

2018

NHM/NHMS/F Series Hydraulic Motor Crankshaft Connecting-rod Intermot Product Catalog



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

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ABOUT US

NINGBO OIL CONTROL HYDRAULIC CO., LTD. is a Sino-Italian Joint venture specializing in designing and manufacturing of hydraulic motor, gearbox, hydraulic winch and other hydraulic products. Evolving from its predecessor NINGBO INTERMOT HYDRAULIC MOTOR CO., LTD., established by INTERMOT S.r.l. (Italy), R&D S.r.l. (Italy) and the holding family members of SAI S.p.a. (Italy), Ningbo Oil Control has more than 20 years of experience and in-depth know-how in the hydraulic industry. Our products have covered a great variety of applications throughout the world with INTERMOT brand renowned for its outstanding price for value to the customers. Relying on the latest technology from Italy, the company integrates the corporate functions of R&D, designing & roto-typing, production, testing and marketing.

Up to now, we possess modernized workshop of over 20,000 square meters and an array of high-quality automatic machinery and equipments from Europe, Japan and Taiwan with the ultimate pursuit of quality, stability and precision. Our staff is qualified with strict professional training, competitive skills and personality. With management information systems such as ERP and CRM, we are certified with ISO9001:2000 and CCS marine certification. Scientific and efficient management has also contributed to the excellent quality of INTERMOT products and responsive and professional after-sales service has won great reputation in the industry.

Our main product range includes: NHM series, CM series, FMB (fixed disp.) / FMC(dual-disp.) series of low-speed high-torque hydraulic motor, OILW travel gearbox, OILP planetary gearbox, OILH hydraulic winch, 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 hydraulic motors are widely applied in construction 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 new century, we always honor our quality slogan, being 'Take responsibility for our products and services, while fulfilling the actual demands of our customers' . In pursuit of quality, we are keen to provide our customers with reliable products and services, striving to be the leader in the hydraulic motor sector in China.

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F SERIES HYDRAULIC MOTORS

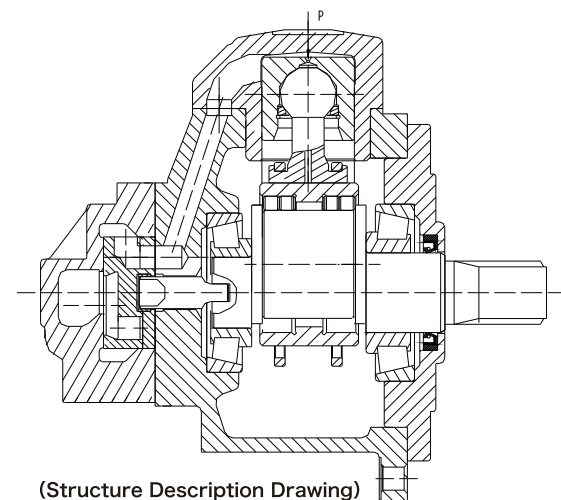
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NHM SERIES HYDRAULIC MOTOR PRODUCT FEATURE

NHM Series crankshaft connecting rod type low-speed high-torque hydraulic motor is produced in accordance with the technology and design from Italy. On this basis, continuous improvements have been made in technologies according to the local market demands to suit the needs of customers. Main features of the design include:

1. Low noise output due to the eccentric shaft and five-piston structure with lower vibration frequency characteristics
2. The high start-up torque and low-speed stability resulting in the smooth running of the motor at low speed;
3. Strong reliability and less leakage due to the patented plate compensational oil distributor design. Special sealing ring between piston and cylinder guarantees high volumetric efficiency;
4. High mechanical efficiency due to the roller design between the crankshaft and connecting rod;
5. With the reversible direction of rotation, the output shaft can endure certain external radial and axial forces;
6. High power-mass ratio, a relatively small volume and weight.



(Structure Description Drawing)

FORMULA & CALCULATION

1. The actual output torque of the hydraulic motor: $M = 0.159 (P_1 - P_2) V \cdot \eta_m$ (N.m)

Where: P_1 、 P_2 ----- Inlet and outlet pressure (MPa)
 V ----- Displacement (ml/r)
 η_m ----- Mechanical efficiency (%)

2. Output power of the hydraulic motor:

$$N = \frac{M \cdot n}{9550} \text{ (kW)} \quad N = \frac{q (P_1 - P_2)}{60000} \text{ (kW)}$$

Where: n ----- Rotation speed (r/min)
 q ----- Input flow (ml/min)
 η_v ----- Volumetric efficiency (%)

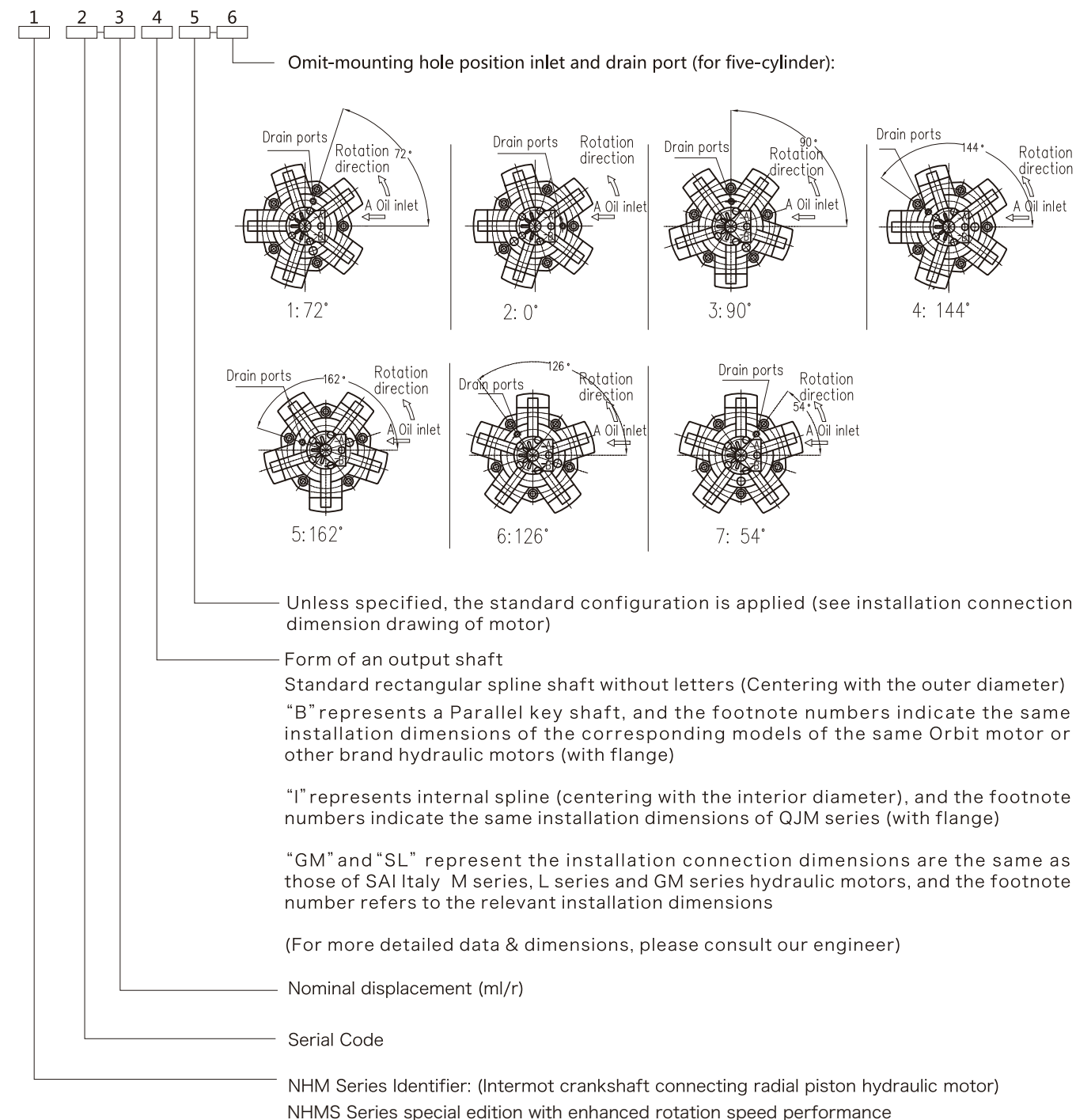
3. Rotating speed of the hydraulic motor

$$n = \frac{q}{V} \eta_v \text{ (r/min)}$$

INSTRUCTIONS

1. Filtration: the recommended filtration precision for normal industrial application is 25 μ m, and allowable precision is 75 μ m under low-pressure low-speed or interval working conditions.
2. Viscosity: The optimum performance could only be obtained in the good viscosity condition and therefore in most conditions, the viscosity of the motor should be within the range of 15-1000 cst.
3. Before the first time start-up, the hydraulic motor must be filled with hydraulic oil to prevent damage.
4. Leakage: The drain port should be separately connected to the tank. Oil drain pipe should be installed below the oil level surface of the tank. Normally, the allowable maximum pressure for the motor body is 0.1 Mpa.
5. The highest horizontal level of the drain pipe should be higher than the highest horizontal position of the motor housing to prevent the emptying oil storage.
6. The hydraulic motor can be installed in any position with rigid support. During the installation, ensure that the drive shaft of the hydraulic motor and the output shaft of the hydraulic motor are concentric.
7. Strictly ensure the cleanliness of the oil port connection, and keep away any solid particles.
8. Release both the radial and axial loads of the output shaft to enable the longer life of the motor.
9. The type of motor cannot work as a pump.

ORDERING CODE



MODEL EXAMPLE

NHM6-450BD31-1

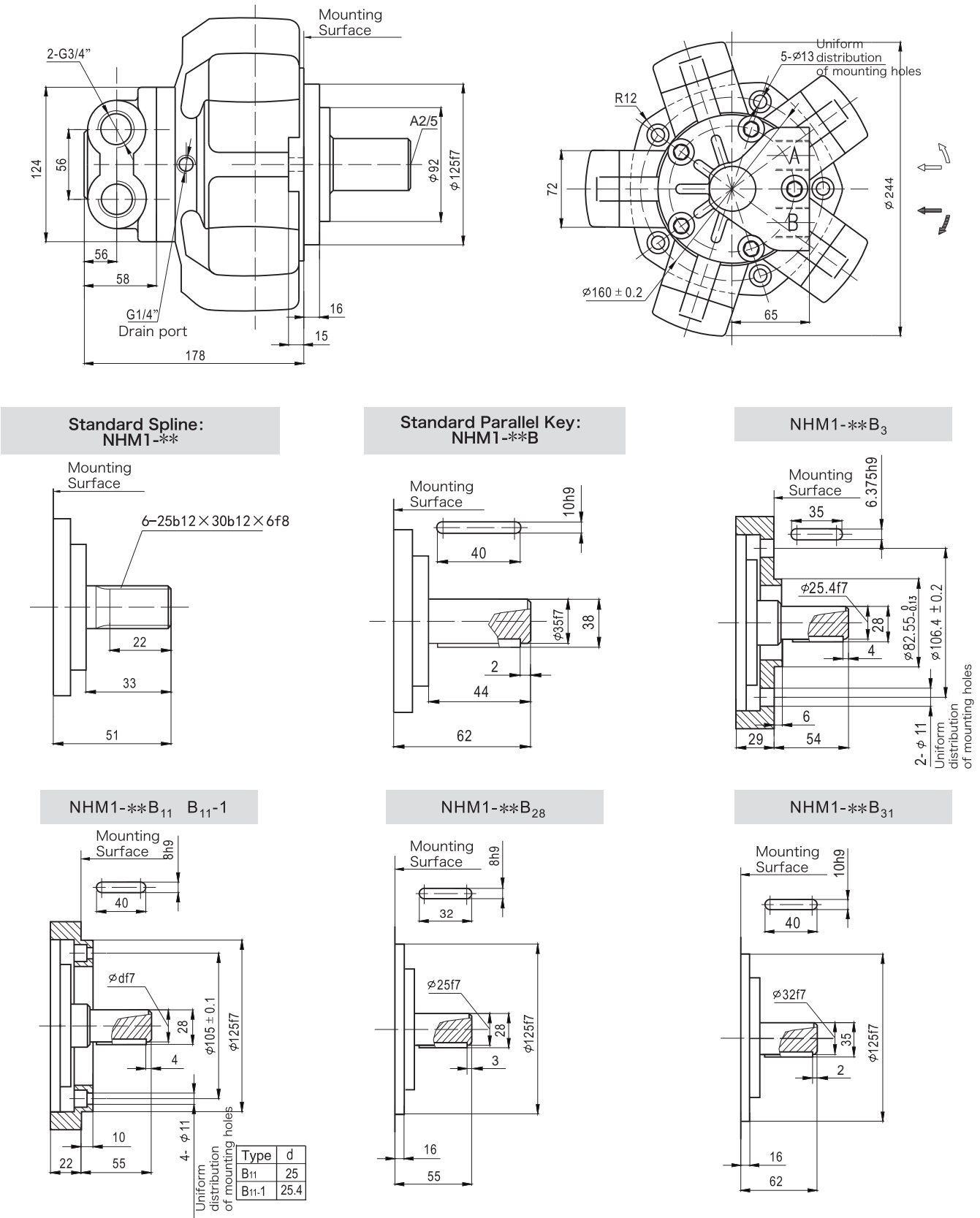
Represents NHM6 series radial piston hydraulic motor with crankshaft connecting-rod structure, displacement: 450 ml/r, output shaft: B (Parallel Key), and oil distributor: D31, the relative mounting position of oil inlet and drain port is 72°.

