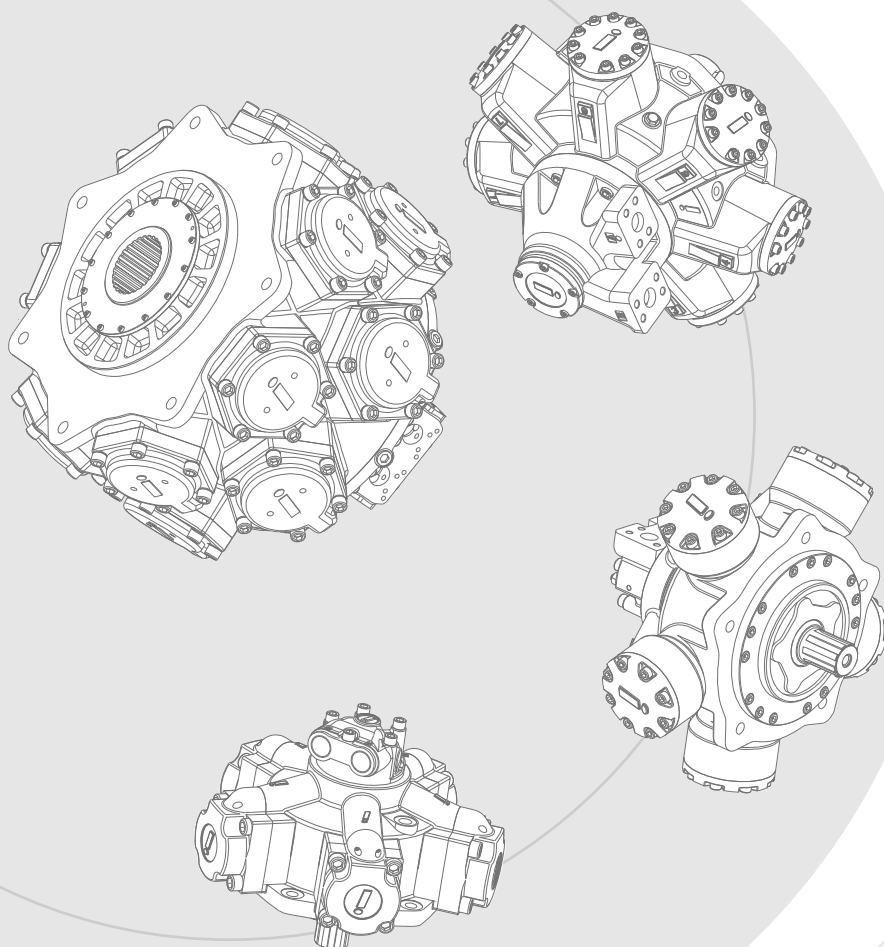




中意合资
Sino-Italian JV

CATALOGUE

HYDRAULIC MOTORS



NINGBO OIL CONTROL HYDRAULIC CO., LTD.
NINGBO INTERMOT HYDRAULIC MOTOR CO., LTD.

ABOUT US

NINGBO OIL CONTROL HYDRAULIC CO., LTD. is originated from NINGBO INTERMOT HYDRAULIC MOTOR CO., LTD., a Sino-Italian Joint venture established in 1992, by the Chinese partner, INTERMOT S.r.l. (Italy), R&D S.r.l. (Italy) and SAI S.p.a. (Italy). NINGBO OIL CONTROL has been specializing in the development and manufacture of hydraulic motors, inheriting the European classics while focusing on quality development. Relying on the advanced hydraulic technologies and rigorous manufacturing expertise from Italy, the company is committed to creating value for customers. We persist in developing modern corporate cultures whereas continuous innovation remains the constant pursuit of the company. Our product range covers a vast variety of applications throughout the world and the brand 'intermot' is renowned for its outstanding price for value within the industry.

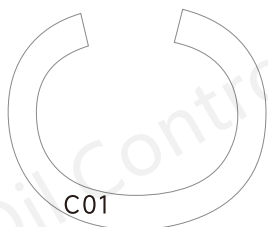
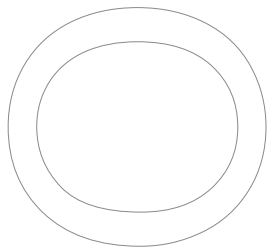
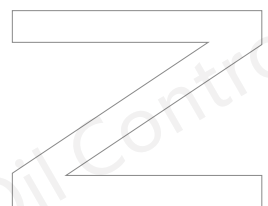
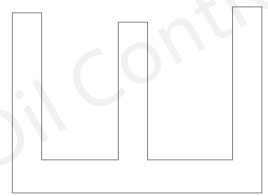
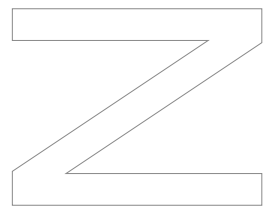
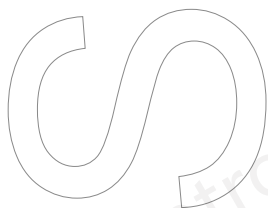
In the past 30 years, the strong technical genes and blood has been driving us to become a competitive professional hydraulic motor manufacturer with the most comprehensive varieties of product portfolio to fulfill customer demands. As the high market shareholder, Ningbo Oil Control has been qualified as the National High-tech Innovation enterprise for 20+ consecutive years and possesses more than 60 intellectual patents including inventions and utility models, and we are the <Low Speed High Torque Hydraulic Motor> National Industry Standard Drafting Entity. Moreover, as the S.R.D.I. innovative enterprise of Zhejiang province, we have a provincial level high-tech R&D center namely - Transmission and Control Engineering R&D Center. As a long-term strategic partner with many first-tier international brands, Ningbo Oil Control always maintains an in-depth cooperative relationship with Zhejiang University and other competitive institutes, our R&D personnel accounts for about 40% of the total staff headcount, over 50% of the employees have 10+ years of professional service experience with the company, the strong R&D team with the stable staff team sets the technology and quality of the enterprise.

In 2022, we successfully integrated MES, ERP, PLM management systems, and introduced WMS intelligent storage and other digital production system to build up a new 5G+ industrial Internet digital green factory, which contributes significantly to the improvement of production efficiency and consistency. At the present, Oil control has a modern production workshop of over 20,000 square meters, and owns many high-quality equipments imported from Japan and Europe such as fully automatic comprehensive machining centers and CNC machine tools, i.e. DMG MORI flexible machining system, Yamazaki Mazak, Doosan, etc. The company has passed the ISO9001:2015 quality system certification and product inspection certification of CCS, BV, NK, Lloyds, ABS, DNV, international Classification Societies. By providing high-quality and cost-effective products of domestic alternatives to help customers reduce costs.

Our main product range includes: NHM series, GHM series, CM series, FMB (fixed disp.) / FMC (dual-disp.) series of low-speed high-torque hydraulic motor, RM (Swivel cylinder crankshaft) series, PMS (Radial Cam-ring) series LSHT hydraulic motor, OILW travel gearbox, OILP planetary gearbox, OILH hydraulic winch, and EPMZ orbit hydraulic motor. Meanwhile, we are also the distributor of the hydraulic products such as 'M+S' orbit motor of Bulgaria and orbit motor of Eaton Jining. Our products application field covers engineering, hoisting and transportation, metallurgic and heavy duty machinery, oil extraction, coal mining, marine applications, machine tools, plastic molding machines, geological prospecting and other hydraulic transmission systems. Our products are particularly suitable for driving injection moulding machine, lifting screw drives, driving winch and various rolling drums, as well as other transmission mechanics like track and wheel machines.

