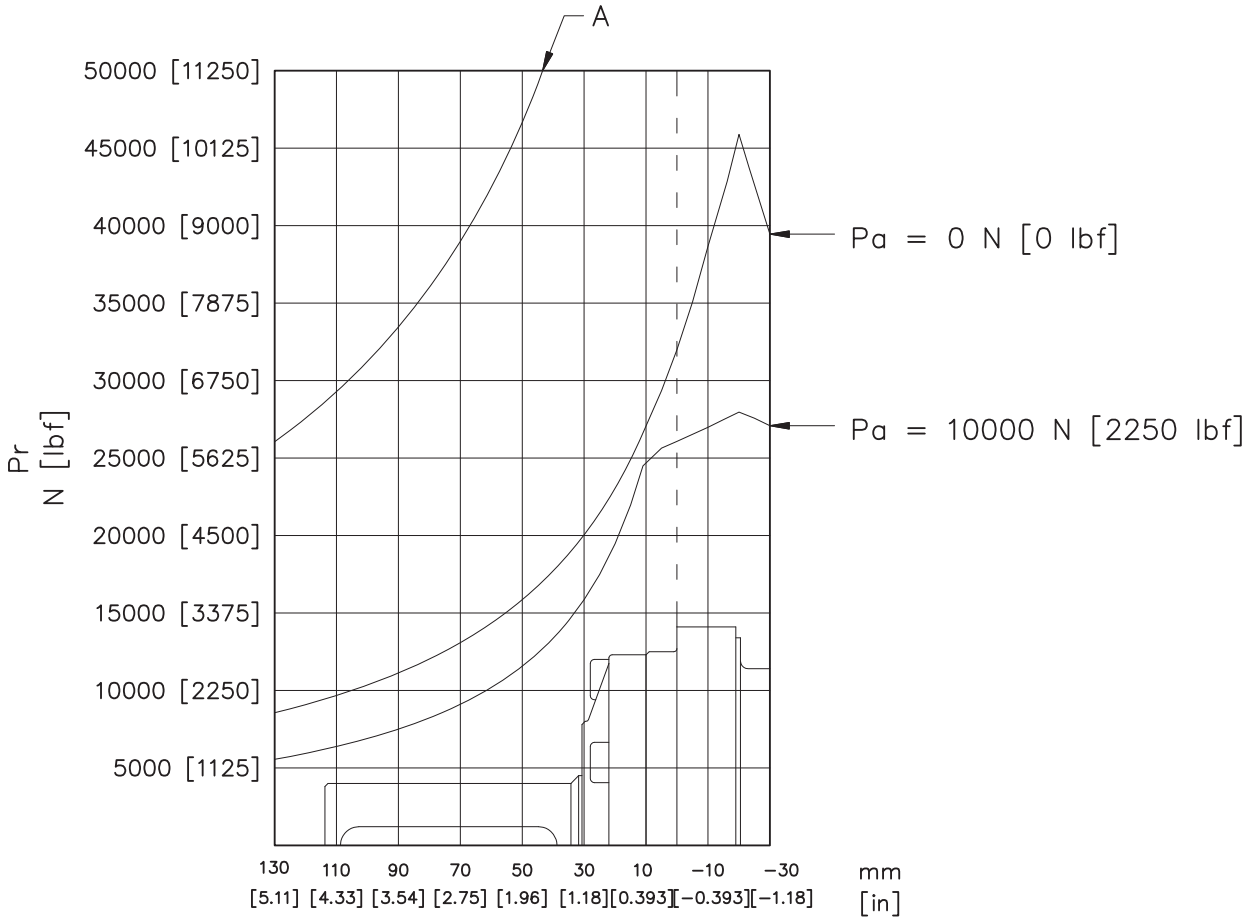
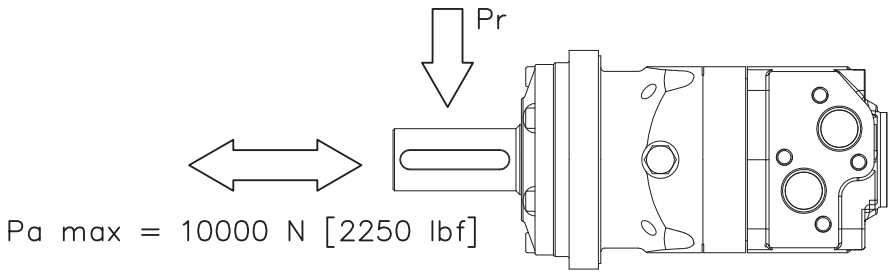


Diagram according to tests done with a relevant number of motors and using hydraulics oil with kinematic viscosity of 37 cSt at 45 °C temperature.

Shaft loads diagram is for a bearings life L10h of 3000 hours at 200 rpm when mineral base hydraulic oil with a sufficient content of anti-wear additives is used. Bearing life calculation refers to a 90% degree of reliability.
Curve “A” shows the maximum radial load that can be taken by the bearings uner maximum static load duty.





HT

Ordering codes

The following alphanumeric digits system has been developed to identify all of the configuration options for the HT motors. Use the model code below to specify the desired features. **All alphanumeric digits system of the code must be present when ordering.** We recommend to carefully read the catalogue before filling the ordering code.

