intermot®
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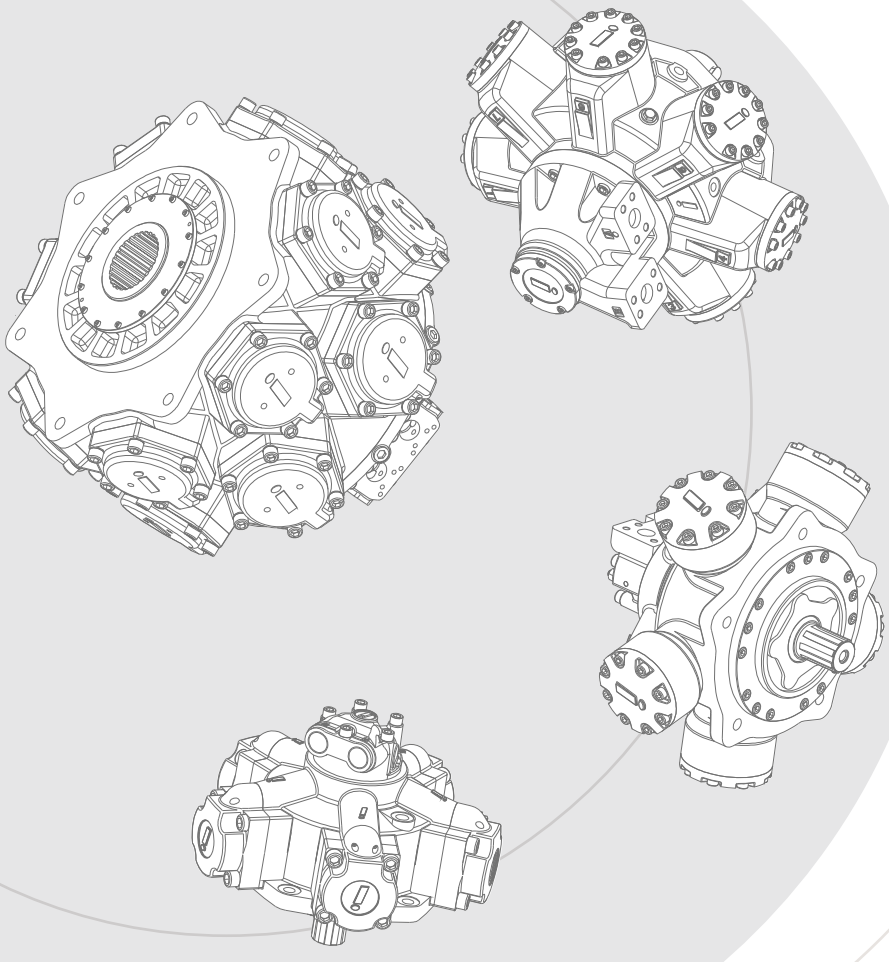
CATALOGUE
HYDRAULIC MOTORS



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

intermot

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.