TECHNICAL PERFORMANCE PARAMETERS

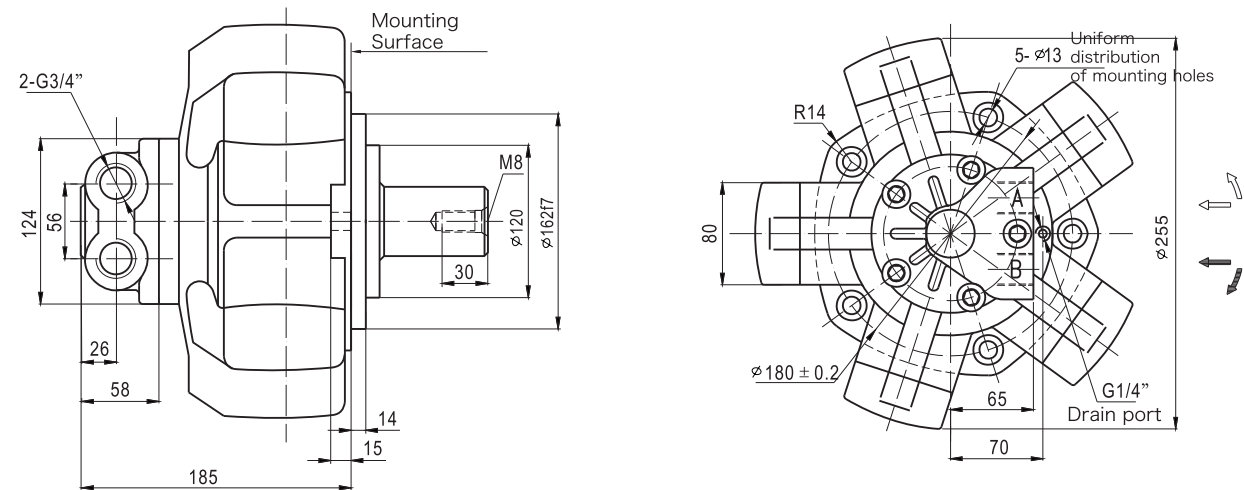
Type NHM	Displacement (ml/r)	Pressure (MPa)		Torque (N.m)		Speed (r/min)	Weight (Kg)
		Rated Pressure	Max.Pressure	Rated Torque	Unit Torque		
NHM1-63	77	25	32	284	11	15~900	21
NHM1-80	91	25	32	335	13	15-850	
NHM1-100	96	25	32	355	14	15-800	
NHM1-110	113	25	32	419	17	15-800	
NHM1-125	126	20	25	371	19	15-800	
NHM1-140	138	20	25	410	20	15-800	
NHM1-160	159	16	20	376	24	15-700	
NHM1-175	181	16	20	428	27	15-630	
NHM1-200	196	16	20	464	29	15-630	28
NHM2-100	113	25	32	419	17	15-800	
NHM2-150	159	25	32	588	24	15-700	
NHM2-175	180	20	25	532	27	15-600	
NHM2-200	207	20	25	611	31	8-600	
NHM2-250	235	16	20	556	35	8-600	
NHM2-280	276	16	20	653	41	8-500	
NHM3-175	181	25	32	670	27	8-600	35
NHM3-200	201	25	32	743	30	8-600	
NHM3-250	254	20	25	752	38	8-500	
NHM3-300	289	20	25	856	43	6-450	
NHM3-350	340	16	20	804	50	6-400	
NHM3-400	380	16	20	899	56	6-350	
NHM6-400	397	25	32	1469	59	5-500	57
NHM6-450	452	25	32	1672	67	5-500	
NHM6-500	491	20	25	1451	73	5-400	
NHM6-600	594	20	25	1756	88	4-400	
NHM6-700	683	16	20	1616	101	4-350	
NHM6-750	754	16	20	1785	112	4-320	
NHM8-600	617	25	32	2282	91	4-450	66
NHM8-700	710	25	32	2626	105	4-400	
NHM8-800	810	20	25	2396	120	4-350	
NHM8-900	889	20	25	2629	131	3-350	
NHM8-1000	1000	16	20	2366	148	3-300	
NHM11-700	707	25	32	2612	104	4-350	88
NHM11-800	784	25	32	2899	116	4-350	
NHM11-900	894	25	32	3306	132	4-350	
NHM11-1000	981	20	25	2902	145	3-320	
NHM11-1100	1104	20	25	3265	163	3-320	
NHM11-1200	1234	16	20	2919	182	3-320	
NHM11-1300	1301	16	20	3079	192	3-250	
NHM16-1400	1413	25	32	5224	209	2-300	154
NHM16-1500	1528	20	25	4520	226	2-300	
NHM16-1600	1648	20	25	4874	244	2-300	
NHM16-1800	1815	20	25	5367	268	2-250	
NHM16-2000	2035	16	20	4814	301	2-250	
NHM16-2200	2267	16	20	5364	335	2-200	
NHM16-2400	2444	16	20	5783	361	2-200	
NHM31-2400	2375	20	25	7023	351	2-200	324
NHM31-2500	2553	25	32	9438	378	2-200	
NHM31-2800	2683	20	25	7935	397	1-200	
NHM31-3000	3063	20	25	9057	453	1-200	
NHM31-3150	3218	20	25	9518	476	1-160	
NHM31-3500	3561	16	20	8424	527	1-160	
NHM31-4000	4153	16	20	9825	614	1-140	
NHM31-4500	4522	16	20	10698	669	1-140	
NHM31-5000	4828	16	20	11423	714	1-140	500
NHM70-4600	4604	20	25	13617	681	1-120	
NHM70-5000	4946	20	25	14626	731	1-120	
NHM70-5400	5452	20	25	16125	806	1-120	

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.

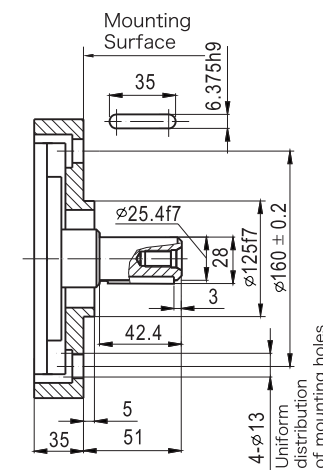
NHM(S) 1-63~200 INSTALLATION DIMENSIONS



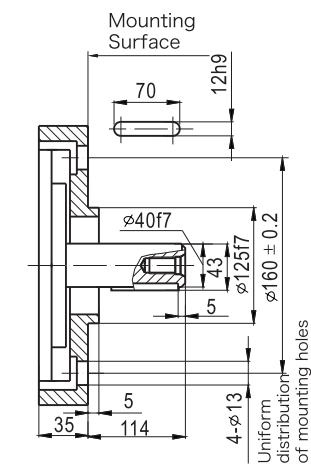
NHM(S)2-100~280 INSTALLATION DIMENSIONS



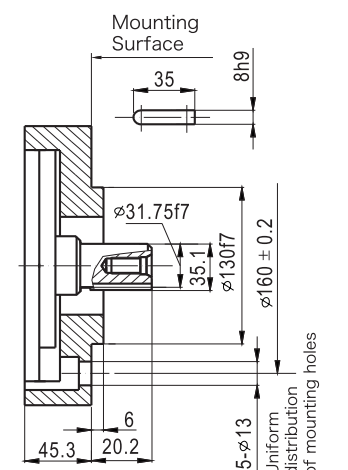
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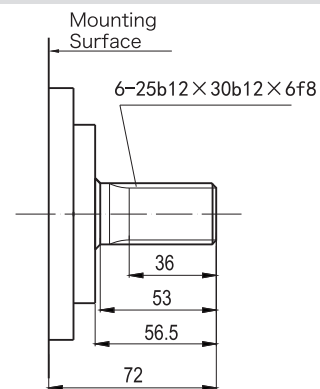
NHM2-**B₅



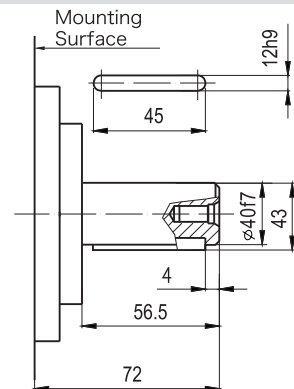
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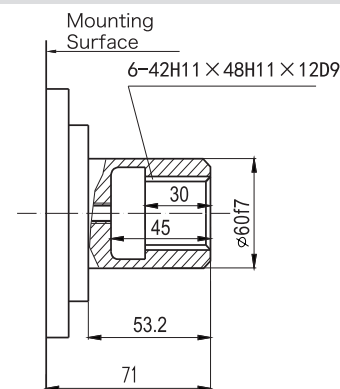
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NHM2-**



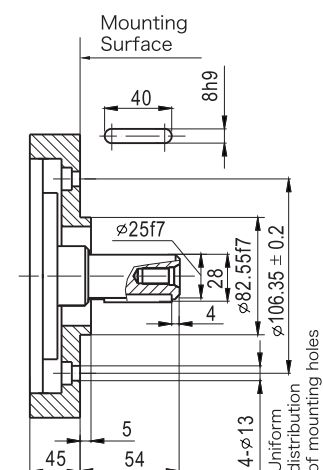
Standard Parallel Key:
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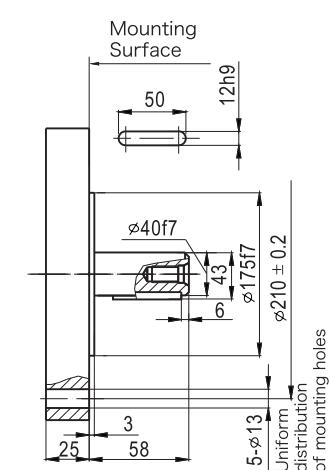
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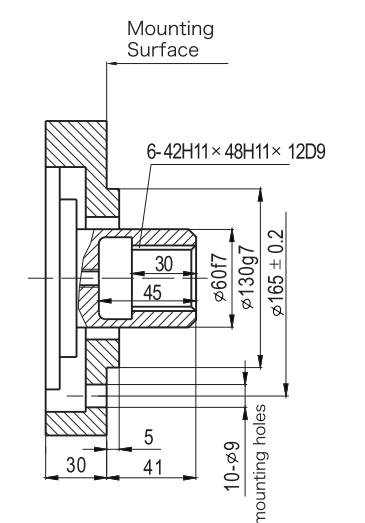
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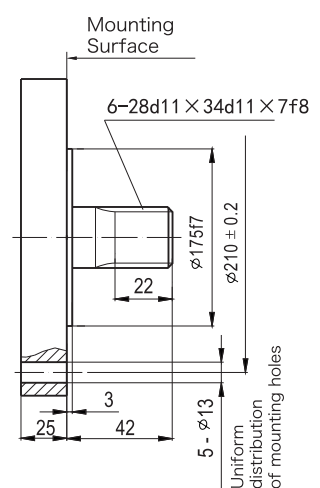
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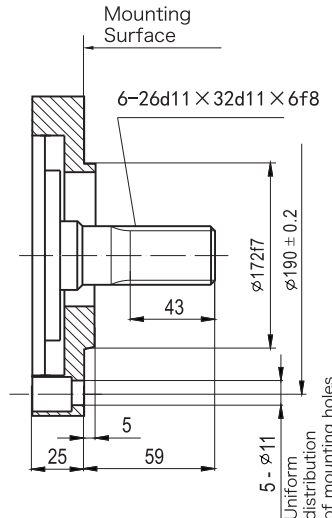
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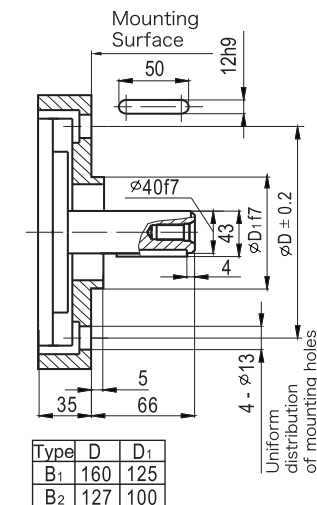
NHM2-**SL₁



