Intermot Hydraulic Motors

Brakes

TECHNICAL CATALOGUE

INDEX

Intermot Hydraulic Motors

Disk Brakes – F Series

TECHNICAL CATALOGUE

INDEX

Disk Brakes – F Series – Technical data

F21R F21DR

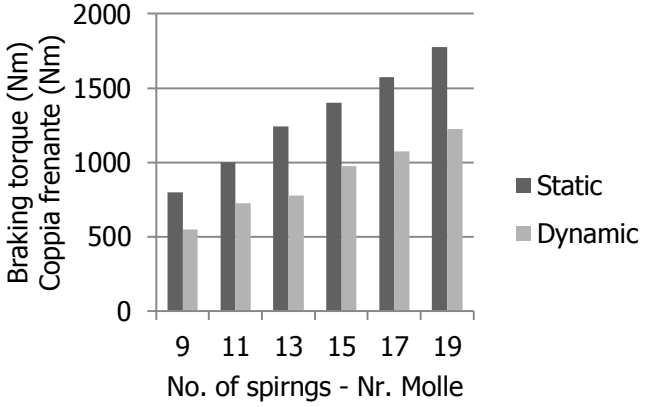
Brake Model Modello Freno	**F21R**	**F21DR**
Static torque * Coppia statica*	1800 Nm	1800 Nm
Minimum complete opening pressure ** Pressione minima di apertura completa **	35 bar	35 bar
Maximum pressure on the cylinder Pressione massima sul cilindro	60 bar	60 bar
Dry mass Massa a secco	26,3 kg	33,6
Lubrification oil quantity Quantità olio lubrificante	450 cm³	450 cm³
Pilot oil quantity Quantità olio di pilotaggio	65,1 cm³	65,1 cm³

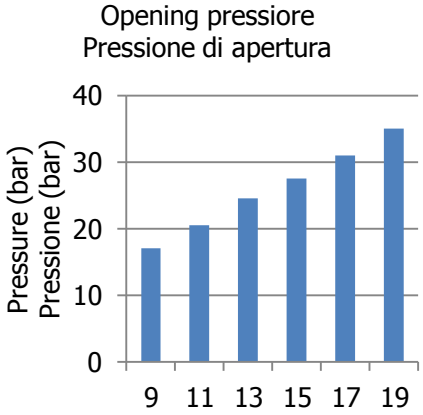
*Considered with itnernal pilot pressure at 0 bar
*Considerata con pressione di pilotaggio 0 bar all'interno del freno
** Available also with higher opening pressure, with less oil quantity
** Disponibile anche con pressione di apertura maggiorata e ridotta quantità di olio di pilotaggio

F21R F21DR

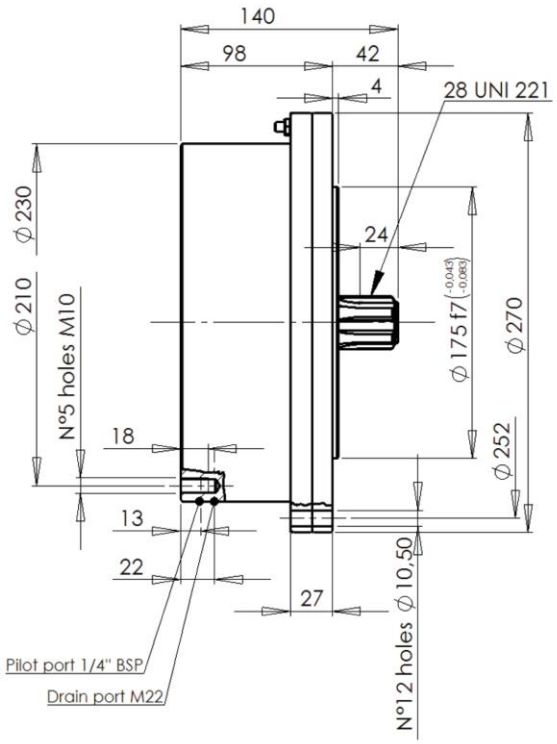
Braking torque in function of the number of brake disk springs.
The standard version is supplied with 19 springs.

