UK GENERAL INFORMATION

To meet the needs of an increasingly demanding and selective market Dinamic Oil have completely updated their RE and GB ranges of planetary gearboxes. With the introduction of new sizes the already comprehensive product lines have been extended and enhanced in line with feedback from the power transmission market.

Planetary gearboxes are suited to a broad range of applications covering the high overload characteristics found in the mobile industry to the longevity and reliability requirements of the industrial sector.

In the mobile market Dinamic Oil products can be found in machinery for lifting & transportation, building and construction, agriculture & marine; specific applications include concrete pumps, excavators, cranes and aerial platforms, in fact anywhere rotational movement is required. The use of planetary gearboxes for industrial applications is growing rapidly and they are now common in sheet metal, steel, plastics water treatment, chemical, energy mining and process industries.

The new 2012 catalogue facilitates quick & easy preliminary gearbox selection based on the transmissible power adjusted by the appropriate service factors. However, the Dinamic Oil Technical Sales Department is at your disposal providing a wealth of experience backed by the latest technology to provide confirmation and ensure the most cost effective solution in accordance with relevant standards.

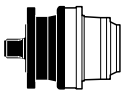
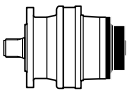
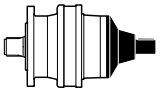
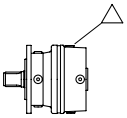
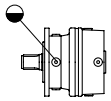
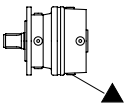
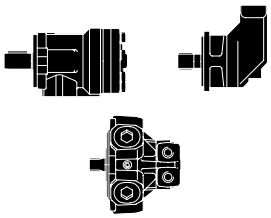
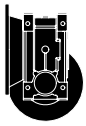
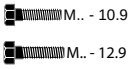
The catalogue illustrates the range of gearboxes in production at the time of going to press with maximum torque capacity between 1000Nm and 3,000,000Nm. If your requirements fall outside this range please contact us.
The renowned versatility of Dinamic Oil gearboxes has been further expanded with the introduction of new input and output adaptors and accessories to make this the most comprehensive transmission system on the market

Contents

List of tables

1.0 Symbols and Unit of Measurement

Symbol	Unit of measurement	Description
$_1$		Input value
$_2$		Output value
bu	mm	Height of toothed set
de	mm	External diameter
dp	mm	Theoretical primitive diameter
fa	N	Axial load
$\mathbf{f_{amax}}$	N	Maximum axial load
$\mathbf{f_r}$	N	Radial load
H	mm	Pinion height
$\mathbf{i_e}$	-	Effective reduction ratio
m	mm	Module
n	RPM	Speed
$\mathbf{n_{max}}$	RPM	Maximum speed
nxh	RPMxh	Duration index
$\mathbf{P_1}$	kW	Rated power
pb	bar	Brake opening pressure
pmax	bar	Maximum brake pressure
$\mathbf{P_t}$	kW	Thermal power
T	Nm	Torque
$\mathbf{T_b}$	Nm	Braking torque
$\mathbf{T_{max}}$	Nm	Maximum torque
X	mm	Load application distance
x	-	Tooth correction
z	-	Number of teeth

Symbol	Description
	Support at output
	Input
	Support at input
 ...Nm	Tightening torque [Nm]
	Oil quantity [liters]
	Weight [kg]
	Oil fill / breather plug
	Oil level
	Oil drain
	Hydraulic motors
	Electrical motors
	Wormgearbox
 M.. - 10.9 M.. - 12.9	Recommended screw
	Reference page

2.0 Construction Options

USABLE MOTORS

1 Electric motor
2 Orbital hydraulic motor
3 Hydraulic motor with axial pistons
4 Hydraulic motor with radial pistons
5 Orbital hydraulic motor "MLR"

TYPES OF INPUT

9 Preparation for motor connection
10 Input shaft
11 Direct electric motor adapter
12 Direct orbital motor adapter
13 Negative brake "F1../F2.."
14 Negative brake "F5../F6../F8../F9"
15 Standard flange
16 Adaptor "MZ"
17 Adaptor "MD"