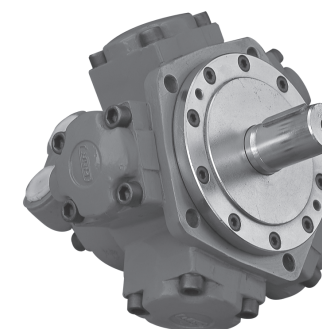
NHM2-**H₁



NHM2-**B₁、B₂

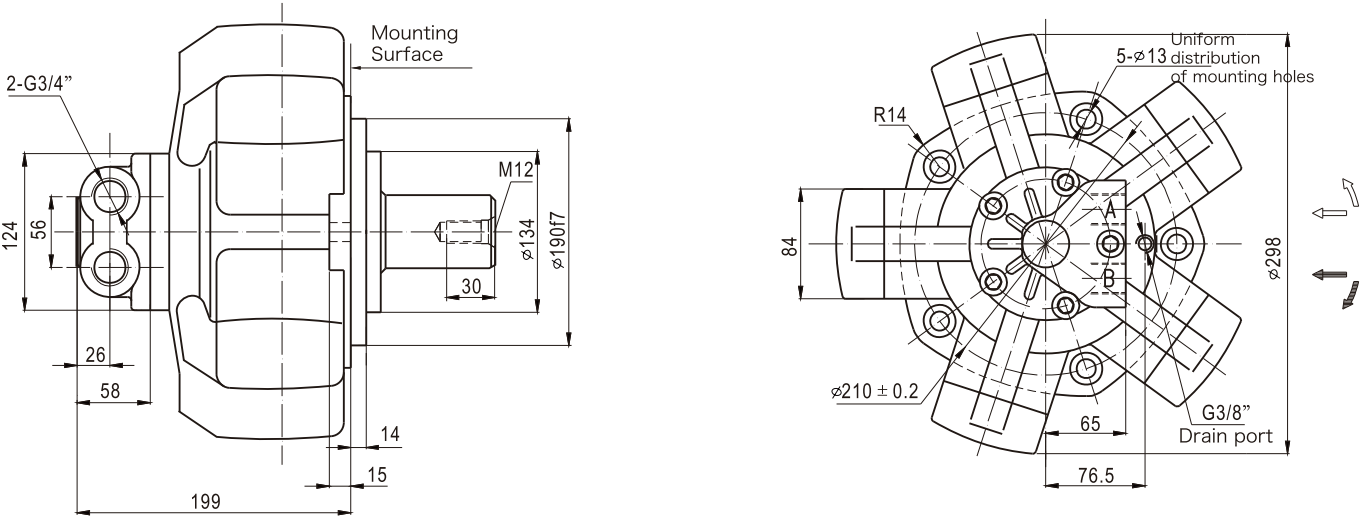


Type	D	D ₁
B ₁	160	125
B ₂	127	100

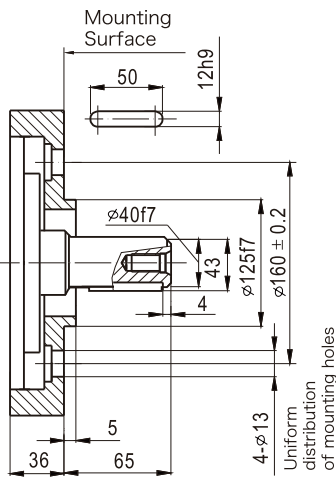


INTERMOT
HYDRAULIC MOTOR

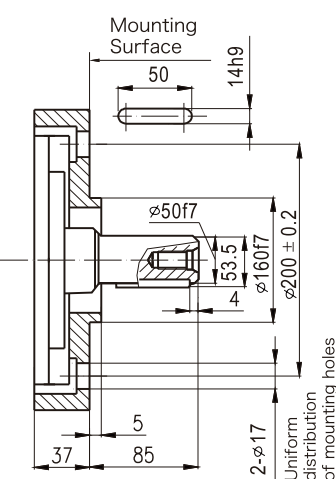
NHM(S)3-175~400 INSTALLATION DIMENSIONS



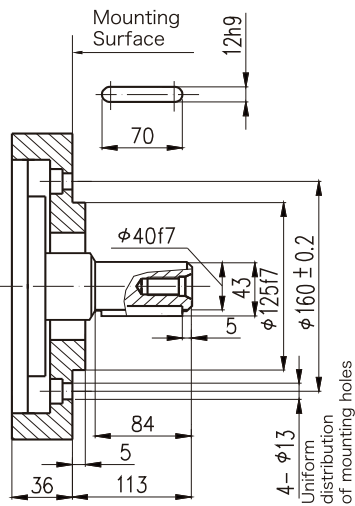
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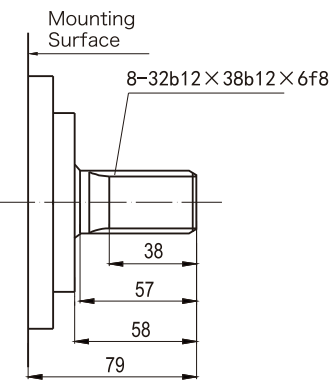
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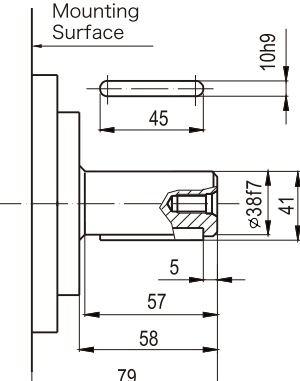
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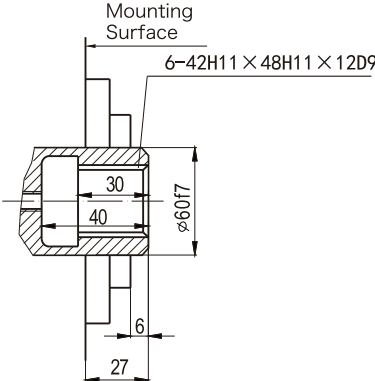
Standard Spline:
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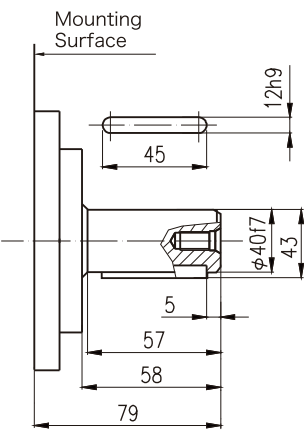
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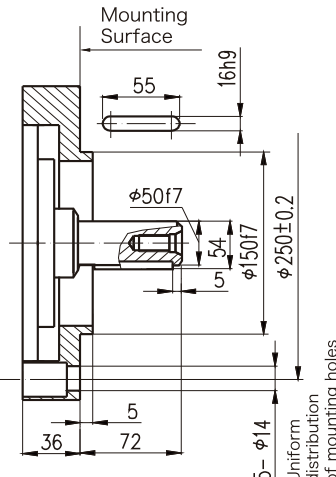
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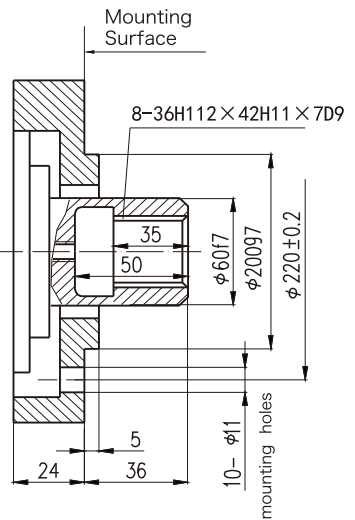
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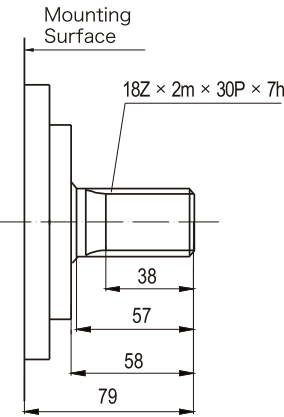
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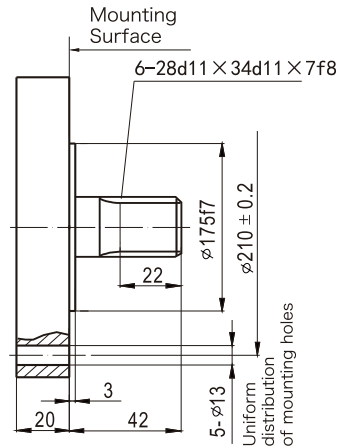
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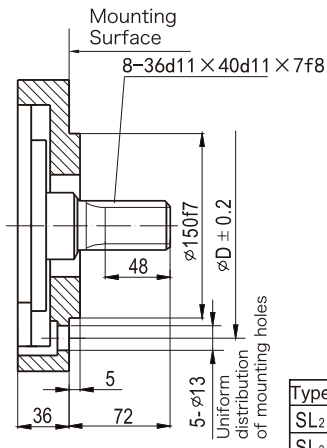
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NHM3-**SL₁

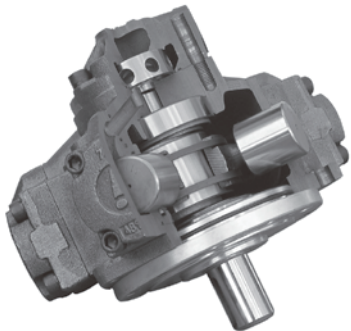


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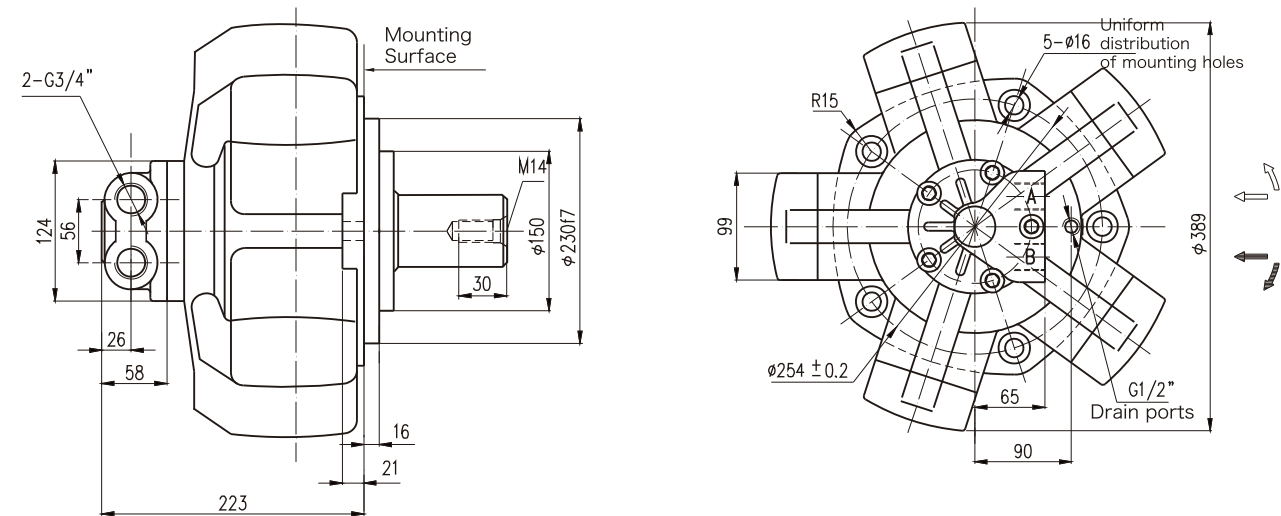