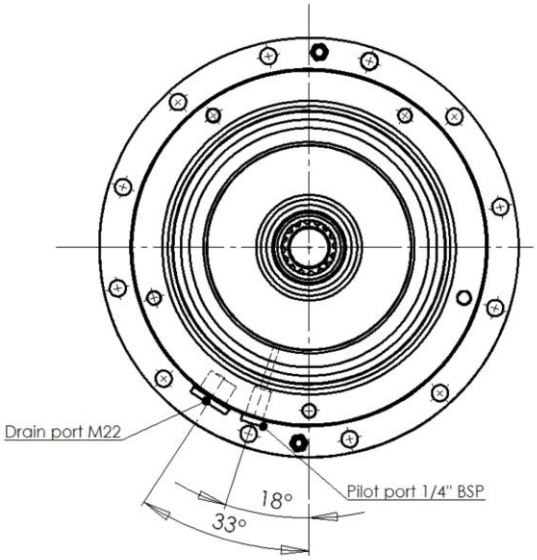
Coppia frenante in funzione del numero di molle spingi disco.
La versione standard viene fornita con 19 molle.





F21R





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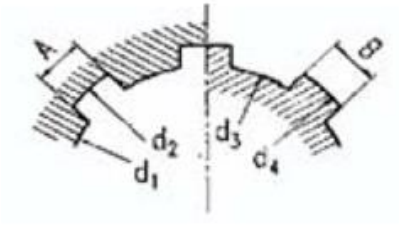
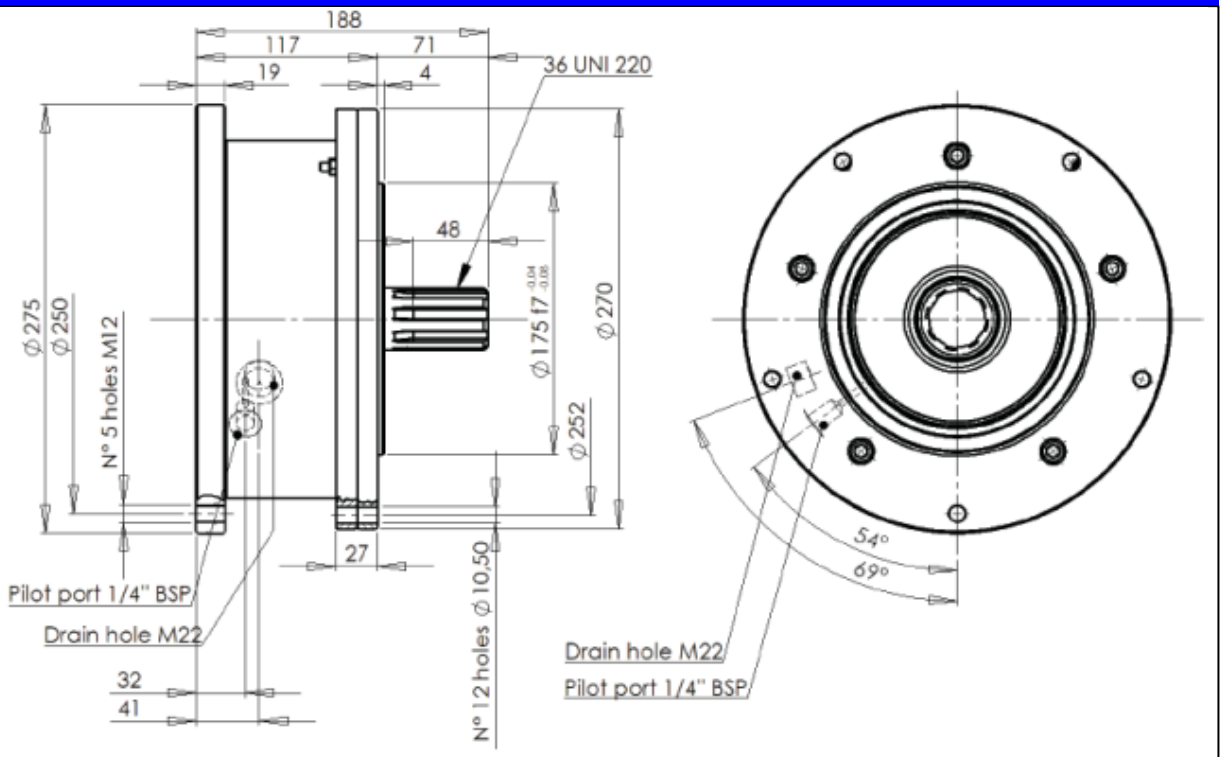


d_1	Ø28.0	+0.021 +0	H7
d_2	Ø34.1	+0.160 +0	H11
A	7.0	+0.028 +0.013	F7
d_3	Ø28.0	-0.007 -0.020	g6
d_4	Ø34.0	-0.065 -0.160	h14
B	7.0	-0.013 -0.028	f7