1	2	3	4	5	6	7	8	9	10	11	12	13
Series	Displacement	Version	Mount flange	Shaft end	Main port	Seal	Valve	Valve feature	Flushing Valve	Option	Version feature	Painting
HT	315	S	4C	CL400	M10	N	M101	020	XX	XX	XXXX	XX

1

Series	
HT	Orbital motor

2

Displacement	
160	160 cm³/giro [9.76 in³/rev]
200	200 cm³/giro [12.2 in³/rev]
250	250 cm³/giro [15.25 in³/rev]
315	315 cm³/giro [19.215 in³/rev]
400	400 cm³/giro [24.4 in³/rev]
500	500 cm³/giro [30.5 in³/rev]

3

Version	
S	Standard Version
C	Bearingless Version
F	Brake Version
W	Wheel Version

4

Mounting Flange		Version			
		S	C	F	W
4C	SAE C 4 Bolt	●	-	-	-
C4	ISO 4 Bolt Ø 125 mm [Ø 4.9 in] - Drain port 1/4 G (BSPP)	●	●	●	-
CS	ISO 4 Bolt Ø 125 mm [Ø 4.921 in] - Drain port 9/16" - 18 UNF	-	●	-	-
CW	ISO 4 Bolt Ø 160 mm [Ø 6.299 in] - Drain port 1/4 G (BSPP)	-	-	-	●

● Available
- Not Available

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5

Shaft End		Version			
		S	C	F	W
DB002	Dog Bone T=16 12/24 DP	-	●	-	-
CL400	Ø40 mm [1.56 in] Parallel keyed	●	-	●	●
C3800	Ø38 mm [1.48 in] Parallel keyed	●	-	-	-
CN400	Tapered Shaft (Available only with mount flange C4 and M10 Main Ports)	●	-	●	●
SC380	Splined Shaft (ANS B 92.1 / 1970 12/24 DP Z=17 spline)	●	-	●	●

6

Main Port		Version			
		S	C	F	W
M10	3/4 G BSPP (23x40) Main Ports (Standard)	●	●	●	●
M1Z	3/4 G BSPP (23x40) Main Ports, Without M10 threads	-	-	●	-
S10	1" 1/16 - 12 UN Main Ports	●	●	-	●

7

Seals	
N	NBR (Standard)
V	FKM

8

Valve		Main Port		
		M10	M1Z	S10
XXXX	Not Required	●	●	●
M101	Pressure relief valve VAF 10 - D	●	-	-
M102	Double-acting overcentre valve with shuttle valve VCR1 10 - D/AF	●	-	-
M103	Overcentre Valve with VCD2 10 - S/AF	●	-	-

Valve

9

Valve Features		Valve			
		XXXX	M101	M102	M103
000	Feature not necessary	●	-	-	-
023	Not Set 100÷350 bar [1450 to 5075 psi] - Direction of rotation CW	-	-	-	●
024	Not Set 100÷350 bar [1450 to 5075 psi] - Direction of rotation CCW	-	-	-	●
026	Not Set 30÷210 bar [435 to 3045 psi] - Direction of rotation CW	-	-	-	●
027	Not Set 30÷210 bar [435 to 3045 psi] - Direction of rotation CCW	-	-	-	●
020	Not Set 100÷200 bar [1450 to 2900 psi]	-	●	-	-
025	Not Set 210÷300 bar [3045 to 4350 psi]	-	●	-	-
700	Pilot Ratio 7:1	-	-	●	-
100	Pilot Ratio 10:1	-	-	●	-

HT

● Available
- Not Available

Ordering codes

10

Flushing Valve [1]	
XX	Not Required
06	VSC/F Flushing valve - 6 l/min [1.58 U.S. gpm]
09	VSC/F Flushing valve - 10.5 l/min [2.77 U.S. gpm]
15	VSC/F Flushing valve - 15 l/min [3.96 U.S. gpm]

11

Option	
XX	None

12

Version Feature		Version			
		S	**C**	**F**	**W**
XXXX	Standard version	●	●	●	●
HPS	High Pressure Sea	●	-	-	-
HD0	Heavy duty (available only with M10 Main ports, CL400-CN400-SC380 shats and without internal check valves)	●	-	-	-
DH0	Heavy duty (available only with M10 Main ports, CL400-CN400-SC380 shats and without internal check valves) + High Pressure Seal	●	-	-	-
TC7	Tachometer with sensor arrangement (available only with C4 flange and M10 main ports and C4 flange and M10 main ports)	●	-	-	-
TC8	Tachometer with sensor with 2 metres cable (available only with C4 flange and M10 main ports and C4 flange and M10 main ports)	●	-	-	-
FD0	Brake and Drain Ports 1/8 G	-	-	●	-

