

Part number:

HYDROMA

HYDRAULICKÉ SYSTÉMY

**HIDROMA
SYSTEMS**

UKŁADY HYDRAULICZNE

HYDROMA

ГИДРАВЛИЧЕСКИЕ СИСТЕМЫ

Motors

Industrial Products

Ordering Code – Staffa Motor Series B

F11 – HM*B – 060 – S3 – FM3 – Tx – * – PL**

Fluid Type

Blank: Mineral oil.
F3: Phosphate ester (HFD fluid).
F11: Water-based fluids (HFA, HFB & HFC)
*: Consult

Model Type

Blank: Standard (HMB)
HD: Heavy duty (HMHDB)

Frame Size

(See options page 7)

Shaft Type

See shaft type option list on Page 3

Main Port Connections

See Port Connection details on Page 4

Special Features

PL**: Non-catalogued features, (**)= number assigned as required.

eg:
Stainless steel shaft sleeves.
Alternative port connections.
Shaft variants.
Alternative displacement.
Special mountings.
Special paint.

Design Series Number

Tacho/Encoder Drive

Blank: None
T: Staffa original tacho drive.
Tx: Customer specific encoder drive.

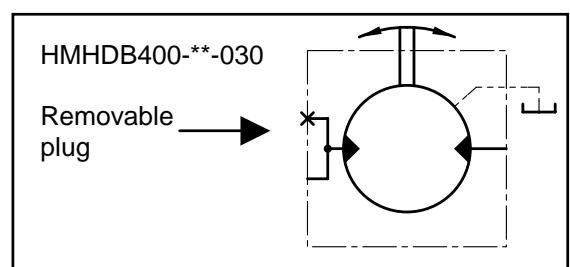
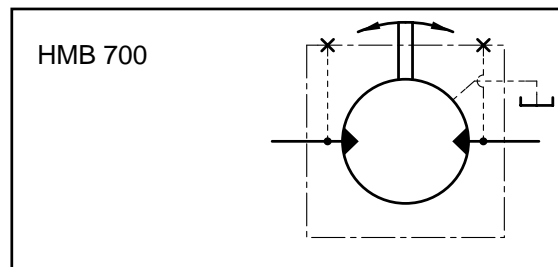
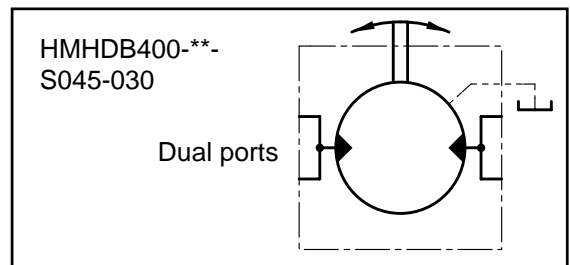
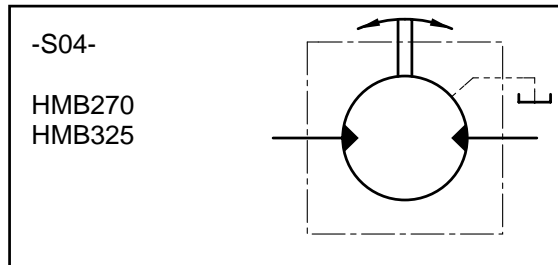
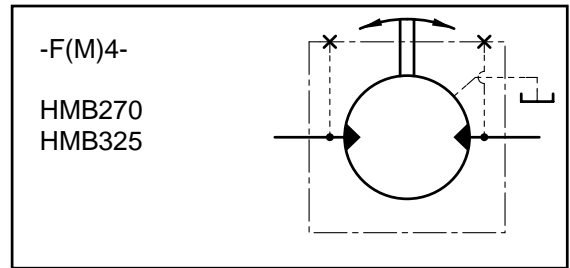
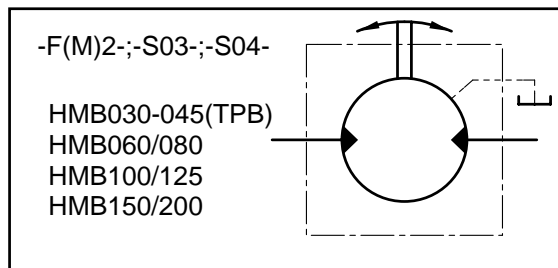
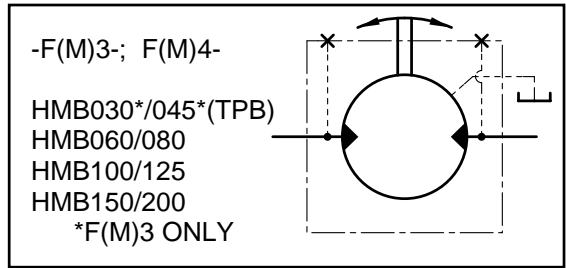
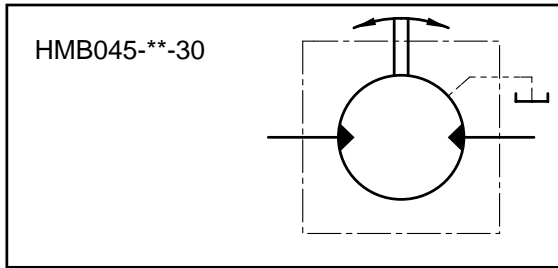
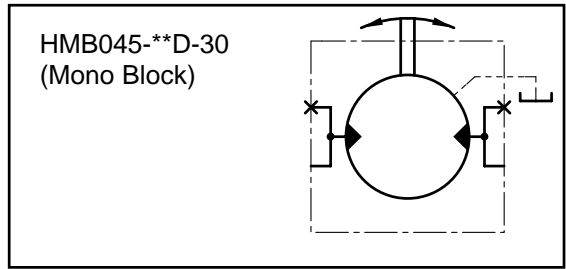
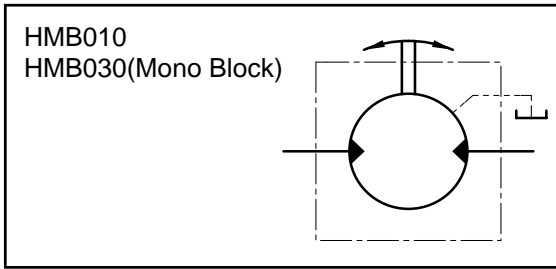
Model
Staffa B

Page
2.70

Data Sheet
M-1001/03.00



.Functional Symbols



Non-Standard Displacements

Motor	Displacements cc/rev								
HMB010	177	130	94	50					
HMB030	492	477	455	330	320	300	278	251	213
HMB045	800	700	634	570	500	440			
HMB080	1250	1100	1000						
HMB100	1530	1500							
HMB125	1800								
HMB150	1880	2130							
HMB200	3630*	2870							
HMHDB200	3630*	2785							
HMB270	4588	4500	3688	3600					
HMHDB270	4000								
HMB325	6100*	5187							
HMHDB400	6137	6468	5322	4340	4000	8000*			
HMB700	10600	9600	8850						

Note:

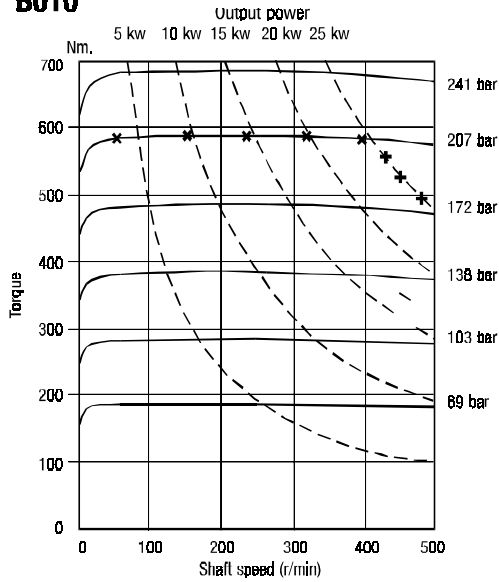
* Reduced pressure and power rating.