Type	D
SL ₂	195
SL ₃	250

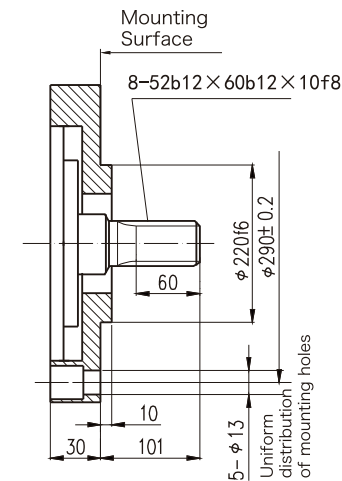
INTERMOT
HYDRAULIC MOTOR



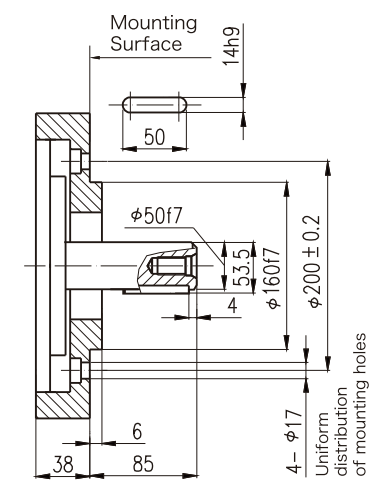
NHM(S)6-400~750 INSTALLATION DIMENSIONS



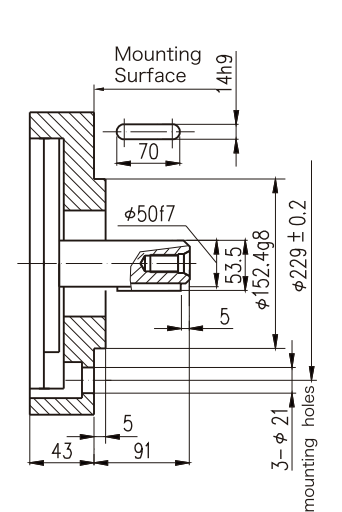
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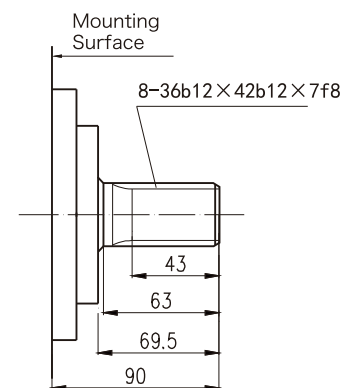
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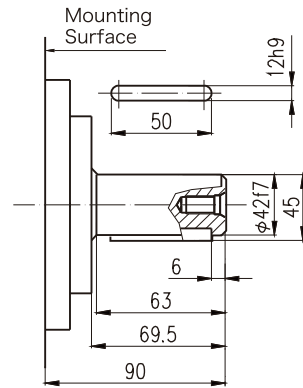
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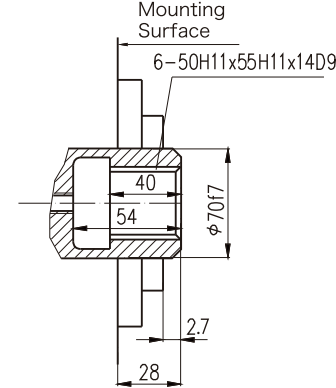
Standard Spline:
NHM6-**



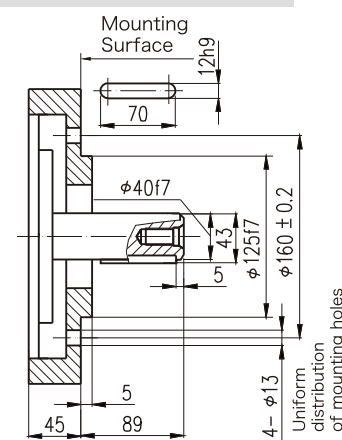
Standard Parallel Key:
NHM6-** B



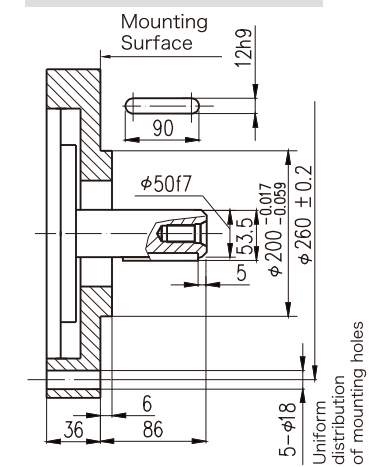
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NHM6-**I₁



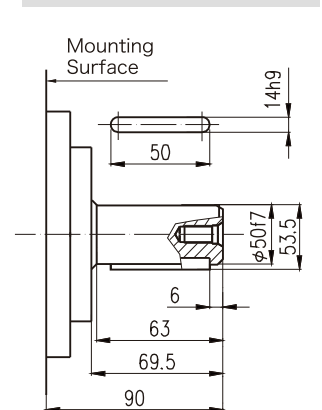
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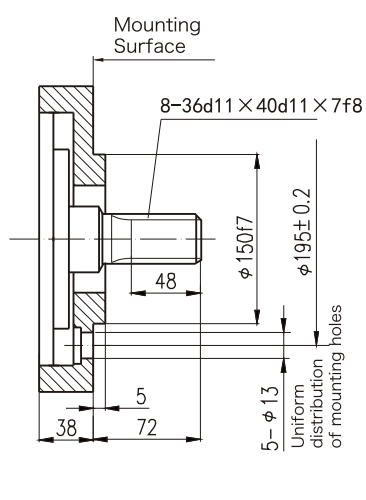
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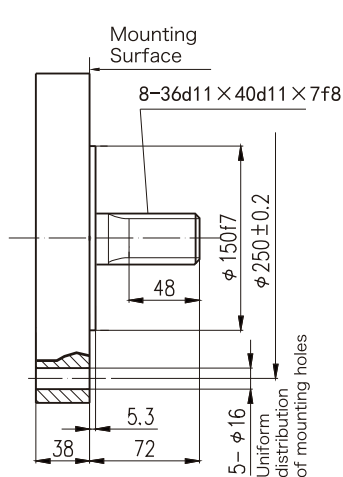
NHM6-**B₃₃



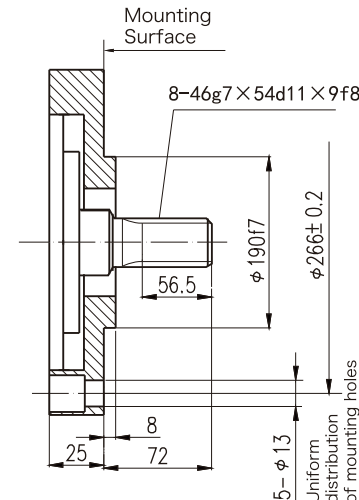
NHM6-**SL₂



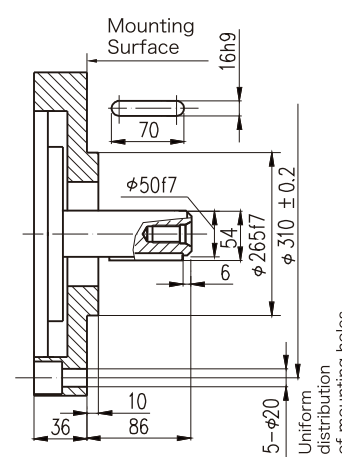
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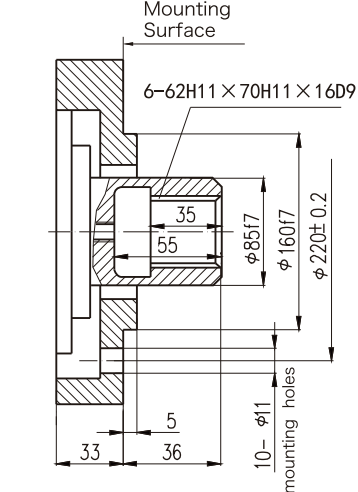
NHM6-**N



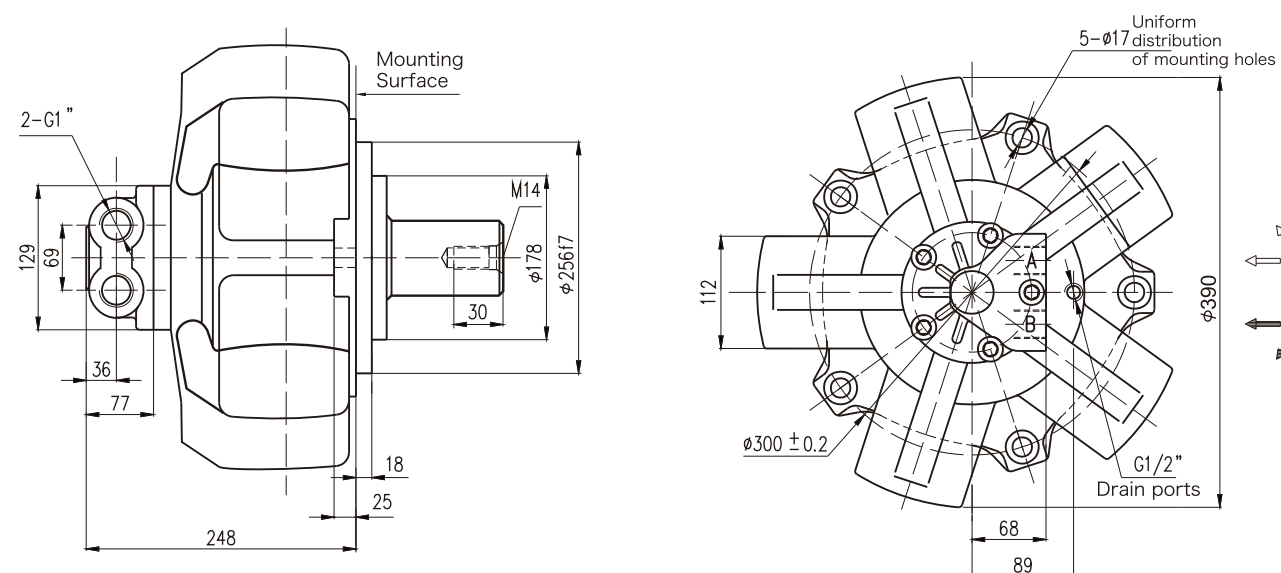
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NHM6-**I₁₁



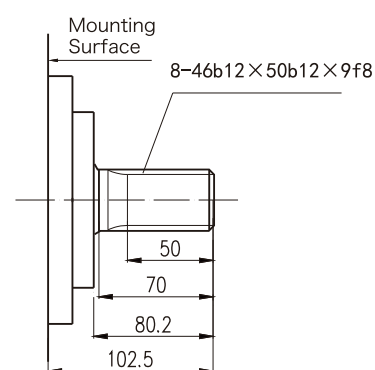
NHM(S) 8-600~1000 INSTALLATION DIMENSIONS



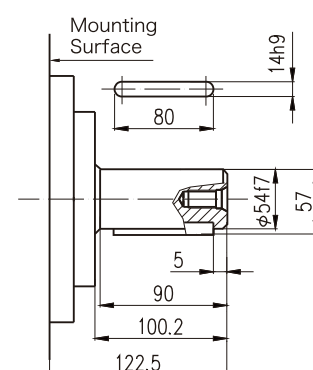
Standard Spline:
NHM8- **

Standard Parallel Key:
NHM8- ** B

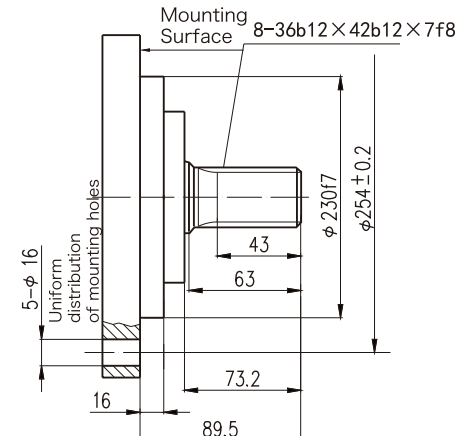
NHM8- ** 6M



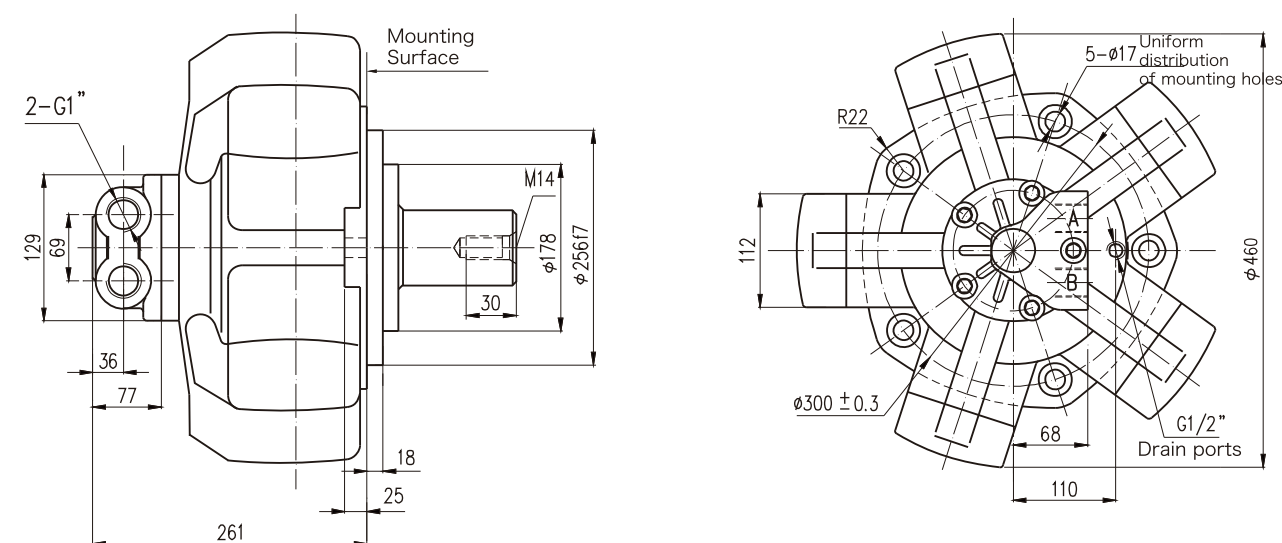
NHM8-**6MB



NHM8-**a2



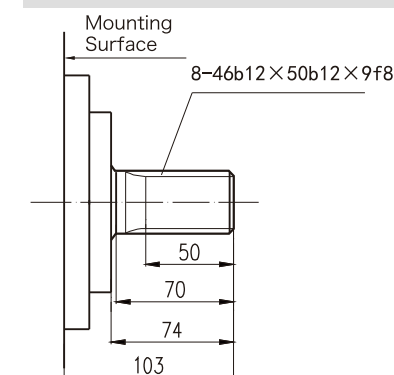
NHM(S) 11-700~1300 INSTALLATION DIMENSIONS