13

Painting	
XX	Not painted
01	Black Painted RAL 9005
21	Blue Painted RAL 5021

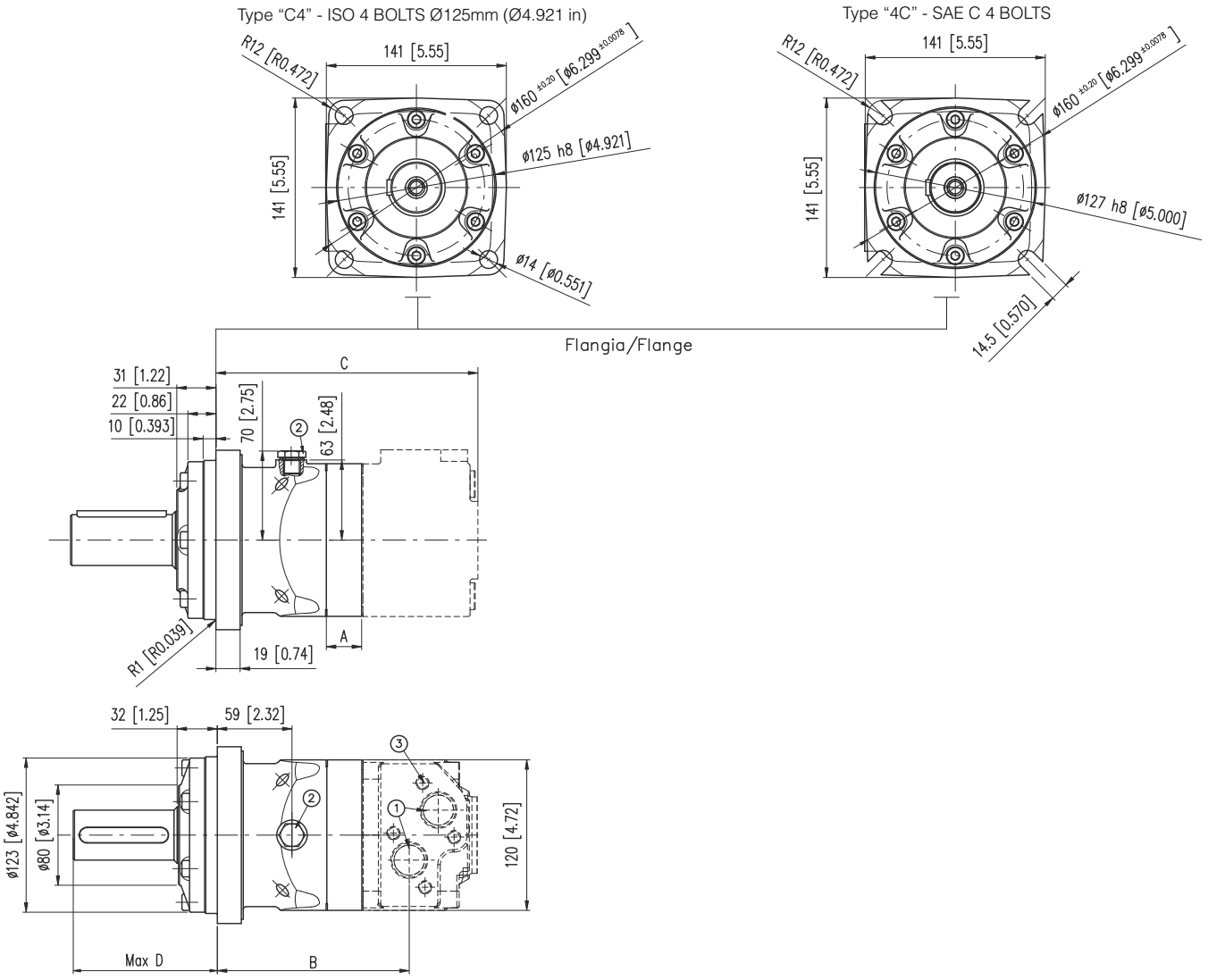
[1] It is possible to combine the flushing valves only with VAF 10 - D valve.

● Available
- Not Available

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HT S C4/4C M10

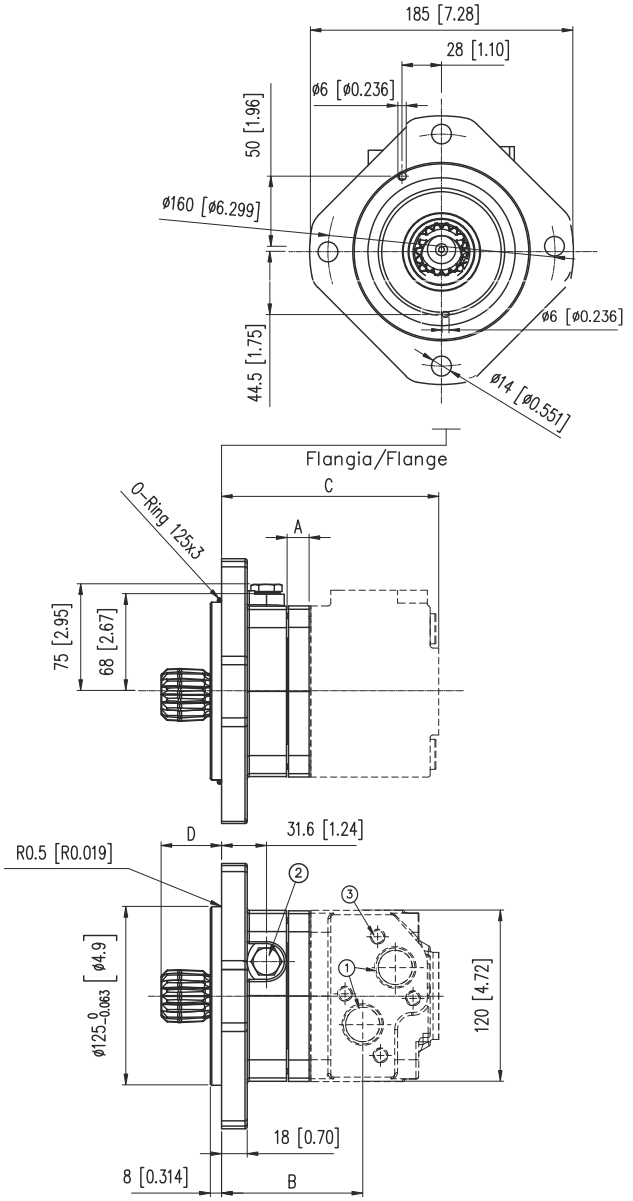


① Main ports
② 1/4 G (BSPP) drain port thread depth 12 mm [0.472 in] (With C4 flange version)
9/16 - 18 UNF drain port thread depth 13 mm [0.511 in] (With 4C flange version)
③ M10 hole (With M10 main ports version)