Dimensional drawings

F21DR



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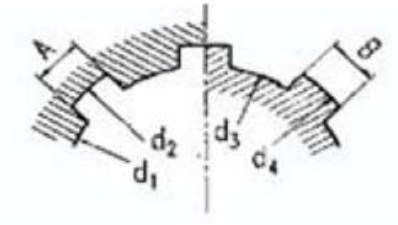


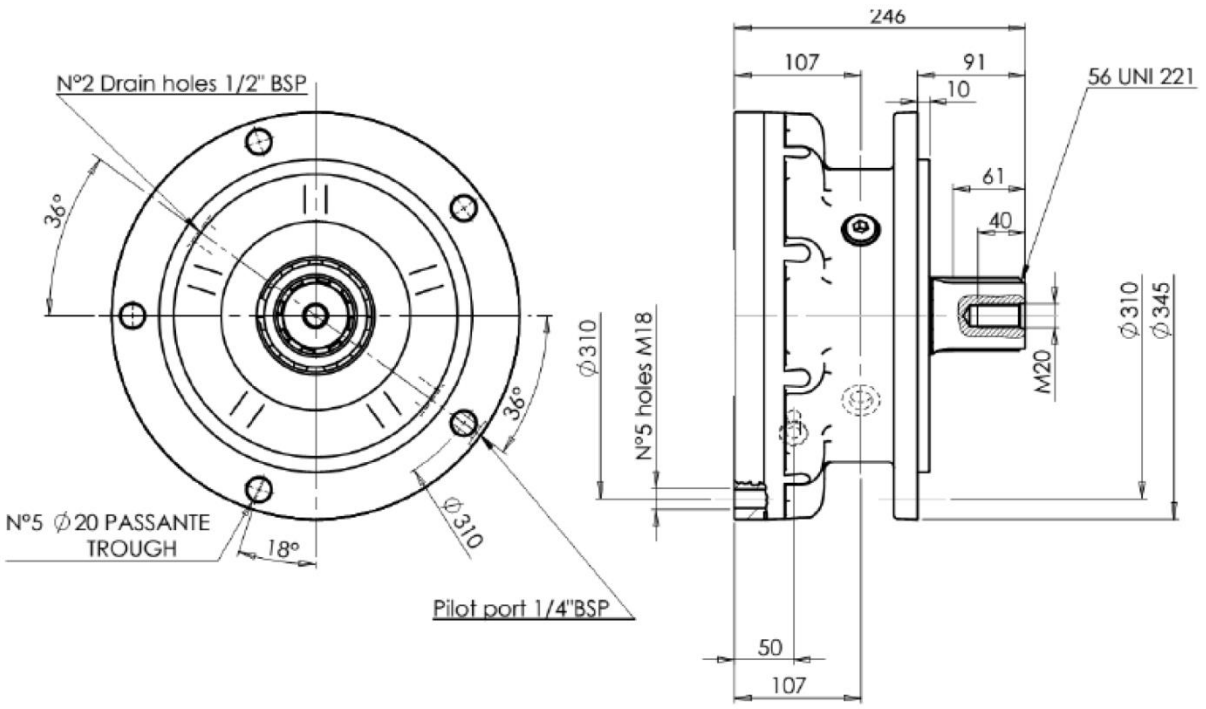
d_1	Ø36.0	+0.025 +0	H7
d_2	Ø40.0	+0.160 +0	H11
A	Ø7.0	+0.028 +0.013	F7
d_3	Ø36.0	-0.009 -0.025	g6
d_4	Ø40.0	-0.065 -0.160	d11
B	Ø7.0	-0.013 -0.028	f7

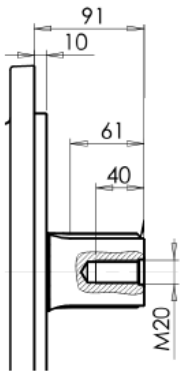
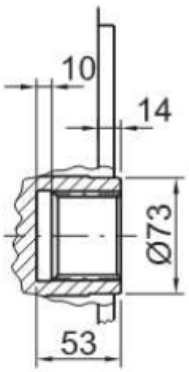
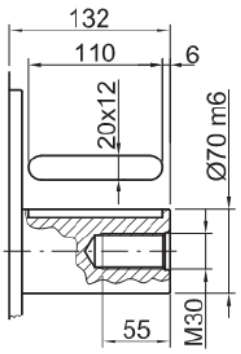
F80

Brake Model Modello Freno	**F80S 22 SPRINGS**	**F80S 15 SPRINGS**
Static torque * Coppia statica*	8000 Nm	1800 Nm
Minimum complete opening pressure ** Pressione minima di apertura completa **	35 bar	12 bar
Maximum pressure on the cylinder Pressione massima sul cilindro	60 bar	60 bar
Dry mass Massa a secco	70 kg	70 kg
Lubrification oil quantity Quantità olio lubrificante	1200 cm³	1200 cm³
Pilot oil quantity Quantità olio di pilotaggio	70,8 cm³	70,8 cm³