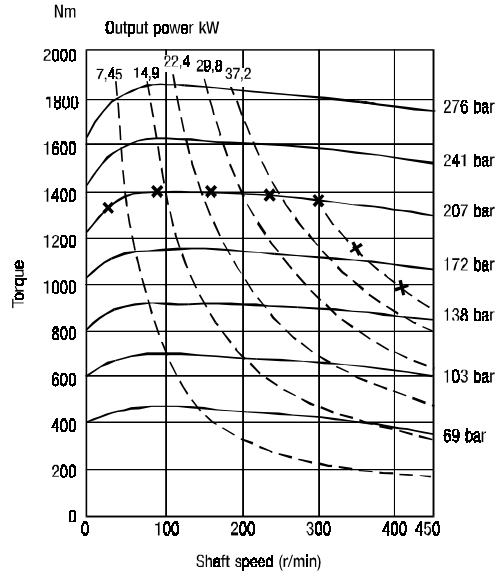
Output Torque

These torque curves indicate the maximum output torque and power of a fully run-in motor for a range of pressures and speeds when operating with zero outlet pressure on Mineral Oil of 50 cSt (232 SUS) viscosity. High return line pressures will reduce torque for a given pressure differential. - x - x - x - Upper limit of continuous rating envelope.

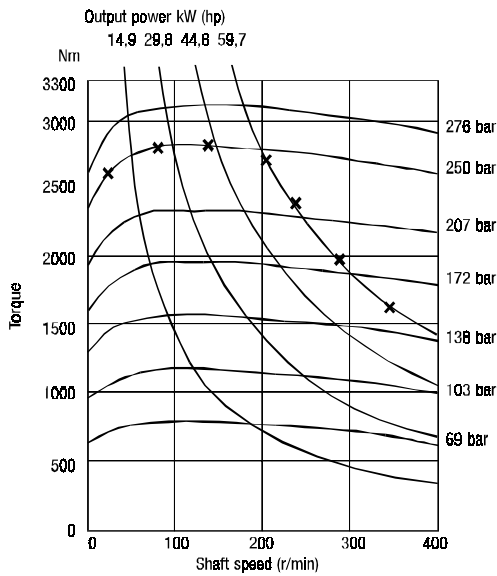
B010



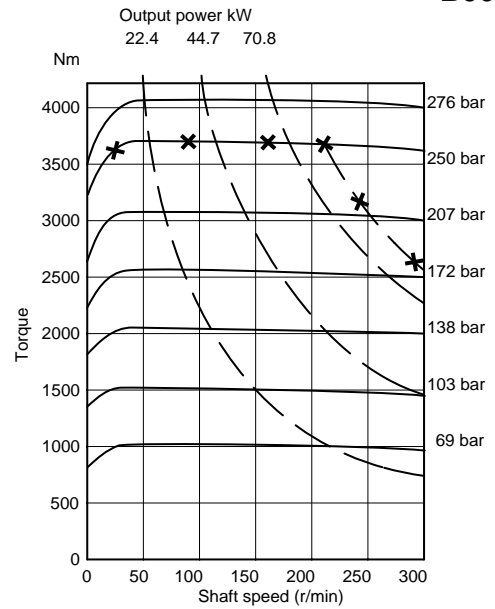
B030



B045

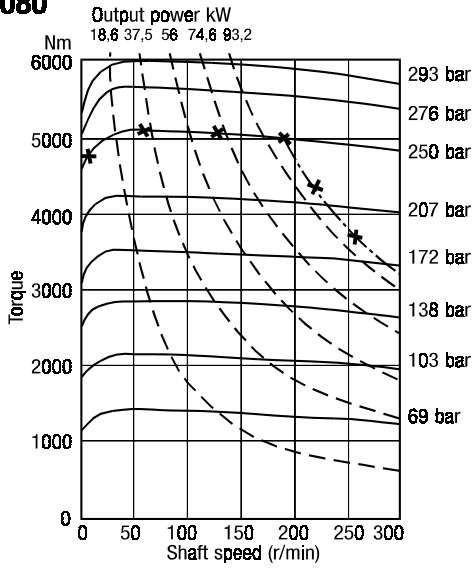


B060

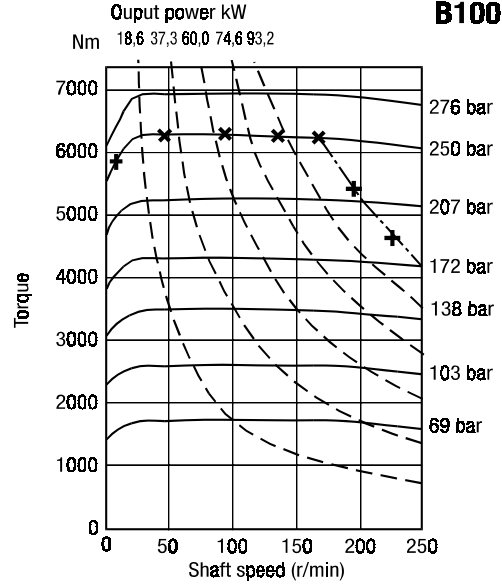


Output Torque (continued)