Displ. cm³/giro [in³/rev]	**160 [9.7]**	**200 [12.2]**	**250 [15.2]**	**315 [19.2]**	**400 [24.4]**	**500 [30.5]**
A mm [in]	17 [0.67]	22 [0.87]	28.2 [1.11]	37.5 [1.48]	48 [1.89]	62 [2.44]
B mm [in]	140 [5.51]	145 [5.71]	153.2 [6.03]	160.5 [6.32]	171 [6.73]	185 [7.28]
C mm [in]	193.6 [7.62]	198.6 [7.82]	206.8 [8.14]	214.1 [8.43]	224.6 [8.84]	238.6 [9.39]
Weight kg [lb]	20 [44]	20.5 [45.1]	21 [46.2]	22 [48.4]	23 [50.6]	24 [52.8]

SHAFT	**CL400**	**C3800**	**CN400**	**SC380**
D mm [in]	113.8 [4.48]	91.2 [3.59]	113.6 [4.47]	113.7 [4.47]

HT C C4/CS M10



Type “C4-CS” - ISO 4 BOLTS Ø125mm (Ø4.921 in)

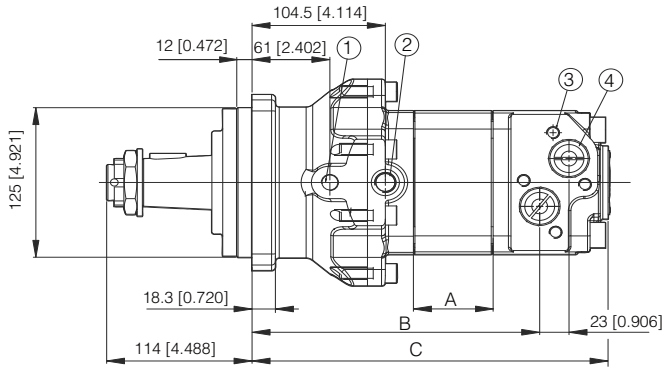
① Main ports
② 1/4 G (BSPP) drain port thread depth 14 mm [0.551 in] (With C4 flange version)
9/16 - 18 UNF drain port thread depth 14 mm [0.551 in] (With CS flange version)
③ M10 hole (With M10 main ports version)

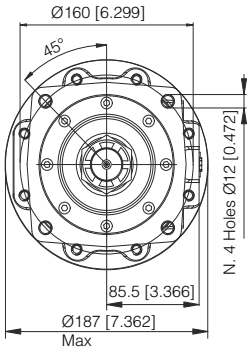
Displ. cm³/giro [in³/rev]	**160 [9.7]**	**200 [12.2]**	**250 [15.2]**	**315 [19.2]**	**400 [24.4]**	**500 [30.5]**
A mm [in]	17 [0.67]	22 [0.87]	28.2 [1.11]	37.5 [1.48]	48 [1.89]	62 [2.44]
B mm [in]	99.5 [3.92]	104.5 [4.11]	110.7 [4.36]	120 [4.72]	130.5 [5.14]	144.5 [5.69]
C mm [in]	154 [6.06]	159 [6.26]	165.2 [6.50]	174.5 [6.87]	185 [7.28]	199 [7.83]
D mm [in]	45 [1.77]	45 [1.77]	45 [1.77]	45 [1.77]	45 [1.77]	45 [1.77]
Weight kg [lb]	14.5 [31.9]	14.75 [32.5]	15 [33]	15.3 [33.8]	15.78 [34.8]	16.3 [36]

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HT F C4 M10





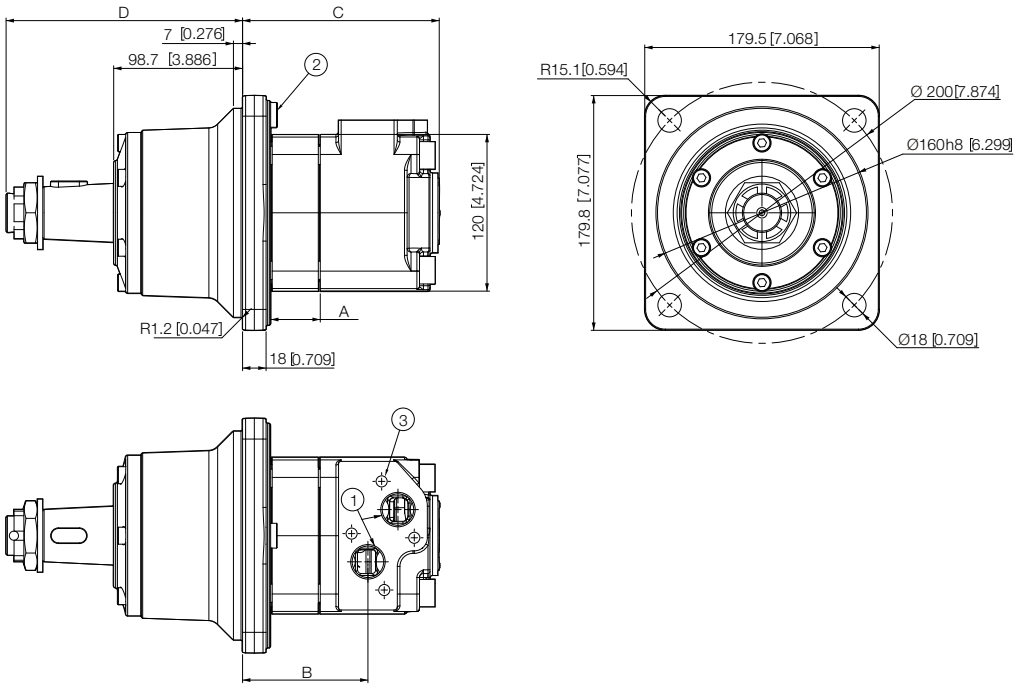
① Brake release port G 1/4 -12 mm [0.47] deep
② Drain connection G 3/8 -14 mm [0.55] deep
③ M10 - 10 mm [0.39] deep
④ G 3/4 - 17 mm [0.67] deep