Confronting with the challenge of the demanding market, we adhere to the corporate creed of 'Take responsibility for our products and services, while fulfilling the actual demands of our customers'. Ningbo Oil Control seeks sustainable development through continuous internal reforms, with the application of intelligent manufacturing technologies, to keep abreast of the development of leading enterprises in injection molding machinery and the marine industries. To embrace the future, Oil Control is playing an active role in the industrial electrification transformation, and is committed to converting tangible products into intangible power. Our vision is not simply to be the Pioneer of Hydraulic Motor industry, but also to create a brilliant future of Hydraulic Motors and to be the most competitive hydraulic motor manufacturer in China.





C01

FMB

Series Technical Catalogue

1.Product Features	C02
2.Calculations & Formulas	C03
3.Instructions & Advices	C03
4.Ordering Code	C03
5.Technical Performance Parameters	C04
6.Performance Graph	C05
7.Dimensions	
FM (HD)B60/100-700~1650	C07
FM (HD)B125-1400~2000	C09
FM (HD)B150/200-2000~3600	C11
FM (HD)B270/325-3300~5300	C13
FM (HD)B400/500-5500~8000	C15
FM (HD)B700-9000~12600	C17

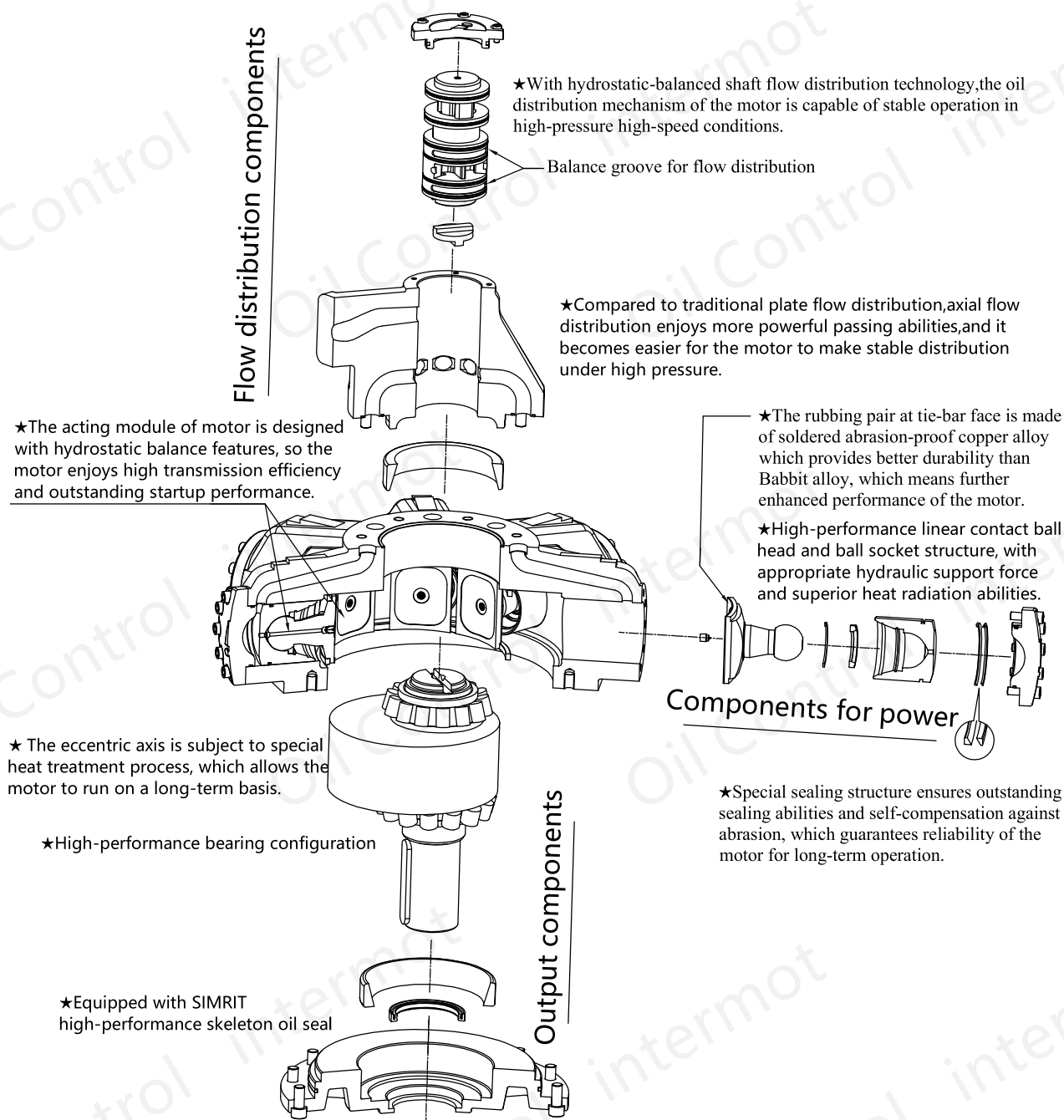


**Hydrostatic Balance Motor with
Crankshaft & Connecting-rods**

FMB SERISE HYDRAULIC

PRODUCT FEATURE

FMB series hydraulic motors, recently launched products with new structures of the company, embody years of experiences of INTERMOT in manufacturing hydraulic motors and enjoy the advantages of internal/external crank shaft hydraulic motors worldwide, which contributes to the significant enhancement of pressure grade and speed range of hydraulic motors. The motors falling into this series are characterized by outstanding reliability, high efficiency, long service life, low noise level and wide speed range, etc., so that they widely used in the hydraulic transmission systems in a number of industries such as marine, plastic machinery, mining, construction, metallurgy, petroleum, and geological prospecting, etc..



CALCULATIONS & FORMULAS

Actual output torque of hydraulic motor:

$$M = 0.159 \times (P_1 - P_2) \times V \times \eta_m \quad (N.m)$$

Output power of hydraulic motor:

$$N = \frac{M \times n}{9550} \quad (kW)$$

$$N = \frac{q \times (P_1 - P_2)}{60000} \eta_m \times \eta_v \quad (kW)$$

Where:

P_1	——	Pressure at inlet of hydraulic motor (Mpa)
P_2	——	pressure at outlet of hydraulic motor (Mpa)
V	——	Displacement of hydraulic motor (ml/r)
η_m	——	Mechanical efficiency of hydraulic motor
n	——	Rotation speed of hydraulic motor (r/min)
q	——	Flow of hydraulic motor (ml/min)
η_v	——	Volumetric efficiency of hydraulic motor

INSTRUCTIONS & ADVICES

In addition to the reference to NHM series motor (PAGE A02) , please pay attention to the following issues:

1. As the F series motors adopt a hydrostatically-balanced structure to increase the leakage of the motor, ensure the inner diameter of the drain pipe must not be less than 16 mm when it is connected with the external drain pipe, otherwise, the oil seal could be impacted or damaged. When connecting the tie-in of the drain port, do not over-screw in to avoid damage of the parts.