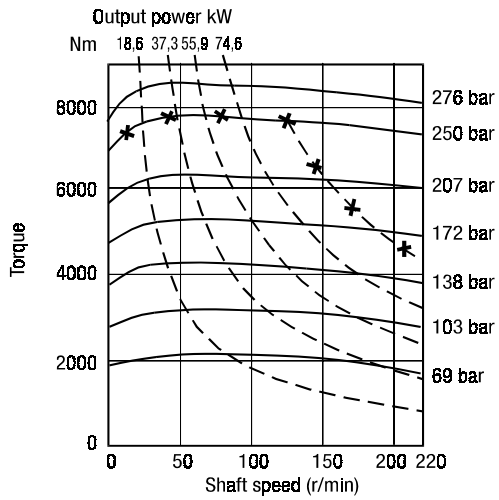
B080



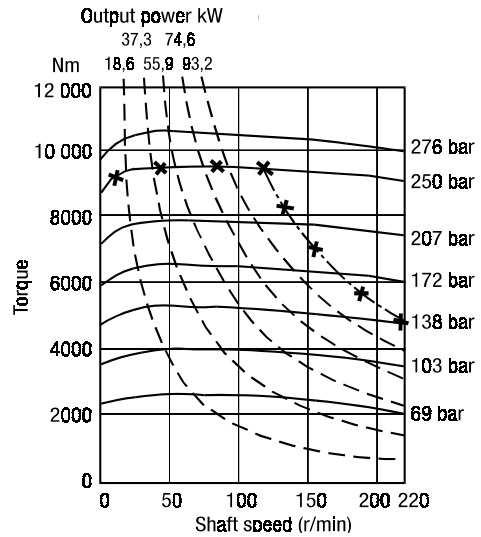
B100



B125

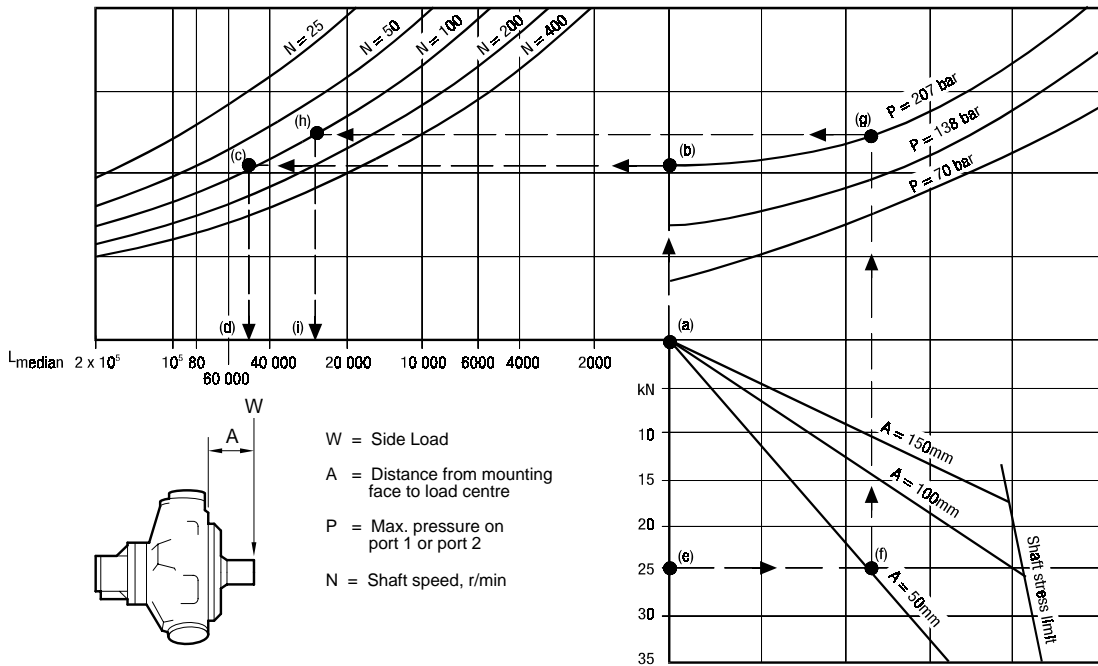


B150

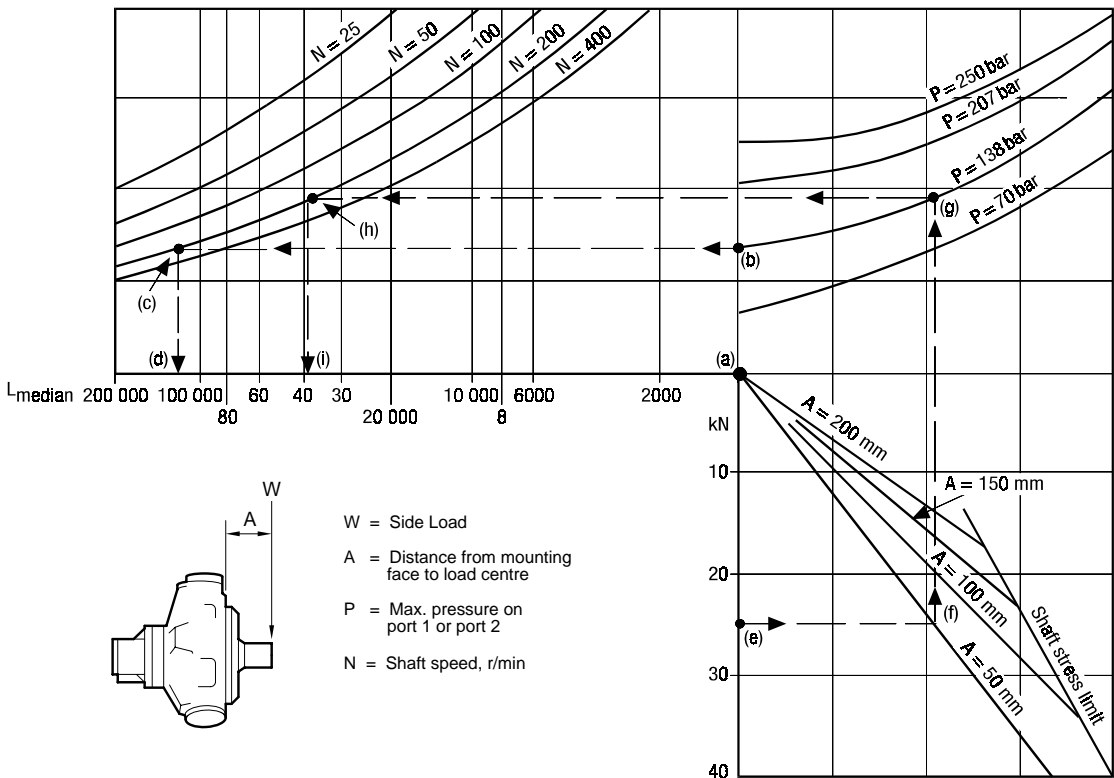


Bearing Life Graphs (continued)