*Considered with itnernal pilot pressure at 0 bar
*Considerata con pressione di pilotaggio 0 bar all'interno del freno
** Available also with higher opening pressure, with less oil quantity
** Disponibile anche con pressione di apertura maggiorata e ridotta quantità di olio di pilotaggio

F80 / F80S



SHAFTS		
A0: Splined shaft 56 UNI 221	A1: Internal splined shaft 55x3x17 DIN 5480	A2: Parallel shaft
		

Intermot Hydraulic Motors

Drum Brakes – RC Series

TECHNICAL CATALOGUE

INDEX

Hydraulic fluids recommendations

Hydraulic fluids

We recommend the use of hydraulic oils with anti-wear additives (ISO HM or HV) and minimum viscosity index of 95.
Once normal working temperature is reached, oil viscosity must be at least 12 cSt, preferably in the range from 20 to 60 cSt.
Hydraulic oils meeting Denison MF-O, Vickers M-2952-S I - 286-S performance requirements and DIN 51524 specifications, are preferred.
Mineral hydraulic oils are divided into four main types, designated by the International Standards Organisation (ISO) as HH, HL, HM and HV. We advise to use only products with HM or HV specifications.
HM type:
These are the most widely employed hydraulic oils. They include small quantities of anti-wear additives to provide significant improvement in wear reduction. "Superior" quality HM type oils can be used for all equipment, with the added assurance that they will be suitable for the highest temperature.
HV type:
HV hydraulic oils show minimal change in viscosity with temperature variations.

Oil viscosity reccomendation

Room temperature HM type ISO-VG
- -20°C / 0°C BP ENERGOL HLP - HM 22
- -15°C /+5°C BP ENERGOL HLP - HM 32
- -8°C /+15°C BP BNERGOL HLP - HM 46
- 0°C /+22°C BP ENERGOL HLP - HM 68
- +8°C /+30°C BP ENERGOL HLP - HM100
- -20°C /+5°C BP BARTRAN HV 32
- -15°C /+22°C BP BARTRAN HV 46
- 0°C /+30°C BP BARTRAN HV 68

Our motors have been designed to work also with:
- oils type ATF (Automatic Transmission Fluid)
- oils with viscosity SAE 10W - 20 -30
- multigrade motor oils SAE 10 W/40 or 15 W/40
- universal oils

During cold start-up, avoid high-speed operation until the system is warmed up to provide adequate lubrication. Continuous working temperature must not exceed 70°C.

Fire resistant oil limitations

	Max cont. pressure	Max. int. pressure	Max speed
HFA 5-95% oil-water	103	138	50%
HFB, 60-40% oil-water	138	172	100%
HFC, water-glycol	103	138	50%
HFD, ester phosphate	250	293	100%

Filtration

Hydraulic systems oil must always be filtered.
The choice of filtration grade derives from needs of service life and money spent. In order to obtain stated service life it is important to follow our recommendations concerning filtration grade.
When choosing the filter it is important to consider the amount of dirt particles that filter can absorb and still operate satisfactorily. For that reason we recommend filters showing when you need to substitute filtering cartridge.
- 25 µm filtration required in most applications
- 10 µm filtration in closed circuit applications

Oxidation

Hydraulic oil oxidizes with time of use and temperature.
Oxidation causes changes in colour and smell, acidity increase or sludge formation in the tank. Oxidation rate increases rapidly at surface temperatures above 60°C, in these situations oil should be checked more often.
The oxidation process increases the acidity of the fluid; the acidity is stated in terms of the "neutralization number". Oxidation is usually slow at the beginning and then it increases rapidly. A sharp increase (by a factor of 2 to 3) in neutralization number between inspections shows that oil has oxidized too much and should be replaced immediately.

Water content

Oil contamination by water can be detected by sampling from the bottom of the tank. Most hydraulic oils repel the water, which then collects at the bottom of the tank. This water must be drained off at regular intervals. Certain types of transmission oils and engine oils emulsify the water; this can be detected by coatings on filter cartridges or a change in the colour of the oil. In such cases, obtain your oil supplier advice.

Degree of contamination

Heavy contamination of the oil causes wear rising in hydraulic system components. Contamination causes must be immediately investigated and remedied.

Analysis

It is recommended oil being analyzed every 6 months. The analysis should cover viscosity, oxidation, water content, additives and contamination. Most oil suppliers are equipped to analyze oil state and to recommend appropriate action. Oil must be immediately replaced if the analysis shows that it is exhausted.