Displ. cm³/giro [in³/rev]	**160 [9.7]**	**200 [12.2]**	**250 [15.2]**	**315 [19.2]**	**400 [24.4]**	**500 [30.5]**
A mm [in]	17 [0.67]	22 [0.87]	28.2 [1.11]	37.5 [1.48]	48 [1.89]	62 [2.44]
B mm [in]	180 [7.09]	185 [7.28]	191.2 [7.53]	200.5 [7.89]	211 [8.31]	225 [8.86]
C mm [in]	233.6 [9.20]	225.6 [8.88]	244.8 [9.64]	254.1 [10]	264.6 [10.42]	278.6 [10.97]
Weight kg [lb]	25,5 [56,22]	25,8 [56,88]	26,1 [57,54]	26,3 [57,98]	27,3 [60,19]	28,2 [62,17]

SHAFT	**CL400**	**C3800**	**CN400**	**SC380**
D (mm) [in]	113.8 [4.48]	91.2 [3.59]	113.6 [4.47]	113.7 [4.47]

Dimensions and weight

HT W CW CN400



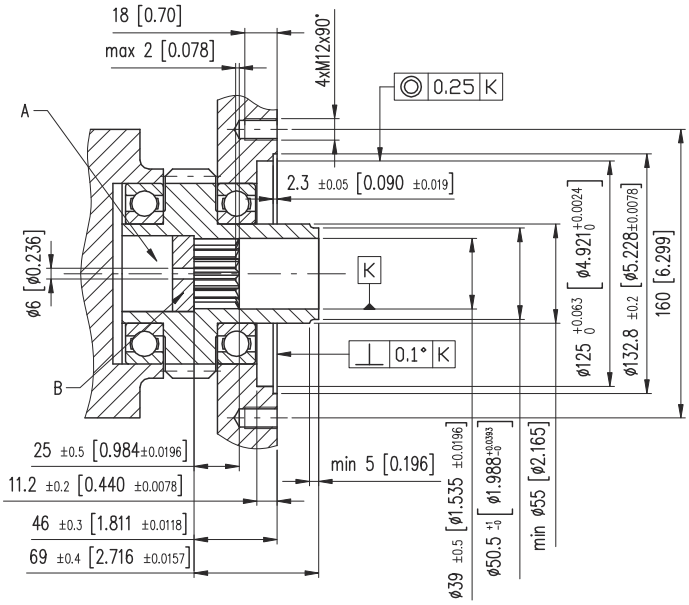
① Brake release port G 3/4 -17 mm [0.67] deep
② Drain connection G 1/4 -12 mm [0.47] deep
③ M10 - 10 mm [0.39] deep

HT

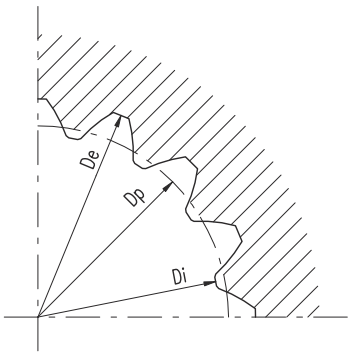
Displ. cm³/giro [in³/rev]	**160 [9.7]**	**200 [12.2]**	**250 [15.2]**	**315 [19.2]**	**400 [24.4]**	**500 [30.5]**
A mm [in]	17 [0.67]	22 [0.87]	28.2 [1.11]	37.5 [1.48]	48 [1.89]	62 [2.44]
B mm [in]	75.5 [2.97]	80.5 [3.17]	88.7 [3.49]	96 [3.78]	106.5 [4.19]	120.5 [4.74]
C mm [in]	129.1 [5.08]	134.1 [5.28]	142.3 [5.60]	149.6 [5.89]	160.1 [6.30]	174.1 [6.80]
Weight kg [lb]	21.2 [46.6]	21.7 [47.8]	22.2 [48.9]	23.2 [51.0]	24.2 [53.2]	25.2 [55.4]

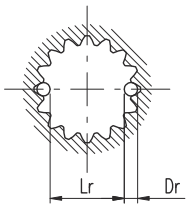
SHAFT	**CN400**
D (mm) [in]	178.1 [7.012]