CONTENTS

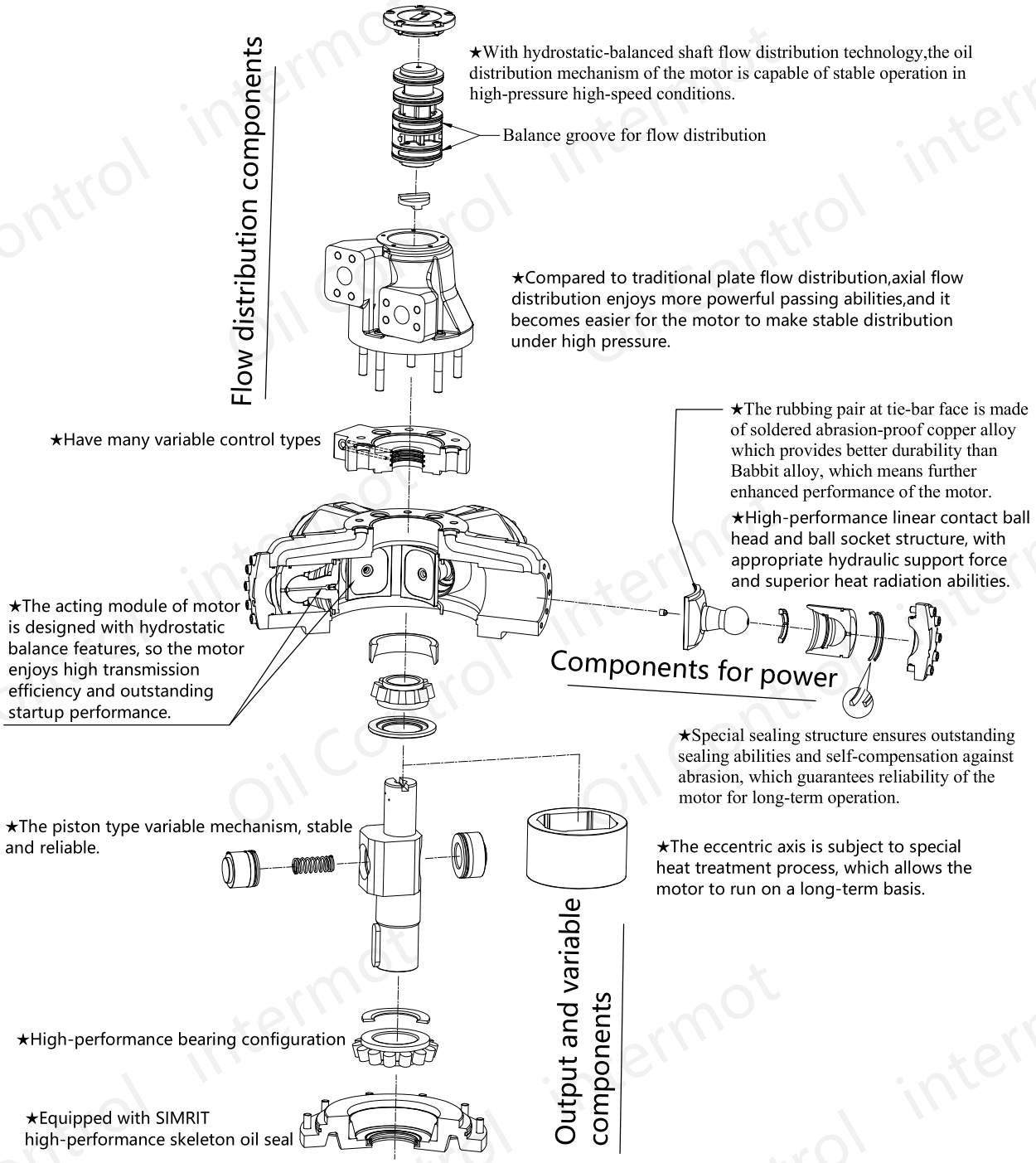
FMC Series Technical Catalogue

Hydrostatic Balance
Dual-Displacement Motor

FMC SERISE HYDRAULIC

PRODUCT FEATURE

FMC series dual displacement hydraulic motor is an upgrade of the FMB series fixed displacement hydraulic motor.The FMC series inherits the FMB series hydrostatic balance structure,high efficiency,high staring torque, high volumetric efficiency.etc.The FMC series dual displacement hydraulic motor enables users to select the required displacement for a wide range of special working conditions. Users can switch the displacement by using a remote control or by manual control.Main Application:Capstan ,Hoisting machinery,Hydraulic drive for automobiles,etc.



CALCULATIONS & FORMULAS

Actual output torque of hydraulic motor:

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

Output power of hydraulic motor:

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

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

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

****-***-***-***-***-*****-**-****

1	2	3	4	5	6	7	8

1) Code of FMC series daul displacement hydraulic motor
2) Series
3) High displacement
4) Low displacement
5) Shaft Type
   P Parallel key
   S Male spline
   Q Female spline
   T Long taper with key
6) Main Port Connections
7) Displacement control type
8) Other design parameters

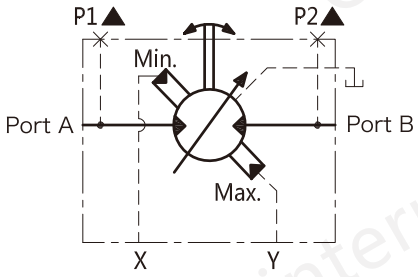
Examples:

FMC200-3100-100-P-FM4-C refers to FMC series daul displacement hydraulic motor,product series of 200,high displacement of 3100 ml/r,low displacement of 1000 ml/r,shaft type of P,main port connection of FM4,displacement control type of C.See dimension diagram for detailed sizes.

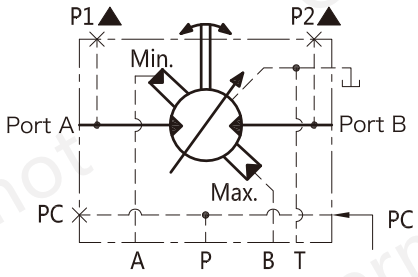
Note: the orders without specified model of output axis or flanges at inlet/outlet oil port will be deemed as orders for standard configuration.

DISPLACEMENT ORDERING CONTROL TYPE

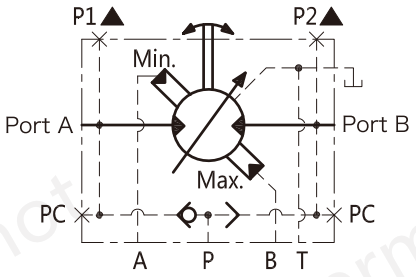
X: Control pressure from port X or port Y



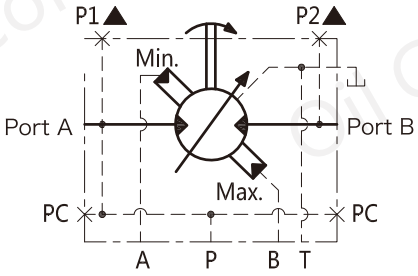
C: Control pressure from external port PC



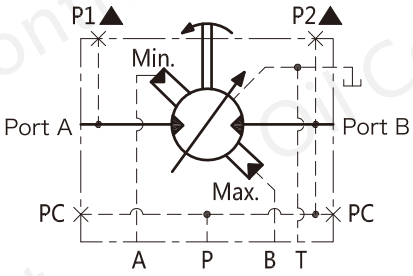
CS: Control pressure from port A or port B with shuttle valve



