RUBIX

Ex INCLUDED

HDP-HDO SERIES

Parallel shaft gear units HDP series
Bevel helical gear units HDO series

Bonfiglioli

Revisions

Refer to page 392 for the catalogue revision index. Visit www.bonfiglioli.com to search for catalogues with up-to-date revisions.

1 SYMBOLS AND UNITS OF MEASUREMENT

Symbols	Units of Measure	Description
$An_{1,2}$	[kN]	Permissible axial force
f_S	–	Service factor
i	–	Gear ratio
l	–	Cyclic duration factor
J	[Kgm^2]	Mass moment of inertia
$M_{1,2}$	[Nm]	Torque
$Mc_{1,2}$	[Nm]	Calculated torque
$Mn_{1,2}$	[Nm]	Rated torque
$Mr_{1,2}$	[Nm]	Torque demand
$n_{1,2}$	[min^{-1}]	Speed
$P_{1,2}$	[kW]	Power
$Pn_{1,2}$	[kW]	Rated power
$Pr_{1,2}$	[kW]	Power demand
P_T	[kW]	Overall thermal capacity
$P_{TFAN...}$	[kW]	Thermal capacity with the contribution of forced ventilation
P_{TSR}	[kW]	Thermal capacity inclusive of contribution from cooling coil
$P_{TMCRA...}$	[kW]	Thermal capacity inclusive of contribution from air/oil exchanger cooling unit
$P_{TMCRW...}$	[kW]	Thermal capacity inclusive of contribution from water/oil exchanger cooling unit
$Rc_{1,2}$	[kN]	Calculated radial force
$Rn_{1,2}$	[kN]	Permissible overhung load
t_a	[°C]	Ambient temperature
t_s	[°C]	Surface temperature
t_o	[°C]	Oil temperature
η	–	Efficiency

$_1$ value applies to input shaft

$_2$ value applies to output shaft

2 GENERAL DESIGN FEATURES

Gear units of the HDP and HDO 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 customisation through a wide range of options offered in the catalogue

3 ALLOWED TEMPERATURE LIMITS

Symbols	Description / Condition	Value (*)	
		Synthetic Oil	Mineral Oil
t_a	Ambient temperature		
$t_{au\ min}$	Minimum operating ambient temperature	**-30°C**	**-10°C**
$t_{au\ Max}$	Maximum operating ambient temperature	**+50°C**	**+40°C**
$t_{as\ min}$	Minimum storage ambient temperature	**-40°C**	**-10°C**
$t_{as\ Max}$	Maximum storage ambient temperature	**+50°C**	**+50°C**
t_s	Surface temperature		
$t_{s\ min}$	Minimum gearbox surface temperature starting with partial load (#)	**-25°C**	**-10°C**
$t_{sc\ min}$	Minimum gearbox surface temperature starting with full load	**-10°C**	**-5°C**
$t_{s\ Max}$	Maximum casing surface temperature during continuous operation (measured next to the gearbox input)	**+100°C**	**+100°C** (@)
t_o	Oil temperature		
$t_{o\ Max}$	Maximum oil temperature during continuous operation	**+95°C**	**+95°C** (@)

(*) = Refer to the table “Selection of the optimal oil viscosity” for further information about minimum and maximum values of different oil viscosity and for using hydraulic circuits. For values of t_a < -20°C and t_s, t_o > 80 °C, choose (as permitted in the product configuration stage) the sealing type of the most suitable material to the type of application. If needed contact Bonfiglioli Technical Service.

(@) = Continuous operation it is not advised if t_s and t_o range is 80°C to 95 °C.

(#) = For full load start-up it is recommended to ramp-up and provide for greater absorption of the motor. If needed, contact Bonfiglioli Technical Service.

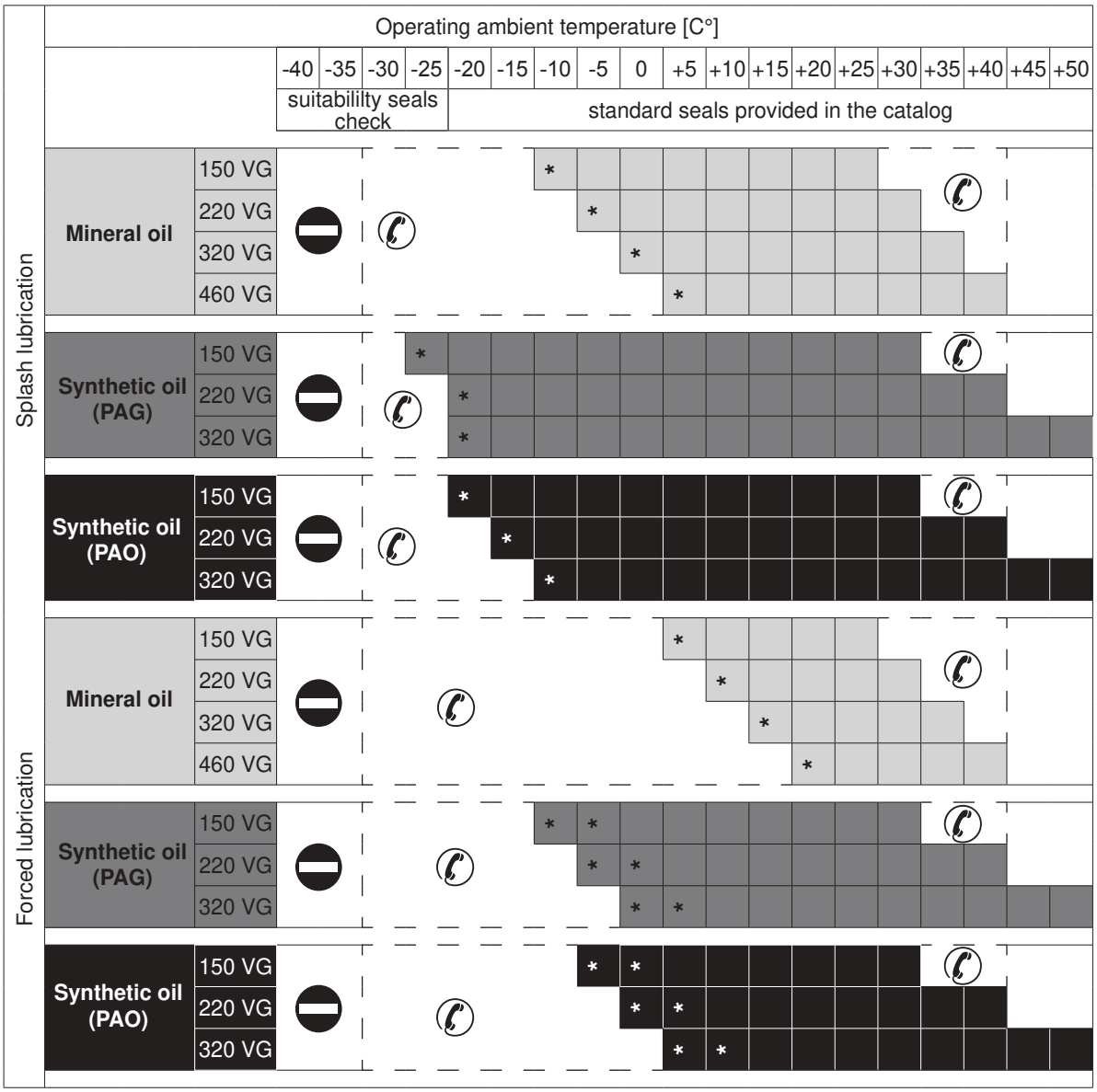
4 INSTALLATION

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 the eventual painting, the machined surfaces and the outer face of the oilseals must be protected to prevent paint drying out the rubber and jeopardising 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.
The customer is required to verify the mating on the output shaft defining appropriate tolerances according to the torque to be transmitted.
• 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 2006/42/CE.
• 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.

5 LUBRICATION

Refer to the User's Manual available at www.bonfiglioli.com for indications about checking the oil level and its replacement.
Do not mix mineral oils with synthetic oils and/or different brands.
However, oil level should be checked at regular intervals and topped up as required.
Check monthly if unit operates under intermittent duty, more frequently if duty is continuous.

5.1 Selection of the optimal oil viscosity (data relating to Shell Oils)



Recommended operating limits

Allowed operating limits.

Forbidden operating limits.

* = It is recommended to ramp-up and to provide for greater absorption of the motor.
If needed and in the event of impulse loads, contact Bonfiglioli Technical Service.

5.2 Lubrication for HDP-HDO series gearboxes

The internal parts of HDP gearboxes are lubricated with a mixed immersion and splash system. Should the output speed be lower than 1 min^{-1} or the input speed greater than 1800 min^{-1}, please contact Bonfiglioli Technical Service for advise.
In mounting position V5, the top bearings in gearbox sizes HDP 60 to HDP 90 are pre-lubricated with grease and fitted with Nilos seals, unless the order specifies a forced lubrication system with mechanical pump (optional variants OP1, OP2) or electric pump (option MOP).
If HDP 100 to 180 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.
These gearboxes are supplied without lubricant. It is the customer's responsibility to fill them with the appropriate amount of oil before start-up.

The internal parts of HDO gearboxes are lubricated with a mixed immersion and splash system. Should the output speed be lower than 1 min^{-1} or the input speed greater than 1800 min^{-1}, please contact Bonfiglioli Technical Service for advise.
In mounting positions V5 and B6, the top bearings in gearbox sizes HDO 71 to HD0 95 are pre-lubricated with grease and fitted with Nilos seals.
If HDO 100 to 180 gearboxes have to be installed in mounting positions V5 and B6 it is required that the order specifies a forced lubrication system with mechanical pump (optional variants OP1, OP2) or electric pump (option MOP).
Depending on the configuration and mounting position, HDO gearboxes may require one of a number of forced lubrication systems described later in this catalogue.
The gearboxes are supplied without lubricant. It is the customer's responsibility to fill them with the appropriate amount of oil before start-up.

6 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 (Tectile 506 EH 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.

7 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.

8 PAINT COATING

HDP gearboxes in sizes 60 to 90 and HDO in sizes 71 to 95 are externally and internally painted in oven hardened epoxy resin and polyester powder paint. The painted (ferrous) surfaces of these gearboxes are protected to at least corrosivity class C2 (UNI EN ISO 12944-2). The colour is RAL 7042 grey. A synthetic top coat may be applied later.
HDP and HDO gearbox sizes 100 to 180 are internally and externally spray painted with an epoxy primer, and then externally painted on completion of assembly. These gearboxes are protected to at least corrosivity class C3 (UNI EN ISO 12944-2). The colour is RAL 7042 grey.

9 SERVICE FACTOR

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

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	1.15	1.25
- Heavy duty		
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

Application	≤ 10 hours/day	> 10 hours/day
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
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

(*) - 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
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
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

Application	≤ 10 hours/day	> 10 hours/day
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
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

(*) - 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
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
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

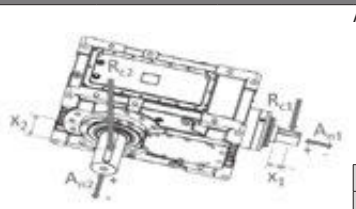
Application	≤ 10 hours/day	> 10 hours/day
Sheet	1.25	1.25
Tubing	1.25	1.50
PUMPS		
Centrifugal	1.15	1.25
Reciprocating		
Single acting, three or more cylinders	1.25	1.50
Double acting, two or more cylinders	1.25	1.50
Rotary		
Gear type	1.15	1.25
Lobe	1.15	1.25
Vane	1.15	1.25
RUBBER INDUSTRY		
Intensive 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

SELECTING THE GEAR UNIT

Selection of the the Atex product must fit through the compilation of this selection form. For a safe selection it is strongly recommended to rely on the long time experience of the Bonfiglioli Technical Service Dept.

Bonfiglioli Forever Forward	**TECHNICAL DATA REQUIRED FOR THE SELECTION OF HDP - HDO**	Nr:	
		Date:	
		Rev_	Date:

		A)	***GENERAL DATA***					
#	1		Company / Customer					
#	2		Contact					
#	3		Branch / Distributor					
#	4		Order quantity					
	5		Delivery time					
		B)	***ELECTRIC MOTOR***					
	6		Motor Type					
#	7	P_{n1}	Rated motor power		[kW]			
#	8	P_{r1}	Motor power demand		[kW]			
	9	n_1	Input speed		[min^{-1}]			
	10		Pole number					
	11		Motor mounting: B3 - B5 - B14					
		C_1)	***GEARBOX***			***C_2)***	***ATEX CONDITION [GROUPII] - 2014/34/EU***	
#	12		Gearbox configuration					
#	13	i	Gear ratio			Category: [**2** = standard / **3** = special]		
#	14	n_2	Output speed		[min^{-1}]	Atmosphere: [**G** = gas / **D** = dust]		
#	15	M_{r2}	Output torque demand		[Nm]	Zone: [**1 - 21** / **2 - 22**]		
#	17	f_S	Service factor required			Temperature class: [T4 / 135°C]		
	18		Rotation of the output shaft [front view]:		**CW**		**CCW**	
#	19	L_{10H}	Bearings lifetime		[h]			
	20		Gears lifetime		[h]			
	21	SF_{min}	Safety for tooth root stress		standard reference (ISO preferred)			
	22	SH_{min}	Safety for flank pressure		standard reference (ISO preferred)			
		D)	***ADDITIONAL LOADS***					
	23	R_{c2}	Radial load on output shaft		[N]			
	24	x_2	Load application distance from shaft shoulder		[mm]			
	25	α_{Rc2}	Angle of application of the output Radial load		[° ' "]			
	26	R_{c1}	Radial load on input shaft		[N]			
	27	x_1	Load application distance from shaft shoulder		[mm]			
	28	α_{Rc1}	Angle of application of the input Radial load		[° ' "]			
	29	A_{n2}	Thrust load on output shaft (+ / -)		[N]			
	30	A_{n1}	Thrust load on intput shaft (+ / -)		[N]			



Angle Position

+ =Push

- = Pull

		E)	***APPLICATION***					
#	31		Type of application					
	32		Duty cycle	Time phase %	Time phase hours	Gearbox output torque [Nm]	Gearbox output speed [min^{-1}]	
				,,,,	,,,,			
				,,,,	,,,,			
				,,,,	,,,,			
				,,,,	,,,,			
				,,,,	,,,,			
	33		Notes about Duty Cycle:					
			Duty type	**S1**	**S2**	**S3**	**S4-S8**	
	34	v_A	Ambient air velocity	[m/s]	≤ 0.5	> 0.5 ≤ 1.4	> 1.4	
#	35	t_a	Ambient temperature range	[°C]				
	36		Altitude a.s.l.	[m]				
	37		Rating according FEM class	T-	L-	M-		
		F)	***OPTIONS OR ADDITIONAL REQUESTS***					
	38		Lubrification					
	39		Supplementary cooling systems					
	40		Paint coating					
	41		To specific requests for testing					
		G)	***NOTES***					
	42		Notes and additional Customer requirements:					
#	43		**PLP number if present for Special Gearbox**					

Mandatory for the selection

The selection of the drive unit can only be optimized upon knowing both the engineering and the environmental conditions the gearbox will operate into.

10 ENGINEERING SELECTION

1. First determine the gear ratio:

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

2. Calculate the power $\mathbf{P_{r1}}$ required at the input shaft:

$$P_{r1} = \frac{M_{r2} \times n_2}{9550 \times \eta}$$

	η
2x 	0.96
3x 	0.94
4x 	0.92

3. Determine the applicable service factor $\mathbf{f_s}$ and the adjusting factor $\mathbf{f_m}$ 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 power $\mathbf{P_{n1}}$, so that:

$$P_{n1} \geq P_{r1} \times f_s \times f_m$$

11 VERIFICATIONS

11.1 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 $\mathbf{M_p}$ generated during the operating cycle:

$$M_p \leq M_{n2ref} \times f_p$$

Peaks/hour		f_p				
		1	**2 ... 10**	**11 ... 50**	**51 ... 100**	**> 100**
Drive	Constant direction	2.0 1.8 (HDO 71…95 3x) 1.6 (HDO 71…95 4x)	1.6	1.3	1.1	1.0
	Reversals	1.4 1.3 (HDO 71…95 3x) 1.1 (HDO 71…95 4x)	1.1	0.9	0.8	0.7

For configuration S (output shaft with shrink disc), use the following values to verify applicability.

Peaks/hour		f_p		
		1 ... 50	**51 ... 100**	**> 100**
Drive	Constant direction	1.3 1.1 (HDP 80) 1 (HDO 81) 1.2 (HDO 95)	1.1 1 (HDO 81)	1.0
	Reversals	0.9 0.8 (HDP 80 - HDO 95) 0.7 (HDO 81)	0.8 0.7 (HDO 81)	0.7

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

11.2 MOTOR MOUNTING

Verify that the appropriate motor adapter is available for the selected gear unit. See sections 15.5 and 26.6.
Because of standardisation, the rated power of the electric motor selected might be greater than power $\mathbf{P_{r1}}$ 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.

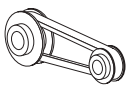
11.3 BACKSTOP DEVICE

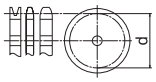
If the gear unit is specified with a backstop, verify the load capacity of the device at sections 15.6.3 and 26.7.3 of this catalogue and make sure the torque M_{1MAX} is never exceeded in operation.

11.4 CALCULATING THE RESULTING OVERHUNG LOAD

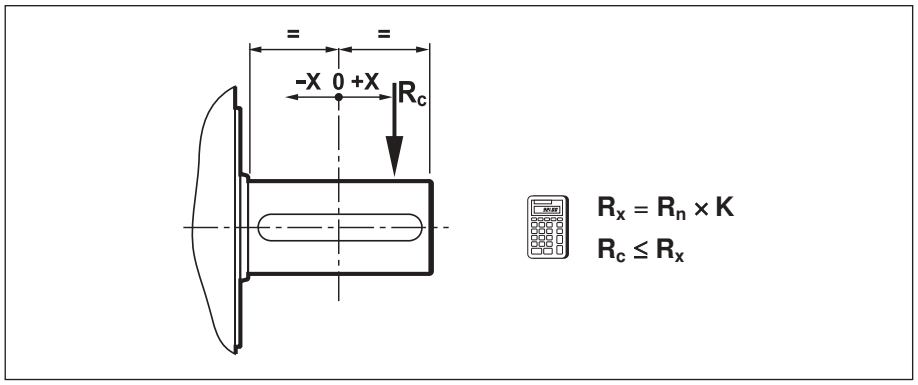
External transmissions keyed onto input and/or output shaft generate loads that act radially onto same shaft.
Resulting shaft loading must be compatible with both the bearing and the shaft capacity.
Namely shaft loading ($\mathbf{R_{c1}}$ for input shaft, $\mathbf{R_{c2}}$ for output shaft), must be equal or lower than admissible overhung load capacity for shaft under study ($\mathbf{R_{x1}}$ for input shaft, $\mathbf{R_{x2}}$ 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 $\mathbf{K_1}$ or factor $\mathbf{K_2}$ to suit the particular shaft.
The load generated by an external transmission can be calculated, to a good approximation, by the following equation:

$$\mathbf{R_c = \frac{2000 \times M \times K_r}{d}}$$

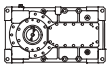
$\mathbf{K_r = 1}$	
$\mathbf{K_r = 1.25}$	
$\mathbf{K_r = 1.5 - 2.0}$	

M [Nm]	
d [mm]	

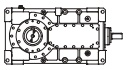
11.5 OVERHUNG LOADING VERIFICATION



The $Rn_{1\ max}$ values listed in the table are the maximum permissible overhung loads; these loads may have to be reduced in certain applications.
For an exact value, please contact Bonfiglioli's Technical Service.

	i =	$Rn_{1\ max}$ [kN]	K_1												
			x [mm] =												
			-100	-75	-50	-25	0	25	50	75	100	150	200	250	300
HDP 60 2	7.1 ... 15.2	4.5	—	—	—	1.29	1.00	0.82	0.69	0.60	0.53	—	—	—	—
	17.3 ... 19.4	3.0	—	—	—	1.28	1.00	0.82	0.70	0.60	0.53	—	—	—	—
HDP 60 3	22.7 ... 49.1	3.1	—	—	—	1.29	1.00	0.82	0.69	0.60	0.53	—	—	—	—
	56.6 ... 98.4	2.1	—	—	—	1.33	1.00	0.80	0.67	0.57	0.50	—	—	—	—
HDP 70 2	8.0 ... 17.7	4.5	—	—	—	1.29	1.00	0.82	0.69	0.60	0.53	—	—	—	—
	19.4 ... 22.6	3.0	—	—	—	1.28	1.00	0.82	0.70	0.60	0.53	—	—	—	—
HDP 70 3	25.5 ... 57.0	3.1	—	—	—	1.29	1.00	0.82	0.69	0.60	0.53	—	—	—	—
	63.7 ... 114.4	2.1	—	—	—	1.33	1.00	0.80	0.67	0.57	0.50	—	—	—	—
HDP 80 2	8.1 ... 14.6	5.0	—	—	1.53	1.21	1.00	0.85	0.74	0.66	0.59	0.49	—	—	—
	15.5 ... 22.6	5.5	—	—	—	1.24	1.00	0.84	0.72	0.63	0.56	0.41	—	—	—
HDP 80 3	25.8 ...75.2	5.8	—	—	—	1.26	1.00	0.83	0.71	0.62	0.53	0.39	—	—	—
	76.4 ... 111.4	3.0	—	—	—	1.29	1.00	0.82	0.69	0.54	0.44	0.32	—	—	—
HDP 90 2	7.9 ... 13.6	6.3	—	—	1.48	1.19	1.00	0.86	0.76	0.67	0.61	0.51	—	—	—
	15.8 ... 22.4	6.3	—	—	1.48	1.19	1.00	0.86	0.76	0.67	0.61	0.51	—	—	—
HDP 90 3	25.4 ... 73.3	6.1	—	—	1.45	1.18	1.00	0.87	0.76	0.68	0.62	0.52	—	—	—
	77.8 ... 110.1	3.7	—	—	—	1.22	1.00	0.85	0.73	0.61	0.50	0.37	—	—	—
HDP 100 2	7.4 ... 21.8	11.1	—	—	1.35	1.15	1.00	0.89	0.80	0.72	0.66	0.56	0.49	—	—
HDP 100 3	22.8 ...50	6.3	—	—	1.48	1.19	1.00	0.86	0.76	0.67	0.61	0.51	—	—	—
	55.5 ... 107.8	6.9	—	—	1.54	1.21	1.00	0.85	0.74	0.65	0.59	0.49	—	—	—
HDP 100 4	110.6 ... 246.9	2.1	—	—	—	1.18	1.00	0.87	0.76	0.68	0.62	—	—	—	—
	286.4 ... 507.9	2.7	—	—	—	1.25	1.00	0.83	0.71	0.63	0.56	—	—	—	—
HDP 110 2	8.1 ... 25.0	11.1	—	—	1.35	1.15	1.00	0.89	0.80	0.72	0.66	0.56	0.49	—	—
HDP 110 3	24.9 ... 54.5	6.3	—	—	1.48	1.19	1.00	0.86	0.76	0.67	0.61	0.51	—	—	—
	60.7 ...123.5	6.9	—	—	1.54	1.21	1.00	0.85	0.74	0.65	0.59	0.49	—	—	—
HDP 110 4	120. ... 214.2	2.1	—	—	—	1.18	1.00	0.87	0.76	0.68	0.62	—	—	—	—
	248.6 ... 499.4	2.7	—	—	—	1.25	1.00	0.83	0.71	0.63	0.56	—	—	—	—

	i =	$Rn_{1\ max}$ [kN]	K_1												
			x [mm] =												
			-100	-75	-50	-25	0	25	50	75	100	150	200	250	300
HDP 120 2	**7.9 ... 25.4**	17.8	—	—	1.37	1.16	1.00	0.88	0.79	0.71	0.65	0.55	0.48	—	—
HDP 120 3	**25.8 ... 56.1**	6.3	—	—	1.48	1.19	1.00	0.86	0.76	0.67	0.61	0.51	—	—	—
	64.3 ... 125.2	6.9	—	—	1.54	1.21	1.00	0.85	0.74	0.65	0.59	0.49	—	—	—
HDP 120 4	**128 ... 277.2**	2.1	—	—	—	1.18	1.00	0.87	0.76	0.68	0.62	—	—	—	—
	323.2 ... 523.7	2.7	—	—	—	1.25	1.00	0.83	0.71	0.63	0.56	—	—	—	—
HDP 125 2	**8.9 ... 25.0**	17.8	—	—	1.37	1.16	1.00	0.88	0.79	0.71	0.65	0.55	0.48	—	—
HDP 125 3	**29.1 ... 62.6**	6.3	—	—	1.48	1.19	1.00	0.86	0.76	0.67	0.61	0.51	—	—	—
	72.5 ... 123.6	6.9	—	—	1.54	1.21	1.00	0.85	0.74	0.65	0.59	0.49	—	—	—
HDP 125 4	**144.4 ... 506.5**	2.1	—	—	—	1.18	1.00	0.87	0.76	0.68	0.62	—	—	—	—
HDP 130 2	**7.3 ... 12.3**	28.0	—	1.47	1.27	1.12	1.00	0.90	0.82	0.76	0.69	0.54	0.45	0.38	—
	14.1 ... 21.7	22.1	—	—	1.30	1.13	1.00	0.90	0.81	0.74	0.69	0.55	0.45	—	—
HDP 130 3	**21.8 ... 48.1**	11.9	—	—	1.28	1.12	1.00	0.90	0.82	0.75	0.69	0.60	0.53	—	—
	56.5 ... 108.3	8.1	—	—	1.31	1.13	1.00	0.89	0.81	0.74	0.68	0.58	—	—	—
HDP 130 4	**111.2 ... 237.9**	4.8	—	—	1.33	1.14	1.00	0.89	0.80	0.73	0.67	0.57	—	—	—
	274.5 ... 534.5	1.8	—	—	—	1.15	1.00	0.88	0.79	0.72	0.65	—	—	—	—
HDP 140 2	**8.4 ... 14.4**	28.0	—	1.47	1.27	1.12	1.00	0.90	0.82	0.76	0.69	0.54	0.45	0.38	—
	16.3 ... 24.9	22.1	—	—	1.30	1.13	1.00	0.90	0.81	0.74	0.69	0.55	0.45	—	—
HDP 140 3	**25.1 ... 56.2**	11.9	—	—	1.28	1.12	1.00	0.90	0.82	0.75	0.69	0.60	0.53	—	—
	65.1 ... 124.7	8.1	—	—	1.31	1.13	1.00	0.89	0.81	0.74	0.68	0.58	—	—	—
HDP 140 4	**141.6 ... 277.5**	4.8	—	—	1.33	1.14	1.00	0.89	0.80	0.73	0.67	0.57	—	—	—
	315.9 ... 495.3	1.8	—	—	—	1.15	1.00	0.88	0.79	0.72	0.65	—	—	—	—
HDP 150 2	**7.9 ... 14.1**	31.7	1.60	1.39	1.23	1.10	1.00	0.91	0.84	0.78	0.73	0.61	0.51	0.44	0.38
	15.4 ... 19.6	26.4	—	1.43	1.25	1.11	1.00	0.91	0.83	0.77	0.71	0.58	0.48	0.40	—
HDP 150 3	**21.5 ... 38.1**	26.6	—	1.44	1.26	1.11	1.00	0.91	0.83	0.77	0.71	0.57	0.47	0.40	—
	43.5 ... 77.0	17.4	—	—	1.28	1.12	1.00	0.90	0.82	0.75	0.70	0.61	0.54	—	—
HDP 150 4	**89.0 ... 157.8**	10.8	—	—	1.47	1.19	1.00	0.86	0.76	0.68	0.61	0.51	—	—	—
	170.9 ... 303.1	6.1	—	—	1.45	1.18	1.00	0.87	0.76	0.68	0.62	0.52	—	—	—
HDP 160 2	**9.0 ...15.9**	31.7	1.60	1.39	1.23	1.10	1.00	0.91	0.84	0.78	0.73	0.61	0.51	0.44	0.38
	17.5 ... 22.1	26.4	—	1.43	1.25	1.11	1.00	0.91	0.83	0.77	0.71	0.58	0.48	0.40	—
HDP 160 3	**24.4 ... 43.1**	26.6	—	1.44	1.26	1.11	1.00	0.91	0.83	0.77	0.71	0.57	0.47	0.40	—
	49.4 ... 87.0	17.4	—	—	1.28	1.12	1.00	0.90	0.82	0.75	0.70	0.61	0.54	—	—
HDP 160 4	**101.1 ... 178.1**	10.8	—	—	1.47	1.19	1.00	0.86	0.76	0.68	0.61	0.51	—	—	—
	194.1 ... 342.2	6.1	—	—	1.45	1.18	1.00	0.87	0.76	0.68	0.62	0.52	—	—	—
HDP 170 2	**7.8 ... 14.2**	35.3	1.33	1.22	1.14	1.06	1.00	0.95	0.90	0.85	0.81	0.73	0.67	0.62	0.58
	15.4 ... 19.3	32.5	1.40	1.28	1.18	1.09	1.00	0.94	0.88	0.82	0.78	0.7	0.65	0.61	0.57
HDP 170 3	**23.2 ... 39.7**	24.8	—	1.29	1.18	1.08	1.00	0.93	0.87	0.82	0.77	0.69	0.62	0.57	—
	45.1 ... 77.2	11.6	—	—	1.13	1.06	1.00	0.97	0.91	0.87	0.84	0.77	0.71	—	—
HDP 170 4	**92.7 ... 158.8**	10.8	—	—	1.47	1.19	1.00	0.86	0.76	0.68	0.61	0.51	—	—	—
	177.4 ... 303.8	8.1	—	—	1.31	1.13	1.00	0.89	0.81	0.74	0.68	0.58	—	—	—
HDP 180 2	**8.7 ... 15.7**	35.3	1.33	1.22	1.14	1.06	1.00	0.95	0.90	0.85	0.81	0.73	0.67	0.62	0.58
	17.1 ... 21.4	32.5	1.40	1.28	1.18	1.09	1.00	0.94	0.88	0.82	0.78	0.7	0.65	0.61	0.57
HDP 180 3	**25.8 ... 43.9**	24.8	—	1.29	1.18	1.08	1.00	0.93	0.87	0.82	0.77	0.69	0.62	0.57	—
	50.1 ... 85.4	11.6	—	—	1.13	1.06	1.00	0.97	0.91	0.87	0.84	0.77	0.71	—	—
HDP 180 4	**103.0 ... 175.6**	10.8	—	—	1.47	1.19	1.00	0.86	0.76	0.68	0.61	0.51	—	—	—
	197.2 ... 336.1	8.1	—	—	1.31	1.13	1.00	0.89	0.81	0.74	0.68	0.58	—	—	—