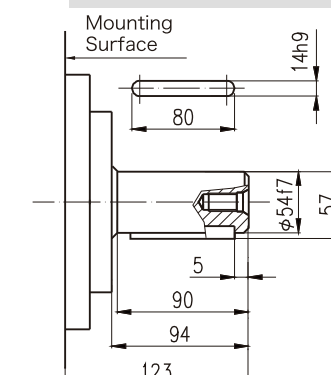
Standard Spline:
NHM11- **

Standard Parallel Key:
NHM11- ** B

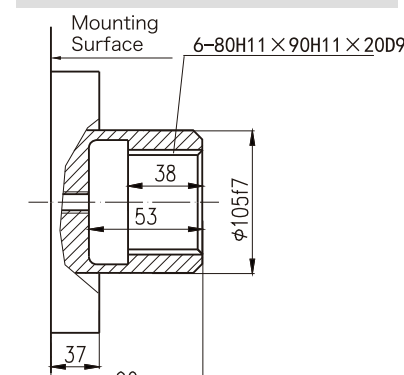
Standard Internal:
NHM11- ** I



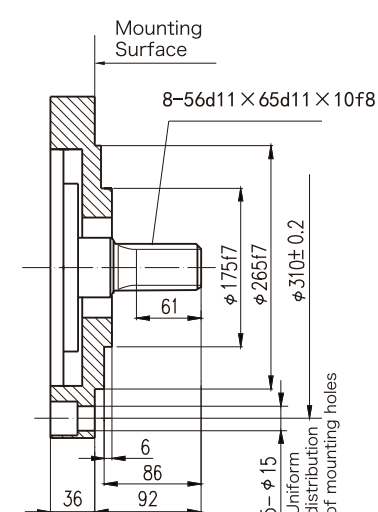
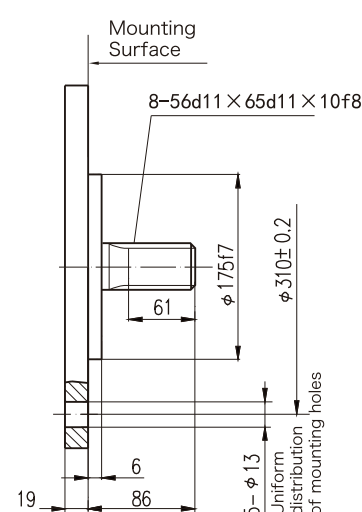
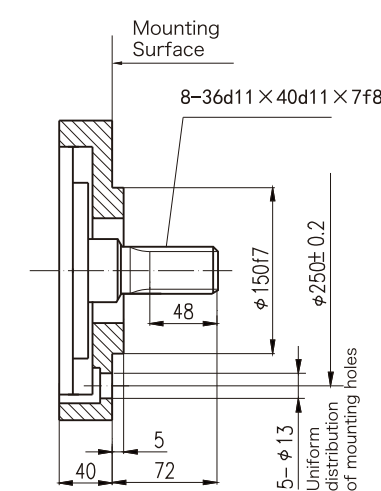
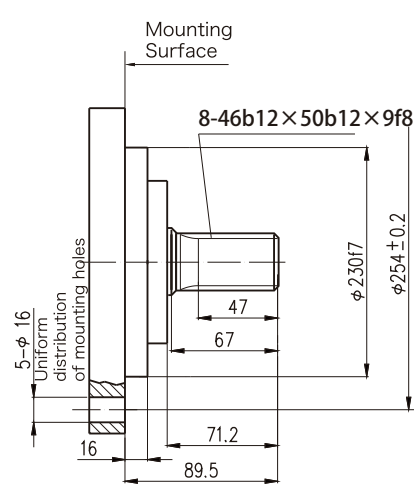
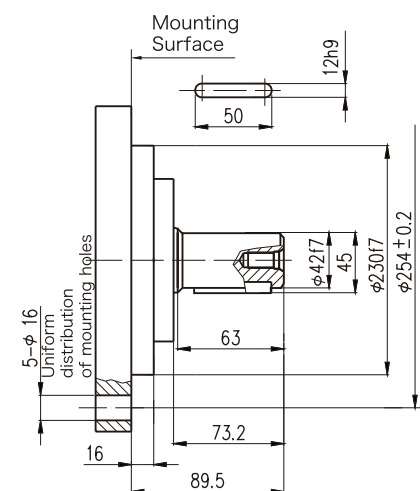
NHM11-**SL₃



