BONFIGLIOLI
RIDUTTORI

HDP

BONFIGLIOLI
Power & Control Solutions

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1 - GENERAL INFORMATION

1.1 - SYMBOLS AND UNITS OF MEASUREMENT

Symb	U.m.	Description	Symb	U.m.	Description
An	[lbs]	Rated thrust load	**Pn**	[hp]	Rated horsepower
i	-	Gear ratio	**Pr**	[hp]	Horsepower required
I	-	Intermittence	**Rc**	[lbs]	Calculated radial load
J	[lb·ft^2]	Mass moment of inertia	**Rn**	[lbs]	Rated overhung load (OHL)
T	[lb·in]	Torque	**S.F.**	-	Service factor
Tc	[lb·in]	Calculated torque	η	-	Dynamic efficiency
Tn	[lb·in]	Speed reducer rated torque			
Tr	[lb·in]	Torque required			
n	[rpm]	Speed	Footnotes:		
P	[hp]	Horsepower	$\square_1$ value applies to input shaft		
			$\square_2$ value applies to output shaft		

1.2 - PRODUCT FEATURES

Gear units of the HDP series make optimum use of advanced design features, to offer:

- Top torque density.
- Superior performance.
- Silent and vibration-free operation.
- Total ruggedness and reliability.
- Lifetime calculation in accordance with the applicable ISO and AGMA standards.
- Extensive customization through a wide range of options offered in the catalog.

The main construction features of the HDP parallel shaft gear unit range are:

- sizes from HDP 60 to HDP 90 with 2 and 3 stage reduction.
- sizes from HDP 100 to HDP 140 with 2, 3 and 4 stage reduction.

- Optimum distribution of rated torque values across the entire ratio range.
- Gear ratios with 12% constant escalation.
- HDP 60 ... HDP 120: Rigid housing, spheroidal cast iron, paint coated both internally and externally. A modern design without recesses for easy cleaning. Universal mounting thanks to the many machined surfaces. Profiles and dimensions optimized by FEM analysis for superior structural rigidity, low acoustic emissions and a moderate weight.
- HDP 130 and HDP 140: gear case in nodular cast iron horizontally split. This design makes maintenance operations quick and economical.
- Casehardened and hardened alloy steel helical gears with ground profile, optimized for:
  - quieter operation and smoother transmission of input gears
  - maximum transmissible torque of the final reductions
- Input shafts generally casehardened and ground finished. Output shafts from hardened and tempered alloy steel.

- Input shaft configurations:
  - HDP 60 ... HDP 140: solid, single or double-sided shaft with dimensions to UNI/ISO 775-88 (extended length)
- Output shaft configurations:
  - solid, single or double-sided shaft with dimensions to UNI/ISO 775-88 (extended length)
  - hollow shaft with keyway
  - hollow shaft with shrink disc
- Heavy duty taper roller bearings or extra large self-aligning roller bearings from the premium suppliers brands for unparalleled overhung load capacity.
- A wide range of customization options are available upon request, including:
  - auxiliary cooling/heating devices
  - forced lubrication systems
  - backstop device
  - mounting or manifold flanges
  - bearings for increased overhung load capacity (only for HDP 60 ... HDP 90)
  - seals and gaskets in various types and materials
  - sensors
  - dry-well device for vertical shaft installations
  - fixing elements

1.3 - INSTALLATION

The following installation instructions must be observed:

- Make sure that the gearbox is correctly secured to avoid vibrations.
  If shocks or overloads are expected, install hydraulic couplings, clutches, torque limiters, etc.
- Before being painted, the machined surfaces and the outer face of the oilseals must be protected to prevent paint drying out the rubber and jeopardizing the oil-seal function.
- Components to be keyed on to the gearbox output shafts should be machined to ISO H7 tolerances to prevent mating surfaces jamming and causing irreparable damage to the gearbox during installation. Suitable pullers and extractors should also be used to fit and remove such components. These should be properly secured to the threaded hole at the end of the shafts.
- Mating surfaces must be cleaned and treated with suitable protective products before mounting to avoid oxidation and, as a result, seizure of parts.

- Prior to putting the gear unit into operation make sure that the equipment that incorporates the same complies with the current revision of the Machines Directive 89/392.
- Before starting up the machine, make sure that oil level conforms to the mounting position specified for the gear unit and viscosity is suitable for the specific application.
- For outdoor installation provide adequate guards in order to protect the drive from rainfalls as well as direct sun radiation.

1.4 - MAINTENANCE

It is advisable to change the lubricant after the initial 300 hours of operation and thoroughly clean the interior of the unit with a suitable detergent.
Do not mix different types and/or brands of oil.
Periodically check the oil level, and replace at the intervals given in the chart.

(A1)

Oil temperature	Oil change interval [hours]	
	Mineral oil	Synthetic oil
°C < 65 [°F < 149]	8000	25000
65 < °C < 80 [149 < °F < 176]	4000	15000
80 < °C < 95 [176 < °F < 203]	2000	12500

1.5 - STORAGE

Observe the following instructions to ensure correct storage of the products:

- Do not store outdoors, in areas exposed to weather or with excessive humidity.
- Always place boards, wood or other material between the products and the floor. The gearboxes should not have direct contact with the floor.

• In case of long-term storage all machined surfaces such as flanges, shafts and couplings must be coated with a suitable rust inhibiting product (Shell Ensis or equivalent). Furthermore gear units must be placed with the fill plug in the highest position and filled up with oil. Before putting the units into operation the appropriate quantity, and type, of oil must be restored.

1.6 - CONDITIONS OF SUPPLY

Gear units are supplied as follows:
• configured for installation in the mounting position specified when ordering;
• tested to manufacturer specifications;
• mating machined surfaces come unpainted;
• nuts and bolts for mounting motors are provided if a flanged motor input is specified.

1.7 - PAINT COATING

HDP gearboxes of sizes 60 to 90 are externally and internally painted in oven hardened epoxy resin and polyester powder paint that provides excellent protection against corrosion and is suitable for outdoor installations.
The color is RAL 7042 grey. A synthetic top coat may also be applied.
HDP gearbox sizes 100 to 140 are internally and externally spray painted with an epoxy primer, and then externally finished with a coat of epoxy enamel.
Total thickness of paint is 80-100 μm.

1.8 - SERVICE FACTOR

Service factors listed here under are empirical values based on AGMA and ISO specifications as well as experience for use in common applications.
They apply for state of the art-designed driven machines and normal operating conditions.

(*) - Indication of service factor based on FEM 1.001 classification available upon request. Consult factory.

- Hoists for passengers lift: charted **values not applicable**. Consult factory.

Application	≤ **10** hours/day	> **10** hours/day
AGITATORS, MIXERS		
Pure liquids	1.25	1.50
Liquids and solids	1.25	1.50
Liquids - variable density	1.50	1.75
BLOWERS		
Centrifugal	1.00	1.25
Lobe	1.25	1.50
Vane	1.25	1.50
CLARIFIERS	1.00	1.25
CLAY WORKING MACHINERY		
Brick press	1.75	2.00
Briquette machine	1.75	2.00
Pug mill	1.25	1.50
COMPACTORS	2.00	2.00
COMPRESSORS		
Centrifugal	1.25	1.50
Lobe	1.25	1.50
Reciprocating, multi-cylinder	1.50	1.75
Reciprocating, single-cylinder	1.75	2.00
CONVEYORS **GENERAL PURPOSE**		
Uniformly loaded or fed - Heavy duty	1.15	1.25
Not uniformly fed	1.25	1.50
- Reciprocating or shaker	1.75	2.00
CRANES (*)		
Dry dock		
Main hoist	2.50	2.50
Auxiliary hoist	2.50	3.00
Boom hoist	2.50	3.00
Slewing Drive	2.50	3.00
Traction Drive	3.00	3.00
Trolley Drive		
Gantry Drive	3.00	3.00
Traction Drive	2.00	2.00
Industrial duty		
Main hoist	2.50	3.00
Auxiliary hoist	2.50	3.00
Bridge and	3.00	3.00
Trolley travel	3.00	3.00
CRUSHER		
Stone or ore	2.00	2.00

Application	≤ 10 hours/day	> 10 hours/day
DREDGES		
Conveyors	1.25	1.50
Cutter head drives	2.00	2.00
Screen drives	1.75	2.00
Stackers	1.25	1.50
Winches	1.25	1.50
ELEVATORS		
Bucket	1.25	1.50
Centrifugal discharge	1.15	1.25
Escalators	1.15	1.25
Freight	1.25	1.50
Gravity discharge	1.15	1.25
EXTRUDERS		
General	1.50	1.50
Plastics		
Variable speed drive	1.50	1.50
Fixed speed drive	1.75	1.75
Rubber		
Continuous screw operation	1.75	1.75
Intermittent screw operation	1.75	1.75
FANS		
Centrifugal	1.00	1.25
Cooling towers	2.00	2.00
Forced draft	1.25	1.25
Induced draft	1.50	1.50
Industrial and mine	1.50	1.50
FEEDERS		
Apron	1.25	1.50
Belt	1.15	1.50
Disc	1.00	1.25
Reciprocating	1.75	2.00
Screw	1.25	1.50
FOOD INDUSTRY		
Dough mixer	1.25	1.50
Meat grinders	1.25	1.50
Slicers	1.25	1.50
GENERATORS AND EXCITERS	1.00	1.25
HAMMER MILLS	1.75	2.00
HOISTS (*)		
Heavy duty	1.75	2.00
Medium duty	1.25	1.50
Skip hoist	1.25	1.50
LUMBER INDUSTRY		
Barkers - spindle feed	1.25	1.50
Main drive	1.75	1.75

Application	≤ 10 hours/day	> 10 hours/day
Conveyors - burner	1.25	1.50
Main or heavy duty	1.50	1.50
Main log	1.75	2.00
Re-saw, merry-go-round	1.25	1.50
Conveyors		
Slab	1.75	2.00
Transfer	1.25	1.50
Chains		
Floor	1.50	1.50
Green	1.50	1.75
Cut-off saws		
Chain	1.50	1.75
Drag	1.50	1.75
Debarking drums	1.75	2.00
Feeds		
Edger	1.25	1.50
Gang	1.75	1.75
Trimmer	1.25	1.50
Log deck	1.75	1.75
Log hauls - incline - weel type	1.75	1.75
Log turning devices	1.75	1.75
Planer feed	1.25	1.50
Planer tilting hoists	1.50	1.50
Rolls - live-off brg. - roll cases	1.75	1.75
Sorting table	1.25	1.50
Tipple hoist	1.25	1.50
Transfers		
Chain	1.50	1.75
Craneways	1.50	1.75
Tray drives	1.25	1.50
Veneer lathe drives	1.25	1.50
METAL MILLS		
Slab pushers	1.50	1.50
Shears	2.00	2.00
Wire drawing	1.25	1.50
Wire winding machine	1.50	1.50
MILLS, ROTARY TYPE		
Ball and rod	2.00	2.00
Spur ring gear	2.00	2.00
Helical ring gear	1.50	1.50
Direct connected	2.00	2.00
Cement kilns	1.50	1.50
Dryers and coolers	1.50	1.50
MIXERS		
Concrete	1.50	1.75

Application	≤ 10 hours/day	> 10 hours/day
PAPER MILLS		
Agitator (mixer)	1.50	1.50
Agitator for pure liquors	1.25	1.25
Barking drums	2.00	2.00
Barkers - mechanical	2.00	2.00
Beater	1.50	1.50
Breaker stack	1.25	1.25
Calendar	1.25	1.25
Chipper	2.00	2.00
Chip feeder	1.50	1.50
Coating rolls	1.25	1.25
Conveyors		
Chip, bark, chemical	1.25	1.25
Log (including slab)	2.00	2.00
Couch rolls	1.25	1.25
Cutter	2.00	2.00
Cylinder molds	1.25	1.25
Dryers		
Paper machine	1.25	1.25
Conveyors type	1.25	1.25
Embosser	1.25	1.25
Extruder	1.50	1.50
Jordan	1.50	1.50
Kiln drive	1.50	1.50
Paper rolls	1.25	1.25
Platter	1.50	1.50
Presses - felt and suction	1.25	1.25
Pulper	2.00	2.00
Pumps - vacuum	1.50	1.50
Reel (surface type)	1.25	1.25
Screens		
Chip	1.50	1.50
Rotary	1.50	1.50
Vibrating	2.00	2.00
Size press	1.25	1.25
Super calendar	1.25	1.25
Thickener (AC motor)	1.50	1.50
Thickener (DC motor)	1.25	1.25
Washer (AC motor)	1.50	1.50
Washer (DC motor)	1.25	1.25
Wind and unwind stand	1.25	1.50
Winders (surface type)	1.25	1.25
Yankee dryers	1.25	1.25
PLASTICS INDUSTRY		
Batch mixers	1.75	1.75
Continuous mixers	1.50	1.50

Application	≤ 10 hours/day	> 10 hours/day
Compounding mill	1.25	1.25
Calendars	1.50	1.50
Secondary processing		
Blow molders	1.50	1.50
Coating	1.25	1.25
Film	1.25	1.25
Pre-plasticizers	1.50	1.50
Rods	1.25	1.25
Sheet	1.25	1.25
Tubing	1.25	1.50
PUMPS		
Centrifugal	1.15	1.25
Reciprocating		
Single acting, 3 or more cylinders	1.25	1.50
Double acting, 2 or more cylinders	1.25	1.50
Rotary		
Gear type	1.15	1.25
Lobe	1.15	1.25
Vane	1.15	1.25
RUBBER INDUSTRY		
Intensive internal mixer		
Batch mixers	1.75	1.75
Continuous mixers	1.50	1.50
Refiner - two rolls	1.50	1.50
Calendars	1.50	1.50
SAND MULLER	1.25	1.50
SEWAGE DISPOSAL EQUIPMENT		
Aerators	2.00	2.00
Chemical feeders	1.25	1.25
Dewatering screens	1.50	1.50
Scum breakers	1.50	1.50
Slow or rapid mixers	1.50	1.50
Sludge collectors	1.25	1.25
Thickeners	1.50	1.50
Vacuum filters	1.50	1.50
SCREENS		
Air washing	1.00	1.25
Rotary - stone or gravel	1.25	1.50
Travelling water intake	1.00	1.25
SUGAR INDUSTRY		
Beet slicer	2.00	2.00
Cane knives	1.50	1.50
Crushers	1.50	1.50
Mills (low speed end)	1.75	1.75
TEXTILE MACHINERY	1.25	1.50

1.9 - LUBRICATION

HDP gearboxes are lubricated with a mixed immersion and splash system. Should the drive speed n_1 be lower than 500 rpm please contact Bonfiglioli Technical Service. In mounting position V5, top bearings of sizes HDP 60 to HDP 90 are grease packed and fitted with Nilos grease retainers, unless the order specifies a forced lubrication system with mechanical pump (optional variants OP1, OP2) or electric pump (option MOP).
If HDP 100 to 140 gearboxes have to be installed in mounting position V5, with the output shaft vertical, one of the above mentioned forced lubrication systems must be specified. The actual system should be selected on the basis of speed and/or operating conditions.
Gearboxes are supplied without lubricant. It is the customer's responsibility to fill them with the appropriate amount of oil before start-up.

Quantities of lubricant listed in the chart are indicative. Refer to centreline of sight glass or the dipstick, if provided, for correct filling. The quantity of lubricant listed in the chart may vary, sometimes substantially, depending on the ratio or particular execution of the product.

(A2)

Quantities are $\dfrac{litres}{gallons}$

	Oil quantity			
	B3	**B6**	**B7**	**V5**
HDP 60 2 - 60 3	10 *2.6*	14.8 *4*	14.6 *4*	16 *4*
HDP 70 2 - 70 3	11 *3*	16 *4*	15 *4*	17 *4*
HDP 80 2 - 80 3	16 *4*	24 *6*	24 *6*	26 *7*
HDP 90 2 - 90 3	23 *6*	34 *9*	33 *9*	37 *10*
HDP 100 2	27 *7*	61 *16*	49 *13*	51 *13*
HDP 100 3 - 100 4	32 *8*	70 *18*	56 *15*	58 *15*
HDP 110 2	27 *7*	61 *16*	49 *13*	51 *13*
HDP 110 3 - 110 4	32 *8*	70 *18*	56 *15*	58 *15*
HDP 120 2	35 *9*	83 *22*	66 *17*	68 *18*
HDP 120 3	43 *11*	96 *25*	77 *20*	79 *21*
HDP 120 4	43 *11*	96 *25*	74 *19*	79 *21*
HDP 130 2	57 *15*	154 *40*	123 *32*	128 *33*
HDP 130 3 - 130 4	86 *22*	181 *47*	145 *38*	150 *39*
HDP 140 2	48 *12*	130 *34*	120 *31*	125 *33*
HDP 140 3	84 *22*	163 *42*	130 *34*	135 *35*
HDP 140 4	88 *23*	163 *42*	130 *34*	135 *35*

(A3)

Lubricant		Kinematic viscosity at 40 [°C], 104 [°F] [cst]		
		ISO VG 220	**ISO VG 320**	**ISO VG 460**
Mineral oil (EP additives)	t_{amb}	0 ... 20 [°C] 32 ... 68 [°F]	10 ... 40 [°C] 50 ... 104 [°F]	20 ... 50 [°C] 68 ... 122 [°F]
Synthetic oil	t_{amb}	0 ... 30 [°C] 32 ... 86 [°F]	10 ... 50 [°C] 50 ... 122 [°F]	—

Lubricant must be pre-heated through the appropriate electric resistance (HE option) in the following cases:

• operation at ambient temperatures lower than 0 °C / 32 °F.

• operation of gear units lubricated by oil immersion and splashing when the minimum ambient temperature exceeds the pour point of lubricant by less than 10 °C / 50 °F.

• Upon starting up gear units with forced lubrication systems (options OP1, OP2 or MOP) if the oil viscosity exceeds 1800 cst. Depending on the type of lubricant used, this value may be produced with ambient temperatures between 10 °C / 50 °F and 20 °C / 68 °F approx.

2 - SELECTING THE GEAR UNIT

2.1 - ENGINEERING SELECTION

1. First determine the gear ratio:

$$i = \frac{n_1}{n_2}$$

2. Calculate horsepower P_{r1} required at input shaft:

$$P_{r1} = \frac{T_{r2} \times n_2}{63025 \times \eta}$$

	η
2x ⚙	0.96
3x ⚙	0.94
4x ⚙	0.92

3. Determine the applicable service factor **S.F.** and the adjusting factor f_m depending on prime mover:

	f_m
Electric motor Hydraulic motor Turbine	1.00
Multi-cylinder internal combustion engine	1.25
Single cylinder internal combustion engine	1.50

4. Use the rating charts to select the gear unit with the gear ratio nearest to that calculated, and with a rated horsepower P_{n1}, so that:

$$P_{n1} \geq P_{r1} \times S.F. \times f_m$$

2.2 - VERIFICATIONS

2.2.1 - SHOCK LOADING

For intermittent duty, impact/shock loading applications or start-ups under full load or with high inertial loads, make sure the following condition is satisfied for momentary peak torque T_p generated during the operating cycle:

$$T_p \leq T_{n2} \times f_p$$

Peaks / hour		f_p				
		1	2 ... 10	11 ... 50	51 ... 100	> 100
Drive	Constant direction	2.0	1.6	1.3	1.1	1.0
	Reversals	1.4	1.2	0.9	0.8	0.7

If the above condition is not satisfied, consider installing a torque limiter or selecting a gear unit of the next size up.

2.2.2 - MOTOR MOUNTING

Because of standardization, the rated power of the electric motor selected might be greater than horsepower P_{r1} actually requested by the application.
Make sure that the electric motor will never develop the extra power at any stage of the operating cycle.
If you have any doubts about the validity of the application data, or uncertainty concerning the actual load pattern, install a torque limiting device or proportionally revise the applicable service factor.

2.2.3 - BACKSTOP DEVICE

If the gear unit is specified with a backstop, verify the load capacity of the device at section <u>3.5.3</u> of this catalog and make sure the torque T_{1MAX} is never exceeded in operation.

2.2.4 - CALCULATING THE RESULTING OVERHUNG LOAD

External transmissions keyed onto input and/or output shafts generate loads that act radially onto same shaft.
Resulting shaft loading must be compatible with both the bearing and the shaft capacity.
Namely shaft loading (R_{c1} for input shaft, R_{c2} for output shaft), must be equal or lower than admissible overhung load capacity for shaft under study (R_{x1} for input shaft, R_{x2} for output shaft). OHL capability listed in the rating chart section.
The procedure described above applies to both the input shaft and the output shaft, but care must be taken to apply factor K_1 or factor K_2 to suit the particular shaft.
The load generated by an external transmission can be calculated, to a good approximation, by the following equation:

(A4)

$R_c[\text{lb}] = \dfrac{2 \times K_r \times T[\text{lb} \cdot \text{in}]}{d[\text{in}]}$	
$K_r = 1$	
$K_r = 1.25$	
$K_r = 1.5 - 2.0$	
$T[\text{lb} \cdot \text{in}]$	M
$d[\text{in}]$	
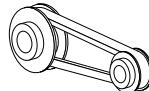
2.2.5 - OVERHUNG LOADING VERIFICATION

(A5)

$$R_x = R_n \times K$$
$$R_c \leq R_x$$

(A6)

x [mm] =	⚙	-75	-50	-25	0	25	50	75	100	150	200	250
						K_1						
HDP 60	2x	—	—	1.10	1.00	0.77	0.62	0.52	0.45	—	—	—
	3x	—	—	1.10	1.00	0.77	0.62	0.52	0.45	—	—	—
HDP 70	2x	—	—	1.10	1.00	0.77	0.62	0.52	0.45	—	—	—
	3x	—	—	1.10	1.00	0.77	0.62	0.52	0.45	—	—	—
HDP 80	2x	—	1.17	1.08	1.00	0.81	0.68	0.54	0.44	0.32	—	—
	3x	—	1.17	1.08	1.00	0.81	0.68	0.54	0.44	0.32	—	—
HDP 90	2x	—	1.15	1.07	1.00	0.83	0.72	0.61	0.50	0.37	—	—
	3x	—	1.15	1.07	1.00	0.83	0.72	0.61	0.50	0.37	—	—
HDP 100	2x	—	1.13	1.06	1.00	0.88	0.79	0.71	0.65	0.55	0.48	—
	3x	—	1.14	1.06	1.00	0.84	0.73	0.64	0.58	0.48	—	—
	4x	—	—	1.10	1.00	0.83	0.71	0.62	0.55	—	—	—
HDP 110	2x	—	1.13	1.06	1.00	0.88	0.79	0.71	0.65	0.55	0.48	—
	3x	—	1.14	1.06	1.00	0.84	0.73	0.64	0.58	0.48	—	—
	4x	—	—	1.10	1.00	0.83	0.71	0.62	0.55	—	—	—
HDP 120	2x	—	1.12	1.06	1.00	0.87	0.78	0.70	0.64	0.54	0.47	—
	3x	—	1.13	1.06	1.00	0.84	0.73	0.64	0.58	0.48	—	—
	4x	—	—	1.10	1.00	0.83	0.71	0.62	0.55	—	—	—
HDP 130	2x	1.15	1.09	1.04	1.00	0.84	0.73	0.62	0.54	0.42	0.35	0.30
	3x	—	1.10	1.05	1.00	0.88	0.79	0.71	0.65	0.55	0.48	—
	4x	—	1.17	1.08	1.00	0.88	0.78	0.71	0.64	0.54	—	—
HDP 140	2x	1.15	1.09	1.04	1.00	0.84	0.73	0.62	0.54	0.42	0.35	0.30
	3x	—	1.10	1.05	1.00	0.88	0.79	0.71	0.65	0.55	0.48	—
	4x	—	1.17	1.08	1.00	0.88	0.78	0.71	0.64	0.54	—	—

(A7)

x [mm] =	-100	-75	-50	-25	0	25	50	75	100	150	200	250	300	350	400	450
						K_2										
HDP 60	—	—	1.20	1.09	1.00	0.74	0.58	0.48	0.41	0.32	—	—	—	—	—	—
HDP 70	—	1.34	1.20	1.09	1.00	0.77	0.63	0.53	0.46	0.36	0.30	—	—	—	—	—
HDP 80	1.38	1.26	1.16	1.07	1.00	0.82	0.69	0.59	0.52	0.42	0.35	0.30	—	—	—	—
HDP 90	1.33	1.23	1.14	1.07	1.00	0.81	0.68	0.58	0.51	0.41	0.34	0.30	—	—	—	—
HDP 100	1.28	1.20	1.12	1.06	1.00	0.81	0.68	0.58	0.51	0.41	0.34	0.30	0.26	—	—	—
HDP 110	1.27	1.19	1.12	1.06	1.00	0.83	0.71	0.63	0.56	0.45	0.38	0.33	0.29	0.26	0.24	—
HDP 120	1.25	1.18	1.11	1.05	1.00	0.83	0.71	0.63	0.56	0.45	0.38	0.33	0.29	0.26	0.24	—
HDP 130	1.20	1.14	1.09	1.04	1.00	0.86	0.75	0.67	0.60	0.50	0.43	0.38	0.33	0.30	0.27	0.25
HDP 140	1.20	1.14	1.09	1.04	1.00	0.86	0.75	0.67	0.60	0.50	0.43	0.38	0.33	0.30	0.27	0.25

2.2.6 - SHAFT LOADING

1. Overhung loads on output shaft

Refer to section 4.1, and verify that both the radial and the axial force acting onto output shaft do not exceed the maximum permitted for the selected product configuration.

Only for HDP units size 60 through 90 the HDB option provides higher capacity bearings to cater for particularly heavy external loads. If external loads exceed the capacity of even the heavy-duty bearings, consider providing external support for the drive shafts, reducing external loads or, if necessary, selecting a gear unit of the next size up.

When checking the overhung load capacity refer to scheme shown at paragraph 2.2.5. Calculate the admissible overhung load **Rx** that is relevant to the distance the force applies from shaft midpoint and compare this with the force **Rc** that acts onto the shaft.

Multiply the nominal radial load Rn_2, as listed in the technical data section, for the load location factor K2 to get the permissible overhung load Rx_2 for the output shaft. Rated overhung loads **Rn** are calculated for the most unfavorable condition as far as direction of rotation and the angle the force applies onto the shaft.

Catalog values are therefore conservative, for an in-depth calculation contact the Technical Service of Bonfiglioli Riduttori.

When a radial force applies a thrust load $An_2 \leq 0.2 \times Rn_2$ is also permitted.

2. Thrust loads on output shaft

Refer to section 4.2 and verify that thrust force on the shaft does not exceed that specified in the chart for the selected product configuration and combination of direction of shaft rotation / direction of force.

Permissible thrust loads refer exclusively to forces applying axially on the shaft. In case of forces applying offset or radially onto the output shaft please consult with Bonfiglioli's Technical Service.

3. Overhung and thrust loads on input shaft

When checking the overhung load capacity refer to scheme shown at paragraph 2.2.5. Calculate the admissible overhung load **Rx** that is relevant to the distance the force applies from shaft midpoint and compare this with the force **Rc** that acts onto the shaft.

Multiply the nominal radial load Rn_1, as listed in the technical data section, for the load location factor K_1 to get the permissible overhung load Rx_1 for the output shaft. Rated overhung loads **Rn** are calculated for the most unfavourable condition as far as direction of rotation and the angle the force applies onto the shaft. Catalog values are therefore conservative, for an in-depth calculation contact the Technical Service of Bonfiglioli Riduttori. When a radial force applies a thrust load $An_1 \leq 0.2 \times Rn_1$ is also permitted.

In the case of gearboxes with through-shafts (LD, RD and DD) the maximum permitted overhung load refers to the shaft end highlighted in black in table (A8).

If an overhung load is applied to both shaft ends, contact Bonfiglioli Riduttori's Technical Service for advise.