	i =	$Rn_{1\ max}$ [kN]	K_1												
			x [mm] =												
			-100	-75	-50	-25	0	25	50	75	100	150	200	250	300
HDO 71 2	**5.6 ... 14.6**	11.3	—	—	2.35	1.41	1.00	0.78	0.64	0.54	0.46	—	—	—	—
HDO 71 3	**21.8 ... 71.9**	6.1	—	—	—	1.56	1.00	0.70	0.51	0.39	0.33	—	—	—	—
HDO 71 4	**77.0 ... 475.4**	4.8	—	—	—	1.88	1.00	0.54	0.38	0.29	0.23	—	—	—	—
HDO 81 2	**5.5 ... 14.7**	17.2	—	—	2.59	1.58	1.00	0.69	0.52	0.43	0.35	—	—	—	—
HDO 81 3	**25.9 ... 71.9**	11.7	—	—	2.61	1.56	1.00	0.69	0.52	0.43	0.36	—	—	—	—
HDO 81 4	**78.3 ... 473.3**	7.2	—	—	—	1.76	1.00	0.54	0.38	0.28	0.22	—	—	—	—
HDO 91 2	**7.4 ... 15.9**	17.9	—	—	2.37	1.41	1.00	0.78	0.64	0.54	0.46	—	—	—	—
HDO 91 3	**18.6 ... 66.1**	11.6	—	—	2.17	1.37	1.00	0.79	0.65	0.52	0.43	—	—	—	—
HDO 91 4	**82.0 ... 489.3**	5.9	—	—	—	1.54	1.00	0.75	0.53	0.42	0.34	—	—	—	—
HDO 95 3	**21.2 ... 72.3**	11.6	—	—	2.17	1.37	1.00	0.79	0.65	0.52	0.43	—	—	—	—
HDO 95 4	**81.6 ... 489.7**	5.8	—	—	—	1.55	1.00	0.74	0.53	0.41	0.34	—	—	—	—
HDO 100 2	**5.8 ... 13.5**	19.4	—	—	1.88	1.30	1.00	0.81	0.68	0.59	0.51	0.40	0.32	—	—
HDO 100 3	**14 ... 17.3**	18.7	—	—	2.23	1.38	1.00	0.78	0.64	0.54	0.45	0.34	—	—	—
	20.2 ... 67.5	10.8	—	—	2.23	1.38	1.00	0.78	0.63	0.51	0.43	0.32	—	—	—
HDO 100 4	**70.8 ... 139.8**	7.2	—	—	—	1.56	1.00	0.72	0.52	0.40	0.33	—	—	—	—
	160 ... 344.2	4.8	—	—	—	1.56	1.00	0.74	0.58	0.46	0.38	—	—	—	—
HDO 110 2	**6.4 ... 15.5**	19.4	—	—	1.88	1.30	1.00	0.81	0.68	0.59	0.51	0.40	0.32	—	—
HDO 110 3	**18.9 ... 20.9**	18.7	—	—	2.23	1.38	1.00	0.78	0.64	0.54	0.45	0.34	—	—	—
	22 ... 77.5	10.8	—	—	2.23	1.38	1.00	0.78	0.63	0.51	0.43	0.32	—	—	—
HDO 110 4	**77.4 ... 121.7**	7.2	—	—	—	1.56	1.00	0.72	0.52	0.40	0.33	—	—	—	—
	137.1 ... 395	4.8	—	—	—	1.56	1.00	0.74	0.58	0.46	0.38	—	—	—	—
HDO 120 2	**6.6 ... 15.5**	22.6	—	—	1.82	1.29	1.00	0.78	0.62	0.51	0.44	0.34	0.28	—	—
HDO 120 3	**17.3 ... 24.6**	18.7	—	—	2.23	1.38	1.00	0.78	0.64	0.54	0.45	0.34	—	—	—
	28.3 ... 78.6	10.8	—	—	2.23	1.38	1.00	0.78	0.63	0.51	0.43	0.32	—	—	—
HDO 120 4	**87 ... 162.2**	7.2	—	—	—	1.56	1.00	0.72	0.52	0.40	0.33	—	—	—	—
	179.7 ... 400.6	4.8	—	—	—	1.56	1.00	0.74	0.58	0.46	0.38	—	—	—	—
HDO 125 2	**7.4 ... 16.9**	22.6	—	—	1.82	1.29	1.00	0.78	0.62	0.51	0.44	0.34	0.28	—	—
HDO 125 3	**19.2 ... 35.8**	18.7	—	—	2.23	1.38	1.00	0.78	0.64	0.54	0.45	0.34	—	—	—
	38.8 ... 85.9	10.8	—	—	2.23	1.38	1.00	0.78	0.63	0.51	0.43	0.32	—	—	—
HDO 125 4	**97.0 ... 178.0**	7.2	—	—	—	1.56	1.00	0.72	0.52	0.40	0.33	—	—	—	—
	200.3 ... 438.0	4.8	—	—	—	1.56	1.00	0.74	0.58	0.46	0.38	—	—	—	—
HDO 130 2	**5.7 ... 13.6**	35.8	—	2.21	1.57	1.22	1.00	0.85	0.73	0.62	0.54	0.42	0.35	0.30	—
HDO 130 3	**15.2 ... 67.1**	22.6	—	—	1.82	1.29	1.00	0.78	0.62	0.51	0.44	0.34	0.28	—	—
HDO 130 4	**71.5 ... 335.6**	10.9	—	—	2.25	1.38	1.00	0.78	0.63	0.50	0.42	0.32	—	—	—
HDO 140 2	**6.6 ... 15.7**	35.8	—	2.21	1.57	1.22	1.00	0.85	0.73	0.62	0.54	0.42	0.35	0.30	—
HDO 140 3	**17.7 ... 77.3**	22.6	—	—	1.82	1.29	1.00	0.78	0.62	0.51	0.44	0.34	0.28	—	—
HDO 140 4	**82.3 ... 386.6**	10.9	—	—	2.25	1.38	1.00	0.78	0.63	0.50	0.42	0.32	—	—	—

	i =	$Rn_{1\ max}$ [kN]	K_1 x [mm] =												
			-100	-75	-50	-25	0	25	50	75	100	150	200	250	300
HDO 150 2	**5.5 … 7.0**	54.0	2.75	1.91	1.47	1.19	1.00	0.86	0.76	0.67	0.59	0.47	0.40	0.34	0.30
	8.1 … 13.7	41.6	2.75	1.91	1.47	1.19	1.00	0.86	0.76	0.66	0.58	0.46	0.39	0.33	0.29
HDO 150 3	**15.6 … 60.8**	35.8	—	2.21	1.57	1.22	1.00	0.85	0.73	0.62	0.54	0.42	0.35	0.30	—
HDO 150 4	**66.9 … 92.9**	18.7	—	—	2.23	1.38	1.00	0.78	0.64	0.54	0.45	0.34	—	—	—
	101.8 … 238.8	10.9	—	—	2.25	1.38	1.00	0.78	0.63	0.50	0.42	0.32	—	—	—
HDO 160 2	**7.3 … 7.9**	54.0	2.75	1.91	1.47	1.19	1.00	0.86	0.76	0.67	0.59	0.47	0.40	0.34	0.30
	8.9 … 15.4	41.6	2.75	1.91	1.47	1.19	1.00	0.86	0.76	0.66	0.58	0.46	0.39	0.33	0.29
HDO 160 3	**17.7 … 68.6**	35.8	—	2.21	1.57	1.22	1.00	0.85	0.73	0.62	0.54	0.42	0.35	0.30	—
HDO 160 4	**75.9 … 96.3**	18.7	—	—	2.23	1.38	1.00	0.78	0.64	0.54	0.45	0.34	—	—	—
	115.2 … 269.7	10.9	—	—	2.25	1.38	1.00	0.78	0.63	0.50	0.42	0.32	—	—	—
HDO 170 3	**15.9 ... 21.7**	41.6	2.75	1.91	1.47	1.19	1.00	0.86	0.76	0.66	0.58	0.46	0.39	0.33	0.29
	26.2 ... 59.9	35.8	—	2.21	1.57	1.22	1.00	0.85	0.73	0.62	0.54	0.42	0.35	0.30	—
HDO 170 4	**72.9 … 239.5**	22.6	—	—	1.82	1.29	1.00	0.78	0.62	0.51	0.44	0.34	0.28	—	—
HDO 180 3	**17.7 ... 27.9**	41.6	2.75	1.91	1.47	1.19	1.00	0.86	0.76	0.66	0.58	0.46	0.39	0.33	0.29
	31.4 ... 66.2	35.8	—	2.21	1.57	1.22	1.00	0.85	0.73	0.62	0.54	0.42	0.35	0.30	—
HDO 180 4	**81.0 … 244.9**	22.6	—	—	1.82	1.29	1.00	0.78	0.62	0.51	0.44	0.34	0.28	—	—

The values for overhung and thrust loads are the maximum permissible values.

	$Rn_{2\ max}$ [kN]	K_2 x [mm] =																$An_{2\ max}$ [kN]
		-100	-75	-50	-25	0	25	50	75	100	150	200	250	300	350	400	450	500	
HDP 60	35.0	—	—	1.20	1.09	1.00	0.74	0.58	0.48	0.41	0.32	—	—	—	—	—	—	—	17.5
HDP 70 HDO 71	40.0	—	1.34	1.20	1.09	1.00	0.77	0.63	0.53	0.46	0.36	0.30	—	—	—	—	—	—	25.0
HDP 80 HDO 81	46.0	1.38	1.26	1.16	1.07	1.00	0.82	0.69	0.59	0.52	0.42	0.35	0.30	—	—	—	—	—	32.5
HDP 90 HDO 91	62.0	1.33	1.23	1.14	1.07	1.00	0.81	0.68	0.58	0.51	0.41	0.34	0.30	—	—	—	—	—	37.5
HDO 95	69.0	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	—	—	—	—	38.5
HDP 100 HDO 100	80.0	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	—	—	—	—	40.0
HDP 110 HDO 110	86.0	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	—	—	43.0
HDP 120 HDO 120	107.0	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	—	—	53.5
HDP 125 HDO 125	130.0	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	—	65.0
HDP 130 HDO 130	160.0	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	—	80.0
HDP 140 HDO 140	190.0	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	—	95.0
HDP 150 HDO 150	200.0	1.15	1.11	1.07	1.03	1.00	0.92	0.85	0.80	0.75	0.66	0.60	0.54	0.49	0.45	0.41	0.38	0.35	100.0
HDP 160 HDO 160	220.0	1.15	1.11	1.07	1.03	1.00	0.92	0.85	0.80	0.75	0.66	0.60	0.54	0.49	0.45	0.41	0.38	0.35	110.0
HDP 170 HDO 170	250.0	1.15	1.11	1.07	1.03	1.00	0.92	0.85	0.80	0.75	0.66	0.60	0.54	0.49	0.45	0.41	0.38	0.35	125.0
HDP 180 HDO 180	260.0	1.15	1.11	1.07	1.03	1.00	0.92	0.85	0.80	0.75	0.66	0.60	0.54	0.49	0.45	0.41	0.38	0.35	130.0

11.6 SHAFT LOADING

11.6.1 Overhung load on the output shaft

Make sure that the overhung load on the output shaft does not exceed the maximum permitted value for the gearbox in question. The HDB option can be specified only for HDP 60...HDP 90 and HDO 71...HDO 91 to provide higher capacity bearings to cater for particularly large overhung loads. If external loads exceed the load capacity of even the heavy duty bearings, consider the options of providing external support for the shafts, reducing external load in some other way, or, if necessary, selecting a gearbox of the next size up.

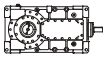
To check overhung load capacity, refer to the figure in section 11.5 and compare the actual overhung load Rc on the shaft with the maximum permissible overhung load **Rx** for the distance from the centre of the shaft at which the load is applied. Maximum permissible overhung load $\mathbf{Rx_2}$ for the output shaft is obtained by multiplying the nominal overhung load $\mathbf{Rn_2}$, as listed in the technical data section, by the load location factor $\mathbf{K_2}$.

Rated overhung loads Rn are conservative values, as they are calculated for the most unfavourable conditions in terms of direction of rotation and angle of application of the force on the shaft.

The following table shows the rated overhung loads that can be applied to solid (LP) output shafts under the following conditions:

- force applied to the centre of the end of the shaft
- no thrust loads
- gearbox service factor ≥ 1.25

Contact Bonfiglioli Riduttori's Technical Service if an exact calculation is required.

	$\mathbf{Rn_2}$ [kN]					
	HDP/HD0 ... 2		HDP/HD0 ... 3		HDP/HD0 ... 4	
$\mathbf{n_2}$	**≤ 150 [min^-1]**		**≤ 75 [min^-1]**		**≤ 25 [min^-1]**	
	Shaft arrangement					
	**LR/RL**	**LL/RR**	**LR/RL**	**LL/RR**	**LL/RR**	**LR/RL**
	**L1/R2**	**L2/R1**	**L1/R2**	**L2/R1**	**L1/R2**	**L2/R1**
HDP 60	22	14	31	22	BONFIGLIOLI TECHNICAL SERVICE	
HDP 70 - HDO 71	18	9	25	16		
HDP 80 - HDO 81	15	8	28	15		
HDP 90 - HDO 91	20	10	36	20		
HDP 100 - HDO 95 - HDO 100	28	13	52	26	80	55
HDP 110 - HDO 110	46	33	61	37	86	72
HDP 120 - HDO 120	62	34	83	54	107	101
HDP 125 - HDO 125	75	48	98	69	130	122
HDP 130 - HDO 130	90	46	119	73	160	137
HDP 140 - HDO 140	85	43	116	73	183	138
HDP 150 - HDO 150	BONFIGLIOLI TECHNICAL SERVICE		109	52	183	132
HDP 160 - HDO 160			88	36	172	110
HDP 170 - HDO 170	BONFIGLIOLI TECHNICAL SERVICE					
HDP 180 - HDO 180						

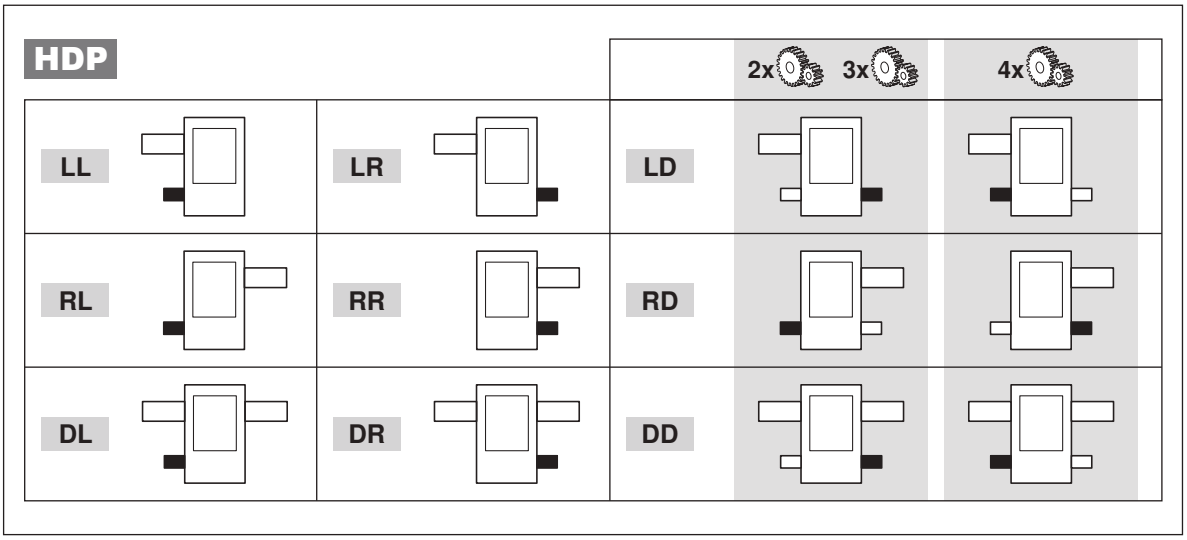
For other load conditions, such as:
- high overhung loads
- thrust loads
- combined overhung and thrust loads
- different output shaft configurations

consult Bonfiglioli Riduttori's Technical Service.

11.6.2 Overhung and thrust loads on input shaft

When checking the overhung load capacity refer to scheme shown at paragraph 11.5. 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 $\mathbf{Rn_1}$, as listed in the technical data section, for the load location factor $\mathbf{K_1}$ to get the permissible overhung load $\mathbf{Rx_1}$ 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. Catalogue values are therefore conservative, for an in-depth calculation, or in case of HDP with 4 reductions and through-shafts (LD, RD and DD), contact the Technical Service of Bonfiglioli Riduttori.
When a radial force applies a thrust load $\mathbf{An_1 \leq 0.2 \times Rn_1}$ is also permitted.

In the case of HDP gearboxes with through-shafts the maximum permitted overhung load refers to the shaft end highlighted in black below:



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

11.7 THERMAL CAPACITY

Thermal power P_T is the maximum power that the gearbox can transmit mechanically, under continuous operation, without the internal temperature rising to a value that could damage the gearbox components.

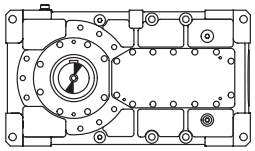
Under the following operating conditions:
- mounting position B3, gearbox connected through a metallic support
- continuous functioning
- installation in large areas (air speed > 1.4 m/s)
- max. installation altitude 1000 m

total thermal capacity values and thermal capacity values inclusive of contributions from auxiliary cooling units are listed in sections 17 and 28.
For other conditions contact Bonfiglioli's Technical Service.

The figure determined must be greater than the Pr_1 power value for the gearbox input shaft. It is therefore important to verify the following formula:

$$P_{T...} \geq Pr_1$$

12 SAMPLE APPLICATIONS



Application data	
n_1 = 1500 min^{-1}	f_s = 1.5
n_2 = 83 min^{-1}	Mr_2 = 7850 Nm
Mounting position:	**B3**
Environmental conditions	
Ambient temperature	= 40°C
Installation in large areas	

Product selection:

a) $i = \frac{n_1}{n_2} = \frac{1500}{83} \approx 18.1$

b) $Pr_1 = \frac{Mr_2 \times n_2}{9550 \times \eta} = \frac{7850 \times 83}{9550 \times 0.96} \approx 71.1$ kW

c) $Pn_1 \geq Pr_1 \cdot f_s \approx 106.6$ kW

→ **HDP 80 2 18.0 LP LR VP B3** [Pn_1 = 108.7 kW @ n_1 = 1500 min^{-1}]

Thermal capacity check:

P_T = 55 kW < Pr_1 = 71.1 kW ⚠

Option 1
- Fan cooling

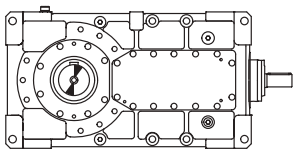
$P_{TFANL/R}$ = 76 kW @ n_1 = 1500 min^{-1}

$P_{TFANL/R} > Pr_1$ ✓ OK

Option 2
- Cooling coil

P_{TSR} = 96 kW @ n_1 = 1500 min^{-1}

$P_{TSR} > Pr_1$ ✓ OK



Application data	
n_1 = 1500 min^{-1}	f_s = 1.5
n_2 = 120 min^{-1}	Mr_2 = 13500 Nm
Mounting position:	**B3**
Environmental conditions	
Ambient temperature	= 40°C
Installation in large areas	

Product selection:

a) $i = \frac{n_1}{n_2} = \frac{1500}{120} = 12.5$ b) $Pr_1 = \frac{Mr_2 \times n_2}{9550 \times \eta} = \frac{13500 \times 120}{9550 \times 0.96} \approx 176.7$ kW c) $Pn_1 \geq Pr_1 \cdot f_s \approx 265.1$ kW

→ **HDO 110 2 12.5 LP L 1 VP B3** [Pn_1 = 329.4 kW @ n_1 = 1500 min^{-1}]

Thermal capacity check:

$P_T = 52$ kW $< Pr_1 = 176.7$ kW ⚠

Option 1

- Cooling units with air/oil heat exchanger

P_{TMCRA9} = 184 kW @ n_1 = 1500 min^{-1}

$P_{TMCRA9} > Pr_1$ ✓ OK

Option 2

- Cooling units with water/oil heat exchanger

P_{TMCRW5} = 250 kW @ n_1 = 1500 min^{-1}

$P_{TMCRW5} > Pr_1$ ✓ OK

13 INTRODUCTION TO THE ATEX DIRECTIVES

13.1 Explosive atmosphere

An **explosive atmosphere** for the purposes of Directive 2014/34/EU is defined as a mixture:

a. of **flammable substances**, in the form of gases, vapours, mists or dusts;
b. with **air**;
c. under atmospheric conditions;
d. in which, after ignition, the combustion spreads to the entire unburned mixture (it has to be noted that sometimes, mainly with dust, not always the whole quantity of the combustible material is consumed by the combustion).

An atmosphere, which could become explosive due to local and/or operational conditions is called a **potentially explosive atmosphere**.
It is only in this kind of potentially explosive atmosphere which products falling under the Directive 2014/34/EU are designed for.

13.2 European harmonised atex standards

Directive 2014/34/EU stipulates the minimum safety requirements for products intended for use in explosion risk areas within the member countries of the European Union. The directive also assigns such equipment to **categories,** which are defined by the directive itself.

The following table describes the **zones** into which the user of a plant, in which an explosive atmosphere may occur,is required to divide the equipment application areas.

Zones		Formation frequency of a potentially explosive atmosphere	Type of danger
Gaseous atmosphere G	Dusty atmosphere D		
0	20	Present continuously or for long periods	Permanent
1	21	Likely to occur in normal operation occasionally	Potential
2	22	Not likely to occur in normal operation but if it does occur will persist for short period only	Minimal

BONFIGLIOLI RIDUTTORI gear units selected in this catalogue are marked and suitable for installation in zones 1, 21, as highlighted in light gray in the above diagram and they may of course also be installed in areas (minor risk) 2 and 22.
As from 20 April 2016 the ATEX directive 2014/34/EU come into force throughout the entire European Union, and replace existing conflicting national and European laws on explosive atmospheres and the previous directive 94/9/EC.
The directives apply to mechanical, hydraulic and pneumatic equipment.

13.3 Levels of protection for the various categories of equipment

The various categories of equipment must be able to operate in conformity witht he Manufacturer's operational specifications, at certain defined levels of protection.
The availability of BONFIGLIOLI RIDUTTORI products is highlighted in grey.

Protection level	Category		Type of protection	Operating conditions
	Group **I**	Group **II**		
Very high	M1		Two independent means of protection or safety capable of operating even when two independent faults occur	The equipment remains powered and operational even in the presence of an explosive atmosphere
Very high		1	Two independent means of protection or safety capable of operating even when two independent faults occur	The equipment remains powered and operational in zones 0, 1, 2 (G) and/or zones 20, 21, 22 (D)
High	M2		Protection suitable for normal operation and heavy duty conditions	Power to the equipment is shut off in the presence of a potentially explosive atmosphere
High		2	Protection suitable for normal operation and frequent faults or equipment in which malfunction is normal.	The equipment remains powered and operational in zones 1, 2 (G) and/or zones 21, 22 (D)
Normal		3	Protection suitable for normal operation	The equipment remains powered and operational in zones 2 (G) and/or 22 (D)

13.4 Definition of groups

Group I Applies to equipment intended for use underground in parts of mines and those parts of surface installations of such mines, liable to been dangered by fire damp and/or combustible dust.
Group II Applies to equipment intended for use in other places liable to been dangered by explosive atmospheres.

BONFIGLIOLI RIDUTTORI products may not therefore be installed in mines, classified in **Group I** and in **Group II**, category 1.
To summarise, the classification of equipment in to groups, categories and zones is illustrated in the table below, where by the availability of BONFIGLIOLI RIDUTTORI products is highlighted in grey.

Group	I mines, firedamp		II other potentially explosive areas (gas, dust)					
Category	M1	M2	1		2		3	
Atmosphere(1)			G	D	G	D	G	D
Zone			0	20	1	21	2	22
Type of protection gear unit(2)					Ex h Gb	Ex h Db	Ex h Gc	Ex h Dc

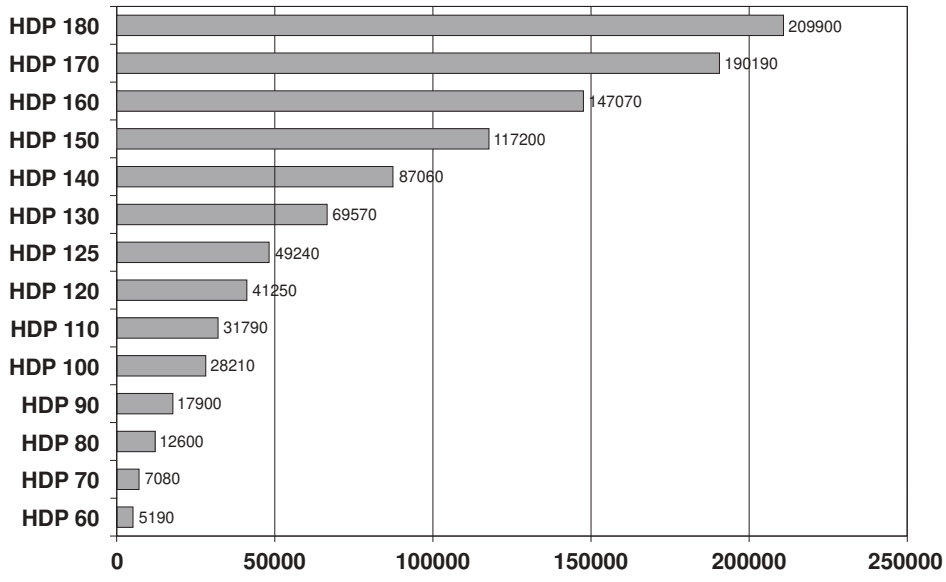
(1) **G** = gas **D** = dust
(2) as per 80079-36 and EN 80079-37

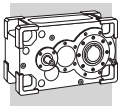
13.5 Declaration of conformity

The Declaration of Conformity, is the document which attests to the conformity of the product to Directive 2014/34/EU.
The validity of the Declaration is bound to observance of the instructions given in the User, Installation and Service Manual for safe use of the product throughout its service life.
This can be downloaded from www.bonfiglioli.com where the manual is available in PDF format in a number of languages.
The instructions regarding ambient conditions are of particular importance inasmuch as failure to observe them during operation of the product renders the certificate null and void. In case of doubt regarding the validity of the certificate of conformity, contact the BONFIGLIOLI RIDUTTORI technical department.