REDUCTION STAGES

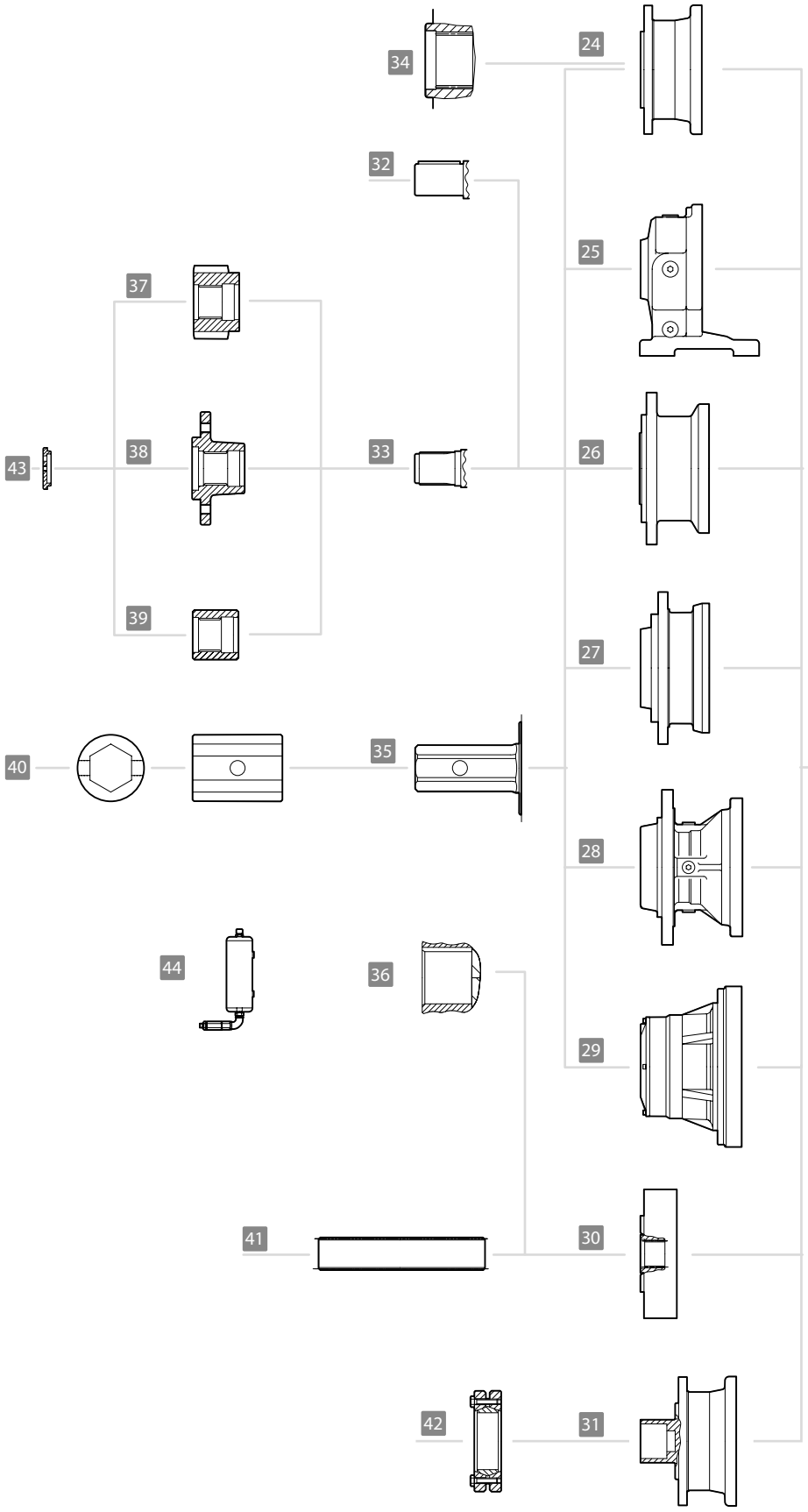
18 Angular gearbox with direct input
19 One reduction stage
20 Two reduction stages
21 Three reduction stages
22 Four reduction stages
23 Five reduction stages