HMB030 Shaft Types P, S, and Z

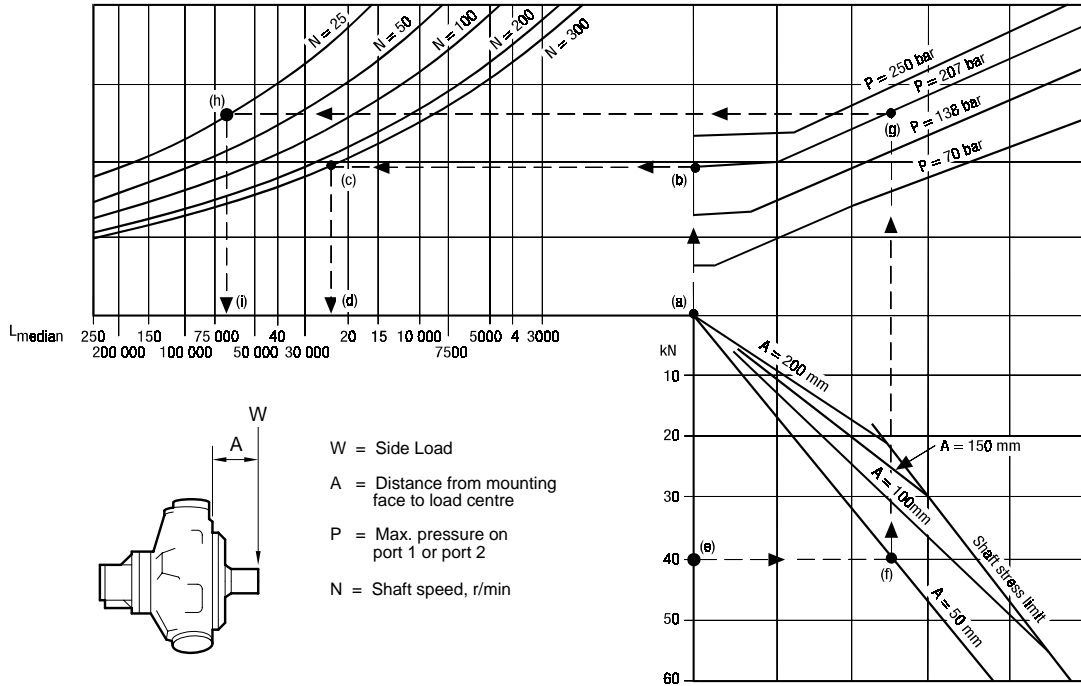


HMB045 Shaft Types P, S, and Z

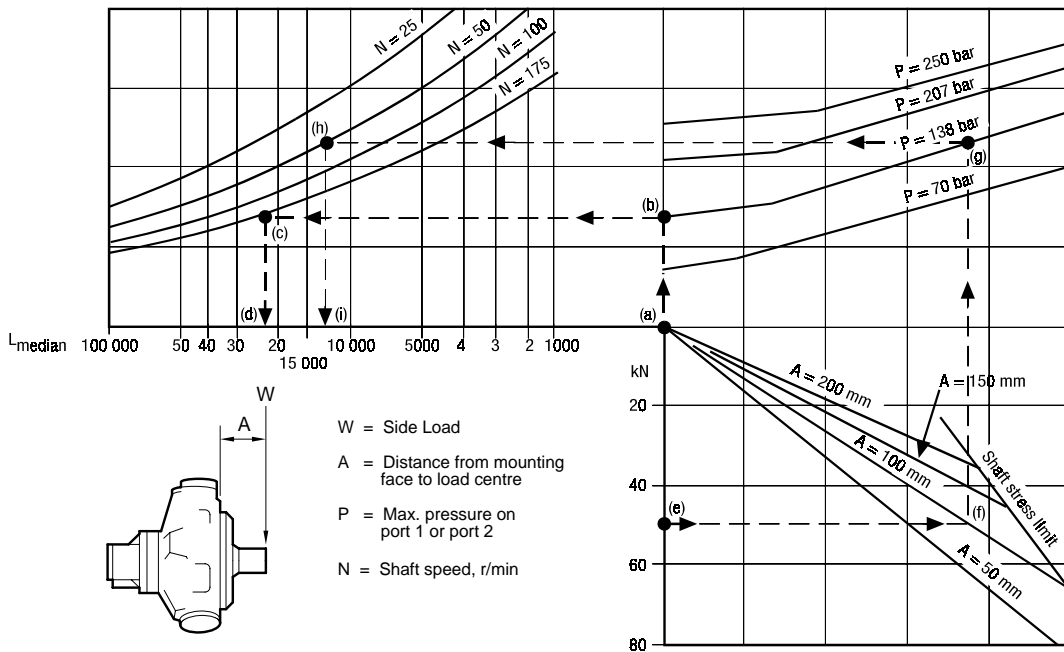


Bearing Life Graphs (continued)

HMB 060, HMB080, HMB100 Shaft Types P, S, Z, X



HMB125, HMB 150, HMB200 Shaft Types P1, S3, S4, Z3, T



Circuit and Application Notes**Starting Torque**

The starting torques shown on the graphs on pages 9 to 12 are average and will vary with system parameters.

Low Speed Operations

Minimum operating speeds are determined by the hydraulic system and load conditions (load inertia, drive elasticity, etc.) Recommended minimum speeds are shown below:

Model Type	r/min
B010	20
B030	5
B045	6
B06080/100/125/150/200	3
B270/B325/HMB400	2
B700	1

Note: Speed as low as 0.025 rpm can be accurately achieved using electronic control systems. For operation at speeds below these figures please contact Kawasaki Precision Machinery (UK) Ltd.

High Back Pressure

When both inlet and outlet ports are pressurised continuously, the lower port pressure must not exceed 70 bar at any time.

Note: High back pressure reduces the effective torque output of the motor.

Boost Pressure

When operating as a motor the outlet pressure should equal or exceed the crankcase pressure . If pumping occurs (i.e. overrunning loads) then a positive pressure , "P" ,is required at the motor ports .Calculate "P" (bar) from the operating formula

$$\text{Boost Formula } P = 1 + \frac{N^2 \times V^2}{K} + C$$

Where P is in Bar, N = motor speed (RPM), V = motor displacement (cc/rev.), C=Crankcase pressure (BAR) and K=a constant from the table below:

MOTOR	PORTING	CONSTANT
HMB010	Standard	8×10^8
HMB030	Standard	3.7×10^9
	SO3, F(M)3	7.5×10^9
HMB045	Standard	1.3×10^{10}
	SO3, F(M)3	1.6×10^{10}
HMB060/080/100	F(M)2	2.7×10^9
	F(M)3, S03	1.8×10^{10}
HM(HD)B125/150/200	F(M)2	4.2×10^9
	F(M)3, S03	4.0×10^{10}
	F(M)4, S04	8.0×10^{10}
HM(HD)B270/325	F(M)4, S04	7.2×10^{10}
HMHDB400	Standard	6.0×10^{10}
	S045	7.2×10^{10}
HMB700	Standard	1.3×10^{11}



Circuit and Application Notes (continued)**Mineral Oil recommendations**

The fluid should be a good hydraulic grade, non-detergent Mineral Oil. It should contain anti-oxidant, anti-foam and demulsifying additives. It should contain antiwear or EP additives. Automatic transmission fluids and motor oils are not recommended.

Temperature limits

Ambient min.	-30°C (-22°F)
Ambient max.	+ 70°C (158°F)
Max. operating temperature range.	
Mineral Oil	Water- containing
Min -20°C (-4°F)	+10°C (50°F)
Max. + 80°C (175°F)	+54°C (130°F)

Note: To obtain optimum services life from both fluid and hydraulic systems components, a fluid operating temperature of 40°C is recommended.

Filtration

Full flow filtration (open circuit), or full boost flow filtration (close circuit) to ensure system cleanliness to ISO4406/1986 code 18/14 or cleaner.

Noise levels

The airborne noise level is less than 66.7 dB(A) DIN (&) dB (A) NFPA) through the “continuous” operating envelope. Where noise is a critical factor, installation resonances can be reduced by isolating the motor by elastomeric means from the structure and the return line installation. Potential return line resonances originating from liquid borne noise can be further attenuated by providing a return line back pressure of 2 to 5 bar.

Polar Moment of Inertia & Mass:

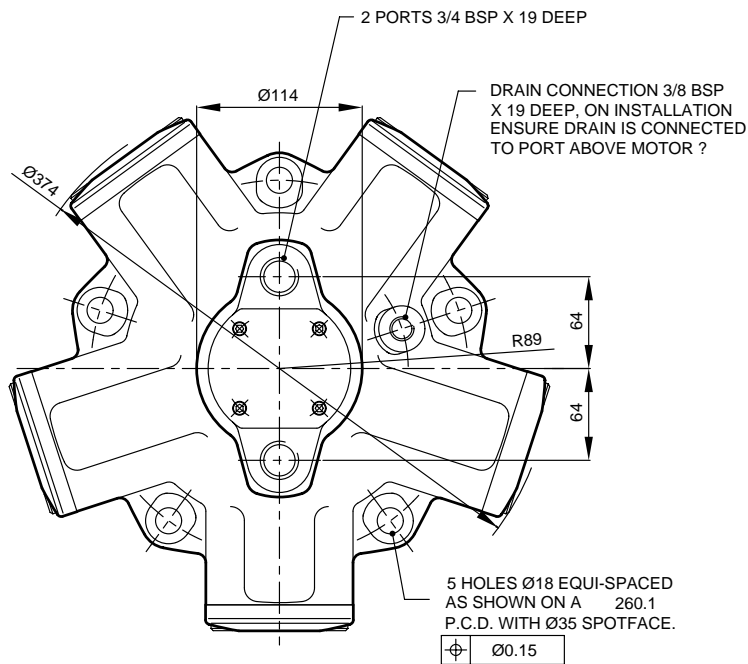
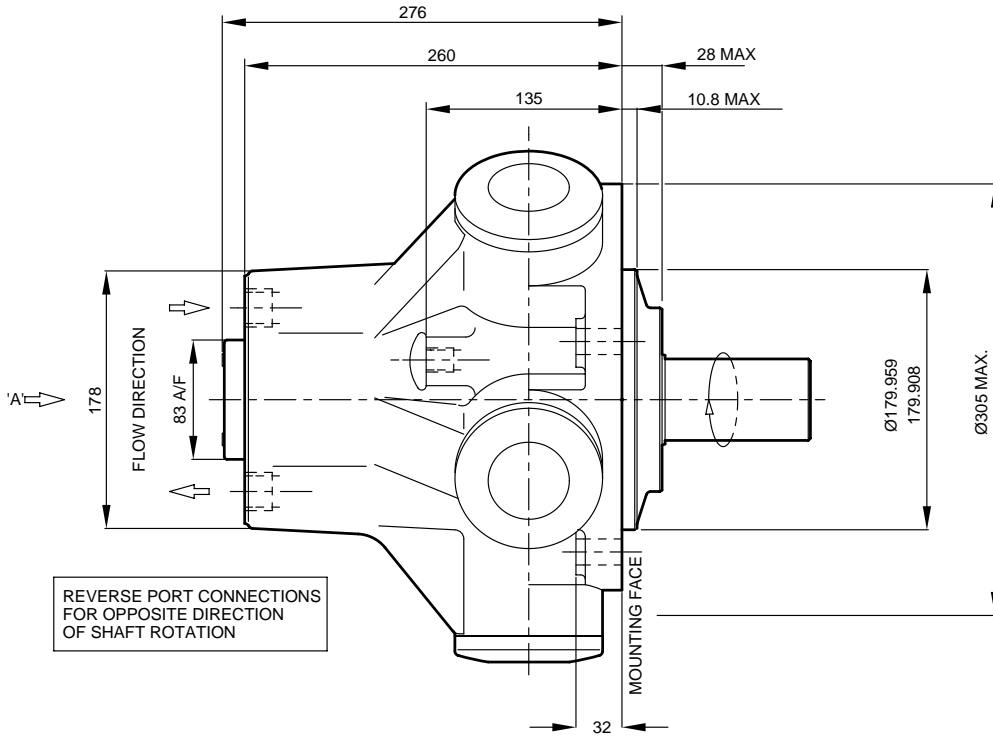
Model Type	Polar moment of Inertia (kg.m ²) (Typical data)	Mass (kg) (Approx. all models)
HMB010	0.0076	40
HMB030	0.015	73
HMB045	0.047	120
HMB060	0.055	144
HMB080	0.060	144
HMB100	0.076	144
HMB125	0.22	217
HMB150	0.25	265
HMB200	0.27	265
HMB270	0.91	420
HMB325	0.95	429
HMHDB400 (With 4" valve)	0.54	481
HMHDB400 (With 4.5" valve)	0.54	510
HMB700	2.38	1050



Installation Drawings

HMB030 motor with rear entry ports (Mono block)

See additional views for side entry model and for shaft types



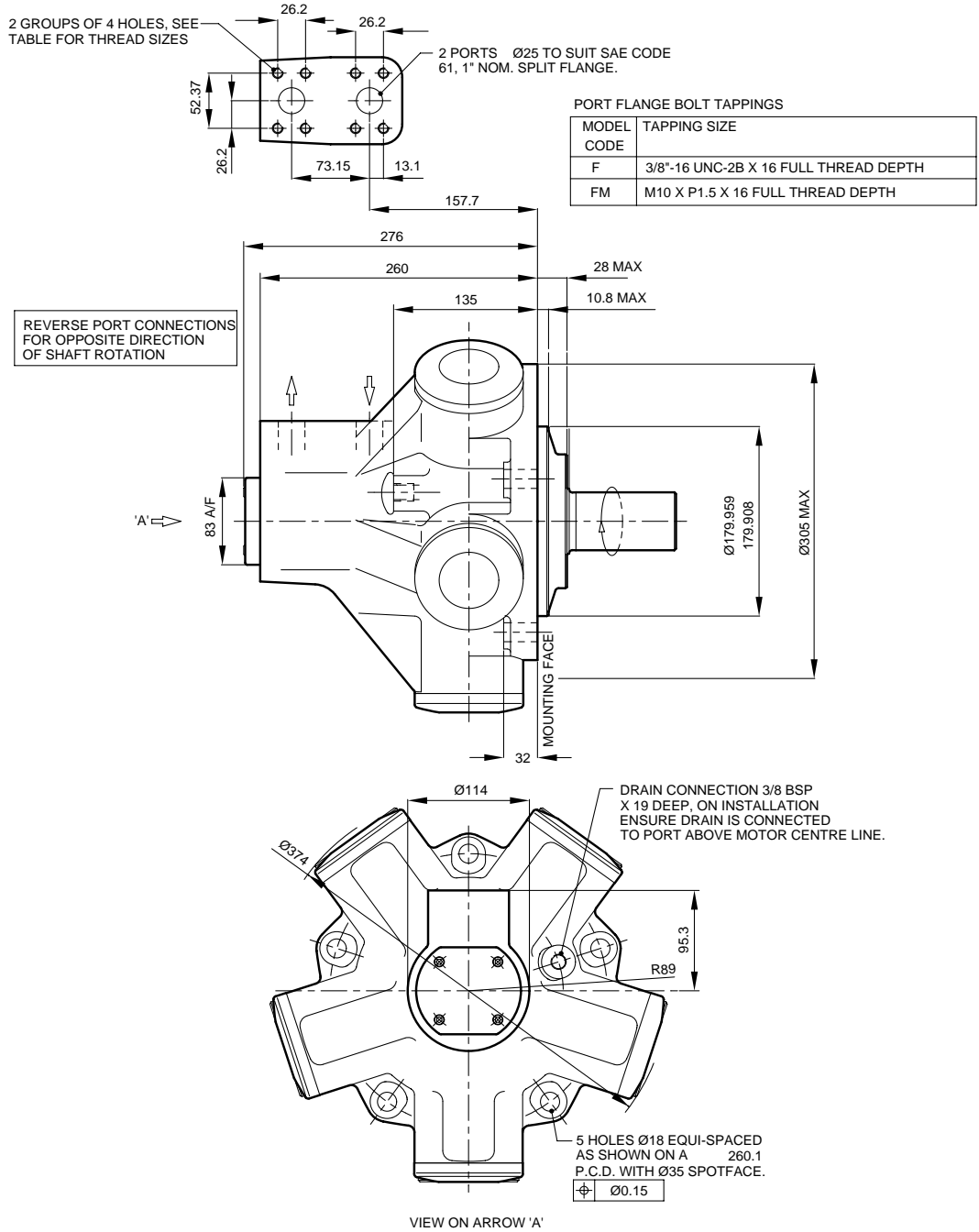
VIEW ON ARROW 'A'



HMB030 Motor

HMB030 motor with side entry ports (Mono block)

See view of rear entry motor for additional shaft types.