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A: Oil circulation hole
B: Hardened stop plate





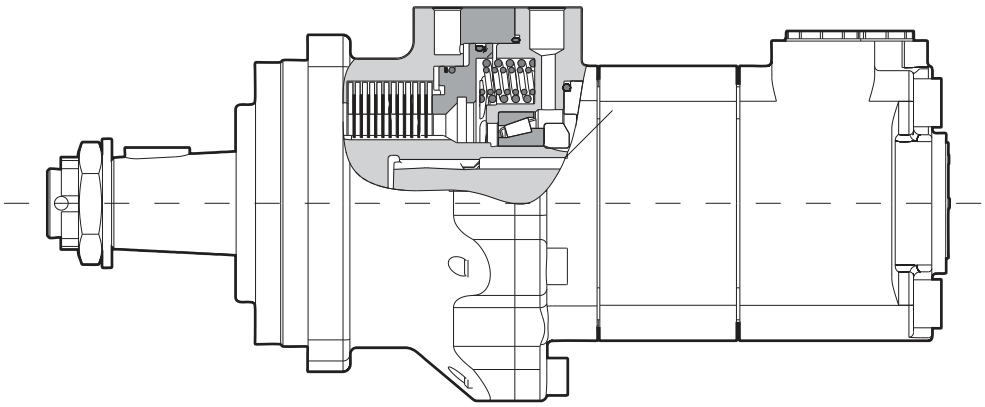
Internal involute spline Standard ANS B92.1 - 1970 classe 5 (corrected m · x = 1)		
Diametral Pich		12/24
Number of theeeth	Z	16
Pich diameter	Dp	33.866
Pressure angle		30°
Module	m	2.1166
Minor diameter	Di	32.15 +0.25 0
Major diameter	De	38.4 +0.25 0
Max measurament between pins*	Lr	26.9 +0.15 0
Pins diameter	Dr	4.834 h5
* Finished dimensions (when hardened)		

Material:
NiCr steel with case hardening, induction hardening and tempering treatment or with hardness of 58 HRC.

Drain line:
A drain line must be used when the return line pressure exceed the permissible pressure in the attachesd component. The drain line can be connected at two different points:
1) At the motor drain connection.
2) At the drain connection of the attached component.

HT

Brake feature



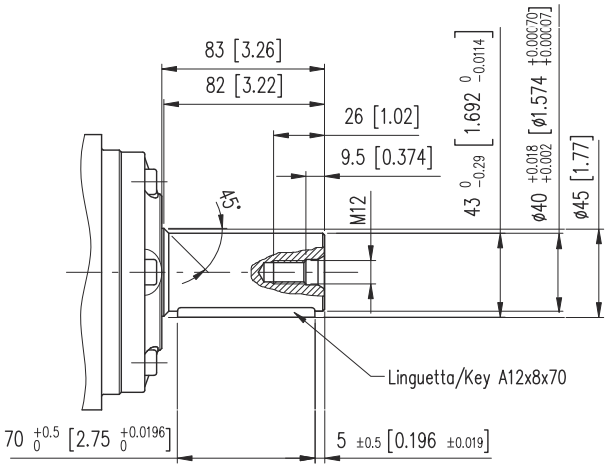
Minimum brake static torque	142 daNm [1047 lb.ft]
Starting release pressure	30 bar [435 psi]
Full release pressure	35 bar [508 psi]
Max pressure drain line	5 bar [73 psi]
Max pressure in brake line	280 bar [4060 psi]

The brakes built into F version motors are multidisc pressure released ones for static operation. With no pressure from the pump to the motor, a set of springs will push the discs one against the other, hence the motor shaft will not be allowed to rotate unless the shaft itself is driven with a torque widely exceeding the max. static torque of the brake.
By sending pressure to the motor a shuttle valve (to be included in the system) will send pressure to the brake, overcome the resistance of the springs and release the brake hence allowing the start of the motor. Wheel motors require some care in the engineering of the machine.

The major aspects to consider are:

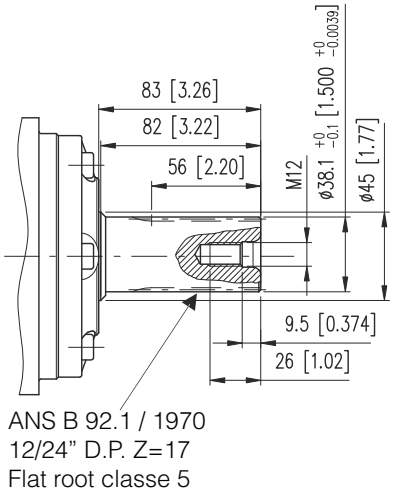
- Hub and motor shaft tapers must be perfectly matching, in order to avoid excessive key stress, which can occur in case of bottoming of shaft tip washer and nut at the end of the thread.
- A proper service factor should be considered in case of shocks to the shaft (eg. With the machine travelling on very uneven soil) stop has been reached.