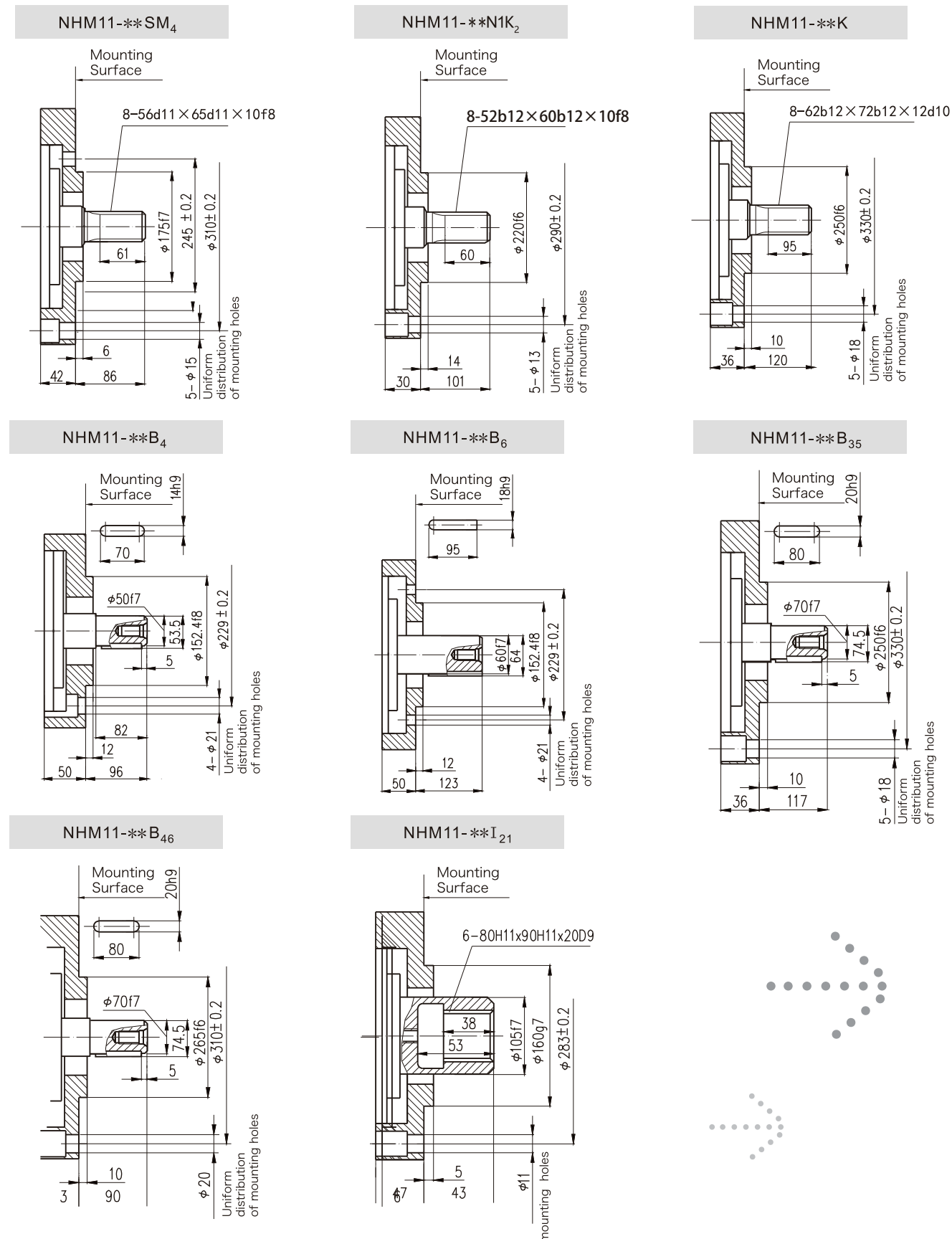
NHM11-**SL₄



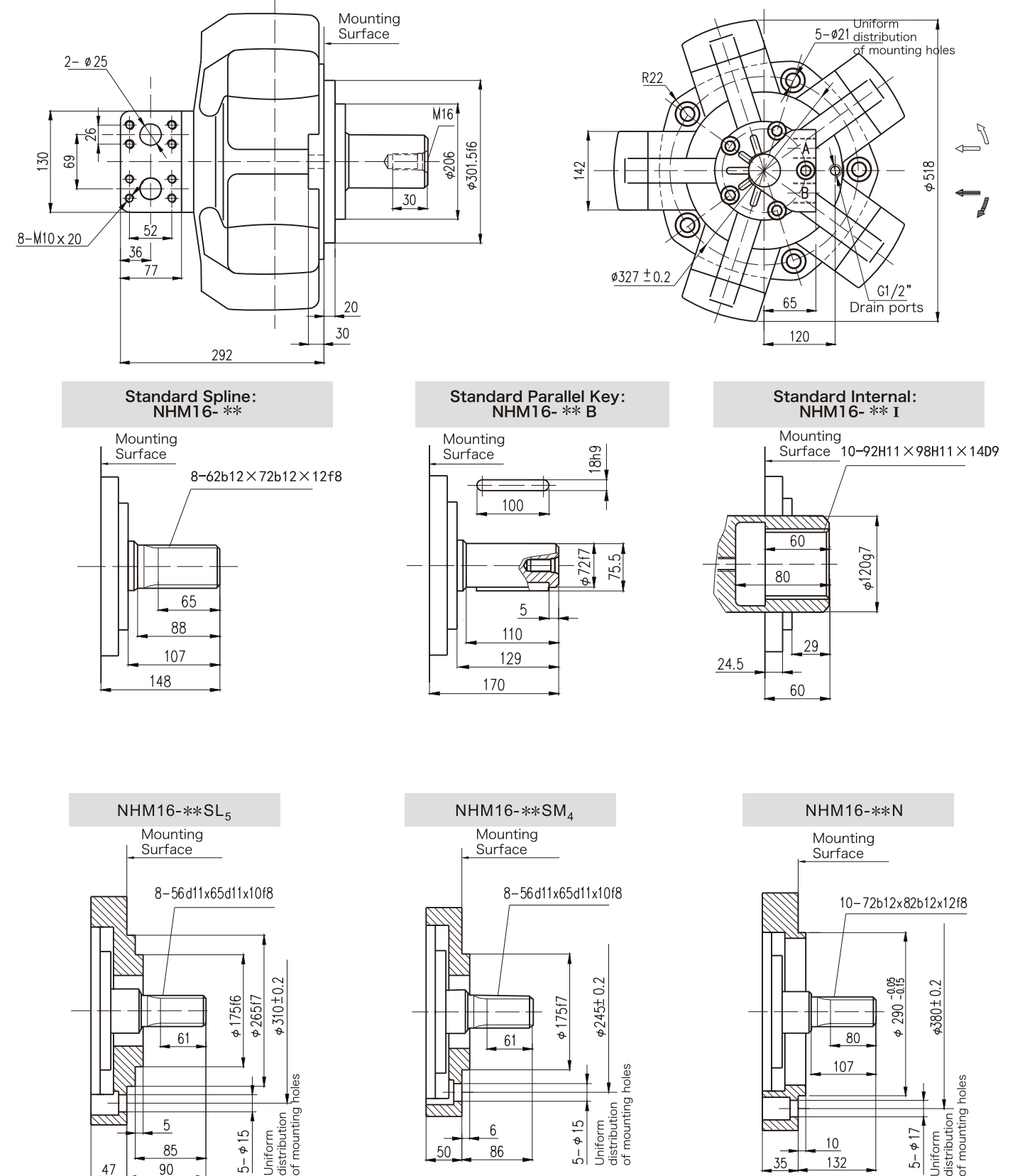
NHM11-**SL₅



NHM(S)11-700~1300 INSTALLATION DIMENSIONS

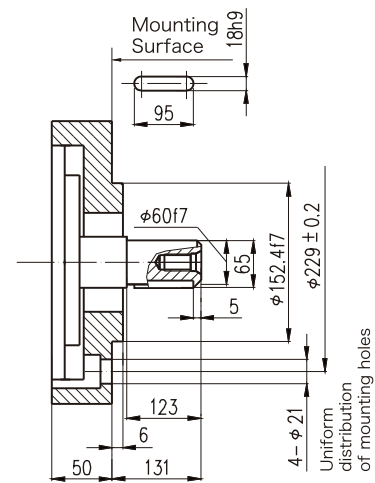


NHM(S)16-1400~2400 INSTALLATION DIMENSIONS

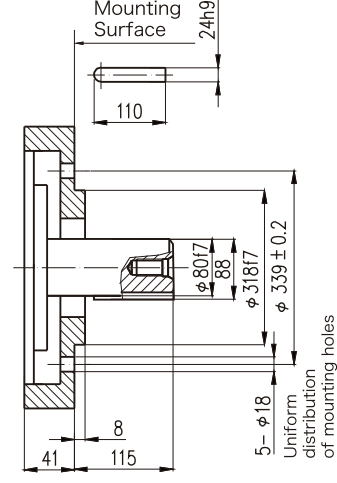


NHM(S)16-1400~2400 INSTALLATION DIMENSIONS

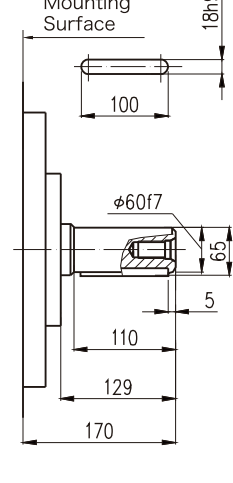
NHM16-**B₆



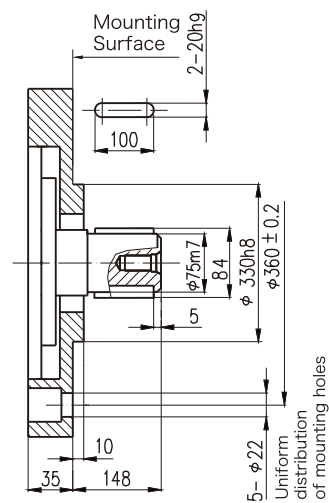
NHM16-**B₁₇



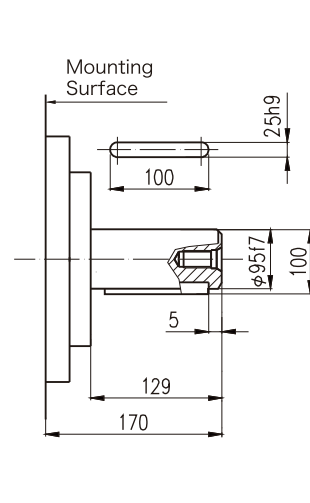
NHM16-**B₁₉



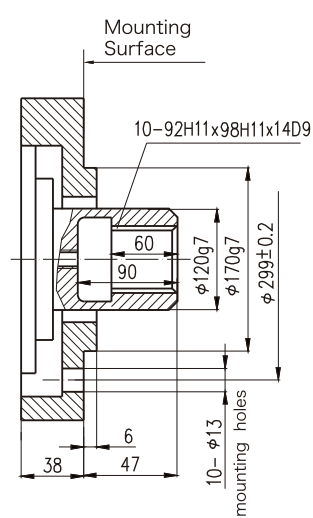
NHM16- ** D



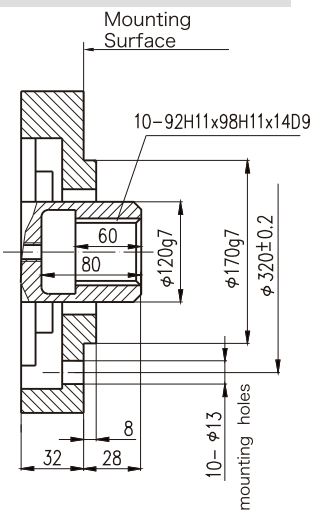
NHM16- ** B₃₀



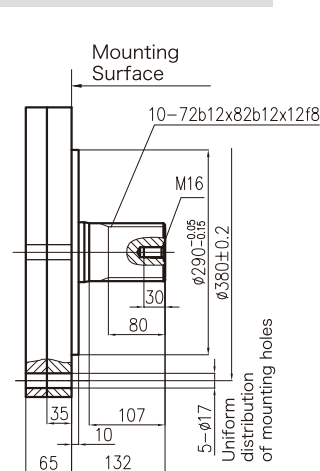
NHM16- ** I₃₂



NHM16-**I₄₂

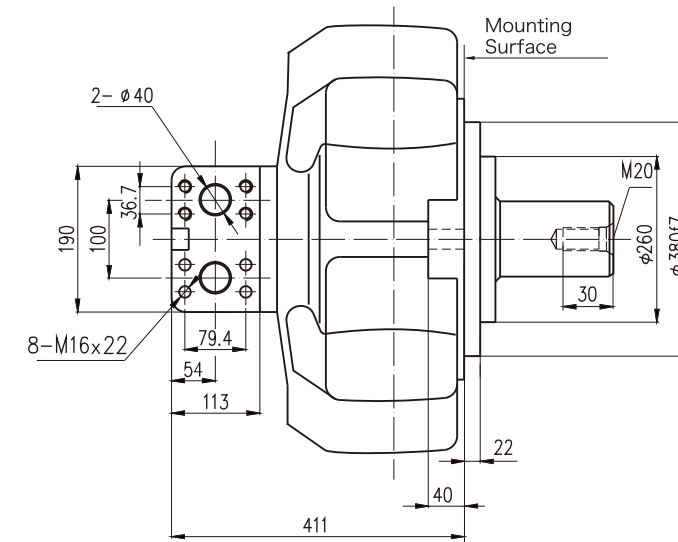


NHM16-**H5C

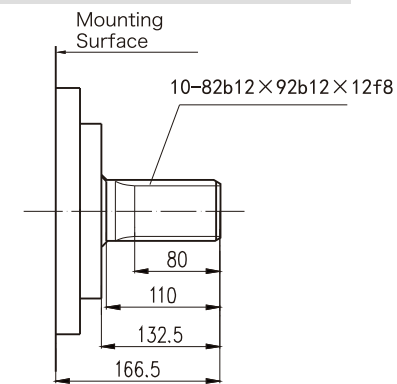


INTERMOT
HYDRAULIC MOTOR

NHM(S)31-2500~5000 INSTALLATION DIMENSIONS

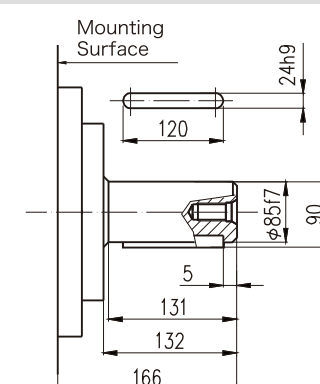


Standard Spline:
NHM31- **



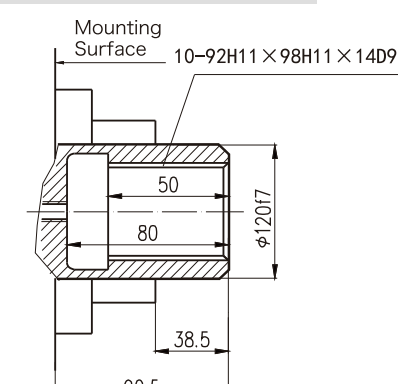
NHM31-**SL₇

Standard Parallel Key:
NHM31- ** B

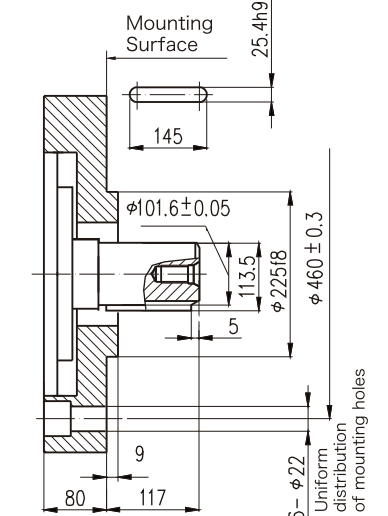
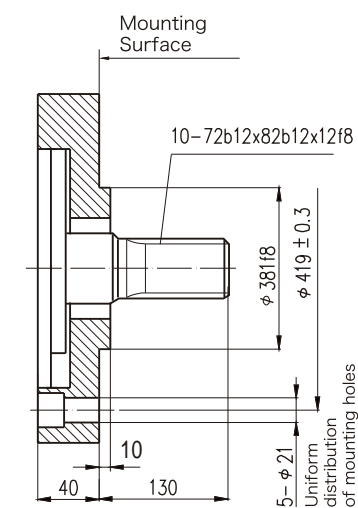
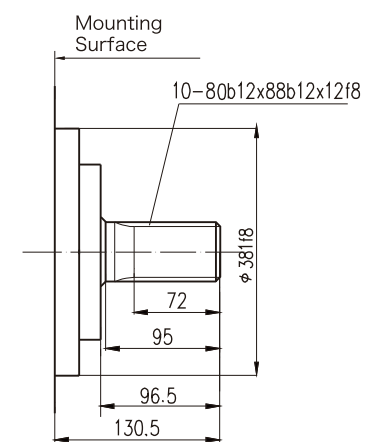