HMB30 Shaft Specification

Shaft Type "P" Parallel keyed shaft

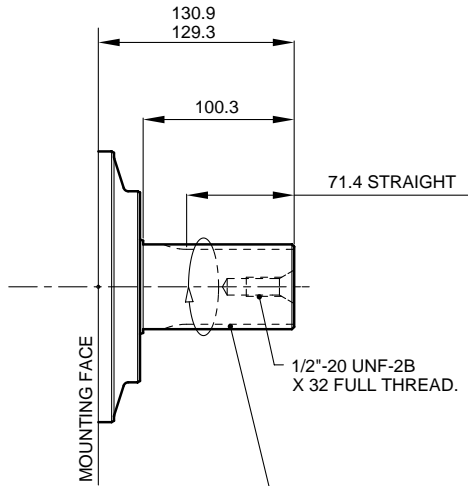
Shaft Type "S" Involute spline, 17 teeth to BS3550

Shaft Type "Z" Involute spline, 17 teeth to DIN 5480

SHAFT TYPE 'S'
17 SPLINES TO BS 3550-1963

SHAFT TYPE 'Z'
17 SPLINES TO DIN 5480

FOR SHAFT TYPE 'Z'
DIN 5480, W55 X 3 X 17 X 7h



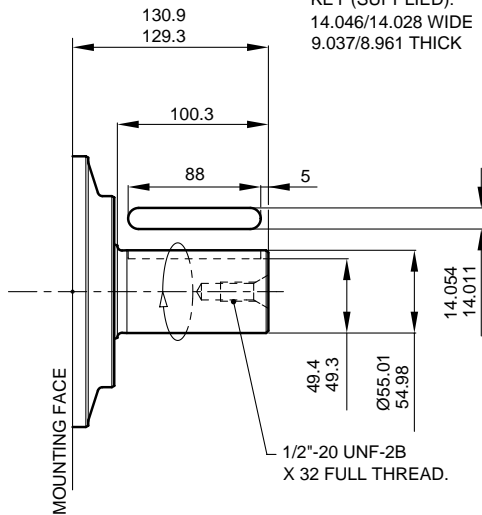
SPLINE DATA

FOR SHAFT TYPE 'S'
TO BS 3550-1963 (ANSI B92.1, 1970 CLASS 5)
FLAT ROOT SIDE FIT, CLASS 1

PRESSURE ANGLE	30°
NUMBER OF TEETH	17
PITCH	8/16
MAJOR DIAMETER	56.41/56.28
FORM DIAMETER	50.703
MINOR DIAMETER	50.07/49.60
PIN DIAMETER	6.096
DIAMETER OVER PINS	62.985/62.931

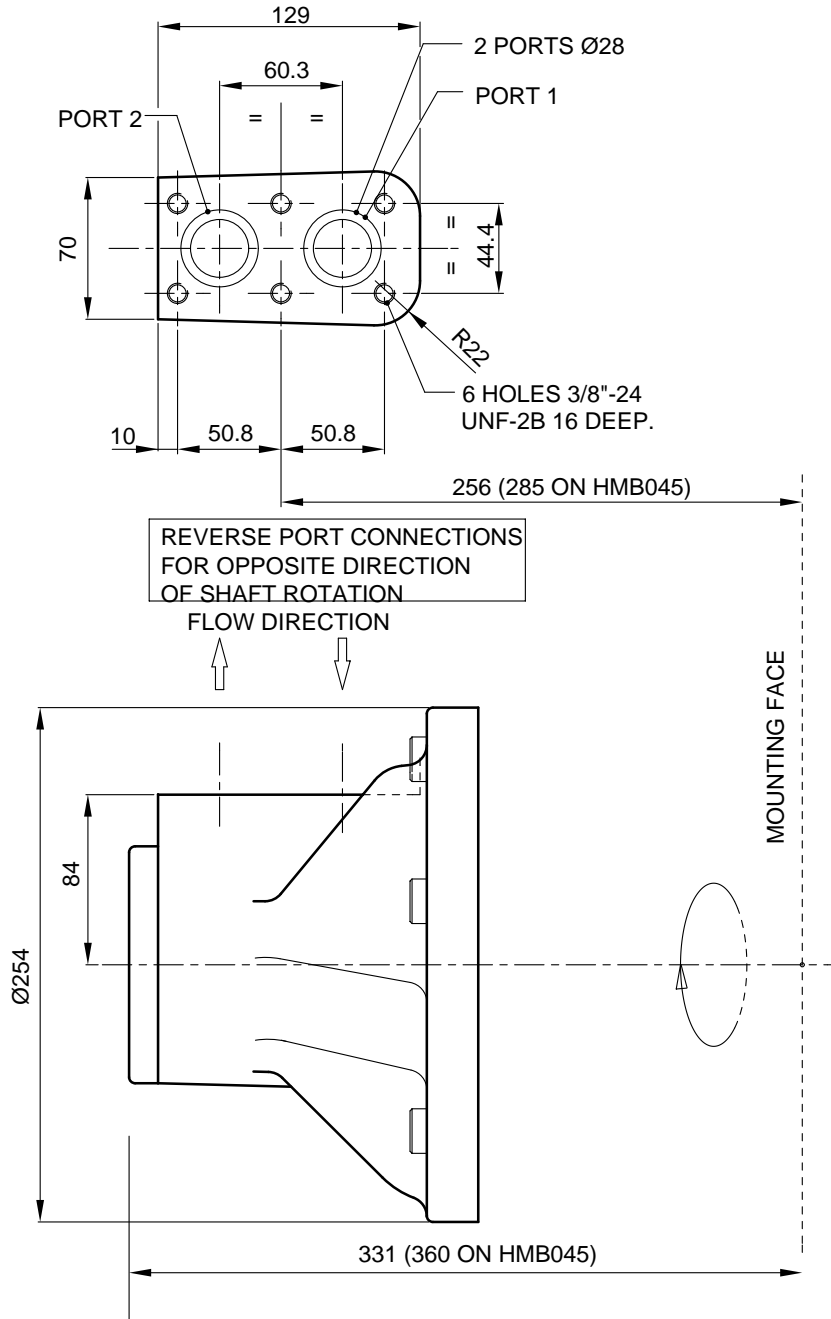
SHAFT TYPE 'P'
CYLINDRICAL SHAFT WITH KEY

KEY (SUPPLIED):
14.046/14.028 WIDE
9.037/8.961 THICK



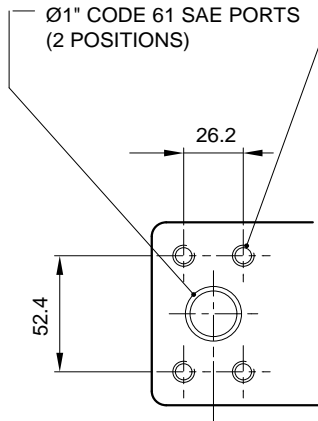
HMB030/HMB045 Valve Housings

**3" VALVE HOUSING WITH 6-BOLT FLANGE, 'S03'
SUPPLIED WITH 2 'O' RING SEALS**



HMB030/HMB045 Valve Housings (continued)

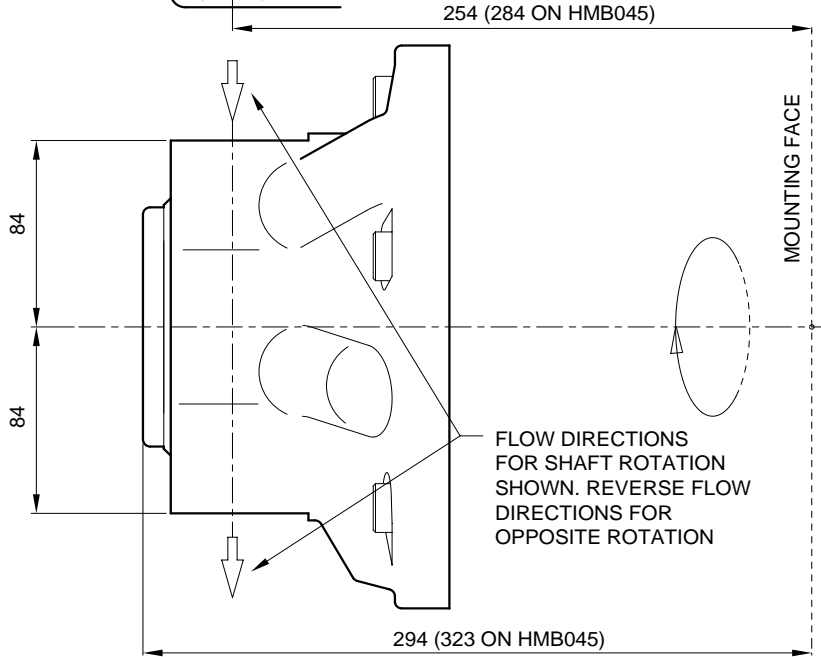
1" SAE 4-BOLT FLANGE, 'F2'/'FM2'