ORDERING CODE

FM(HD)B - *** - *** - *** - *** - *****

1 2 3 4 5 6

1 Code of FM(HD) B series low-speed high-torque hydraulic motor

FMB refers to a standard model

FMHDB refers to heavy duty (enhanced) model, with better bearing configuration and reliability

2 Series

3 Nominal displacement

4 Shaft type

P Parallel key

S / Z Male spline

Q Female spline

T Long taper with key

5 Main Port Connections

6 Other design parameters

Examples:

FMB270-4300-P1-FM4 refers to FMB series low-speed high-torque motor, with product series of 270, and a nominal displacement of 4,300 ml/r; P1 stands for output axis, and FM4 is the flange at inlet/outlet oil port. See dimension diagram for detailed sizes.

Note: The orders without specified model of output axis or flanges at inlet/outlet oil port will be deemed as orders for standard configuration.

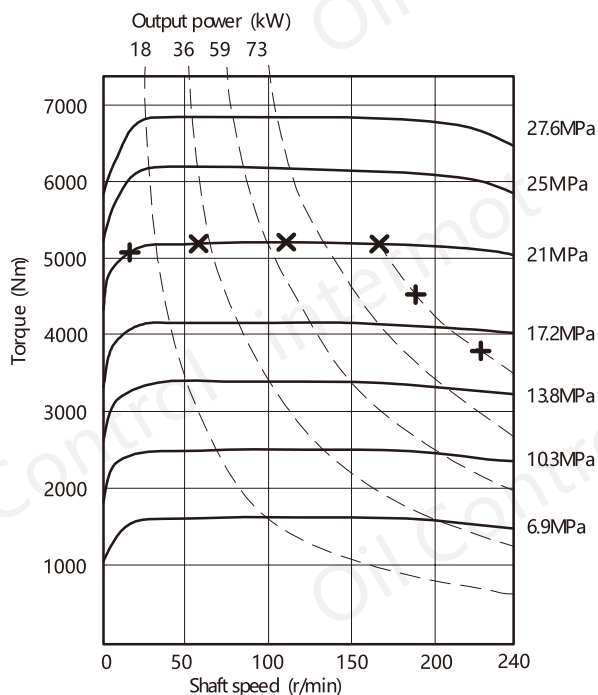
TECHNICAL PERFORMANCE PARAMETERS

Type	Displacement (ml/r)	Rated Pressure (MPa)	Max. Pressure (MPa)	Rated Torque (N.m)	Unit Torque (N.m/MPa)	Max.Speed (r/min)	Max.Power (kW)	Weight (kg)
FMB060-700	716	21	29	2199	105	300	58	121
FMB060-800	815	21	29	2504	119	300	65	121
FMB060-900	899	21	29	2762	132	300	73	121
FMB060-1000	998	21	29	3066	146	300	80	121
FMB100-1000	988	21	29	3035	145	300	90	144
FMB100-1100	1088	21	29	3342	159	300	90	144
FMB100-1250	1237	21	29	3800	181	280	90	144
FMB100-1400	1385	21	29	4255	203	260	100	144
FMB100-1650	1630	21	29	5007	238	240	100	144
FMB125-1400	1459	21	29	4482	213	300	100	235
FMB125-1600	1621	21	29	4980	237	270	110	235
FMB125-1800	1864	21	29	5726	273	235	110	235
FMB125-2000	2027	21	29	6227	297	220	110	235
FMB150-2500	2497	21	29	7670	365	220	115	285
FMB200-2800	2757	21	29	8469	403	195	120	285
FMB200-3100	3080	21	29	9461	451	175	120	285
FMB200-3600	3648	16	21	8538	534	145	120	285
FMB270-3300	3291	21	29	10110	481	160	120	420
FMB270-3600	3575	21	29	10982	523	145	126	420
FMB270-4000	3973	21	29	12205	581	130	126	420
FMB270-4300	4313	21	29	13249	631	120	126	420
FMB325-4500	4538	21	29	13940	664	115	126	430
FMB325-5000	4992	21	29	15335	730	105	126	430
FMB325-5300	5310	21	29	16312	777	100	126	430
FMB400-5500	5510	21	29	16926	806	145	175	495
FMB400-6000	5996	21	29	18419	877	135	175	495
FMB400-6500	6483	21	29	19915	948	126	175	495
FMB400-6800	6807	21	29	20910	996	120	175	495
FMB500-8000	8066	18	25	21238	1180	100	175	530
FMB700-9000	9082	18	25	23913	1329	100	205	1000
FMB700-10000	10004	18	25	26341	1463	100	205	1000
FMB700-11600	11590	18	25	30517	1695	100	205	1000
FMB700-12600	12599	18	25	33174	1843	100	205	1000

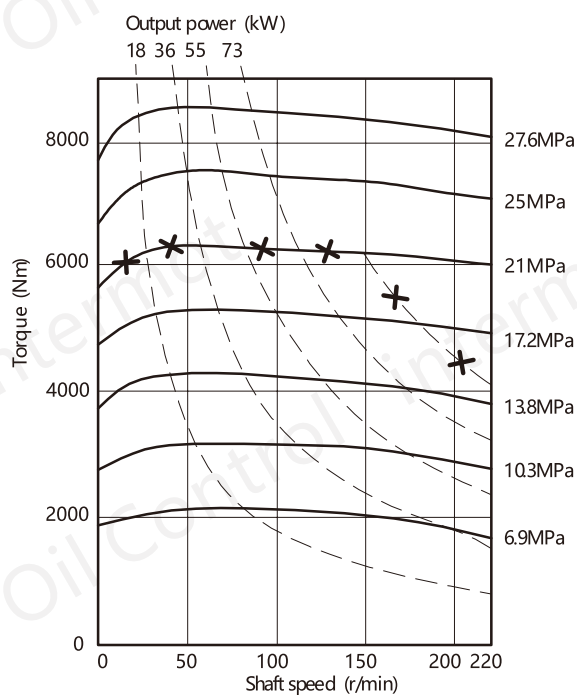
The above data are measured and obtained under specific actual experimental conditions, and only for product description purposes. The data should not be interpreted as warranted characteristics in legal term. Ningbo intermot(Ningbo Oil Control Hydraulic Co. Ltd.) reserves the rights to implement modifications without notice. All Partial or total reproduction and copy of such data without formal authorization is strictly forbidden.

PERFORMANCE GRAPH

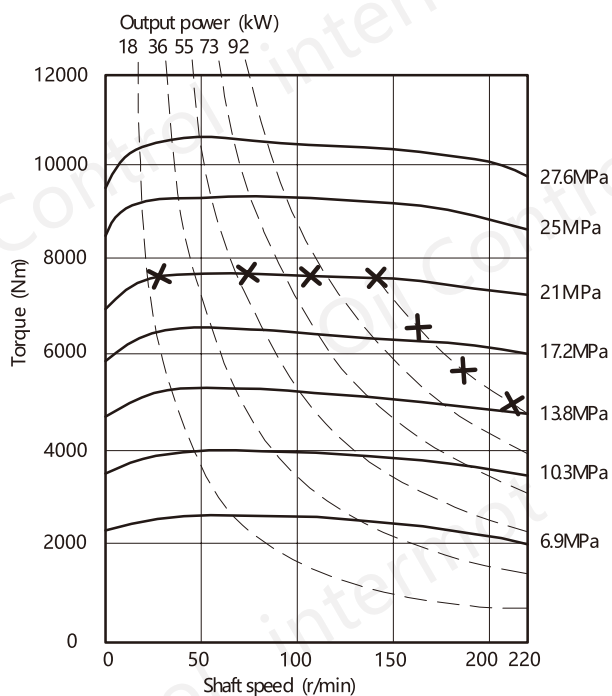
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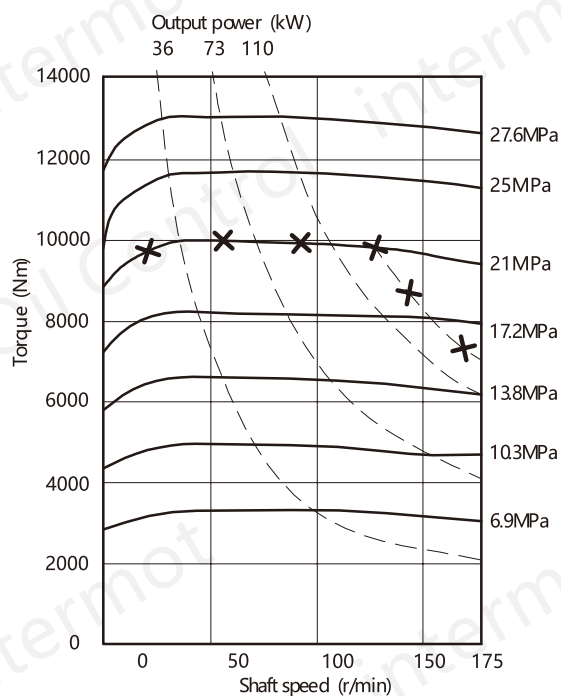
FMB125-2000