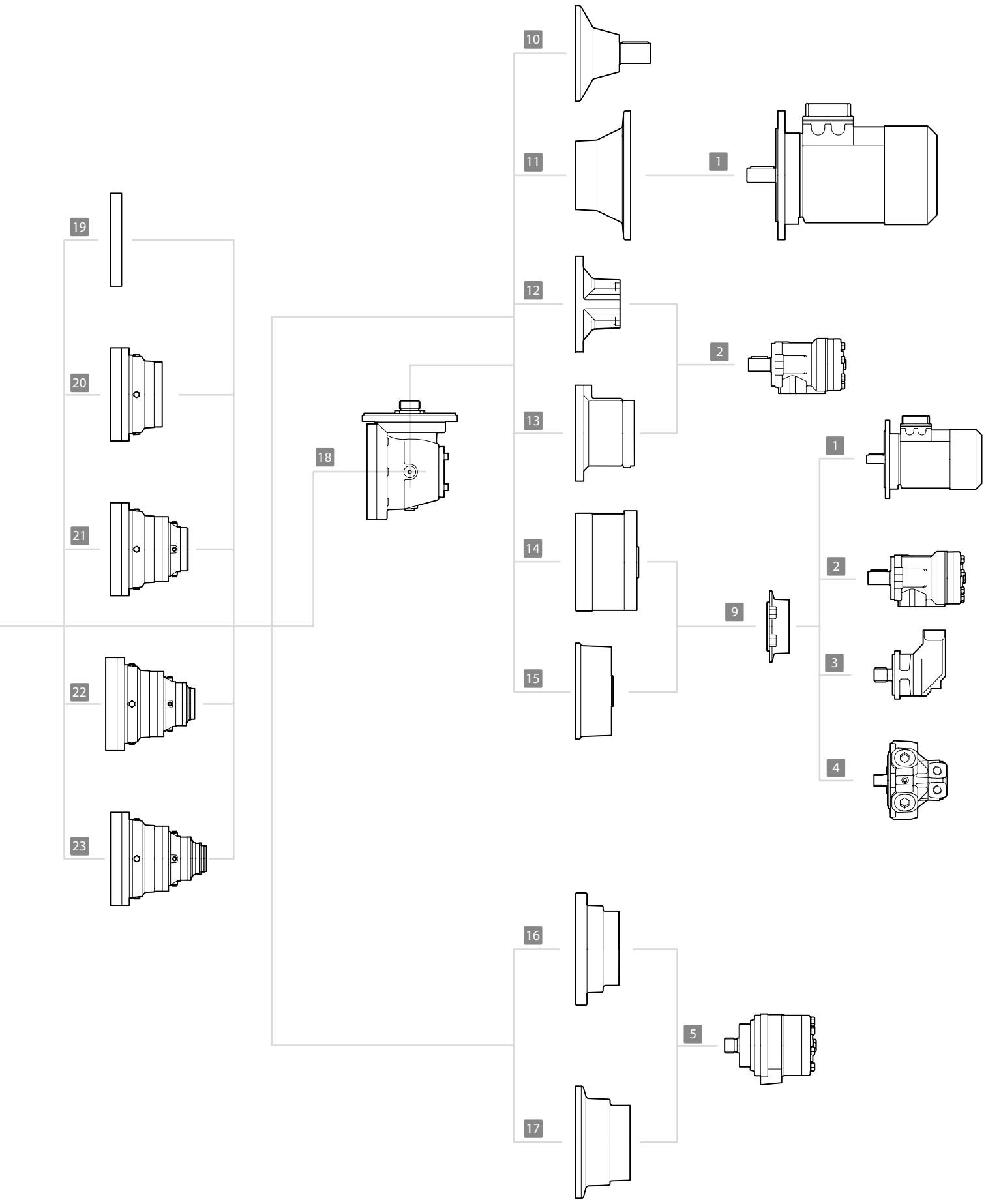
SUPPORTS AND OUTPUT SHAFTS

24 Output support "N"
25 Output support "P"
26 Output support "T"
27 Output support "TR"
28 Output support "TL"
29 Output support "H"
30 Output support "F"
31 Output support "NQ"
32 Cylindrical output shaft
33 Splined output support
34 Female splined output shaft
35 Hexagonal output shaft
36 Female cylindrical output shaft

ACCESSORIES

37 Pinion "P"
38 Flange "FL"
39 Splined bushing "BS"
40 Hexagonal bushing "ES"
41 Splined bar "BF"
42 Shrink disk "GA"
43 End plate "EP"
44 Oil expansion tank "VE"




10
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3.0 Technical Definitions

All values specified in this catalogue were calculated using the ISO 6336 and ISO 281 standards, but may not meet additional requirements set by the internal regulations of certifying bodies.
To select products that comply with these regulations, contact Dinamic Oil's sales team.

f_S - Service Factor

this factor represents the application's industrial rating; it depends on operating conditions, type of drive and frequency of start-up.
The information provided in this catalog is calculated for $f_s = 1$. The service factor value of a gearbox may be calculated by dividing its nominal power by its absorbed power.

Service factors (tab. 1)

	OPERATING CONDITIONS								
	Uniform U			With moderate shocks **M**			With heavy shocks **H**		
hours / day	START-UPS / HOUR								
	< 16	**16 - 63**	**64 - 250**	**< 16**	**16 - 63**	**64- 250**	**< 16**	**16 - 63**	**64 - 250**
< 0.5	0.9	1.3	1.5	0.9	1.3	1.5	1.2	1.5	1.8
0.5 - 3	0.9	1.3	1.5	1.2	1.5	1.8	1.7	2.0	2.3
3 - 8	1.2	1.5	1.8	1.4	1.8	2.0	1.9	2.3	2.8
8 - 24	1.4	1.8	2.0	1.7	2.0	2.5	2.4	2.8	3.0

P_1 - Nominal Power [kW]

the mechanical power transmitted by the gearbox, related to input. At fs = 1 the gearbox has a theoretical lifetime of 10000 hours under the ISO 6336 standard. This value does not take into account any limits on the gearbox's thermal capacity, as it is exclusively based on mechanical resistance in accordance with the speed of use.

P_a - Absorbed Power [kW]

relates to installed or available power, the amount of power actually absorbed by the application, at the gearbox input

P_t - Thermal Power [kW]

the maximum mechanical power the gearbox can transmit while in continuous operation, with splash lubrication, without going beyond its maximum temperature level (oil temperature below 90°C). More power may be transmitted using a Viton seal and synthetic oils or special cooling devices. The values indicated for various gearbox sizes refer to continuous operation with input speeds of 1500 RPM, at an ambient temperature of 20°C and an altitude of 0 / 500 m, for indoor applications.
Under different conditions of use, thermal power must be multiplied by the thermal factors identified in the tables below. For limited periods of operation, followed by periods of rest long enough to guarantee sufficient cooling of the gearbox, thermal power loses its significance and may be neglected.

Thermal Factors (tab. 2)

Ambient Temperature	Operating Time [%]				
	100%	80%	60%	40%	20%
10°	1.2	1.3	1.4	1.6	1.8
20°	1.0	1.1	1.3	1.4	1.6
30°	0.8	1.0	1.1	1.3	1.4
40°	0.7	0.8	1.0	1.1	1.3
50°	0.5	0.7	0.8	1.0	1.1
Altitude [m]	**Input Speed [RPM]**				
	400	800	1000	1500	2000
0	1.2	1.1	1.1	1.0	0.7
500	1.2	1.1	1.1	1.0	0.7
1000	1.1	1.0	1.0	0.9	0.6
1500	1.1	1.0	1.0	0.9	0.6
2000	1.1	1.0	1.0	0.9	0.6

P_d - Power to be Dissipated [kW]
the power that a cooling system must dissipate if the power to be transmitted exceeds the gearbox's thermal power.