Instructions and advices

Installation
Hoses and piping must be clean and free from contamination.
No other special requirements are necessary.
- Motor can be mounted in any position
- In run-away conditions you must use counterbalance valves
- Consult factory for intermittent applications

Splined adaptors (sleeves) are available upon request.

Installation circuit
The choice of open or closed loop circuit will be determined by the application.
Open loop circuits are cheaper and simpler to install.
Closed loop circuit is a superior circuit and usually takes up less space. It also offers better control features.

Start up
Motor case and pistons must be completely filled with oil before starting.
Do not load motor to maximum working pressure. Increase load gradually at start-up.

Case drain – Case pressure
Connect the case drain directly to tank.
The case drain port on the motor must be located on the highest point of the installation to ensure that the motor will always be full of oil. The case drain pressure must not exceed 6 bar continuous pressure.

Important:
When the motor is installed vertically with shaft pointing upwards, consult our Technical Department. If the motor is connected to high inertial loads, the hydraulic system must be designed to prevent peaks of pressure and cavitation.

Temperature
Maximum oil temperature must not exceed 70°C. Heath exchangers must be used with higher temperatures.

Viscosity
The motor works satisfactory in a range of 3°E to 10°E oil viscosity. Best performance is obtained at the highest viscosity.

Back pressure
Don't exceed 70 bar back pressure.

High peaks applications
In case of high pressure peaks applications, a Nitemper treatment on motor body or in cylinders it is suggested to increase wear and tear resistance.

Continuous high speed duty
In case of continuous high speed duty, it is suggested to mount a central reinforced bearing on motor shaft, please contact our Technical Department.

Minimum speed
Standard minimum speed is about 5 to 40 rpm (depending on motor displacement). If you need less speed, it is possible to modify some parts of the distributor.

Flushing
In the need of Flushing, a 2nd drain hole is available upon request. When flushing is not available, it is possible to create an inner motor drain to help cooling.

Cooling Flow
If the motor operates in the Intermittent Power zone, it may require a cooling flow of 20 l/min (5 gpm) to keep a drain flow viscosity of 40 cSt minimum.

Bearings

Bearings lifetime depends on the type of bearing, on motor speed and on working loads.
Lifetime is measured by L10 which is called "theoretic lifetime". It represents the number of cycles that 90% of identical bearings can effort at the same load without showing wear and tear. It is calculated by the following equation:

$$L_{10} = \left(\frac{C}{P}\right)^{p}$$

where: C = theoretical dynamic coefficient (depending on the bearing size)
P = radial load
p = exponent
(p=3 for ball bearings, p=10/3 for roller bearings)
When you work at constant speed, you can calculate the lifetime in hours with the following equation:

$$L_{10h} = \frac{10^6 \cdot L_{10}}{60 \cdot rpm} = \frac{10^6}{60 \cdot rpm}\left(\frac{C}{P}\right)^{p} [h]$$

When you don't have only radial or axial loads, you have to calculate an equivalent load:

$$P = X \cdot F_R + Y \cdot F_A$$

Where: FR = radial load,
X = radial coefficient,
FA = axial load,
Y = axial coefficient
While FR and FA come from working conditions (i.e. torque), X and Y depend on the type of bearing and on the ratio $\frac{F_A}{F_R}$

Shaft seal features

Type: BABSL
Form: AS DIN 3760
Material: SIMRIT® 72 NBR 902
SIMRIT® 75 FKM 595

1. Features
SIMMERRING® radial shaft seal with rubber covered O.D., short, flexibility suspensed, spring loaded sealing lip and additional dust lip: see Part B/ SIMMERRING®, sections 1.1 and 2.

2. Material
Sealing lip and O.D.:
- Acrylonitrile-butadiene rubber with 72 Shore A hardness (designation: SIMRIT® 72 NBR 902)
- Fluoro rubber with 75 Shore A hardness (designation: SIMRIT®75 FKM 595)
Metal insert:
- Plain steel DIN 1624
Spring:
- Spring steel DIN 17223

3. Application
For sealing pressurised media without additional backup ring, e. g. for rotational pressure sealing in hydraulic pumps, hydraulic motors, hydrodynamic clutches. Rubber covered O.D. assures sealing in the housing bore even in case of considerable surface roughness, thermal expansion or split housing.
Particularly suitable for sealing low viscosity and gaseous media.
Where high thermal stability and chemical resistance are required, SIMRIT® 75 FKM 595 material should be used.
Additional dust lip to avoid the entry of light and medium dust and dirt.