14 DESIGN FEATURES

The main construction features of the HDP parallel shaft gear unit range are:
- sizes from HDP 60 to HDP 90 with double and triple reduction.
- sizes from HDP 100 to HDP 180 with double, triple and quadruple reduction.
- Favourable distribution of rated torque values across the entire ratio range.
- Gear ratios in a 12% progression between consecutive values.
- HDP 60 ... HDP 125: Monobloc housing in rigid, spheroidal cast iron, paint coated both internally and externally. Universal mounting thanks to the many machined surfaces. Profiles and dimensions optimised by FEM analysis for superior structural rigidity and low acoustic emissions.
- HDP 130 ... HDP 180: housing in spheroidal cast iron or electrically-welded steel, horizontally split. This design makes maintenance quick and economical. Profiles and dimensions optimised by FEM analysis for superior structural rigidity and low acoustic emissions.
- Casehardened and hardened alloy steel helical gears ground finished and with profile corrected for:
  - more silent operation and smoother transmission of high speed input gears
  - maximum transmissible torque of the lower speed output gear reductions
- Input shafts generally casehardened and ground finished on outer diametre. Output shafts from hardened and tempered alloy steel.



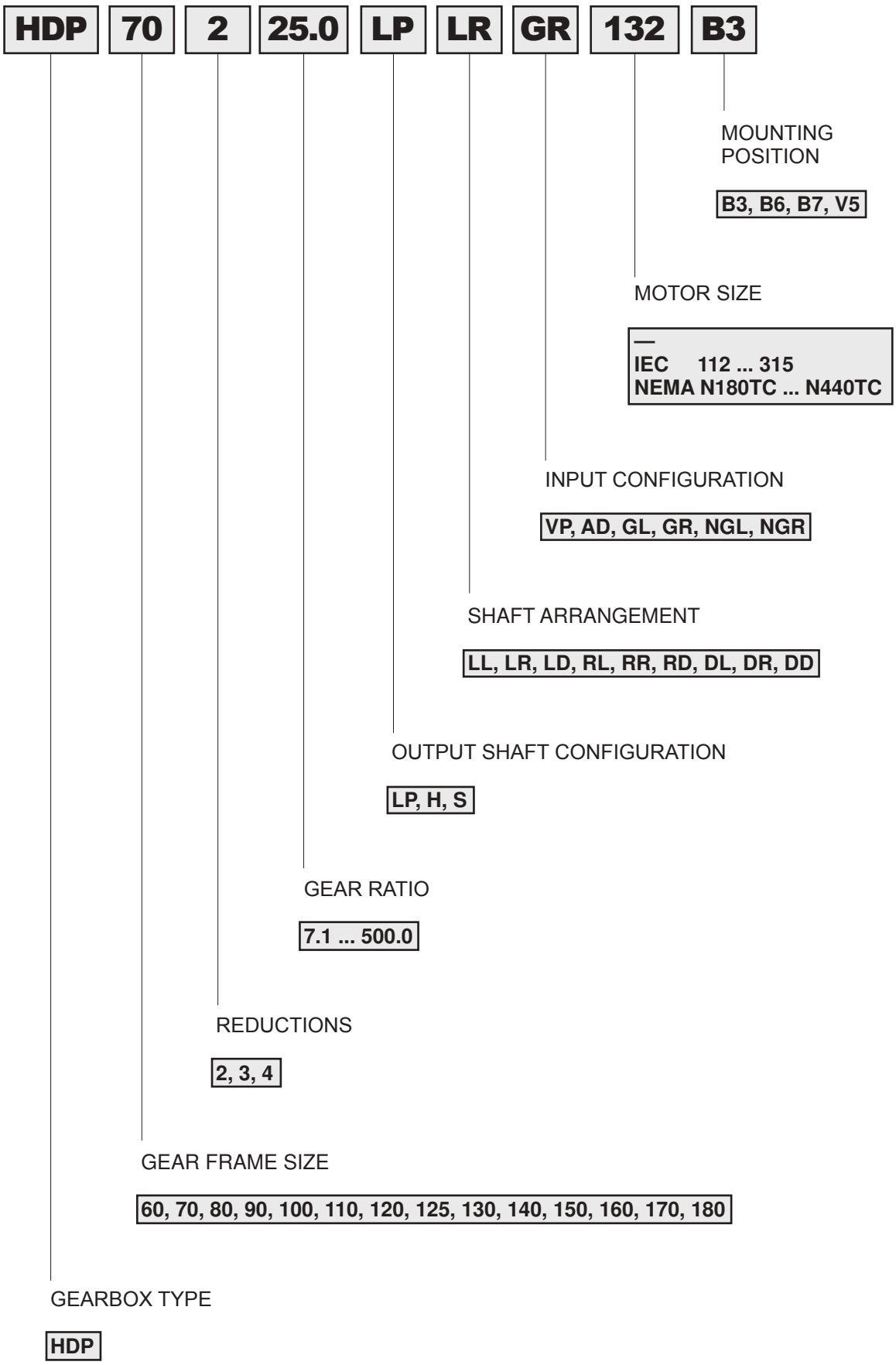


• Input shaft configurations:
- HDP 60 ... HDP 180: solid, single or double-sided shaft with dimensions to UNI/ISO 775-88
- HDP 60 ... HDP 90: direct motor mounting or lantern housing and flexible coupling provision.
- HDP 100 ... HDP 180: motor mounting with bell and housing and flexible coupling.
• Output shaft configurations:
- solid, single or double-sided shaft with dimensions to UNI/ISO 775-88
- hollow shaft with keyway
- hollow shaft with shrink disc
• Heavy duty taper roller bearings or extra large self-aligning roller bearings from the most reputed brands for unparalleled overhung load capacity.

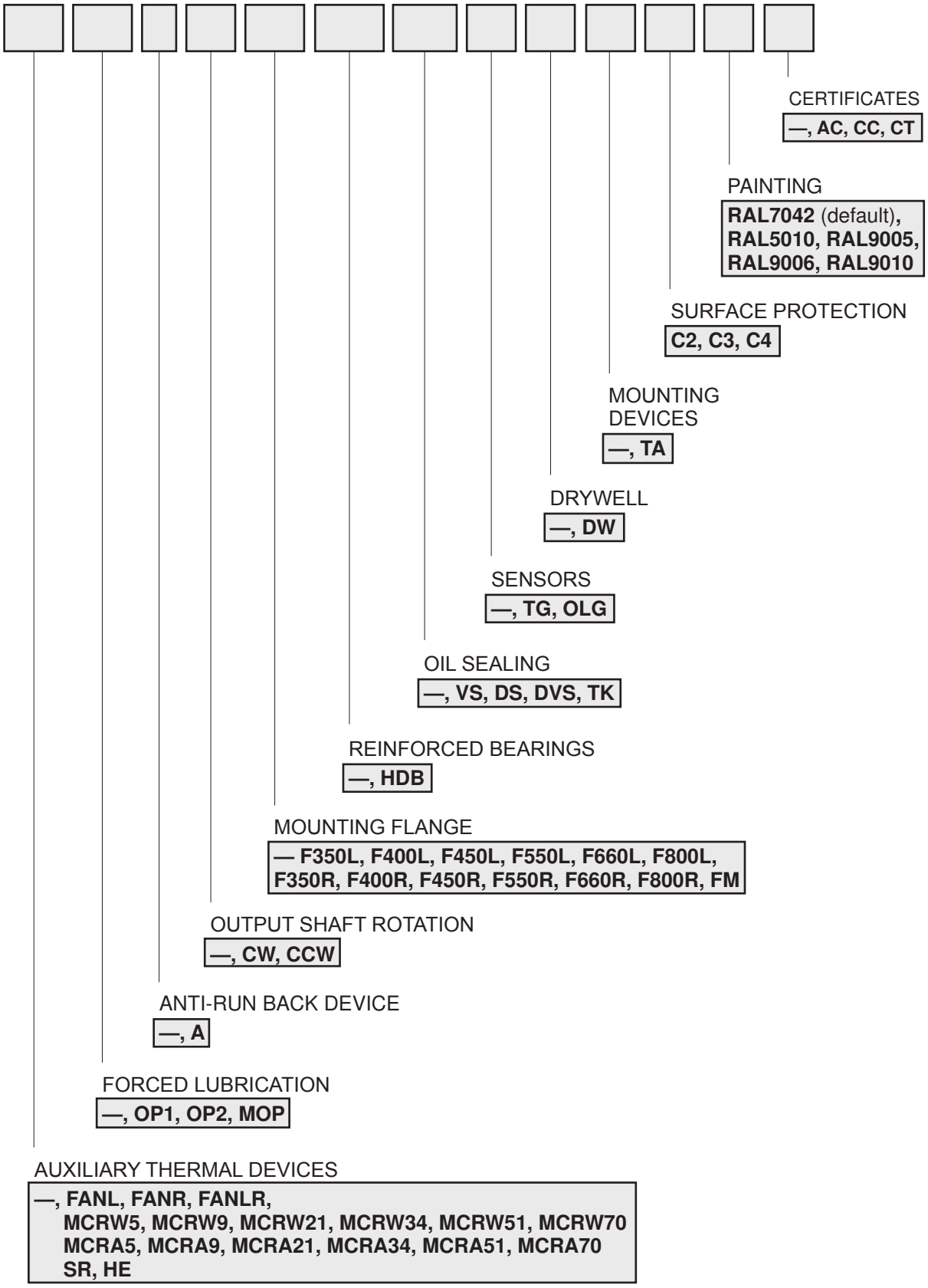
• A wide range of customisation options are available upon request, including:
- auxiliary cooling/heating devices
- forced lubrication systems
- backstop device
- mounting or manifold flanges
- bearings for increased overhung load capacity (only for HDP 60 ... HDP 90)
- seals and gaskets in various types and materials
- sensors
- dry-well device for vertical shaft installations
- fixing elements

15 PRODUCT CONFIGURATIONS

15.1 BASE VARIANTS

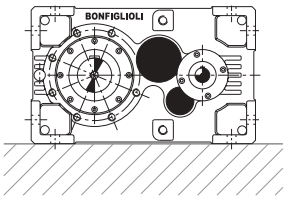
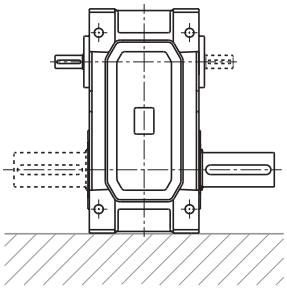
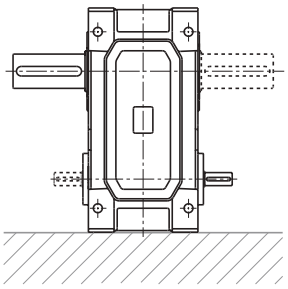
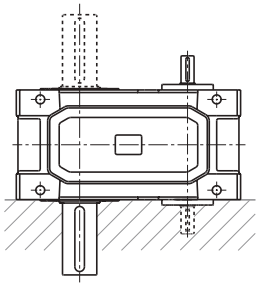


15.2 OPTIONAL VARIANTS



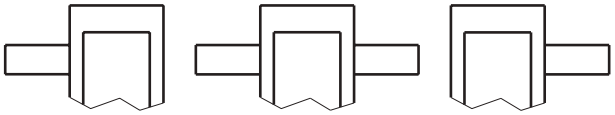
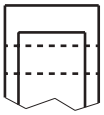
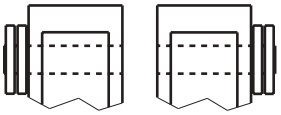
REMARK: The multiple selection of some of the variants may be subject to technical or dimensional constraints. Consult with the factory to have your selection approved.

15.3 MOUNTING POSITION

B3	B6	B7	V5
			
	⛔ HDP 170, HDP 180		

15.4 INPUT AND OUTPUT CONFIGURATION

15.4.1 OUTPUT SHAFT CONFIGURATION

LP	H	S
		

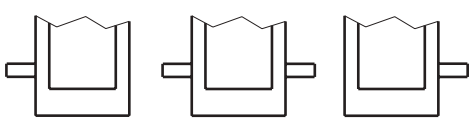
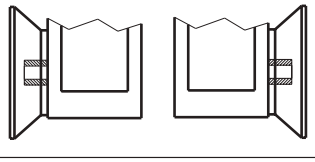
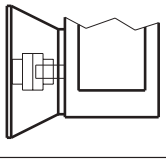
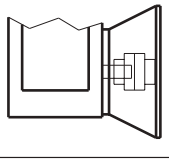
15.4.2 INPUT CONFIGURATION

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**

• **Motor flange mounting** for an IEC-standard electric motor with IM B5 flange. The option is only applicable to units HDP 60... HDP 90 in the triple reduction configuration – Specify **AD**.

• **Motor mounting through motor bell housing IEC or NEMA and flexible coupling**. The option is designated **GL**/**NGL** or **GR**/**NGR** depending on what side of the gear unit the coupling is mounted. The flexible coupling is within the scope for supply.

VP	AD	GL-NGL	GR-NGR
			

15.4.3 SHAFT ARRANGEMENT

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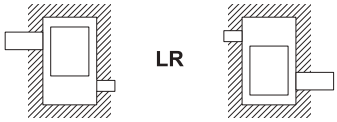
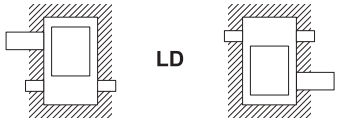
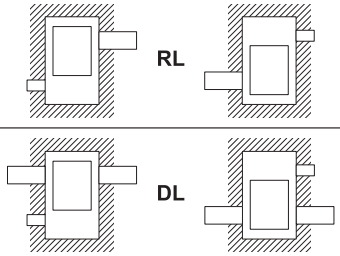
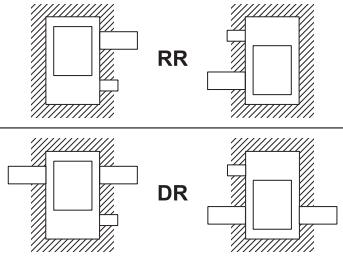
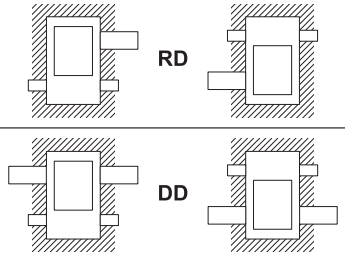
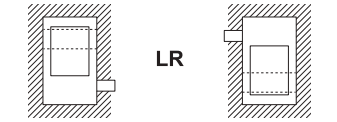
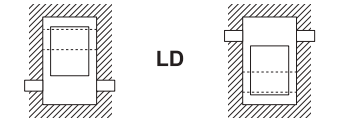
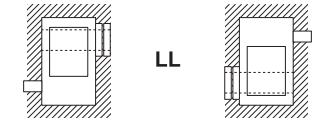
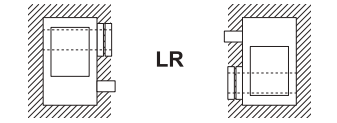
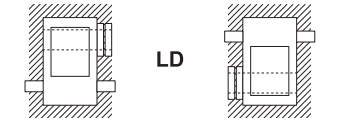
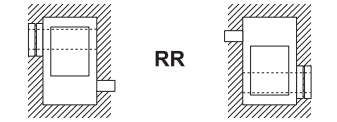
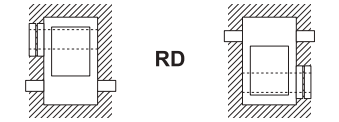
B3	LP	 LL	 LR	 LD
		 RL	 RR	 RD
		DL	DR	DD
	H	 LL	 LR	 LD
	S	 LL	 LR	 LD
		 RL	 RR	 RD

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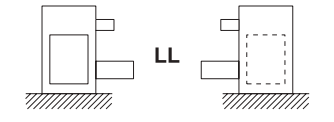
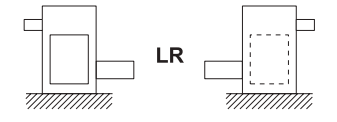
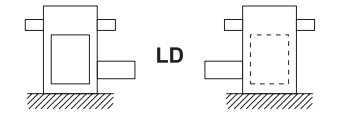
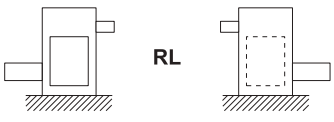
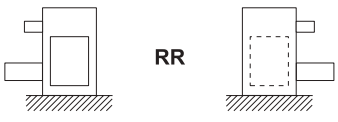
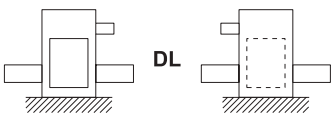
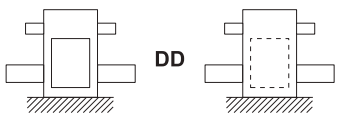
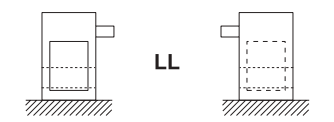
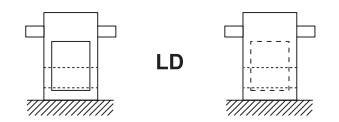
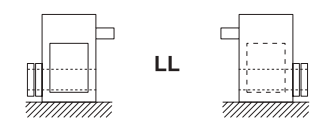
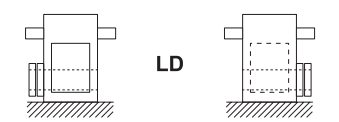
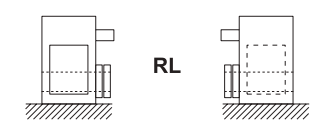
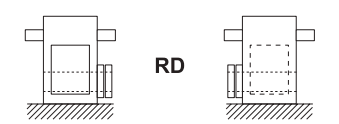
B6	LP	 LL	 LR	 LD
		 RL	 RR	 RD
		 DL	 DR	 DD
	H	 LL	 LR	 LD
	S	 LL	 LR	 LD
		 RL	 RR	 RD

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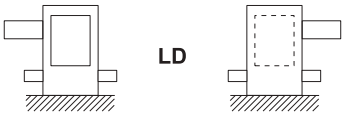
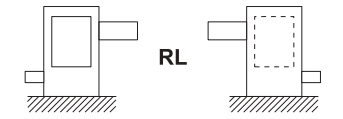
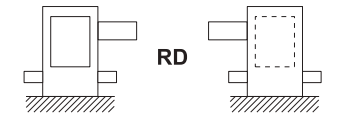
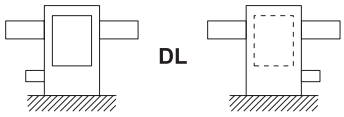
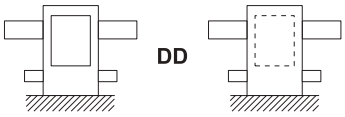
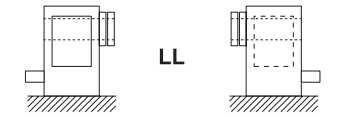
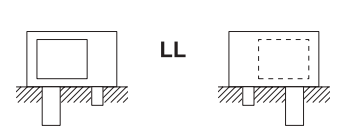
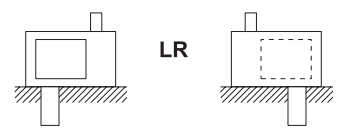
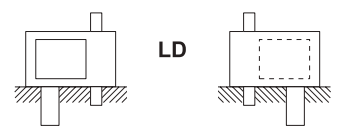
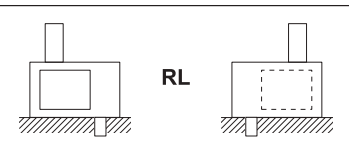
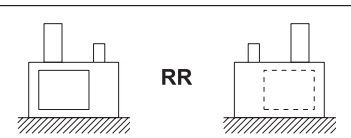
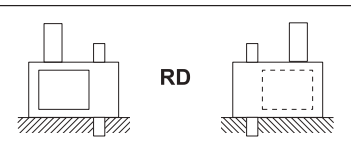
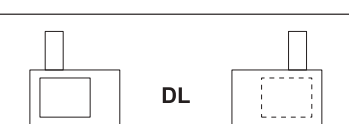
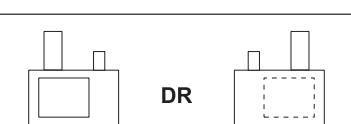
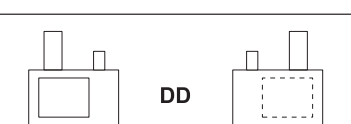
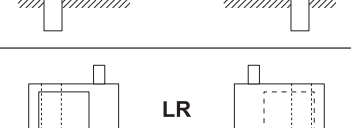
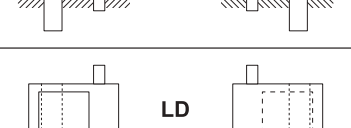
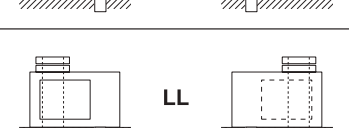
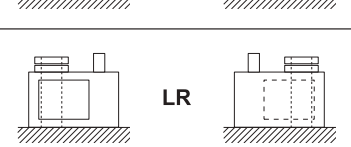
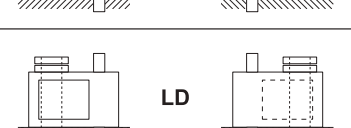
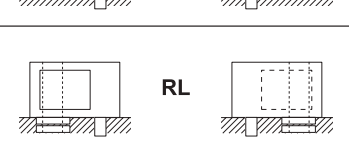
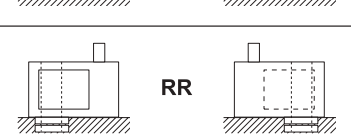
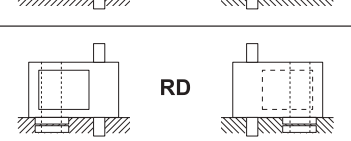
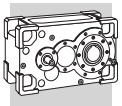
B7	LP	 LL	 LR	 LD
		 RL	 RR	 RD
		 DL	 DR	 DD
	H	 LL	 LR	 LD
	S	 LL	 LR	 LD
		 RL	 RR	 RD

		VP - GL - NGL - AD	VP - GR - NGR - AD	VP - GL - NGL - GR - NGR
V5	LP	 LL	 LR	 LD
		 RL	 RR	 RD
		 DL	 DR	 DD
	H	 LL	 LR	 LD
	S	 LL	 LR	 LD
		 RL	 RR	 RD



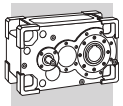
15.5 MOTOR AVAILABILITY

The following charts list the motor/gearbox combinations that are geometrically feasible. Variants are only applicable if either an AD (direct motor mounting) or a GL/NGL - GR/NGR input configuration (coupling through motor bell housing IEC or NEMA and flexible coupling) were previously specified within the ordering code.

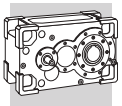
Because of standardisation, the rated power of the electric motor selected might be greater than nominal power Pn1 of choosen gearbox. Make sure that the electric motor will never develop the extra power at any stage of the operating cycle. If you have any doubts about the validity of the application data, or uncertainty concerning the actual load pattern, install a torque limiting device or proportionally revise the applicable service factor.

	Input configuration				
	AD				
	112	132	160	180	200
HDP 60 3	X	X	X	X	
HDP 70 3	X	X	X	X	X
HDP 80 3	—	X	X	X	X
HDP 90 3	—	—	X	X	X

		Input configuration						
		GL - GR						
		132	160	180	200	225	250	280
HDP 60 2	i =	17.3_19.4	7.1_19.4	7.1_19.4	7.1_19.4	7.1_19.4	—	—
HDP 60 3		22.7_98.4	22.7_98.4	22.7_49.1	22.7_49.1	22.7_49.1	—	—
HDP 70 2		19.4_22.6	8.0_22.6	8.0_22.6	8.0_22.6	8.0_22.6	—	—
HDP 70 3		25.5_114.4	25.5_114.4	25.5_57.0	25.5_57.0	25.5_57.0	—	—
HDP 80 2		—	15.5_22.6	15.5_22.6	15.5_22.6	8.1_22.6	8.1_22.6	8.1_22.6
HDP 80 3		—	25.8_111.4	25.8_111.4	25.8_75.2	25.8_75.2	25.8_75.2	25.8_75.2
HDP 90 2		—	15.8_22.4	15.8_22.4	15.8_22.4	15.8_22.4	7.9_22.4	7.9_22.4
HDP 90 3		—	25.4_110.1	25.4_110.1	25.4_110.1	25.4_73.3	25.4_73.3	25.4_73.3



Input configuration										
		GL - GR								
		112	132	160	180	200	225	250	280	315
HDP 100 2		—	—	—	—	—	—	7.4_21.8	7.4_21.8	7.4_21.8
HDP 100 3		—	—	55.5_107.6	55.5_107.6	22.8_107.6	22.8_107.6	22.8_107.6	22.8_50.0	22.8_50.0
HDP 100 4		110.6_507.9	110.6_507.9	110.6_507.9	110.6_507.9	110.6_507.9	—	—	—	—
HDP 110 2		—	—	—	—	—	—	8.1_25.0	8.1_25.0	8.1_25.0
HDP 110 3		—	—	60.7_123.4	60.7_123.4	24.9_123.4	24.9_123.4	24.9_123.4	24.9_54.5	24.9_54.5
HDP 110 4		120.9_499.4	120.9_499.4	120.9_499.4	120.9_499.4	120.9_499.4	—	—	—	—
HDP 120 2		—	—	—	—	—	—	—	7.9_25.4	7.9_25.4
HDP 120 3		—	—	—	64.3_125.2	64.3_125.2	25.8_125.2	25.8_125.2	25.8_56.1	25.8_56.1
HDP 120 4		—	128.0_523.7	128.0_523.7	128.0_523.7	128.0_523.7	128.0_523.7	—	—	—
HDP 125 2		—	—	—	—	—	—	—	8.9_25.0	8.9_25.0
HDP 125 3		—	—	—	72.5_123.6	72.5_123.6	29.1_123.6	29.1_123.6	29.1_62.6	29.1_62.6
HDP 125 4		—	144.4_506.5	144.4_506.5	144.4_506.5	144.4_506.5	144.4_506.5	—	—	—
HDP 130 2	i =	—	—	—	—	—	—	—	—	7.3_21.7
HDP 130 3		—	—	—	—	—	56.5_108.3	56.5_108.3	21.8_108.3	21.8_108.3
HDP 130 4		—	—	111.2_534.5	111.2_534.5	111.2_534.5	111.2_237.9	111.2_237.9	—	—
HDP 140 2		—	—	—	—	—	—	—	—	8.4_24.9
HDP 140 3		—	—	—	—	—	65.1_124.7	65.1_124.7	25.1_124.7	25.1_124.7
HDP 140 4		—	—	141.6_495.3	141.6_495.3	141.6_495.3	141.6_277.5	141.6_277.5	—	—
HDP 150 2		—	—	—	—	—	—	—	—	—
HDP 150 3		—	—	—	—	—	—	—	43.5_77.0	21.5_77.0
HDP 150 4		—	—	170.9_303.1	170.9_303.1	89.0_303.1	89.0_303.1	89.0_303.1	89.0_303.1	89.0_157.8
HDP 160 2		—	—	—	—	—	—	—	—	—
HDP 160 3		—	—	—	—	—	—	—	49.4_87.0	24.4_87.0
HDP 160 4		—	—	194.1_342.2	194.1_342.2	101.1_342.2	101.1_342.2	101.1_342.2	101.1_342.2	101.1_178.1
HDP 170		BONFIGLIOLI TECHNICAL SERVICE								
HDP 180										



Input configuration							
NGL - NGR							
		N210TC	N250TC	N280TC	N320TC	N360TC	N400TC
HDP 60 2	i =	17.3_19.4	7.1_19.4	7.1_19.4	7.1_19.4	7.1_19.4	—
HDP 60 3		22.7_98.4	22.7_98.4	22.7_49.1	22.7_49.1	22.7_49.1	—
HDP 70 2		19.4_22.6	8.0_22.6	8.0_22.6	8.0_22.6	8.0_22.6	—
HDP 70 3		25.5_114.4	25.5_114.4	25.5_57.0	25.5_57.0	25.5_57.0	—
HDP 80 2		—	15.5_22.6	15.5_22.6	8.1_22.6	8.1_22.6	8.1_22.6
HDP 80 3		—	25.8_111.4	25.8_111.4	25.8_75.2	25.8_75.2	25.8_75.2
HDP 90 2		—	15.8_22.4	15.8_22.4	15.8_22.4	7.9_22.4	7.9_22.4
HDP 90 3		—	25.4_110.1	25.4_110.1	25.4_110.1	25.4_73.3	25.4_73.3