NHM31-**NST

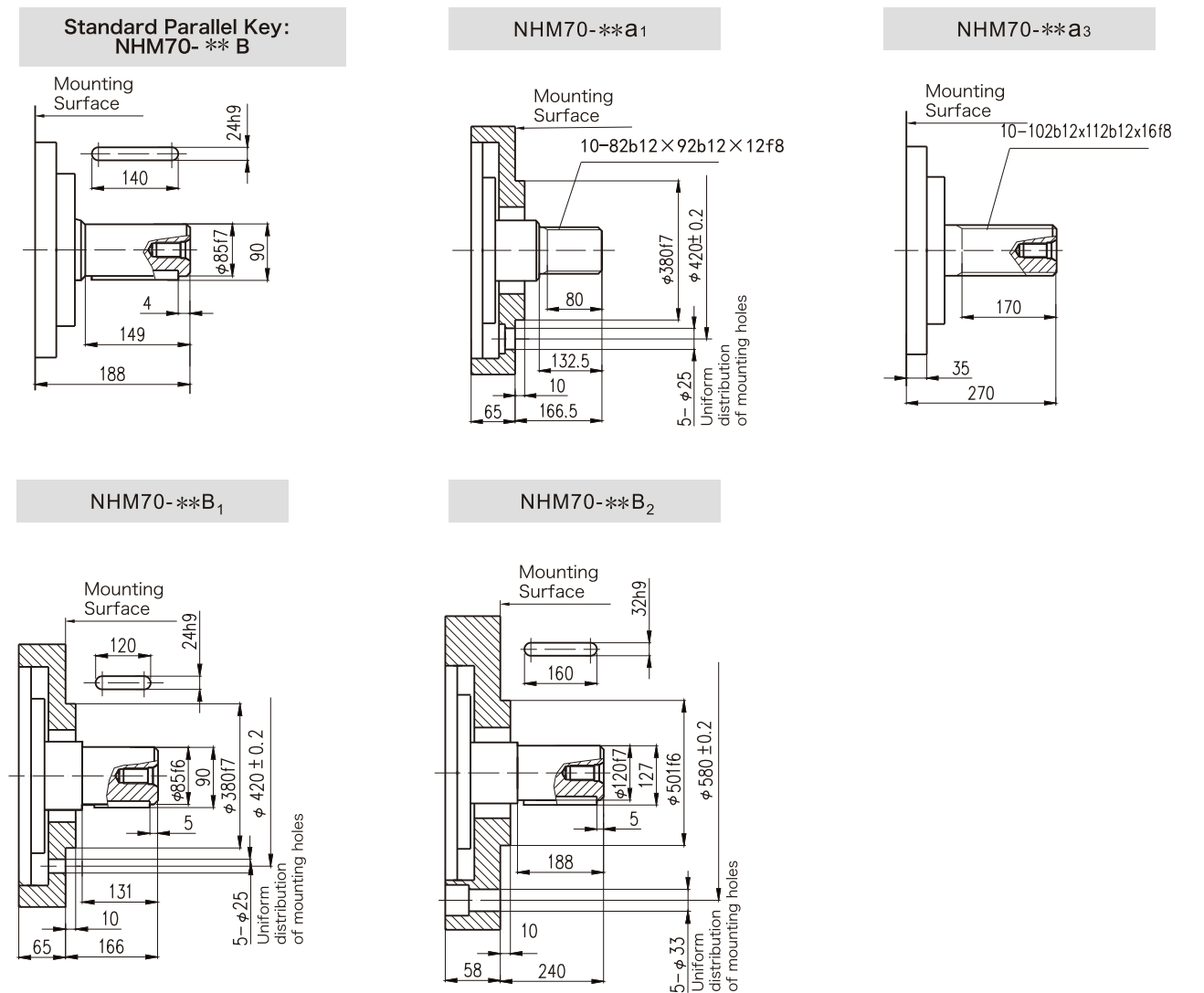
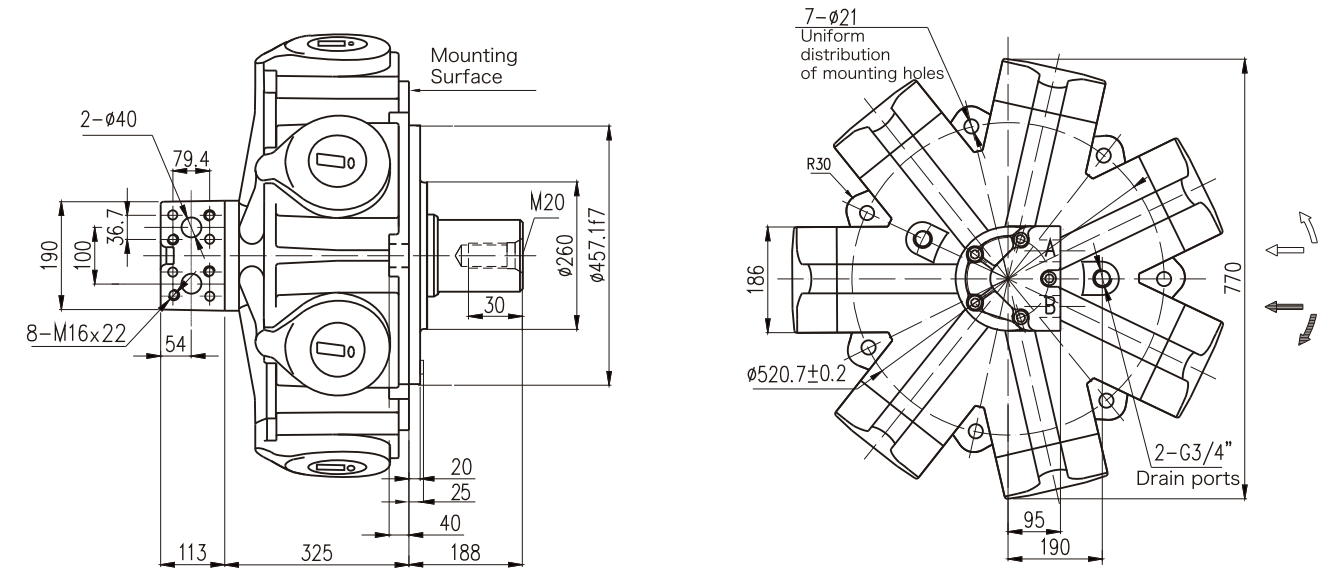
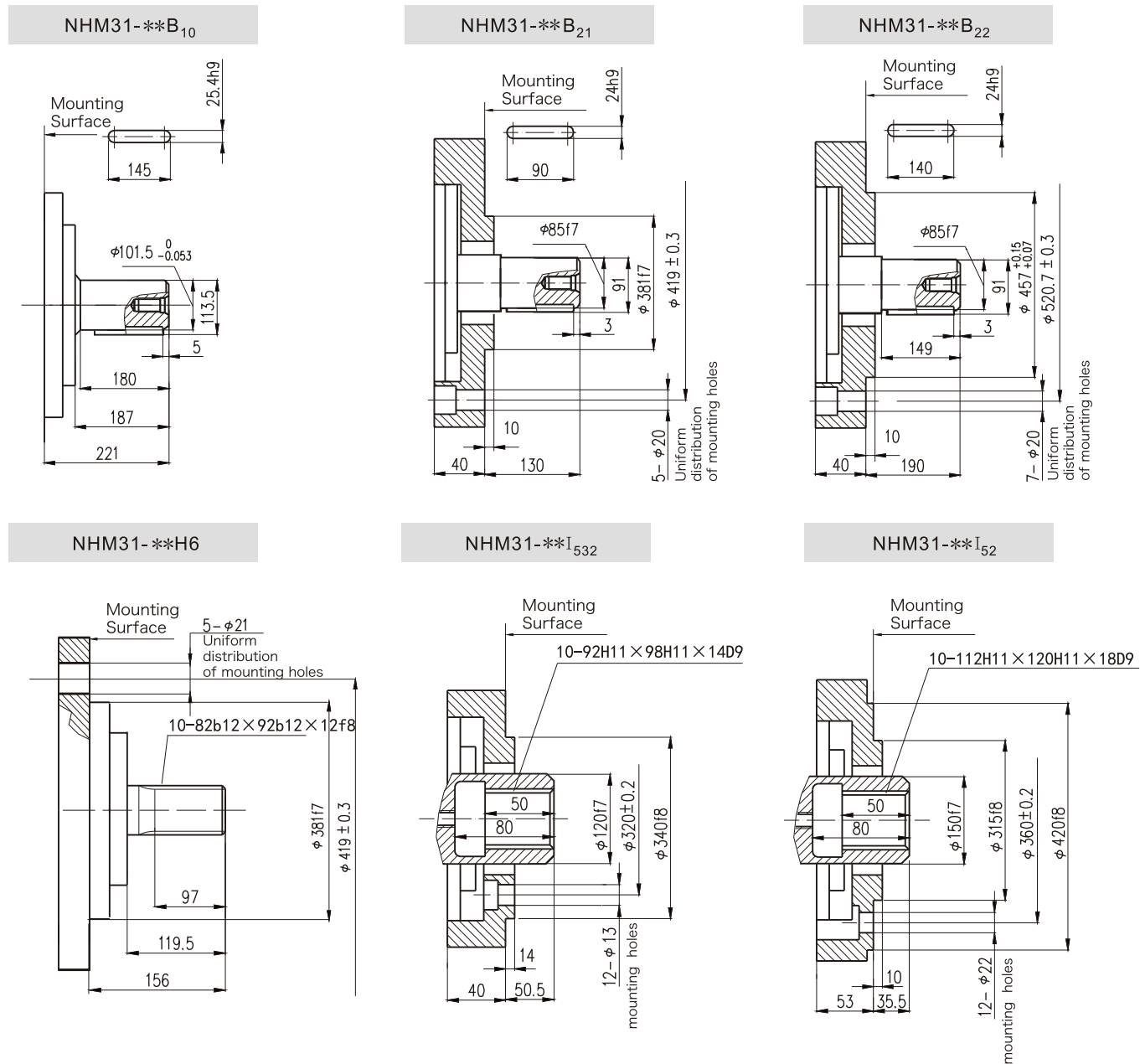
Standard Internal:
NHM31- ** I



NHM31-**B₈



NHM(S)70-4600~5400 INSTALLATION DIMENSIONS



INTERMOT HYDRAULIC MOTOR

F SERIES HYDRAULIC MOTOR

PRODUCT FEATURE

The latest version of F series hydraulic motors represent not only the outstanding experience in the design and manufacturing capability of Intermot, but also absorb the advantages of crankshaft connecting-rod type hydraulic motor both home and abroad. The design has a series of characteristics, including ideal reliability, high efficiency, rigid service life, low noise and wide speed range , and a wide range of applications in mechanical hydraulic transmission systems, such as, marine, shipbuilding, mining, construction and metallurgy, petroleum, coal mine, geological drilling, injection molding industries. Main features include:

1. F series hydraulic motor is designed as a hydro-statically balanced structure between connecting rods and crankshaft. The friction pair gets better lubrication and therefore helps release of the stress of the shaft.
2. Due to the reduction of frictional power and heat loss, mechanical efficiency and startup efficiency of the motor improve, so as the the working pressure of the motor.
3. The crankshaft of F series motor adopts separated structure to enhance the service life characteristics of the crankshaft.
4. The key parts of this series motors are made of special materials and involve special heat treatment processes to effectively improve the rigidity of the motor.
5. The dimensions and performance parameters of this series motor are consistent with the HMB series motors of Staffa and are replaceable with the imported products.

FORMULA&CALCULATION

See NHM series motors (PAGE01).

INSTRUCTIONS

In addition to the reference to NHM series motor (PAGE01) , 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 12 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

F

Unless specified on order, the standard configuration applies (see installation connection dimension drawing of various series of motors). In case of special requirements, please indicate in the order or consult our engineer.

Output shaft

1. a represents the spline output shaft, and the footnote numbers indicate the installation dimensions of the corresponding models of other brands are the same (with flange)

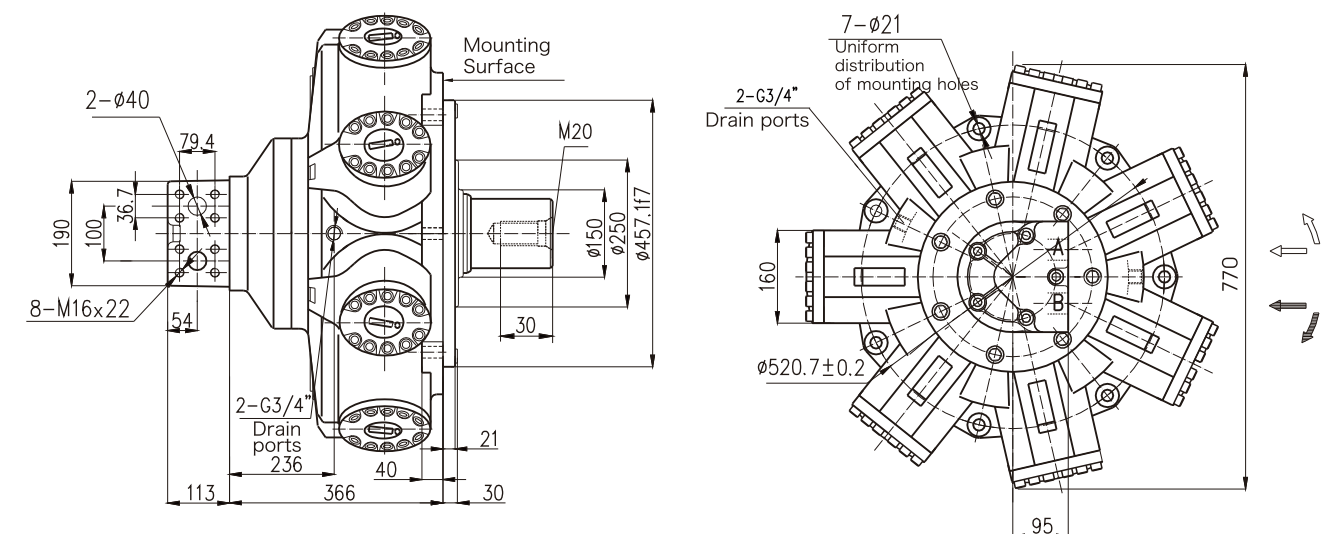
2. B represents the parallel key shaft is the same as HMB series of UK Staffa, and the footnote numbers indicate the installation dimensions of the corresponding models of other brands are the same (with flange).

Nominal displacement (ml/r)

Serial Code

F series Identifier (crankshaft connecting rod low-speed high-torque hydraulic

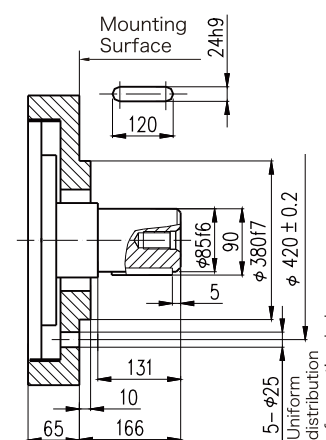
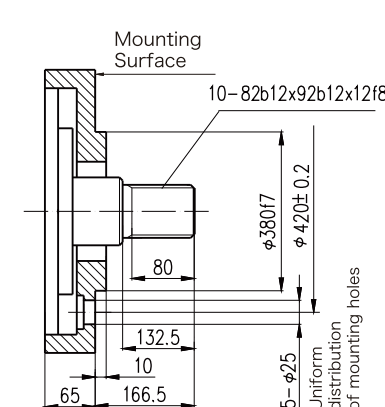
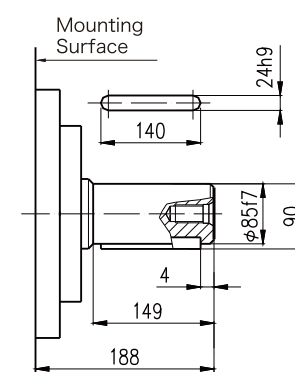
F50 ~3150~5300 INSTALLATION DIMENSIONS