CA: Control pressure from port A



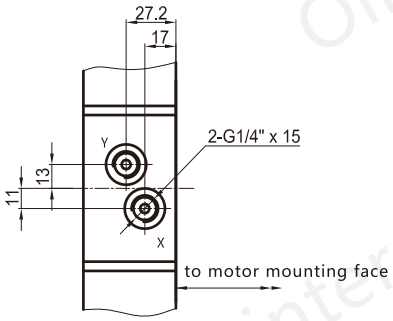
CB: Control pressure from port B



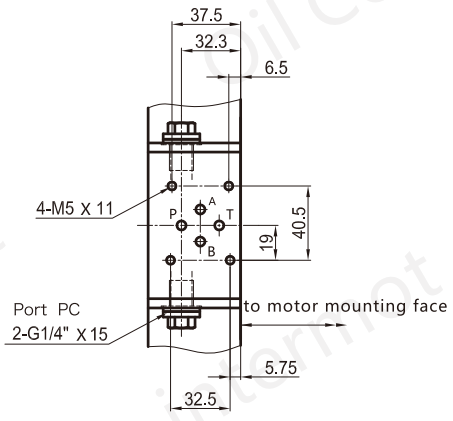
Note : Type C is the default displacement control type

DISPLACEMENT CONTROL PORTS

Type X

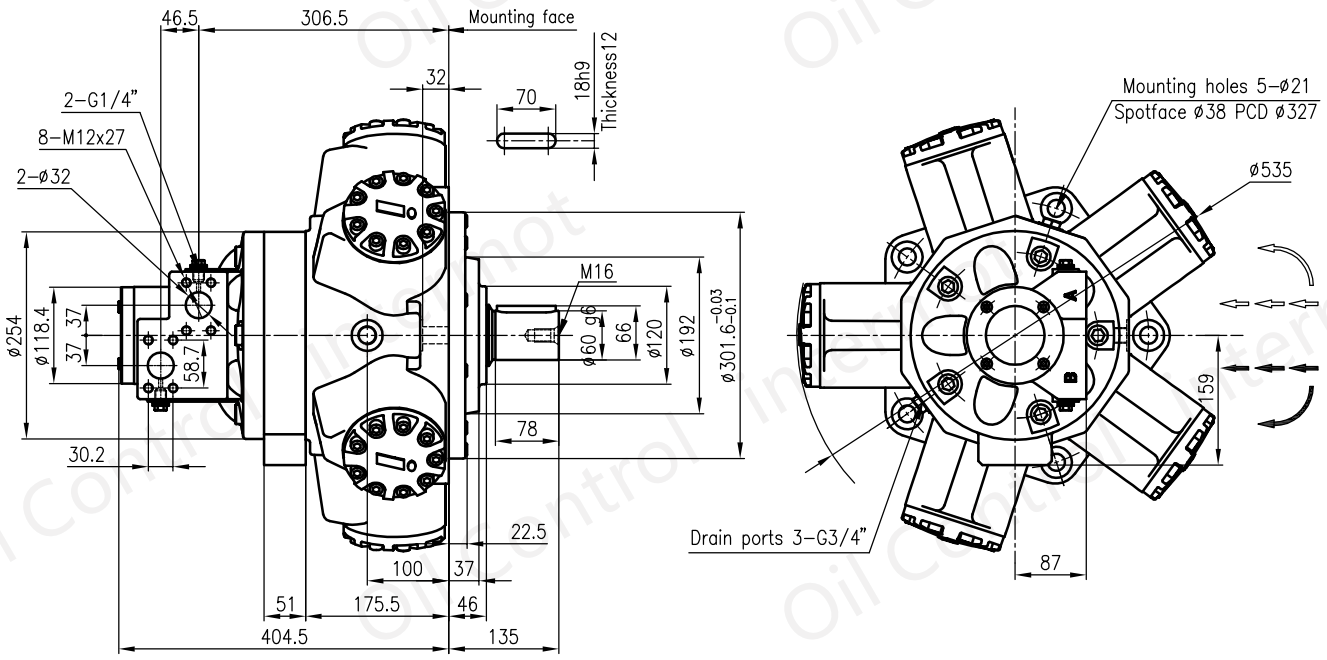


Type C/CS/CA/CB



FMC100 STANDARD CONFIGURATION DIMENSIONS

Main port connections : FM3	Shaft type : P	Variable type : C



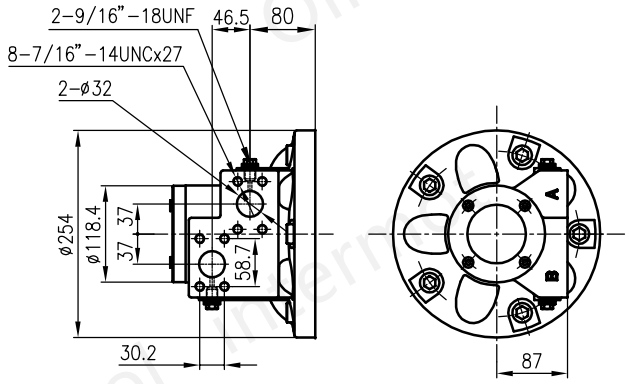
TECHNICAL PERFORMANCE PARAMETERS

Nomial Displacement (ml/r)	1500	1400	1300	1200	1100	1000	900	800	700	600	500	400	300	200	100
Displacerment (ml/r)	1481	1383	1284	1185	1086	987	889	790	691	592	494	395	296	197	0
Unit Torque (N.m/MPa)	212	198	184	169	155	140	125	108	94	78	68	45	30	18	0
Max.Speed (r/min)	260	280	300	330	370	405	485	540	540	540	540	540	540	540	900
Max.Power (kW)	98	95	93	92	90	86	83	73	64	53	46	31	20	9	0
Rated Pressure (MPa)	21	21	21	21	21	21	21	21	21	21	21	21	15	15	1.5
Max.Pressure (MPa)	25	25	25	25	25	25	25	25	25	25	25	25	21	21	1.5