4. Operating conditions
See Part B/ SIMMERRING®, sections 2. 4.
Media: mineral oils, synthetic oils
Temperature: -40°C to +100°C (SIMRIT® 72 NBR 902)
-40°C to +160°C (SIMRIT® 75 FKM 595)
Surface speed: up to 5 m/s
Working pressure: see diagram 1
Maximum permitted values, depending on other operating conditions.

5. Housing and Machining Criteria
See Part B/ SIMMERRING®, sections 2.

Shaft:	Tolerance: ISO h11
	Concentricity: IT 8
	Roughness: Ra=0.2-0.8 µm
	Rz=1-4 µm
	Rmax=6 µm
	Hardness: 45-60 HRc
	Roughness: non oriented; preferably by plunge grinding
Housing:	Tolerance: ISO H8
Roughness:	Rmax<25 µm

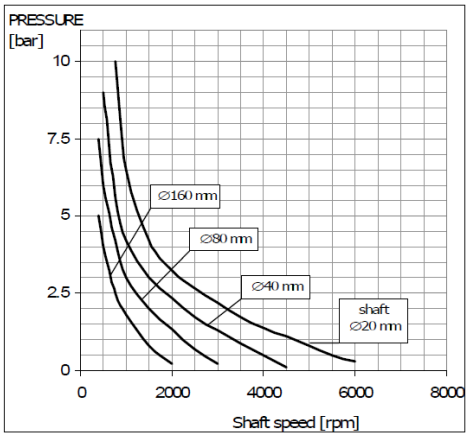
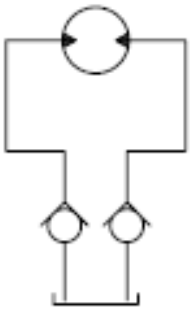


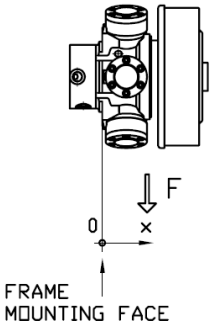
Diagram 1: Pressure Loading Limits
For more details, please contact our Technical Deaprtment.

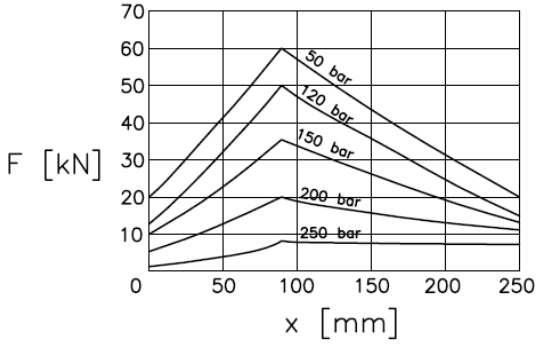
Freewheeling operation



This is the most suitable circuit for high speed freewheeling. The motor operates under vocuum conditions, therefore it can work several hours without causing any damage and overheating.
The switch from normal to freewheeling operation (and viceversa) must be done at low speed and pressure.
For further informations please contact Intermot technical department.

Radial load





In the above diagram, it is shown the maximum radial load to ensure a minimum life of 100000 revolutions.

Drum Brakes – RC Series – Technical data

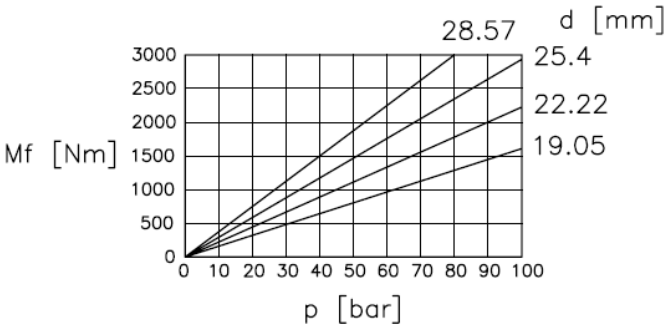
Motor technical data

	Displacement	Specific Torque	Max cont. pressure	Max interm. pressure	Peak pressure	Max cont. speed	Maximum freewheeling speed (*)	Max power	Max torque
	cc/Rev	Nm/bar	bar	bar	bar	Rpm	Rpm	kW	Nm
RC 100	100	1.6	250	280	350	1050	1500	40	560
RC 150	157	2.5	250	280	350	1050	1500	40	875
RC 195	195	3.1	250	280	350	900	1500	40	1085

The motor is available in left and right configuration.
(*) For th ehydraulic circuit, please refer to page 4 (freewheeling opeartion).