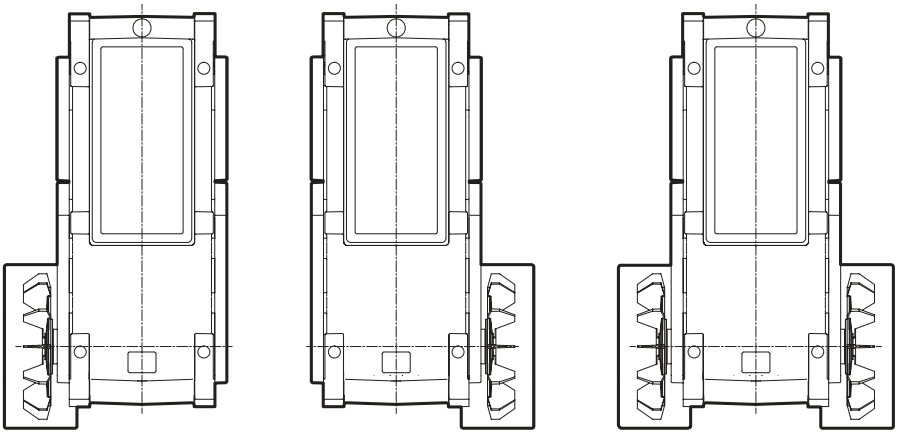
Input configuration									
NGL - NGR									
		N180TC	N210TC	N250TC	N280TC	N320TC	N360TC	N400TC	N440TC
HDP 100 2	i =	—	—	—	—	—	7.4_21.8	7.4_21.8	—
HDP 100 3		—	—	55.5_107.6	55.5_107.6	22.8_107.6	22.8_107.6	22.8_50.0	—
HDP 100 4		110.6_507.9	110.6_507.9	110.6_507.9	110.6_507.9	110.6_507.9	—	—	—
HDP 110 2		—	—	—	—	—	8.1_25.0	8.1_25.0	—
HDP 110 3		—	—	60.7_123.4	60.7_123.4	24.9_123.4	24.9_123.4	24.9_54.5	—
HDP 110 4		120.9_499.4	120.9_499.4	120.9_499.4	120.9_499.4	120.9_499.4	—	—	—
HDP 120 2		—	—	—	—	—	—	7.9_25.4	7.9_25.4
HDP 120 3		—	—	—	64.3_125.2	25.8_125.2	25.8_125.2	25.8_56.1	25.8_56.1
HDP 120 4		—	128.0_523.7	128.0_523.7	128.0_523.7	128.0_523.7	128.0_523.7	—	—
HDP 125 2		—	—	—	—	—	—	8.9_25.0	8.9_25.0
HDP 125 3		—	—	—	72.5_123.6	29.1_123.6	29.1_123.6	29.1_62.6	29.1_62.6
HDP 125 4		—	144.4_506.5	144.4_506.5	144.4_506.5	144.4_506.5	144.4_506.5	—	—
HDP 130 2		—	—	—	—	—	—	—	7.3_21.7
HDP 130 3		—	—	—	—	56.5_108.3	56.5_108.3	21.8_108.3	21.8_108.3
HDP 130 4		—	—	111.2_534.5	111.2_534.5	111.2_534.5	111.2_237.9	—	—
HDP 140 2		—	—	—	—	—	—	—	8.4_24.5
HDP 140 3		—	—	—	—	65.1_124.7	65.1_124.7	25.1_124.7	25.1_124.7
HDP 140 4		—	—	141.6_495.3	141.6_495.3	141.6_495.3	141.6_277.5	—	—

15.6 OPTIONAL VARIANTS

15.6.1 AUXILIARY COOLING DEVICES

15.6.1.1 FAN COOLING

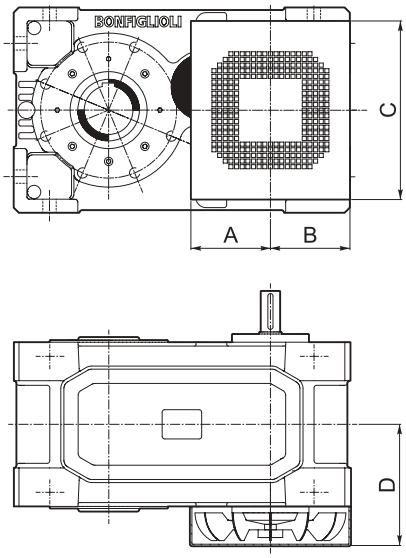
Greater heat dissipation capacity can be achieved by installing cooling fans, which are keyed on to the gearbox input shaft. Gear units HDP 60 ... HDP 90, except for configuration LD – RD – DD, and HDP 100 ... HDP 160 with lantern type motor adapter (GL/NGL or GR/NGR) may have an auxiliary fan fitted to the side opposite the drive end. Specify code **FANL** or **FANR**. On units ranging from HDP 100 to HDP 160 in the solid input shaft configuration (VP), 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 to HDP 160 gearboxes by fitting two fans, specifying code FANLR in the order.
On the gearboxes HDP 170 and HDP 180, are used axial fans with fixed airfoil profile as standard.
Along with the specification of the option FANL or FANR, the direction of rotation for the output shaft (CW or CCW) must also be specified in the order, according to the conventions given in paragraph 15.6.3.



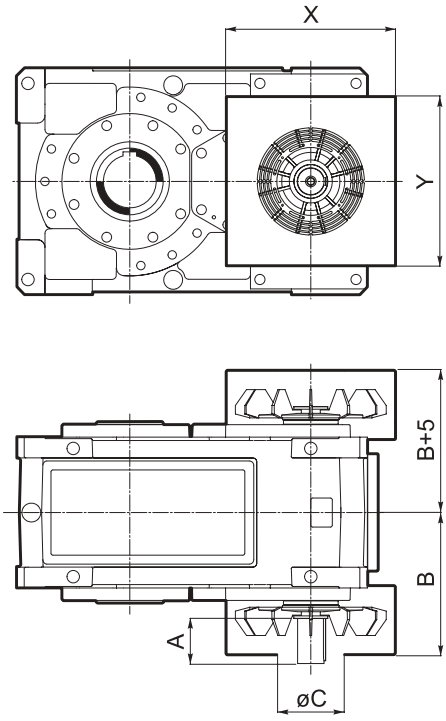
FANL **FANR** **FANLR**

(HDP 100 ... HDP 160)

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_{TFAN}. See chapter 17. The efficiency of forced ventilation falls drastically below the drive speed of $n_1 = 900\ min^{-1}$. In this case, it is advisable to adopt other auxiliary cooling devices to increase the thermal capacity of the gearbox.



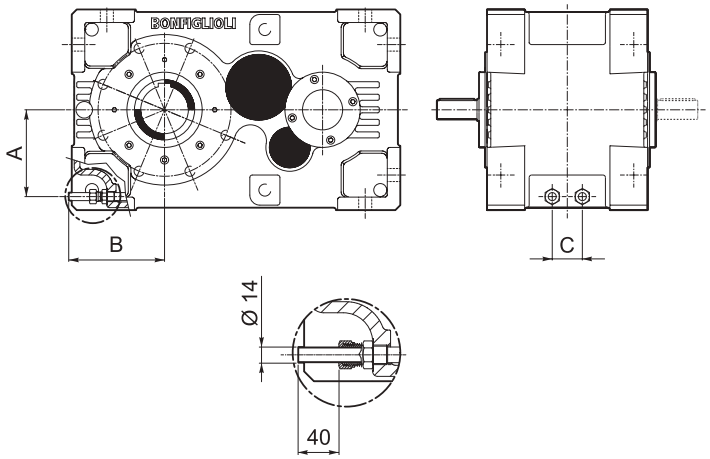
	A [mm]	B [mm]	C [mm]	D [mm]
HDP 60 FAN_	125	130	255	200
HDP 70 FAN_	125	130	255	200
HDP 80 FAN_	155	155	348	235
HDP 90 FAN_	178	178	360	260



	i	A [mm]	B [mm]	C [mm]	X [mm]	Y [mm]
HDP 100 FAN_	7.4 ≤ i ≤ 21.8	105	330	180	424	420
	22.8 ≤ i ≤ 107.6	82	330	180	424	420
	110.6 ≤ i ≤ 507.9	58	330	180	424	420
HDP 110 FAN_	8.1 ≤ i ≤ 25.0	105	330	180	424	420
	24.9 ≤ i ≤ 123.4	82	330	180	424	420
	120.9 ≤ i ≤ 499.4	58	330	180	424	420
HDP 120 FAN_	7.9 ≤ i ≤ 25.4	105	345	180	450	450
	25.8 ≤ i ≤ 125.2	85	345	180	450	450
	128.0 ≤ i ≤ 523.7	58	345	180	450	450
HDP 125 FAN_	8.9 ≤ i ≤ 25.0	105	345	180	450	450
	29.1 ≤ i ≤ 123.6	85	345	180	450	450
	144.4 ≤ i ≤ 506.5	58	345	180	450	450
HDP 130 FAN_	7.3 ≤ i ≤ 12.3	130	422	230	540	590
	14.1 ≤ i ≤ 48.1	105	422	230	540	590
	56.5 ≤ i ≤ 237.9	82	422	230	540	590
	274.5 ≤ i ≤ 534.5	58	422	230	540	590
HDP 140 FAN_	8.4 ≤ i ≤ 14.4	130	422	230	540	590
	16.3 ≤ i ≤ 56.2	105	422	230	540	590
	65.1 ≤ i ≤ 277.5	82	422	230	540	590
	315.9 ≤ i ≤ 495.3	58	422	230	540	590
HDP 150 FAN_	7.9 ≤ i ≤ 14.1	165	472	230	540	665
	15.4 ≤ i ≤ 38.1	130	472	230	540	665
	43.5 ≤ i ≤ 77.0	105	472	230	540	665
	89.0 ≤ i ≤ 303.1	82	472	230	540	665
HDP 160 FAN_	9.0 ≤ i ≤ 15.9	165	472	230	540	665
	17.5 ≤ i ≤ 43.1	130	472	230	540	665
	49.4 ≤ i ≤ 87.0	105	472	230	540	665
	101.1 ≤ i ≤ 342.2	82	472	230	540	665
HDP 170 FAN_	BONFIGLIOLI TECHNICAL SERVICE					
HDP 180 FAN_						

15.6.1.2 HEAT DISSIPATION THROUGH COOLING COIL

The cooling coil option **SR** is designed for integration in a cooling circuit to be provided by the installer.
For optimal efficiency the cooling circuit supply must comply with the following specifications:
• max. pressure 8 bar
• min flow rate 5 l/min for HDP 60 … HDP 90
• min flow rate 10 l/min for HDP 100 … HDP 140
• max. water temperature 20°C
The increased cooling effect obtained in these conditions is shown by the thermal capacity value P_{TSR}. See the section 17



	A [mm]	B [mm]	C [mm]
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	230	285	100
HDP 110_ SR	230	270	100
HDP 120_ SR	258	305	100
HDP 125_ SR	288	345	100
HDP 130_ SR	325	340	100
HDP 140_ SR	325	365	100
HDP 150	BONFIGLIOLI TECHNICAL SERVICE		
HDP 160			
HDP 170			
HDP 180			

15.6.1.3 AUXILIARY COOLING WITH AUTONOMOUS COOLING UNIT

Two types of cooling units 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 15.6.2. The following chart shows device availability according to gearbox size.
Your selection must take into account the deficit in thermal capacity that must be made up by contribution P_{TMCRW} or P_{TMCRA} as shown in the chart in section 17.

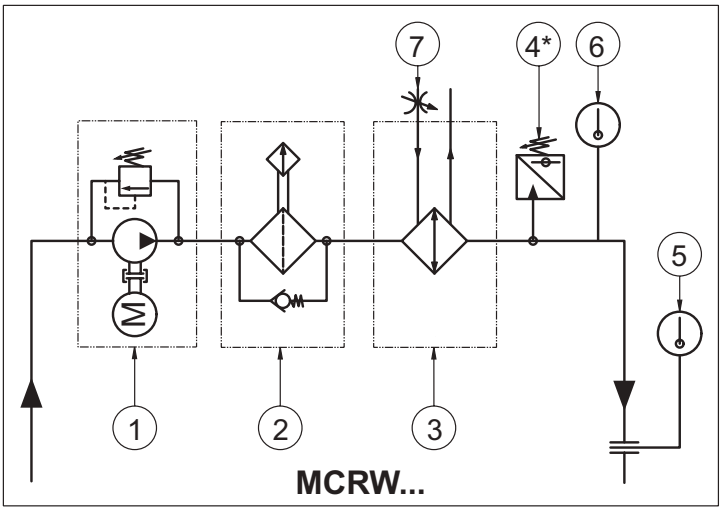
	MCRW5 MCRA5	MCRW9 MCRA9	MCRW21 MCRA21	MCRW34 MCRA34	MCRW51 MCRA51	MCRW70 MCRA70
HDP 100	**X**	**X**				
HDP 110	**X**	**X**				
HDP 120	**X**	**X**	**X (*)**			
HDP 125	**X**	**X**	**X (**)**			
HDP 130	**X**	**X**	**X**	**X (**)**		
HDP 140	**X**	**X**	**X**	**X (**)**		
HDP 150	**X**	**X**	**X**	**X**	**X (**)**	
HDP 160	**X**	**X**	**X**	**X**	**X (**)**	
HDP 170	BONFIGLIOLI TECHNICAL SERVICE					
HDP 180						

(*) not available for mounting position B3.
(**) not available for double reduction units in the mounting position B3.

The main components of the cooling units are as follows:

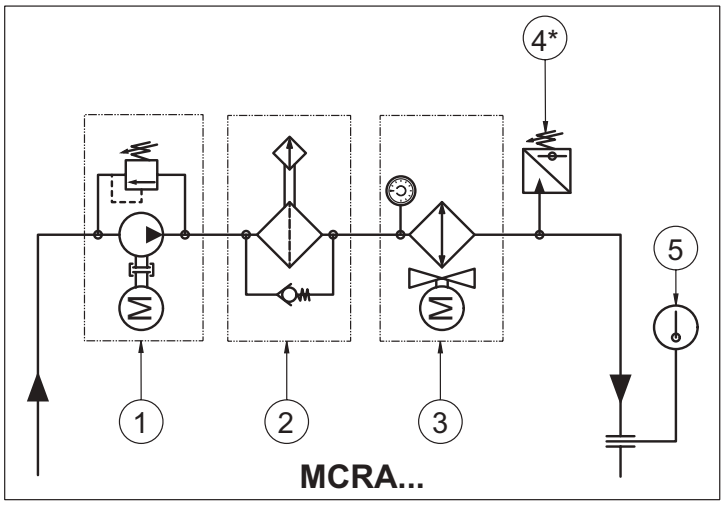
MCRW…

1) motorpump complete with by-pass circuit
2) filter with clogging visual indicator
3) water/oil heat exchanger
4) minimum pressure switch (only available in combination with forced lubrication)
5) maximum temperature thermostat
6) minimum temperature switch
7) electro-valve



MCRA…

1) motorpump complete with by-pass circuit
2) filter with clogging visual indicator
3) air/oil heat exchanger with thermostat
4) minimum pressure switch (only available in combination with forced lubrication)
5) maximum temperature thermostat



General warnings:

MCRW... : provide a water supply system that corresponds to the following specifications:

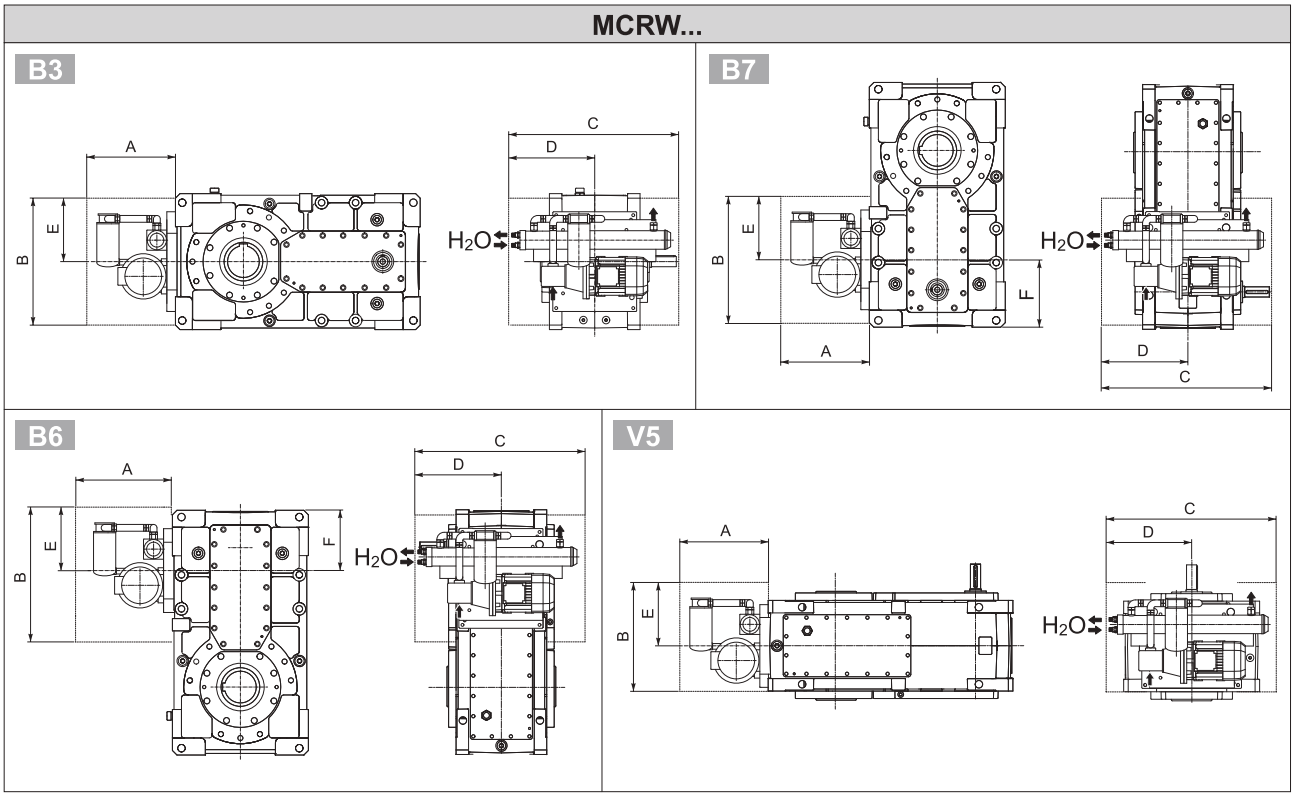
- max. pressure 10 bar
- maximum delivery temperature 20°C
- minimum flow rate Q_{H2O} as per the chart:

	MCRW5	MCRW9	MCRW21	MCRW34	MCRW51	MCRW70
Q_{H2O} [l/min]	10	18	31	56	81	BONFIGLIOLI TECHNICAL SERVICE

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

The cooling units are mounted as shown in the figure below.

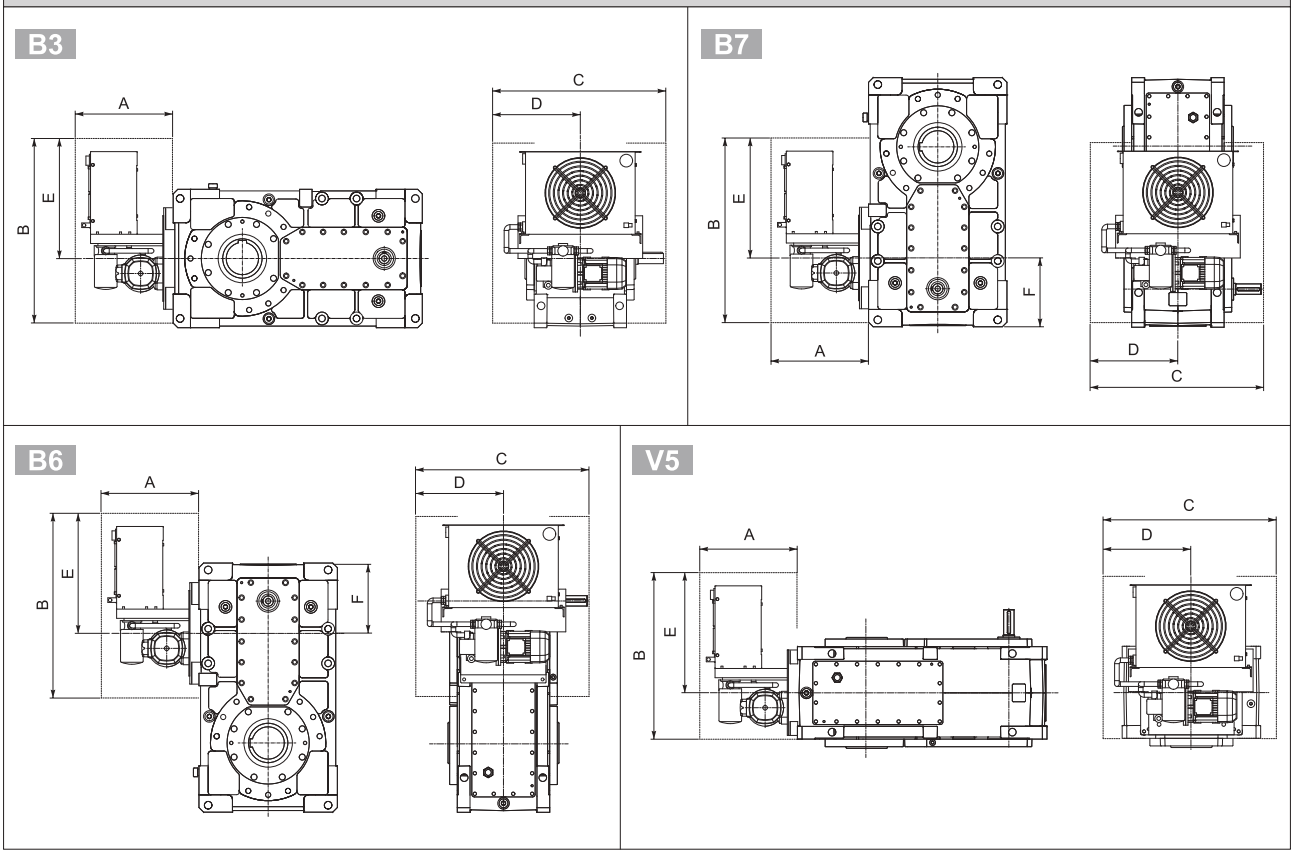
MCRW...



	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]									
						HDP 100 - HDP 110		HDP 120		HDP 125		HDP 130 - HDP 140		HDP 150 - HDP 160	
						2x	3x/4x	2x	3x/4x	2x	3x/4x	2x	3x/4x	2x	3x/4x
MCRW5	360	415	730	365	230	325	270	350	300	BONFIGLIOLI TECHNICAL SERVICE		420	380	475	395
MCRW9	360	380	870	435	195										
MCRW21	400	425	780	390	240										
MCRW34	430	650	1000	500	465										
MCRW51	520	650	1250	625	465										
MCRW70	BONFIGLIOLI TECHNICAL SERVICE														

⚠ Overall dimensions A, B, C, D and E are indicative only

MCRA...



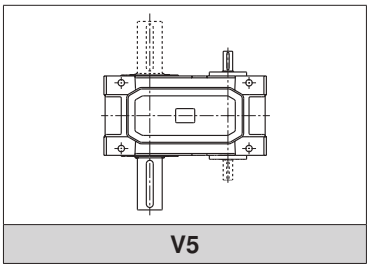
	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]									
						HDP 100 - HDP 110		HDP 120		HDP 125		HDP 130 - HDP 140		HDP 150 - HDP 160	
						2x	3x/4x	2x	3x/4x	2x	3x/4x	2x	3x/4x	2x	3x/4x
MCRA5	400	560	500	250	375	325	270	350	300	BONFIGLIOLI TECHNICAL SERVICE		420	380	475	395
MCRA9	435	650	640	320	465										
MCRA21	440	815	700	350	630										
MCRA34	500	920	840	420	735										
MCRA51	560	1075	1000	500	890										
MCRA70	BONFIGLIOLI TECHNICAL SERVICE														

⚠ Overall dimensions A, B, C, D and E are indicative only

15.6.1.4 HEATERS

In very low ambient temperatures it may prove necessary to pre-heat the lubricant in the sump before start-up and/or during 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 has been reached. The wiring necessary for the thermostat must be provided by the installer.

15.6.2 GREASE LUBRICATION



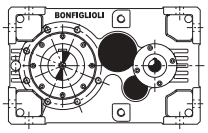
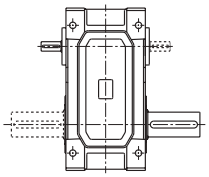
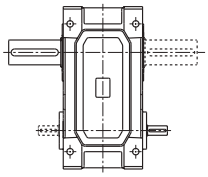
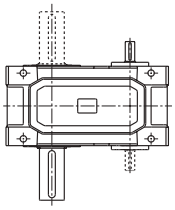
V5

Gearboxes of sizes HDP 60… HDP 90 in mounting position V5 are supplied with upper bearings (not immersed in oil) lubricated with grease and do not require periodic maintenance.

15.6.2.1 FORCED LUBRICATION

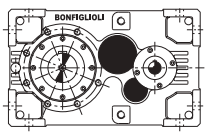
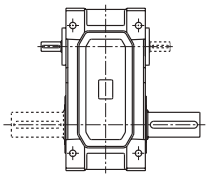
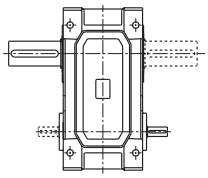
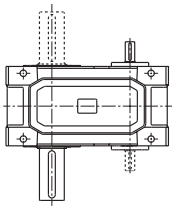
Gearboxes of sizes HDP 60… HDP 90 in mounting position V5 normally supplied with the upper bearings (not immersed in the oil) lubricated with grease can be supplied, on request, with a forced lubrication circuit for the lubrication of the same.

Application conditions of the OPTIONAL forced lubrication devices.

				
	B3	**B6**	**B7**	**V5**
HDP 60 ... HDP 90	⛔	⛔	⛔	OP... MOP

Gearboxes of sizes HDP 100 ... HDP 180 in mounting position V5 are supplied with upper bearings not immersed in oil and lubricated through a forced lubrication circuit the lubrication of the same.

Application conditions of the MANDATORY forced lubrication devices.

				
	B3	**B6**	**B7**	**V5**
HDP 100 ... HDP 180	⛔	⛔	⛔	OP... MOP

Remark: Forced lubrication devices may be replaced, upon approval from Bonfiglioli Technical Service, by independent cooling systems, type MCR...

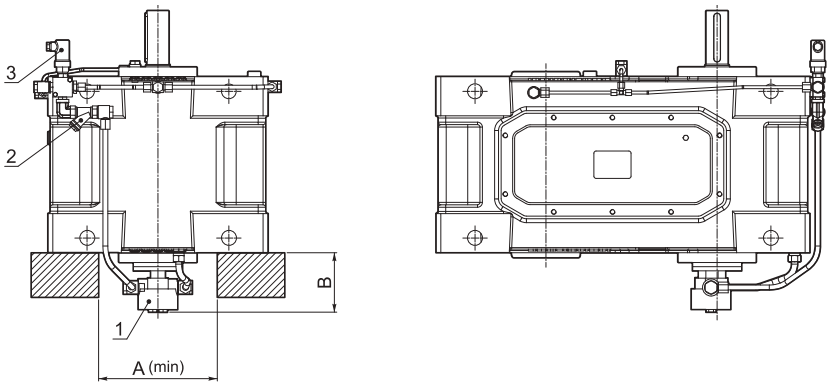
15.6.2.2 MECHANICAL PUMP

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.

	n_1 = 1000 min^{-1}	n_1 = 1200 min^{-1}	n_1 = 1500 min^{-1}
HDP 60 ... HDP 140	OP2	OP2	OP1
HDP 150, HDP 160	OP2	OP2	OP2
HDP 170, HDP 180	BONFIGLIOLI TECHNICAL SERVICE		

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

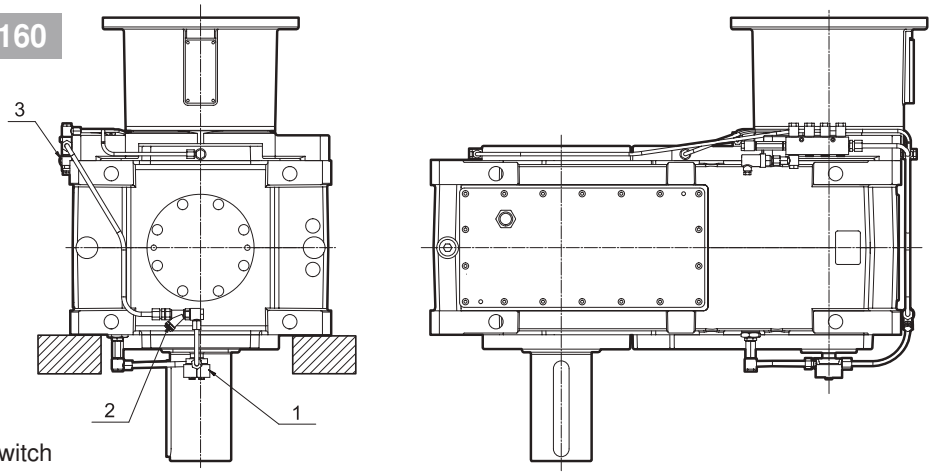
HDP 60 ... HDP 90



1 - Pump
2 - Filter
3 - Minimum pressure switch

	A (min) [mm]	B [mm]
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

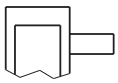
HDP 100 ... HDP 160



1 - Pump
2 - Filter
3 - Minimum pressure switch

Contact the Bonfiglioli Technical Service for overall dimensions.