Optional displacement range of FMC100:
High displacement: 1500, 1400, 1300, 1200, 1100, 1000, 900, 800
Low displacement: 1000, 900, 800, 700, 600, 500, 400, 300, 200, 100

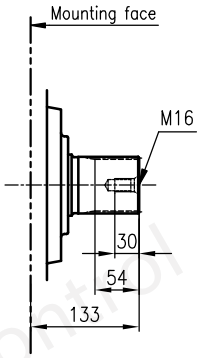
FMC100 OTHER MAIN PORT CONNECTIONS

100 | F3



FMC100 OTHER SHAFT TYPES

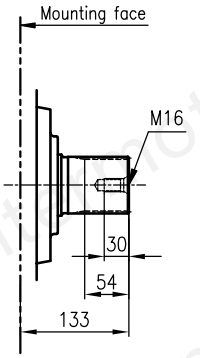
100 | S



Spline parameters
Standard : BS3550-1963

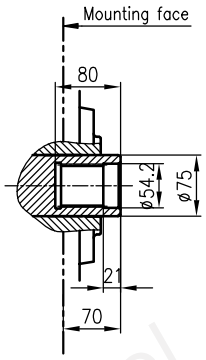
Pressure angle	30°
Number of teeth	14
Pitch	6/12
Major diameter	62.553/62.425
Form diameter	55.052
Minor diameter	54.084/53.525
Pin diameter	8.128
Diameter over pins	71.593/71.544

100 | Z



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



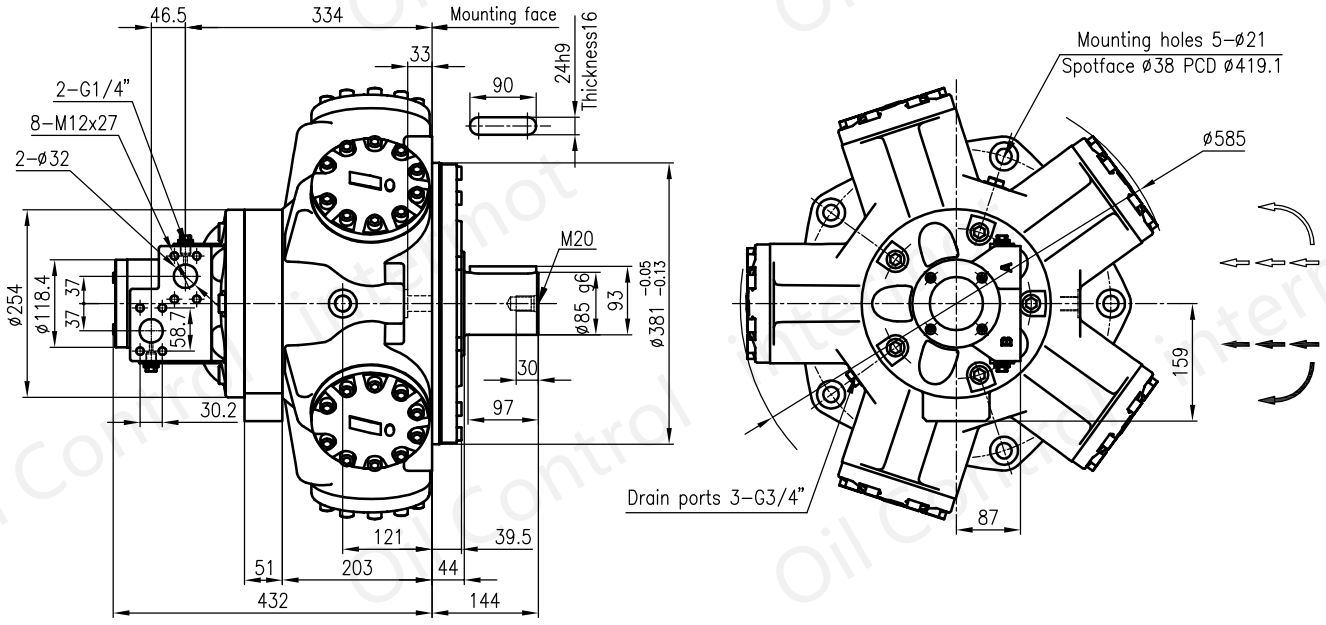
Spline parameters
Standard : BS3550-1963

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

INTERMOT
HYDRAULIC MOTOR

FMC125 STANDARD CONFIGURATION DIMENSIONS

Main port connections : FM3	Shaft type : P	Variable type : C



TECHNICAL PERFORMANCE PARAMETERS

Nomial Displacement (ml/r)	2000	1950	1800	1600	1500	1300	1200	1000	830	670	510	350	190	110
Displacerment (ml/r)	2048	1966	1802	1649	1487	1325	1163	1001	839	677	515	353	191	109
Unit Torque (N.m/MPa)	297	281	258	231	206	180	154	125	100	79	57	30	6	0
Max.Speed (r/min)	190	195	210	210	230	265	300	350	395	485	540	540	540	900
Max.Power (kW)	104	101	94	88	81	75	68	62	55	48	37	19	4	0
Rated Pressure (MPa)	21	21	21	21	21	21	15	15	15	15	15	15	15	1.5
Max.Pressure (MPa)	25	25	25	25	25	25	21	21	21	21	21	21	21	1.5