4 HOLES (2 POSITIONS) SEE TABLE FOR BOLT TAPPINGS

PORT FLANGE BOLT TAPPINGS

MODEL CODE	TAPPING SIZE
F2	3/8"-16 UNC-2B X 22 FULL THREAD DEPTH
FM2	M10 X P1.5 X 22 FULL THREAD DEPTH



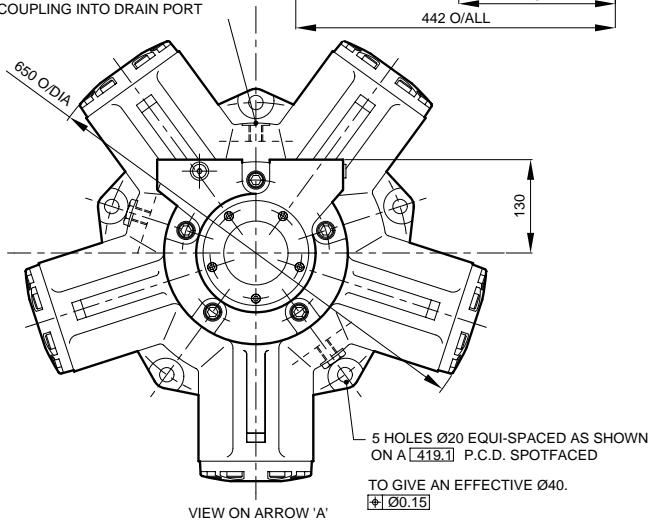
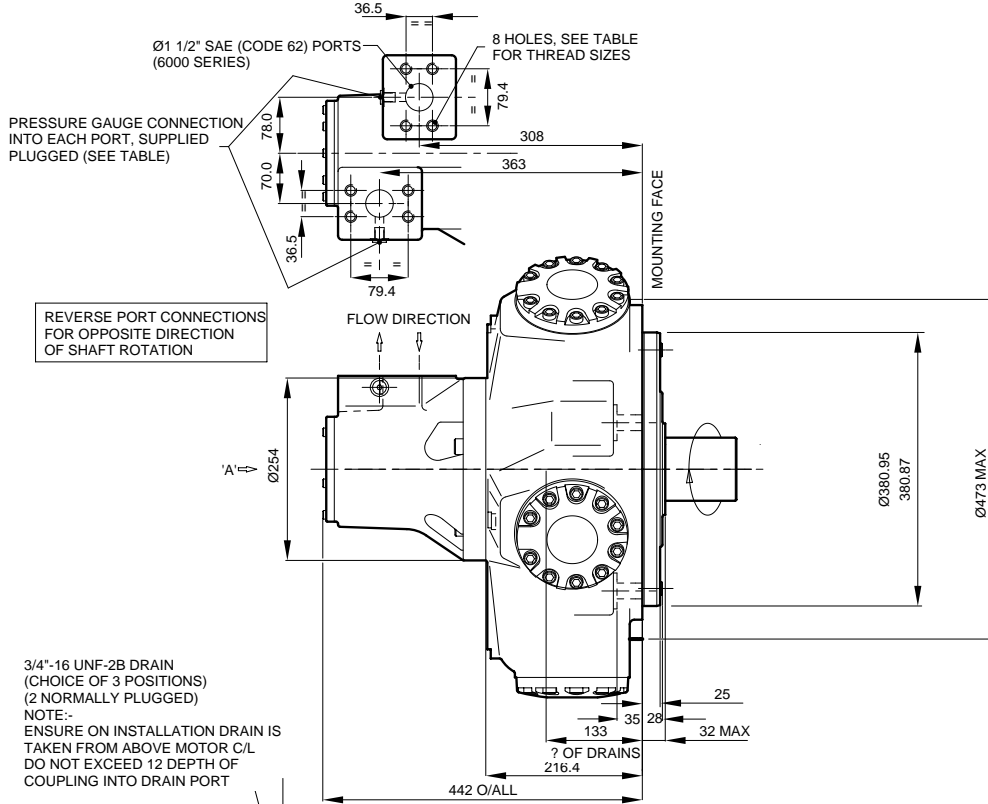
Installation Drawings

HMB150/200 Motors with type "F4"/"FM4" (1 1/2" SAE) port connection

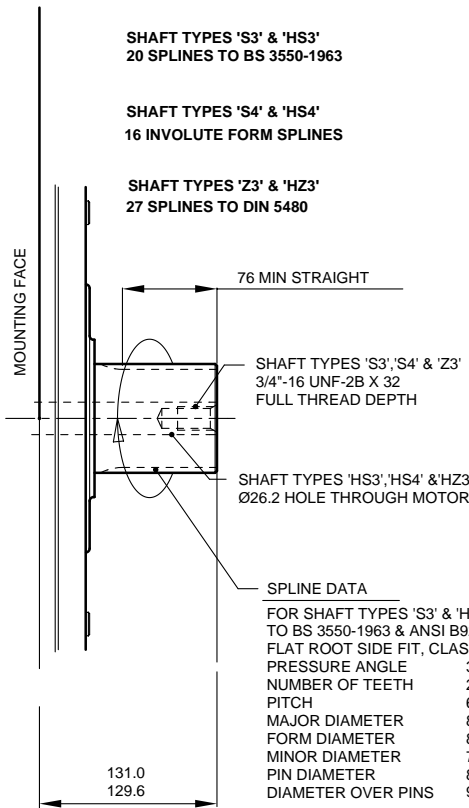
See additional views for shaft types and for types "S04", "F3", "FM3" and "S03" port connection

PORT FLANGE BOLT TAPPINGS

MODEL CODE	TAPPING SIZE	GAUGE CONNECTIONS
F4	5/8"-11 UNC-2B X 35 FULL THREAD DEPTH	9/16"-18 UNF-2B, SAE J475
FM4	M16 X P2.0 X 35 FULL THREAD DEPTH	G1/4" (BSPF)



HMB150 Shaft Specification



SPLINE DATA

FOR SHAFT TYPES 'S3' & 'HS3'
TO BS 3550-1963 & ANSI B92.1, 1970
FLAT ROOT SIDE FIT, CLASS 1
PRESSURE ANGLE 30°
NUMBER OF TEETH 20
PITCH 6/12
MAJOR DIAMETER 87.953/87.825
FORM DIAMETER 80.264
MINOR DIAMETER 79.485/78.925
PIN DIAMETER 8.128
DIAMETER OVER PINS 97.084/97.030

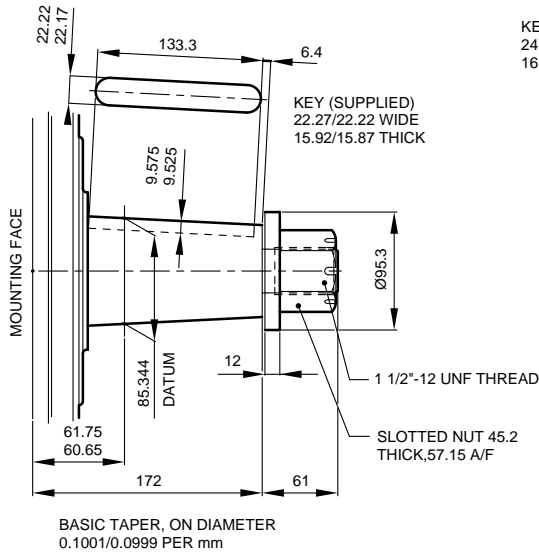
FOR SHAFT TYPES 'Z3' & 'HZ3'
DIN 5480 W85 X 3 X 27 X 7H