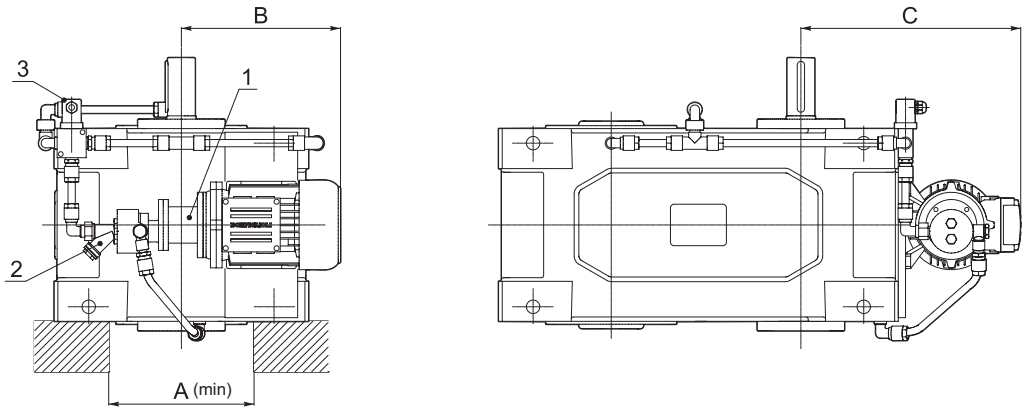
The chart shows the applicability for the pump depending on the input and output configuration.

			LL RL DL	LR RR DR	LD RD DD
HDP 60 ... HDP 180		LP	⛔	VP GR AD	⛔
		H	⛔	VP GR AD	⛔
		S	⛔	VP GR AD	⛔

15.6.2.3 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.

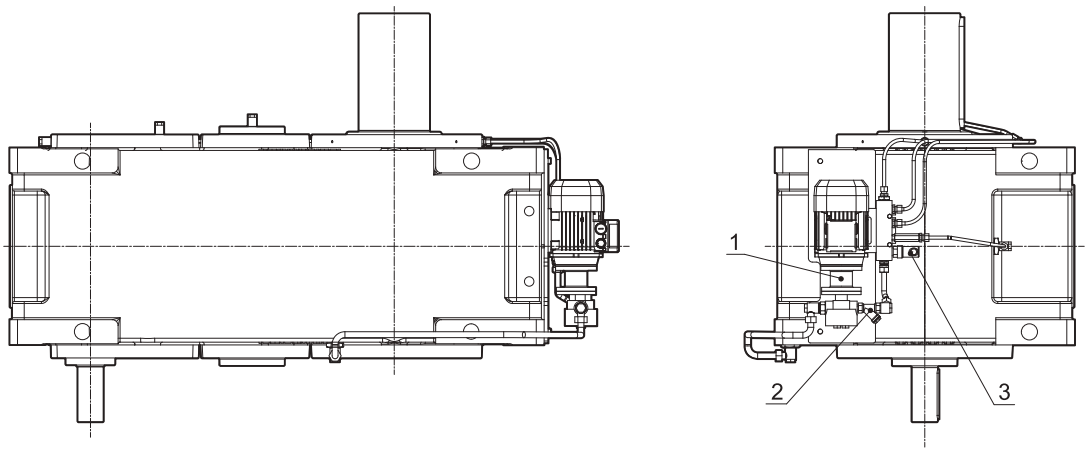
HDP 60 ... HDP 90



1 - Motorpump
2 - Filter
3 - Minimum pressure switch

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

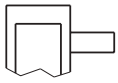
HDP 100 ... HDP 160



1 - Motorpump
2 - Filter
3 - Minimum pressure switch

Contact the Bonfiglioli Technical Service for overall dimensions.

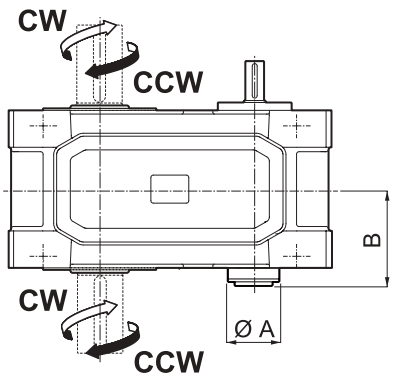
The chart shows the applicability for the motorpump depending on the input and output configuration.

			LL RD DL	LR RR DR	LD RD DD
HDP 60 ... HDP 90		**LP**	VP	VP GR AD	VP GR
		**H**	VP	VP GR AD	VP GR
		**S**	VP	VP GR AD	VP GR
HDP 100 ... HDP 180	No limitation on the basis of output or input configurations				

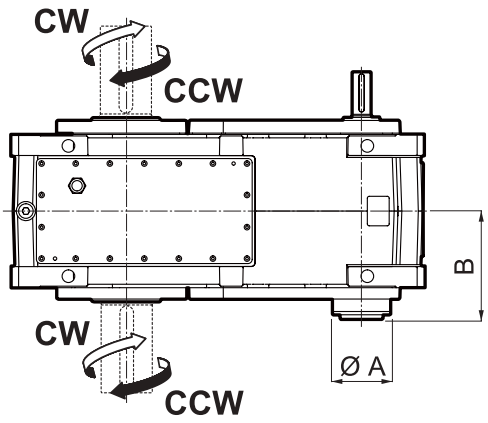
15.6.3 BACKSTOP DEVICE

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 11.1, also make sure that the torque transmitted to the backstop $M_1 = M_2 / (i \times \eta)$ is less than the admissible torque M_{1max} listed in the chart below.
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 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.

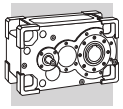
Under continuous operating conditions, it is advisable to maintain a neutral rotation speed n_{1min} greater than that specified in the chart in order to ensure the effective centrifugal release of all the shoes and avoid unnecessary wear.
For further details, contact the Bonfiglioli Technical Service.



	i	A [mm]	B [mm]	M_{1max} [Nm]	n_{1min} [min^{-1}]
HDP 60 2_A	7.1 ≤ i ≤ 15.2	125	202.5	800	630
	i = 17.3 ; 19.4	100	197.5	375	700
HDP 60 3_A	22.7 ≤ i ≤ 98.4	100	197.5	375	700
HDP 70 2_A	8.0 ≤ i ≤ 17.7	125	202.5	800	630
	i = 19.4 ; 22.6	100	197.5	375	700
HDP 70 3_A	25.5 ≤ i ≤ 114.4	100	197.5	375	700
HDP 80 2_A	8.1 ≤ i ≤ 22.6	130	233	910	610
HDP 80 3_A	25.8 ≤ i ≤ 111.4	110	228	550	710
HDP 90 2_A	7.9 ≤ i ≤ 22.4	150	261	1400	560
HDP 90 3_A	25.4 ≤ i ≤ 110.1	125	256	800	630



	i	A [mm]	B [mm]	M_{1max} [Nm]	n_{1min} [min^{-1}]
HDP 100 2_A	7.4 ≤ i ≤ 21.8	175	285	2350	510
HDP 100 3_A	22.8 ≤ i ≤ 50.0	150	298	1400	560
	55.5 ≤ i ≤ 107.6	125	293	800	630
HDP 100 4_A	110.6 ≤ i ≤ 507.9	95	262	310	725
HDP 110 2_A	8.1 ≤ i ≤ 25.0	175	285	2350	510
HDP 110 3_A	24.9 ≤ i ≤ 54.5	150	298	1400	560
	60.7 ≤ i ≤ 123.4	125	293	800	630
HDP 110 4_A	120.9 ≤ i ≤ 499.4	95	262	310	725
HDP 120 2_A	7.9 ≤ i ≤ 25.4	190	315	3050	470
HDP 120 3_A	25.8 ≤ i ≤ 56.1	150	285	1400	560
	64.3 ≤ i ≤ 125.2	125	279	800	630
HDP 120 4_A	128.0 ≤ i ≤ 523.7	95	277	310	725
HDP 125 2_A	8.9 ≤ i ≤ 25.0	190	315	3050	470
HDP 125 3_A	29.1 ≤ i ≤ 62.6	150	285	1400	560
	72.5 ≤ i ≤ 123.6	125	279	800	630
HDP 125 4_A	144.4 ≤ i ≤ 506.5	95	277	310	725
HDP 130 2_A	7.3 ≤ i ≤ 12.3	230	425	5600	410
	14.1 ≤ i ≤ 21.7	210	395	4500	440
HDP 130 3_A	21.8 ≤ i ≤ 48.1	190	366	3050	470
	56.5 ≤ i ≤ 108.3	175	355	2350	510
HDP 130 4_A	111.2 ≤ i ≤ 534.5	110	332	550	670
HDP 140 2_A	8.4 ≤ i ≤ 14.4	230	425	5600	410
	16.3 ≤ i ≤ 24.9	210	395	4500	440
HDP 140 3_A	25.1 ≤ i ≤ 56.2	190	366	3050	470
	65.1 ≤ i ≤ 124.7	175	355	2350	510
HDP 140 4_A	141.6 ≤ i ≤ 495.3	110	332	550	670
HDP 150 2_A	7.9 ≤ i ≤ 14.1	290	487.5	10500	355
	15.4 ≤ i ≤ 19.6	230	447.5	5600	410
HDP 150 3_A	21.5 ≤ i ≤ 38.1	230	445.5	5600	410
	43.5 ≤ i ≤ 77.0	190	417	3050	470
HDP 150 4_A	89.0 ≤ i ≤ 303.1	150	385	1400	560
HDP 160 2_A	9.0 ≤ i ≤ 15.9	290	487.5	10500	355
	17.5 ≤ i ≤ 22.1	230	447.5	5600	410
HDP 160 3_A	24.4 ≤ i ≤ 43.1	230	445.5	5600	410
	49.4 ≤ i ≤ 87.0	190	417	3050	470
HDP 160 4_A	101.1 ≤ i ≤ 342.2	150	385	1400	560
HDP 170	BONFIGLIOLI TECHNICAL SERVICE				
HDP 180					



15.6.4 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). Option cannot be specified along with variant DW -drywell-.

15.6.5 SEALS AND GASKETS

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

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. This option is not available for HDP 60 ... HDP 90 and is not also available for every size of gearboxes if combined with the optional variant “Mounting flanges” (FM excluded).
VS – Fluoro elastomer compound seal rings.
DS – Dual set of seal rings at each shaft end.
DVS – Dual set of Fluoro elastomer compound seal rings at each shaft end.

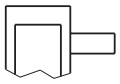
15.6.6 SENSORS

Bimetal thermostat – If the **TG** option is specified, a bimetallic thermostat detects when the oil temperature exceeds 90°C ± 5°C.
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.
The device may not be available in combination with other accessories and/or particular product configurations. Please contact Bonfiglioli Technical Service for advise.

15.6.7 DRYWELL

The Drywell device, option **DW**, guarantees proper sealing for the output shaft. It can only be applied to gearboxes 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 catalogue.
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.

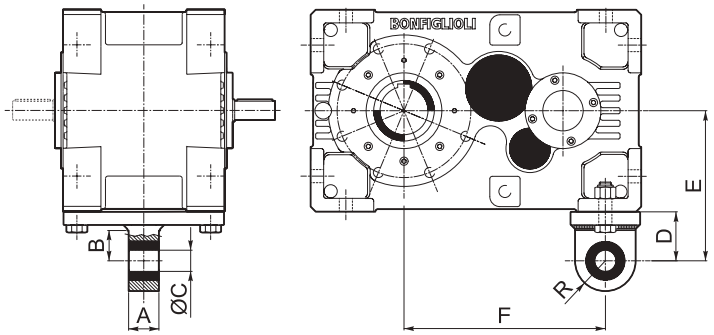
			LR	DR	LD	DD	LL	DL
HDP 60 ... HDP 180		LP	VP GR	VP GR	VP GR GL	VP GR GL	AD	AD
		H	VP GR	⛔	VP GR GL	⛔	AD	⛔
		S	VP GR	⛔	VP GR GL	⛔	AD	⛔

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

⛔ DW	HDP 60	HDP 70	HDP 80	HDP 90	HDP 100	HDP 110	HDP 120	HDP 125	HDP 130	HDP 140	HDP 150	HDP 160	HDP 170	HDP 180
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	—	20.1 22.4 65.8 73.3 98.9 110.1	BONFIGLIOLI TECHNICAL SERVICE									

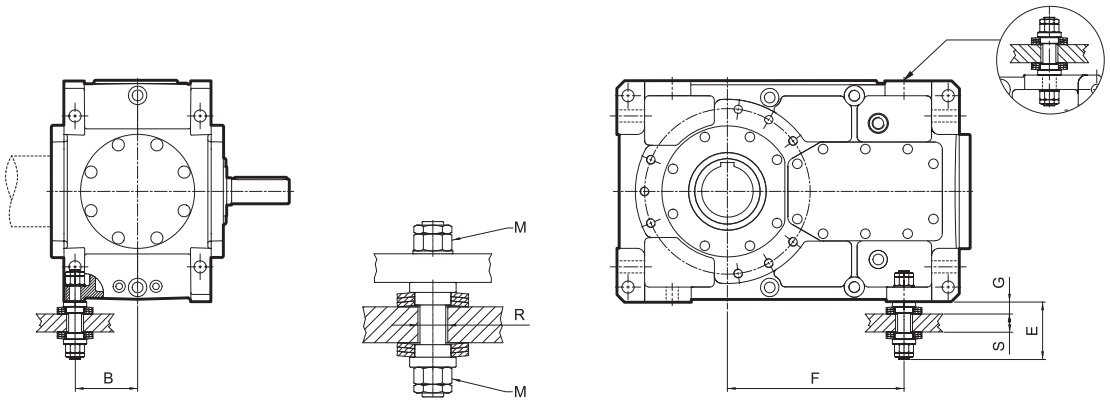
15.6.8 FIXING ELEMENTS

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

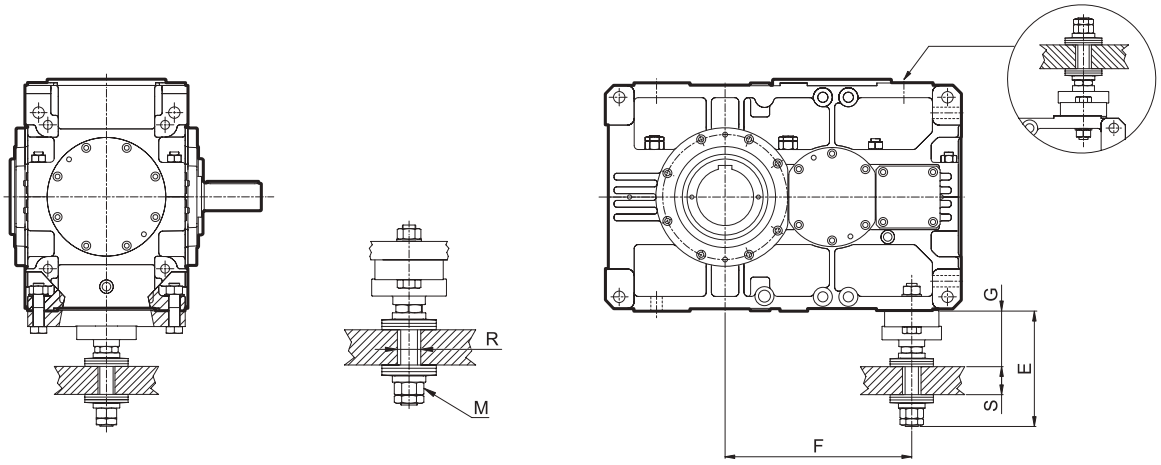


	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	R [mm]
HDP 60_ TA	40	47	32	76	251	340	47
HDP 70_ TA	40	47	32	76	251	375	47
HDP 80_ TA	60	60	42	97	297	400	60
HDP 90_ TA	60	68	42	113	338	460	68

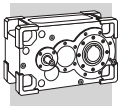
To perform the same function, gearboxes HDP 100 and larger can be supplied with a hardened steel bolt to secure the units to the machine framwork.
Vibration damping cup springs are also supplied within the kit. The customer must adjust the preload of these springs during installation, respecting the value G given in the chart below.
The reaction bolt must be fitted on the side of the gearbox next to the driven machine and in the farthest hole from output shaft centre (see dimension F in the following figure).
Fitting the bolt on same side as the inspection cover is not possible. In this case please contact Bonfiglioli Technical Service for advise.



	F [mm]	B [mm]	E [mm]	G [mm] Rated value	M	R [mm]	S [mm]	DIN2093
HDP 100 2_TA	420	160	153	33.4	M27	35	30 - 40	A100
HDP 100 3_TA **HDP 100 4_TA**	540							
HDP 110 2_TA	435	160	153	33.4	M27	35	30 - 40	A100
HDP 110 3_TA **HDP 110 4_TA**	555							
HDP 120 2_TA	480	170	166	33.4	M30	40	40 - 50	A100
HDP 120 3_TA **HDP 120 4_TA**	630							
HDP 125 2_TA	530	170	166	33.4	M30	40	40 - 50	A100
HDP 125 3_TA **HDP 125 4_TA**	680							
HDP 130 2_TA	585	216	205	42.7	M36	45	50 - 60	A125
HDP 130 3_TA **HDP 130 4_TA**	780							
HDP 140 2_TA	625	216	205	42.7	M36	45	50 - 60	A125
HDP 140 3_TA **HDP 140 4_TA**	790							



	F [mm]	E [mm]	G [mm] Rated value	M	R [mm]	S [mm]	DIN2093
HDP 150 2_TA	687.5	405	204.3	M48x2	52	70 - 80	A160
HDP 150 3_TA **HDP 150 4_TA**	877.5						
HDP 160 2_TA	727.5	405	204.3	M48x2	52	70 - 80	A160
HDP 160 3_TA **HDP 160 4_TA**	927.5						
HDP 170	BONFIGLIOLI TECHNICAL SERVICE						
HDP 180							



15.6.9 SURFACE PROTECTION

HDP 60 ... 90

When no specific protection class is requested, the painted (ferrous) surfaces of gearboxes are protected to at least corrosivity class C2 (UNI EN ISO 12944-2). For improved resistance to atmospheric corrosion, gearboxes can be delivered with C3 and C4 surface protection, obtained by painting the complete gearbox.

HDP 100 ... 180

When no specific protection class is requested, the painted surfaces of gearboxes are protected to at least corrosivity class C3 (UNI EN ISO 12944-2). For improved resistance to atmospheric corrosion, gearboxes can be delivered with C4 surface protection, obtained by painting the complete gearbox.

SURFACE PROTECTION	Typical environments	Maximum surface temperature	Corrosivity class according to UNI EN ISO 12944-2
C3	Urban and industrial environments with up to 100% relative humidity (medium air pollution)	120°C	C3
C4	Industrial areas, coastal areas, chemical plant, with up to 100% relative humidity (high air pollution)	120°C	C4

Gearboxes with optional protection to class C3 or C4 are available in a choice of colours.
If no specific colour is requested (see the “PAINTING” option) gearboxes are finished in RAL 7042.
Gearboxes can also be supplied with surface protection for corrosivity class C5 according to UNI EN ISO 12944-2. Contact our Technical Service for further details.

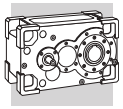
15.6.10 PAINTING

Gearboxes with optional protection to class C3 or C4 are available in the colours listed in the following table.

PAINTING	Colour	RAL number
RAL7042*	Traffik Grey A	7042
RAL5010	Gentian Blue	5010
RAL9005	Jet Black	9005
RAL9006	White Aluminium	9006
RAL9010	Pure White	9010
RAL7035	Light Grey	7035
RAL7001	Silver Grey	7001
RAL5015	Sky Blue	5015
RAL7037	Dusty Grey	7037
RAL5024	Pastel Blue	5024

* Gearboxes are supplied in this standard colour if no other colour is specified.

NOTE - “PAINTING” options can only be specified in conjunction with “SURFACE PROTECTION” options.



15.6.11 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.

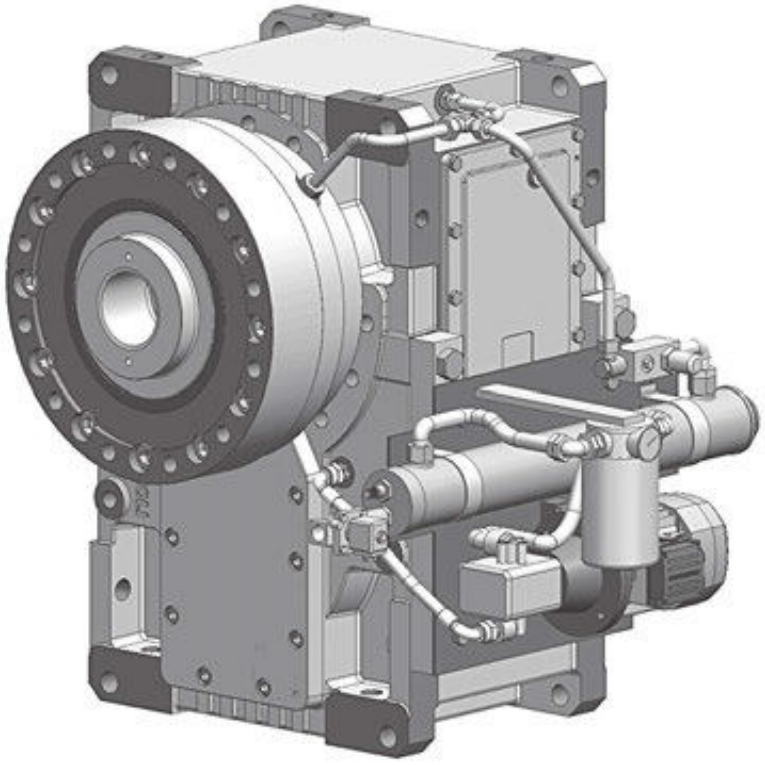
15.7 EXECUTION FOR EXTRUDER

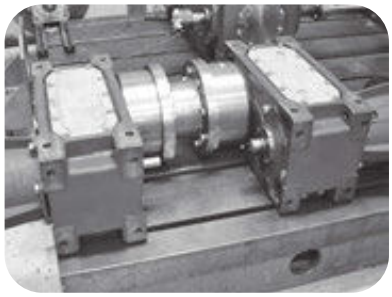
The HDPE series is the configuration specifically developed for **single-screw extruder drive** generated from the renown heavy duty series HDP, with which it shares most of the component parts and gearing.
Mounted forward to the sturdy nodular cast iron case, and housed into a robust extruder support, HDPE units feature a heavy duty spherical roller thrust bearing of series 294…E, exclusively sourced from primary brands.

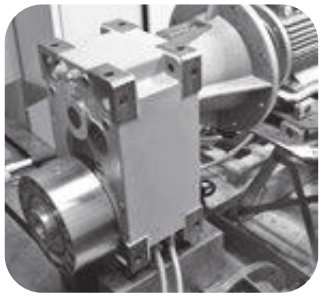
Design features

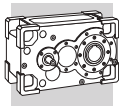
- Spheroidal graphite cast iron casing with universal mounting options
- Thrust bearing optimised for each application
- Radial roller bearings on the output shaft
- Customisable extruder screw/cylinder interface dimensions
- External cooling and forced lubrication units
- Lubrication shared between gearbox casing and screw box
- Fluoro elastomer compound seal rings

For more information see HDPE catalog.





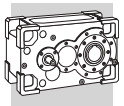




16 REFERENCE TORQUE

The torque values given in the table are influenced by the following elements: gear teeth, shafts and couplings. Performance may therefore vary with application conditions (see the “Thermal Capacity and Rating Charts”).