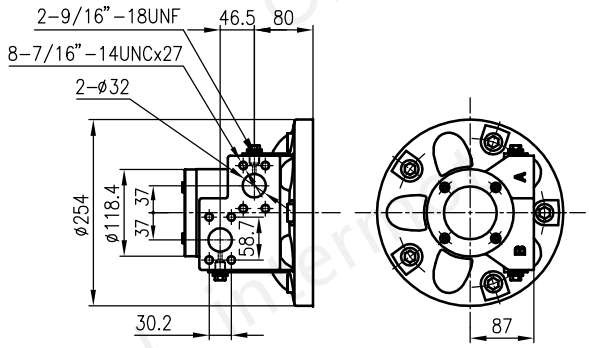
Optional displacement range of FMC125:

High displacement: 2000, 1950, 1800, 1600, 1500

Low displacement: 1300, 1200, 1000, 830, 670, 510, 350, 190, 110

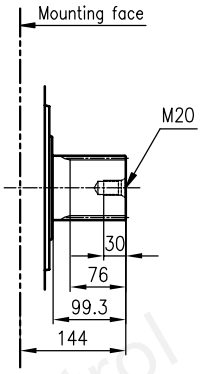
FMC125 OTHER MAIN PORT CONNECTIONS

125 | F3



FMC125 OTHER SHAFT TYPES

125 | S

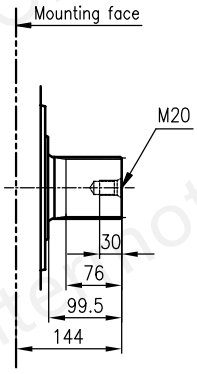


Spline parameters

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

125 | Z

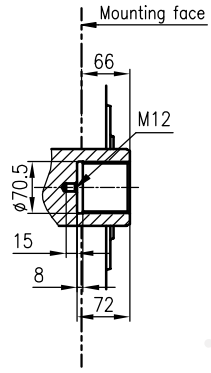


Spline parameters

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

125 | Q



Spline parameters

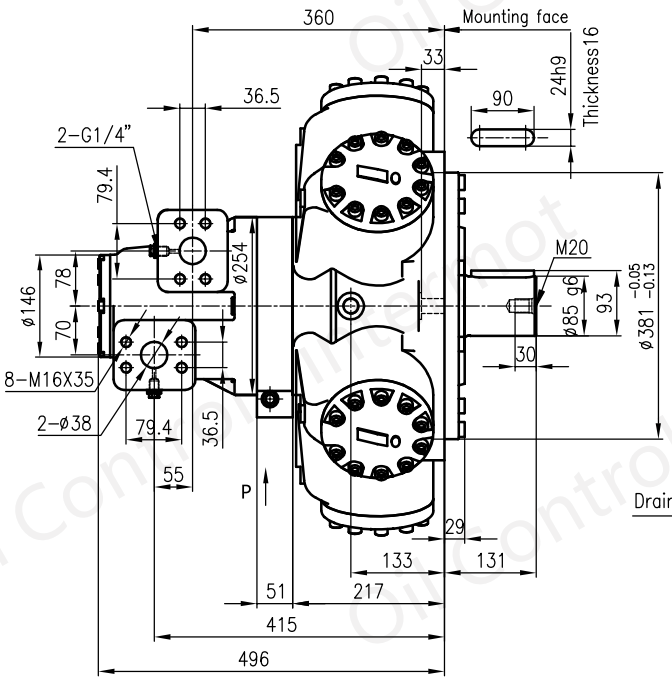
Standard : BS3550-1963

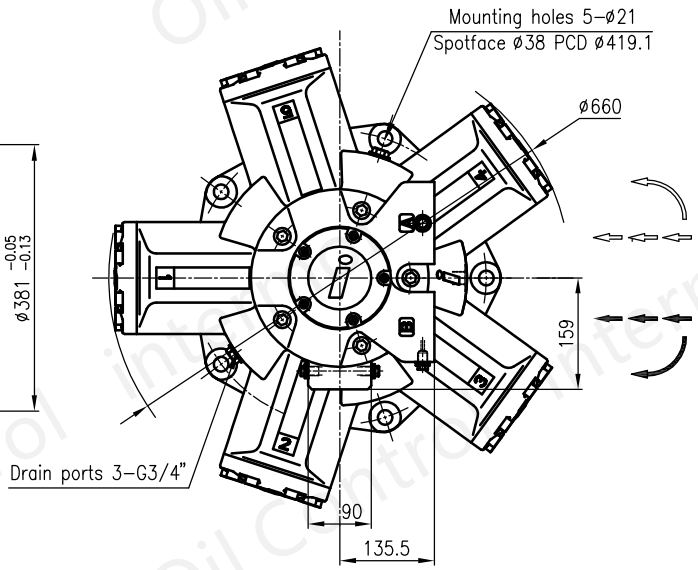
Pressure angle	30°
Number of teeth	32
Pitch	12/24
Major diameter	70.18/69.85
Minor diameter	65.743/65.616
Pin diameter	3.658
Diameter between pins	62.619/62.553