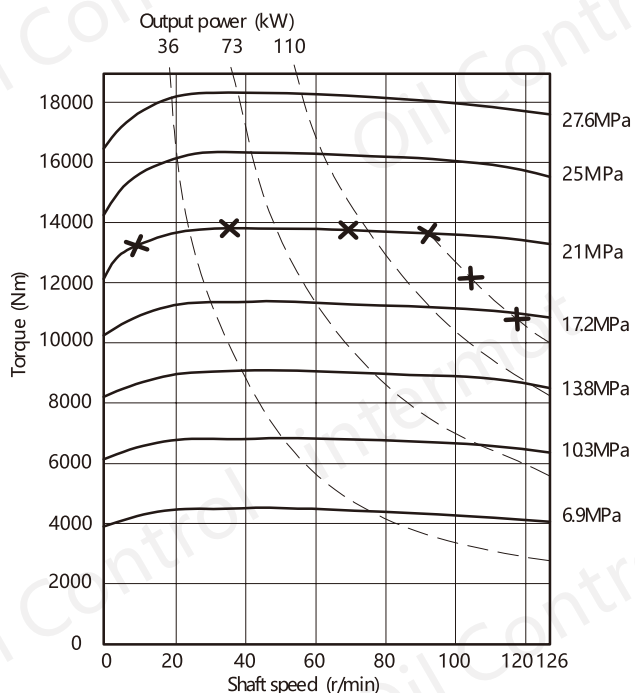
FMB150-2500



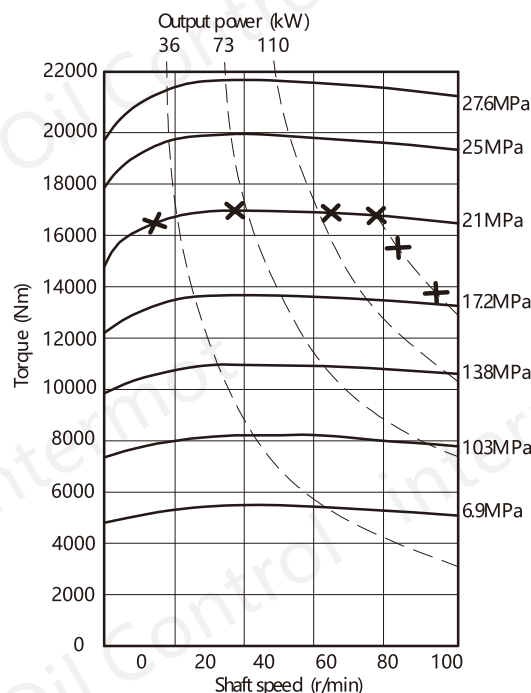
FMB200-3100



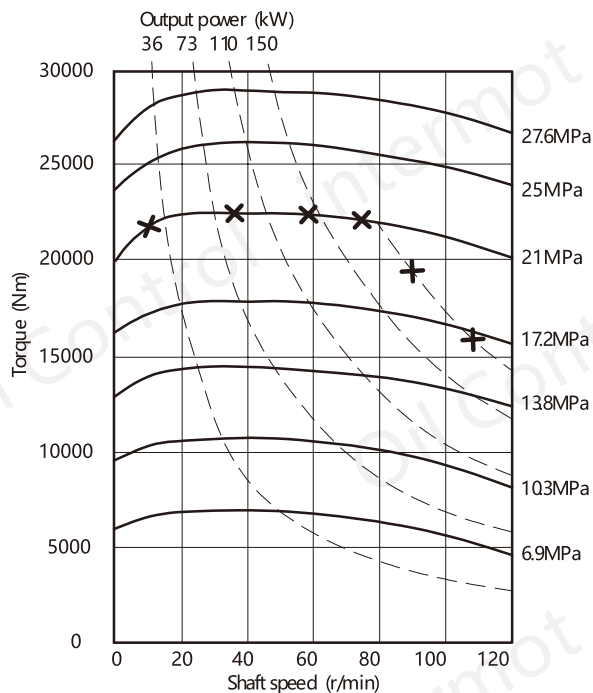
FMB270-4300



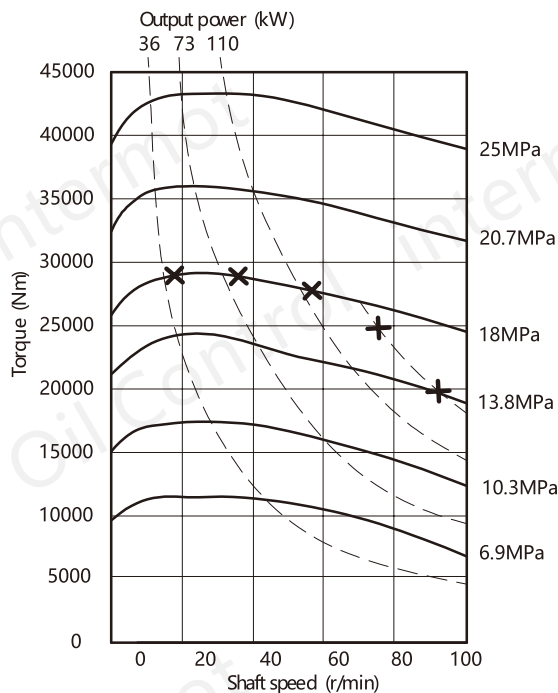
FMB325-5300



FMB400-6800



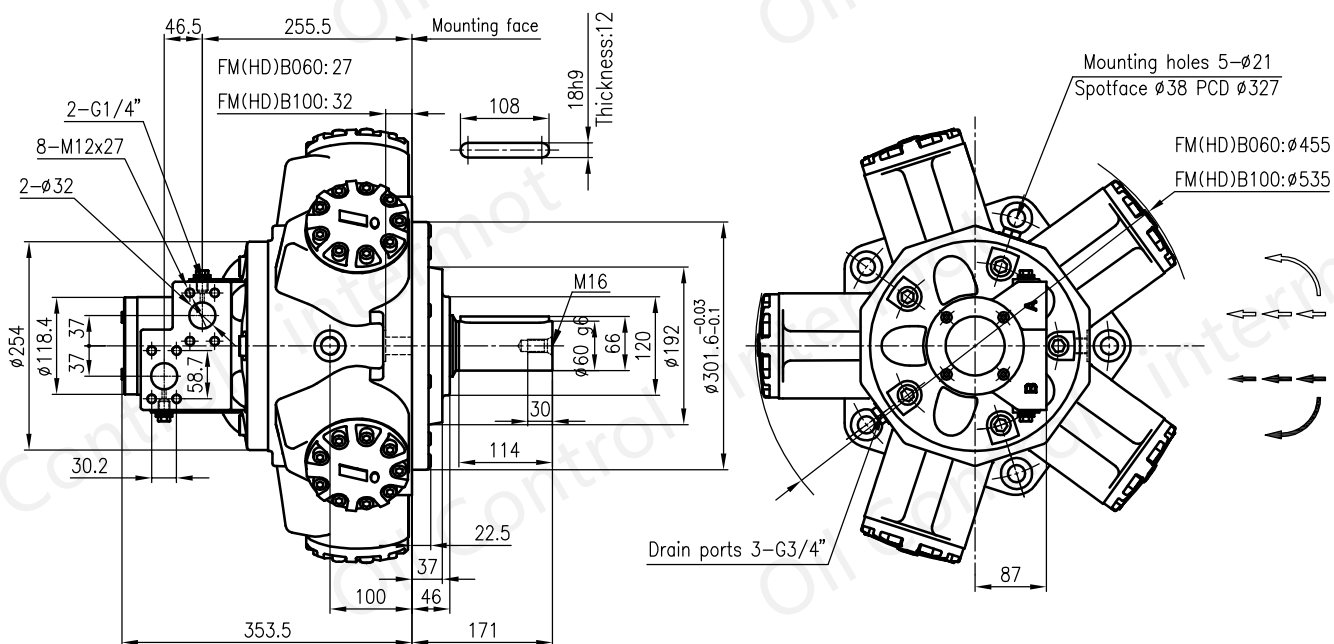
FMB700-12600



The above data are measured and obtained under specific actual experimental conditions, and only for product description purposes. The data should not be interpreted as warranted characteristics in legal term. Ningbo intermot(Ningbo Oil Control Hydraulic Co. Ltd.) reserves the rights to implement modifications without notice. All Partial or total reproduction and copy of such data without formal authorization is strictly forbidden.

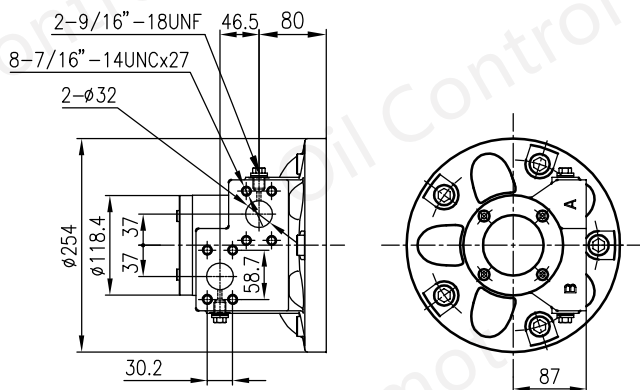
FM(HD)B060/100 STANDARD CONFIGURATION DIMENSIONS

Main port connections : FM3 Shaft type : P