(A8)

LL	**LR**	**LD** 2x 3x 4x
RL	**RR**	**RD** 4x 2x 3x
DL	**DR**	**DD** 2x 3x 4x
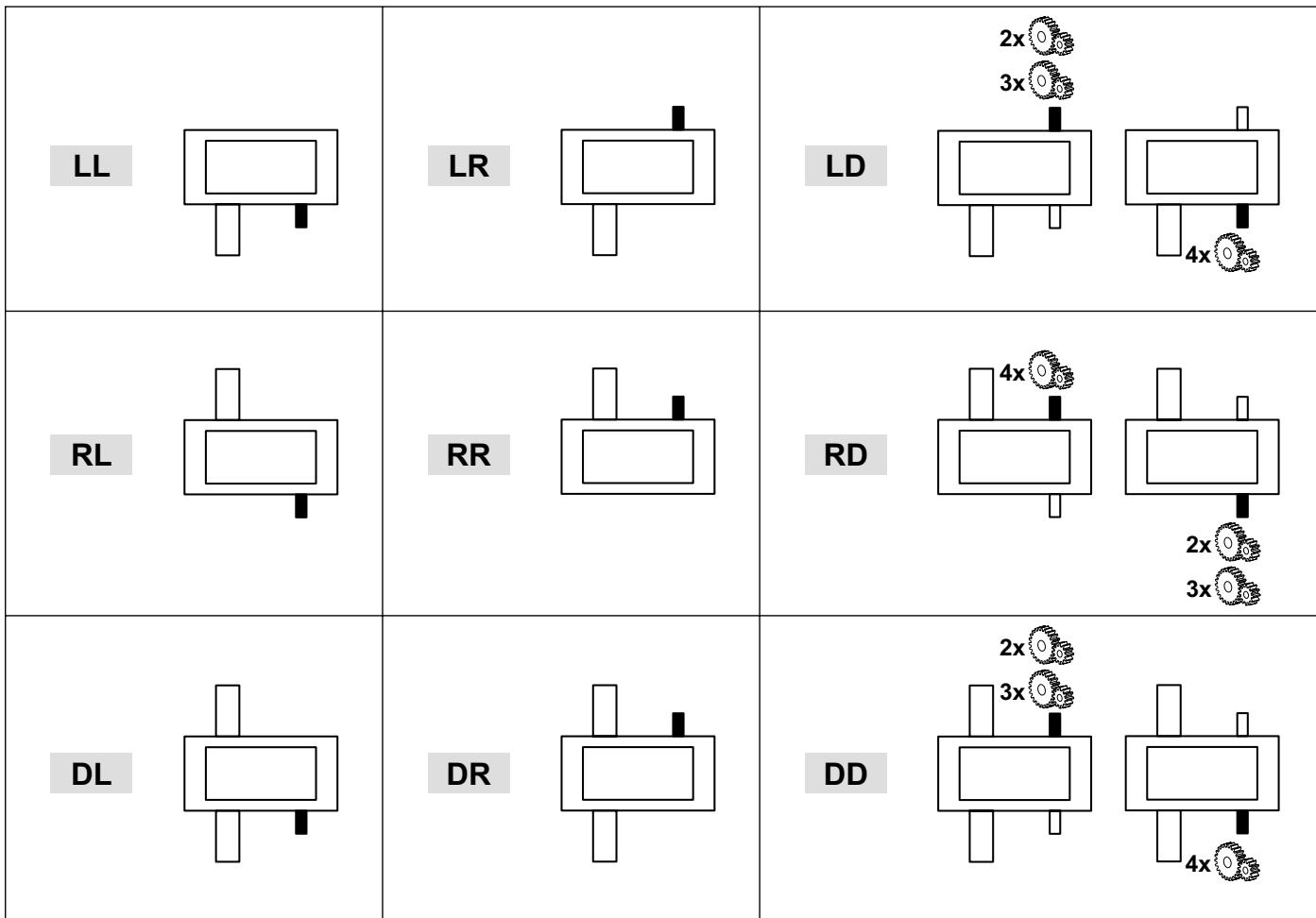
2.2.7 - THERMAL CAPACITY

Thermal capacity P_T is the maximum horsepower that the gearbox can transmit mechanically under continuous operation at an ambient temperature of 20 °C / 68 °F, without the internal temperature rising to a value that could damage the gearbox inner parts.

Checking the thermal capacity may not be necessary if the gear unit operates continuously for less than 3 hours followed by a rest time sufficient to restore the ambient temperature.

Overall thermal capacity can be calculated throuhgh the following equation (A9).

Total value obtained must be greater than the P_{r1} power value for the gearbox input shaft. It is therefore important to verify the following condition:

$$P_T \geq Pr_1$$

|	
P_T	Overall thermal capacity
P_{TB}	Base thermal capacity
P_{T0}	Equivalent thermal capacity under no load
P_{FAN}	Additional thermal capacity linked to fan cooling
P_{SR}	Additional thermal capacity linked to cooling coil fitted in the sump
P_{MCRW}	Water/oil cooling unit contribution
P_{MCRA}	Contribution of air/oil cooling unit

(A9)

$$P_T = (P_{TB} \times f_{TA} \times f_{AMB} \times f_{ALT} \times f_{INT}) - (P_{T0} \times f_i \times fn_1) + (P_{FAN} \times f_{TA} \times f_{ALT}) + P_{SR} + P_{MCRW} + P_{MCRA}$$

mounting positon	P$_{TB}$ [hp]			P$_{T0}$ [hp]			P$_{SR}$ [hp]		
	2x	3x	4x	2x	3x	4x	2x	3x	4x
HDP 60 B3	62	43	—	21	12	—	43	24	—
B6	66	46	—	35	15	—	43	24	—
B7	66	46	—	46	17	—	24	12	—
V5	58	39	—	42	13	—	23	13	—
HDP 70 B3	64	44	—	24	13	—	43	24	—
B6	70	48	—	47	16	—	43	24	—
B7	70	48	—	54	19	—	23	11	—
V5	60	42	—	46	16	—	24	13	—
HDP 80 B3	84	59	—	13	15	—	55	38	—
B6	92	63	—	75	25	—	55	38	—
B7	92	63	—	84	28	—	31	21	—
V5	80	55	—	76	23	—	36	24	—
HDP 90 B3	111	76	—	19	20	—	64	29	—
B6	121	83	—	110	36	—	52	29	—
B7	121	83	—	125	39	—	36	11	—
V5	105	72	—	106	31	—	40	19	—
HDP 100 B3	138	105	79	75	27	15	118	84	64
B6	147	114	87	150	58	17	107	84	64
B7	147	114	87	180	68	21	71	62	47
V5	126	95	72	138	55	23	82	56	43
HDP 110 B3	138	105	79	79	28	16	118	84	64
B6	147	114	87	170	62	17	107	84	64
B7	147	114	87	196	72	21	71	62	47
V5	126	95	72	142	59	23	82	56	43
HDP 120 B3	169	130	99	115	34	20	118	84	64
B6	181	142	107	248	78	20	113	84	64
B7	181	142	107	292	86	24	74	63	48
V5	153	118	90	214	64	25	82	56	43
HDP 130 B3	256	198	151	185	62	40	143	137	105
B6	269	214	164	406	135	40	131	127	99
B7	269	214	164	473	160	52	84	97	74
V5	231	178	135	349	126	55	88	99	75
HDP 140 B3	267	206	157	197	64	43	143	137	105
B6	284	224	170	473	147	42	134	131	105
B7	284	224	170	523	170	54	87	98	74
V5	241	185	141	361	138	56	88	99	75

	1x			2x		
n₁ [rpm]	**P_FANL, P_FANR [hp]**			**P_FANLR [hp]**		
	2x	**3x**	**4x**	**2x**	**3x**	**4x**
HDP 60						
900	13	9	—	—	—	—
1100	17	12	—	—	—	—
1400	20	13	—	—	—	—
1750	23	16	—	—	—	—
HDP 70						
900	13	9	—	—	—	—
1100	17	12	—	—	—	—
1400	20	13	—	—	—	—
1750	23	16	—	—	—	—
HDP 80						
900	25	17	—	—	—	—
1100	32	21	—	—	—	—
1400	36	24	—	—	—	—
1750	42	28	—	—	—	—
HDP 90						
900	29	20	—	—	—	—
1100	38	25	—	—	—	—
1400	43	29	—	—	—	—
1750	50	34	—	—	—	—
HDP 100						
900	55	38	29	99	67	54
1100	71	47	38	127	84	67
1400	79	52	42	142	94	75
1750	91	61	48	163	108	86
HDP 110						
900	55	38	29	99	67	54
1100	71	47	38	127	84	67
1400	79	52	42	142	94	75
1750	91	61	48	163	108	86
HDP 120						
900	55	39	29	99	70	54
1100	71	50	38	127	90	67
1400	79	55	42	142	99	75
1750	91	64	48	163	114	86
HDP 130						
900	87	62	46	157	111	82
1100	113	79	59	202	142	106
1400	125	88	66	224	160	118
1750	144	101	75	257	183	135
HDP 140						
900	87	62	46	157	111	82
1100	113	79	59	202	142	106
1400	125	88	66	224	160	118
1750	144	101	75	257	183	135

(A12)

	MCRW5			MCRW9			MCRW21			MCRW34		
	2x	3x	4x	2x	3x	4x	2x	3x	4x	2x	3x	4x
P_{MCRW} [hp]	155	113	88	282	204	160	496	359	282	906	657	516

(A13)

			MCRA5			MCRA9			MCRA21			MCRA34		
			2x	3x	4x	2x	3x	4x	2x	3x	4x	2x	3x	4x
P_{MCRA} [hp]	t_{AIR}	**20** °C **68** °F	235	170	134	339	247	193	665	483	378	899	651	512
	t_{AIR}	**30** °C **86** °F	182	133	103	264	192	150	517	375	294	700	507	398
	t_{AIR}	**40** °C **104** °F	130	95	74	189	137	107	370	268	210	500	362	284
	t_{AIR}	**50** °C **122** °F	78	56	44	113	82	64	221	161	126	300	217	170

(A14)

Adjusting factors	
Symbol	Relationship
f_i	Factor depends on nominal gear ratio [i_N]
f_{n1}	Factor depends on drive speed n_1. Interpolate for intermediate speed values
f_{TA}	Factor depends on ambient temperature t_a. Interpolate for intermediate values
f_{INT}	Factor depends on the operating cycle per hour [ED%]. Interpolation is permitted
f_{AMB}	Factor depends on the type of ambient the gear unit is installed into
f_{ALT}	Factor depends on the altitude the gear unit operates at. Interpolation is permitted

Ambient temperature				
10 °C 50 °F	20 °C 68 °F	30 °C 86 °F	40 °C 104 °F	50 °C 122 °F
f_{TA} 1.14	1.00	0.86	0.71	0.57

small confined space	large indoor space	*outdoors*
v = 1 mph	v = 3 mph	v = 9 mph
f_{AMB} 0.75	1.00	1.30

Operating cycle per hours [%]				
100%	80%	60%	40%	20%
f_{INT} 1.00	1.05	1.20	1.35	1.80

n_1 [rpm]			
900	1100	1400	1750
f_{n1} 0.63	0.78	1.00	1.30

Altitude a.s.l. [ft]			
0	3280	6560	9840
f_{ALT} 1.00	0.93	0.87	0.81

f_i								
2x			**3x**			**4x**		
i_N	B3-B6	B7-V5	i_N	B3-B6	B7-V5	i_N	B3-B6	B7-V5
7.1	1.00	1.00	22.4	1.00	1.00	112	1.00	1.00
8.0	1.00	1.00	25.0	1.00	1.00	125	1.00	1.00
9.0	1.00	1.00	28.0	1.00	1.00	140	1.00	1.00
10.0	0.78	0.83	31.5	0.87	0.91	160	0.93	0.96
11.2	0.78	0.83	35.5	0.87	0.91	180	0.93	0.96
12.5	0.59	0.68	40.0	0.78	0.84	200	0.86	0.92
14.0	0.59	0.68	45.0	0.78	0.84	224	0.86	0.92
16.0	0.45	0.58	50.0	0.70	0.79	250	0.71	0.79
18.0	0.45	0.58	56.0	0.70	0.79	280	0.71	0.79
20.0	0.35	0.50	63.0	0.42	0.53	315	0.45	0.54
22.4	0.35	0.50	71.0	0.42	0.53	355	0.45	0.54
25.0	0.35	0.50	80.0	0.37	0.49	400	0.40	0.50
			90.0	0.37	0.49	450	0.40	0.50
			100.0	0.34	0.47	500	0.40	0.50
			112.0	0.34	0.47			
			125.0	0.34	0.47			

2.3 - SAMPLE APPLICATION

Application data	
drive speed n_1 = 1100 rpm	Safety factor **S.F.** = 2
o/p speed n_2 = 90 rpm	Torque Tr_2 = 25,000 lbs·in
Mounting position:	**B7**
Operating cycle per hour:	100% → f_{INT} = 1

Environmental conditions		
Ambient temperature	= 30°C / 86°F	f_{TA} = 0.86
Large indoor space		f_{AMB} = 1
Altitude a.s.l.	= 0 ft	f_{ALT} = 1

Product selection:

a)
$$i = \frac{n_1}{n_2} = \frac{1100}{90} = 12.2$$

b)
$$Pr_1 = \frac{Tr2 \times n_2}{63025 \times \eta} = \frac{25000 \times 90}{63025 \times 0.96} \approx 37 \text{ hp}$$

c)
$$P_{n1} \geq P_{r1} \times f_s = 37 \times 2 = 74 \text{ hp}$$

| HDP 70 2 11.7 LP LR VP B7 |

horsepower rating Pn_1 = 79 hp @ n_1 = 1100 rpm

Checking the thermal capacity:

P_{TB} = 70 hp	f_{TA} = 0.86 @ t_{AMB} = 30°C / 86°F	fn_1 = 0.78 @ n_1 = 1100 rpm
P_{TO} = 54 hp	f_{AMB} = 1.0	f_{INT} = 1 @ l = 100%
P_{FAN} = n.a.	f_{ALT} = 1.0	fi = 0.83 @ i_N = 11.2
P_{SR} = n.a.		

$$P_T = (P_{TB} \times f_{TA} \times f_{AMB} \times f_{ALT} \times f_{INT}) - (P_{TO} \times f_i \times fn_1) + (P_{FAN} \times f_{TA} \times f_{ALT}) + P_{SR} + P_{MRCW} + P_{MCRA} = 25 \text{ hp}$$

$$P_T < Pr_1 \qquad \triangle$$

Option 1
- Fan cooling

$$P_{FAN} = 17 \text{ hp @ } n_1 = 1100 \rightarrow P_T = 40 \text{ hp}$$

$$P_T > Pr_1 \qquad ✓ \text{ OK}$$

Option 2
- Cooling coil

$$P_{SR} = 23 \text{ hp} \rightarrow P_T = 48 \text{ hp}$$

$$P_T > Pr_1 \qquad ✓ \text{ OK}$$

3 - PRODUCT CONFIGURATIONS

3.1 - BASE VARIANTS

HDP   70   2   25.0   LP   LR   VP   B3

MOUNTING POSITION

B3, B6, B7, V5

3.3

INPUT CONFIGURATION

VP

3.4.2

SHAFT ARRANGEMENT

LL, LR, LD, RL, RR, RD, DL, DR, DD

3.4.3

OUTPUT SHAFT CONFIGURATION

LP, H, S

3.4.1

GEAR RATIO

7.1 ... 500.0

REDUCTIONS

2, 3, 4

GEAR FRAME SIZE

60, 70, 80, 90, 100, 110, 120, 130, 140

GEARBOX TYPE

HDP

3.2 - OPTIONAL VARIANTS

CERTIFICATES

—, AC, CC, CT   3.5.9

MOUNTING DEVICES

—, TA   3.5.8

DRYWELL

—, DW   3.5.7

SENSORS

—, TG, OLG   3.5.6

OIL SEALING

—, VS, DS, DVS, TK   3.5.5

REINFORCED BEARINGS

—, HDB   3.5.4

MOUNTING FLANGE

**— F350L, F400L, F450L, F550L, F660L, F800L,
F350R, F400R, F450R, F550R, F660R, F800R, FM**   5.1

OUTPUT SHAFT ROTATION

—, CW, CCW

ANTI-RUN BACK DEVICE

—, A   3.5.3

FORCED LUBRICATION

—, OP1, OP2, MOP   3.5.2

AUXILIARY THERMAL DEVICES

**—,FANL, FANR, FANLR,
MCRW5, MCRW9, MCRW21, MCRW34,
MCRA5, MCRA9, MCRA21, MCRA34,
SR, HE**   3.5.1

REMARK: The multiple selection of some of the variants may be subject to technical or dimensional constraints.
Consult with the factory to have your selection approved.

3.3 - MOUNTING POSITION

(A16)

B3	B6
B7	**V5**

3.4 - INPUT AND OUTPUT CONFIGURATION

3.4.1 - OUTPUT CONFIGURATION

(A17)

LP

H	S
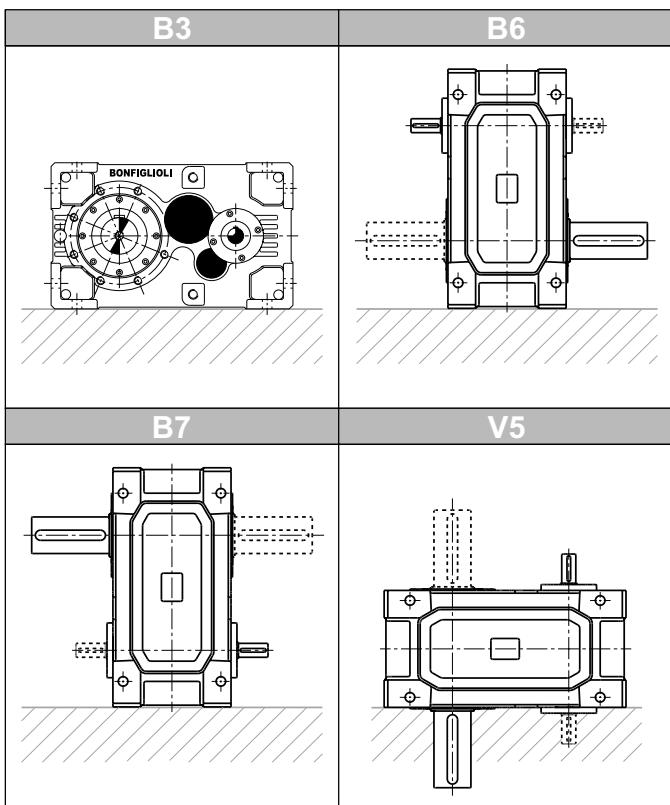
3.4.2 - INPUT CONFIGURATION

On the input side the gear unit can be arranged in either one of the configurations described here after:

· **Solid input shaft**, single- or double-sided – Specify **VP**

(A18)

VP
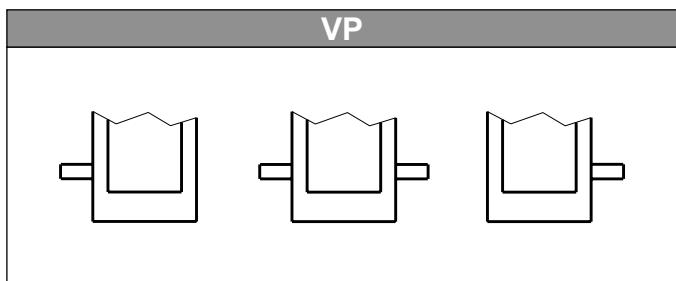
3.4.3 - MOTOR MOUNTING

Flanges, scoops, top mounts and baseplates are available, consult Bonfiglioli.
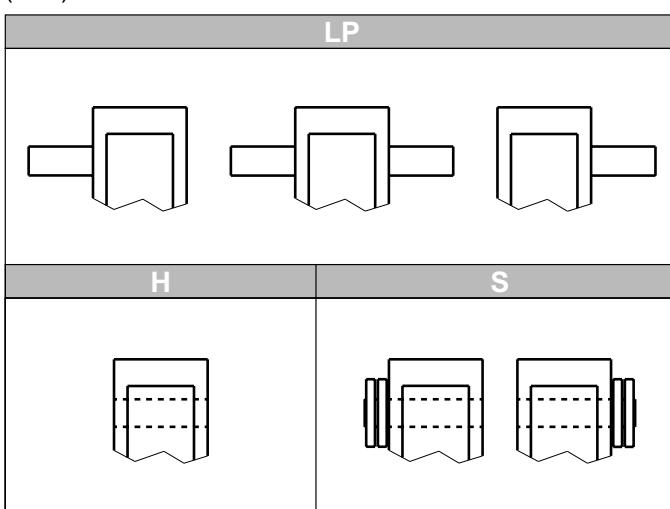
3.4.4 - SHAFT ARRANGEMENT

(A19)

OUTPUT		INPUT		
		VP	VP	VP
LP		LL	LR	LD
LP		RL	RR	RD
LP		DL	DR	DD
H		LL	LR	LD
S		LL	LR	LD
S		RL	RR	RD

21

3.5 - OPTIONAL VARIANTS

3.5.1 - AUXILIARY COOLING DEVICES

3.5.1.1 - FAN COOLING

Greater dissipation capacity can be achieved by installing cooling fans, which are keyed onto gearbox input shaft.

In the case of HDP 60 ... HDP 90 a fan can be fitted to the side opposite the drive end. Specify code FANL or FANR.

On HDP 100 ... HDP 140, the fan can be mounted on the right or left side irrespective of whether a drive shaft is present or not.

It is also possible to maximise the cooling capacity on HDP 100 … HDP 140 by fitting two fans, specifying code FANLR in the order.

This option is not available in conjunction with configurations that use the same shaft end or with MOP variant (forced lubrication with electric pump).

The increased cooling effect is shown by the thermal capacity value P_{FAN}. See chapter 2.2.7

The efficiency of forced ventilation falls drastically below the drive speed of $n_1 = 900$ rpm. In this case, it is advisable to adopt other auxiliary cooling devices to increase the thermal capacity of the gearbox.

(A20)

FANL   **FANR**

(A21)
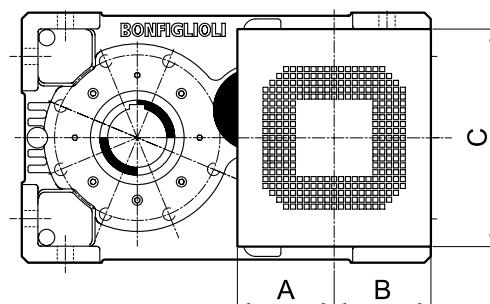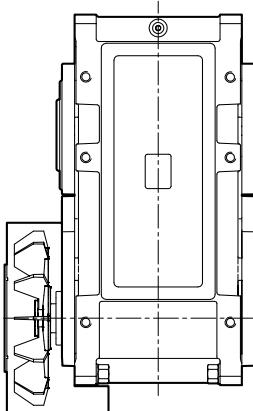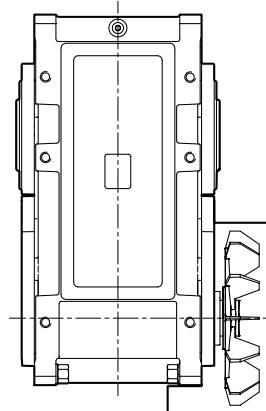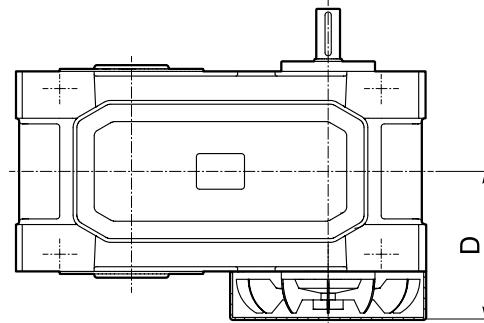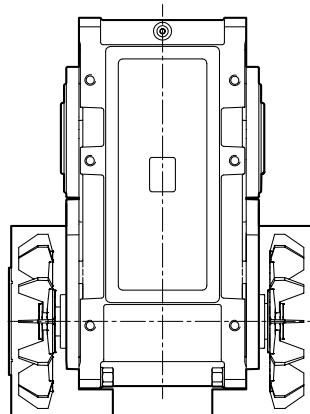
FANLR
(HDP 100 ... HDP 140)

|	A	B	C	D
HDP 60 FAN_	125	130	255	200
HDP 70 FAN_	125	130	255	200
HDP 80 FAN_	155	155	348	235
HDP 90 FAN_	178	178	360	260

(A22)

3.5.1.2 - HEAT DISSIPATION THROUGH COOLING COIL

The cooling coil option **SR** is designed for integration in a cooling circuit to be provided by the installer.

The water supply circuit must correspond to the following specifications: maximum pressure 116 psi, flow rate 1.32 gal/min, maximum delivery temperature 20 °C / 68 °F.

The increased cooling effect obtained in these conditions is shown by the thermal capacity value P_{SR}.

See section, 2.2.7

(A23)

	ratio [i]	A	B	C	X	Y
HDP 100 FAN_	7.4…21.8	105	330	180	424	420
	22.8…107.6	82	330	180	424	420
	110.6…507.9	58	330	180	424	420
HDP 110 FAN_	8.1…25.0	105	330	180	424	420
	24.9…123.4	82	330	180	424	420
	120.9…499.4	58	330	180	424	420
HDP 120 FAN_	7.9…25.4	105	345	180	450	450
	25.8…125.2	85	345	180	450	450
	128.0…523.7	58	345	180	450	450
HDP 130 FAN_	7.3…12.3	130	422	230	540	590
	14.1…48.1	105	422	230	540	590
	56.5…237.9	82	422	230	540	590
	274.5…534.5	58	422	230	540	590
HDP 140 FAN_	8.4…14.4	130	422	230	540	590
	16.3…56.2	105	422	230	540	590
	65.1…277.5	82	422	230	540	590
	315.9…495.3	58	422	230	540	590

	A	B	C
HDP 60_ SR	147	170	60
HDP 70_ SR	147	170	60
HDP 80_ SR	173	190	60
HDP 90_ SR	190	210	60
HDP 100_ SR	232	285	100
HDP 110_ SR	232	270	100
HDP 120_ SR	258	305	100
HDP 130_ SR	325	340	100
HDP 140_ SR	325	365	100

3.5.1.3 - AUXILIARY COOLING WITH INDEPENDENT COOLING UNIT

Two types of cooling unit are available, each in a range of sizes providing different cooling capacities.

The two types use different cooling media for the oil: MCRW… – water/oil heat exchanger and MCRA… – air/oil heat exchanger.

If an independent cooling unit is installed on the advice of the Bonfiglioli Technical Service, no additional forced lubrication devices are required. See section 3.5.2

The following chart shows device availability according to gearbox size.

Selection must take into account the deficit in thermal power that must be made up by contribution P_{MCRW} or P_{MCRA} as shown in the chart in section 2.2.7

(A24)

	MCRW5 MCRA5	MCRW9 MCRA9	MCRW21 MCRA21	MCRW34 MCRA34
HDP 100	X	X		
HDP 110	X	X		
HDP 120	X	X	X(*)	
HDP 130	X	X	X	X(*)
HDP 140	X	X	X	X(*)

(*) not available for mounting position B3.

Independent cooling units feature:

- electric pump with bypass circuit
- delivery filter with blockage indicator
- water/oil heat exchanger with solenoid valve (MCRW...) or air/oil heat exchanger (MCRA...)
- minimum pressure switch
- thermostat of insertion and alarm

General warnings:

MCRW... : need water supply to the following specifications:

- max. pressure, 145 psi
- maximum delivery temperature, 20 °C / 68 °F
- minimum flow rate Q_{H2O} as per the chart:

(A25)

	MCRW5	MCRW9	MCRW21	MCRW34
Q_{H2O} [gallons/min]	2.6	4.8	8.2	14.8

MCRA...: leave sufficient space around the heat exchanger to ensure an unrestricted air flow.

Cooling units are installed on the gearboxes as shown in the figure below.

Contact Bonfiglioli Technical Service for overall dimensions.

(A26)
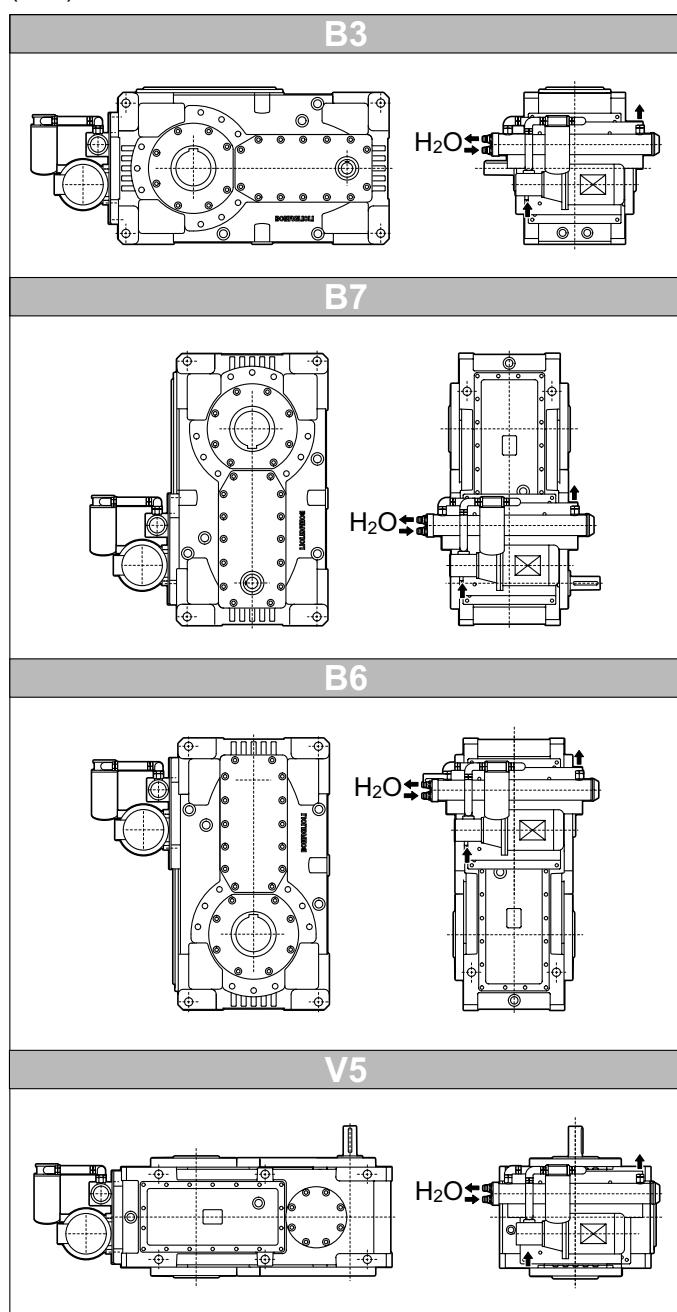
3.5.1.4 - HEATERS

At very low ambient temperatures it may prove necessary to pre-heat the lubricant in the sump before start-up and/or in operation.

The **HE** option envisages the installation of an electrical heating element, supplied with a thermostat to detect when the minimum temperature needed for correct operation is reached.

Wiring necessary for the thermostat must be provided by the installer.

3.5.2 - FORCED LUBRICATION

Pattern for MANDATORY specification of forced lubrication devices.

(A27)

		HDP 60 ... 90	HDP 100 ... 140
B3		⊖	⊖
B6		⊖	⊖
B7		⊖	⊖
V5		(*)	OP... MOP
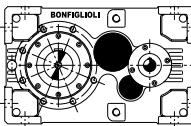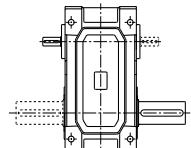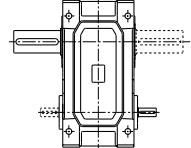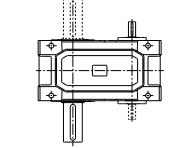
Remark: Forced lubrication devices may be replaced, upon approval from Bonfiglioli Techical Service, by independent cooling systems, type MCR...