INTERMOT
HYDRAULIC MOTOR

FMC200 STANDARD CONFIGURATION DIMENSIONS

Main port connections : FM4	Shaft type : P	Variable type : C





TECHNICAL PERFORMANCE PARAMETERS

Nomial Displacement (ml/r)	3100	2900	2800	2600	2400	2300	2100	2000	1800	1600	1500	1300	1200	1000	830	670	350	190	110
Displacerment (ml/r)	3080	2958	2796	2634	2472	2310	2148	1973	1811	1649	1487	1325	1163	1001	839	677	353	191	109
Unit Torque (N.m/MPa)	447	422	400	375	351	326	300	281	258	231	206	180	154	125	100	79	30	6	0
Max.Speed (r/min)	160	165	175	190	196	210	220	245	265	290	320	320	320	320	320	320	320	320	900
Max.Power (kW)	115	115	115	112	108	108	104	101	100	98	97	90	83	67	54	42	16	3	0
Rated Pressure (MPa)	21	21	21	21	21	21	21	21	21	21	21	21	15	15	15	15	15	15	1.5
Max.Pressure (MPa)	25	25	25	25	25	25	25	25	25	25	25	25	21	21	21	21	21	21	1.5

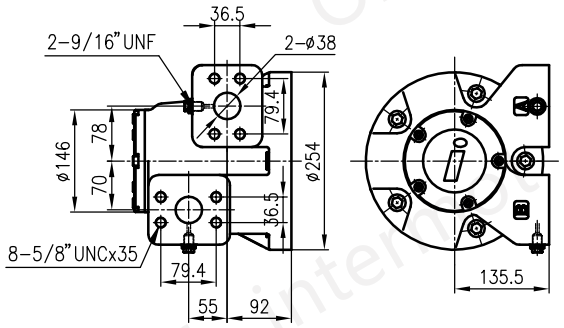
Optional displacement range of FMC200:

High displacement: 3100, 2900, 2800, 2600, 2400, 2300, 2100, 2000, 1800, 1600

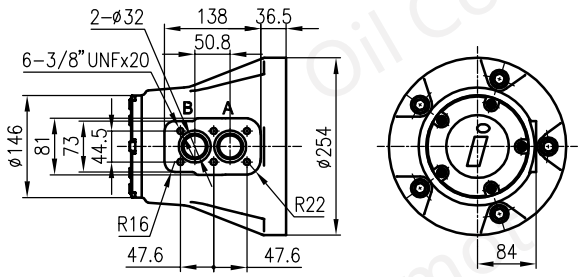
Low displacement: 2300, 2100, 2000, 1800, 1600, 1500, 1300, 1200, 1000, 830, 670, 350, 190, 110