η_m - Mechanical Efficiency
The ratio between mechanical power output and input; normally considered equal to 0.97 ÷ 0.98 for each epicycloidal reduction stage in the gearbox, and equal to 0.94 ÷ 0.95 for bevel gear; the actual value depends on a number of factors including speed, torque, ratio, assembly position and lubrication.

T_2 - Torque Transmitted [Nm]
this value represents torque continuously applied at a speed of n_1, at which the gearbox has a theoretical lifetime of 10000 h for gears, or 5000 h (L_{h10}) for the bearings in gear mechanisms.

T_{max} - Maximum Transmissible torque [Nm]
the maximum torque transmitted by the accessory supplied with the gearbox, if applicable. This value may limit the maximum transmissible torque of the gearbox.

T_{2max} - Maximum Torque [Nm]
the maximum admissible output torque, as a peak value or for brief periods of time (calculated at 90% Rs of the weakest component).
For drives with a high number of start-ups or inversions, appropriately reduced maximum torque values should be considered.
The value specified refers to the version with a splined female shaft (FS); different versions may have lower values.

T_b - Braking Torque [Nm]
the value of braking torque that may be conveyed statically by the negative brake.

n_1 - Input Speed [RPM]
the speed on the fast side of the gearbox.

n_2 - Output Speed [RPM]
the speed on the slow side of the gearbox.

n_{1max} - Maximum Speed [RPM]
the maximum input speed at the brake. For applications with higher values, contact Dinamic Oil's sales service to determine application compatibility.

i_e - Effective Reduction Ratio
the actual reduction ratio, meaning the ratio between the gearbox's input and output speeds.

nxh - Duration Index [RPMxh]
the value of the product between speed and duration of theoretical lifetime in hours. This value is expressed as $n_2$xh when used with output speed, $n_1$xh with used with input speed.

Duration Values Required for Different Applications (tab. 3)

Application	Required Lifetime
Agricultural machinery	300 - 3000
Machines operated intermittently or for short periods of time (construction machines)	3000 - 8000
Machines operated intermittently or for short periods of time with high operational reliability (freight lifts)	8000 - 12000
Machines operated 8 hours a day but not all the time (various industrial machines, rotary mills)	10000 - 25000
Machines operated 8 hours a day all the time (various industrial machines, conveyor belts)	20000 - 30000
Machines operated continuously (rolling mills, textiles machines)	40000 - 50000

k_f - Correction Factor
the factor applied to calculate the theoretical lifetime of bearings with male shafts for values of nxh other than those shown in catalog diagrams. External load curves are calculated for all gearboxes as:
- $n_2$xh = 100000 for output supports
- $n_1$xh = 1500000 for input supports

L_{min} - Minimum Length of Torque Arm [mm]
the minimum length recommended for the torque arm, applied to pendular applications.

4.0 Gearbox selection

4.1 Selection

Gearbox selection is based on the service factor required by the application and the required output speed. Once the electric motor has been determined (in terms of nominal speed and power), select the gearbox with the reduction ratio required to reach the required output speed and nominal power needed to ensure that the ratio between its value and the value of the motor's rated power is higher than the service factor.

$$i_e = n_1 / n_2$$

$$P_1 \geq P_a \times f_s$$

Confirm the selection with other parameters such as thermal power, impulse torque and any radial or axial loads acting on the male input and output shafts.
If the drive is not electric, apply the same method for the output torque required by the application rather than the nominal power.

4.2 Verification

Gearbox input and output supports:
these must be verified based on any radial and axial loads present. For each model, the catalog provides diagrams representing the dynamic radial loads that may be supported in accordance with the ISO 281 standard with a duration of L_{10} corresponding to nxh = 100000. For different durations, an applicable radial load can be calculated by multiplying the values in the diagrams by the corrective factor k_f.
The radial load cannot in any case exceed the maximum value on the curve in the diagram.
Make sure that if there are axial loads, they do not exceed the maximum permitted value.

Output torque:
this must never exceed the maximum transmissible torque of the selected gearbox. Carefully check that this value is higher than the maximum torque deliverable by the motor installed, shown at the gearbox output (that is, multiplied by the actual reduction ratio and the gearbox's mechanical yield).

Input speed:
for speeds other than those shown in the table, please contact the sales office.