(*) Forced lubrication in this case is only optionally requested, NOT MANDATORY.

3.5.2.1 - MECHANICAL PUMP

In continuous duty applications and V5 mounting position installations, an optional forced lubrication circuit is available on request, complete with a pump keyed to the shaft end opposite the drive side. This system ensures adequate lubrication of the top bearings. When ordering, specify the pump type - **OP1** or **OP2** to suit drive speed n_1. See the table below.

(A28)

$n_1 = 900$ [rpm]	$n_1 = 1100$ [rpm]	$n_1 = 1400$ [rpm]	$n_1 = 1750$ [rpm]
OP2	OP2	OP1	OP1

This option is not available along with other configurations that use the same shaft end.

(A29)


HDP 60 ... HDP 90
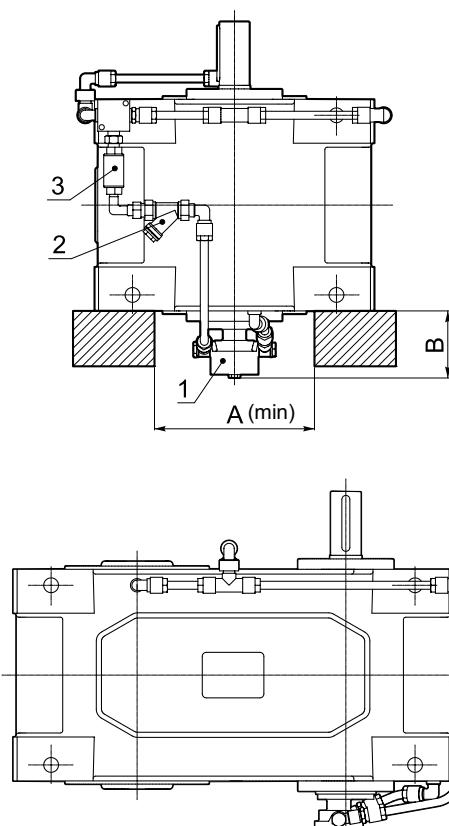
1 - Pump
2 - Filter
3 - Oil flow visual indicator

	A (min)	B
HDP 60_ OP1	190	105
HDP 60_ OP2	190	105
HDP 70_ OP1	215	105
HDP 70_ OP2	215	105
HDP 80_ OP1	240	105
HDP 80_ OP2	240	130
HDP 90_ OP1	240	130
HDP 90_ OP2	240	130

(A31)

HDP 60 ... HDP 140		LL RL DL	LR RR DR	LD RD DD
	LP	⊖	VP	⊖
	H	⊖	VP	⊖
	S	⊖	VP	⊖
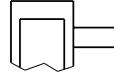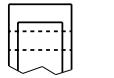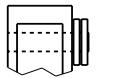
(A30)

HDP 100 ... HDP 140
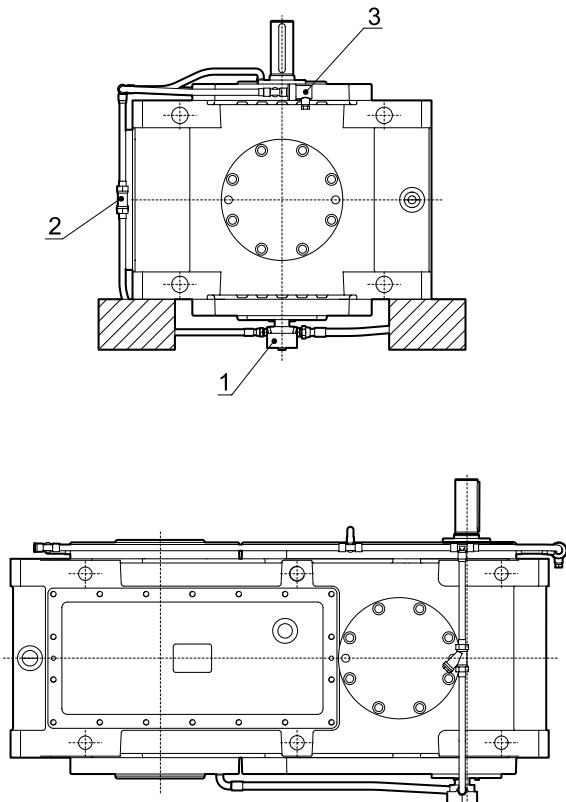
1 - Pump
2 - Filter
3 - Minimum pressure switch

Contact Bonfiglioli Technical Service for overall dimensions.

Chart (A31) shows the applicability for the pump depending on input and output configuration.

3.5.2.2 - MOTOR PUMP

For intermittent duty applications and V5 mounting position installations, a forced lubrication circuit is available on request, complete with an independently powered motor pump. This system ensures a constant oil flow to the top bearings. Specify the **MOP** option.
Option MOP is not available if fan cooling - option FAN_ - is also specified.

(A32)

HDP 60 ... HDP 90
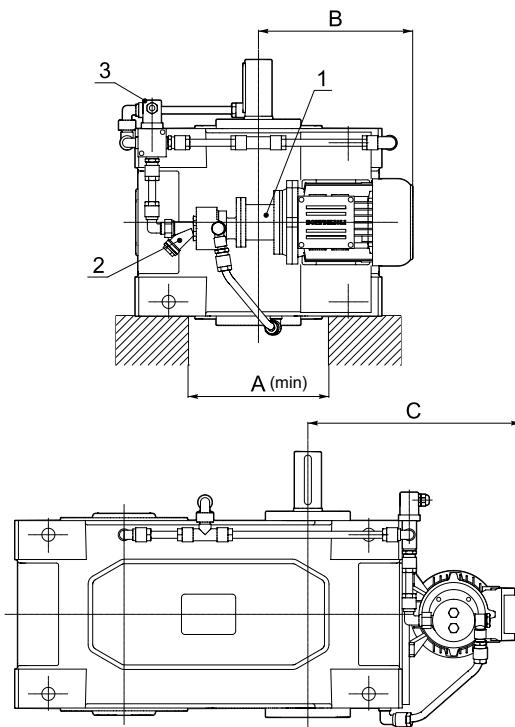
1 - Motorpump
2 - Filter
3 - Minimum pressure switch

	A (min)	B	C
HDP 60_ MOP	190	260	310
HDP 70_ MOP	215	260	330
HDP 80_ MOP	240	270	355
HDP 90_ MOP	240	285	390

(A34)

		LL RD DL	LR RR DR	LD RD DD
	LP	VP	VP	VP
	H	VP	VP	VP
	S	VP	VP	VP
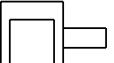
(A33)

HDP 100 ... HDP 140
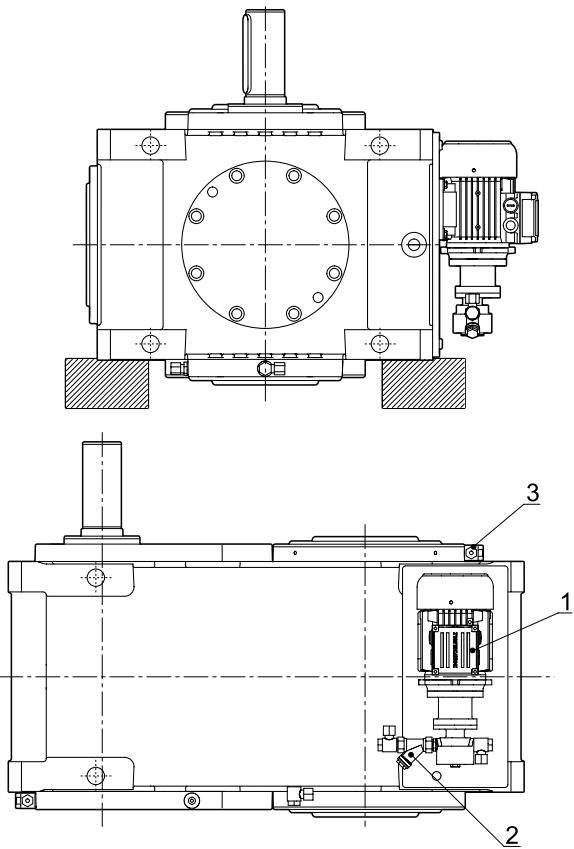
1 - Motorpump
2 - Filter
3 - Minimum pressure switch

Contact Bonfiglioli Technical Service for overall dimensions.

Chart shows applicability for the motorpump depending on input and output configuration.

3.5.3 - BACKSTOP DEVICE

The backstop device ensures that only one direction of rotation is allowed, and prevents the gearbox to be backdriven by the load connected to the output shaft.

In addition to verifying the shock loads shown in section 2.2.1, also make sure that the torque transmitted to the backstop $T_1 = T_2 / (i \times \eta)$ is less than the admissible torque T_{1max} listed in the chart here after (A35).
The backstop is keyed to the input shaft opposite the drive end and it is accessible for inspection.

Along with the specification of the backstop device, option **A**, the direction of free rotation for the output shaft (**CW** or **CCW**) must also be specified in the order.
This option is not available with other configurations that use the same shaft end.

If special operating conditions require it, the user can reverse the direction of rotation of the backstop device by opening the backstop compartment and reversing the direction of the freewheel. If you need to perform this operation, contact Bonfiglioli's Technical Service for the necessary instructions.

The type of backstop is a sprag type device used, based on centrifugally released shoes, does not require any regular maintenance.
This option is not available with other configurations that use the same shaft end.
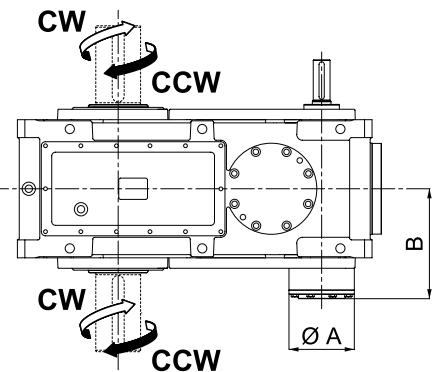
	i	A	B	T_{1max} [in·lbs]	n_{1min} [rpm]
HDP 60 2_A	7.1 ... 15.2	125	202.5	7080	720
	17.3 - 19.4	100	197.5	3319	780
HDP 60 3_A	22.7 … 98.4	100	197.5	3319	780
HDP 70 2_A	8.0 ... 17.7	125	202.5	7080	720
	19.4 - 22.6	100	197.5	3319	780
HDP 70 3_A	25.5 … 114.4	100	197.5	3319	780
HDP 80 2_A	8.1 ... 22.6	130	233	8071	665
HDP 80 3_A	25.8 … 111.4	110	228	4868	740
HDP 90 2_A	7.9 ... 22.4	150	261	12390	610
HDP 90 3_A	25.4 … 110.1	125	256	7080	720
HDP 100 2_A	7.4 ... 21.8	175	285	20798	490
HDP 100 3_A	22.8 … 50.0	150	298	12390	610
	55.5 … 107.6	125	293	7080	720
HDP 100 4_A	110.6 … 507.9	95	262	2744	825
HDP 110 2_A	8.1 … 25.0	175	285	20798	490
HDP 110 3_A	24.9 … 54.5	150	298	12390	610
	60.7 … 123.4	125	293	7080	720
HDP 110 4_A	120.9 … 499.4	95	262	2744	825
HDP 120 2_A	7.9 … 25.4	190	315	26993	480
HDP 120 3_A	25.8 … 56.1	150	285	12390	610
	64.3 … 125.2	125	279	7080	720
HDP 120 4_A	128.0 … 523.7	95	277	2744	825
HDP 130 2_A	7.3 … 12.3	230	425	49560	420
	14.1 ... 21.7	210	395	39825	450
HDP 130 3_A	21.8 … 48.1	190	366	26993	480
	56.5 … 108.3	175	366	20798	490
HDP 130 4_A	111.2 … 121.4	110	332	4868	740
HDP 140 2_A	8.4 … 14.4	230	425	49560	420
	16.3 ... 24.9	210	395	39825	450
HDP 140 3_A	25.1 … 56.2	190	366	26993	480
	72.0 … 124.7	175	342	20798	490
HDP 140 4_A	141.6 … 495.3	110	332	4868	740

⚠ Under continuous operating conditions, it is advisable to maintain a neutral rotation speed n_{1min} greater than that specified in the chart in order to ensure the effective centrifugal release of all the shoes and avoid unnecessary wear. For further details, contact Bonfiglioli Technical Service.

3.5.4 - REINFORCED BEARINGS

Optional heavy-duty bearings are also available, with increased overhung load capacity. The HDB option can only be applied to HDP 60 ... HDP 90 units with the LP shaft arrangement (solid shaft).
See the relevant section in this catalog for precise overhung load values.
Option cannot be specified along with variant DW -drywell-.

3.5.5 - SEALS AND GASKETS

On request, gearboxes can be equipped with different oil sealing systems. These are:

(A36)	TK	VS	DS	DVS
HDP 60	⊖	X	X	X
HDP 70	⊖	X	X	X
HDP 80	⊖	X	X	X
HDP 90	⊖	X	X	X
HDP 100	X	X	X	X
HDP 110	X	X	X	X
HDP 120	X	X	X	X
HDP 130	X	X	X	X
HDP 140	X	X	X	X

TK - Taconite seals are recommended for environments characterised by the presence of abrasive dust or powders. Taconite seals incorporate a combination of sealing rings, labyrinths and a grease chamber.
Greasing must be ensured as part of the scheduled maintenance programme.
VS – Viton® compound seal rings.
DS – Dual set of seal rings at each shaft end.
DVS – Dual set of Viton® compound seal rings at each shaft end.

3.5.6 - SENSORS

Bimetal thermostat – If the **TG** option is specified, a bimetallic thermostat detects when the oil temperature exceeds 90 °C ± 5 °C / 200 °F ± 40 °F.
The device is supplied with the gear unit, but installation and wiring are the responsibility of the installer.

Oil level indicator – If the **OLG** option is specified in the order, the gearbox is supplied with a device to permit remote control of the oil level. The device best operates when the gearbox is idle and should be bypassed when the gearbox is operating. Wiring is the responsibility of the installer.
Variant not available along with the DW -dry well-.

3.5.7 - DRYWELL

The Drywell device, option DW, guarantees proper sealing for the output shaft. It can only be applied to gearboxes with a solid output shaft LP, in vertical mounting position V5. When specified, it necessarily requires the installation of a forced lubrication system, selected from those available for the gearbox, as illustrated in the relevant section of this catalog.
At scheduled intervals, check and refill the grease in the vane underneath the output shaft's bottom bearing.
The chart shows the applicability for the drywell depending on the input and output configurations.

(A37)		LR	DR	LD	DD	LL	DL
	LP	VP	VP	VP	VP	—	
	H	VP	⊖	VP	⊖	—	⊖
	S	VP	⊖	VP	⊖	—	⊖

The drywell **is NOT available** for the gear ratios listed here under:

(A38)

⊖ DW	HDP 60	HDP 70	HDP 80	HDP 90	HDP 100 ... 140
i =	17.3 19.4 43.7 49.1 87.6 98.4	19.4 22.6 49.1 57.0 98.5 114.4	—	20.4 22.4 65.8 73.3 98.9 110.1	Contact Bonfiglioli Technical Service

3.5.8 - MOUNTING DEVICES

For shaft-mounted installations, HDP 60...HDP 90 gear-boxes can be fitted with an electro-welded steel torque arm, complete with anti-vibration bushing.

(A39)
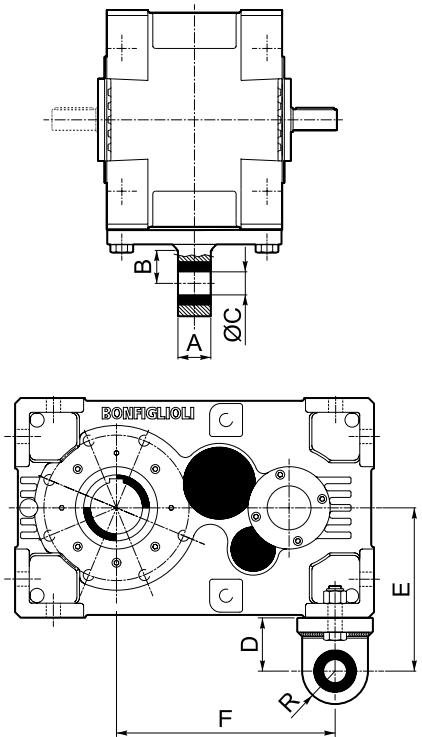
_ TA	A	B	C	D	E	F	R
HDP 60	40	47	32	76	251	340	47
HDP 70	40	47	32	76	251	375	47
HDP 80	60	60	42	97	297	400	60
HDP 90	60	68	42	113	338	460	68

To perform the same function, gearboxes HDP 100 ... HDP 140 can be supplied with a hardened steel bolt to secure the units to the machine framework.

Vibration damping cup springs are also supplied in the kit. The customer must adjust the preload of these springs during installation, respecting clearance G shown in the chart below. The torque bolt must be fitted on the side of the gearbox next to the driven machine.

(A40)
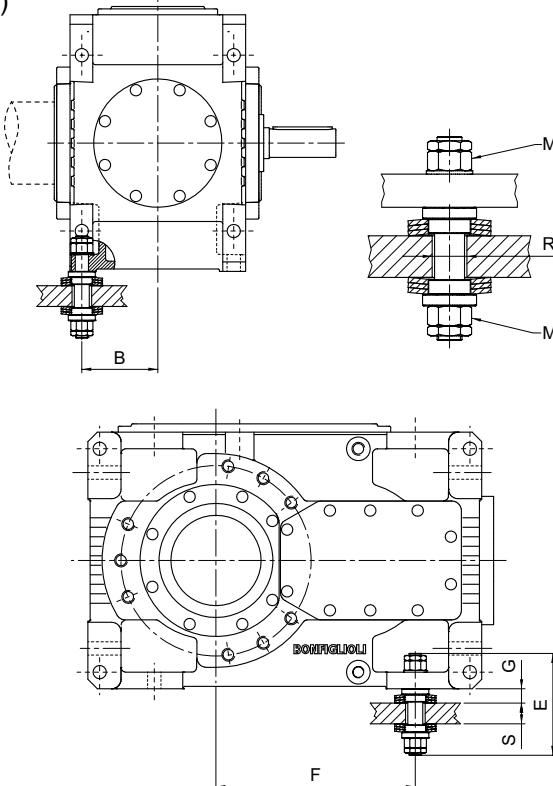
_ TA	F	B	E	N° 3+3 Springs DIN2093	G	R	S	M
HDP 100 2	420	160	237	A100	33.1	35	30 40	M27
HDP 100 3	540							
HDP 100 4								
HDP 110 2	435	160	237	A100	33.1	35	30 40	M27
HDP 110 3	555							
HDP 110 4								
HDP 120 2	480	170	254	A100	33.1	40	40 50	M30
HDP 120 3	630							
HDP 120 4								
HDP 130 2	585	216	316	A125	43.3	45	50 60	M36
HDP 130 3	780							
HDP 130 4								
HDP 140 2	625	216	316	A125	43.3	45	50 60	M36
HDP 140 3	790							
HDP 140 4								

3.5.9 - CERTIFICATES

AC - Certificate of compliance

The document certifies the compliance of the product with the purchase order and the construction in conformity with the applicable procedures of the Bonfiglioli Quality System.

CC - Inspection certificate

The document entails checking on order compliance, the visual inspection of external conditions and of mating dimensions. Checking on main functional parameters in unloaded conditions is also performed along with oil seal proofing, both in static and in running conditions. Units inspected are sampled within the shipping batch and marked individually.

CT - Type certificate

Further to the activities relevant to the Inspection certificate the following checks are also conducted:

• noise

• surface temperature

• tightness of external hardware

• functionality of ancillary devices, if fitted

All checks are conducted with the gear unit running unloaded. Units inspected are sampled within the shipping batch and marked individually.

4 - GEARBOX RATING CHARTS

HDP 60											
	n_1 = 1750 rpm			n_1 = 1400 rpm			n_1 = 1100 rpm			n_1 = 900 rpm		
	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]
HDP 60 2_ 7.1	34515	140	710	37170	120	719	39825	101	789	40710	85	1009
HDP 60 2_ 8.0	35400	127	989	37170	107	1014	37170	84	1014	37170	69	1014
HDP 60 2_ 9.0	37170	120	—	39825	103	—	40710	83	472	40710	68	807
HDP 60 2_ 10.1	37170	107	690	37170	85	964	37613	68	1014	37613	56	1014
HDP 60 2_ 11.2	39825	103	486	40710	84	737	40710	66	1014	41153	55	1014
HDP 60 2_ 12.5	37170	86	1014	37613	69	1014	38055	55	1014	38055	45	1014
HDP 60 2_ 13.5	40710	87	731	40710	70	1014	41153	55	1014	41153	45	1014
HDP 60 2_ 15.2	37613	72	1014	38055	58	1014	38055	45	1014	38055	37	1014
HDP 60 2_ 17.3	40710	68	—	41153	55	378	41153	43	663	41153	35	663
HDP 60 2_ 19.4	38055	57	663	38055	45	663	38055	36	663	38055	29.2	663
HDP 60 3_ 22.7	35843	47	611	38498	40	647	41153	34	686	41153	27.5	686
HDP 60 3_ 25.5	37170	43	686	38055	35	686	38055	27.7	686	38055	22.7	686
HDP 60 3_ 28.2	39825	42	686	41153	34	686	41153	27.0	686	41153	22.1	686
HDP 60 3_ 31.7	38055	35	686	38055	28.3	686	38055	22.3	686	38055	18.2	686
HDP 60 3_ 34.2	41153	35	686	41153	28.4	686	41153	22.3	686	41153	18.2	686
HDP 60 3_ 38.5	38055	29.2	686	38055	23.4	686	38055	18.3	686	38055	15.0	686
HDP 60 3_ 43.7	41153	27.8	686	41153	22.2	686	41153	17.5	686	41153	14.3	686
HDP 60 3_ 49.1	38055	22.9	686	38055	18.3	686	38055	14.4	686	38055	11.8	686
HDP 60 3_ 56.6	41153	21.5	479	41153	17.2	479	41153	13.5	479	41153	11.0	479
HDP 60 3_ 63.6	38055	17.7	479	38055	14.1	479	38055	11.1	479	38055	9.1	479
HDP 60 3_ 68.6	41153	17.7	479	41153	14.2	479	41153	11.1	479	41153	9.1	479
HDP 60 3_ 77.1	38055	14.6	479	38055	11.6	479	38055	9.2	479	38055	7.5	479
HDP 60 3_ 87.6	41153	13.9	479	41153	11.1	479	41153	8.7	479	41153	7.1	479
HDP 60 3_ 98.4	38055	11.4	479	38055	9.1	479	38055	7.2	479	38055	5.9	479

(—) Contact Bonfiglioli Technical Service.

HDP 70

	n₁ = 1750 rpm			n₁ = 1400 rpm			n₁ = 1100 rpm			n₁ = 900 rpm		
	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]
HDP 70 2_8.0	45135	162	724	48233	139	780	51773	117	845	54870	102	908
HDP 70 2_9.3	46905	145	1014	50003	124	1014	53543	104	1014	55313	88	1014
HDP 70 2_10.1	48233	138	—	51773	119	—	55755	100	—	57968	85	292
HDP 70 2_11.7	50003	123	735	53543	106	780	55313	86	1014	55755	71	1014
HDP 70 2_12.6	52215	120	454	55755	103	492	57968	84	728	57968	69	1014
HDP 70 2_14.6	53985	107	980	55313	88	1014	55755	70	1014	56198	57	1014
HDP 70 2_15.2	55755	106	528	57525	87	760	57968	69	1014	57968	57	1014
HDP 70 2_17.7	55313	91	1014	55755	73	1014	56198	58	1014	56198	47	1014
HDP 70 2_19.4	57968	86	—	57968	69	389	57968	54	663	57968	44	663
HDP 70 2_22.6	55755	72	663	56198	58	663	56198	45	663	56198	37	663
HDP 70 3_25.5	57525	67	—	57968	54	402	57968	42	629	57968	34	686
HDP 70 3_29.6	56198	56	629	56198	45	686	56198	35	686	56198	28.8	686
HDP 70 3_31.7	53100	49	519	56640	42	562	57968	34	686	57968	27.7	686
HDP 70 3_36.9	54870	44	665	56198	36	686	56198	28.3	686	56198	23.1	686
HDP 70 3_38.5	56640	43	677	57968	36	686	57968	27.9	686	57968	22.8	686
HDP 70 3_44.7	56198	37	686	56198	29.7	686	56198	23.3	686	56198	19.1	686
HDP 70 3_49.1	57968	35	686	57968	27.9	686	57968	21.9	686	57968	17.9	686
HDP 70 3_57.0	56198	29.1	686	56198	23.3	686	56198	18.3	686	56198	15.0	686
HDP 70 3_63.7	53543	24.8	472	57525	21.3	479	57968	16.9	479	57968	13.8	479
HDP 70 3_73.9	56198	22.4	479	56198	18.0	479	56198	14.1	479	56198	11.5	479
HDP 70 3_77.2	57968	22.2	479	57968	17.7	479	57968	13.9	479	57968	11.4	479
HDP 70 3_89.6	56198	18.5	479	56198	14.8	479	56198	11.6	479	56198	9.5	479
HDP 70 3_98.5	57968	17.4	479	57968	13.9	479	57968	10.9	479	57968	8.9	479
HDP 70 3_114.4	56198	14.5	479	56198	11.6	479	56198	9.1	479	56198	7.5	479

(—) Contact Bonfiglioli Technical Service.