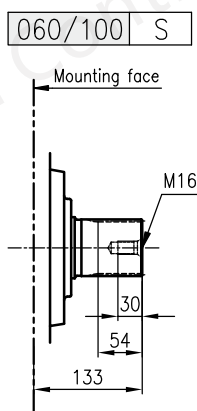
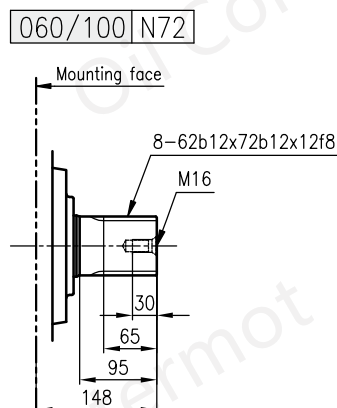
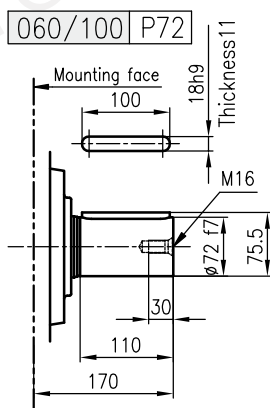


FM(HD)B060/100 OTHER MAIN PORT CONNECTIONS

060/100 F3

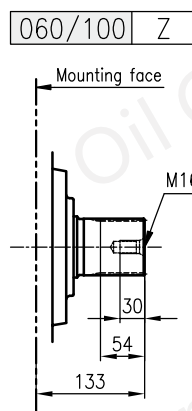


FM(HD)B060/100 OTHER SHAFT TYPES



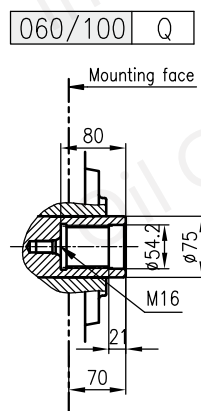
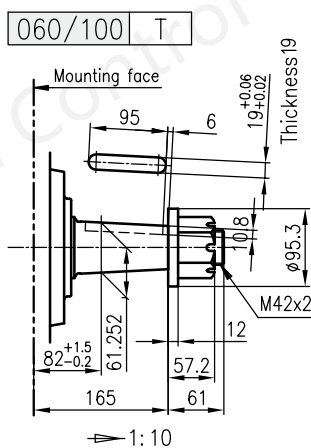
Spline parameters
Standard : BS3550-1963

Pressure angle	30°
Number of teeth	14
Pitch	6/12
Major diameter	62.553/62.425
Form diameter	55.052
Minor diameter	54.084/53.525
Pin diameter	8.128
Diameter over pins	71.593/71.544



Spline parameters
Standard : DIN5480 W70x3x22x7h

Pressure angle	30°
Number of teeth	22
Modulus	3
Addendum modification	+0.35
Tolerance grade	7h
Major diameter	69.4
Minor diameter	63.4
Spanned tooth count	4
Base tangent length	31.99



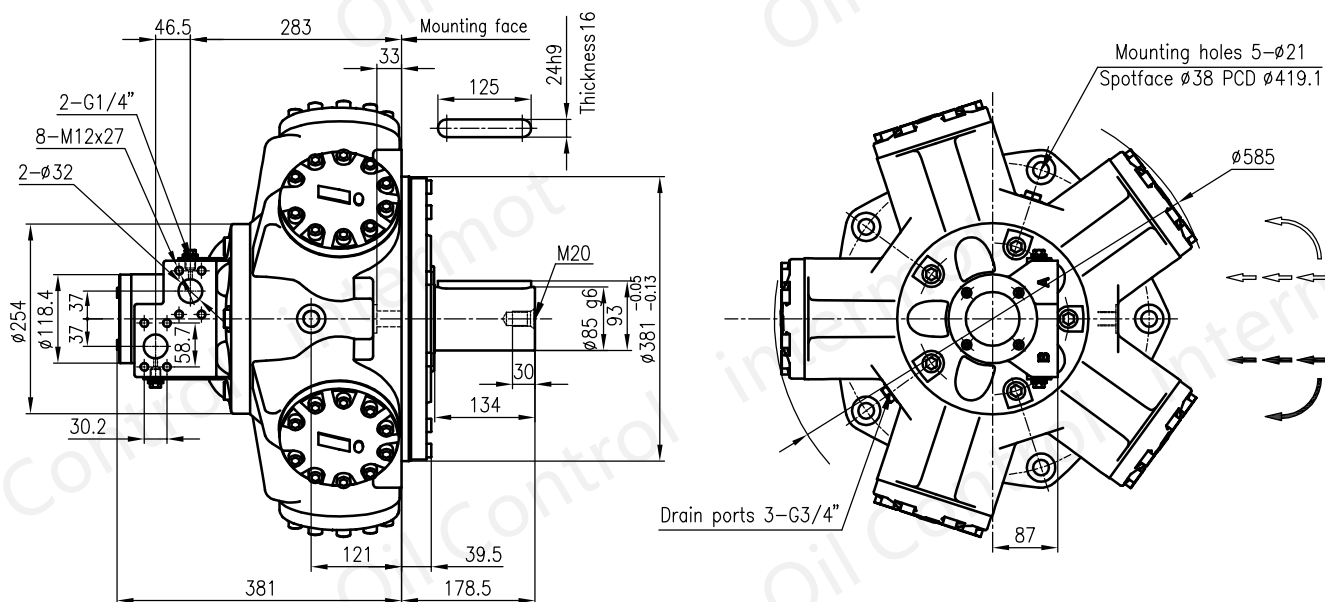
Spline parameters
Standard : BS3550-1963