CL400 Cylindrical Shaft



Max. admissible Torque
Cont. 1220 Nm [899.14 lbf·ft]

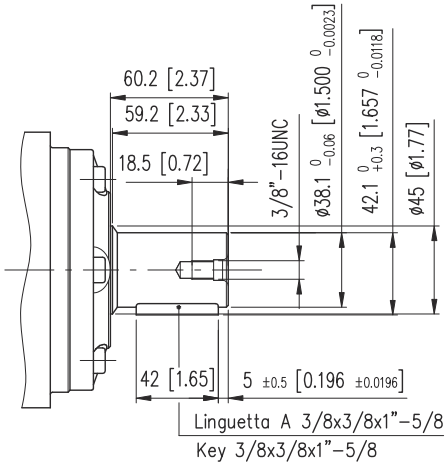
SC380 Splined Shaft



ANS B 92.1 / 1970
12/24" D.P. Z=17
Flat root classe 5

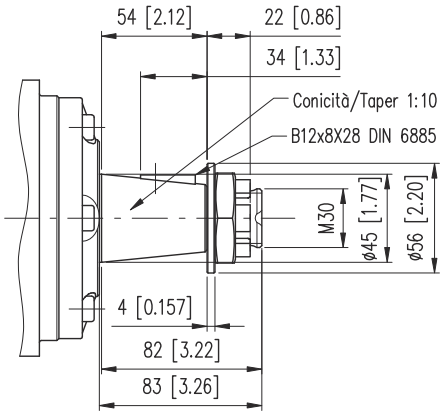
Max. admissible Torque
Cont. 1220 Nm [899.14 lbf·ft]

C3800 Cylindrical Shaft



Max. admissible Torque
Cont. 1220 Nm [899.14 lbf·ft]

CN400 Tapered Shaft

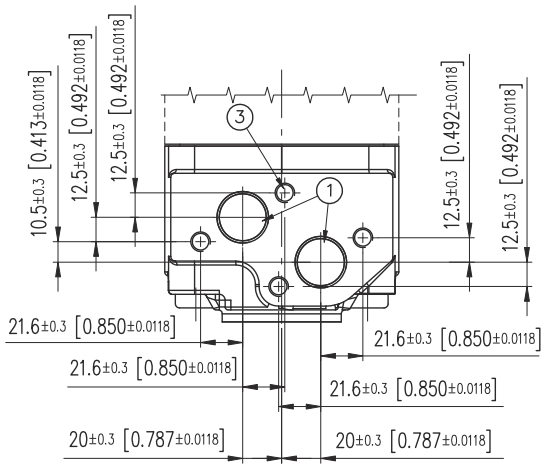


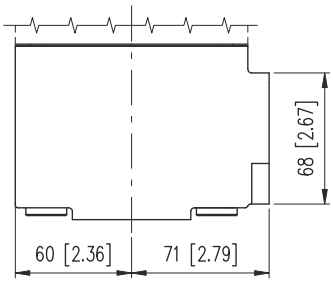
Max. admissible Torque
Cont. 1220 Nm [899.14 lbf·ft]

HT

Main ports dimensions and direction of rotation

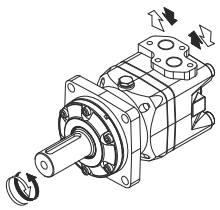
M10 3/4 G BSPP (23x40)



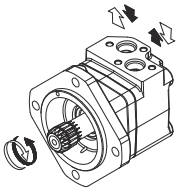


1) N.2 3/4 G (BSPP) main ports thread depth 17 mm [0.66 in]
3) N.4 M10 hole thread depth 12 mm [0.472 in]

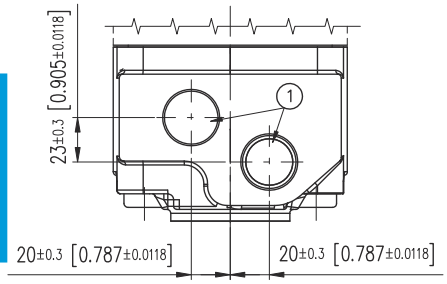
S Version

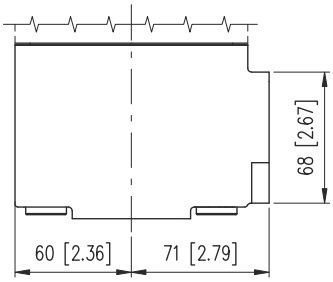


C Version



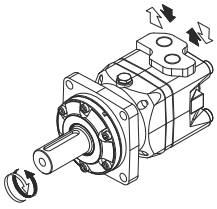
S10 1“ 1/16 - 12 UN



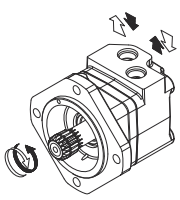


1) N.2 1”1/16 - 12 UN main ports thread depth 20 mm [0.78 in]

S Version



C Version



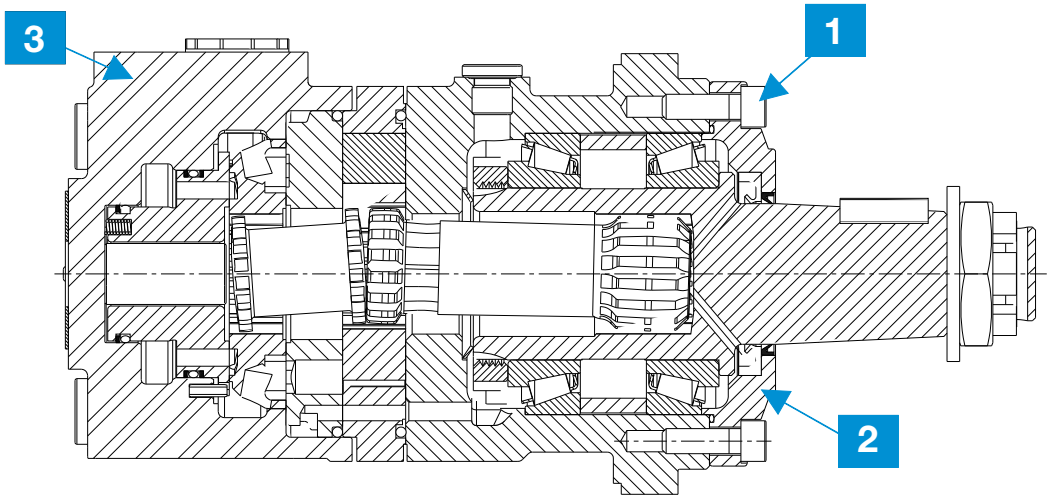
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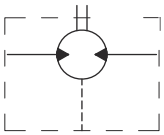
HD0 Heavy Duty