HDP 80

	n₁ = 1750 rpm			n₁ = 1400 rpm			n₁ = 1100 rpm			n₁ = 900 rpm		
	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]
HDP 80 2_8.1	78765	283	825	84075	241	895	90713	205	935	91598	169	1115
HDP 80 2_9.4	81420	252	1115	87173	215	1115	93368	181	1115	99563	158	1115
HDP 80 2_9.8	84075	247	665	89828	211	724	96908	179	771	100448	152	1009
HDP 80 2_11.4	87173	221	1115	93368	189	1115	100005	159	1115	100448	131	1115
HDP 80 2_12.6	91598	210	490	97793	180	562	101333	146	935	101775	120	1115
HDP 80 2_14.6	94253	186	1115	100005	158	1115	100890	125	1115	101333	103	1115
HDP 80 2_15.5	97793	183	728	101333	151	1043	101775	119	1243	101775	98	1243
HDP 80 2_18.0	96465	155	1243	100448	129	1243	101333	102	1243	101333	84	1243
HDP 80 2_19.4	101333	151	1243	101775	121	1243	101775	95	1243	101775	78	1243
HDP 80 2_22.6	100448	129	1243	101333	104	1243	101333	82	1243	101333	67	1243
HDP 80 3_25.8	84518	97	609	87615	80	769	87615	63	1081	87615	52	1311
HDP 80 3_30.0	94695	93	735	101333	80	782	101333	63	1095	101333	51	1311
HDP 80 3_31.7	90713	84	1030	97350	72	1093	101775	60	1257	101775	49	1311
HDP 80 3_36.8	101333	81	1128	101333	65	1311	101333	51	1311	101333	42	1311
HDP 80 3_39.8	96465	72	1311	101775	60	1311	101775	47	1311	101775	39	1311
HDP 80 3_46.2	101333	65	1227	101333	52	1311	101333	41	1311	101333	33	1311
HDP 80 3_51.6	100448	57	654	101775	47	913	101775	37	1194	101775	29.9	1430
HDP 80 3_59.9	101333	50	1070	101333	40	1297	101333	31	1439	101333	25.7	1439
HDP 80 3_64.8	101775	46	1227	101775	37	1439	101775	29.1	1439	101775	23.8	1439
HDP 80 3_75.2	101333	40	1439	101333	31.8	1439	101333	25.0	1439	101333	20.4	1439
HDP 80 3_76.4	101775	39	—	101775	31.4	270	101775	24.7	380	101775	20.2	479
HDP 80 3_88.7	101333	34	346	101333	27.0	443	101333	21.2	553	101333	17.3	650
HDP 80 3_95.9	101775	31.3	420	101775	25.0	515	101775	19.7	625	101775	16.1	681
HDP 80 3_111.4	101333	26.9	555	101333	21.5	652	101333	16.9	681	101333	13.8	681

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HDP 90

	n₁ = 1750 rpm			n₁ = 1400 rpm			n₁ = 1100 rpm			n₁ = 900 rpm		
	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]
HDP 90 2_7.9	103545	378	895	110625	323	946	119033	273	1032	123900	232	1297
HDP 90 2_8.8	108413	355	1369	115935	304	1425	124343	256	1425	132308	223	1425
HDP 90 2_10.1	112395	323	854	119918	276	935	129210	234	987	137175	203	1045
HDP 90 2_11.2	117263	303	1369	125670	260	1425	133193	216	1425	134078	178	1425
HDP 90 2_12.2	119033	282	1212	126998	241	1335	136733	204	1421	145140	177	1425
HDP 90 2_13.6	124785	265	1425	133193	227	1425	134078	179	1425	134963	148	1425
HDP 90 2_15.8	126998	232	1254	135848	199	1335	146025	168	1425	146468	138	1425
HDP 90 2_17.6	133193	219	1425	134078	176	1425	134963	139	1425	134963	114	1425
HDP 90 2_20.1	136290	196	1425	145583	168	1425	146468	133	1425	146468	108	1425
HDP 90 2_22.4	134520	174	1425	134963	140	1425	134963	110	1425	134963	90	1425
HDP 90 3_25.4	129210	150	1313	138060	128	1374	146468	107	1374	146468	87	1374
HDP 90 3_28.3	134078	140	1374	134963	113	1374	134963	88	1374	134963	72	1374
HDP 90 3_32.9	138060	124	1374	146468	105	1374	146468	83	1374	146468	68	1374
HDP 90 3_36.6	134963	109	1374	134963	87	1374	134963	68	1374	134963	56	1374
HDP 90 3_40.0	133635	98	497	142928	84	533	146468	68	780	146468	56	1068
HDP 90 3_44.6	134963	89	843	134963	71	1106	134963	56	1374	134963	46	1374
HDP 90 3_51.8	144255	82	1077	146468	67	1286	146468	52	1374	146468	43	1374
HDP 90 3_57.7	134963	69	1374	134963	55	1374	134963	43	1374	134963	36	1374
HDP 90 3_65.8	146468	66	1374	146468	53	1374	146468	41	1374	146468	34	1374
HDP 90 3_73.3	134963	54	1374	134963	43	1374	134963	34	1374	134963	27.9	1374
HDP 90 3_77.8	142928	54	279	146468	44	461	146468	35	762	146468	28.6	827
HDP 90 3_86.6	134963	46	798	134963	37	827	134963	28.9	827	134963	23.6	827
HDP 90 3_98.9	146468	44	827	146468	35	827	146468	27.5	827	146468	22.5	827
HDP 90 3_110.1	134963	36	827	134963	28.9	827	134963	22.7	827	134963	18.6	827

HDP 100

	n₁ = 1750 rpm			n₁ = 1400 rpm			n₁ = 1100 rpm			n₁ = 900 rpm		
	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]
HDP 100 2_7.4	162840	636	1520	173903	544	1641	187178	460	1744	198683	399	1866
HDP 100 2_8.2	182310	641	1405	184080	518	2210	185408	410	2498	186293	337	2498
HDP 100 2_9.1	171248	544	1668	182753	464	1843	196470	392	1931	204878	335	2338
HDP 100 2_10.1	184080	526	2019	184965	423	2498	186293	335	2498	187620	276	2498
HDP 100 2_11.3	180540	464	1744	192930	397	1870	207533	335	2003	207533	274	2498
HDP 100 2_12.5	184965	428	2498	186293	345	2498	187620	273	2498	188948	225	2498
HDP 100 2_14.2	188505	385	1931	201780	330	2052	210188	270	2498	210188	221	2498
HDP 100 2_15.7	186293	342	2498	187620	276	2498	188948	218	2498	188948	179	2498
HDP 100 2_18.0	198240	319	2437	211958	272	2498	211958	214	2498	211958	175	2498
HDP 100 2_20.0	187620	271	2498	188948	219	2498	188948	172	2498	188948	141	2498
HDP 100 2_21.8	176558	234	2498	177443	188	2498	177443	148	2498	177443	121	2498
HDP 100 3_22.8	177443	230	764	189833	197	816	203993	166	879	212843	142	996
HDP 100 3_25.3	188948	220	883	188948	176	1126	188948	139	1412	188948	113	1421
HDP 100 3_28.1	186735	196	1178	200010	168	1257	212843	140	1376	212843	115	1421
HDP 100 3_31.3	188948	178	1389	188948	143	1421	188948	112	1421	188948	92	1421
HDP 100 3_35.4	195143	163	1421	208860	139	1421	212843	112	1421	212843	91	1421
HDP 100 3_39.3	188948	142	1421	188948	113	1421	188948	89	1421	188948	73	1421
HDP 100 3_45.0	204435	134	1421	212843	112	1421	212843	88	1421	212843	72	1421
HDP 100 3_50.0	188948	112	1421	188948	89	1421	188948	70	1421	188948	57	1421
HDP 100 3_55.5	212843	113	526	212843	90	834	212843	71	1063	212843	58	1268
HDP 100 3_61.7	188948	90	1084	188948	72	1284	188948	57	1513	188948	46	1551
HDP 100 3_69.9	212843	90	1095	212843	72	1293	212843	56	1522	212843	46	1551
HDP 100 3_77.7	188948	72	1450	188948	57	1551	188948	45	1551	188948	37	1551
HDP 100 3_88.9	212843	71	1472	212843	57	1551	212843	44	1551	212843	36	1551
HDP 100 3_98.8	188948	56	1551	188948	45	1551	188948	35	1551	188948	29.0	1551
HDP 100 3_107.6	177443	49	1551	177443	39	1551	177443	31	1551	177443	25.0	1551
HDP 100 4_110.6	199568	54	398	212843	46	429	212843	36	470	212843	29.8	470
HDP 100 4_122.9	188948	46	470	188948	37	470	188948	29.1	470	188948	23.8	470
HDP 100 4_139.2	208860	45	470	212843	37	470	212843	28.9	470	212843	23.7	470
HDP 100 4_154.7	188948	37	470	188948	29.4	470	188948	23.1	470	188948	18.9	470
HDP 100 4_177.0	212843	36	470	212843	29.0	470	212843	22.8	470	212843	18.6	470
HDP 100 4_196.7	188948	28.9	470	188948	23.1	470	188948	18.2	470	188948	14.9	470
HDP 100 4_222.2	212843	28.8	470	212843	23.1	470	212843	18.1	470	212843	14.8	470
HDP 100 4_246.9	188948	23.0	470	188948	18.4	470	188948	14.5	470	188948	11.9	470
HDP 100 4_286.4	212843	22.4	515	212843	17.9	602	212843	14.1	602	212843	11.5	602
HDP 100 4_318.3	188948	17.9	602	188948	14.3	602	188948	11.2	602	188948	9.2	602
HDP 100 4_359.6	212843	17.8	602	212843	14.3	602	212843	11.2	602	212843	9.2	602
HDP 100 4_399.5	188948	14.2	602	188948	11.4	602	188948	9.0	602	188948	7.3	602
HDP 100 4_457.1	212843	14.0	602	212843	11.2	602	212843	8.8	602	212843	7.2	602
HDP 100 4_507.9	188948	11.2	602	188948	9.0	602	188948	7.0	602	188948	5.8	602

HDP 110

	n₁ = 1750 rpm			n₁ = 1400 rpm			n₁ = 1100 rpm			n₁ = 900 rpm		
	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]
HDP 1102_8.1	187620	671	877	200453	574	964	212843	479	1218	212843	392	2129
HDP 1102_9.0	198683	642	1405	212400	549	1493	224790	456	1843	224790	373	2498
HDP 1102_9.9	197355	574	1081	211073	491	1151	216383	395	1866	216383	324	2498
HDP 1102_11.0	212400	557	1414	227445	478	1493	228330	377	2480	228330	308	2498
HDP 1102_12.3	207975	489	1140	219038	412	1405	219038	324	2437	219038	265	2498
HDP 1102_13.6	223905	476	1470	230543	392	2019	230985	308	2498	230985	252	2498
HDP 1102_15.5	217268	406	1315	221693	332	2019	221693	261	2498	221693	213	2498
HDP 1102_17.1	230543	389	1816	232313	314	2498	233640	248	2498	233640	203	2498
HDP 1102_19.7	224348	330	2052	224348	264	2498	224348	207	2498	224348	170	2498
HDP 1102_21.8	232755	309	2498	233640	248	2498	233640	195	2498	233640	160	2498
HDP 1102_25.0	207975	241	2498	209303	194	2498	209303	152	2498	209303	125	2498
HDP 1103_24.9	203550	241	627	217710	207	668	234083	175	717	244260	149	825
HDP 1103_27.6	212400	227	796	227003	194	852	233640	157	1052	233640	129	1306
HDP 1103_30.7	218153	209	1014	233198	179	1086	247358	149	1207	247358	122	1421
HDP 1103_34.0	227888	198	1160	233640	162	1344	233640	127	1421	233640	104	1421
HDP 1103_38.7	227445	174	1421	243375	149	1421	250455	120	1421	250455	98	1421
HDP 1103_42.8	233640	161	1421	233640	129	1421	233640	101	1421	233640	83	1421
HDP 1103_49.2	234083	140	1421	234083	112	1421	234083	88	1421	234083	72	1421
HDP 1103_54.5	233640	127	1421	233640	101	1421	233640	80	1421	233640	65	1421
HDP 1103_60.7	247358	120	252	247358	96	587	247358	76	922	247358	62	1126
HDP 110 3_67.2	233640	103	841	233640	82	1041	233640	64	1270	233640	53	1475
HDP 110 3_76.4	250455	97	958	250455	77	1155	250455	61	1387	250455	50	1551
HDP 110 3_84.6	233640	81	1259	233640	65	1457	233640	51	1551	233640	42	1551
HDP 110 3_97.1	234083	71	1463	234083	57	1551	234083	45	1551	234083	37	1551
HDP 110 3_107.6	233640	64	1551	233640	51	1551	233640	40	1551	233640	33	1551
HDP 110 3_123.4	209303	50	1551	209303	40	1551	209303	31.4	1551	209303	25.7	1551
HDP 110 4_120.9	229658	57	324	245588	49	344	252225	40	450	252225	32.3	470
HDP 110 4_133.9	233640	53	443	233640	42	470	233640	33	470	233640	27.0	470
HDP 110 4_168.5	233640	42	470	233640	33	470	233640	26.2	470	233640	21.5	470
HDP 110 4_191.0	253995	40	470	253995	32	470	253995	25.2	470	253995	20.6	470
HDP 110 4_193.4	234083	36	470	234083	29.2	470	234083	22.9	470	234083	18.7	470
HDP 110 4_214.2	233640	33	470	233640	26.3	470	233640	20.6	470	233640	16.9	470
HDP 110 4_248.6	252225	30.5	—	252225	24.4	238	252225	19.2	373	252225	15.7	488
HDP 110 4_275.4	233640	25.5	375	233640	20.4	483	233640	16.1	600	233640	13.1	602
HDP 110 4_313.0	253995	24.4	427	253995	19.6	531	253995	15.4	602	253995	12.6	602
HDP 110 4_346.7	233640	20.3	593	233640	16.2	602	233640	12.8	602	233640	10.4	602
HDP 110 4_392.9	253995	19.5	602	253995	15.6	602	253995	12.2	602	253995	10.0	602
HDP 110 4_440.7	233640	16.0	602	233640	12.8	602	233640	10.0	602	233640	8.2	602
HDP 110 4_499.4	234083	14.1	602	234083	11.3	602	234083	8.9	602	234083	7.3	602

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HDP 120

	n_1 = 1750 rpm			n_1 = 1400 rpm			n_1 = 1100 rpm			n_1 = 900 rpm		
	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]
HDP 120 2_7.9	250013	914	1744	267270	782	1859	287183	660	2007	304883	574	2140
HDP 120 2_8.6	254438	855	2700	272138	731	2880	292493	618	3102	305768	528	3538
HDP 120 2_10.3	270810	760	1819	289838	651	1924	310193	547	2156	311520	450	3260
HDP 120 2_11.2	276120	712	2765	295148	609	2963	306210	496	3655	307980	408	4004
HDP 120 2_13.0	281430	626	2963	300900	535	3161	311963	436	3950	312848	358	4004
HDP 120 2_14.2	287183	586	3761	306210	500	4004	308423	396	4004	309750	325	4004
HDP 120 2_16.0	295590	535	2979	311520	451	3439	312848	356	4004	312848	291	4004
HDP 120 2_17.4	302228	502	3983	307980	410	4004	309750	324	4004	309750	265	4004
HDP 120 2_20.6	311963	438	3021	312848	351	4004	312848	276	4004	312848	226	4004
HDP 120 2_22.5	308423	397	4004	309750	319	4004	309750	251	4004	309750	205	4004
HDP 120 2_25.4	279660	319	4004	280988	256	4004	280988	201	4004	280988	165	4004
HDP 120 3_25.8	275678	316	—	294705	270	—	312848	225	—	312848	184	701
HDP 120 3_28.0	281430	296	510	300900	253	549	309750	205	913	309750	168	1207
HDP 120 3_32.5	288510	262	1050	308423	224	1124	312848	178	1407	312848	146	1421
HDP 120 3_35.4	292935	244	1259	309750	206	1380	309750	162	1421	309750	133	1421
HDP 120 3_39.9	303113	224	998	312848	185	1164	312848	145	1421	312848	119	1421
HDP 120 3_43.5	307538	209	1178	309750	168	1412	309750	132	1421	309750	108	1421
HDP 120 3_51.6	312848	179	1421	312848	143	1421	312848	113	1421	312848	92	1421
HDP 120 3_56.1	309750	163	1421	309750	130	1421	309750	102	1421	309750	84	1421
HDP 120 3_64.3	312848	144	366	312848	115	785	312848	90	1057	312848	74	1297
HDP 120 3_70.0	309750	131	809	309750	104	1041	309750	82	1313	309750	67	1551
HDP 120 3_78.9	312848	117	1077	312848	94	1311	312848	74	1551	312848	60	1551
HDP 120 3_85.9	309750	106	1286	309750	85	1520	309750	67	1551	309750	55	1551
HDP 120 3_101.8	312848	91	1162	312848	73	1369	312848	57	1551	312848	47	1551
HDP 120 3_110.9	309750	82	1326	309750	66	1533	309750	52	1551	309750	42	1551
HDP 120 3_125.2	280988	66	1551	280988	53	1551	280988	42	1551	280988	34	1551
HDP 120 4_128.0	288953	68	—	309308	58	—	312848	46	—	312848	38	317
HDP 120 4_139.4	309750	67	—	309750	54	—	309750	42	373	309750	34	470
HDP 120 4_157.1	297803	57	360	312848	48	414	312848	38	470	312848	31	470
HDP 120 4_171.1	309750	55	432	309750	44	470	309750	34	470	309750	28.0	470
HDP 120 4_202.8	312848	46	470	312848	37	470	312848	29.2	470	312848	23.9	470
HDP 120 4_220.8	309750	42	470	309750	34	470	309750	26.6	470	309750	21.7	470
HDP 120 4_254.6	312848	37	470	312848	29.6	470	312848	23.3	470	312848	19.0	470
HDP 120 4_277.2	309750	34	470	309750	26.9	470	309750	21.2	470	309750	17.3	470
HDP 120 4_323.2	312848	29.2	—	312848	23.3	326	312848	18.3	463	312848	15.0	578
HDP 120 4_351.9	309750	26.5	344	309750	21.2	461	309750	16.7	587	309750	13.6	602
HDP 120 4_405.7	312848	23.2	602	312848	18.6	602	312848	14.6	602	312848	11.9	602
HDP 120 4_454.3	309750	20.5	602	309750	16.4	602	309750	12.9	602	309750	10.6	602
HDP 120 4_523.7	312848	18.0	602	312848	14.4	602	312848	11.3	602	312848	9.3	602

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HDP 130

	n₁ = 1750 rpm			n₁ = 1400 rpm			n₁ = 1100 rpm			n₁ = 900 rpm		
	Tn₂ [in·lbs]	**Pn₁** [hp]	**Rn₁** [lbs]	**Tn₂** [in·lbs]	**Pn₁** [hp]	**Rn₁** [lbs]	**Tn₂** [in·lbs]	**Pn₁** [hp]	**Rn₁** [lbs]	**Tn₂** [in·lbs]	**Pn₁** [hp]	**Rn₁** [lbs]
HDP 130 2_7.3	380550	1515	1115	407100	1297	1185	437633	1095	1277	464625	952	1360
HDP 130 2_7.9	388958	1419	1650	415950	1214	1760	447368	1026	1893	475245	892	2007
HDP 130 2_8.6	401348	1348	1140	429225	1153	1218	461085	973	1315	489848	846	1398
HDP 130 2_9.4	410198	1262	1679	438518	1079	1794	471705	912	1924	500468	792	2052
HDP 130 2_11.3	429668	1099	1547	459315	940	1657	493830	794	1778	524363	690	1893
HDP 130 2_12.3	439403	1030	2052	469935	881	2190	501353	738	2419	503565	607	3062
HDP 130 2_14.1	438518	897	2859	469050	768	3051	504450	649	3275	524805	552	3660
HDP 130 2_15.4	450023	844	3287	481440	722	3507	503565	593	3979	503565	485	4692
HDP 130 2_17.4	488963	811	1212	519053	689	1360	519053	541	2167	519053	443	2880
HDP 130 2_19.0	500468	761	1760	503565	612	2403	503565	481	3203	503565	394	3918
HDP 130 2_21.7	472148	631	3172	474360	507	3831	474360	398	4631	474360	326	4973
HDP 130 3_21.8	500468	678	—	524805	569	—	524805	447	697	524805	366	1169
HDP 130 3_23.8	503565	625	542	503565	500	1003	503565	393	1535	503565	321	2014
HDP 130 3_28.6	524805	541	1360	524805	433	1821	524805	340	2354	524805	278	2684
HDP 130 3_31.2	503565	476	1998	503565	381	2462	503565	299	2684	503565	245	2684
HDP 130 3_35.7	499140	412	1722	524805	347	1915	524805	272	2684	524805	223	2684
HDP 130 3_39.0	503565	381	2030	503565	305	2428	503565	239	2684	503565	196	2684
HDP 130 3_44.1	519053	347	2356	519053	278	2684	519053	218	2684	519053	179	2684
HDP 130 3_48.1	503565	309	2684	503565	247	2684	503565	194	2684	503565	159	2684
HDP 130 3_56.5	524805	274	463	524805	219	814	524805	172	1223	524805	141	1583
HDP 130 3_61.7	503565	241	1021	503565	193	1371	503565	151	1778	503565	124	1810
HDP 130 3_70.7	524805	219	1385	524805	175	1735	524805	138	1810	524805	113	1810
HDP 130 3_77.1	503565	193	1810	503565	154	1810	503565	121	1810	503565	99	1810
HDP 130 3_87.2	519053	176	1810	519053	141	1810	519053	110	1810	519053	90	1810
HDP 130 3_95.1	503565	156	1810	503565	125	1810	503565	98	1810	503565	80	1810
HDP 130 3_108.3	474360	129	1810	474360	103	1810	474360	81	1810	474360	66	1810
HDP 130 4_111.2	463740	126	935	495600	107	1003	524805	89	1088	524805	73	1088
HDP 130 4_121.4	503565	125	944	503565	100	1088	503565	79	1088	503565	64	1088
HDP 130 4_139.0	524805	114	1075	524805	91	1088	524805	71	1088	524805	58	1088
HDP 130 4_151.7	503565	100	1088	503565	80	1088	503565	63	1088	503565	51	1088
HDP 130 4_176.7	521708	89	1088	524805	72	1088	524805	56	1088	524805	46	1088
HDP 130 4_192.9	503565	79	1088	503565	63	1088	503565	49	1088	503565	40	1088
HDP 130 4_217.9	519053	72	1088	519053	57	1088	519053	45	1088	519053	37	1088
HDP 130 4_237.9	503565	64	1088	503565	51	1088	503565	40	1088	503565	33	1088
HDP 130 4_274.5	524805	58	398	524805	46	398	524805	36	398	524805	29.6	398
HDP 130 4_299.6	503565	51	398	503565	40	398	503565	32	398	503565	26.0	398
HDP 130 4_348.9	524805	45	398	524805	36	398	524805	28.5	398	524805	23.3	398
HDP 130 4_380.9	503565	40	398	503565	32	398	503565	25.0	398	503565	20.5	398
HDP 130 4_469.8	503565	32	398	503565	25.8	398	503565	20.3	398	503565	16.6	398
HDP 130 4_534.5	474360	26.7	398	474360	21.4	398	474360	16.8	398	474360	13.7	398

(—) Contact Bonfiglioli Technical Service.

HDP 140

	n₁ = 1750 rpm			n₁ = 1400 rpm			n₁ = 1100 rpm			n₁ = 900 rpm		
	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]	Tn_2 [in·lbs]	Pn_1 [hp]	Rn_1 [lbs]
HDP 140 2_8.4	495600	1715	—	530115	1467	—	569940	1240	—	605340	1077	—
HDP 140 2_9.3	537195	1680	—	574365	1437	—	617730	1214	229	643395	1035	461
HDP 140 2_9.9	524805	1531	—	561090	1310	—	603128	1106	—	640740	962	—
HDP 140 2_11.0	566400	1494	236	605340	1277	256	642953	1066	405	646493	877	1025
HDP 140 2_13.0	563745	1253	432	602685	1072	461	647820	905	499	662423	757	942
HDP 140 2_14.4	606225	1218	686	643395	1034	805	647820	818	1502	650475	672	2145
HDP 140 2_16.3	576135	1024	1843	615960	876	1974	655785	733	2210	655785	600	2925
HDP 140 2_18.0	620828	998	2057	647378	832	2414	650475	657	3172	650475	538	3885
HDP 140 2_20.1	558878	806	1272	597818	689	1356	597818	542	2160	597818	443	2875
HDP 140 2_22.2	601800	784	1508	643395	671	1612	650475	533	2315	650475	436	3028
HDP 140 2_24.9	592065	687	2563	594720	552	3221	594720	434	4028	594720	355	4741
HDP 140 3_25.1	576135	678	—	615960	580	—	623040	461	477	623040	377	951
HDP 140 3_27.7	637643	678	—	650475	553	348	650475	435	883	650475	356	1356
HDP 140 3_32.9	649148	582	962	662423	475	1306	662423	373	1843	662423	305	2315
HDP 140 3_36.4	650475	527	1499	650475	422	1960	650475	331	2495	650475	271	2684
HDP 140 3_41.1	646493	464	1218	655785	376	1551	655785	296	2014	655785	242	2426
HDP 140 3_45.5	650475	422	1630	650475	337	2030	650475	265	2491	650475	217	2684
HDP 140 3_50.7	597818	348	2354	597818	278	2684	597818	219	2684	597818	179	2684
HDP 140 3_56.2	650475	342	2412	650475	273	2684	650475	215	2684	650475	176	2684
HDP 140 3_65.1	662423	300	812	662423	240	1218	662423	189	1690	662423	154	1810
HDP 140 3_72.0	650475	267	1383	650475	213	1787	650475	168	1810	650475	137	1810
HDP 140 3_81.3	655785	238	1070	655785	190	1421	655785	150	1810	655785	122	1810
HDP 140 3_90.0	650475	213	1484	650475	171	1810	650475	134	1810	650475	110	1810
HDP 140 3_100.3	597818	176	1810	597818	141	1810	597818	111	1810	597818	90	1810
HDP 140 3_111.0	650475	173	1810	650475	138	1810	650475	109	1810	650475	89	1810
HDP 140 3_124.7	594720	141	1810	594720	113	1810	594720	88	1810	594720	72	1810
HDP 140 4_141.6	590295	126	937	631448	107	1003	650475	87	1088	650475	71	1088
HDP 140 4_160.0	655785	123	962	655785	99	1088	655785	78	1088	655785	63	1088
HDP 140 4_177.0	650475	111	1088	650475	89	1088	650475	70	1088	650475	57	1088
HDP 140 4_197.3	597818	91	1088	597818	73	1088	597818	57	1088	597818	47	1088
HDP 140 4_225.0	650475	87	1088	650475	70	1088	650475	55	1088	650475	45	1088
HDP 140 4_250.8	597818	72	1088	597818	57	1088	597818	45	1088	597818	37	1088
HDP 140 4_277.5	650475	71	1088	650475	56	1088	650475	44	1088	650475	36	1088
HDP 140 4_315.9	655785	63	398	655785	50	398	655785	39	398	655785	32	398
HDP 140 4_349.6	650475	56	398	650475	45	398	650475	35	398	650475	28.8	398
HDP 140 4_401.6	655785	49	398	655785	39	398	655785	31	398	655785	25.3	398
HDP 140 4_444.4	650475	44	398	650475	35	398	650475	27.7	398	650475	22.7	398
HDP 140 4_495.3	597818	36	398	597818	29.1	398	597818	22.8	398	597818	18.7	398

(—) Contact Bonfiglioli Technical Service.

4.1 - PERMITTED OVERHUNG LOADS ON OUTPUT SHAFT

HDP 60

input **VP**

| LR | LD | RL | RD | DL | DR | DD |

Rn₂ [klbs]

n_2 x h		T_2 = 38100 in·lbs		T_2 = 30100 in·lbs		T_2 = 25200 in·lbs		T_2 = 19000 in·lbs	
250 000	→	7.7	7.9	7.9		7.9		7.9	
	←	7.2	7.9	7.7	7.9	7.9		7.9	
500 000	→	5.6	6.7	6.3	7.2	6.5	7.4	6.8	7.7
	←	5.4	6.3	5.9	6.8	6.2	7.0	6.5	7.4
750 000	→	4.5	5.5	5.4	6.2	5.7	6.4	5.9	6.7
	←	4.6	5.3	5.0	5.8	5.3	6.1	5.6	6.4
1 000 000	→	3.7	4.7	4.7	5.6	5.1	5.8	5.4	6.1
	←	4.0	4.7	4.5	5.2	4.7	5.4	5.1	5.8
1 250 000	→	3.1	4.1	4.1	5.0	4.7	5.4	5.0	5.6
	←	3.4	4.3	4.1	4.7	4.3	5.0	4.7	5.4
2 500 000	→		2.4	2.7	3.4	3.3	4.0	3.9	4.4
	←		2.5	2.9	3.5	3.3	3.8	3.6	4.1
3 750 000	→			1.9	2.6	2.5	3.2	3.3	3.8
	←			2.0	2.8	2.7	3.2	3.1	3.5
5 000 000	→				2.0	2.1	2.7	2.8	3.4
	←				2.2	2.2	2.8	2.7	3.1

HDP 60

input **VP**

| LL | RR | DL | DR | DD |

Rn₂ [klbs]

n_2 x h		T_2 = 38100 in·lbs		T_2 = 30100 in·lbs		T_2 = 25200 in·lbs		T_2 = 19000 in·lbs	
250 000	→	6.2	7.3	6.9	7.9	7.3	7.9	7.8	7.9
	←	5.6	6.7	6.4	7.5	6.9	7.9	7.5	7.9
500 000	→	4.5	5.3	5.1	6.0	5.5	6.4	6.0	6.9
	←	3.9	4.7	4.7	5.5	5.1	6.0	5.8	6.6
750 000	→	3.6	4.3	4.2	5.0	4.6	5.4	5.1	5.9
	←	3.0	3.8	3.8	4.6	4.3	5.0	4.9	5.6
1 000 000	→	3.0	3.7	3.7	4.4	4.1	4.8	4.6	5.3
	←	2.5	3.1	3.2	3.9	3.7	4.4	4.3	5.0
1 250 000	→	2.6	3.3	3.3	3.9	3.7	4.3	4.2	4.9
	←	2.0	2.7	2.8	3.5	3.3	4.0	3.9	4.6
2 500 000	→		2.0	2.2	2.7	2.6	3.1	3.1	3.6
	←		1.5	1.8	2.3	2.2	2.8	2.8	3.4
3 750 000	→			1.6	2.1	2.0	2.5	2.6	3.0
	←			1.2	1.7	1.7	2.2	2.3	2.8
5 000 000	→				1.7	1.7	2.1	2.2	2.7
	←				1.3	1.3	1.8	2.0	2.4

h: expected lifetime [hours] for bearing of the output shaft.

Rated overhung loads relevant to reinforced bearings option HDB.

Shaft the rated overhung load is applicable to. For double extended shaft the load is only applicable to the extension highlighted. Should this not be the case consult Bonfiglioli's Technical Service.

HDP 70

input **VP** — shaft configurations: LR, LD, RL, RD, DL, DR, DD

Rn₂ [klbs]

$n_2 \times h$		$T_2 = 56200$ in·lbs		$T_2 = 44700$ in·lbs		$T_2 = 37200$ in·lbs		$T_2 = 27900$ in·lbs	
250 000	→	7.9	9.0	8.4	9.0	8.6	9.0	8.8	9.0
	←	7.4	9.0	7.8	9.0	8.1	9.0	8.5	9.0
500 000	→	5.6	7.8	6.5	8.3	6.8	8.5	7.0	8.8
	←	5.6	7.4	6.0	7.8	6.3	8.1	6.7	8.5
750 000	→	4.5	6.4	5.4	7.2	5.9	7.4	6.1	7.7
	←	4.7	6.3	5.1	6.7	5.4	7.0	5.8	7.4
1 000 000	→	3.7	5.5	4.7	6.4	5.2	6.7	5.6	7.0
	←	4.0	5.6	4.6	6.0	4.9	6.3	5.2	6.7
1 250 000	→	2.9	4.9	4.1	5.7	4.7	6.2	5.1	6.5
	←	3.4	5.1	4.1	5.5	4.5	5.8	4.8	6.2
2 500 000	→		2.9	2.5	4.0	3.3	4.6	4.0	5.1
	←		3.3	2.8	4.2	3.3	4.4	3.7	4.8
3 750 000	→				3.2	2.6	3.8	3.3	4.4
	←		2.2		3.4	2.7	3.8	3.1	4.1
5 000 000	→					2.5	3.2	2.9	3.9
	←					2.8	3.3	2.8	3.7

HDP 70

input **VP** — shaft configurations: LL, RR, DL, DR, DD

Rn₂ [klbs]

$n_2 \times h$		$T_2 = 56200$ in·lbs		$T_2 = 44700$ in·lbs		$T_2 = 37200$ in·lbs		$T_2 = 27900$ in·lbs	
250 000	→	5.8	8.0	6.6	8.8	7.1	9.0	7.7	9.0
	←	5.2	7.4	6.1	8.3	6.7	8.9	7.4	9.0
500 000	→	4.0	5.8	4.8	6.6	5.3	7.1	5.9	7.7
	←	3.4	5.2	4.3	6.1	4.9	6.7	5.6	7.4
750 000	→	3.1	4.7	3.9	5.5	4.4	6.0	5.0	6.6
	←	2.5	4.1	3.4	5.0	4.0	5.6	4.7	6.3
1 000 000	→	2.6	4.0	3.3	4.8	3.8	5.3	4.5	5.9
	←		3.4	2.8	4.3	3.4	4.9	4.1	5.6
1 250 000	→		3.5	2.9	4.3	3.4	4.8	4.0	5.4
	←		2.9	2.4	3.8	3.0	4.4	3.7	5.1
2 500 000	→		2.2		2.9	2.3	3.4	2.9	4.0
	←		1.5		2.4		3.0	2.6	3.7
3 750 000	→				2.2		2.7	2.4	3.4
	←				1.7		2.3		3.0
5 000 000	→				1.8		2.3		2.9
	←				1.3		1.9		2.6

h: expected lifetime [hours] for bearing of the output shaft.