Brake technical data

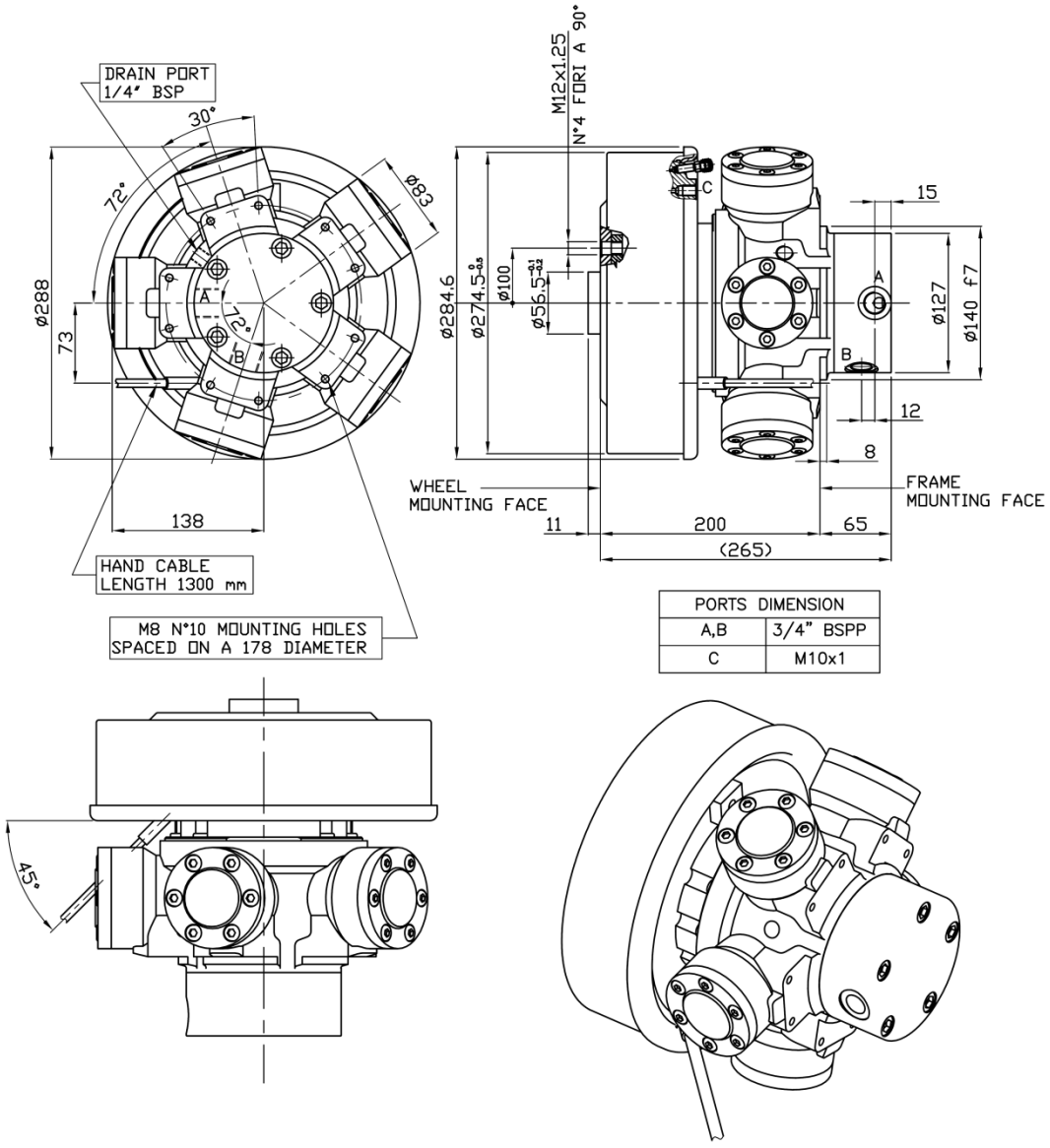
Brake Piston Code	Brake Piston Diameter	Max Braking Torque	Max Braking Pressure
	(mm)	(Nm)	(bar)
1	19.05	1600	100
2	22.22	2250	100
3	25.4	2950	100
4	28.57	3000	80



The drum brake is equipped with a cylinder for dynamic brake and a hand cable for the parking brake. The user can choose, according to the required braking torque and pressure, among four different brake cylinder dimensions (see the diagram). The user can use brake oil or mineral oil.
The brake is equipped by an air bleeder to remove periodically the air from the brake, because the air presence in the brake can cause braking problems.