Thermal power:
if installed power exceeds the gearbox's thermal power, select a larger gearbox and use synthetic oil with Viton seals or use a cooling circuit.
If you use Viton seals and synthetic oil, you may consider the thermal factor equivalent to an ambient temperature lower than 20°C with respect to the actual temperature, in order to consider the fact that the gearbox can withstand overheating 20°C over the projected data.
If you use a cooling system, the power to be dissipated is

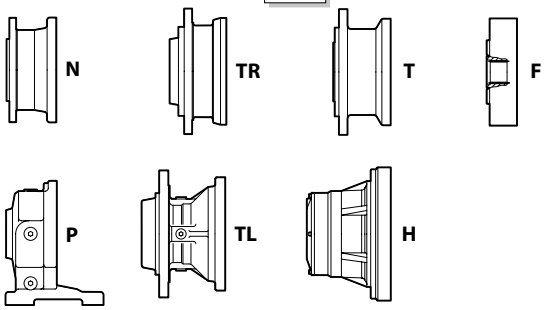
$$P_d = (P_a - P_t) \cdot (1 - \eta_m)$$

5.0 Order code

RA	21	3	P	S	78.7	

OUTPUT VERSION

G-2



OUTPUT SHAFT

G-2

S = Male spline
F = Female spline
C = Cylindrical shaft
K = Extended cylindrical shaft
E = Hexagonal shaft
Q = Hollow female shaft
FS = Female spline
FC = Female cylindrical shaft
U = Female cylindrical shaft

NUMBER OF STAGES

F-2

1 - 2 - 3 - 4 - 5 - 6

GEARBOX FRAME SIZE

F-1

RE - RA	RE - RA	GB - GBA	GB - GBA
110	**1520**	**12010**	**61000**
210	**2000**	**16000**	**85000**
240	**2520**	**21000**	**110000**
310	**3000**	**26000**	**130000**
510	**3510**	**31000**	GB
610	**4800**	**40000**	**150000**
810	**6000**	**45000**	**205000**
1020	**8000**	**53000**	**235000**

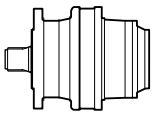
REDUCTION RATIO

F-2

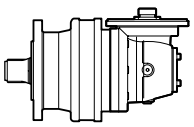
Please write the exact ratio as shown on the selection table

EXECUTION

F-1



RE - GB = Linear



RA - GBA = Angular

COMPOSITION

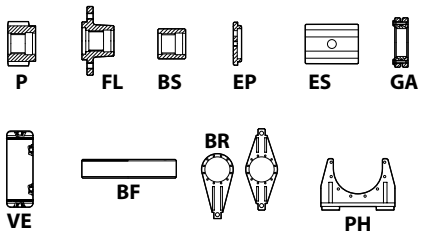
F-2

/ = Standard
L = Light
R = Reinforced
S = Special

ST **BB** **B3** **0** **BS**

OUTPUT ACCESSOIRES

H-36



P = Pinion
FL = Flange
BS = Splined bushing
EP = End plate
ES = Hexagonal bushing
GA = Shrink disc
VE = Expansion tank
BF = Splined bar
BR = Torque arm
PH = Foot support

RIGHT ANGLE POSITIONING

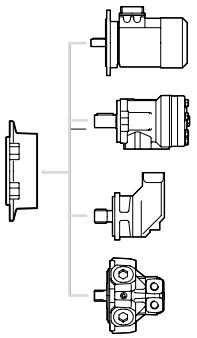
H-46

MOUNTING POSITION

H-46

MOTOR ADAPTER CONFIGURATION

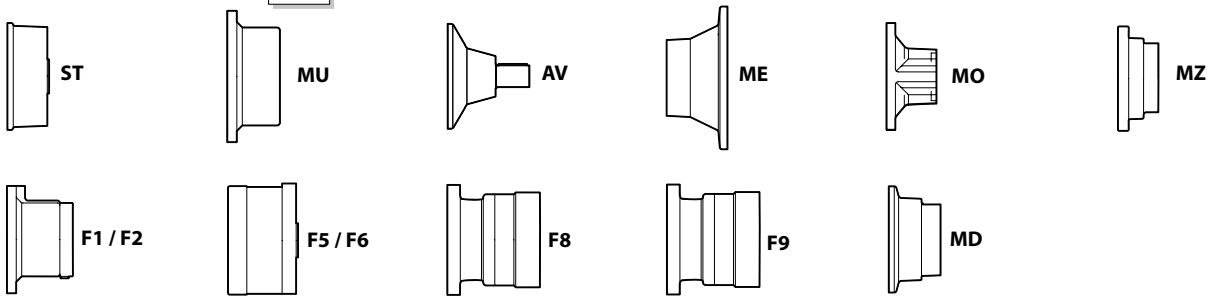
H-27



Electric motor
Orbit motor
Axial piston motor
Radial piston motor

DIRECT INPUTS

H-2



The example shows the ordering code for a right angle planetery gearbox frame 210, with 3 reduction stages a foot mounted output support and a male splined shaft, and 78.7 reduction ratio, with a "ST" input and "SAE B", 16/32 15 teeth motor adapter flange. Horizontal mounting position and standard right angle positioning, and a splined bushing output accessory.

6.0 Negative Hydraulic Brakes

6.1 1.1 Negative Hydraulic Multi disk Brakes

Dinamic Oil gearboxes may have a static negative multi disk brakes and hydraulic control.
The brakes on models **F1** through **F2** are designed for direct assembly of orbital hydraulic motors with flanging, compliant with the SAE A Standard.
The brakes on models **F5** through **F6** reach greater braking torques and have an ST universal for connection to wide range of motors available on the market.
The brakes on model **F8** reach braking torques of up to 3000 Nm and have anl MU input for connection to a wide range of motors available on the market.
The brakes on model **F9** reach braking torques of up to 1500 Nm. An optional sprag clutch mechanism with a torque of up to 1200 Nm can also be mounted. They have a "SAE C" or "SAE D" input and or optional universal ST input. These can be used for connection to a wide range of motors available on the market.
The **MD** brake is assembled with a direct flange connection for MLR motors on reduction stages RE 110-240.