Rated overhung loads relevant to reinforced bearings option HDB.

Shaft the rated overhung load is applicable to.
For double extended shaft the load is only applicable to the extension highlighted. Should this not be the case consult Bonfiglioli's Technical Service.

HDP 80

input **VP** LR LD RL RD DL DR DD

n₂ x h	T₂ = 101300 in·lbs		T₂ = 81000 in·lbs		T₂ = 67300 in·lbs		T₂ = 50400 in·lbs	
250 000 →	8.8	10.3	9.8	10.3	10.2	10.3	10.6	10.3
←	8.3	10.3	9.1	10.3	9.5	10.3	10.1	10.3
500 000 →	5.8	9.4	7.3	10.3	7.9	10.3	8.4	10.3
←	6.1	9.0	6.8	9.7	7.3	10.2	7.9	10.3
750 000 →	3.8	7.5	5.8	8.8	6.7	9.4	7.3	9.8
←	4.5	7.5	5.7	8.3	6.2	8.7	6.8	9.3
1 000 000 →	2.3	6.3	4.8	7.7	5.8	8.5	6.5	8.9
←	3.3	6.6	5.0	7.3	5.5	7.8	6.1	8.4
1 250 000 →		5.4	4.0	6.9	5.1	7.7	6.0	8.2
←		5.8	4.4	6.7	5.0	7.1	5.6	7.7
2 500 000 →		2.3		4.5	3.0	5.5	4.4	6.4
←		2.9		4.8	3.4	5.4	4.2	6.0
3 750 000 →				3.1		4.3	3.5	5.4
←				3.4		4.5	3.5	5.1
5 000 000 →				2.0		3.6	2.9	4.7
←				2.5		3.8	3.1	4.5

Rn₂ [klbs]

HDP 80

input **VP** LL RR DL DR DD
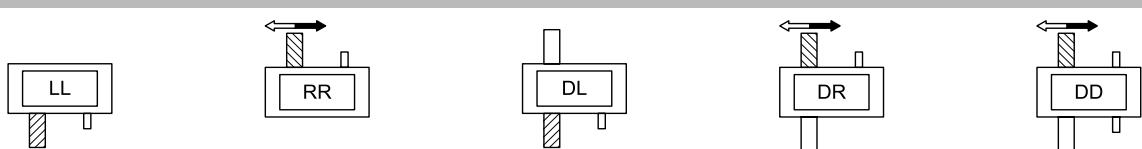
n₂ x h	T₂ = 101300 in·lbs		T₂ = 81000 in·lbs		T₂ = 67300 in·lbs		T₂ = 50400 in·lbs	
250 000 →	6.2	9.8	7.3	10.3	8.1	10.3	9.1	10.3
←	5.2	8.9	6.6	10.2	7.5	10.3	8.6	10.3
500 000 →	3.9	6.9	5.1	8.0	5.9	8.8	6.8	9.7
←	3.0	6.0	4.3	7.3	5.2	8.2	6.3	9.2
750 000 →	2.8	5.5	4.0	6.6	4.8	7.4	5.7	8.3
←	1.9	4.5	3.2	5.8	4.1	6.7	5.2	7.8
1 000 000 →		4.5	3.3	5.7	4.0	6.4	5.0	7.4
←		3.6	2.5	4.9	3.4	5.8	4.5	6.9
1 250 000 →		3.9	2.8	5.0	3.5	5.8	4.5	6.7
←		2.9	2.0	4.3	2.9	5.1	4.0	6.2
2 500 000 →		2.1		3.2		4.0	3.1	4.9
←		1.2		2.5		3.4	2.7	4.5
3 750 000 →				2.3		3.1		4.0
←				1.6		2.5		3.6
5 000 000 →						2.5		3.5
←						1.9		3.0

Rn₂ [klbs]

h: expected lifetime [hours] for bearing of the output shaft.

Rated overhung loads relevant to reinforced bearings option HDB.

Shaft the rated overhung load is applicable to. For double extended shaft the load is only applicable to the extension highlighted. Should this not be the case consult Bonfiglioli's Technical Service.

HDP 90

input VP

	LR	LD	RL	RD	DL	DR	DD

Rn$_2$ [klbs]

n$_2$ x h		T$_2$ = 135000 in·lbs		T$_2$ = 108000 in·lbs		T$_2$ = 89800 in·lbs		T$_2$ = 67300 in·lbs	
250 000	→	11.0	13.9	12.8	13.9	13.8	13.9	14.3	
	←	11.3	13.9	12.2	13.9	12.8	13.9	13.6	13.9
500 000	→	7.2	11.7	9.1	13.6	10.3	13.9	11.4	13.9
	←	7.8	12.0	9.2	13.0	9.8	13.7	10.6	13.9
750 000	→	5.2	9.1	7.2	11.2	8.4	12.5	9.9	13.3
	←	5.6	10.0	7.8	11.1	8.4	11.7	9.1	12.6
1 000 000	→	3.8	7.5	6.0	9.6	7.2	10.9	8.7	12.1
	←	4.1	8.1	6.5	9.8	7.4	10.5	8.2	11.3
1 250 000	→		6.3	5.0	8.5	6.4	9.8	7.9	11.2
	←		6.8	5.5	8.9	6.8	9.6	7.5	10.4
2 500 000	→		2.7		5.2	3.9	6.7	5.6	8.4
	←		2.7		5.7	4.3	7.2	5.7	8.0
3 750 000	→				3.5		5.1	4.4	6.9
	←				3.8		5.6	4.8	6.8
5 000 000	→						4.1	3.6	5.9
	←						4.4	4.0	6.0

HDP 90

input VP

	LL	RR	DL	DR	DD

Rn$_2$ [klbs]

n$_2$ x h		T$_2$ = 135000 in·lbs		T$_2$ = 108000 in·lbs		T$_2$ = 89800 in·lbs		T$_2$ = 67300 in·lbs	
250 000	→	9.1	13.9	10.5	13.9	11.4	13.9	12.5	13.9
	←	7.4	12.2	9.1	13.9	10.3	13.9	11.6	13.9
500 000	→	6.2	10.0	7.5	11.4	8.4	12.3	9.5	13.5
	←	4.4	8.3	6.1	10.0	7.3	11.2	8.7	12.7
750 000	→	4.7	8.0	6.0	9.5	6.9	10.4	8.1	11.6
	←	2.9	6.4	4.7	8.1	5.8	9.3	7.2	10.7
1 000 000	→	3.7	6.8	5.1	8.2	6.0	9.1	7.1	10.3
	←	2.0	5.1	3.7	6.9	4.8	8.0	6.2	9.5
1 250 000	→		5.9	4.4	7.3	5.3	8.3	6.5	9.4
	←		4.2	3.0	6.0	4.2	7.5	5.6	8.6
2 500 000	→				4.9	3.5	5.8	4.6	7.0
	←				3.5	2.3	4.7	3.7	6.2
3 750 000	→				3.3		4.6	3.7	5.8
	←				2.3		3.5	2.8	4.9
5 000 000	→						3.8		5.0
	←						2.7		4.2

h: expected lifetime [hours] for bearing of the output shaft.

Rated overhung loads relevant to reinforced bearings option HDB.

Shaft the rated overhung load is applicable to.
For double extended shaft the load is only applicable to the extension highlighted. Should this not be the case consult Bonfiglioli's Technical Service.

HDP 100
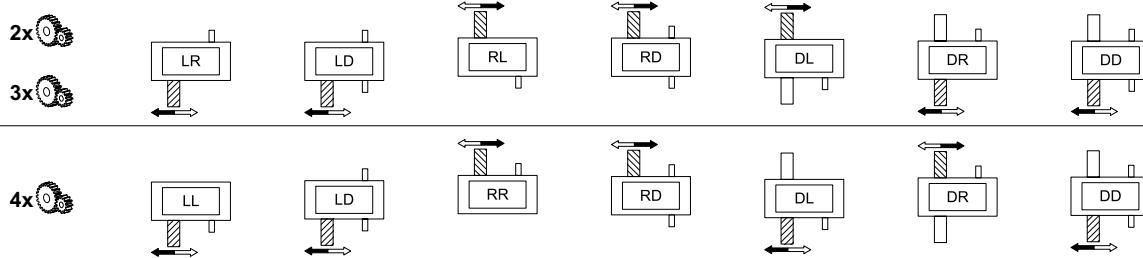
n$_2$ x h	T$_2$ = 177000 in·lbs	T$_2$ = 141600 in·lbs	T$_2$ = 117700 in·lbs	T$_2$ = 88500 in·lbs
250 000 →	17.2	18.0	18.0	18.0
250 000 ←	17.8	18.0	18.0	18.0
500 000 →	12.7	14.0	14.9	15.9
500 000 ←	12.0	15.7	16.2	16.9
750 000 →	9.8	11.8	12.7	13.7
750 000 ←	9.0	13.0	13.4	14.7
1 000 000 →	7.6	10.4	11.3	12.3
1 000 000 ←	7.0	11.2	11.7	13.4
1 250 000 →	5.8	9.3	10.3	11.3
1 250 000 ←	5.5	9.8	10.4	12.4
2 500 000 →		5.0	7.3	8.6
2 500 000 ←		5.1	6.7	8.9
3 750 000 →			5.3	7.3
3 750 000 ←			4.8	7.2
5 000 000 →			3.8	6.4
5 000 000 ←				6.0

HDP 100
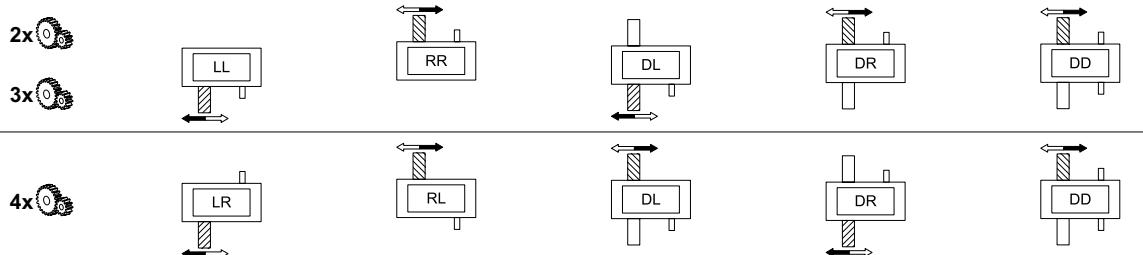
n$_2$ x h	T$_2$ = 177000 in·lbs	T$_2$ = 141600 in·lbs	T$_2$ = 117700 in·lbs	T$_2$ = 88500 in·lbs
250 000 →	11.7	14.1	15.6	17.6
250 000 ←	13.9	15.8	17.1	18.0
500 000 →	7.3	9.6	11.2	13.2
500 000 ←	9.5	11.4	12.7	14.3
750 000 →	5.1	7.5	9.0	11.0
750 000 ←	7.3	9.2	10.5	12.1
1 000 000 →	3.7	6.0	7.6	9.6
1 000 000 ←	5.9	7.8	9.1	10.7
1 250 000 →		5.1	6.6	8.6
1 250 000 ←	4.9	6.8	8.1	9.7
2 500 000 →			3.9	5.9
2 500 000 ←		4.1	5.4	7.0
3 750 000 →				4.5
3 750 000 ←			4.1	5.6
5 000 000 →				3.7
5 000 000 ←				4.8

h: expected lifetime [hours] for bearing of the output shaft.

Shaft the rated overhung load is applicable to. For double extended shaft the load is only applicable to the extension highlighted. Should this not be the case consult Bonfiglioli's Technical Service.

| 2x | LR | LD | RL | RD | DL | DR | DD |
| 3x | | | | | | | |

| 4x | LL | LD | RR | RD | DL | DR | DD |
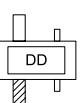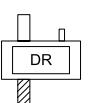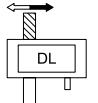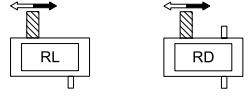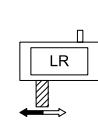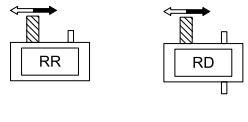
Rn$_2$ [klbs]

n$_2$ x h		T$_2$ = 209300 in·lbs	T$_2$ = 167300 in·lbs	T$_2$ = 139400 in·lbs	T$_2$ = 104400 in·lbs
250 000	→	19.3	19.3	19.3	19.3
	←	19.3	19.3	19.3	19.3
500 000	→	14.7	16.0	16.9	18.0
	←	15.4	17.7	18.3	19.0
750 000	→	12.3	13.6	14.5	15.6
	←	12.3	14.7	15.8	16.6
1 000 000	→	10.7	12.0	12.9	14.0
	←	10.1	12.7	14.2	15.0
1 250 000	→	9.2	10.9	11.8	12.8
	←	8.6	11.2	12.8	13.9
2 500 000	→	4.0	7.7	8.8	9.8
	←		7.1	8.9	10.9
3 750 000	→		5.3	7.3	8.3
	←		4.6	6.9	9.0
5 000 000	→			6.0	7.4
	←			5.6	7.8

| 2x | LL | RR | DL | DR | DD |
| 3x | | | | | |

| 4x | LR | RL | DL | DR | DD |

Rn$_2$ [klbs]

n$_2$ x h		T$_2$ = 209300 in·lbs	T$_2$ = 167300 in·lbs	T$_2$ = 139400 in·lbs	T$_2$ = 104400 in·lbs
250 000	→	14.5	16.9	18.4	19.3
	←	16.6	18.5	19.3	19.3
500 000	→	9.6	11.9	13.5	15.4
	←	11.7	13.6	14.9	16.5
750 000	→	7.1	9.5	11.0	12.9
	←	9.3	11.2	12.5	14.1
1 000 000	→	5.6	7.9	9.5	11.4
	←	7.7	9.6	10.9	12.5
1 250 000	→	4.5	6.8	8.4	10.3
	←	6.6	8.5	9.8	11.4
2 500 000	→			5.3	7.3
	←		5.5	6.8	8.4
3 750 000	→				5.8
	←		4.0	5.3	6.9
5 000 000	→				4.8
	←			4.3	5.9

h: expected lifetime [hours] for bearing of the output shaft.

Shaft the rated overhung load is applicable to. For double extended shaft the load is only applicable to the extension highlighted. Should this not be the case consult Bonfiglioli's Technical Service.

HDP 120

2x / 3x

| | LR | LD | RL | RD | DL | DR | DD |

4x

| | LL | LD | RR | RD | DL | DR | DD |

Rn$_2$ [klbs]

n$_2$ x h		T$_2$ = 281000 in·lbs	T$_2$ = 224800 in·lbs	T$_2$ = 187200 in·lbs	T$_2$ = 140300 in·lbs
250 000	→	24.1	24.1	24.1	24.1
	←	24.1	24.1	24.1	24.1
500 000	→	19.8	21.4	22.5	23.8
	←	19.8	22.8	24.1	24.1
750 000	→	16.6	18.2	19.3	20.6
	←	15.6	18.8	20.8	21.8
1 000 000	→	14.1	16.2	17.2	18.6
	←	12.9	16.3	18.3	19.8
1 250 000	→	11.9	14.7	15.8	17.1
	←	11.0	14.4	16.5	18.3
2 500 000	→	5.3	9.9	11.8	13.2
	←	5.2	9.1	11.4	14.0
3 750 000	→		6.8	9.6	11.2
	←		6.3	8.8	11.6
5 000 000	→			7.7	9.9
	←			7.1	10.0

HDP 120

2x / 3x

| | LL | RR | DL | DR | DD |

4x

| | LR | RL | DL | DR | DD |
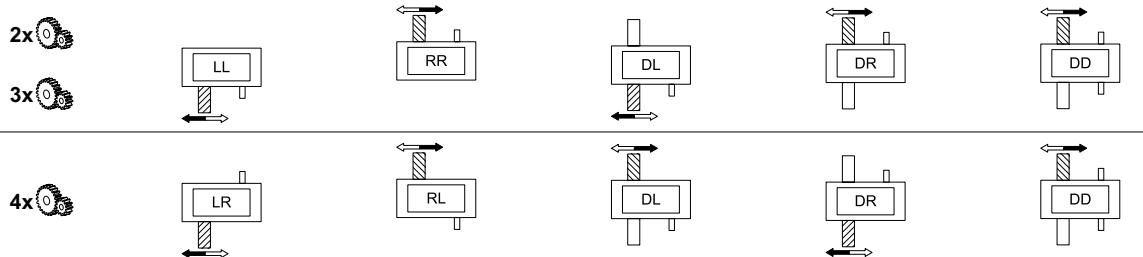
Rn$_2$ [klbs]

n$_2$ x h		T$_2$ = 281000 in·lbs	T$_2$ = 224800 in·lbs	T$_2$ = 187200 in·lbs	T$_2$ = 140300 in·lbs
250 000	→	20.0	22.8	24.1	24.1
	←	22.6	24.1	24.1	24.1
500 000	→	13.6	16.4	18.3	20.7
	←	16.2	18.5	20.1	22.0
750 000	→	10.4	13.2	15.1	17.5
	←	13.0	15.4	16.9	18.8
1 000 000	→	8.3	11.2	13.1	15.5
	←	11.0	13.3	14.9	16.8
1 250 000	→	6.9	9.7	11.6	14.0
	←	9.5	11.9	13.4	15.3
2 500 000	→		5.7	7.6	10.0
	←		7.9	9.4	11.4
3 750 000	→			5.7	8.1
	←		5.9	7.5	9.4
5 000 000	→				6.8
	←			6.2	8.1

h: expected lifetime [hours] for bearing of the output shaft.

Shaft the rated overhung load is applicable to. For double extended shaft the load is only applicable to the extension highlighted. Should this not be the case consult Bonfiglioli's Technical Service.

HDP 130

n₂ x h	T₂ = 474400 in·lbs	T₂ = 379200 in·lbs	T₂ = 316000 in·lbs	T₂ = 237200 in·lbs
250 000 ⟹	36.0	36.0	36.0	36.0
⟸	36.0	36.0	36.0	36.0
500 000 ⟹	26.8	31.6	34.2	35.6
⟸	28.1	30.4	31.9	33.9
750 000 ⟹	20.8	25.9	28.9	31.0
⟸	22.4	25.8	27.4	29.3
1 000 000 ⟹	16.9	22.1	25.3	28.1
⟸	18.3	22.9	24.5	26.4
1 250 000 ⟹	14.1	19.4	22.7	26.0
⟸	14.1	20.8	22.4	24.3
2 500 000 ⟹		11.2	15.3	19.4
⟸		12.6	16.5	18.7
3 750 000 ⟹			11.2	15.8
⟸		8.4	12.6	15.9
5 000 000 ⟹			8.4	13.5
⟸			9.8	14.1

Rn₂ [klbs]

HDP 130
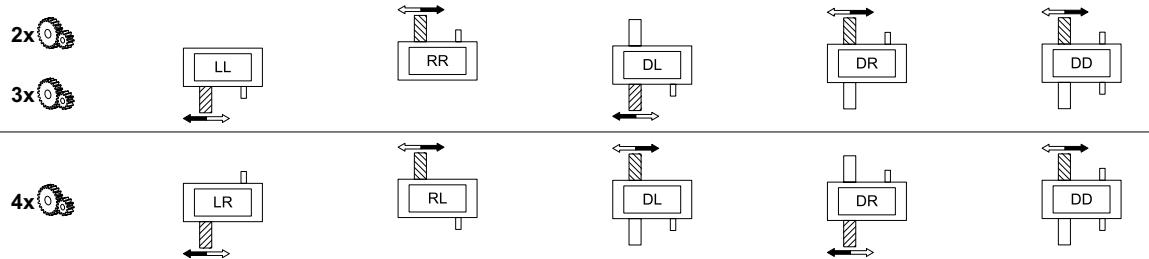
n₂ x h	T₂ = 474400 in·lbs	T₂ = 379200 in·lbs	T₂ = 316000 in·lbs	T₂ = 237200 in·lbs
250 000 ⟹	30.5	34.2	36.0	36.0
⟸	26.9	31.3	34.2	36.0
500 000 ⟹	21.3	25.0	27.5	30.5
⟸	17.7	22.1	25.1	28.7
750 000 ⟹	16.8	20.5	22.9	26.0
⟸	13.2	17.6	20.5	24.2
1 000 000 ⟹	14.1	17.6	20.0	23.1
⟸	9.8	14.7	17.6	21.3
1 250 000 ⟹	11.2	15.5	17.9	21.0
⟸	8.4	12.6	15.5	19.2
2 500 000 ⟹		9.8	12.3	15.3
⟸			9.8	13.5
3 750 000 ⟹			9.8	12.5
⟸				10.7
5 000 000 ⟹			7.7	10.7
⟸				8.9

Rn₂ [klbs]

h: expected lifetime [hours] for bearing of the output shaft.

Shaft the rated overhung load is applicable to. For double extended shaft the load is only applicable to the extension highlighted. Should this not be the case consult Bonfiglioli's Technical Service.

HDP 140

2x / 3x	LR	LD	RL	RD	DL	DR	DD
4x	LL	LD	RR	RD	DL	DR	DD

Rn$_2$ [klbs]

n$_2$ x h		T$_2$ = 594700 in·lbs	T$_2$ = 475700 in·lbs	T$_2$ = 396500 in·lbs	T$_2$ = 297400 in·lbs
250 000	→	38.6	42.1	42.7	42.7
	←	36.0	38.7	40.6	42.7
500 000	→	26.4	31.7	34.0	35.6
	←	26.7	29.4	31.2	33.5
750 000	→	20.2	25.7	29.0	31.0
	←	22.1	24.8	26.6	28.9
1 000 000	→	16.1	21.8	25.3	28.1
	←	17.6	21.9	23.6	25.9
1 250 000	→	13.0	19.0	22.6	25.9
	←	14.1	19.7	21.5	23.8
2 500 000	→		11.0	14.9	19.4
	←		11.9	15.8	18.1
3 750 000	→			11.0	15.7
	←			12.0	15.2
5 000 000	→				13.3
	←			9.0	13.4

HDP 140

2x / 3x	LL	RR	DL	DR	DD
4x	LR	RL	DL	DR	DD

Rn$_2$ [klbs]

n$_2$ x h		T$_2$ = 594700 in·lbs	T$_2$ = 475700 in·lbs	T$_2$ = 396500 in·lbs	T$_2$ = 297400 in·lbs
250 000	→	30.9	34.6	37.1	40.2
	←	26.2	30.9	34.0	37.9
500 000	→	21.6	25.3	27.8	30.9
	←	16.9	21.6	24.7	28.6
750 000	→	16.9	20.7	23.2	26.3
	←	12.3	16.9	20.1	24.0
1 000 000	→	14.0	17.7	20.2	23.4
	←	9.3	14.0	17.1	21.0
1 250 000	→	11.8	15.6	18.1	21.2
	←		11.9	15.0	18.9
2 500 000	→		9.8	12.4	15.5
	←			9.2	13.2
3 750 000	→			9.5	12.6
	←				10.3
5 000 000	→				10.8
	←				

h: expected lifetime [hours] for bearing of the output shaft.

Shaft the rated overhung load is applicable to. For double extended shaft the load is only applicable to the extension highlighted. Should this not be the case consult Bonfiglioli's Technical Service.

4.2 - PERMITTED THRUST LOAD ON OUTPUT SHAFT

HDP 60

input **VP** LL LR LD RL RR RD DL DR DD

|		An$_2$ [klbs]							
n$_2$ x h		T$_2$ = 38100 in·lbs		T$_2$ = 30100 in·lbs		T$_2$ = 25200 in·lbs		T$_2$ = 19000 in·lbs	
250 000	a	3.9		3.9		3.9		3.9	
	b	3.9		3.9		3.9		3.9	
	c	3.9		3.9		3.9		3.9	
	d	3.9		3.9		3.9		3.9	
500 000	a	3.9		3.9		3.9		3.9	
	b	3.9		3.9		3.9		3.9	
	c	3.9		3.9		3.9		3.9	
	d	3.9		3.9		3.9		3.9	
750 000	a	3.7	3.9	3.9		3.9		3.9	
	b	3.9		3.9		3.9		3.9	
	c	3.5	3.9	3.9		3.9		3.9	
	d	3.9		3.9		3.9		3.9	
1 000 000	a	3.0	3.9	3.9		3.9		3.9	
	b	3.9		3.9		3.9		3.9	
	c	2.8	3.7	3.9		3.9		3.9	
	d	3.9		3.9		3.9		3.9	
1 250 000	a	2.5	3.3	3.5	3.9	3.9		3.9	
	b	3.9		3.9		3.9		3.9	
	c	2.3	3.1	3.4	3.9	3.9		3.9	
	d	3.9		3.9		3.9		3.9	
2 500 000	a	1.1	1.8	2.1	2.8	2.7	3.4	3.6	3.9
	b	3.9		3.9		3.9		3.9	
	c	0.9	1.6	2.0	2.7	2.6	3.3	3.5	3.9
	d	3.9		3.9		3.9		3.9	
3 750 000	a		1.0	1.4	2.0	2.1	2.7	2.9	3.5
	b	3.9		3.9		3.9		3.9	
	c		0.8	1.3	1.9	2.0	2.5	2.8	3.4
	d	3.9		3.9		3.9		3.9	
5 000 000	a			1.0	1.6	1.6	2.2	2.4	3.0
	b		3.9	3.9		3.9		3.9	
	c			0.9	1.4	1.5	2.1	2.3	2.9
	d		3.9	3.8	3.9	3.9		3.9	

⇐ ⇒ direction of rotation of output shaft

↓ ↑ direction of application of axial force

▢ Rated overhung loads relevant to reinforced bearings option HDB.

HDP 70

input **VP**

| LL | LR | LD | d↕c a↔b (RL) d↕c a↔b | b↕a c↔d (RR) b↕a c↔d | d↕c a↔b (RD) b↕a c↔d | d↕c a↔b (DL) d↕c a↔b | b↕a c↔d (DR) b↕a c↔d | b↕a c↔d (DD) b↕a c↔d |

LL: d↕c / a↓b a↔b
LR: b↕a / c↓d a↔b
LD: b↕a / c↓d a↔b
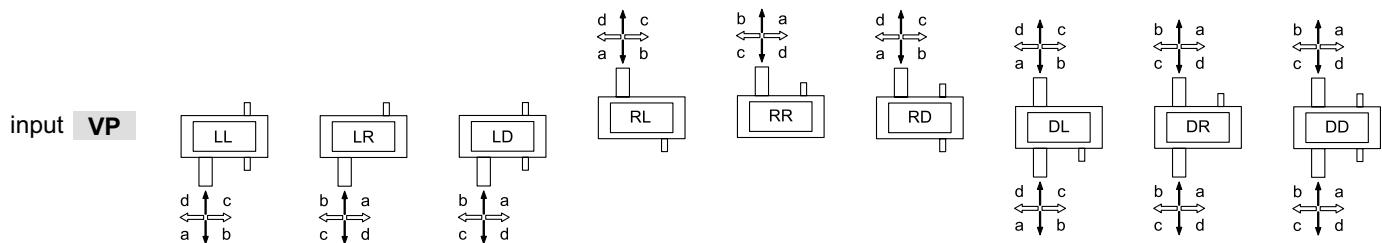
An₂ [klbs]

n₂ x h	↕↔		T₂ = 56200 in·lbs		T₂ = 44700 in·lbs		T₂ = 37200 in·lbs		T₂ = 27900 in·lbs	
		a	5.6		5.6		5.6		5.6	
250 000		b	5.6		5.6		5.6		5.6	
		c	5.6		5.6		5.6		5.6	
		d	5.6		5.6		5.6		5.6	
		a	5.6		5.6		5.6		5.6	
500 000		b	5.6		5.6		5.6		5.6	
		c	5.6		5.6		5.6		5.6	
		d	5.6		5.6		5.6		5.6	
		a	4.6	5.6	5.6		5.6		5.6	
750 000		b	5.6		5.6		5.6		5.6	
		c	4.3	5.6	5.6		5.6		5.6	
		d	5.6		5.6		5.6		5.6	
		a	3.7	5.6	5.0	5.6	5.6		5.6	
1 000 000		b	5.6		5.6		5.6		5.6	
		c	3.5	5.6	4.8	5.6	5.6	5.6	5.6	
		d	5.6		5.6		5.6		5.6	
		a	3.1	5.1	4.3	5.6	5.1	5.6	5.6	
1 250 000		b	5.6		5.6		5.6		5.6	
		c	2.8	4.8	4.1	5.6	5.0	5.6	5.6	
		d	5.6		5.6		5.6		5.6	
		a	1.4	3.0	2.6	4.2	3.4	5.0	4.4	5.6
2 500 000		b	5.4	5.6	5.6		5.6		5.6	
		c	1.1	2.8	2.4	4.0	3.3	4.9	4.3	5.6
		d	5.0	5.6	5.5	5.6	5.6		5.6	
		a		2.0	1.8	3.2	2.6	4.0	3.6	5.0
3 750 000		b		5.6	5.0	5.6	5.2	5.6	5.6	5.6
		c		1.7	1.6	3.0	2.4	3.8	3.4	4.9
		d		5.6	4.7	5.6	5.0	5.6	5.4	5.6
		a		1.3	1.2	2.6	2.0	3.3	3.0	4.3
5 000 000		b		5.4	4.4	5.6	4.7	5.6	5.0	5.6
		c		1.1	1.0	2.3	1.8	3.2	2.9	4.2
		d		5.0	4.1	5.5	4.4	5.6	4.8	5.6

⇐ ⇒ direction of rotation of output shaft

↓ ↑ direction of application of axial force

☐ Rated overhung loads relevant to reinforced bearings option HDB.