Dimensional drawings

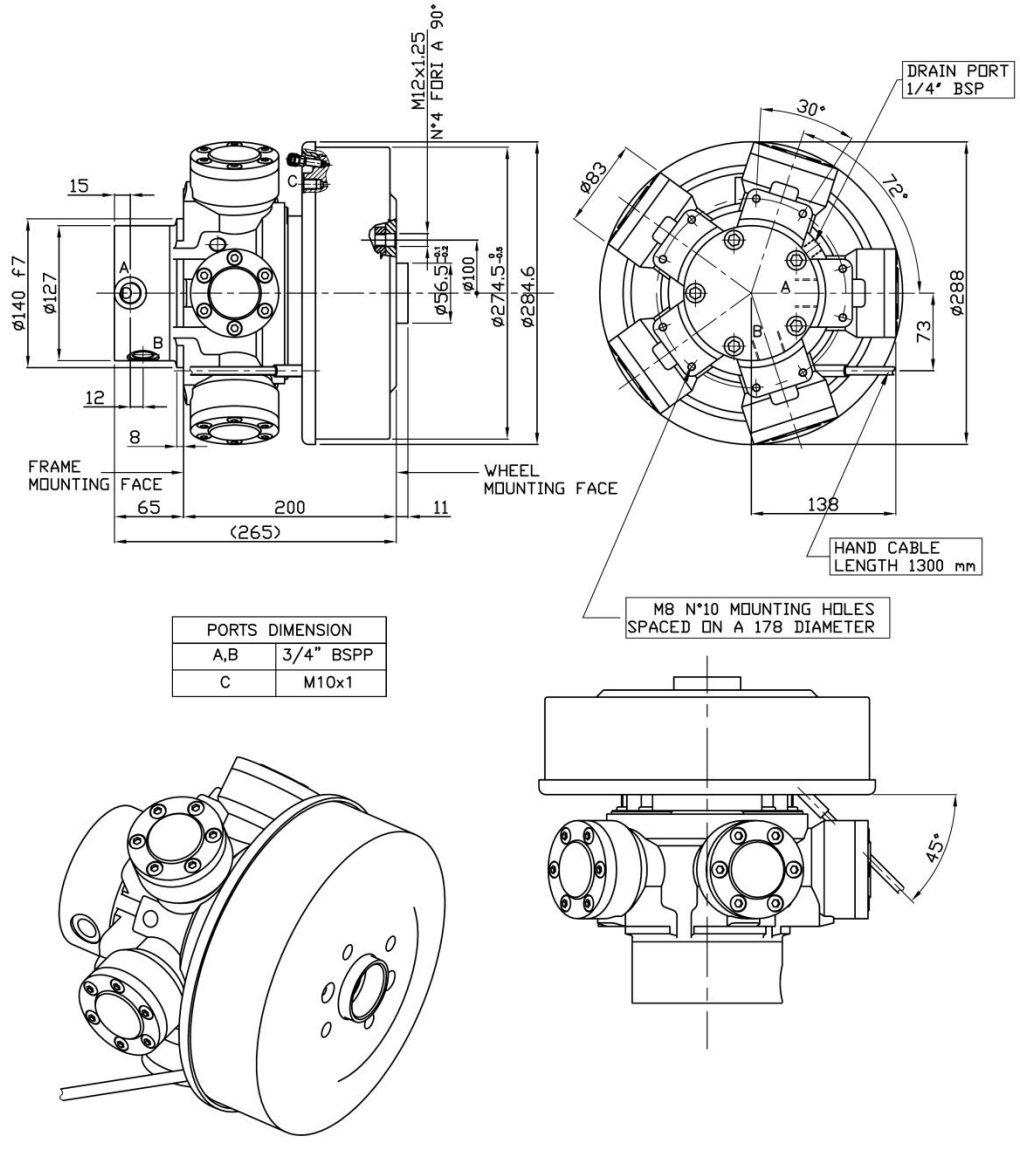
RC 100-150-195 DX



PORTS DIMENSION	
A,B	3/4" BSPP
C	M10x1

The drum brake is equipped by cylinder for dynamic brake and cable for parking brake

RC 100-150-195 SX



PORTS DIMENSION	
A,B	3/4" BSPP
C	M10x1

The drum brake is equipped by cylinder for dynamic brake and cable for parking brake

Ordering Instructions

_ _ _ _ _	_ _ _	_	_	_
Wheel motor				
RC Series				
	Displacement			
	100			
	150			
	195			
		Type		
		DX		
		SX		
			Brake piston code	
			1	
			2	
			3	
			4	
				Brake fluid
				A (brake oil)
				B (mineral oil)

Example:
RC 150 DX 4 A
RC 195 SX 3 B