HDP															
		Mn_{2REF} [Nm]													
	i_N	HDP 60	HDP 70	HDP 80	HDP 90	HDP 100	HDP 110	HDP 120	HDP 125	HDP 130	HDP 140	HDP 150	HDP 160	HDP 170	HDP 180
2x	7.1	5.190	—	—	—	24.400	—	—		68.800	—	—	—	—	—
	8.0	4.720	6.200	10.350	14.000	24.710	26.080	36.820		65.830	86.990	113.880	—	150.450	—
	9.0	5.190	7.080	12.050	15.600	24.840	27.420	38.290	42.100	68.360	86.040	116.900	129.320	174.600	167.150
	10.0	4.720	6.750	11.350	17.700	24.740	26.540	37.550	43.940	65.410	86.990	112.740	150.940	189.150	193.450
	11.2	5.190	7.080	12.350	17.120	25.230	27.880	39.010	42.910	67.690	85.490	123.320	144.620	188.900	207.610
	12.5	4.720	6.750	11.500	17.700	24.740	26.940	38.140	44.300	64.770	86.990	115.490	142.390	197.670	209.900
	14.0	5.190	7.080	12.500	17.120	25.620	28.270	39.590	43.590	67.180	84.660	111.370	151.130	188.150	215.480
	16.0	4.720	6.750	11.750	17.000	24.570	27.330	38.580	44.980	64.290	86.990	123.610	142.840	188.900	204.880
	18.0	5.190	7.080	11.950	17.120	25.890	28.660	40.030	44.090	66.730	84.030	114.210	142.390	195.560	209.900
	20.0	4.720	6.750	11.900	17.700	24.410	27.660	39.000	45.480	63.860	86.990	110.150	149.410	186.170	213.180
	22.4	—	7.080	12.600	17.120	22.790	28.990	39.780	44.580	64.070	83.480	—	141.240	—	202.720
	25.0	—	—	—	—	—	26.960	36.630	45.950	—	82.230	—	—	—	—
3x	22.4	5.190	—	—	—	26.130	—	—		66.280	—	113.760	—	183.920	—
	25.0	4.720	6.750	9.900	17.900	24.260	30.360	40.090		63.450	77.440	113.030	129.180	190.190	204.380
	28.0	5.190	7.080	11.500	17.120	25.990	29.680	39.550	45.940	65.790	82.930	109.030	146.300	182.320	202.450
	31.5	4.720	6.750	11.650	17.900	24.140	30.740	40.810	47.450	62.990	84.810	117.200	139.790	188.900	200.130
	35.5	5.190	7.080	12.600	17.120	25.860	29.540	39.330	46.680	65.430	82.330	112.010	143.440	190.190	209.900
	40.0	4.720	6.750	12.600	17.900	24.030	31.130	40.620	48.180	62.650	84.810	108.070	146.300	182.210	202.450
	45.0	5.190	7.080	12.600	17.120	25.740	29.400	39.150	47.230	65.120	81.890	117.200	138.540	183.920	198.410
	50.0	4.720	6.750	11.950	17.900	23.920	31.100	40.410	48.720	62.360	82.170	111.000	138.770	189.610	204.380
	56.0	5.190	7.080	12.600	17.120	25.650	29.270	38.960	47.750	64.780	81.510	107.110	145.150	180.610	202.450
	63.0	4.720	6.750	12.600	17.900	23.830	30.740	40.250	49.240	62.050	84.810	117.200	137.300	188.900	196.680
	71.0	5.190	7.080	12.600	17.120	25.880	29.160	38.800	46.680	65.650	81.100	110.230	143.440	188.320	209.900
	80.0	4.720	6.750	12.000	17.900	24.050	31.130	40.600	48.180	62.890	84.810	106.390	144.140	179.410	202.450
	90.0	5.190	7.080	12.600	17.120	26.850	29.430	39.160	47.230	67.750	82.200	—	136.370	—	195.370
	100.0	4.720	6.750	12.600	17.900	24.880	31.350	41.250	48.720	64.910	82.170	—	—	—	—
	112.0	—	7.080	12.600	17.120	23.340	30.550	40.740	47.750	63.140	84.850	—	—	—	—
	125.0	—	—	—	—	—	27.630	37.570	49.240	—	78.870	—	—	—	—
4x	90.0	—	—	—	—	—	—	—		—	—	116.800	—	183.920	—
	100.0	—	—	—	—	—	—	—		—	—	116.060	132.640	190.190	204.380
	112.0	—	—	—	—	27.790	—	—		69.570	—	112.070	146.300	182.320	202.450
	125.0	—	—	—	—	24.880	31.350	41.250		66.770	—	117.200	143.630	188.900	205.480
	140.0	—	—	—	—	28.210	31.630	40.920	46.680	69.570	87.060	117.090	142.380	190.190	209.900
	160.0	—	—	—	—	24.880	31.790	41.250	48.180	66.770	84.860	114.780	146.300	182.320	202.450
	180.0	—	—	—	—	28.210	31.570	40.920	46.680	69.570	87.060	116.800	147.070	183.920	207.020
	200.0	—	—	—	—	24.880	31.570	41.250	48.180	66.770	81.580	117.090	132.640	190.190	204.380
	224.0	—	—	—	—	28.210	31.790	40.920	47.230	69.570	87.060	114.780	146.300	182.320	202.450
	250.0	—	—	—	—	24.880	31.350	41.250	49.240	66.770	81.230	117.200	147.070	188.900	205.480
	280.0	—	—	—	—	28.210	31.790	40.920	47.750	69.570	87.060	117.090	140.530	190.190	209.900
	315.0	—	—	—	—	25.110	31.570	41.250	48.180	66.770	84.860	114.780	146.300	182.320	202.450
	355.0	—	—	—	—	28.210	31.790	40.920	47.230	69.570	87.060	—	147.070	—	207.020
	400.0	—	—	—	—	25.410	31.570	41.250	48.180	66.770	84.860	—	—	—	—
	450.0	—	—	—	—	28.210	31.790	40.920	47.230	66.770	87.060	—	—	—	—
	500.0	—	—	—	—	25.410	31.570	41.250	49.240	63.140	82.170	—	—	—	—



HDP 60 — n_1 = 1500 min ^{1}

	i	n_2 [min ^{1}]	Mn_2 [Nm]	Pn_1 [kW]	t_a = 20°C			t_a = 40°C		
					P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TSR} [kW]	P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TSR} [kW]
HDP 60 2	**7.1**	210	4570	105	57	74	89	*	50	69
HDP 60 2	**8.0**	187	4630	94	57	74	89	*	50	69
HDP 60 2	**9.0**	167	4900	89	57	74	89	37	50	69
HDP 60 2	**10.1**	149	4720	77	61	78	93	41	54	73
HDP 60 2	**11.2**	134	5190	76	61	78	93	41	54	73
HDP 60 2	**12.5**	120	4720	62	—	—	—	44	57	76
HDP 60 2	**13.5**	111	5190	63	—	—	—	44	57	76
HDP 60 2	**15.2**	99	4720	51	—	—	—	46	59	78
HDP 60 2	**17.3**	87	5190	49	—	—	—	46	59	78
HDP 60 2	**19.4**	77	4720	40	—	—	—	—	—	—
HDP 60 3	**22.7**	66	4740	35	—	—	—	28	37	46
HDP 60 3	**25.5**	59	4720	31	—	—	—	28	37	46
HDP 60 3	**28.2**	53	5190	31	—	—	—	28	37	46
HDP 60 3	**31.7**	47	4720	25	—	—	—	—	—	—
HDP 60 3	**34.2**	44	5190	25	—	—	—	—	—	—
HDP 60 3	**38.5**	39	4720	20	—	—	—	—	—	—
HDP 60 3	**43.7**	34	5190	19.8	—	—	—	—	—	—
HDP 60 3	**49.1**	31	4720	16.0	—	—	—	—	—	—
HDP 60 3	**56.6**	26.5	5190	15.3	—	—	—	—	—	—
HDP 60 3	**63.6**	23.6	4720	12.4	—	—	—	—	—	—
HDP 60 3	**68.6**	21.9	5190	12.6	—	—	—	—	—	—
HDP 60 3	**77.1**	19.4	4720	10.2	—	—	—	—	—	—
HDP 60 3	**87.6**	17.1	5190	9.9	—	—	—	—	—	—
HDP 60 3	**98.4**	15.2	4720	8.0	—	—	—	—	—	—

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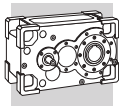
— Thermal verification not necessary

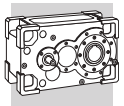


HDP 70 — n_1 = 1500 min^{-1}

	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	t_a = 20°C			t_a = 40°C		
					P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TSR} [kW]	P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TSR} [kW]
HDP 70 2	**8.0**	187	5940	121	60	77	92	*	52	71
HDP 70 2	**9.3**	161	6150	108	60	77	92	*	52	71
HDP 70 2	**10.1**	149	6370	103	64	81	96	43	56	75
HDP 70 2	**11.7**	128	6590	92	64	81	96	43	56	75
HDP 70 2	**12.6**	120	6750	88	67	84	99	46	59	78
HDP 70 2	**14.6**	103	7080	79	67	84	99	46	59	78
HDP 70 2	**15.2**	99	6750	73	70	87	102	49	62	81
HDP 70 2	**17.7**	85	7080	66	—	—	—	49	62	81
HDP 70 2	**19.4**	77	6750	57	—	—	—	51	64	83
HDP 70 2	**22.6**	67	7080	51	—	—	—	51	64	83
HDP 70 3	**25.5**	59	6750	44	42	54	60	28	37	46
HDP 70 3	**29.6**	51	7080	40	—	—	—	28	37	46
HDP 70 3	**31.7**	47	6750	35	—	—	—	29	38	47
HDP 70 3	**36.9**	41	7080	32	—	—	—	29	38	47
HDP 70 3	**38.5**	39	6750	29	—	—	—	—	—	—
HDP 70 3	**44.7**	34	7080	26	—	—	—	—	—	—
HDP 70 3	**49.1**	31	6750	23	—	—	—	—	—	—
HDP 70 3	**57.0**	26.3	7080	21	—	—	—	—	—	—
HDP 70 3	**63.7**	23.6	6750	17.7	—	—	—	—	—	—
HDP 70 3	**73.9**	20.3	7080	16.0	—	—	—	—	—	—
HDP 70 3	**77.2**	19.4	6750	14.6	—	—	—	—	—	—
HDP 70 3	**89.6**	16.7	7080	13.2	—	—	—	—	—	—
HDP 70 3	**98.5**	15.2	6750	11.4	—	—	—	—	—	—
HDP 70 3	**114.4**	13.1	7080	10.3	—	—	—	—	—	—

* BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

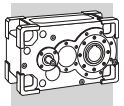


HDP 80 — n_1 = 1500 min^{-1}

					t_a = 20°C			t_a = 40°C		
	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	P_T [kW]	$P_{TFANL/R}$ [kW]	P_{TSR} [kW]	P_T [kW]	$P_{TFANL/R}$ [kW]	P_{TSR} [kW]
HDP 80 2	**8.1**	186	10350	210	92	120	133	*	85	105
HDP 80 2	**9.4**	160	10730	187	92	120	133	*	85	105
HDP 80 2	**9.8**	152	11060	184	94	122	135	*	88	108
HDP 80 2	**11.4**	131	11500	165	94	122	135	67	88	108
HDP 80 2	**12.6**	119	11500	149	96	124	137	69	90	110
HDP 80 2	**14.6**	103	12420	139	96	124	137	69	90	110
HDP 80 2	**15.5**	97	11750	124	97	125	138	70	91	111
HDP 80 2	**18.0**	83	11950	109	97	125	138	70	91	111
HDP 80 2	**19.4**	77	11900	100	99	127	140	71	92	112
HDP 80 2	**22.6**	66	12600	91	—	—	—	71	92	112
HDP 80 3	**25.8**	58	9900	64	59	79	87	40	54	68
HDP 80 3	**30.0**	50	11500	64	59	79	87	40	54	68
HDP 80 3	**31.7**	47	11650	61	60	80	88	42	56	70
HDP 80 3	**36.8**	41	12600	57	—	—	—	42	56	70
HDP 80 3	**39.8**	38	12600	53	—	—	—	43	57	71
HDP 80 3	**46.2**	32	12600	45	—	—	—	43	57	71
HDP 80 3	**51.6**	29.1	11950	39	—	—	—	—	—	—
HDP 80 3	**59.9**	25.0	12600	35	—	—	—	—	—	—
HDP 80 3	**64.8**	23.1	12600	32	—	—	—	—	—	—
HDP 80 3	**75.2**	19.9	12600	28	—	—	—	—	—	—
HDP 80 3	**76.4**	19.6	12000	26	—	—	—	—	—	—
HDP 80 3	**88.7**	16.9	12600	24	—	—	—	—	—	—
HDP 80 3	**95.9**	15.6	12600	22	—	—	—	—	—	—
HDP 80 3	**111.4**	13.5	12600	18.9	—	—	—	—	—	—

* BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



HDP 90 — n_1 = 1500 min^{-1}

	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	t_a = 20°C			t_a = 40°C		
					P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TSR} [kW]	P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TSR} [kW]
HDP 90 2	**7.9**	189	13620	281	119	153	167	*	*	131
HDP 90 2	**8.8**	170	14280	265	119	153	167	*	108	131
HDP 90 2	**10.1**	149	14770	240	122	156	170	*	111	134
HDP 90 2	**11.2**	134	15470	226	122	156	170	*	111	134
HDP 90 2	**12.2**	123	15640	209	125	159	173	89	114	137
HDP 90 2	**13.6**	110	16460	198	125	159	173	89	114	137
HDP 90 2	**15.8**	95	16730	173	127	161	175	91	116	139
HDP 90 2	**17.6**	85	17120	159	127	161	175	91	116	139
HDP 90 2	**20.1**	75	17700	144	128	162	176	92	117	140
HDP 90 2	**22.4**	67	17120	125	—	—	—	92	117	140
HDP 90 3	**25.4**	59	17000	112	76	99	98	51	68	73
HDP 90 3	**28.3**	53	17120	101	76	99	98	51	68	73
HDP 90 3	**32.9**	46	17900	91	78	101	100	53	70	75
HDP 90 3	**36.6**	41	17120	78	78	101	100	53	70	75
HDP 90 3	**40.0**	37	17600	73	—	—	—	55	72	77
HDP 90 3	**44.6**	34	17120	64	—	—	—	55	72	77
HDP 90 3	**51.8**	29.0	17900	58	—	—	—	56	73	78
HDP 90 3	**57.7**	26.0	17120	50	—	—	—	—	—	—
HDP 90 3	**65.8**	22.8	17900	45	—	—	—	—	—	—
HDP 90 3	**73.3**	20.5	17120	39	—	—	—	—	—	—
HDP 90 3	**77.8**	19.3	17900	38	—	—	—	—	—	—
HDP 90 3	**86.6**	17.3	17120	33	—	—	—	—	—	—
HDP 90 3	**98.9**	15.2	17900	30	—	—	—	—	—	—
HDP 90 3	**110.1**	13.6	17120	26	—	—	—	—	—	—

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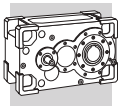
— Thermal verification not necessary



HDP 100 — n_1 = 1500 min^{-1}

	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	t_a = 20°C							
					P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TFANLR} [kW]	P_{TMCRA5} [kW]	P_{TMCRA9} [kW]	P_{TSR} [kW]	P_{TMCRW5} [kW]	P_{TMCRW9} [kW]
HDP 100 2	**7.4**	203	21450	474	*	*	229	283	361	196	224	318
HDP 100 2	**8.2**	182	24040	478	*	*	231	285	363	198	226	320
HDP 100 2	**9.1**	165	22560	405	*	200	240	294	372	207	235	329
HDP 100 2	**10.1**	148	24740	400	*	202	242	296	374	209	237	331
HDP 100 2	**11.3**	133	23790	346	*	210	250	304	382	217	245	339
HDP 100 2	**12.5**	120	24740	324	130	211	251	305	383	218	246	340
HDP 100 2	**14.2**	106	24880	287	137	218	258	312	—	225	253	347
HDP 100 2	**15.7**	95	24570	255	138	219	259	313	—	226	254	348
HDP 100 2	**18.0**	83	25890	235	143	224	264	318	—	231	259	—
HDP 100 2	**20.0**	75	24410	200	144	225	—	319	—	232	260	—
HDP 100 2	**21.8**	69	22790	171	144	225	—	319	—	232	260	—
HDP 100 3	**22.8**	66	23410	172	106	160	187	233	—	169	190	—
HDP 100 3	**25.3**	59	24260	160	106	160	187	233	—	169	190	—
HDP 100 3	**28.1**	53	24640	146	108	162	—	235	—	171	192	—
HDP 100 3	**31.3**	48	24140	129	108	162	—	235	—	171	192	—
HDP 100 3	**35.4**	42	25740	121	110	164	—	237	—	173	194	—
HDP 100 3	**39.3**	38	24030	102	—	—	—	—	—	—	—	—
HDP 100 3	**45.0**	33	25740	95	—	—	—	—	—	—	—	—
HDP 100 3	**50.0**	30	23920	80	—	—	—	—	—	—	—	—
HDP 100 3	**55.5**	27.0	25650	77	—	—	—	—	—	—	—	—
HDP 100 3	**61.7**	24.3	23830	64	—	—	—	—	—	—	—	—
HDP 100 3	**69.9**	21.5	25880	62	—	—	—	—	—	—	—	—
HDP 100 3	**77.7**	19.3	24050	52	—	—	—	—	—	—	—	—
HDP 100 3	**88.9**	16.9	26850	50	—	—	—	—	—	—	—	—
HDP 100 3	**98.8**	15.2	24880	42	—	—	—	—	—	—	—	—
HDP 100 3	**107.6**	13.9	23340	36	—	—	—	—	—	—	—	—
HDP 100 4	**110.6**	13.6	26300	40	—	—	—	—	—	—	—	—
HDP 100 4	**122.9**	12.2	24880	34	—	—	—	—	—	—	—	—
HDP 100 4	**139.2**	10.8	27540	34	—	—	—	—	—	—	—	—
HDP 100 4	**154.7**	9.7	24880	27	—	—	—	—	—	—	—	—
HDP 100 4	**177.0**	8.5	28210	27	—	—	—	—	—	—	—	—
HDP 100 4	**196.7**	7.6	24880	22	—	—	—	—	—	—	—	—
HDP 100 4	**222.2**	6.8	28210	22	—	—	—	—	—	—	—	—
HDP 100 4	**246.9**	6.1	24880	17.2	—	—	—	—	—	—	—	—
HDP 100 4	**286.4**	5.2	28210	16.8	—	—	—	—	—	—	—	—
HDP 100 4	**318.3**	4.7	25110	13.4	—	—	—	—	—	—	—	—
HDP 100 4	**359.6**	4.2	28210	13.4	—	—	—	—	—	—	—	—
HDP 100 4	**399.5**	3.8	25410	10.8	—	—	—	—	—	—	—	—
HDP 100 4	**457.1**	3.3	28210	10.5	—	—	—	—	—	—	—	—
HDP 100 4	**507.9**	3.0	25410	8.5	—	—	—	—	—	—	—	—

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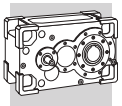

HDP 110 — n_1 = 1500 min^{-1}

	i	n_2	Mn_2	Pn_1	t_a = 20°C							
		[min^{-1}]	[Nm]	[kW]	P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TFANLR} [kW]	P_{TMCRA5} [kW]	P_{TMCRA9} [kW]	P_{TSR} [kW]	P_{TMCRW5} [kW]	P_{TMCRW9} [kW]
HDP 110 2	**8.1**	186	24740	500	*	*	244	280	358	*	221	315
HDP 110 2	**9.0**	167	26170	478	*	200	246	282	360	195	223	317
HDP 110 2	**9.9**	151	26010	428	*	210	256	292	370	205	233	327
HDP 110 2	**11.0**	136	27880	414	*	212	258	294	372	207	235	329
HDP 110 2	**12.3**	122	26940	358	*	220	266	302	380	215	243	337
HDP 110 2	**13.6**	110	28270	340	*	221	267	303	381	216	244	338
HDP 110 2	**15.5**	97	27330	289	135	228	274	310	—	223	251	345
HDP 110 2	**17.1**	88	28660	273	136	229	275	311	—	224	252	346
HDP 110 2	**19.7**	76	27660	230	142	235	—	317	—	230	258	—
HDP 110 2	**21.8**	69	28990	218	142	235	—	317	—	230	258	—
HDP 110 2	**25.0**	60	26960	176	143	236	—	318	—	231	259	—
HDP 110 3	**24.9**	60	26870	180	105	198	—	280	—	193	221	—
HDP 110 3	**27.6**	54	28010	170	105	198	—	280	—	193	221	—
HDP 110 3	**30.7**	49	28750	156	107	200	—	282	—	195	223	—
HDP 110 3	**34.0**	44	29540	145	108	201	—	283	—	196	224	—
HDP 110 3	**38.7**	39	30000	129	109	202	—	284	—	197	225	—
HDP 110 3	**42.8**	35	29400	115	109	202	—	284	—	197	225	—
HDP 110 3	**49.2**	31	31100	106	—	—	—	—	—	—	—	—
HDP 110 3	**54.5**	27.5	29270	90	—	—	—	—	—	—	—	—
HDP 110 3	**60.7**	24.7	30740	85	—	—	—	—	—	—	—	—
HDP 110 3	**67.2**	22.3	29160	72	—	—	—	—	—	—	—	—
HDP 110 3	**76.4**	19.6	31130	68	—	—	—	—	—	—	—	—
HDP 110 3	**84.6**	17.7	29430	58	—	—	—	—	—	—	—	—
HDP 110 3	**97.1**	15.4	31120	53	—	—	—	—	—	—	—	—
HDP 110 3	**107.6**	13.9	30550	47	—	—	—	—	—	—	—	—
HDP 110 3	**123.4**	12.2	27630	37	—	—	—	—	—	—	—	—
HDP 110 4	**120.9**	12.4	30410	43	—	—	—	—	—	—	—	—
HDP 110 4	**133.9**	11.2	31630	40	—	—	—	—	—	—	—	—
HDP 110 4	**168.5**	8.9	31790	32	—	—	—	—	—	—	—	—
HDP 110 4	**191.0**	7.9	31570	28	—	—	—	—	—	—	—	—
HDP 110 4	**193.4**	7.8	31570	28	—	—	—	—	—	—	—	—
HDP 110 4	**214.2**	7.0	31790	25	—	—	—	—	—	—	—	—
HDP 110 4	**248.6**	6.0	31350	21	—	—	—	—	—	—	—	—
HDP 110 4	**275.4**	5.4	31790	19.7	—	—	—	—	—	—	—	—
HDP 110 4	**313.0**	4.8	31570	17.2	—	—	—	—	—	—	—	—
HDP 110 4	**346.7**	4.3	31790	15.6	—	—	—	—	—	—	—	—
HDP 110 4	**392.9**	3.8	31570	13.7	—	—	—	—	—	—	—	—
HDP 110 4	**440.7**	3.4	31790	12.3	—	—	—	—	—	—	—	—
HDP 110 4	**499.4**	3.0	31570	10.8	—	—	—	—	—	—	—	—

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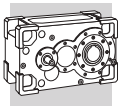

HDP 120 — n_1 = 1500 min^{-1}

	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	t_a = 20°C							
					P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TFANLR} [kW]	P_{TMCRA5} [kW]	P_{TMCRA9} [kW]	P_{TSR} [kW]	P_{TMCRW5} [kW]	P_{TMCRW9} [kW]
HDP 120 2	**7.9**	190	32940	681	*	*	*	291	369	*	*	326
HDP 120 2	**8.6**	174	33560	637	*	*	255	294	372	*	*	329
HDP 120 2	**10.3**	146	35710	567	*	231	275	314	392	*	255	349
HDP 120 2	**11.2**	134	36370	530	*	232	276	315	393	228	256	350
HDP 120 2	**13.0**	115	37080	466	*	245	289	328	406	241	269	363
HDP 120 2	**14.2**	106	37840	437	*	247	291	330	408	243	271	365
HDP 120 2	**16.0**	94	38580	395	163	255	299	338	416	251	279	373
HDP 120 2	**17.4**	86	39810	374	164	256	300	339	417	252	280	374
HDP 120 2	**20.6**	73	39000	309	173	265	309	348	—	261	289	383
HDP 120 2	**22.5**	67	39780	290	174	266	310	349	—	262	290	384
HDP 120 2	**25.4**	59	36630	236	175	267	—	350	—	263	291	—
HDP 120 3	**25.8**	58	36330	235	130	194	226	257	—	193	214	282
HDP 120 3	**28.0**	53	37110	221	131	195	227	258	—	194	215	283
HDP 120 3	**32.5**	46	38040	195	133	197	—	260	—	196	217	—
HDP 120 3	**35.4**	42	38620	182	134	198	—	261	—	197	218	—
HDP 120 3	**39.9**	38	39930	167	136	200	—	263	—	199	220	—
HDP 120 3	**43.5**	34	39150	150	136	200	—	263	—	199	220	—
HDP 120 3	**51.6**	29.1	40410	131	—	—	—	—	—	—	—	—
HDP 120 3	**56.1**	26.7	38960	116	—	—	—	—	—	—	—	—
HDP 120 3	**64.3**	23.3	40250	105	—	—	—	—	—	—	—	—
HDP 120 3	**70.0**	21.4	38800	93	—	—	—	—	—	—	—	—
HDP 120 3	**78.9**	19.0	40600	86	—	—	—	—	—	—	—	—
HDP 120 3	**85.9**	17.5	39160	76	—	—	—	—	—	—	—	—
HDP 120 3	**101.8**	14.7	41250	68	—	—	—	—	—	—	—	—
HDP 120 3	**110.9**	13.5	40740	61	—	—	—	—	—	—	—	—
HDP 120 3	**125.2**	12.0	37570	50	—	—	—	—	—	—	—	—
HDP 120 4	**128.0**	11.7	38110	51	—	—	—	—	—	—	—	—
HDP 120 4	**139.4**	10.8	40920	50	—	—	—	—	—	—	—	—
HDP 120 4	**157.1**	9.5	39600	43	—	—	—	—	—	—	—	—
HDP 120 4	**171.1**	8.8	40920	41	—	—	—	—	—	—	—	—
HDP 120 4	**202.8**	7.4	41250	35	—	—	—	—	—	—	—	—
HDP 120 4	**220.8**	6.8	40920	32	—	—	—	—	—	—	—	—
HDP 120 4	**254.6**	5.9	41250	28	—	—	—	—	—	—	—	—
HDP 120 4	**277.2**	5.4	40920	25	—	—	—	—	—	—	—	—
HDP 120 4	**323.2**	4.6	41250	22	—	—	—	—	—	—	—	—
HDP 120 4	**351.9**	4.3	40920	19.8	—	—	—	—	—	—	—	—
HDP 120 4	**405.7**	3.7	41250	17.3	—	—	—	—	—	—	—	—
HDP 120 4	**454.3**	3.3	40920	15.3	—	—	—	—	—	—	—	—
HDP 120 4	**523.7**	2.9	41250	13.4	—	—	—	—	—	—	—	—

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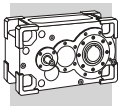

HDP 125 — n_1 = 1500 min^{-1}

	i	n_2	Mn_2	Pn_1	t_a = 20°C							
		[min^{-1}]	[Nm]	[kW]	P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TFANLR} [kW]	P_{TMCRA5} [kW]	P_{TMCRA9} [kW]	P_{TSR} [kW]	P_{TMCRW5} [kW]	P_{TMCRW9} [kW]
HDP 125 2	**8.9**	168	40210	737	*	*	*	308	386	*	*	343
HDP 125 2	**9.6**	156	40830	696	*	*	294	333	411	*	*	368
HDP 125 2	**11.6**	129	42910	604	*	260	304	343	421	256	284	378
HDP 125 2	**12.5**	120	44240	578	*	274	318	357	435	270	298	392
HDP 125 2	**14.7**	102	43590	486	*	276	320	359	437	272	300	394
HDP 125 2	**15.8**	95	44980	466	193	285	329	368	446	281	309	403
HDP 125 2	**18.0**	83	44090	400	194	286	330	369	447	282	310	404
HDP 125 2	**19.4**	77	45480	383	202	294	338	377	455	290	318	412
HDP 125 2	**23.3**	64	44580	313	203	295	339	378	—	291	319	—
HDP 125 2	**25.0**	60	45950	300	204	296	340	379	—	292	320	—
HDP 125 3	**29.1**	52	40990	235	158	222	254	285	—	221	242	—
HDP 125 3	**31.3**	48	43680	233	160	224	—	287	—	223	244	—
HDP 125 3	**36.7**	41	46030	209	161	225	—	288	—	224	245	—
HDP 125 3	**39.5**	38	46580	197	163	227	—	290	—	226	247	—
HDP 125 3	**45.1**	33	47230	175	163	227	—	290	—	226	247	—
HDP 125 3	**48.5**	31	48720	168	—	—	—	—	—	—	—	—
HDP 125 3	**58.2**	25.8	47750	137	—	—	—	—	—	—	—	—
HDP 125 3	**62.6**	24.0	49240	131	—	—	—	—	—	—	—	—
HDP 125 3	**72.5**	20.7	46680	107	—	—	—	—	—	—	—	—
HDP 125 3	**78.0**	19.2	48180	103	—	—	—	—	—	—	—	—
HDP 125 3	**89.0**	16.9	47230	89	—	—	—	—	—	—	—	—
HDP 125 3	**95.8**	15.7	48720	85	—	—	—	—	—	—	—	—
HDP 125 3	**114.9**	13.1	48230	70	—	—	—	—	—	—	—	—
HDP 125 3	**123.6**	12.1	49240	66	—	—	—	—	—	—	—	—
HDP 125 4	**144.4**	10.4	43000	51	—	—	—	—	—	—	—	—
HDP 125 4	**155.4**	9.7	46280	51	—	—	—	—	—	—	—	—
HDP 125 4	**181.2**	8.3	46680	44	—	—	—	—	—	—	—	—
HDP 125 4	**195.0**	7.7	48180	42	—	—	—	—	—	—	—	—
HDP 125 4	**222.5**	6.7	47230	36	—	—	—	—	—	—	—	—
HDP 125 4	**246.2**	6.1	49240	34	—	—	—	—	—	—	—	—
HDP 125 4	**287.2**	5.2	47750	28	—	—	—	—	—	—	—	—
HDP 125 4	**319.6**	4.7	48180	26	—	—	—	—	—	—	—	—
HDP 125 4	**364.6**	4.1	47230	22	—	—	—	—	—	—	—	—
HDP 125 4	**401.2**	3.7	48180	20	—	—	—	—	—	—	—	—
HDP 125 4	**457.7**	3.3	47230	17.6	—	—	—	—	—	—	—	—
HDP 125 4	**506.5**	3.0	49240	16.6	—	—	—	—	—	—	—	—

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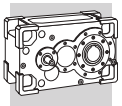
— Thermal verification not necessary