DH0 Heavy Duty + High Pressure Seal

Compared to the standard version, the heavy duty has the following differences:

1) The screw in the seal cover are fitted with thread locker toprevent the screws being loosened by vibration.
2) Seal cover with reinforced material.
3) The check valves have been omitted because a drain line is always used in applications where operating conditions are severe.

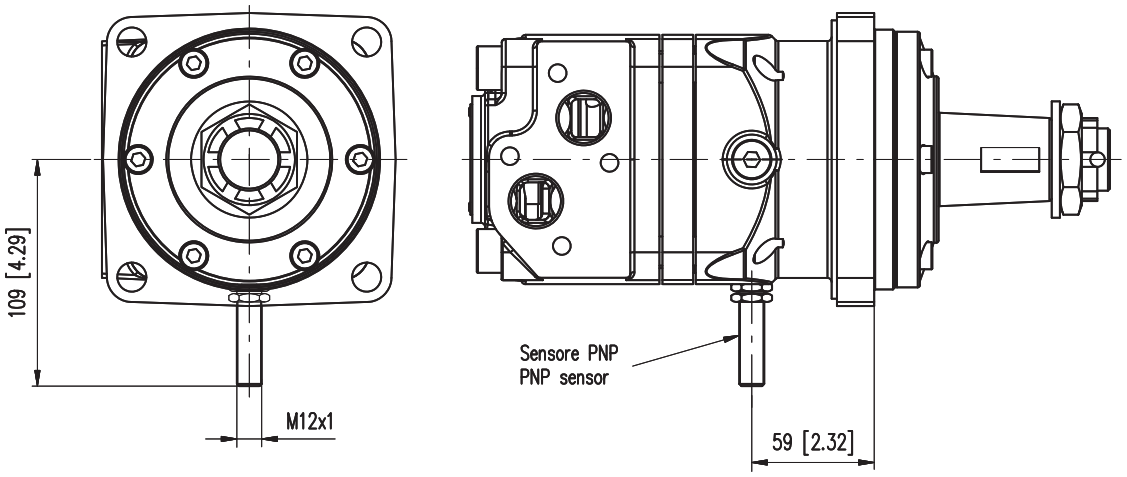




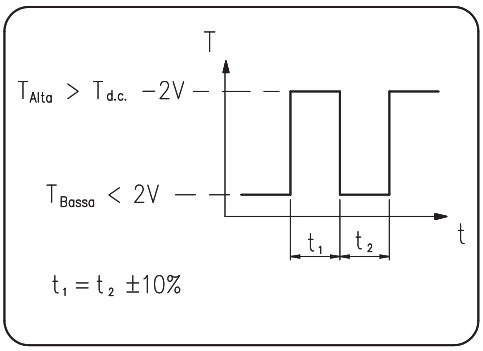
Note: A drain line must always be used because the motors have no built-in check valves

HT

TC7 Tachometer



Output signal

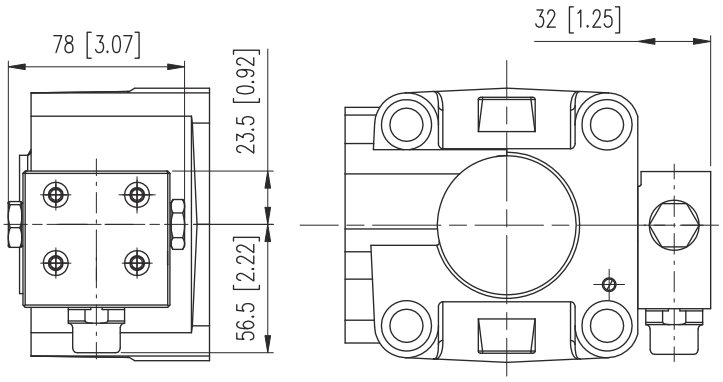


Number of pulses per revolution = 42
Inductive principle
Ouput current PNP
Voltage 10-65 V d.c.
Max load 300 mA
Max frequency 1200 Hz
Temperature range -25C +85C Enclosure IP 67

HT

SPECIAL COVER FOR FLUSHING VALVE

To mount the flushing valve on motors, it is necessary to use a special cover. This is only possible with the “M10-S10” main ports. If it is necessary to assembly the flushing valve on motors, to specify in the purchase order the valves type 06 - 09 - 15 - 21 (See position 10 of ordering code).



For more informations on the Flushing valve, see the Valves and Accessories section or Service Bulletin - 05-0082-A04



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Each product configuration listed below is subject to availability: please contact Sales Dpt. for more commercial detailed info.

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