Pressure angle	30°
Number of teeth	24
Pitch	12/24
Major diameter	53.246/52.916
Minor diameter	48.811/48.684
Pin diameter	3.658
Diameter between pins	45.626/45.550

FM(HD)B125 STANDARD CONFIGURATION DIMENSIONS

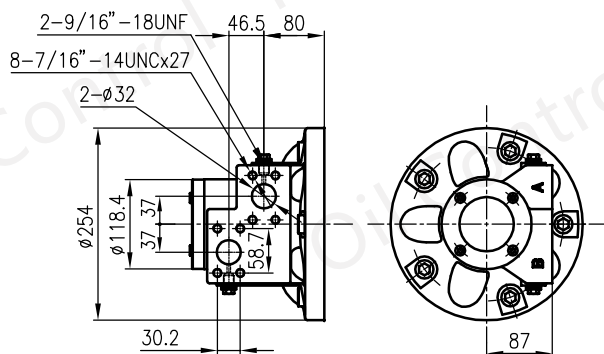
Main port connections : FM3

Shaft type : P1

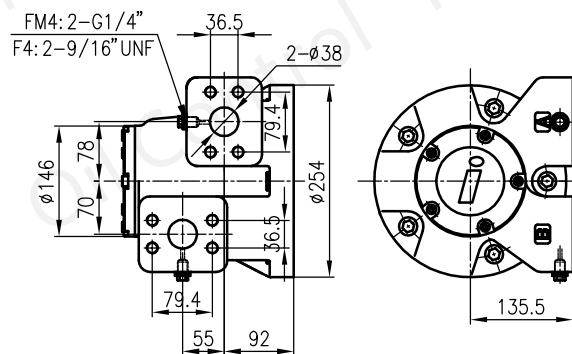


FM(HD)B125 OTHER MAIN PORT CONNECTIONS

125 F3

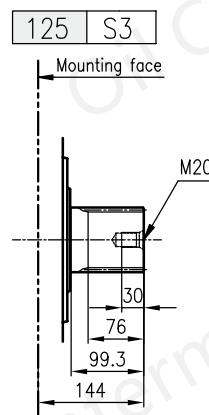
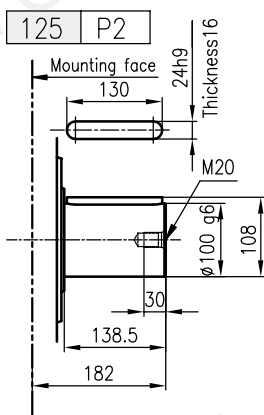


125 FM4/F4



INTERMOT
HYDRAULIC MOTOR

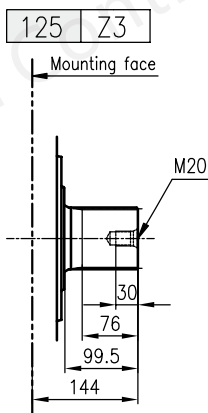
FM(HD)B125 OTHER SHAFT TYPES



Spline parameters

Standard : BS3550-1963

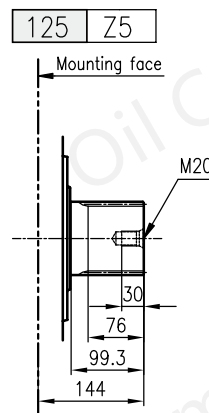
Pressure angle	30 °
Number of teeth	20
Pitch	6/12
Major diameter	87.953/87.825
Form diameter	80.264
Minor diameter	79.485/78.925
Pin diameter	8.128
Diameter over pins	97.084/97.030



Spline parameters

Standard : DIN5480 W85x3x27x7h

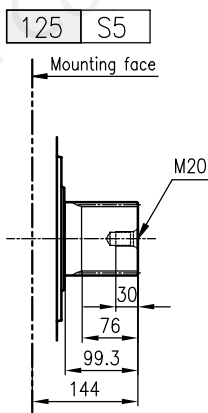
Pressure angle	30 °
Number of teeth	27
Modulus	3
Addendum modification	+0.35
Tolerance grade	7h
Major diameter	84.4
Minor diameter	78.4
Spanned tooth count	5
Base tangent length	40.85



Spline parameters

Standard : DIN5480 W100x4x24x7h

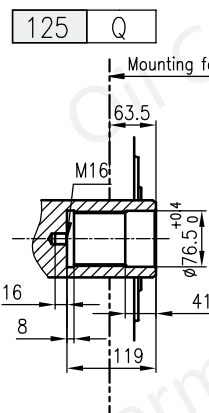
Pressure angle	30 °
Number of teeth	24
Modulus	4
Addendum modification	-0.2
Tolerance grade	7h
Major diameter	99.2
Minor diameter	91.2
Spanned tooth count	5
Base tangent length	42.359



Spline parameters

Standard : BS3550-1963

Pressure angle	30 °
Number of teeth	23
Pitch	6/12
Major diameter	100.66/100.52
Form diameter	92.939
Minor diameter	92.185/91.625
Pin diameter	8.128
Diameter over pins	109.58/109.51

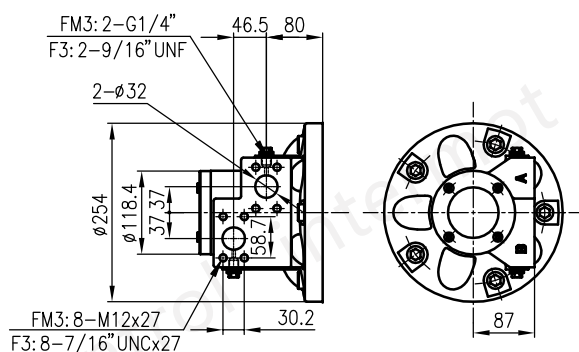
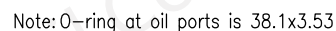


Spline parameters

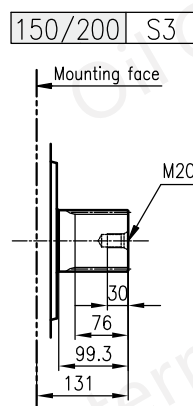
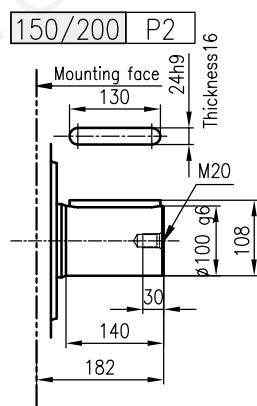
Standard : BS3550-1963