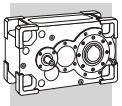
HDP 130

n_1 = 1500 min^{-1}

	i	n_2	Mn_2	Pn_1	t_a = 20°C											
					P_T	$P_{TFANL\ /\ R}$	P_{TFANLR}	P_{TMCRA5}	P_{TMCRA9}	$P_{TMCRA21}$	$P_{TMCRA34}$	P_{TSR}	P_{TMCRW5}	P_{TMCRW9}	$P_{TMCRW21}$	$P_{TMCRW34}$
		[min^{-1}]	[Nm]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
HDP 130 2	**7.3**	207	48400	1090	*	*	*	*	*	663		*	*	*	537	
HDP 130 2	**7.9**	189	51280	1058	*	*	*	*	425	668		*	*	*	542	
HDP 130 2	**8.6**	174	51140	971	*	*	411	*	445	688		*	*	402	562	
HDP 130 2	**9.4**	160	54050	940	*	*	415	*	449	692		*	*	406	566	
HDP 130 2	**11.3**	133	56600	819	*	372	442	398	476	719		330	339	433	593	
HDP 130 2	**12.3**	122	57900	767	*	375	445	401	479	722	⛔	333	342	436	596	⛔
HDP 130 2	**14.1**	106	57810	669	*	391	461	417	495	738		349	358	452	612	
HDP 130 2	**15.4**	97	59300	629	*	393	463	419	497	740		351	360	454	614	
HDP 130 2	**17.4**	86	61990	582	255	404	474	430	508	751		362	371	465	625	
HDP 130 2	**19.0**	79	63860	549	257	406	476	432	510	753		364	373	467	627	
HDP 130 2	**21.7**	69	64070	484	259	408	478	434	512	—		366	375	469	629	
HDP 130 3	**21.8**	69	65950	505	*	296	347	319	376	552	—	294	276	344	460	682
HDP 130 3	**23.8**	63	63450	445	193	297	348	320	377	553	—	295	277	345	461	—
HDP 130 3	**28.6**	52	65790	384	198	302	353	325	382	558	—	300	282	350	466	—
HDP 130 3	**31.2**	48	62990	337	199	303	354	326	383	—	—	301	283	351	—	—
HDP 130 3	**35.7**	42	65430	305	202	306	—	329	—	—	—	304	286	354	—	—
HDP 130 3	**39.0**	38	62650	268	203	307	—	330	—	—	—	305	287	—	—	—
HDP 130 3	**44.1**	34	65120	246	205	309	—	332	—	—	—	307	289	—	—	—
HDP 130 3	**48.1**	31	62360	216	206	310	—	333	—	—	—	308	290	—	—	—
HDP 130 3	**56.5**	26.5	64780	191	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 3	**61.7**	24.3	62050	168	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 3	**70.7**	21.2	65650	155	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 3	**77.1**	19.4	62890	136	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 3	**87.2**	17.2	67750	130	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 3	**95.1**	15.8	64910	114	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 3	**108.3**	13.9	63140	97	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**111.2**	13.5	61600	94	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**121.4**	12.4	66770	94	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**139.0**	10.8	69570	85	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**151.7**	9.9	66770	75	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**176.7**	8.5	69350	67	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**192.9**	7.8	66770	59	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**217.9**	6.9	69570	54	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**237.9**	6.3	66770	48	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**274.5**	5.5	69570	43	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**299.6**	5.0	66770	38	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**348.9**	4.3	69570	34	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**380.9**	3.9	66770	30	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**469.8**	3.2	66770	24	—	—	—	—	—	—	—	—	—	—	—	—
HDP 130 4	**534.5**	2.8	63140	20	—	—	—	—	—	—	—	—	—	—	—	—

* BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

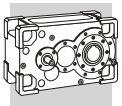


HDP 140 — n_1 = 1500 min^{-1}

					t_a = 20°C											
	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	P_T [kW]	$P_{TFANL\,/\,R}$ [kW]	P_{TFANLR} [kW]	P_{TMCRA5} [kW]	P_{TMCRA9} [kW]	$P_{TMCRA21}$ [kW]	$P_{TMCRA34}$ [kW]	P_{TSR} [kW]	P_{TMCRW5} [kW]	P_{TMCRW9} [kW]	$P_{TMCRW21}$ [kW]	$P_{TMCRW34}$ [kW]
HDP 140 2	**8.4**	179	55710	1090	*	*	*	*	*	667		*	*	*	541	
HDP 140 2	**9.3**	162	61640	1090	*	*	*	*	*	674		*	*	*	548	
HDP 140 2	**9.9**	151	58850	971	*	*	417	*	451	694		*	*	408	568	
HDP 140 2	**11.0**	137	65130	971	*	*	423	*	457	700		*	*	414	574	
HDP 140 2	**13.0**	115	66760	839	*	380	450	406	484	727		338	347	441	601	
HDP 140 2	**14.4**	104	73870	839	*	384	454	410	488	731	⛔	342	351	445	605	⛔
HDP 140 2	**16.3**	92	75910	763	*	400	470	426	504	747		358	367	461	621	
HDP 140 2	**18.0**	83	81780	743	*	403	473	429	507	750		361	370	464	624	
HDP 140 2	**20.1**	75	71350	582	265	414	484	440	518	761		372	381	475	635	
HDP 140 2	**22.2**	68	78950	582	267	416	486	442	520	763		374	383	477	637	
HDP 140 2	**24.9**	60	82230	539	270	419	489	445	523	766		377	386	480	640	
HDP 140 3	**25.1**	60	75910	505	*	303	354	326	383	559	—	301	283	351	467	689
HDP 140 3	**27.7**	54	82930	499	200	304	355	327	384	560	—	302	284	352	468	690
HDP 140 3	**32.9**	46	84810	430	206	310	361	333	390	566	—	308	290	358	474	—
HDP 140 3	**36.4**	41	82330	377	207	311	362	334	391	—	—	309	291	359	475	—
HDP 140 3	**41.1**	36	84810	344	210	314	365	337	394	—	—	312	294	362	—	—
HDP 140 3	**45.5**	33	81890	300	211	315	—	338	—	—	—	313	295	363	—	—
HDP 140 3	**50.7**	29.6	82170	270	214	318	—	341	—	—	—	316	298	—	—	—
HDP 140 3	**56.2**	26.7	81510	242	214	318	—	341	—	—	—	316	298	—	—	—
HDP 140 3	**65.1**	23.1	84810	218	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 3	**72.0**	20.8	81100	188	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 3	**81.3**	18.4	84810	174	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 3	**90.0**	16.7	82200	152	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 3	**100.3**	15.0	82170	137	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 3	**111.0**	13.5	84850	128	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 3	**124.7**	12.0	78870	106	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**141.6**	10.6	78480	94	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**160.0**	9.4	84820	90	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**177.0**	8.5	87060	84	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**197.3**	7.6	81580	70	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**225.0**	6.7	87060	66	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**250.8**	6.0	81230	55	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**277.5**	5.4	87060	53	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**315.9**	4.7	84820	46	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**349.6**	4.3	87060	42	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**401.6**	3.7	84820	36	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**444.4**	3.4	87060	33	—	—	—	—	—	—	—	—	—	—	—	—
HDP 140 4	**495.3**	3.0	82170	28	—	—	—	—	—	—	—	—	—	—	—	—

* BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

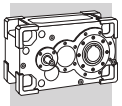


HDP 150 — n_1 = 1500 min^{-1}

					t_a = 20°C												
	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	P_T [kW]	$P_{TFANL\ /\ R}$ [kW]	P_{TFANLR} [kW]	P_{TMCRA5} [kW]	P_{TMCRA9} [kW]	$P_{TMCRA21}$ [kW]	$P_{TMCRA34}$ [kW]	$P_{TMCRA51}$ [kW]	P_{TMCRW5} [kW]	P_{TMCRW9} [kW]	$P_{TMCRW21}$ [kW]	$P_{TMCRW34}$ [kW]	$P_{TMCRW51}$ [kW]
HDP 150 2	**7.9**	190	78630	1627	*	*	*	*	*	685	860	◐	*	*	*	865	◐
HDP 150 2	**9.3**	162	92140	1627	*	*	*	*	*	700	875		*	*	*	880	
HDP 150 2	**10.1**	149	97880	1587	*	*	*	*	*	706	881		*	*	*	886	
HDP 150 2	**11.1**	136	97060	1435	*	*	*	*	*	760	935		*	*	634	940	
HDP 150 2	**13.0**	116	106020	1338	*	*	541	*	*	769	944		*	*	643	949	
HDP 150 2	**14.1**	106	108500	1257	*	*	545	*	530	773	948		*	*	647	953	
HDP 150 2	**15.4**	98	102870	1095	*	498	579	486	564	807	982		*	521	681	987	
HDP 150 2	**18.0**	83	114210	1037	*	504	585	492	570	813	988		433	527	687	993	
HDP 150 2	**19.6**	76	110150	919	*	507	588	495	573	816	991		436	530	690	996	
HDP 150 3	**21.5**	70	92560	718	*	359	415	358	415	591	717	781	315	383	499	721	—
HDP 150 3	**25.2**	60	108460	718	*	362	418	361	418	594	720	—	318	386	502	724	—
HDP 150 3	**27.4**	55	109030	663	*	363	419	362	419	595	721	—	319	387	503	725	—
HDP 150 3	**29.9**	50	117200	654	*	373	429	372	429	605	731	—	329	397	513	735	—
HDP 150 3	**35.0**	43	112010	534	247	375	431	374	431	607	—	—	331	399	515	737	—
HDP 150 3	**38.1**	39	108070	473	247	375	431	374	431	607	—	—	331	399	515	—	—
HDP 150 3	**43.5**	35	117200	450	276	404	460	403	460	—	—	—	360	428	544	—	—
HDP 150 3	**50.9**	29.5	111000	364	278	406	—	405	—	—	—	—	362	430	—	—	—
HDP 150 3	**55.5**	27.0	107110	322	278	406	—	405	—	—	—	—	362	—	—	—	—
HDP 150 3	**60.4**	24.8	117200	324	282	410	—	409	—	—	—	—	366	—	—	—	—
HDP 150 3	**70.8**	21.2	110230	260	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 3	**77.0**	19.5	106390	230	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**89.0**	16.9	116800	224	202	299	—	302	—	—	—	—	268	—	—	—	—
HDP 150 4	**104.3**	14.4	116060	190	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**113.6**	13.2	112070	168	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**123.6**	12.1	117200	161	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**144.9**	10.4	117090	138	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**157.8**	9.5	114780	124	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**170.9**	8.8	116800	116	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**200.3**	7.5	117090	100	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**218.1**	6.9	114780	90	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**237.5**	6.3	117200	84	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**278.3**	5.4	117090	72	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 150 4	**303.1**	4.9	114780	64	—	—	—	—	—	—	—	—	—	—	—	—	—

* BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

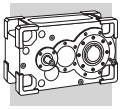


HDP 160 — n_1 = 1500 min^{-1}

					t_a = 20°C												
	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	P_T [kW]	$P_{TFANL\ /\ R}$ [kW]	P_{TFANLR} [kW]	P_{TMCRA5} [kW]	P_{TMCRA9} [kW]	$P_{TMCRA21}$ [kW]	$P_{TMCRA34}$ [kW]	$P_{TMCRA51}$ [kW]	P_{TMCRW5} [kW]	P_{TMCRW9} [kW]	$P_{TMCRW21}$ [kW]	$P_{TMCRW34}$ [kW]	$P_{TMCRW51}$ [kW]
HDP 160 2	**9.0**	167	89290	1627	*	*	*	*	*	693	868	◐	*	*	*	873	◐
HDP 160 2	**10.5**	143	104220	1627	*	*	*	*	*	710	885		*	*	*	890	
HDP 160 2	**11.4**	132	110510	1587	*	*	*	*	*	718	893		*	*	*	898	
HDP 160 2	**12.6**	119	110220	1435	*	*	*	*	*	775	950		*	*	649	955	
HDP 160 2	**14.7**	102	119890	1337	*	*	558	*	543	786	961		*	*	660	966	
HDP 160 2	**15.9**	94	122470	1257	*	*	563	*	548	791	966		*	505	665	971	
HDP 160 2	**17.5**	86	116810	1095	*	517	598	505	583	826	1001		446	540	700	1006	
HDP 160 2	**20.4**	74	133430	1071	*	524	605	512	590	833	1008		453	547	707	1013	
HDP 160 2	**22.1**	68	136230	1006	*	528	609	516	594	837	1012		457	551	711	1017	
HDP 160 3	**24.4**	61	105110	718	*	373	429	372	429	605	731	—	329	397	513	735	—
HDP 160 3	**28.5**	53	122690	718	*	377	433	376	433	609	735	—	333	401	517	739	—
HDP 160 3	**31.0**	48	133350	718	*	378	434	377	434	610	736	—	334	402	518	740	—
HDP 160 3	**33.9**	44	142310	700	*	388	444	387	444	620	746	—	344	412	528	750	—
HDP 160 3	**39.6**	38	146300	616	262	390	446	389	446	622	—	—	346	414	530	752	—
HDP 160 3	**43.1**	35	138540	537	263	391	447	390	447	623	—	—	347	415	531	753	—
HDP 160 3	**49.4**	30	138770	469	293	421	477	420	477	—	—	—	377	445	561	—	—
HDP 160 3	**57.6**	26.0	145150	421	294	422	—	421	—	—	—	—	378	446	—	—	—
HDP 160 3	**62.6**	24.0	137300	366	295	423	—	422	—	—	—	—	379	—	—	—	—
HDP 160 3	**68.6**	21.9	143440	349	299	427	—	426	—	—	—	—	383	—	—	—	—
HDP 160 3	**80.0**	18.7	144140	301	300	428	—	427	—	—	—	—	384	—	—	—	—
HDP 160 3	**87.0**	17.2	136370	262	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**101.1**	14.8	132640	224	215	312	—	315	—	—	—	—	281	—	—	—	—
HDP 160 4	**117.9**	12.7	146300	211	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**128.2**	11.7	143630	191	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**140.4**	10.7	142380	173	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**163.9**	9.2	146300	152	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**178.1**	8.4	147070	141	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**194.1**	7.7	132640	116	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**226.6**	6.6	146300	110	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**246.3**	6.1	147070	102	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**269.7**	5.6	140530	89	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**314.8**	4.8	146300	79	—	—	—	—	—	—	—	—	—	—	—	—	—
HDP 160 4	**342.2**	4.4	147070	73	—	—	—	—	—	—	—	—	—	—	—	—	—

* BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

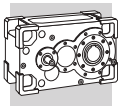


HDP 170 — n_1 = 1500 min^{-1}

	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	t_a = 20°C		t_a = 40°C	
					P_T [kW]	P_{TFAN} [kW]	P_T [kW]	P_{TFAN} [kW]
HDP 170 2	**7.8**	191	133930	2796	*	*	*	*
HDP 170 2	**9.1**	165	140750	2532	*	*	*	*
HDP 170 2	**9.8**	152	143860	2389	*	*	*	*
HDP 170 2	**11.3**	133	144760	2099	*	*	*	*
HDP 170 2	**13.1**	115	159740	1996	*	*	*	*
HDP 170 2	**14.2**	106	163600	1887	*	*	*	*
HDP 170 2	**15.4**	98	157710	1679	*	*	*	*
HDP 170 2	**17.8**	84	165580	1519	*	641	*	*
HDP 170 2	**19.3**	78	169600	1436	*	645	*	*
HDP 170 3	**23.2**	65	151770	1093	*	*	*	*
HDP 170 3	**26.9**	56	176160	1093	*	*	*	*
HDP 170 3	**29.1**	51	182320	1044	*	420	*	*
HDP 170 3	**31.6**	48	177810	940	*	434	*	*
HDP 170 3	**36.7**	41	190190	866	*	436	*	*
HDP 170 3	**39.7**	38	182210	766	*	438	*	*
HDP 170 3	**45.1**	33	183920	680	336	481	*	336
HDP 170 3	**52.4**	28.6	189610	604	338	483	*	338
HDP 170 3	**56.7**	26.4	180610	531	338	483	232	338
HDP 170 3	**61.4**	24.4	188900	513	344	489	238	344
HDP 170 3	**71.3**	21.0	188320	441	346	491	239	345
HDP 170 3	**77.2**	19.4	179410	388	346	491	240	346
HDP 170 4	**92.7**	16.2	183920	338	212	322	*	212
HDP 170 4	**107.6**	13.9	190190	301	213	323	132	213
HDP 170 4	**116.6**	12.9	182320	266	223	333	142	223
HDP 170 4	**126.3**	11.9	188900	255	229	339	149	230
HDP 170 4	**146.6**	10.2	190190	221	—	—	149	230
HDP 170 4	**158.8**	9.4	182320	196	—	—	156	237
HDP 170 4	**177.4**	8.5	183920	177	—	—	176	257
HDP 170 4	**206.0**	7.3	190190	157	—	—	—	—
HDP 170 4	**223.1**	6.7	182320	139	—	—	—	—
HDP 170 4	**241.7**	6.2	188900	133	—	—	—	—
HDP 170 4	**280.5**	5.3	190190	115	—	—	—	—
HDP 170 4	**303.8**	4.9	182320	102	—	—	—	—

* BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



HDP 180								n_1 = 1500 min^{-1}
					t_a = 20°C		t_a = 40°C	
	i	n_2 [min^{-1}]	Mn_2 [Nm]	Pn_1 [kW]	P_T [kW]	P_{TFAN} [kW]	P_T [kW]	P_{TFAN} [kW]
HDP 180 2	**8.7**	172	148810	2796	*	*	*	*
HDP 180 2	**10.1**	149	155960	2533	*	*	*	*
HDP 180 2	**10.9**	138	159170	2390	*	*	*	*
HDP 180 2	**12.5**	120	160840	2099	*	*	*	*
HDP 180 2	**14.5**	103	176950	1996	*	*	*	*
HDP 180 2	**15.7**	96	180960	1887	*	*	*	*
HDP 180 2	**17.1**	88	175290	1680	*	*	*	*
HDP 180 2	**19.8**	76	183470	1519	*	678	*	*
HDP 180 2	**21.4**	70	187640	1437	*	682	*	*
HDP 180 3	**25.8**	58	168630	1093	*	441	*	*
HDP 180 3	**29.8**	50	195130	1093	*	445	*	*
HDP 180 3	**32.2**	47	200130	1036	*	446	*	*
HDP 180 3	**35.1**	43	197560	940	*	459	*	*
HDP 180 3	**40.6**	37	202450	832	*	462	*	*
HDP 180 3	**43.9**	34	198410	754	318	463	*	311
HDP 180 3	**50.1**	29.9	204380	680	361	506	*	354
HDP 180 3	**58.0**	25.9	202450	583	363	508	250	356
HDP 180 3	**62.7**	23.9	196680	523	363	508	251	357
HDP 180 3	**68.3**	22.0	209900	513	369	514	257	363
HDP 180 3	**79.0**	19.0	202450	428	370	515	258	364
HDP 180 3	**85.4**	17.6	195370	382	371	516	258	364
HDP 180 4	**103.0**	14.6	204380	338	231	341	145	226
HDP 180 4	**119.2**	12.6	202450	289	231	341	146	227
HDP 180 4	**128.9**	11.6	205480	271	241	351	155	236
HDP 180 4	**140.3**	10.7	209900	255	248	358	162	243
HDP 180 4	**162.4**	9.2	202450	212	—	—	163	244
HDP 180 4	**175.6**	8.5	207020	201	—	—	170	251
HDP 180 4	**197.2**	7.6	204380	177	—	—	—	—
HDP 180 4	**228.1**	6.6	202450	151	—	—	—	—
HDP 180 4	**246.7**	6.1	205480	142	—	—	—	—
HDP 180 4	**268.5**	5.6	209900	133	—	—	—	—
HDP 180 4	**310.7**	4.8	202450	111	—	—	—	—
HDP 180 4	**336.1**	4.5	207020	105	—	—	—	—

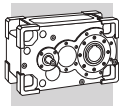
* BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

18 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 . 10^{-4} [kg m^2]													
		HDP 60	HDP 70	HDP 80	HDP 90	HDP 100	HDP 110	HDP 120	HDP 125	HDP 130	HDP 140	HDP 150	HDP 160	HDP 170	HDP 180
2x	7.1	120	—	—	—	1220	—	—	—	5602	—	—	—	BONFIGLIOLI TECHNICAL SERVICE	
	8.0	116	143	335	600	1170	1288	2558	—	5402	6157	12297	—		
	9.0	95	133	314	570	918	1232	2481	2729	4446	5858	11477	13554		
	10.0	92	109	263	440	884	963	1804	2643	4303	4840	11094	12503		
	11.2	68	103	248	421	682	926	1759	1905	3050	4627	7584	12014		
	12.5	67	77	183	324	661	712	1285	1854	2967	3279	7165	8226		
	14.0	54	74	175	311	508	688	1256	1348	1916	3155	6970	7689		
	16.0	53	60	132	226	494	526	1038	1316	1863	2062	4651	7439		
	18.0	33	58	127	219	388	511	1019	1080	1418	1983	4434	4983		
	20.0	33	40	99	171	379	399	717	1059	1383	1514	4332	4705		
	22.4	—	38	95	166	374	390	705	742	1621	1462	—	4576		
	25.0	—	—	—	—	—	378	689	729	—	1401	—	—		
3x	22.4	33	—	—	—	346	—	—	—	1365	—	4112	—		
	25.0	33	36	85	177	341	354	468	—	1343	1427	4002	4282		
	28.0	29	35	83	174	307	348	461	485	1147	1394	3950	4140		
	31.5	29	30	68	156	304	312	382	476	1134	1183	3433	4074		
	35.5	27	30	67	154	279	308	378	393	1031	1163	3375	3521		
	40.0	27	28	67	91	277	282	341	387	1023	1054	3348	3447		
	45.0	24	27	66	90	261	280	338	348	959	1041	1306	3413		
	50.0	24	25	44	82	260	263	296	345	953	974	1278	1347		
	56.0	11	25	44	82	110	262	294	300	414	966	1266	1312		
	63.0	11	12	41	77	109	111	137	298	410	451	1139	1296		
	71.0	11	12	41	77	102	110	136	140	384	446	1125	1161		
	80.0	11	11	21	39	102	103	126	138	382	390	1118	1143		
	90.0	10	11	21	38	97	103	126	128	365	387	—	1134		
	100.0	10	10	20	36	97	98	112	127	364	369	—	—		
	112.0	—	10	20	36	97	97	111	116	374	367	—	—		
	125.0	—	—	—	—	—	97	111	115	—	365	—	—		
4x	90.0	—	—	—	—	—	—	—	—	—	—	510	—		
	100.0	—	—	—	—	—	—	—	—	—	—	503	519		
	112.0	—	—	—	—	46	—	—	—	244	—	500	511		
	125.0	—	—	—	—	46	47	51	—	243	—	470	507		
	140.0	—	—	—	—	45	46	51	52	237	245	466	475		
	160.0	—	—	—	—	44	45	49	52	239	238	465	471		
	180.0	—	—	—	—	43	40	49	45	214	237	184	469		
	200.0	—	—	—	—	43	44	46	45	214	233	182	187		
	224.0	—	—	—	—	39	43	46	43	212	215	181	184		
	250.0	—	—	—	—	39	16	41	43	211	212	173	183		
	280.0	—	—	—	—	16	16	41	41	74	212	172	175		
	315.0	—	—	—	—	16	16	17	18	73	74	172	173		
	355.0	—	—	—	—	15	16	17	17	68	74	—	173		
	400.0	—	—	—	—	15	15	15	16	68	68	—	—		
	450.0	—	—	—	—	14	15	16	16	67	68	—	—		
	500.0	—	—	—	—	14	14	15	16	67	67	—	—		

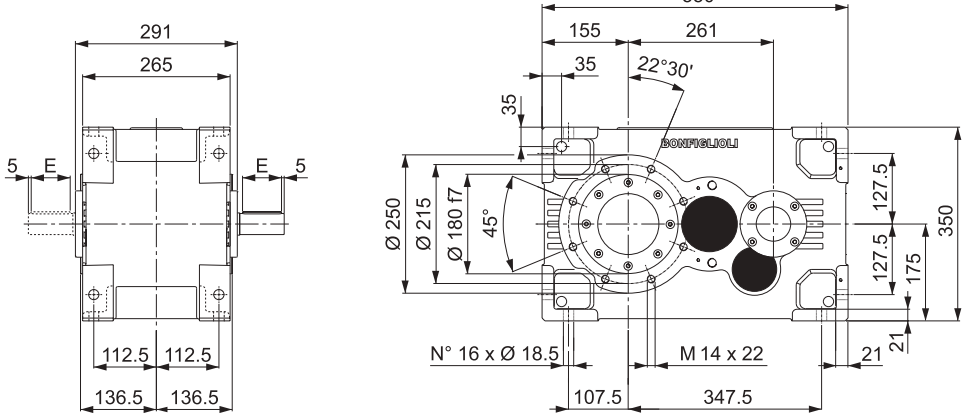


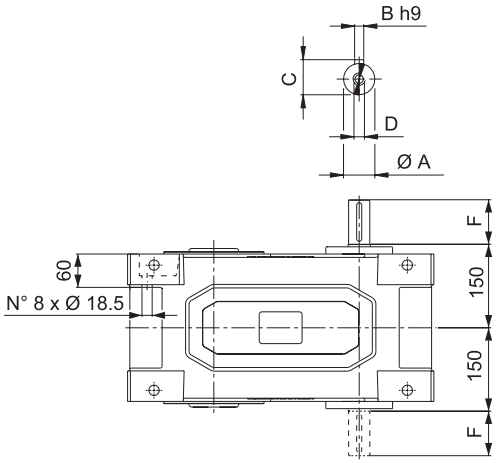
19 EXACT RATIOS

	i_N	i													
		HDP 60	HDP 70	HDP 80	HDP 90	HDP 100	HDP 110	HDP 120	HDP 125	HDP 130	HDP 140	HDP 150	HDP 160	HDP 170	HDP 180
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	7.905	—	7.833	—
	9.0	8.969	9.333	9.361	8.828	9.106	8.956	8.611	8.922	8.613	9.250	9.263	8.977	9.092	8.704
	10.0	10.079	10.090	9.844	10.059	10.118	9.949	10.302	9.601	9.402	9.913	10.087	10.478	9.848	10.071
	11.2	11.156	11.714	11.429	11.200	11.250	11.021	11.219	11.624	11.307	10.969	11.063	11.389	11.278	10.892
	12.5	12.538	12.551	12.600	12.214	12.500	12.292	13.013	12.508	12.343	13.013	12.963	12.563	13.090	12.531
	14.0	13.533	14.571	14.629	13.600	14.160	13.616	14.171	14.682	14.133	14.400	14.116	14.663	14.178	14.500
	16.0	15.209	15.225	15.488	15.807	15.733	15.471	15.976	15.800	15.429	16.267	15.370	15.938	15.361	15.681
	18.0	17.267	17.676	17.981	17.600	18.000	17.138	17.398	18.025	17.431	18.000	18.010	17.454	17.830	17.068
	20.0	19.404	19.425	19.441	20.086	20.000	19.667	20.624	19.397	19.029	20.062	19.612	20.371	19.311	19.750
	22.4	—	22.552	22.571	22.364	21.786	21.786	22.459	23.269	21.652	22.200	—	22.143	—	21.359
	25.0	—	—	—	—	—	25.000	25.357	25.040	—	24.941	—	—	—	—
3x	22.4	22.686	—	—	—	22.765	—	—	—	21.785	—	21.510	—	23.182	—
	25.0	25.494	25.521	25.800	25.406	25.294	24.873	25.756	—	23.781	25.073	25.205	24.427	26.908	25.758
	28.0	28.219	29.630	29.954	28.288	28.125	27.553	28.048	29.059	28.599	27.744	27.448	28.510	29.143	29.806
	31.5	31.713	31.746	31.713	32.878	31.250	30.729	32.533	31.271	31.220	32.916	29.886	30.990	31.576	32.234
	35.5	34.231	36.857	36.818	36.608	35.400	34.040	35.429	36.706	35.749	36.424	35.019	33.938	36.650	35.084
	40.0	38.470	38.510	39.809	40.036	39.333	38.678	39.940	39.500	39.025	41.145	38.135	39.611	39.695	40.597
	45.0	43.675	44.710	46.218	44.578	45.000	42.845	43.495	45.063	44.090	45.529	43.460	43.056	45.111	43.905
	50.0	49.082	49.134	51.625	51.811	50.000	49.167	51.560	48.493	48.131	50.746	50.924	49.353	52.361	50.123
	56.0	56.578	57.044	59.937	57.689	55.547	54.464	56.148	58.172	56.533	56.153	55.456	57.603	56.711	58.000
	63.0	63.583	63.650	64.805	65.837	61.719	60.690	64.253	62.600	61.714	65.067	60.381	62.612	61.444	62.726
	71.0	68.633	73.898	75.238	73.306	69.915	67.229	69.971	72.494	70.667	72.000	70.752	68.568	71.319	68.272
	80.0	77.131	77.213	76.405	77.818	77.683	76.389	78.882	78.013	77.143	81.333	77.048	80.031	77.244	79.000
	90.0	87.567	89.644	88.706	86.646	88.875	84.619	85.902	88.999	87.156	90.000	—	86.990	—	85.437
	100.0	98.408	98.513	95.911	98.884	98.750	97.104	101.830	95.774	95.143	100.311	—	—	—	—
	112.0	—	114.373	111.352	110.102	107.567	107.567	110.892	114.890	108.259	111.000	—	—	—	—
	125.0	—	—	—	—	—	123.438	125.201	123.636	—	124.704	—	—	—	—
4x	90.0	—	—	—	—	—	—	—	—	—	—	88.989	—	92.728	—
	100.0	—	—	—	—	—	—	—	—	—	—	104.273	101.055	107.631	103.032
	112.0	—	—	—	—	110.625	—	—	—	111.182	—	113.553	117.948	116.573	119.222
	125.0	—	—	—	—	122.917	120.868	127.964	—	121.371	—	123.638	128.205	126.302	128.937
	140.0	—	—	—	—	139.240	133.891	139.352	144.376	138.978	141.600	144.873	140.402	146.601	140.336
	160.0	—	—	—	—	154.711	168.525	157.099	155.367	151.714	159.956	157.765	163.872	158.780	162.389
	180.0	—	—	—	—	177.000	190.972	171.080	181.235	176.667	177.000	170.942	178.122	177.437	175.621
	200.0	—	—	—	—	196.667	193.389	202.801	195.031	192.857	197.279	200.301	194.121	205.954	197.152
	225.0	—	—	—	—	222.188	214.226	220.849	222.499	217.889	225.000	218.127	226.571	223.064	228.133
	250.0	—	—	—	—	246.875	248.643	254.575	246.228	237.857	250.778	237.499	246.272	241.681	246.722
	280.0	—	—	—	—	286.437	275.434	277.231	287.226	274.481	277.500	278.290	269.702	280.523	268.535
	315.0	—	—	—	—	318.263	312.958	323.176	319.611	299.636	315.912	303.056	314.787	303.828	310.733
	355.0	—	—	—	—	359.563	346.679	351.936	364.624	348.917	349.575	—	342.160	—	336.052
	400.0	—	—	—	—	399.514	392.856	405.681	401.207	380.893	401.583	—	—	—	—
	450.0	—	—	—	—	457.071	440.694	454.317	457.712	469.768	444.375	—	—	—	—
	500.0	—	—	—	—	507.857	499.393	523.697	506.527	534.530	495.286	—	—	—	—

20 DIMENSIONS AND WEIGHT

HDP 60



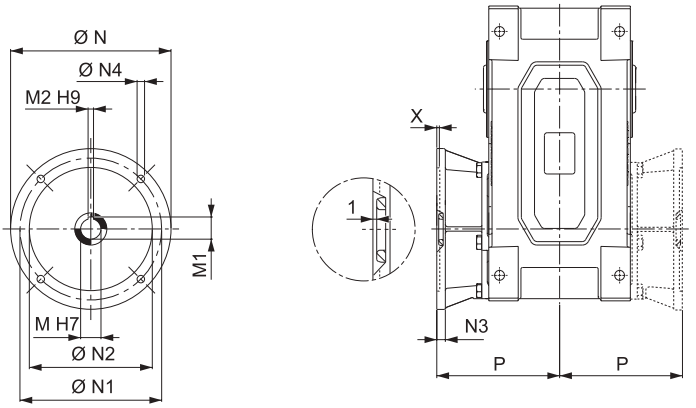


VP

Dimensions are in [mm].