FMC200 OTHER MAIN PORT CONNECTIONS

200 F4

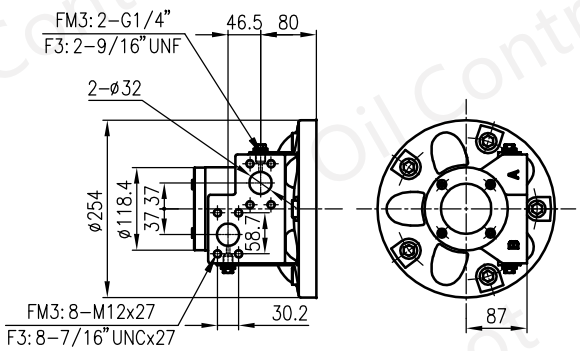


200 S04



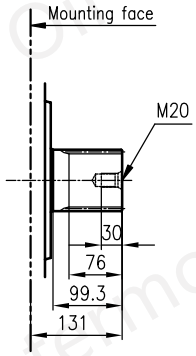
Note: O-ring at oil ports is 38.1x3.53

200 FM3/F3



FMC200 OTHER SHAFT TYPES

200 S

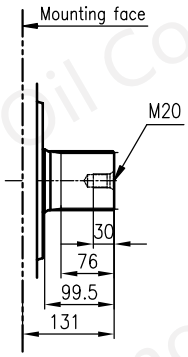


Spline parameters

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

200 Z

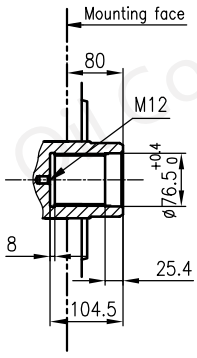


Spline parameters

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

200 Q



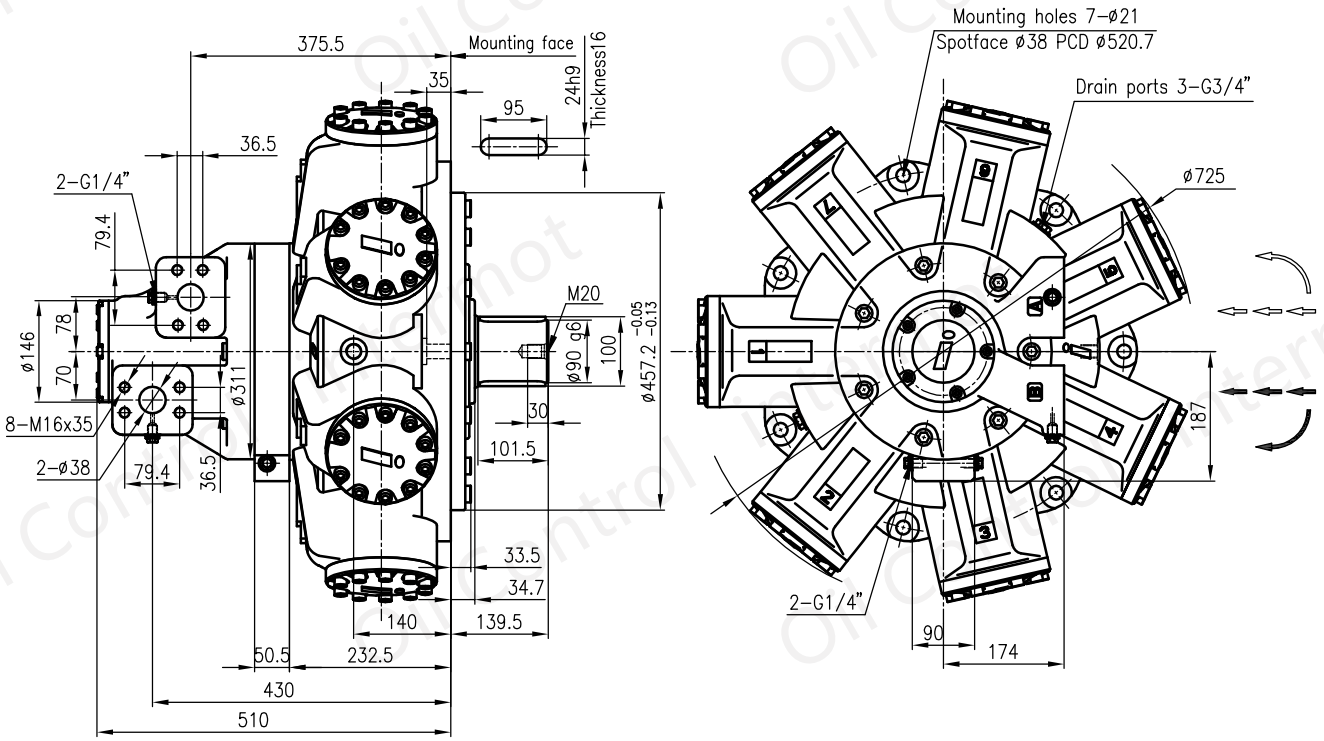
Spline parameters

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

FMC270 STANDARD CONFIGURATION DIMENSIONS

Main port connections : FM4	Shaft type : P	Variable type : C



TECHNICAL PERFORMANCE PARAMETERS

Nomial Displacement (ml/r)	4600	4300	4100	3600	3300	3000	2600	2300	1900	1650	1400	970	680	340	170
Displacerment (ml/r)	4597	4313	4086	3632	3291	2951	2610	2270	1930	1646	1362	965	681	340	170
Unit Torque (N.m/MPa)	657	631	585	514	460	419	356	310	259	210	168	108	73	24	0
Max.Speed (r/min)	108	115	125	135	145	165	180	215	240	290	315	315	315	315	800
Max.Power (kW)	125	120	118	110	105	98	91	82	74	62	51	37	25	8	0
Rated Pressure (MPa)	21	21	21	21	21	21	21	21	21	15	15	15	15	15	1.5
Max.Pressure (MPa)	25	25	25	25	25	25	25	25	25	21	21	21	21	21	1.5

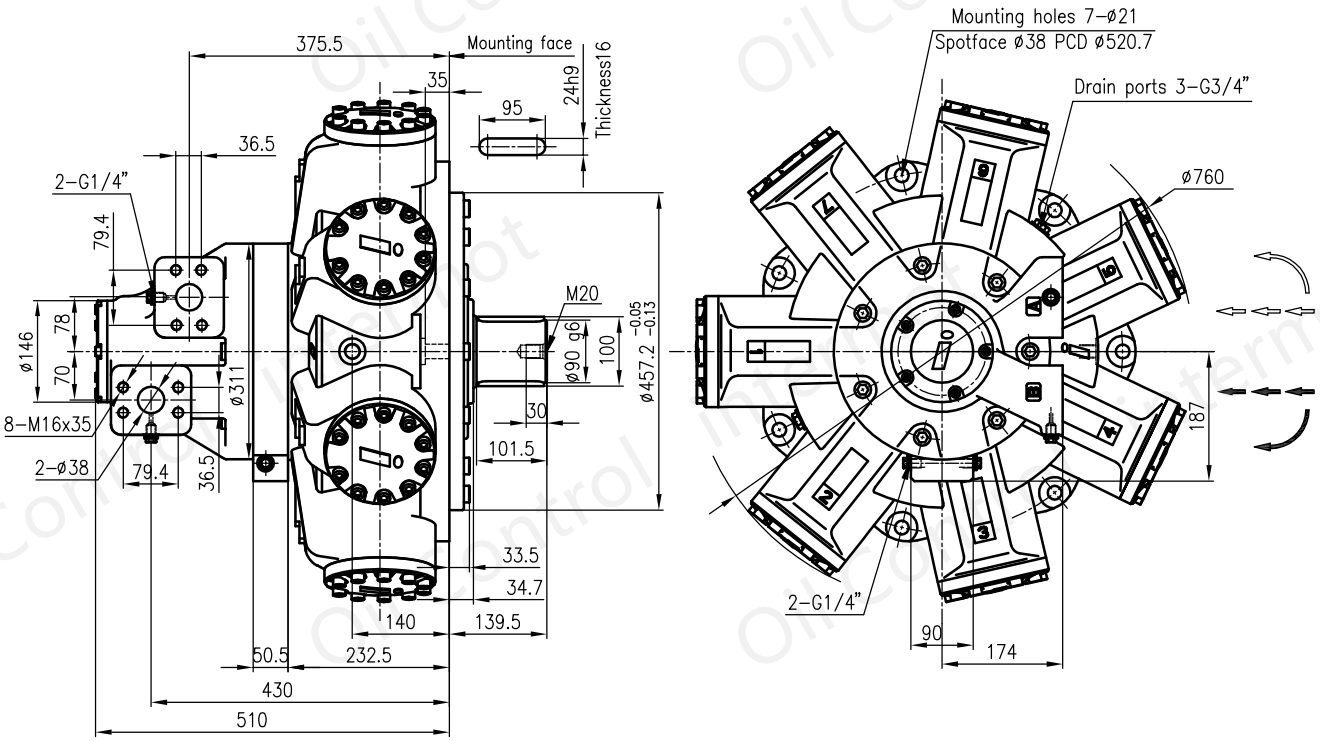
Optional displacement range of FMC270:

High displacement: 4600, 4300, 4100, 3600, 3300

Low displacement: 3300, 3000, 2600, 2300, 1900, 1650, 1400, 970, 680, 340, 170

FMC325 STANDARD CONFIGURATION DIMENSIONS

Main port connections : FM4	Shaft type : P	Variable type : C



TECHNICAL PERFORMANCE PARAMETERS

Nomial Displacement (ml/r)	5300	5100	4900	4600	3600	3300	3000	2600	2300	1900	1650	1400	970	680	340	170
Displacerment (ml/r)	5335	5108	4937	4597	3632	3291	2951	2610	2270	1930	1646	1362	965	681	340	170
Unit Torque (N.m/MPa)	763	731	706	657	514	460	419	356	310	259	210	168	108	73	24	0
Max.Speed (r/min)	90	105	110	110	135	145	165	180	215	240	290	315	315	315	315	800
Max.Power (kW)	125	125	125	125	110	105	98	91	82	74	62	51	37	25	8	0
Rated Pressure (MPa)	21	21	21	21	21	21	21	21	21	21	15	15	15	15	15	1.5
Max.Pressure (MPa)	25	25	25	25	25	25	25	25	25	25	21	21	21	21	21	1.5

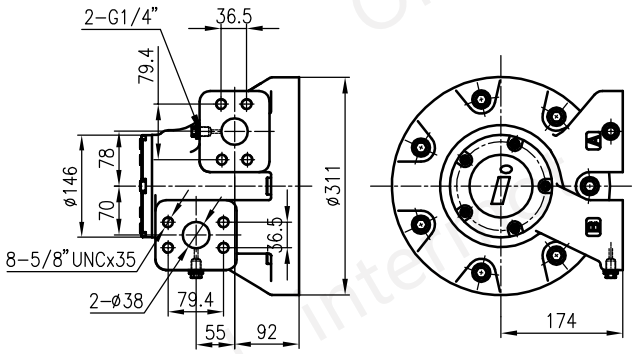
Optional displacement range of FMC325:

High displacement: 5300, 5100, 4900, 4600

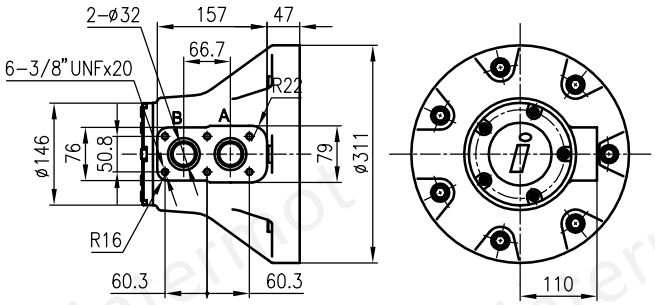
Low displacement: 3600, 3300, 3000, 2600, 2300, 1900, 1650, 1400, 970, 680, 340, 170

FMC325 OTHER MAIN PORT CONNECTIONS

270/325 F4



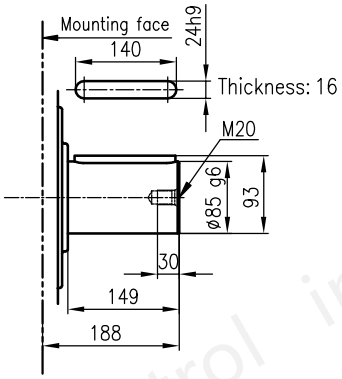
270/325 S04



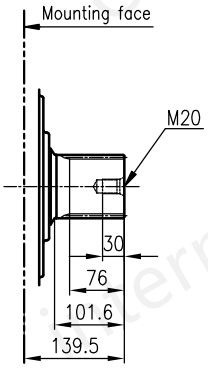
Note: O-ring at oil ports is 38.1x3.53

FMC270/325 OTHER SHAFT TYPES

270/325 P1



270/325 S

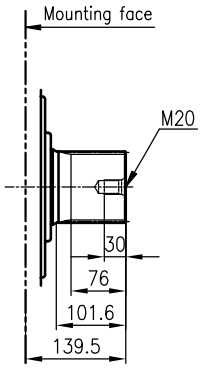


Spline parameters

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

270/325 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

INTERMOT
HYDRAULIC MOTOR

VER: OIL-25-01/1009

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