HDP 80

input **VP**

	d↕c / a↔b / a↕b	b↕a / c↔d / c↕d	b↕a / c↔d / c↕d	d↕c / a↔b / a↕b	b↕a / c↔d / c↕d	d↕c / a↔b / a↕b	b↕a / c↔d / c↕d	b↕a / c↔d / c↕d
	LL	LR	LD	RL	RR	RD	DL	DR	DD

An$_2$ [klbs]

| n$_2$ x h	↕↔	T$_2$ = 101300 in·lbs		T$_2$ = 81000 in·lbs		T$_2$ = 67300 in·lbs		T$_2$ = 50400 in·lbs	
250 000	a	6.7		6.7		6.7		6.7	
	b	6.7		6.7		6.7		6.7	
	c	6.7		6.7		6.7		6.7	
	d	6.7		6.7		6.7		6.7	
500 000	a	5.7	6.7	6.7		6.7		6.7	
	b	6.7		6.7		6.7		6.7	
	c	5.3	6.7	6.7		6.7		6.7	
	d	6.7		6.7		6.7		6.7	
750 000	a	4.0	6.7	5.8	6.7	6.7		6.7	
	b	6.7		6.7		6.7		6.7	
	c	3.6	6.7	5.5	6.7	6.7		6.7	
	d	6.7		6.7		6.7		6.7	
1 000 000	a	2.9	6.0	4.7	6.7	6.0	6.7	6.7	
	b	6.7		6.7		6.7		6.7	
	c	2.5	5.6	4.4	6.7	5.7	6.7	6.7	
	d	6.7		6.7		6.7		6.7	
1 250 000	a	2.1	5.1	4.0	6.7	5.2	6.7	6.7	
	b	6.7		6.7		6.7		6.7	
	c	1.6	4.7	3.6	6.6	4.9	6.7	6.6	6.7
	d	6.7		6.7		6.7		6.7	
2 500 000	a		2.4	1.8	4.2	3.1	5.4	4.6	6.7
	b		6.7	6.7	6.7	6.7		6.7	
	c		2.0	1.5	3.9	2.8	5.2	4.4	6.7
	d		6.7	6.2	6.7	6.7		6.7	
3 750 000	a				2.9	2.0	4.1	3.6	5.6
	b		6.7		6.7	6.0	6.7	6.6	6.7
	c				2.6	1.7	3.9	3.3	5.4
	d		6.7		6.7	5.7	6.7	6.3	6.7
5 000 000	a				2.1	1.3	3.3	2.9	4.8
	b				6.7	5.4	6.7	5.9	6.7
	c				1.8	1.1	3.1	2.7	4.6
	d				6.5	5.0	6.7	5.6	6.7

⟸ ⟹ direction of rotation of output shaft

↓ ↑ direction of application of axial force

▨ Rated overhung loads relevant to reinforced bearings option HDB.

HDP 90

input **VP**

<table>
<tr><td>LL</td><td>LR</td><td>LD</td><td>RL</td><td>RR</td><td>RD</td><td>DL</td><td>DR</td><td>DD</td></tr>
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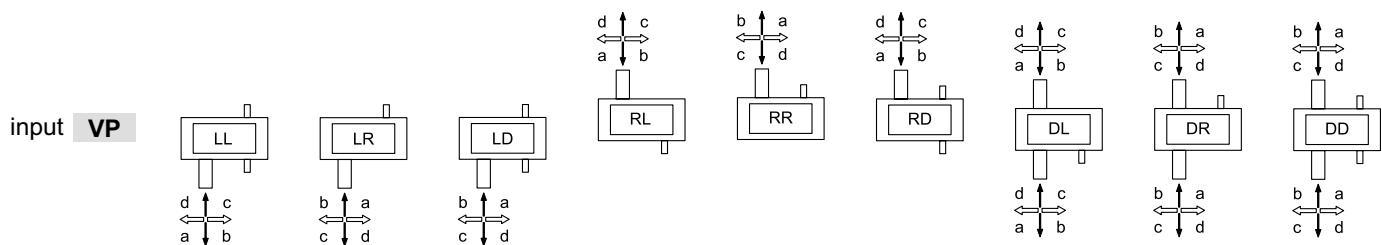
An$_2$ [klbs]

n$_2$ x h		T$_2$ = 135000 in·lbs		T$_2$ = 108000 in·lbs		T$_2$ = 89800 in·lbs		T$_2$ = 67300 in·lbs	
250 000	a	8.4		8.4		8.4		8.4	
	b	8.4		8.4		8.4		8.4	
	c	8.4		8.4		8.4		8.4	
	d	8.4		8.4		8.4		8.4	
500 000	a	7.7	8.4	8.4		8.4		8.4	
	b	8.4		8.4		8.4		8.4	
	c	7.2	8.4	8.4		8.4		8.4	
	d	8.4		8.4		8.4		8.4	
750 000	a	5.3	8.4	7.9	8.4	8.4		8.4	
	b	8.4		8.4		8.4		8.4	
	c	4.9	8.0	7.5	8.4	8.4		8.4	
	d	8.4		8.4		8.4		8.4	
1 000 000	a	3.8	6.7	6.4	8.4	8.1	8.4	8.4	
	b	8.4		8.4		8.4		8.4	
	c	3.4	6.3	6.0	8.4	7.8	8.4	8.4	
	d	8.4		8.4		8.4		8.4	
1 250 000	a	2.7	5.5	5.3	7.9	7.0	8.4	8.4	
	b	8.4		8.4		8.4		8.4	
	c	2.3	5.1	4.9	7.6	6.7	8.4	8.4	
	d	8.4		8.4		8.4		8.4	
2 500 000	a		2.1	2.4	4.6	4.1	6.2	6.2	8.3
	b		8.4	8.4		8.4		8.4	
	c		1.8	2.0	4.3	3.8	6.0	6.0	8.1
	d		8.4	8.4		8.4		8.4	
3 750 000	a			0.9	2.9	2.7	4.6	4.8	6.6
	b		8.4	8.1	8.4	8.4		8.4	
	c			0.6	2.6	2.4	4.3	4.6	6.4
	d		8.4	7.5	8.4	8.2	8.4	8.4	
5 000 000	a				1.9	1.7	3.5	3.9	5.6
	b				8.4	7.7	8.4	8.3	8.4
	c				1.6	1.4	3.3	3.7	5.4
	d				8.4	7.2	8.4	8.0	8.4

⇐ ⇒ direction of rotation of output shaft

↓ ↑ direction of application of axial force

☐ Rated overhung loads relevant to reinforced bearings option HDB.

HDP 100

2x									
3x	LL	LR	LD	RL	RR	RD	DL	DR	DD

| 4x | LL | LR | LD | RL | RR | RD | DL | DR | DD |

An₂ [klbs]

n₂ x h	$\updownarrow\leftrightarrow$	T_2 = 177000 in·lbs	T_2 = 141600 in·lbs	T_2 = 117700 in·lbs	T_2 = 88500 in·lbs
250 000	a	9.0	9.0	9.0	9.0
	b	9.0	9.0	9.0	9.0
	c	9.0	9.0	9.0	9.0
	d	9.0	9.0	9.0	9.0
500 000	a	9.0	9.0	9.0	9.0
	b	9.0	9.0	9.0	9.0
	c	9.0	9.0	9.0	9.0
	d	9.0	9.0	9.0	9.0
750 000	a	9.0	9.0	9.0	9.0
	b	7.9	9.0	9.0	9.0
	c	9.0	9.0	9.0	9.0
	d	7.3	9.0	9.0	9.0
1 000 000	a	9.0	9.0	9.0	9.0
	b	6.0	9.0	9.0	9.0
	c	9.0	9.0	9.0	9.0
	d	5.3	8.6	9.0	9.0
1 250 000	a	9.0	9.0	9.0	9.0
	b	4.6	7.7	9.0	9.0
	c	9.0	9.0	9.0	9.0
	d	3.9	7.2	9.0	9.0
2 500 000	a		9.0	9.0	9.0
	b		3.9	6.0	8.6
	c		9.0	9.0	9.0
	d		3.4	5.6	8.3
3 750 000	a		9.0	9.0	9.0
	b		2.0	4.1	6.7
	c		9.0	9.0	9.0
	d		1.5	3.7	6.4
5 000 000	a		9.0	9.0	9.0
	b		0.8	2.9	5.5
	c		9.0	9.0	9.0
	d		0.3	2.5	5.2

$\Longleftrightarrow\ \Longrightarrow$ direction of rotation of output shaft $\downarrow\uparrow$ direction of application of axial force

HDP 110

2x
3x

| LL | LR | LD | RL | RR | RD | DL | DR | DD |

4x

| LL | LR | LD | RL | RR | RD | DL | DR | DD |
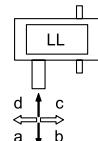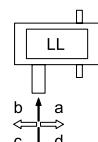
An$_2$ [klbs]

n$_2$ x h		T$_2$ = 209300 in·lbs	T$_2$ = 167300 in·lbs	T$_2$ = 139400 in·lbs	T$_2$ = 104400 in·lbs
250 000	a	9.7	9.7	9.7	9.7
	b	9.7	9.7	9.7	9.7
	c	9.7	9.7	9.7	9.7
	d	9.7	9.7	9.7	9.7
500 000	a	9.7	9.7	9.7	9.7
	b	9.7	9.7	9.7	9.7
	c	9.7	9.7	9.7	9.7
	d	9.7	9.7	9.7	9.7
750 000	a	9.7	9.7	9.7	9.7
	b	9.7	9.7	9.7	9.7
	c	9.7	9.7	9.7	9.7
	d	9.7	9.7	9.7	9.7
1 000 000	a	9.7	9.7	9.7	9.7
	b	9.2	9.7	9.7	9.7
	c	9.7	9.7	9.7	9.7
	d	8.5	9.7	9.7	9.7
1 250 000	a	9.7	9.7	9.7	9.7
	b	7.6	9.7	9.7	9.7
	c	9.7	9.7	9.7	9.7
	d	6.9	9.7	9.7	9.7
2 500 000	a	9.7	9.7	9.7	9.7
	b	3.2	6.4	8.5	9.7
	c	9.7	9.7	9.7	9.7
	d	2.6	5.8	8.0	9.7
3 750 000	a		9.7	9.7	9.7
	b		4.2	6.3	8.9
	c		9.7	9.7	9.7
	d		3.7	5.9	8.6
5 000 000	a			9.7	9.7
	b			4.9	7.5
	c			9.7	9.7
	d			4.5	7.2

⟸ ⟹ direction of rotation of output shaft   ↓ ↑ direction of application of axial force

HDP 120

2x / 3x	LL	LR	LD	RL	RR	RD	DL	DR	DD

4x	LL	LR	LD	RL	RR	RD	DL	DR	DD
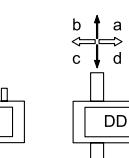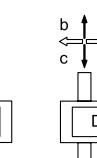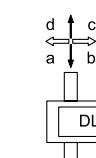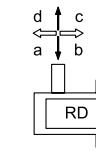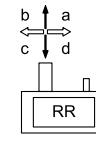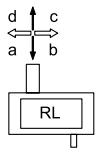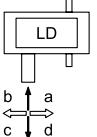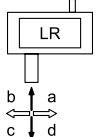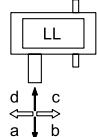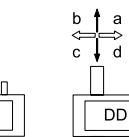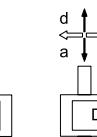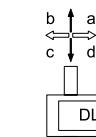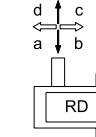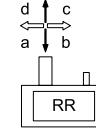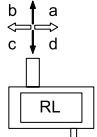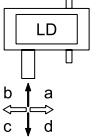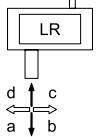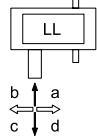
An$_2$ [klbs]

n_2 x h		T_2 = 281000 in·lbs	T_2 = 224800 in·lbs	T_2 = 187200 in·lbs	T_2 = 140300 in·lbs
250 000	a	12.0	12.0	12.0	12.0
	b	12.0	12.0	12.0	12.0
	c	12.0	12.0	12.0	12.0
	d	12.0	12.0	12.0	12.0
500 000	a	12.0	12.0	12.0	12.0
	b	12.0	12.0	12.0	12.0
	c	12.0	12.0	12.0	12.0
	d	12.0	12.0	12.0	12.0
750 000	a	12.0	12.0	12.0	12.0
	b	12.0	12.0	12.0	12.0
	c	12.0	12.0	12.0	12.0
	d	12.0	12.0	12.0	12.0
1 000 000	a	12.0	12.0	12.0	12.0
	b	11.4	12.0	12.0	12.0
	c	12.0	12.0	12.0	12.0
	d	10.7	12.0	12.0	12.0
1 250 000	a	12.0	12.0	12.0	12.0
	b	9.4	12.0	12.0	12.0
	c	12.0	12.0	12.0	12.0
	d	8.7	12.0	12.0	12.0
2 500 000	a	12.0	12.0	12.0	12.0
	b	4.1	7.9	10.4	12.0
	c	12.0	12.0	12.0	12.0
	d	3.4	7.3	10.0	12.0
3 750 000	a	12.0	12.0	12.0	12.0
	b	1.5	5.2	7.8	10.9
	c	12.0	12.0	12.0	12.0
	d	0.8	4.7	7.3	10.6
5 000 000	a		12.0	12.0	12.0
	b		3.6	6.1	9.2
	c		12.0	12.0	12.0
	d		3.0	5.6	8.9

⟸ ⟹ direction of rotation of output shaft   ↓ ↑ direction of application of axial force
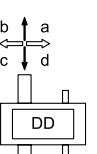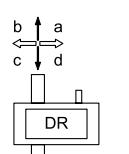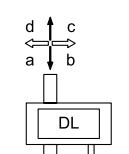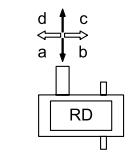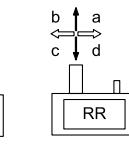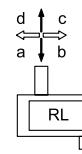
HDP 130
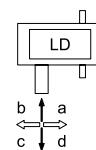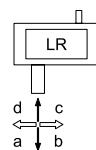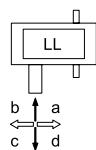
An$_2$ [klbs]

n$_2$ x h		T$_2$ = 474400 in·lbs	T$_2$ = 379200 in·lbs	T$_2$ = 316000 in·lbs	T$_2$ = 237200 in·lbs
250 000	a	18.0	18.0	18.0	18.0
	b	18.0	18.0	18.0	18.0
	c	18.0	18.0	18.0	18.0
	d	18.0	18.0	18.0	18.0
500 000	a	18.0	18.0	18.0	18.0
	b	18.0	18.0	18.0	18.0
	c	18.0	18.0	18.0	18.0
	d	18.0	18.0	18.0	18.0
750 000	a	17.6	18.0	18.0	18.0
	b	18.0	18.0	18.0	18.0
	c	16.5	18.0	18.0	18.0
	d	18.0	18.0	18.0	18.0
1 000 000	a	13.8	18.0	18.0	18.0
	b	18.0	18.0	18.0	18.0
	c	12.7	18.0	18.0	18.0
	d	18.0	18.0	18.0	18.0
1 250 000	a	11.1	16.8	18.0	18.0
	b	18.0	18.0	18.0	18.0
	c	10.0	15.9	18.0	18.0
	d	18.0	18.0	18.0	18.0
2 500 000	a	3.7	9.4	13.2	17.8
	b	18.0	18.0	18.0	18.0
	c	2.5	8.5	12.4	17.3
	d	18.0	18.0	18.0	18.0
3 750 000	a		5.7	9.5	14.2
	b		18.0	18.0	18.0
	c		4.8	8.7	13.6
	d		18.0	18.0	18.0
5 000 000	a		3.4	7.1	11.8
	b		18.0	18.0	18.0
	c		2.5	6.4	11.3
	d		17.7	18.0	18.0

⟸ ⟹ direction of rotation of output shaft   ↓ ↑ direction of application of axial force

HDP 140

2x / 3x	LL	LR	LD	RL	RR	RD	DL	DR	DD

4x	LL	LR	LD	RL	RR	RD	DL	DR	DD
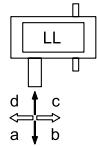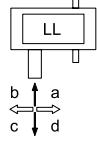
An_2 [klbs]

n_2 x h		T_2 = 594700 in·lbs	T_2 = 475700 in·lbs	T_2 = 396500 in·lbs	T_2 = 297400 in·lbs
250 000	a	21.4	21.4	21.4	21.4
	b	21.4	21.4	21.4	21.4
	c	21.4	21.4	21.4	21.4
	d	21.4	21.4	21.4	21.4
500 000	a	18.9	21.4	21.4	21.4
	b	21.4	21.4	21.4	21.4
	c	17.8	21.4	21.4	21.4
	d	21.4	21.4	21.4	21.4
750 000	a	18.9	21.4	21.4	21.4
	b	21.4	21.4	21.4	21.4
	c	17.8	21.4	21.4	21.4
	d	21.4	21.4	21.4	21.4
1 000 000	a	14.6	21.2	21.4	21.4
	b	21.4	21.4	21.4	21.4
	c	13.5	20.3	21.4	21.4
	d	21.4	21.4	21.4	21.4
1 250 000	a	11.5	18.1	21.4	21.4
	b	21.4	21.4	21.4	21.4
	c	10.4	17.2	21.4	21.4
	d	21.4	21.4	21.4	21.4
2 500 000	a	3.2	9.8	14.1	19.6
	b	21.4	21.4	21.4	21.4
	c	2.1	8.9	13.4	19.0
	d	21.4	21.4	21.4	21.4
3 750 000	a		5.7	10.0	15.5
	b		21.4	21.4	21.4
	c		4.8	9.3	14.9
	d		21.4	21.4	21.4
5 000 000	a		3.0	7.4	12.8
	b		20.1	21.4	21.4
	c		2.1	6.7	12.3
	d		18.8	20.5	21.4

⇐ ⇒ direction of rotation of output shaft   ↓↑ direction of application of axial force

4.3 - MASS MOMENT OF INERTIA

Moments of inertia listed refer to gearbox input shaft and apply exclusively for configurations with a single extension input and output shaft.

i_N	$J \cdot 10^{-4}$ [lb·ft²]								
	HDP 60	HDP 70	HDP 80	HDP 90	HDP 100	HDP 110	HDP 120	HDP 130	HDP 140
2x 7.1	2848	—	—	—	28951	—	—	132935	—
8.0	2753	3393	7950	14238	27764	30564	60701	128189	146106
9.0	2254	3156	7451	13526	21784	29235	58874	105504	139010
10.0	2183	2587	6241	10441	20977	22852	42809	102110	114853
11.2	1614	2444	5885	9990	16184	21974	41741	72377	109799
12.5	1590	1827	4343	7689	15686	16896	30493	70407	77811
14.0	1281	1756	4153	7380	12055	16326	29805	45467	74868
16.0	1258	1424	3132	5363	11723	12482	24632	44209	48931
18.0	783	1376	3014	5197	9207	12126	24181	33649	47057
20.0	783	949	2349	4058	8994	9468	17014	32819	35927
22.4	—	902	2254	3939	8875	9255	16730	38466	34693
25.0	—	—	—	—	—	8970	16350	—	33246
3x 22.4	783	—	—	—	8211	—	—	32391	—
25.0	783	854	2017	4200	8092	8400	11106	31869	33863
28.0	688	831	1970	4129	7285	8258	10940	27218	33080
31.5	688	712	1614	3702	7214	7404	9065	26910	28073
35.5	641	712	1590	3654	6621	7309	8970	24466	27598
40.0	641	664	1590	2159	6573	6692	8092	24276	25011
45.0	570	641	1566	2136	6194	6644	8021	22757	24703
50.0	570	593	1044	1946	6170	6241	7024	22615	23113
56.0	261	593	1044	1946	2610	6217	6977	9824	22923
63.0	261	285	973	1827	2587	2634	3251	9729	10702
71.0	261	285	973	1827	2420	2610	3227	9112	10584
80.0	261	261	498	925	2420	2444	2990	9065	9255
90.0	237	261	498	902	2302	2444	2990	8661	9184
100.0	237	237	475	854	2302	2326	2658	8638	8756
112.0	—	237	475	854	2302	2302	2634	8875	8709
125.0	—	—	—	—	—	2302	2634	—	8661
4x 112.0	—	—	—	—	1092	—	—	5790	—
125.0	—	—	—	—	1092	1115	1210	5766	—
140.0	—	—	—	—	1068	1092	1210	5624	5814
160.0	—	—	—	—	1044	1068	1163	5671	5648
180.0	—	—	—	—	1020	949	1163	5078	5624
200.0	—	—	—	—	1020	1044	1092	5078	5529
224.0	—	—	—	—	925	1020	1092	5031	5102
250.0	—	—	—	—	925	380	973	5007	5031
280.0	—	—	—	—	380	380	973	1756	5031
315.0	—	—	—	—	380	380	403	1732	1756
355.0	—	—	—	—	356	380	403	1614	1756
400.0	—	—	—	—	356	356	356	1614	1614
450.0	—	—	—	—	332	356	380	1590	1614
500.0	—	—	—	—	332	332	356	1590	1590

4.4 - EXACT RATIOS

i_N	i								
	HDP 60	HDP 70	HDP 80	HDP 90	HDP 100	HDP 110	HDP 120	HDP 130	HDP 140
2x									
7.1	7.146	—	—	—	7.400	—	—	7.263	—
8.0	8.031	8.039	8.063	7.929	8.222	8.085	7.907	7.929	8.359
9.0	8.969	9.333	9.361	8.828	9.106	8.956	8.611	8.613	9.250
10.0	10.079	10.090	9.844	10.059	10.118	9.949	10.302	9.402	9.913
11.2	11.156	11.714	11.429	11.200	11.250	11.021	11.219	11.307	10.969
12.5	12.538	12.551	12.600	12.214	12.500	12.292	13.013	12.343	13.013
14.0	13.533	14.571	14.629	13.600	14.160	13.616	14.171	14.133	14.400
16.0	15.209	15.225	15.488	15.807	15.733	15.471	15.976	15.429	16.267
18.0	17.267	17.676	17.981	17.600	18.000	17.138	17.398	17.431	18.000
20.0	19.404	19.425	19.441	20.086	20.000	19.667	20.624	19.029	20.062
22.4	—	22.552	22.571	22.364	21.786	21.786	22.459	21.652	22.200
25.0	—	—	—	—	22.765	25.000	25.357	21.785	24.941
3x									
22.4	22.686	—	—	—	—	—	—	—	—
25.0	25.494	25.521	25.800	25.406	25.294	24.873	25.756	23.781	25.073
28.0	28.219	29.630	29.954	28.288	28.125	27.553	28.048	28.599	27.744
31.5	31.713	31.746	31.713	32.878	31.250	30.729	32.533	31.220	32.916
35.5	34.231	36.857	36.818	36.608	35.400	34.040	35.429	35.749	36.424
40.0	38.470	38.510	39.809	40.036	39.333	38.678	39.940	39.025	41.145
45.0	43.675	44.710	46.218	44.578	45.000	42.845	43.495	44.090	45.529
50.0	49.082	49.134	51.625	51.811	50.000	49.167	51.560	48.131	50.746
56.0	56.578	57.044	59.937	57.689	55.547	54.464	56.148	56.533	56.153
63.0	63.583	63.650	64.805	65.837	61.719	60.690	64.253	61.714	65.067
71.0	68.633	73.898	75.238	73.306	69.915	67.229	69.971	70.667	72.000
80.0	77.131	77.213	76.405	77.818	77.683	76.389	78.882	77.143	81.333
90.0	87.567	89.644	88.706	86.646	88.875	84.619	85.902	87.156	90.000
100.0	98.408	98.513	95.911	98.884	98.750	97.104	101.830	95.143	100.311
112.0	—	114.373	111.352	110.102	107.567	107.567	110.892	108.259	111.000
125.0	—	—	—	—	—	123.438	125.201	—	124.704
4x									
112.0	—	—	—	—	110.625	—	—	111.182	—
125.0	—	—	—	—	122.917	120.868	127.964	121.371	—
140.0	—	—	—	—	139.240	133.891	139.352	138.978	141.600
160.0	—	—	—	—	154.711	168.525	157.099	151.714	159.956
180.0	—	—	—	—	177.000	190.972	171.080	176.667	177.000
200.0	—	—	—	—	196.667	193.389	202.801	192.857	197.279
225.0	—	—	—	—	222.188	214.226	220.849	217.889	225.000
250.0	—	—	—	—	246.875	248.643	254.575	237.857	250.778
280.0	—	—	—	—	286.437	275.434	277.231	274.481	277.500
315.0	—	—	—	—	318.263	312.958	323.176	299.636	315.912
355.0	—	—	—	—	359.563	346.679	351.936	348.917	349.575
400.0	—	—	—	—	399.514	392.856	405.681	380.893	401.583
450.0	—	—	—	—	457.071	440.694	454.317	469.768	444.375
500.0	—	—	—	—	507.857	499.393	523.697	534.530	495.286

5 - DIMENSIONS AND WEIGHT

Tolerances

	Bore				Shaft								
	G7	H7	H8	H9	d9	f7	g6	h6	h7	h9	j6	k6	m6
6 < dia ≤ 10				+0.036 0						0 -0.036			
10 < dia ≤ 18				+0.043 0						0 -0.043			
18 < dia ≤ 30		+0.021 0	+0.033 0	+0.052 0						0 -0.052	+0.009 -0.004		
30 < dia ≤ 50		+0.025 0	+0.039 0							0 -0.062		+0.018 +0.002	
50 < dia ≤ 80	+0.040 +0.010	+0.030 0					-0.010 -0.029	0 -0.019	0 -0.030				+0.030 +0.011
80 < dia ≤ 120	+0.047 +0.012	+0.035 0			-0.120 -0.207		-0.0120 -0.034	0 -0.022	0 -0.035				+0.035 +0.013
120 < dia ≤ 180		+0.040 0			-0.145 -0.245	-0.043 -0.083	-0.014 -0.039	0 -0.025	0 -0.040				+0.040 +0.015
180 < dia ≤ 250		+0.046 0				-0.050 -0.096		0 -0.029	0 -0.046				
250 < dia ≤ 315		+0.052 0				-0.056 -0.108			0 -0.052				
315 < dia ≤ 400						-0.062 -0.119			0 -0.057				
400 < dia ≤ 500						-0.068 -0.131			0 -0.063				
500 < dia ≤ 630						-0.076 -0.146							
630 < dia ≤ 800						-0.080 -0.160							

Dimensions are in mm.

VP
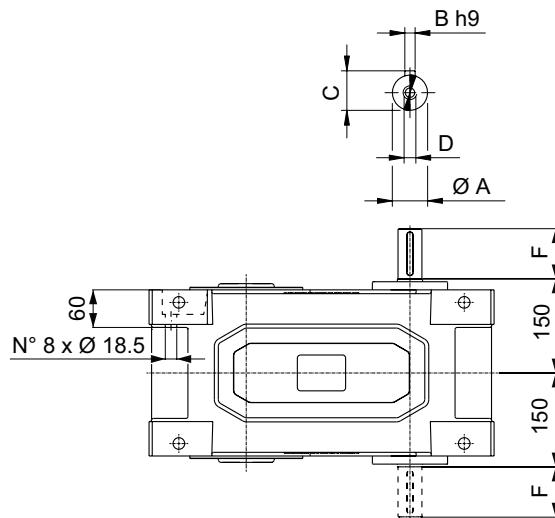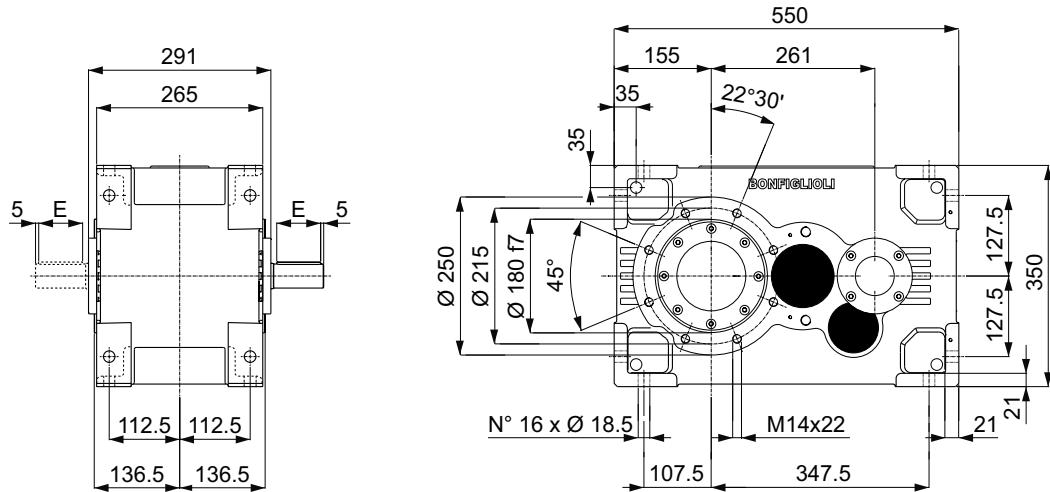
	i =	A	B	C	D	E	F	Weight [kg / *lbs*]
HDP 60 2	**7.1 ... 15.2**	38 k6	10	41	M12x28	70	80	161 / *354*
HDP 60 2	**17.3 ... 19.4**	32 k6	10	35	M12x28	70	80	161 / *354*
HDP 60 3	**22.7 ... 49.1**	32 k6	10	35	M12x28	70	80	164 / *361*
HDP 60 3	**56.6 ... 98.4**	28 j6	8	31	M10x22	50	60	164 / *361*

Dimensions are in mm.