Pressure angle	30 °
Number of teeth	34
Pitch	12/24
Major diameter	74.414/74.048
Minor diameter	69.977/69.850
Pin diameter	3.658
Diameter between pins	66.815/66.744

Main port connections : FM4	Shaft type : P1
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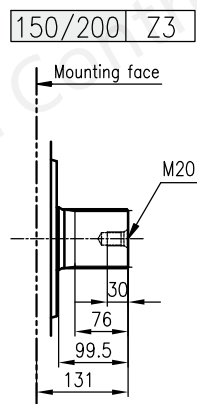
FM(HD)B150/200 OTHER SHAFT TYPES



Spline parameters

Standard : BS3550-1963

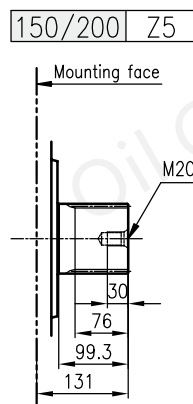
Pressure angle	30 °
Number of teeth	20
Pitch	6/12
Major diameter	87.953/87.825
Form diameter	80.264
Minor diameter	79.485/78.925
Pin diameter	8.128
Diameter over pins	97.084/97.030



Spline parameters

Standard : DIN5480 W85x3x27x7h

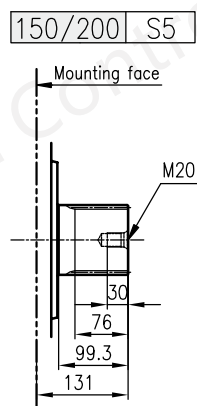
Pressure angle	30 °
Number of teeth	27
Modulus	3
Addendum modification	+0.35
Tolerance grade	7h
Major diameter	84.4
Minor diameter	78.4
Spanned tooth count	5
Base tangent length	40.85



Spline parameters

Standard : DIN5480 W100x4x24x7h

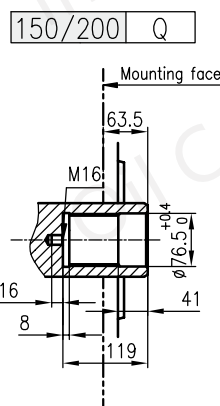
Pressure angle	30 °
Number of teeth	24
Modulus	4
Addendum modification	-0.2
Tolerance grade	7h
Major diameter	99.2
Minor diameter	91.2
Spanned tooth count	5
Base tangent length	42.359



Spline parameters

Standard : BS3550-1963

Pressure angle	30 °
Number of teeth	23
Pitch	6/12
Major diameter	100.66/100.52
Form diameter	92.939
Minor diameter	92.185/91.625
Pin diameter	8.128
Diameter over pins	109.58/109.51



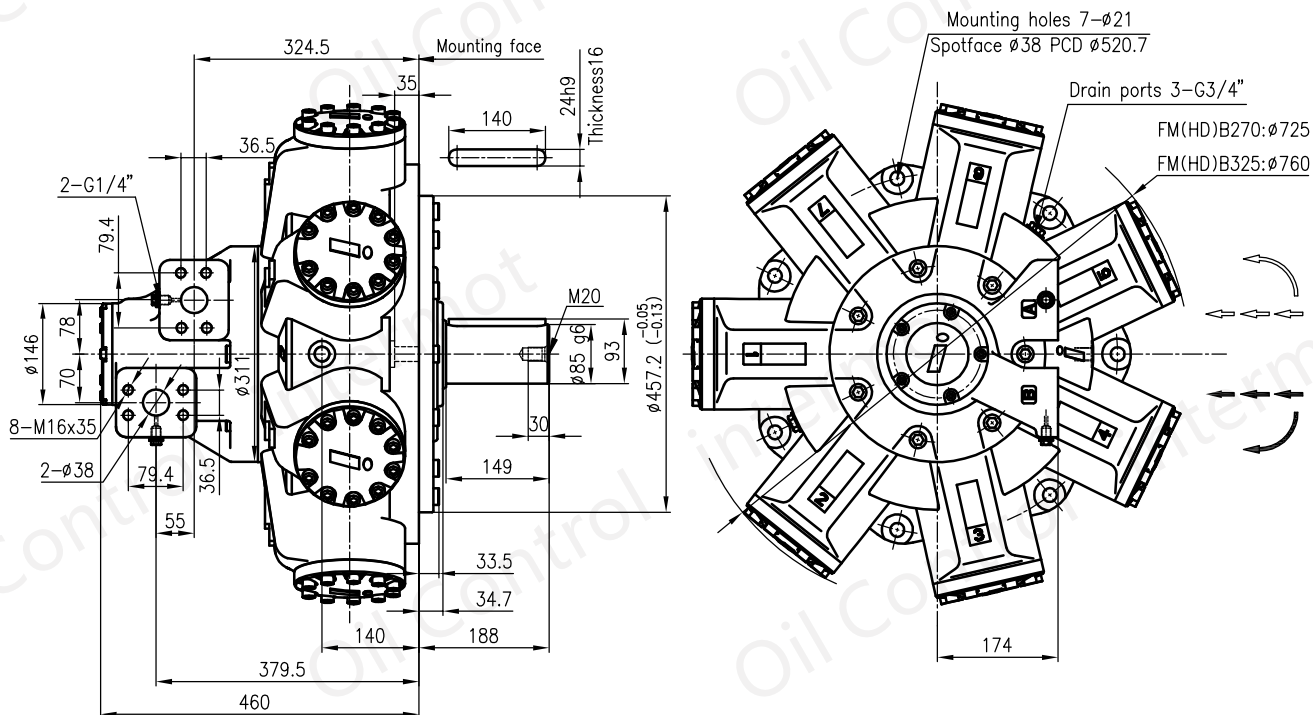
Spline parameters

Standard : BS3550-1963

Pressure angle	30 °
Number of teeth	34
Pitch	12/24
Major diameter	74.414/74.048
Minor diameter	69.977/69.850
Pin diameter	3.658
Diameter between pins	66.815/66.744

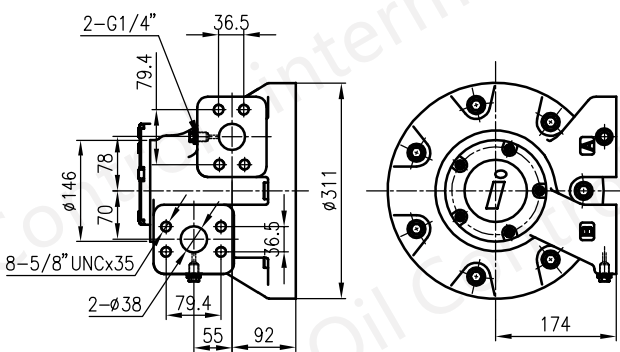
FM(HD)B270/325 STANDARD CONFIGURATION DIMENSIONS