Braking is generated by springs which compress fixed tempered steel disks alternating with bronze disks; friction transforms this thrust into a braking torque.
The brakes open when hydraulic oil pressurizes the brake release port; the pressure acts on a piston which compresses the spring so that the disks can turn freely. These are parking brakes which act by creating static braking torque when hydraulic release pressure is zero. The action stops when hydraulic pressure reaches the minimum release value.
For the following brakes F1, F2 and standard versions of F5, F6 and F8, circa 0.1 liter of mineral oil, with an ISO VG 32 viscosity is required.
Several brake models - F5, F6, F8 and F9 - are available in special versions with a higher maximum velocity.

6.2 Brake Selection

The following criteria must be considered:

- Braking torques are calculated under zero release pressure; if there is counter-pressure in the hydraulic circuit the actual braking values will be reduced as follows:

  Actual torque = Theoretical torque x (Opening pressure – Counter-pressure) / Pressure at the start of opening.

- Brake torque multiplied by the reduction ratio and divided by gearbox efficiency must be greater than or equal to the required output torque:

$$T_b \times i_e / \eta_m \geq T_2$$

- Except in particular cases, brake torque multiplied by the reduction ratio and divided by gearbox efficiency must not exceed the maximum gearbox torque:

$$T_b \times i_e / \eta_m \leq T_{2max}$$

7.0 Assembly Positions

For a complete definition of gearbox order code, it is necessary to determine the assembly position. This position defines the location of the oil filling caps, levels and drainage plugs.
See page H46 - H48.

8.0 Installation Instructions

The information in this chapter is indicative: it provides a partial summary of the installation and maintenance manual, which users should always refer to for more detailed information.

8.1 Installation

Gearboxes with flange and male shaft:
the coupling frame must have an unpainted, flat surface for the gearbox to rest on. The surface should be processed with machine tools and perpendicular to the axis of rotation. The table below shows the tolerance for centering on couplings.
For the RE series, the centering has a tolerance of H8.

Diameter	[mm]	**80 - 120**	**120 - 180**	**180 - 250**
Tolerance	[mm]	+0.054 0	+0.063 0	+0.072 0
Diameter	[mm]	**250 - 315**	**315 - 400**	**400 - 500**
Tolerance	[mm]	+0.081 0	+0.089 0	+0.097 0

The gearboxes sized from RE1520 to RE8000 with output H have two pilot diameters. It is sufficient to use 1 pilot when the radial loads on the output shaft are not present or are less than 50% of the maximum permitted loads.
For the GB line, the pilot diameter has a tolerance of F8.

Diameter	[mm]	**80 - 120**	**120 - 180**	**180 - 250**
Tolerance	[mm]	+0.186 +0.076	+0.205 +0.080	+0.226 +0.086

Gearboxes with a female splined shaft:
gearboxes with a female splined output shaft are not suitable for supporting radial loads on the output; it is therefore very important to carefully align the gearbox and the drive shaft. It is also necessary to check that the drive shaft does not bend while operating.

Gearboxes with Foot Support:
the gearbox foot support must be anchored to a flat surface and be aligned with the drive machine; it is important to align and level it very carefully. Incorrect support or alignment will affect the gearbox's lifetime.

Gearboxes with Pendular Assembly:
anchor the torque arm so that it is not constrained in the direction of the gearbox axis. The anchor point must have appropriate shock absorption.
The dimensional tables for each gearbox show the minimum length of the torque arm.

Torques and corresponding axial forces exerted by large pitch screws (tab. 4)

	Class 8.8		Class 10.9		Class 12.9	
	Torque [Nm]	Force [N]	Torque [Nm]	Force [N]	Torque [Nm]	Force [N]
M10	44	26000	62	37000	74.5	44000
M12	77	37800	108	53000	130	64000
M14	122	51500	172	72000	207	87000
M16	191	70400	269	99000	323	119000
M18	263	86000	370	121000	444	145000
M20	373	110000	525	154000	630	185000
M22	507	138000	714	191000	857	229000
M24	645	158000	908	222000	1090	267000
M27	944	206000	1330	289000	1590	347000
M30	1280	251000	1800	353000	2160	424000
M33	1740	311000	2460	437000	2940	525000
M36	2240	366000	3150	515000	3780	618000
M39	2900	437000	4080	615000	4890	738000
M42	3580	502000	5040	706000	6050	847000

8.2 Lubrication

Gearboxes are supplied without oil.
Before use, the gearbox should be filled up to the specified level with a recommended lubricant oil.
The choice and quantity of oil will be determined by the installer / user based on the type of application.

8.3 Paint

Gearboxes are supplied unpainted. Some parts are treated with a water-soluble base coat of red epoxy paint. The customer should paint them using a paint compatible with the base coat. Oil seals must be protected during painting

8.4 Assembling Flanged Motors

Assembling motors on the coupling flanges supplied by Dinamic Oil is easy, but these important recommendations should be followed:
- lubricate the coupling with a light layer of anti-seizure grease or lubricant;
- make sure the motor runs freely but snugly on the flange, anchoring the gearbox in place, without forcing the shaft or the pilot;
- tighten screws.
Refer to the installation and maintenance manual for additional information.