LP

140 142.5 142.5 140

7.5 125 125 7.5

74.5

20 h9

M20x42

Ø 70 m6

H

142.5

57.5 57.5

74.9

20 H8

Ø 70 G7

S

61.5 194 75

142.5 204.5

Ø 72 G7 / h7

Ø 70 H7 / g6

Ø 183

310 in·lbs

6

Dimensions are in mm.

VP
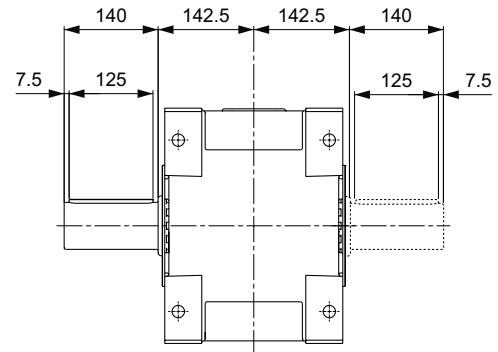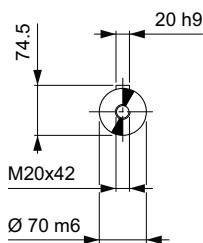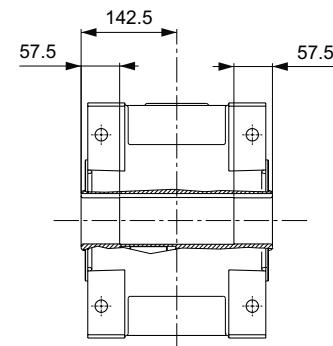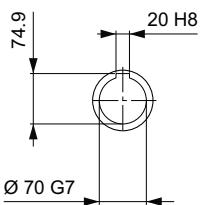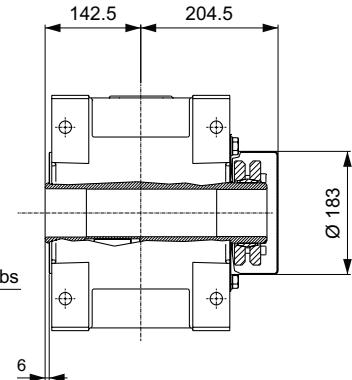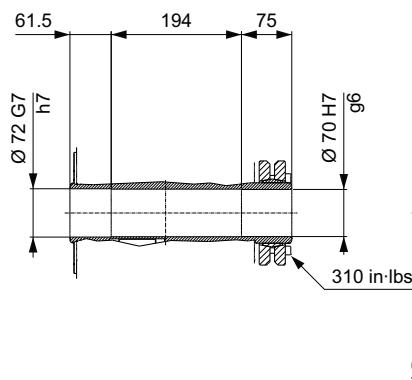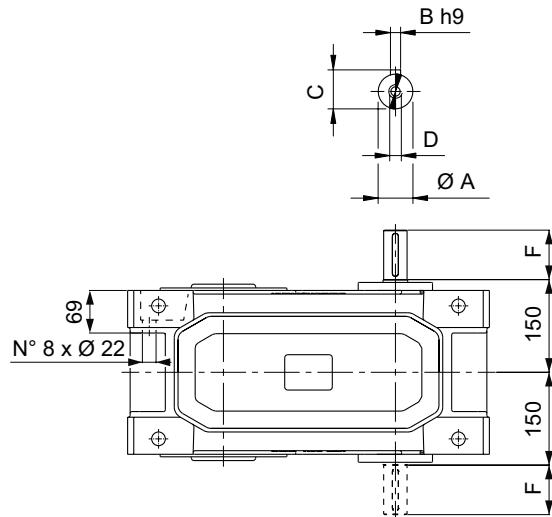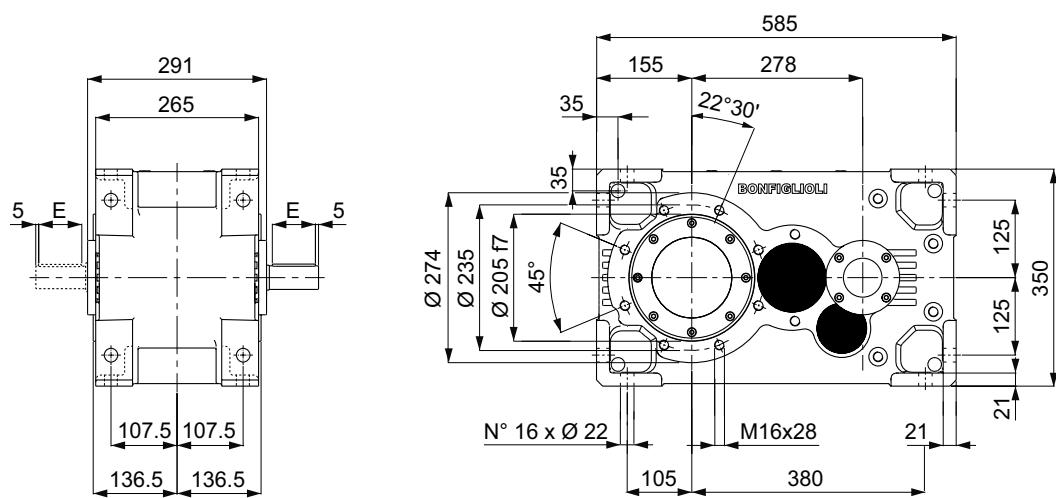
	i =	A	B	C	D	E	F	Weight [kg / *lbs*]
HDP 70 2	**8.0 ... 17.7**	38 k6	10	41	M12x28	70	80	189 / *416*
HDP 70 2	**19.4 ... 22.6**	32 k6	10	35	M12x28	70	80	189 / *416*
HDP 70 3	**25.5 ... 57.0**	32 k6	10	35	M12x28	70	80	192 / *422*
HDP 70 3	**63.7 ... 114.4**	28 j6	8	31	M10x22	50	60	192 / *422*

Dimensions are in mm.

BONFIGLIOLI
RIDUTTORI

LP

22 h9

85

M20x42

Ø 80 m6

170 | 142.5 | 142.5 | 170
10 | 150 | | 150 | 10

H

85.4

22 H8

Ø 80 G7

142.5
80 | 80

6

S

Ø 82 G7/h7

80 | 174.5 | 80

Ø 80 H7/g6

310 in·lbs

142.5 | 204.5

Ø 208

6

Dimensions are in mm.

VP
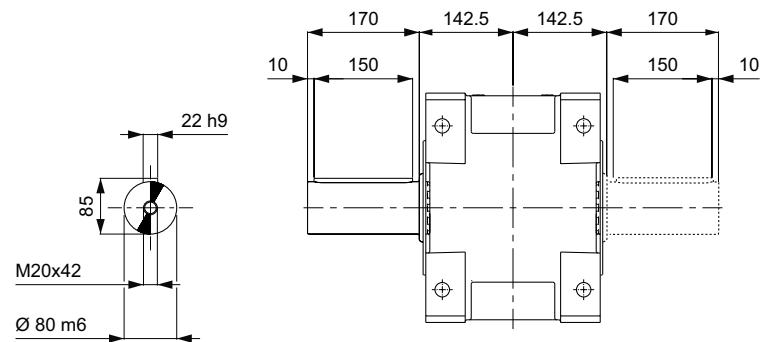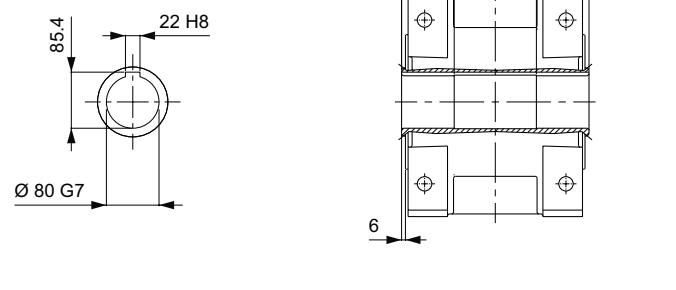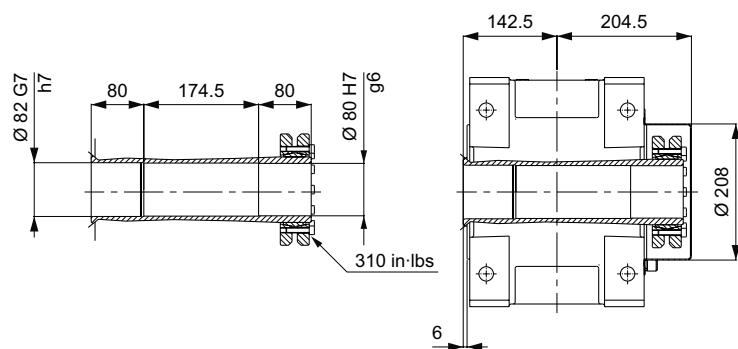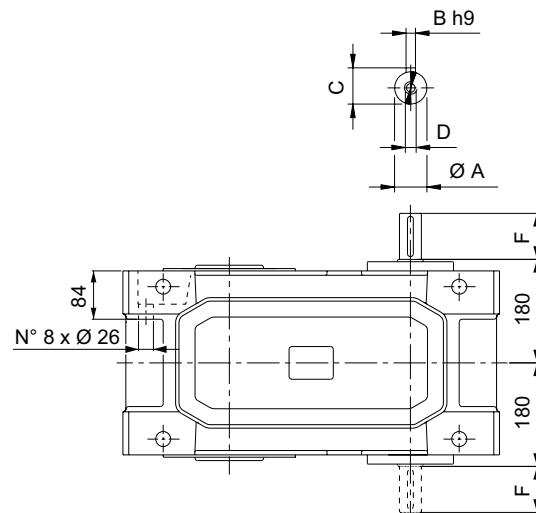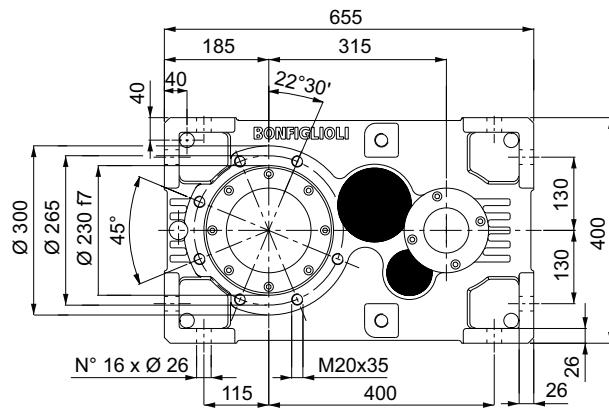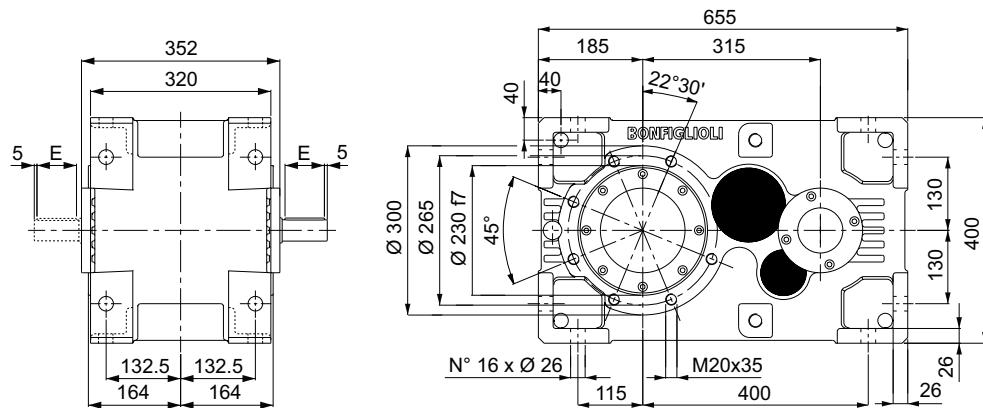
	i =	A	B	C	D	E	F	Weight [kg / *lbs*]
HDP 80 2	**8.1 ... 14.6**	45 k6	14	48.5	M16x36	100	110	301 / *662*
HDP 80 2	**15.5 ... 22.6**	38 k6	10	41	M12x28	70	80	301 / *662*
HDP 80 3	**25.8 ... 75.2**	38 k6	10	41	M12x28	70	80	306 / *673*
HDP 80 3	**76.4 ... 114.4**	28 j6	8	31	M10x22	50	60	306 / *673*

Dimensions are in mm.

LP

210　170　170　210

10　190

28 h9

106

M24x50

Ø 100 m6

190　10

H

170

75　75

25 H8

100.4

Ø 95 G7

6

S

170　240

Ø 97 G7

h7

98　205　98

H7
g6

Ø 95

610 in·lbs

Ø 233

6

Dimensions are in mm.

VP

N° 16 x Ø 30

M24x35

B h9

N° 8 x Ø 30
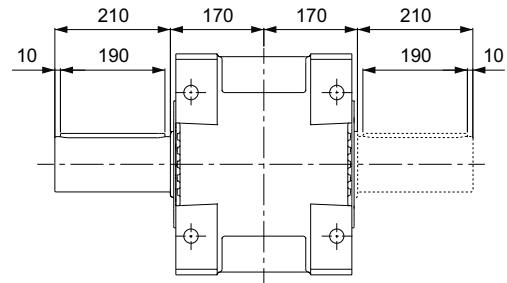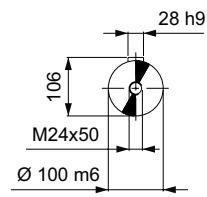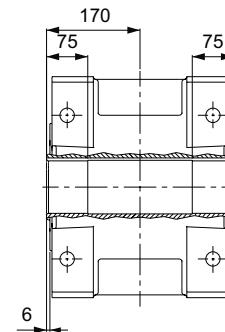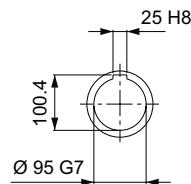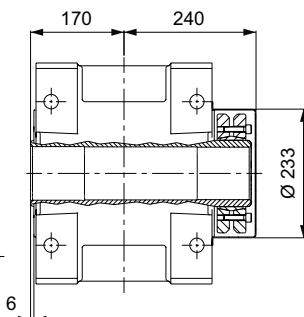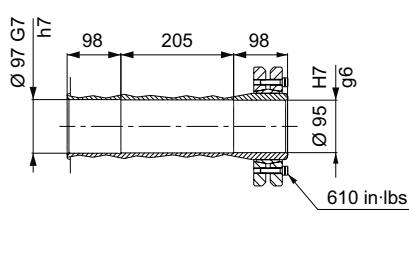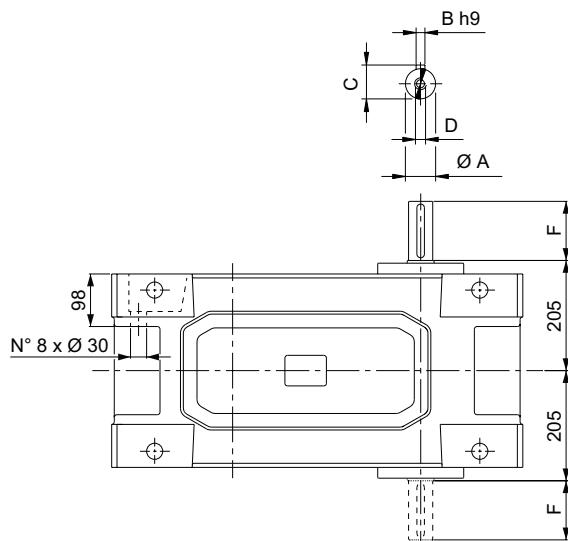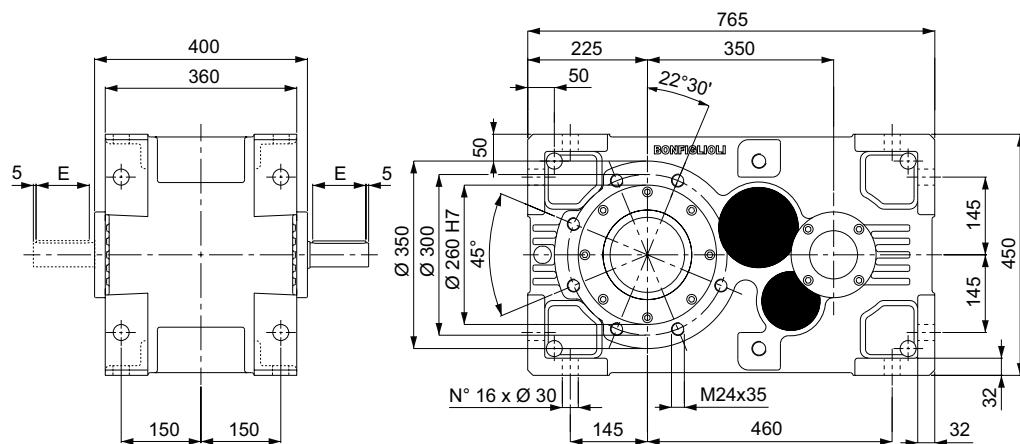
	i =	A	B	C	D	E	F	Weight [kg / *lbs*]
HDP 90 2	**7.9 ... 13.6**	50 k6	14	53.5	M16x36	100	110	429 / *944*
HDP 90 2	**15.8 ... 22.4**	45 k6	14	48.5	M16x36	100	110	429 / *944*
HDP 90 3	**25.4 ... 73.3**	45 k6	14	48.5	M16x36	100	110	440 / *968*
HDP 90 3	**77.8 ... 110.1**	32 k6	10	35	M12x28	70	80	440 / *968*

Dimensions are in mm.

LP

28 h9

116

M24x50

Ø 110 m6

210   190   190   210
10   190   190   10

H

28 H8

116.4

Ø 110 G7

190
90   90
10

S

Ø 112 G7
h7   90   273   80   Ø 110 H7
g6
1125 in·lbs

190   268.5
Ø 253
10

Dimensions are in mm.

BONFIGLIOLI RIDUTTORI
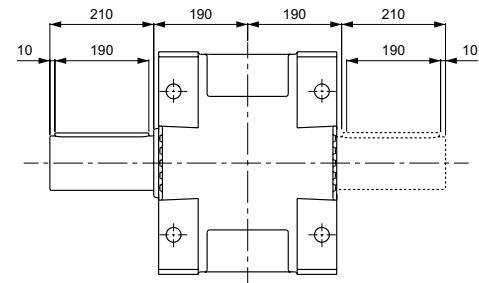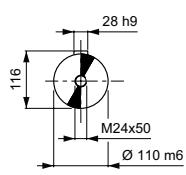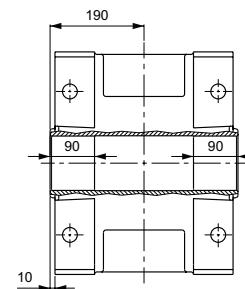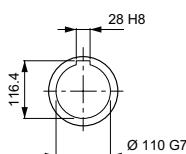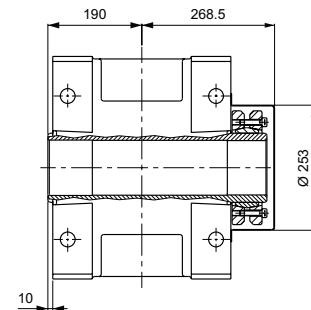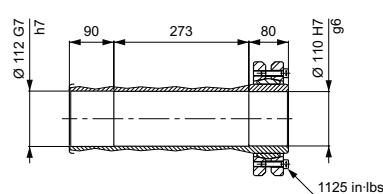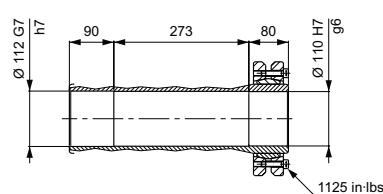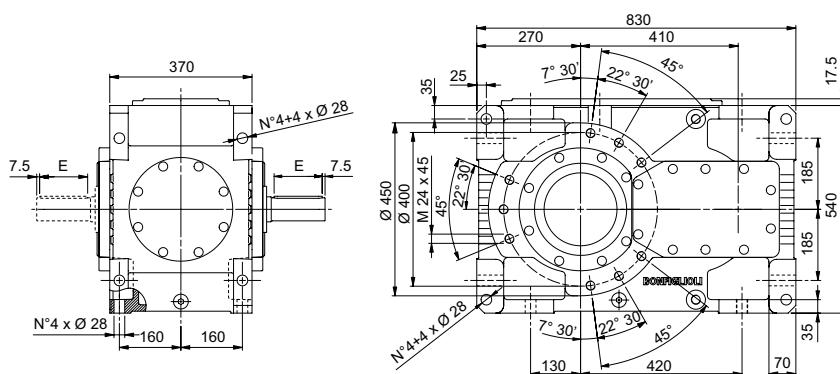
HDP 100 2

HDP 100 3
HDP 100 4
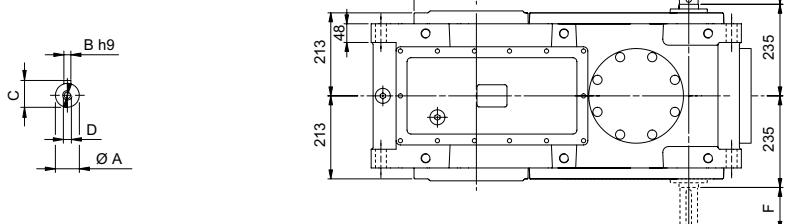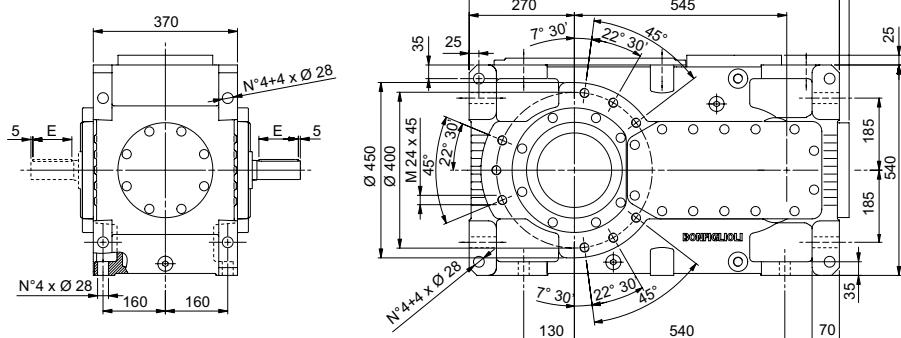
	i =	A	B	C	D	E	F	Weight [kg / *lbs*]
HDP 100 2	7.4 … 21.8	60 m6	18	64	M20x42	125	140	645 / *1419*
HDP 100 3	22.8 … 50	48 k6	14	51.5	M16x36	100	110	735 / *1617*
HDP 100 3	55.5 … 107.8	45 k6	14	48.5	M16x36	100	110	735 / *1617*
HDP 100 4	110.6 … 507.9	32 k6	10	35	M12x28	70	80	730 / *1606*

Dimensions are in mm.

BONFIGLIOLI RIDUTTORI

LP

32 h9

127

M 24 x 50

Ø 120 m6

210 225 225 210

7.5 195 195 7.5

H

Ø 120 H7

32 H8

127.4

12

225

100 100

S

Ø 125 $\frac{H7}{h6}$

105 330 100

1125 in·lbs

12

Ø 120 $\frac{H7}{g6}$

225 335

Ø 324

40

Dimensions are in mm.

BONFIGLIOLI RIDUTTORI
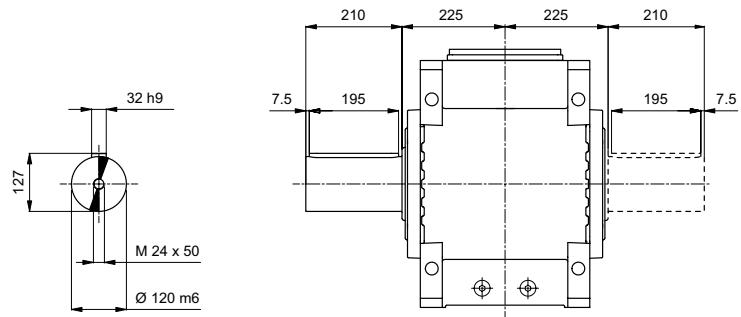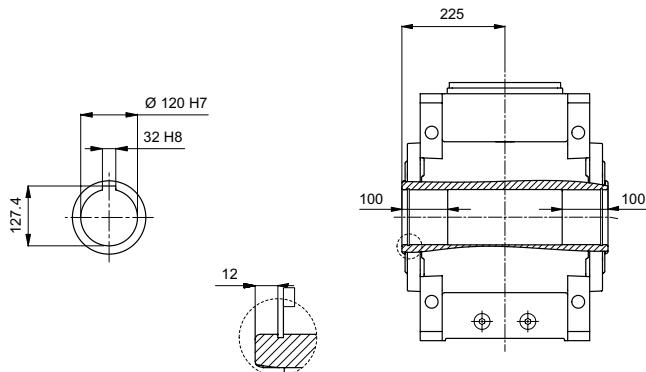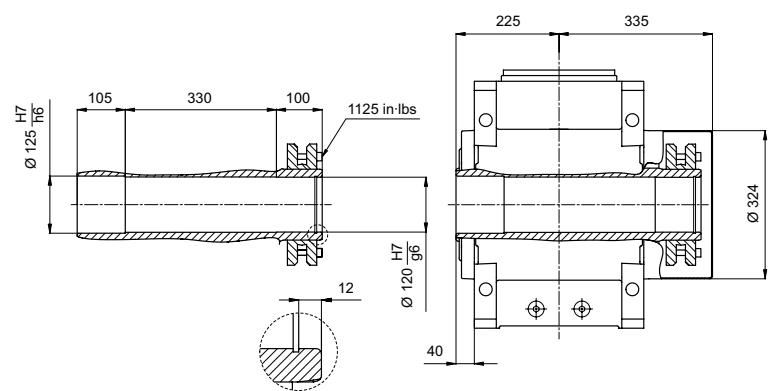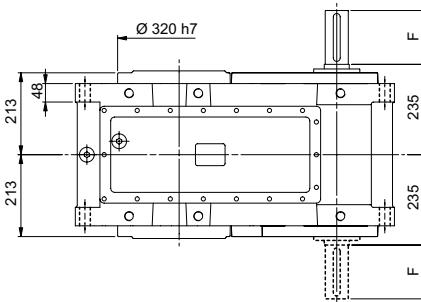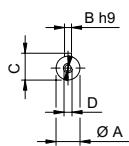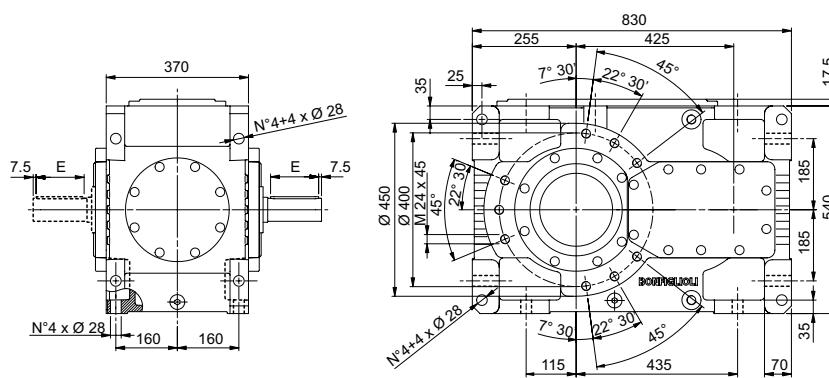
HDP 110 2

HDP 110 3
HDP 110 4
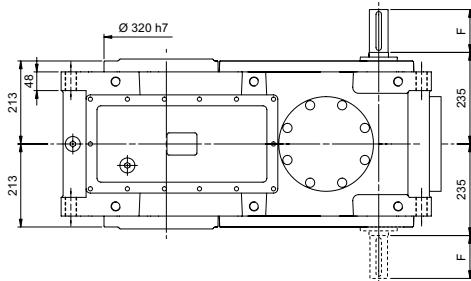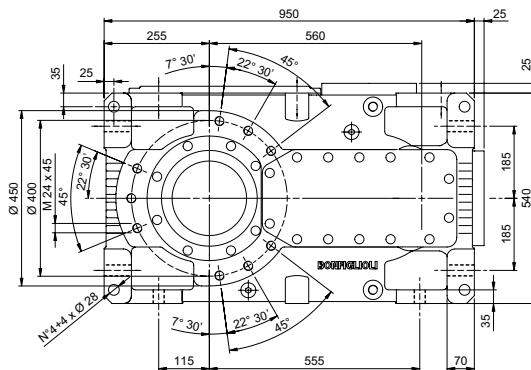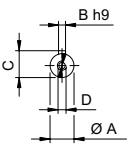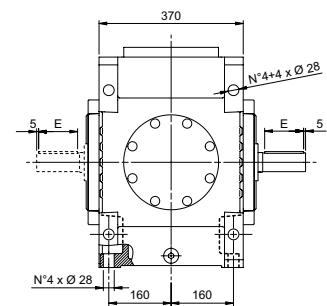
	i =	A	B	C	D	E	F	Weight [kg / *lbs*]
HDP 110 2	**8.1 … 25.0**	60 m6	18	64	M20x42	125	140	690 / *1518*
HDP 110 3	**24.9 … 54.5**	48 k6	14	51.5	M16x36	100	110	770 / *1694*
HDP 110 3	**60.7 … 123.5**	45 k6	14	48.5	M16x36	100	110	770 / *1694*
HDP 110 4	**120.9 … 499.4**	32 k6	10	35	M12x28	70	80	755 / *1661*

Dimensions are in mm.