Standard Parallel Key:
F50- ** B

F50-**a₁

F50-**B₁

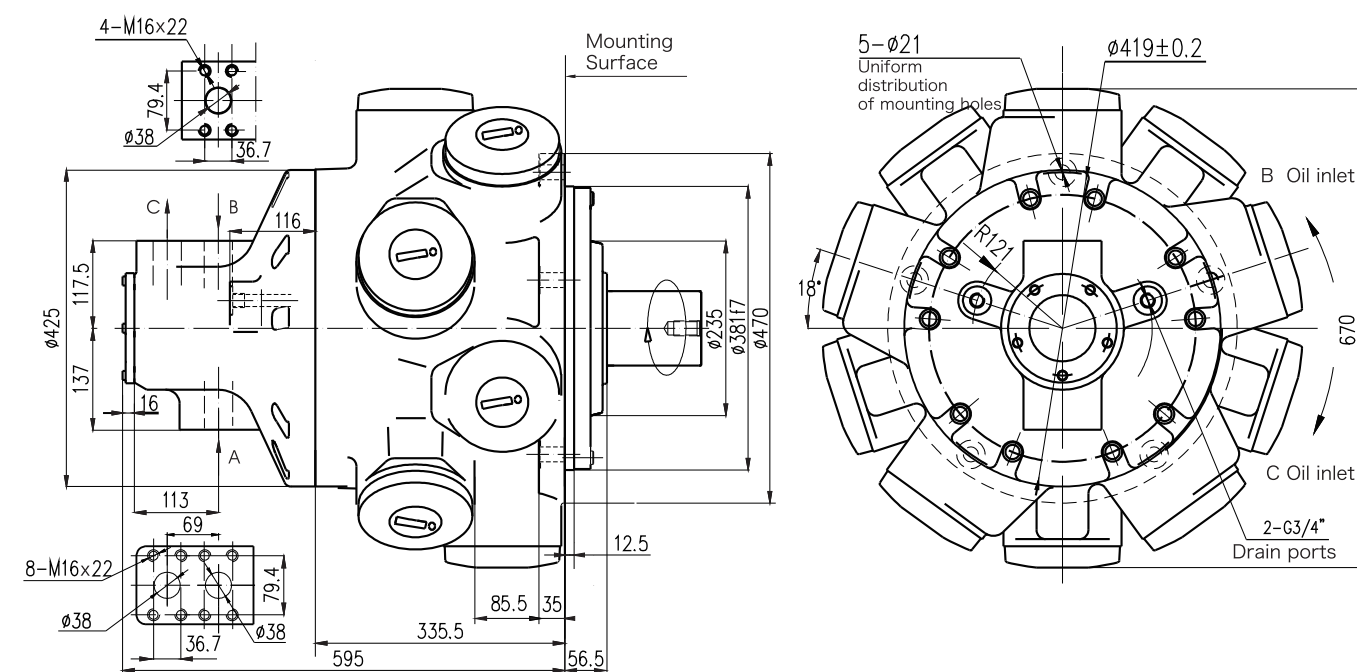


TECHNICAL PERFORMANCE PARAMETERS

Type F	Displacement (ml/r)	Pressure (MPa)		Torque (N.m)		Speed (r/min)	Weight (Kg)
		Rated Pressure	Max.Pressure	Rated Torque	Unit Torque		
F50-3150	3290	20	25	9730	486	8-125	450
F50-3500	3517	20	25	10401	520	8-125	450
F50-4000	3971	20	25	11743	587	8-125	450
F50-4300	4311	20	25	12749	637	8-100	450
F50-4500	4538	20	25	13420	671	8-100	450
F50-5000	5048	20	25	14930	746	8-100	450
F50-5300	5309	20	25	15701	785	8-100	450

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.

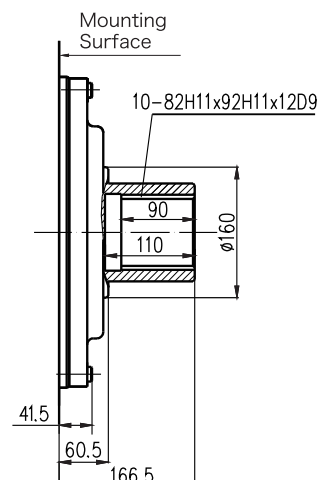
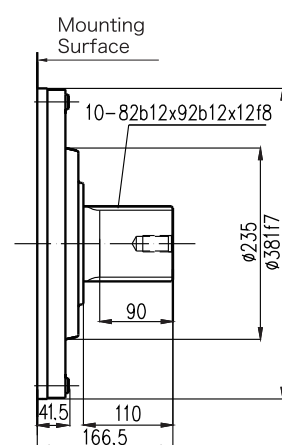
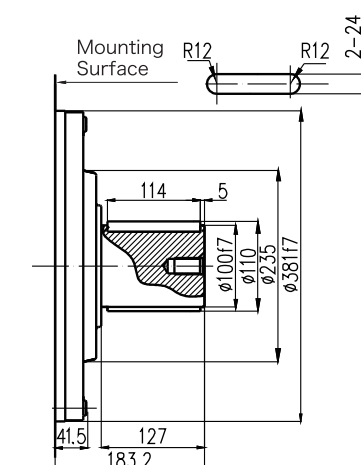
F68-6000~6800 F80-8000 INSTALLATION DIMENSIONS



Standard Parallel Key:
F68- ** B

F68-**a1

F68-I

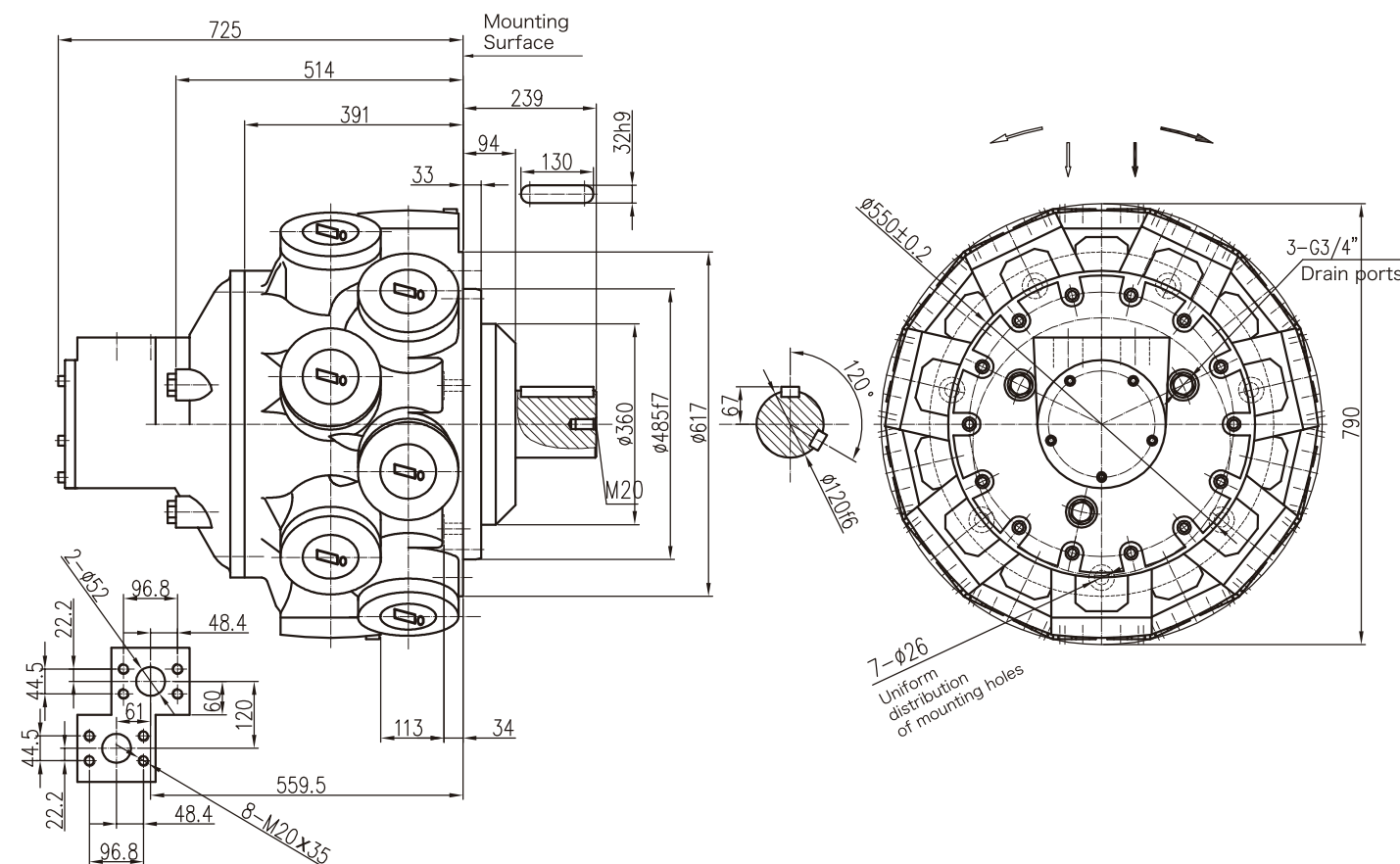


TECHNICAL PERFORMANCE PARAMETERS

Type F	Displacement (ml/r)	Pressure (MPa)		Torque (N.m)		Speed (r/min)	Weight (Kg)
		Rated Pressure	Max.Pressure	Rated Torque	Unit Torque		
F68-6000	6158	20	25	17625	881	8-120	520
F68-6800	6807	20	25	19481	974	8-120	520
F80-8000	8066	20	25	23085	1154	8-100	530

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.

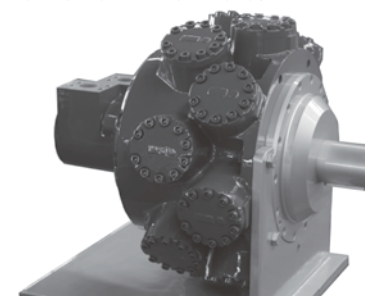
F100-9000~12600 INSTALLATION DIMENSIONS



TECHNICAL PERFORMANCE PARAMETERS

Type F	Displacement (ml/r)	Pressure (MPa)		Torque (N.m)		Speed (r/min)	Weight (Kg)
		Rated Pressure	Max.Pressure	Rated Torque	Unit Torque		
F100-9000	9082	20	25	25992	1300	8-100	1000
F100-10000	10004	20	25	29587	1479	8-100	1000
F100-11600	11590	20	25	33171	1659	8-100	1000
F100-12600	12599	20	25	37261	1863	8-100	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.



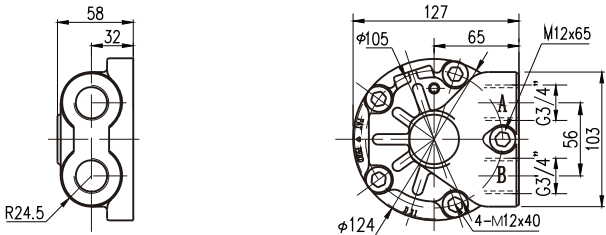
INTERMOT HYDRAULIC MOTOR

DISTRIBUTOR

STANDARD DISTRIBUTOR

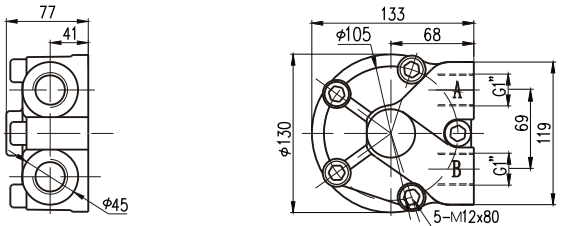
D31
Distributor with 3/4" ports for NHM1、
NHM2、NHM3、NHM6 series motors

Weight: 3kg



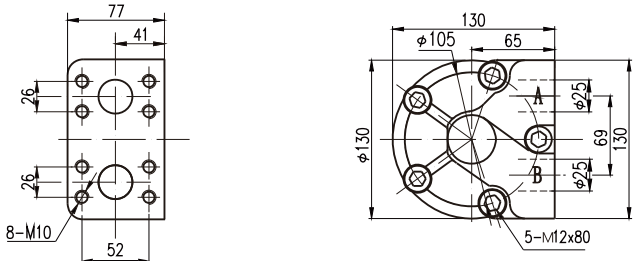
D40
Standard distributor for NHM8、NHM11,
and small motors in the condition of high
speed

Weight: 5kg



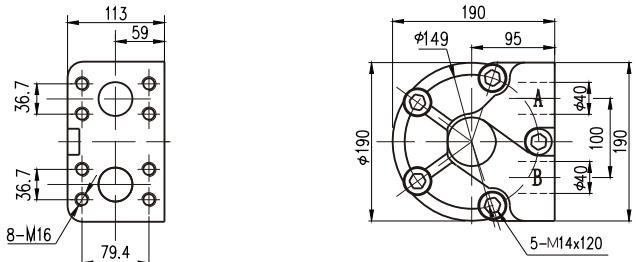
D47
Distributor with 25 flanges for NHM16
series motor

Weight: 6kg



D90
Large flow distributor for NHM70 series
motors

Weight: 14.5kg



- * In case of long hour continuous working of the motor at a high speed condition, oil distributor with flushing settings is recommended, or consult our engineer for more details.
- * Various options of distributors can be applied to the different models of the series according to the actual application requirements, for more information please consult our engineer.

NHM
Exploded-view drawing