8.5 Assembling Motors with Connection Couplings

When connection couplings are used between the motor and the gearbox, ensure that the alignment is compatible with the type of coupling used. Couplings are widely used in industrial applications for a variety of functions, such as:
- limiting input torque,
- absorbing vibrations from the motor,
- compensating for small misalignments.
When using connection couplings, refer to the instruction manuals supplied by the suppliers of the component.

8.6 Gearbox Weight

For your information, the indicative weights of various gearboxes are provided on page H52.

9.0 Storage

The information in this chapter is indicative: it provides a partial summary of the installation and maintenance manual, which users should always refer to for more detailed information.

Gearboxes must not be stored outdoors or in direct contact with the ground or sun. For long-term storage they must be filled with oil, and all external parts covered with grease; coupling surfaces must be protected with rust proof agents, breather plugs replaced by closed plugs and the gearbox should be operated under no load at least once every two months (one complete turn of the output shaft is sufficient).
Refer to the installation and maintenance manual for additional information on storage.

10.0 Lubrication

10.1 Type of Lubrication

Gearboxes are lubricated in oil baths; before operating the gearbox, fill it with oil and look through the level cap to see if the oil is at the correct level; this operation requires special attention, and you must check the level again after a few minutes of operation. The oil quantities identified in the catalog are approximate and vary according to the reduction ratio and the type of gearbox input and output.

10.2 Selecting an Oil

You may use any mechanical transmission oil with EP additives in viscosity classes ISO VG220 to ISO VG320 under ISO 3448. In special cases, oils with different viscosities may be used; for more information on these exceptions, contact Dinamic Oil's Technical Assistance Service. Oil viscosity must be selected based on ambient temperature and the actual operating temperature of the gearbox. If the gearboxes are being operated at very high ambient temperatures, synthetic oil is recommended. Oil may suddenly overheat in gearboxes assembled vertically and continuously functioning; in these cases it is necessary to use an external expansion tank (which Dinamic Oil may supply) to allow the oil to expand through thermal dilation.

10.3 Changing the oil

Oil must be changed after the first 150 hours of operation, and then according to the following table, or least every 2 years.

Avarage operating duration to oil type

Operating temperature [°C]	Oil type		
	Mineraloil [h]	Syntheticoil [h]	
		Polyalfhaolefins (PAO)	Polyglycols (PG)
70°	7000	15000	16000
80°	5000	10000	12000
90°	3000	7500	9000

10.4 Oil quantity

Information on the quantity of oil required for proper gearbox lubrication is provided on page H49.

10.5 Recommended lubricants

Recommended viscosity (tab. 5)

ISO VG 3448	OPERATING TEMPERATURE [C°]												
	Ambient Temperature [C°]												
	-20°	-10°	0	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
220													
320													

Recommended lubricants (tab. 6)

Lubricants for general use

Manufacturer	Mineral Oil	Synthetic Oil	
		Poly-Alpha-Olefin (PAO)	Polyglycol (PG)
AGIP	Blasia	Blasia SX	Blasia S
ARAL	Degol BG		Degol GS
BP	Energol GR-XP	Enersyn EPX	Enersyn HTX
CASTROL	Alpha SP	Alphasyn EP	Alphasyn PG
CHEVRON	Ultra Gear	Tegra Synthetic	HiPerSYN
DEA	Falcon CLP		
ELF	Reductelf SP	Elf Syntherma	Elf Syntherma
ESSO	Spartan EP	Spartan S EP	Glycolube
FINA	Giran		
IP	Mellana		Telesia Oil
KLÜBER	Kluberoil GEM 1	Klubersynt EG4	Klubersynt GH6
MOBIL	Mobilgear XMP	Mobilgear SHC	Glygoile
OPTIMOL	Ultra		
Q8	Goya	El Greco	El Greco
SHELL	Omala S2 G	Omala S4 GX	Omala S4 WE
TOTAL	Carter EP	Carter SH	Carter SY

Lubricants for food use

Manufacturer	Gear Oils
AGIP	Rocol Foodlube Hi-Torque
ESSO	Gear Oil FM
KLÜBER	Klüberoil 4 UH1 N
MOBIL	DTE FM
SHELL	Cassida Fluid GL

10.6 Temperature

The recommended ambient temperature for use of standard gearboxes is from -15°C to +40°C.

11.0 Independent Cooling Units

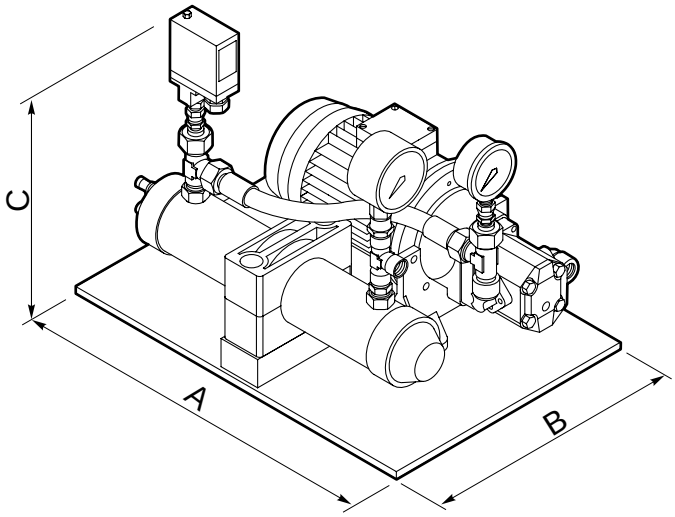
When transmitted power exceeds the thermal power that may be dissipated by the reducer, it is necessary to use a cooling unit to dispose of excessive thermal power.
Dinamic Oil offers a series of independent oil/water and oil/air cooling units which can dissipate up to 50 kW. For greater power levels, contact our technical office.