LP

32 h9
137
M 24 x 50
Ø 130 m6

250 · 225 · 225 · 250
15 · 220 · 220 · 15

H

Ø 130 H7
32 H8
137.4
12

225
100 · 100

S

225 · 335

Ø 135 $\frac{H7}{h6}$
105 · 336 · 100
2800 in·lbs
Ø 324
Ø 130 $\frac{H7}{g6}$
12
40

Dimensions are in mm.

BONFIGLIOLI RIDUTTORI
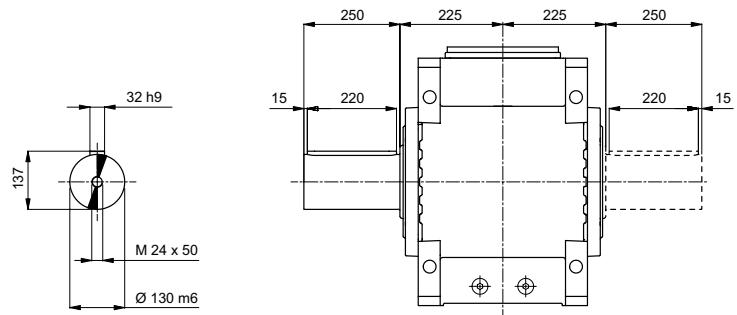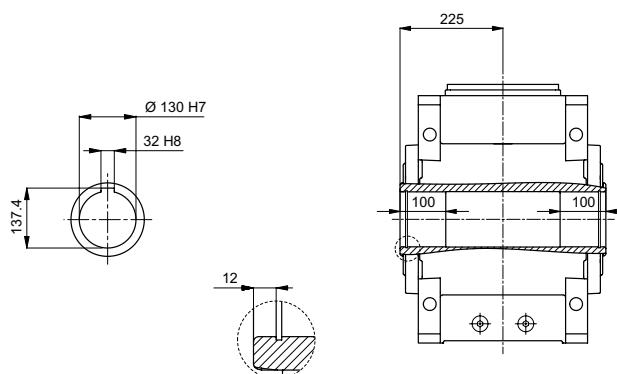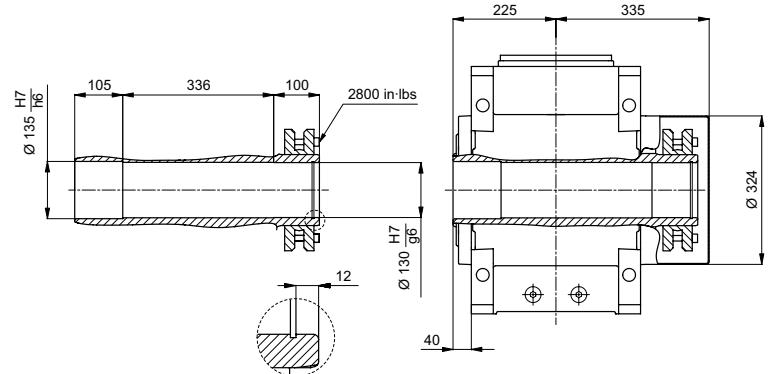
HDP 120 2

HDP 120 3
HDP 120 4
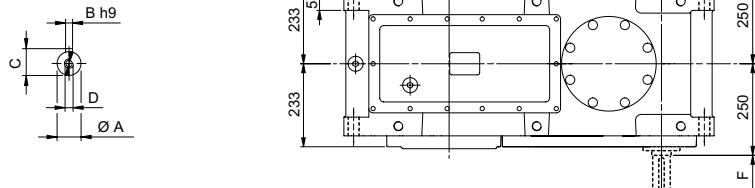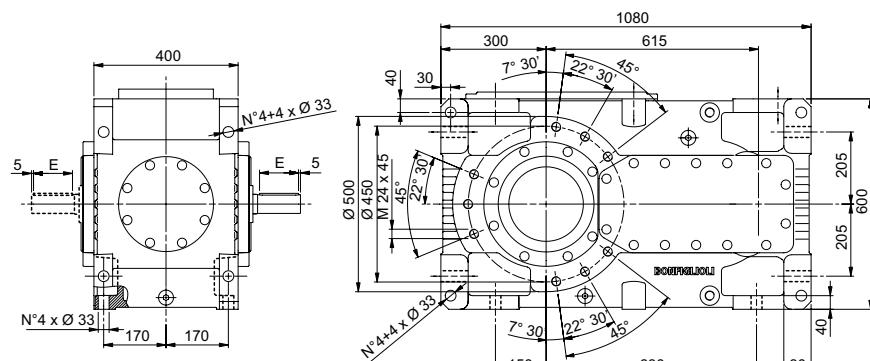
	i =	A	B	C	D	E	F	Weight [kg / lbs]
HDP 120 2	**7.9 … 25.4**	70 m6	20	74.5	M20x42	125	140	940 / 2068
HDP 120 3	**25.8 … 56.1**	48 k6	14	51.5	M16x36	100	110	1045 / 2299
HDP 120 3	**64.3 … 125.2**	45 k6	14	48.5	M16x36	100	110	1045 / 2299
HDP 120 4	**128 … 523.7**	32 k6	10	35	M12x36	70	80	1030 / 2266

Dimensions are in mm.

BONFIGLIOLI RIDUTTORI

LP

250   240   240   250

10   220   220   10

36 h9

148

M 24 x 50

Ø 140 m6

H

240

Ø 140 H7

36 H8

148.4

110   110

15

S

240   350

Ø 145 H7/h6

105   356   110

2800 in·lbs

Ø 364

H7/g6

Ø 140

15

40
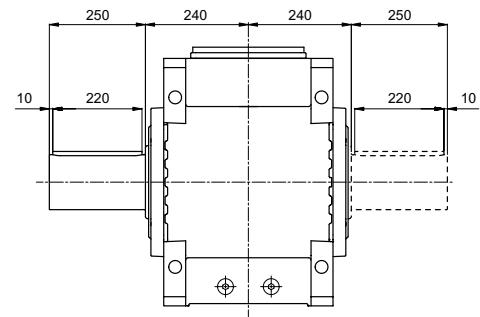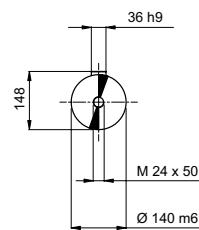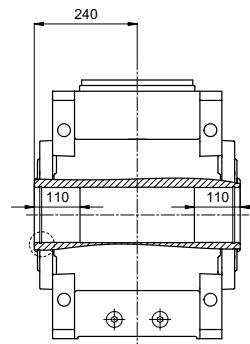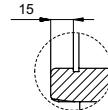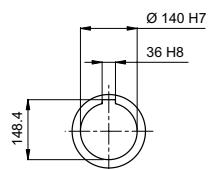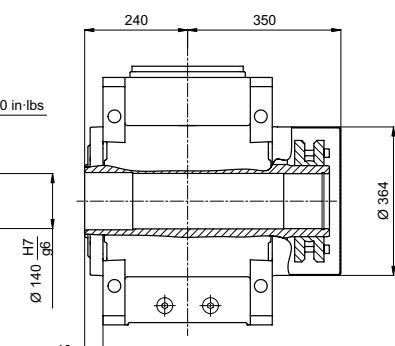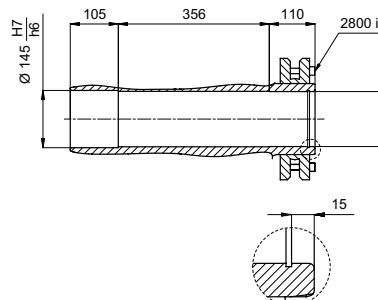
Dimensions are in mm.

HDP 130 2

HDP 130 3
HDP 130 4
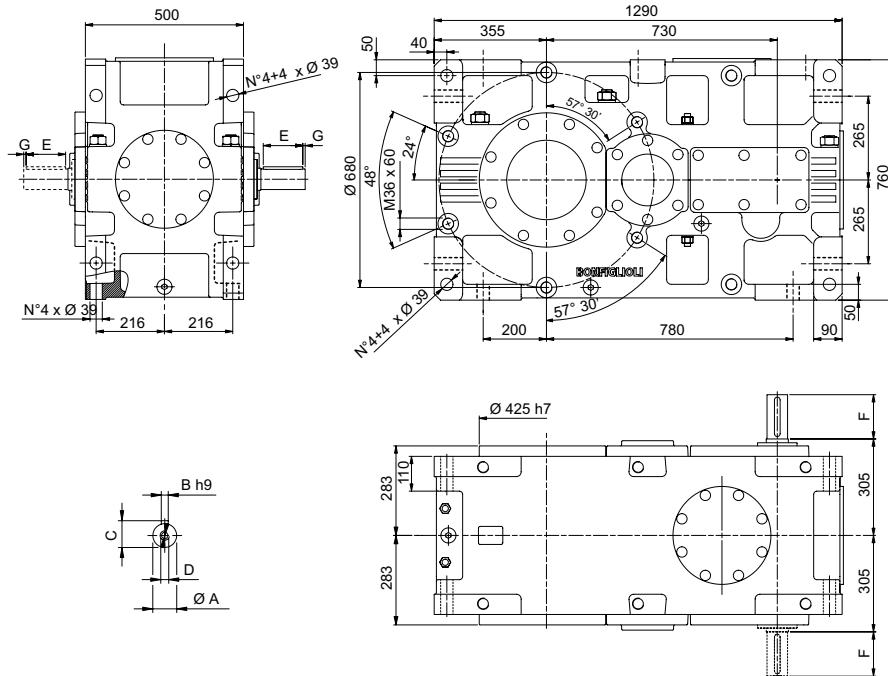
	i =	A	B	C	D	E	F	G	Weight [kg / lbs]
HDP 130 2	7.3 … 12.3	90 m6	25	95	M24x50	160	170	5	1695 / 3729
HDP 130 2	14.1 … 21.7	70 m6	20	74.5	M20x42	125	140	7.5	1695 / 3729
HDP 130 3	21.8 … 48.1	65 m6	18	69	M20x42	125	140	7.5	1810 / 3982
HDP 130 3	56.5 … 108.3	50 k6	14	53.5	M16x36	100	110	5	1810 / 3982
HDP 130 4	111.2 … 237.9	42 k6	12	45	M16x36	100	110	5	1845 / 4059
HDP 130 4	274.5 … 534.5	32 k6	10	35	M12x28	70	80	5	1845 / 4059

Dimensions are in mm.

LP

40 h9

179

M 30 x 60

Ø 170 m6

300   290   290   300

10   280   280   10

H

Ø 170 H7

40 H8

179,4

17

290

135   135

S

Ø 175 H7/h6

105   464   135   2800 in·lbs

17

Ø 170 H7/g6

290   430

Ø 429

40
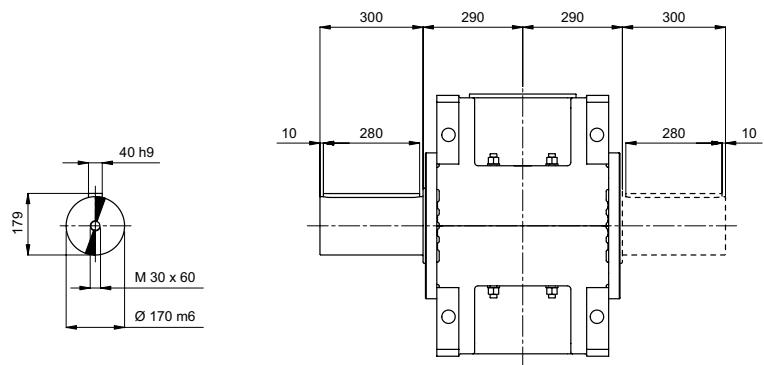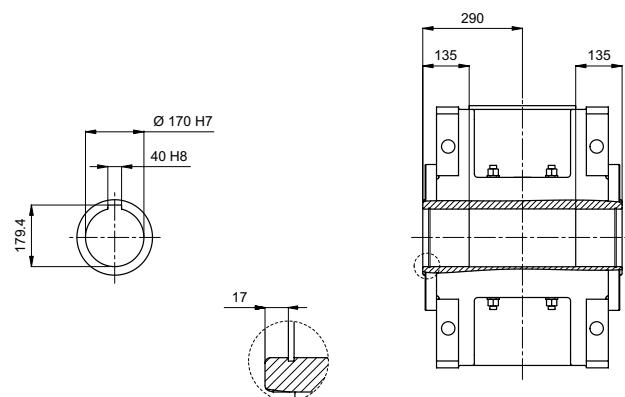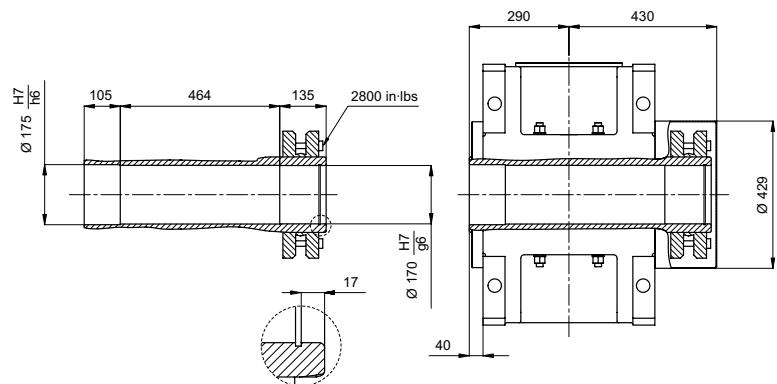
Dimensions are in mm.

HDP 140 2

HDP 140 3
HDP 140 4
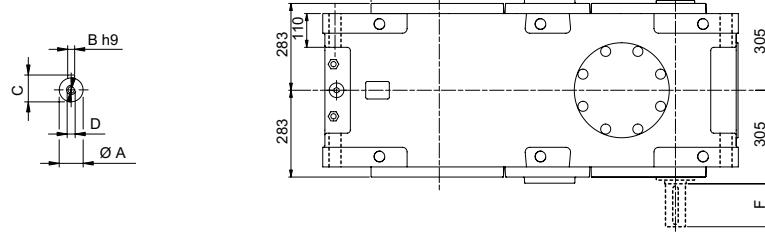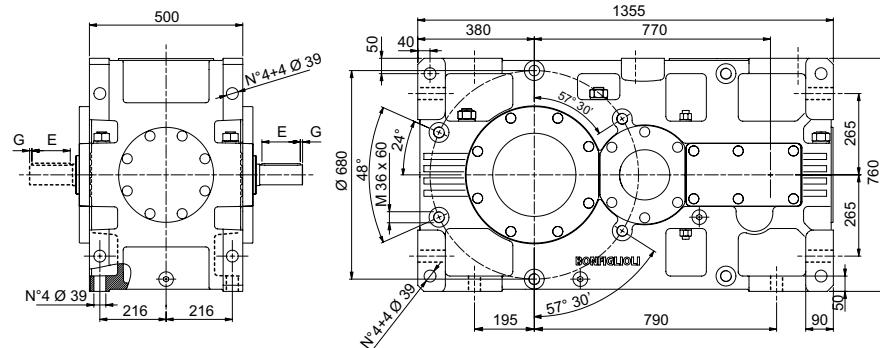
	i =	A	B	C	D	E	F	G	Weight [kg / lbs]
HDP 140 2	8.4 … 14.4	90 m6	25	95	M24x50	160	170	5	1870 / 4114
HDP 140 2	16.3 … 24.9	70 m6	20	74.5	M20x42	125	140	7.5	1870 / 4114
HDP 140 3	25.1 … 56.2	65 m6	18	69	M20x42	125	140	7.5	1995 / 4389
HDP 140 3	65.1 … 124.7	50 k6	14	53.5	M16x36	100	110	5	1995 / 4389
HDP 140 4	141.6 … 277.5	42 k6	12	45	M16x36	100	110	5	2040 / 4488
HDP 140 4	315.9 … 495.3	32 k6	10	35	M12x28	70	80	5	2040 / 4488

Dimensions are in mm.

LP
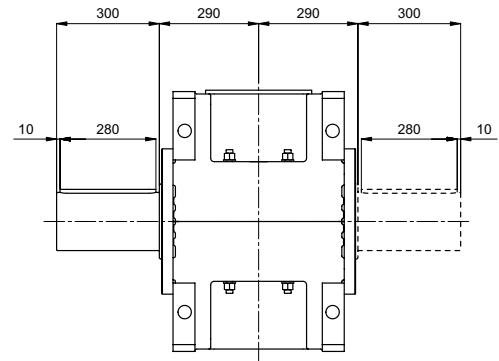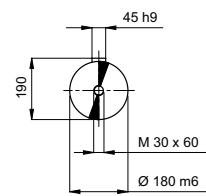
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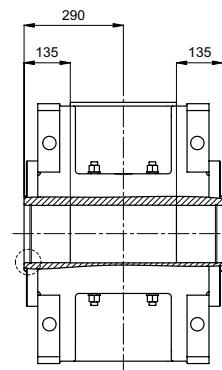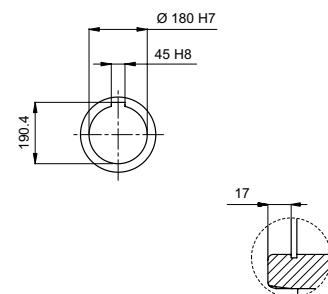
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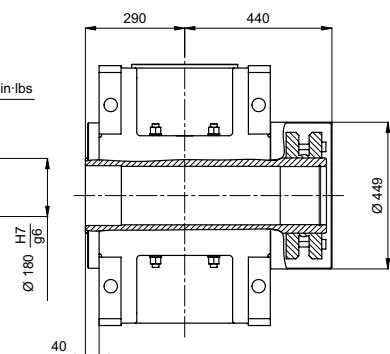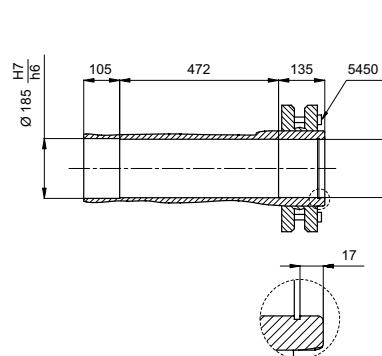
Dimensions are in mm.

5.1 - MOUNTING FLANGE

Ø H ≤ 350

Ø H ≥ 400
Ø H ≤ 600

Ø H = 740
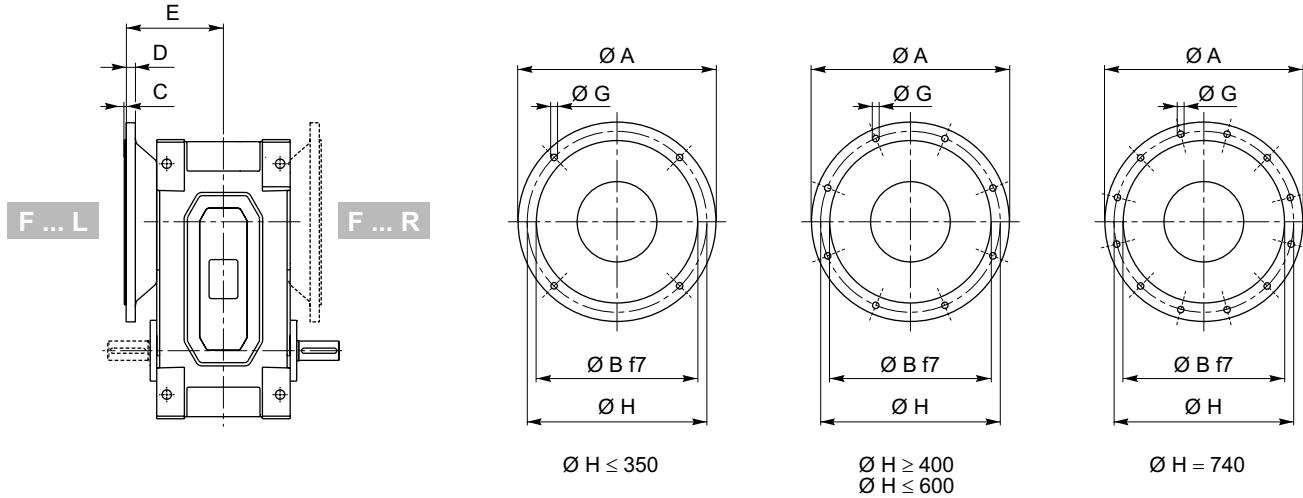
|		A	B	C	D	E	G	H
HDP 60	**F350_**	350	250	5	18	187.5	18	300
	F400_	400	300	5	20	187.5	18	350
HDP 70	**F450_**	450	350	5	22	210	18	400
	F550_	550	450	5	24	210	18	500
HDP 80	**F450_**	450	350	5	22	240	18	400
	F550_	550	450	5	24	240	18	500
HDP 90	**F550_**	550	450	5	24	260	18	500
HDP 100	**F660_**	660	550	7	30	335	22	600
HDP 110	**F660_**	660	550	7	30	335	22	600
HDP 120	**F660_**	660	550	7	30	355	26	600
HDP 130	**F800_**	800	680	7	40	460	26	740
HDP 140	**F800_**	800	680	7	40	460	26	740

Dimensions are in mm.

5.2 - MANIFOLD FLANGE

Available for shaft arrangement: LL, LR, LD, RL, RR and RD, all featuring a single output shaft extension.
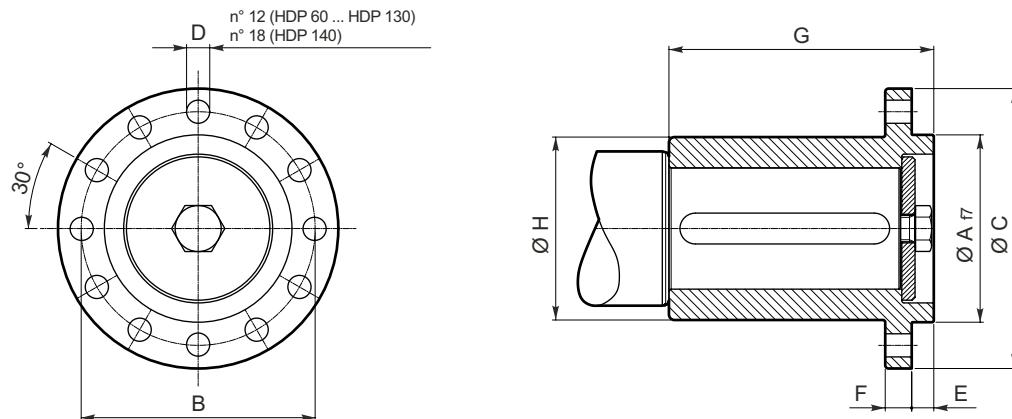
	A	B	C	D	E	F	G	H
HDP 60_ FM	125	175	208	19	14	21	165	135
HDP 70_ FM	125	175	208	19	14	21	195	135
HDP 80_ FM	170	212	254	21	20	24	240	166
HDP 90_ FM	170	212	254	21	20	24	240	166
HDP 100_ FM	200	260	309	25	19	31	244	200
HDP 110_ FM	200	260	309	25	19	31	289	200
HDP 120_ FM	200	260	309	25	19	31	289	200
HDP 130_ FM	220	320	384	32	19	31	344	250
HDP 140_ FM	250	380	450	32	19	40	344	310

Dimensions are in mm.

5.3 - CUSTOMER'S SHAFT

H
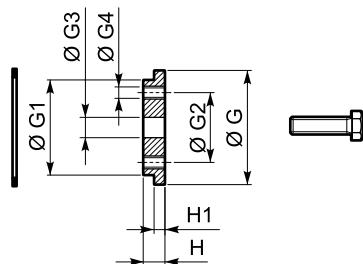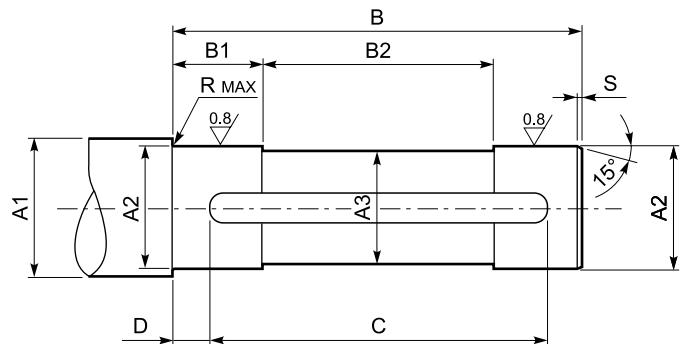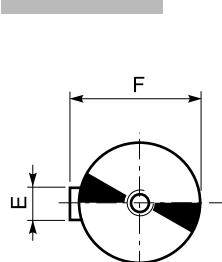
|	A1	A2	A3	B	B1	B2	C	D	E	F	R	S	UNI6604
HDP 60	≥ 78	70 h6	69	283	56	172	220	30	20 h9	74.5	2.5	2	20x12x220A
HDP 70	≥ 89	80 h6	79	283	78	127	220	30	22 h9	85	2.5	2.5	22x14x220A
HDP 80	≥ 104	95 h6	94	338	73	192	280	30	25 h9	100	2.5	2.5	25x14x280A
HDP 90	≥ 121	110 h6	109	378	88	202	320	30	28 h9	116	2.5	2.5	28x16x320A
HDP 100	≥ 133	120 h6	119.5	420	100	250	360	30	32 h9	127	3	2.5	32x18x360A
HDP 110	≥ 143	130 h6	129.5	420	100	250	360	30	32 h9	137	3	2.5	32x18x360A
HDP 120	≥ 153	140 h6	139.5	444	110	260	400	40	36 h9	148	3	2.5	36x20x400A
HDP 130	≥ 183	170 h6	169.5	540	135	310	400	80	40 h9	179	3	2.5	40x22x400A
HDP 140	≥ 193	180 h6	179.5	540	135	310	400	80	45 h9	190	3	2.5	45x25x400A

	Out of scope for supply								
	UNI7437	G	G1	G2	G3	G4	H	H1	UNI5739
HDP 100	120x4	120 d9	96	64	26	M16	24	12	M24x70
HDP 110	130x4	130 d9	105	69	26	M20	24	12	M24x70
HDP 120	140x4	140 d9	115	79	26	M20	30	15	M24x80
HDP 130	170x4	170 d9	142	102	33	M24	34	17	M30x90
HDP 140	180x4	180 d9	150	110	33	M24	34	17	M30x90

Dimensions are in mm.

S
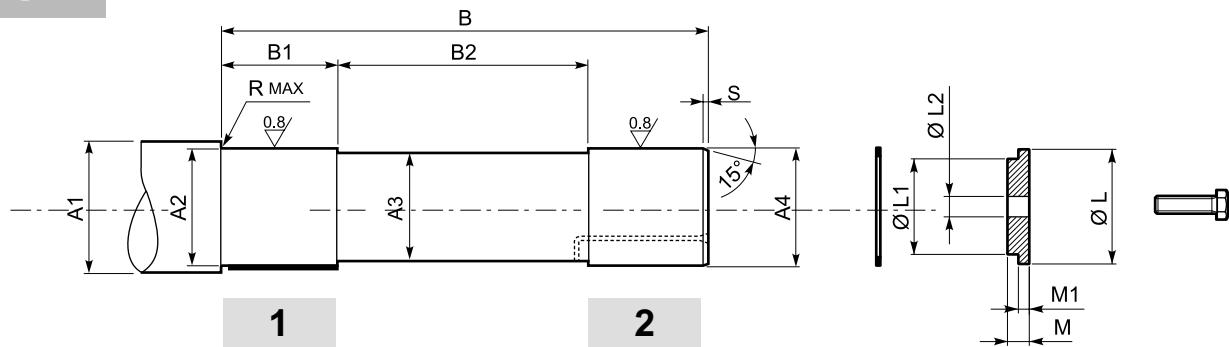
	A1	A2	A3	A4	B	B1	B2	R	S
HDP 60	≥ 90	72 h7	69	70 g6	328	59	194	2.5	2.5
HDP 70	≥ 104	82 h7	79	80 g6	332	77	174	2.5	2.5
HDP 80	≥ 119	97 h7	94	95 g6	398	95	205	2.5	2.5
HDP 90	≥ 136	112 h7	109	110 g6	440	87	273	2.5	2.5
HDP 100	≥ 138	125 h6	119.5	120 g6	517	104	328	3	2.5
HDP 110	≥ 148	135 h6	129.5	130 g6	523	104	334	3	2.5
HDP 120	≥ 158	145 h6	139.5	140 g6	550	104	354	3	2.5
HDP 130	≥ 188	175 h6	169.5	170 g6	681	104	462	3	2.5
HDP 140	≥ 198	185 h6	179.5	180 g6	689	104	470	3	2.5

	Out of scope for supply						
	UNI7437	L	L1	L2	M	M1	**UNI5739**
HDP 100	120x4	120 d9	96	26	16	12	M24x65
HDP 110	130x4	130 d9	105	26	16	12	M24x65
HDP 120	140x4	140 d9	115	26	19	15	M24x70
HDP 130	170x4	170 d9	142	33	21	17	M30x80
HDP 140	180x4	180 d9	150	33	21	17	M30x80

Dimensions are in mm.

To facilitate part removal in the area of the cylindrical guide opposite the shrink disc, install a machine pivot to which a self-lubricating cylindrical bushing (1) can be fitted and/or with a hole big enough to allow application of a rust treatment (2).

In the presence of external thrust loads, vibration, safety problems, requirements for enhanced reliability, or unfavourable mounting positions (e.g. V5 mounting positions, output shaft directed downwards), install suitable devices to secure the shaft in an axial direction and prevent accidental decoupling.

Amended data for overhung and thrust loads.

081203

COD. 1832 R3