SPLINE DATA

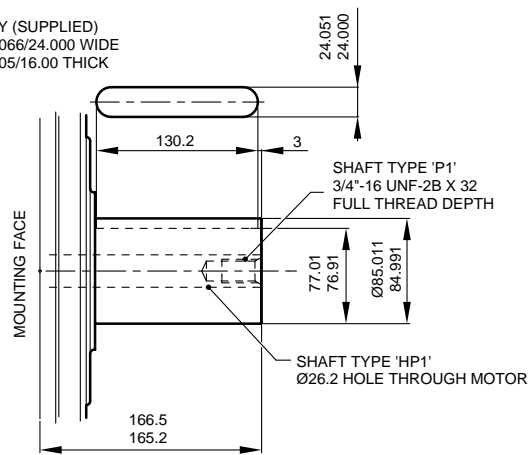
FOR SHAFT TYPES 'S4' & 'HS4'
INVOLUTE GEAR TOOTH FORM

PRESSURE ANGLE	20°
NUMBER OF TEETH	16
PITCH	5/10
MAJOR DIAMETER	86.360/86.233
FORM DIAMETER	76.124
MINOR DIAMETER	74.93/72.39
PIN DIAMETER	8.636
DIAMETER OVER PINS	92.710/92.581

**SHAFT TYPE 'T'
LONG TAPER WITH KEY**



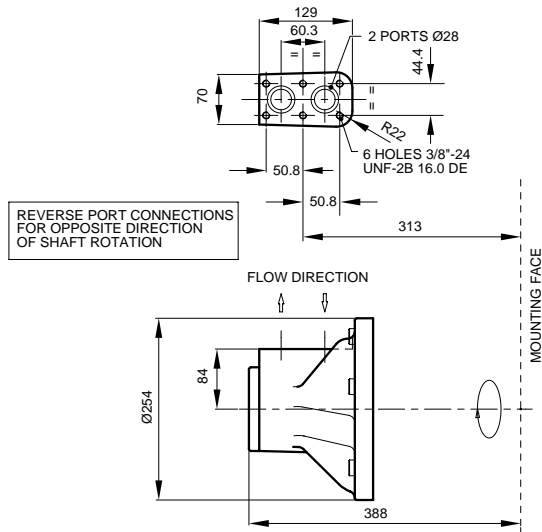
**SHAFT TYPES 'P1' & 'HP1'
CYLINDRICAL SHAFT WITH KEY**



HMB150/200 Valve Housings

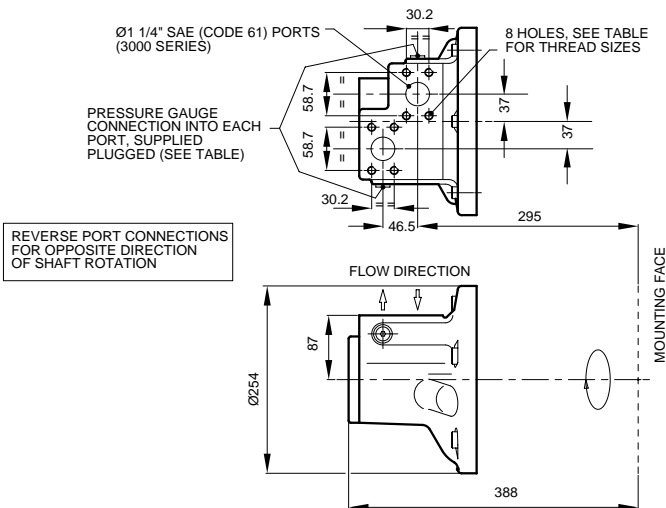
3" Valve Housing with 6-Bolt Flange, "S03"

3" VALVE HOUSING WITH 6-BOLT FLANGE, 'S03'
SUPPLIED WITH 2 'O' RING SEALS



3" VALVE HOUSING WITH 1 1/4" SAE 4-BOLT FLANGES, 'F3'/FM3'

IN MODEL CODE POSITION 4



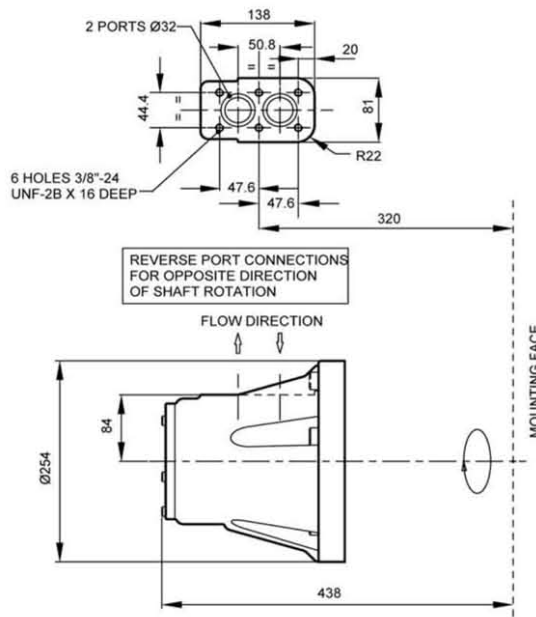
PORT FLANGE BOLT TAPPINGS

MODEL CODE	TAPPING SIZE	GAUGE CONNECTIONS
F3	7/16"-14 UNC-2B X 27 FULL THREAD DEPTH	9/16"-18 UNF-2B, SAE J475
FM3	M12 X R1.75 X 27 FULL THREAD DEPTH	G1/4" (BSPF)

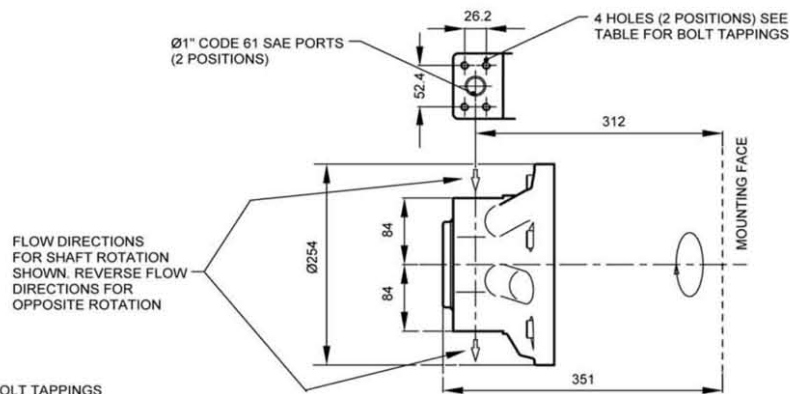


HMB150/HMB200 Valve Housings (continued)
4" Valve Housing with 6-Bolt Flange, "S04"

4" VALVE HOUSING WITH 6-BOLT FLANGE, "S04"
 SUPPLIED WITH 2 'O' RING SEALS



2 1/4" VALVE HOUSING WITH 1" SAE 4-BOLT FLANGES,
 F2/FM2



PORT FLANGE BOLT TAPPINGS

MODEL CODE	TAPPING SIZE
F2	3/8"-16 UNC-2B X 22 FULL THREAD DEPTH
FM2	M10 X P1.5 X 22 FULL THREAD DEPTH



Model Staffa	Page 59.60	Data Sheet M-1001/03.00
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