11.1 Independent oil/water cooling units, standard and customized composition.

Standard series URO/W cooling units are composed of:

- A water/oil heat exchanger.
- A motor-driven pump (motor/pump connection with joint and support; pump with viton seals) composed of a 4 pole B5 motor, standard three-phase 230/400V 50Hz power supply and gear pump.
- 0-16 bar manometer assembled between pump and heat exchanger.
- Analogue 0-120 °C thermometer mounted at the exchanger exit.
- Filter for installation on the tank delivery for cleaning the oil released (recommended option).

Units in customized installations may be equipped with the following options:
- Minimum pressure switch with exchange contacts, for assembly between the pump and the heat exchanger. (In this case the hydraulic system is already prepared).
- Electric flow switch for total control of oil flow. .



Unit	Capacity	Motor-driven oil pump		Water quantity	A	B	C
	[kW]*	[kW]	[l/min]	[l/min]*			
URO/W 4	4	0.37	16	8	500	350	400
URO/W 6	6	0.37	16	10	500	350	400
URO/W 9	9	0.55	16	16	500	350	400
URO/W 13	13	1.1	30	25	500	350	400
URO/W 21	21	1.5	30	40	500	400	450
URO/W 31	31	2.2	56	50	720	510	520
URO/W 50	50	3.0	80	80	730	520	520

* The values appearing in the table are for a water temperature of 20° C..

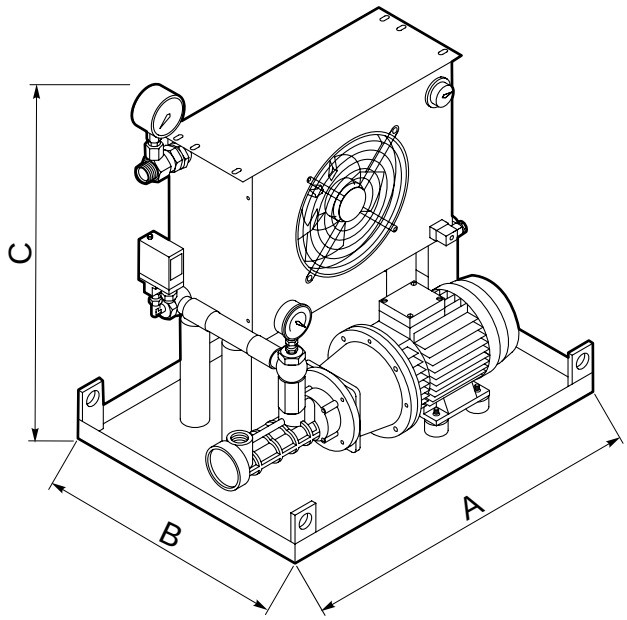
11.2 Independent oil/air cooling units, standard and customized composition

Standard series URO/A cooling units are composed of:

- An air/oil heat exchanger complete with a fan and an adjustable 0-90 ° C thermostat, already wired.
- A motor-driven pump (motor/pump connection with joint and support; pump with viton seals) composed of a 4 pole B3/B5 motor, standard 230/400V - 50Hz power supply and screw pump.
- 0-16 bar manometer assembled between pump and heat exchanger.
- Analogue 0-120 °C thermometer mounted at the exchanger exit.
- Filter for installation on the tank delivery for cleaning the oil released (recommended option).

Units in customized installations may be equipped with the following options:

- Minimum pressure switch with exchange contacts, for assembly between the pump and the heat exchanger. (In this case the hydraulic system is already prepared).
- Electric flow switch for total control of oil flow.
- Filter for installation on the tank delivery for cleaning the oil released (recommended option).



Unit	Capacity	Motor-driven oil pump		Motor-driven fan		A	B	C
	[kW]*	[kW]	[l/min]	[kW]	[m³/h]			
URO/A 5	5	1.5	30	0.12	900	660	430	700
URO/A 7	7	1.5	30	0.12	1300	710	510	700
URO/A 10	10	1.5	30	0.18	2750	710	510	830
URO/A 13	13	1.5	30	0.23	2750	710	510	830
URO/A 16	16	2.2	56	0.23	3500	710	510	1010
URO/A 21	21	2.2	56	0.56	6300	800	500	1200
URO/A 26	26	3	56	0.56	7450	800	500	1265
URO/A 30	30	3	80	0.56	7450	800	500	1265
URO/A 40	40	2.2	56	0.9	9500	1010	600	1350
URO/A 46	46	3	80	0.9	9500	1010	600	1350

* The values appearing in the table are for a air temperature of 20° C.