Main port connections : FM4 Shaft type : P1

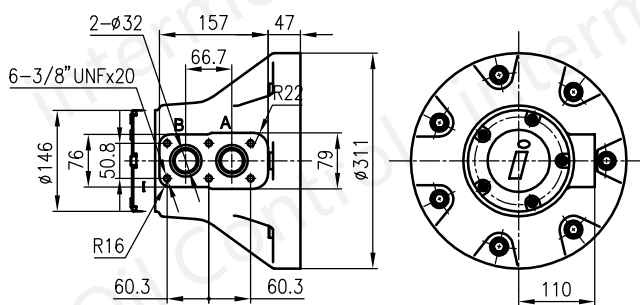


FM(HD)B270/325 OTHER MAIN PORT CONNECTIONS

270/325 F4

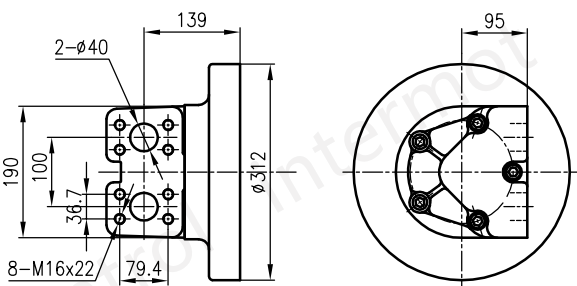


270/325 S04



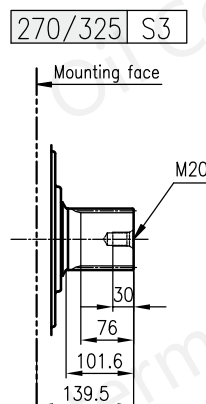
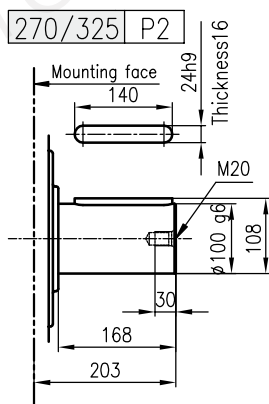
Note: O-ring at oil ports is 38.1x3.53

270/325 D90



INTERMOT
HYDRAULIC MOTOR

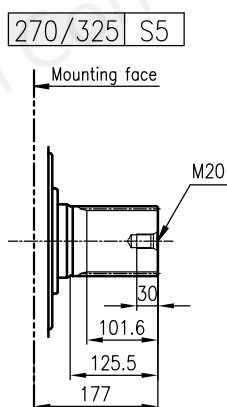
FM(HD)B270/325 OTHER SHAFT TYPES



Spline parameters

Standard : BS3550-1963

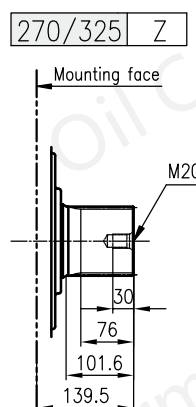
Pressure angle	30°
Number of teeth	20
Pitch	6/12
Major diameter	87.953/87.825
Form diameter	80.264
Minor diameter	79.485/78.925
Pin diameter	8.128
Diameter over pins	97.084/97.030



Spline parameters

Standard : BS3550-1963

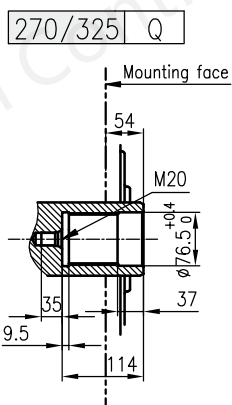
Pressure angle	30°
Number of teeth	23
Pitch	6/12
Major diameter	100.66/100.52
Form diameter	92.939
Minor diameter	92.185/91.625
Pin diameter	8.128
Diameter over pins	109.58/109.51



Spline parameters

Standard : DIN5480 W100x4x24x7h

Pressure angle	30°
Number of teeth	24
Modulus	4
Addendum modification	-0.2
Tolerance grade	7h
Major diameter	99.2
Minor diameter	91.2
Spanned tooth count	5
Base tangent length	42.359



Spline parameters

Standard : BS3550-1963

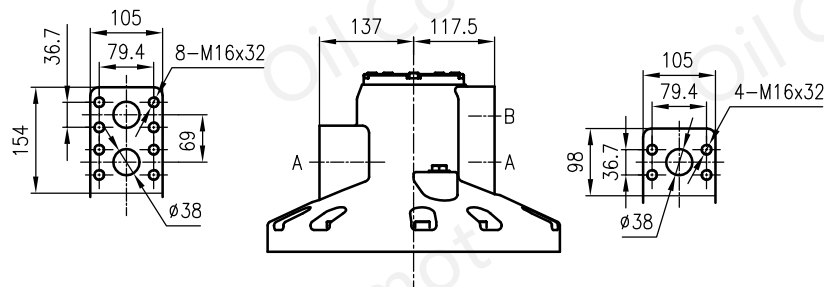
Pressure angle	30°
Number of teeth	34
Pitch	12/24
Major diameter	74.414/74.048
Minor diameter	69.977/69.850
Pin diameter	3.658
Diameter between pins	66.815/66.744



Main port connections : F04	Shaft type : P
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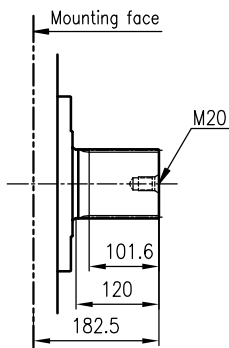
400/500	F68
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C15

FM(HD)B400/500 OTHER SHAFT TYPES

400/500 S

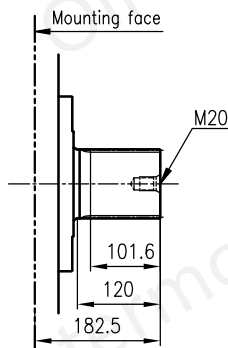


Spline parameters

Standard : BS3550-1963

Pressure angle	30°
Number of teeth	23
Pitch	6/12
Major diameter	100.66/100.52
Form diameter	92.939
Minor diameter	92.185/91.625
Pin diameter	8.128
Diameter over pins	109.58/109.51

400/500 Z

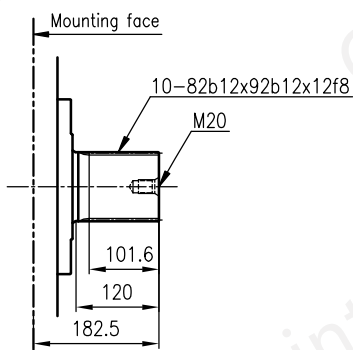


Spline parameters

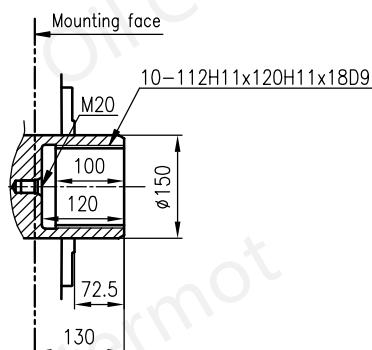
Standard : DIN5480 W100x4x24x7h

Pressure angle	30°
Number of teeth	24
Modulus	4
Addendum modification	-0.2
Tolerance grade	7h
Major diameter	99.2
Minor diameter	91.2
Spanned tooth count	5
Base tangent length	42.359

400/500 A1S



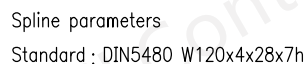
400/500 I



INTERMOT
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Main port connections :	Shaft type : P
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Pressure angle	30°
Number of teeth	28
Modulus	4
Addendum modification	+1.8
Tolerance grade	7h
Major diameter	119.2
Minor diameter	111.2
Spanned tooth count	6
Base tangent length	66.869

INTERMOT HYDRAULIC MOTOR

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