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

AD

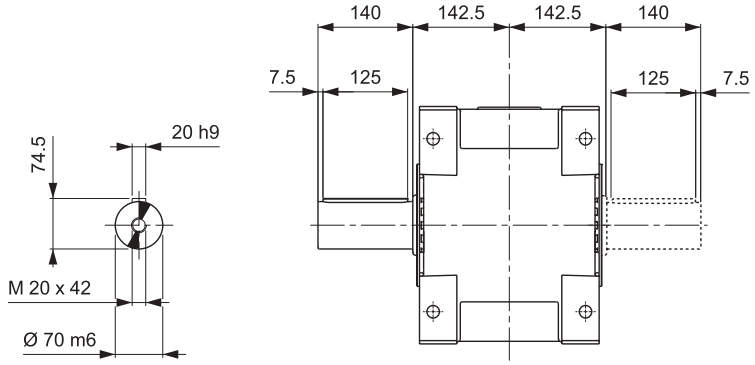


Dimensions are in [mm].

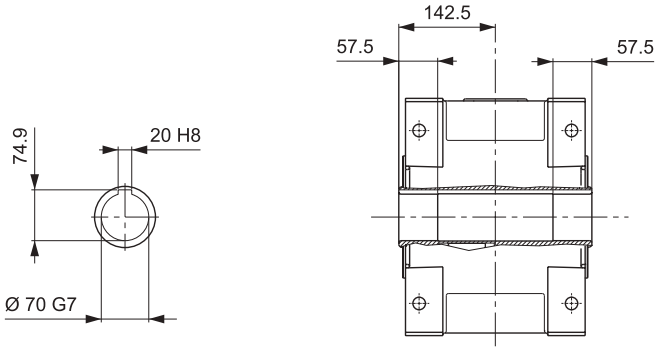
AD	M [mm]	M1 [mm]	M2 [mm]	N [mm]	N1 [mm]	N2 [mm]	N3 [mm]	N4 [mm]	X [mm]	P [mm]
HDP 60 3_ 112	28	31.3	8	250	215	180	15	14	5	220
HDP 60 3_ 132	38	41.3	10	300	265	230	16	14	5	230
HDP 60 3_ 160	42	45.3	12	350	300	250	23	18	6	261
HDP 60 3_ 180	48	51.8	14	350	300	250	23	18	6	261

HDP 60

LP



H



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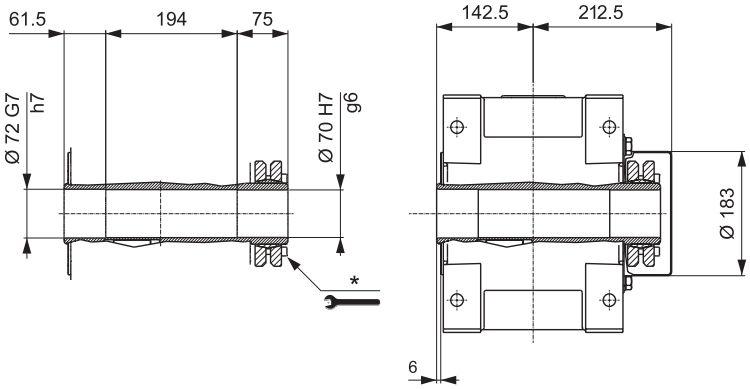
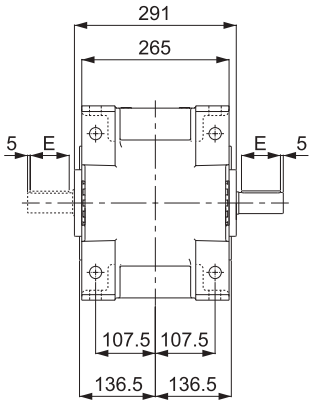
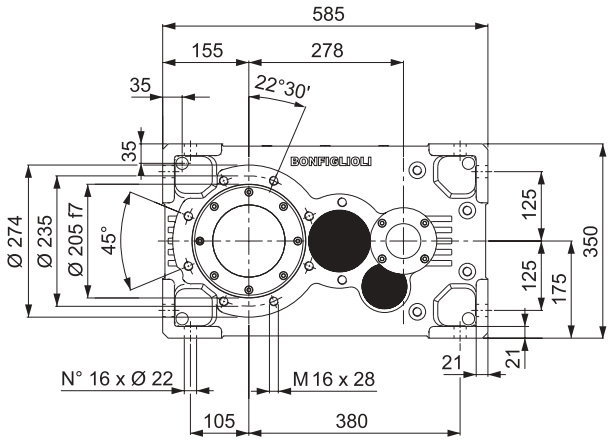


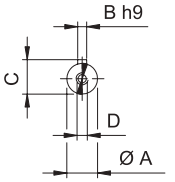
* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

Dimensions are in [mm].

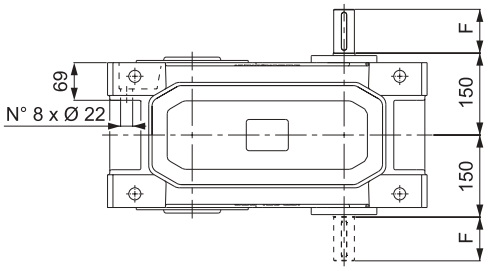
HDP 70







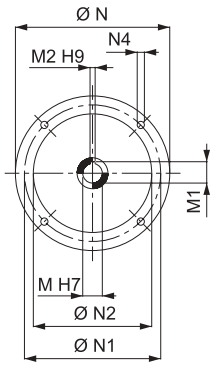
VP

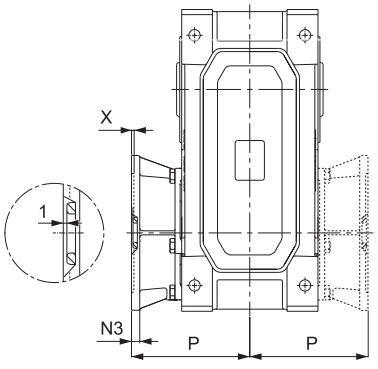


Dimensions are in [mm].

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

AD



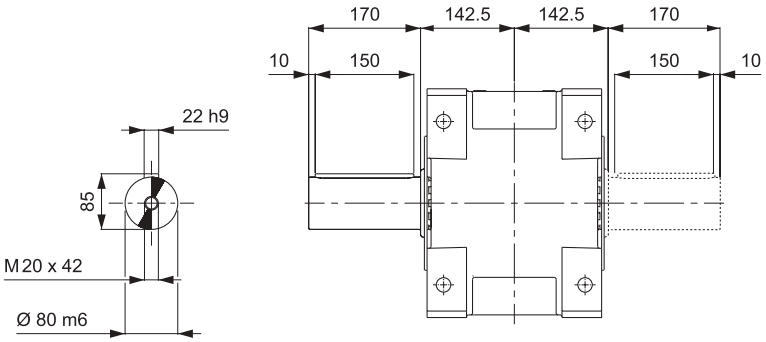


Dimensions are in [mm].

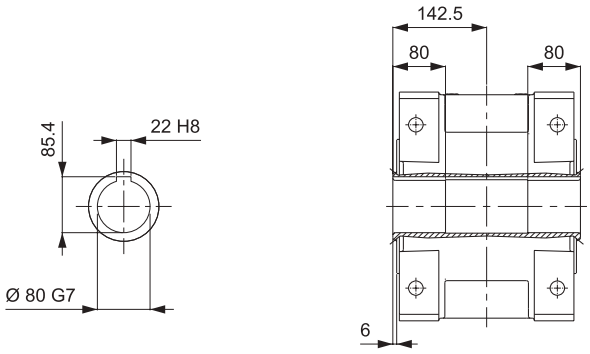
AD	M	M1	M2	N	N1	N2	N3	N4	X	P
HDP 70 3_ 112	28	31.3	8	250	215	180	15	14	5	220
HDP 70 3_ 132	38	41.3	10	300	265	230	16	14	5	230
HDP 70 3_ 160	42	45.3	12	350	300	250	23	18	6	261
HDP 70 3_ 180	48	51.8	14	350	300	250	23	18	6	261
HDP 70 3_ 200	55	59.3	16	400	350	300	-	M16x23	7	286

HDP 70

LP



H



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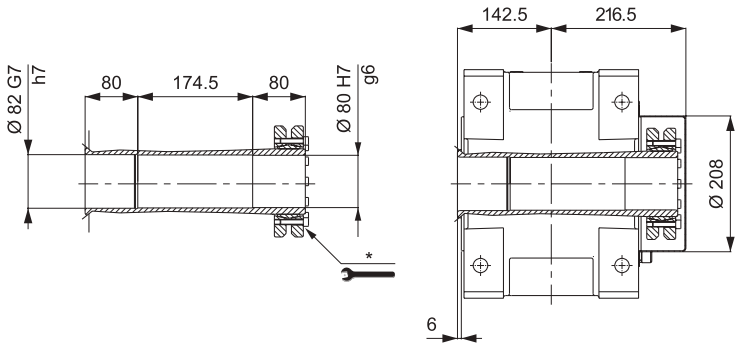
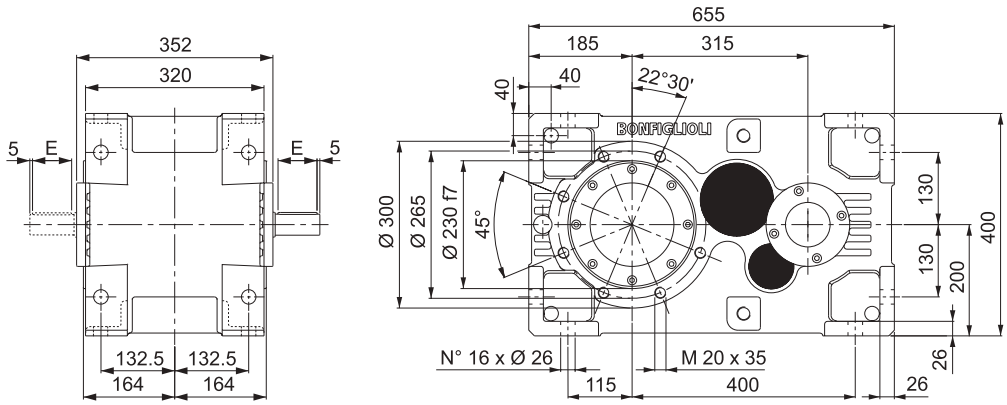


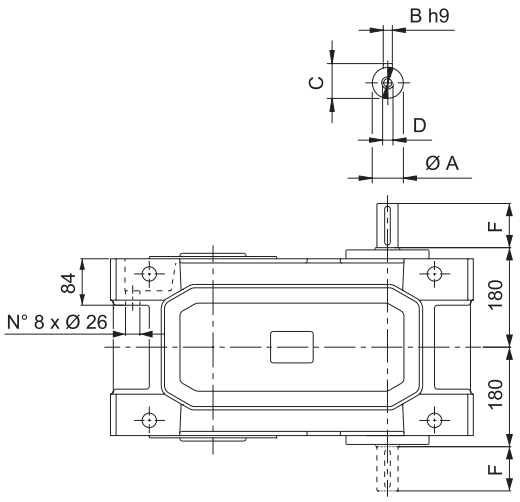
* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

Dimensions are in [mm].

HDP 80



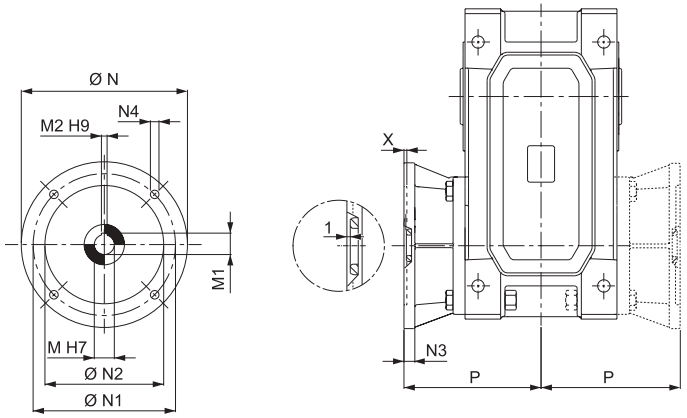
VP



Dimensions are in [mm].

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

AD

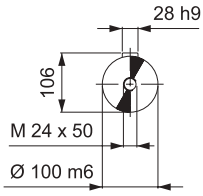


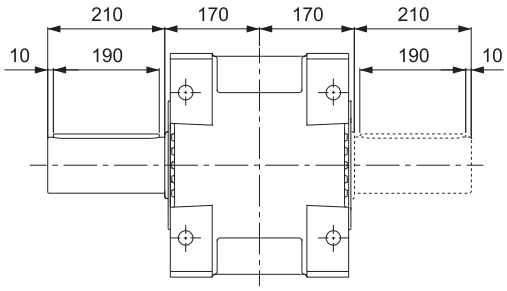
Dimensions are in [mm].

AD	M	M1	M2	N	N1	N2	N3	N4	X	P
HDP 80 3_ 132	38	41.3	10	300	265	230	16	14	5	257.5
HDP 80 3_ 160	42	45.3	12	350	300	250	23	18	6	288.5
HDP 80 3_ 180	48	51.8	14	350	300	250	23	18	6	288.5
HDP 80 3_ 200	55	59.3	16	400	350	300	-	M16x23	7	313.5

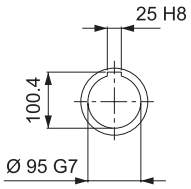
HDP 80

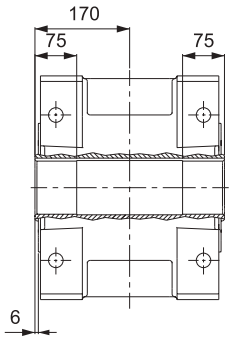
LP



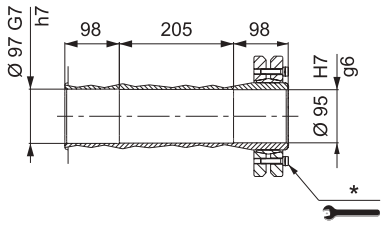


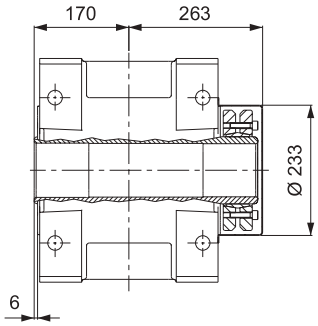
H





S

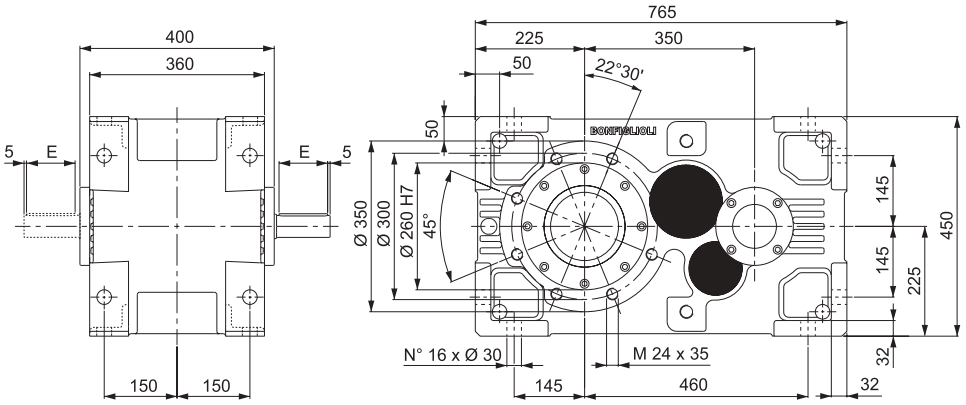




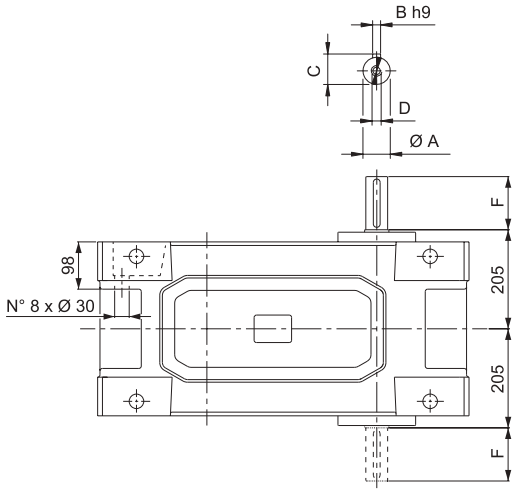
* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

Dimensions are in [mm].

HDP 90



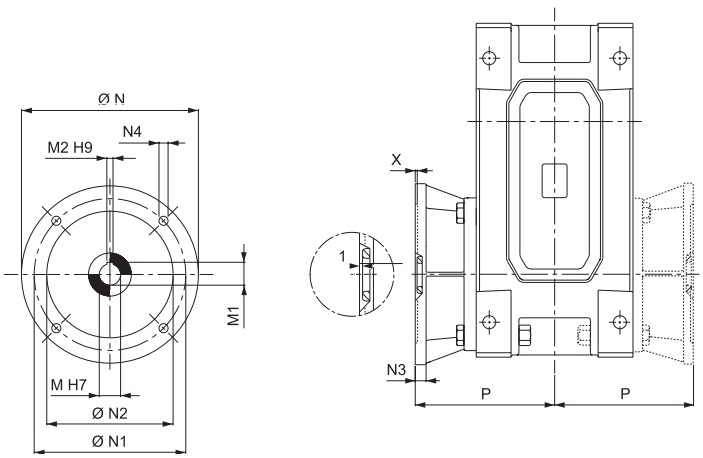
VP



Dimensions are in [mm].

VP	i =	A	B	C	D	E	F	LP
HDP 90 2	**7.9 ... 13.6**	50 k6	14	53.5	M16x36	100	110	429
HDP 90 2	**15.8 ... 22.4**	45 k6	14	48.5	M16x36	100	110	429
HDP 90 3	**25.4 ... 73.3**	45 k6	14	48.5	M16x36	100	110	440
HDP 90 3	**77.8 ... 110.1**	32 k6	10	35	M12x28	70	80	440

AD

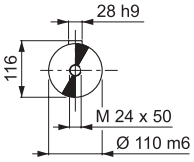


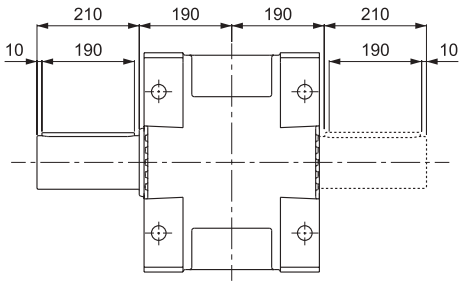
Dimensions are in [mm].

AD	M	M1	M2	N	N1	N2	N3	N4	X	P
HDP 90 3_ 160	42	45.3	12	350	300	250	23	18	6	308.5
HDP 90 3_ 180	48	51.8	14	350	300	250	23	18	6	308.5
HDP 90 3_ 200	55	59.3	16	400	350	300	-	M16x23	7	333.5

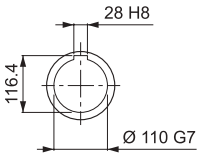
HDP 90

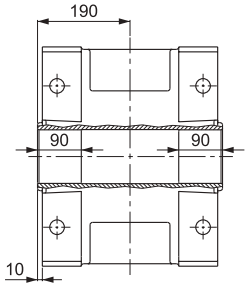
LP



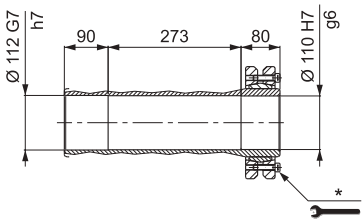


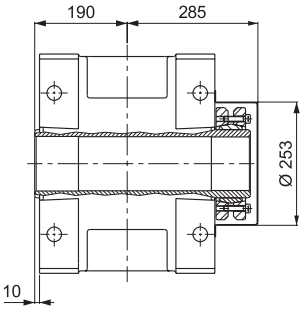
H





S



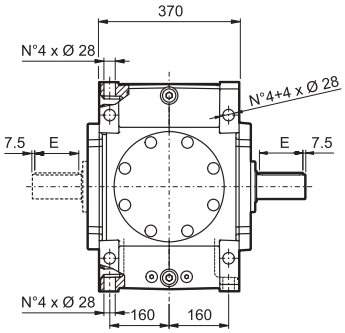


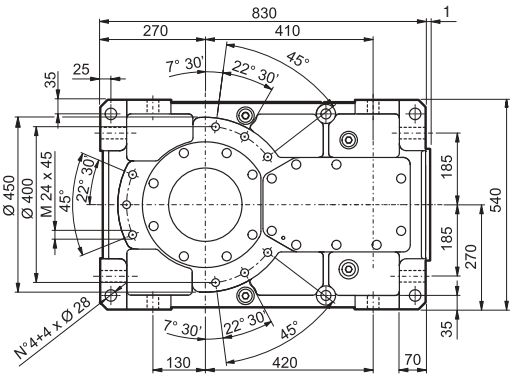
* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

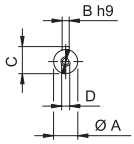
Dimensions are in [mm].

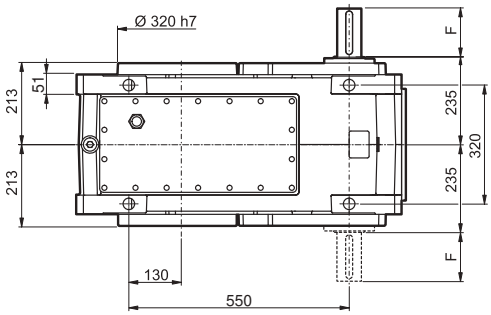
HDP 100

HDP 100 2

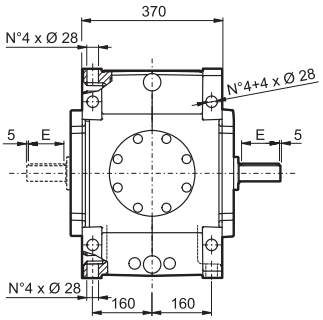


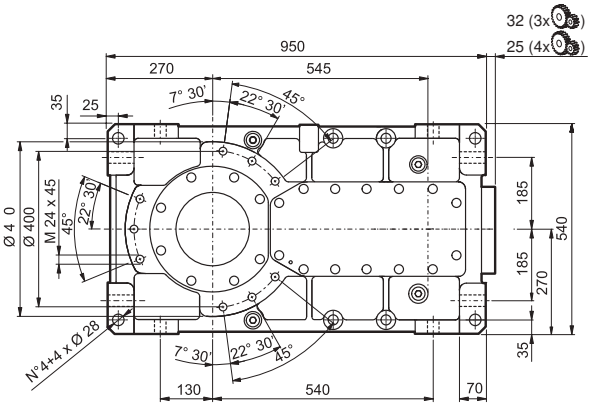


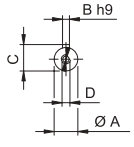


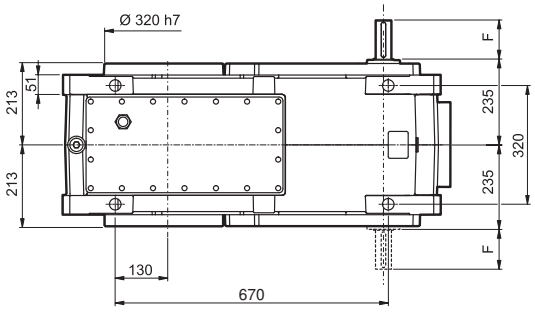


HDP 100 3
HDP 100 4







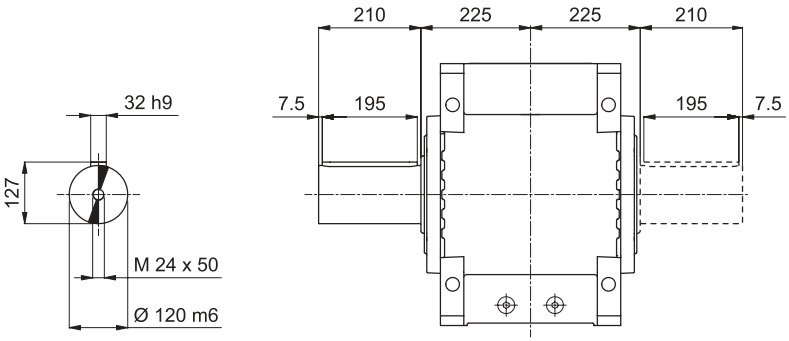


Dimensions are in [mm].

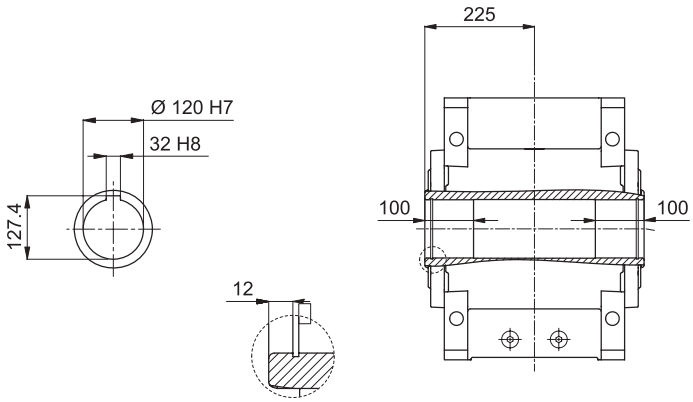
VP	i =	A	B	C	D	E	F	LP
HDP 100 2	**7.4 … 21.8**	60 m6	18	64	M20x42	125	140	625
HDP 100 3	**22.8 … 50**	48 k6	14	51.5	M16x36	100	110	700
HDP 100 3	**55.5 … 107.8**	45 k6	14	48.5	M16x36	100	110	700
HDP 100 4	**110.6 … 507.9**	32 k6	10	35	M12x28	70	80	715

HDP 100

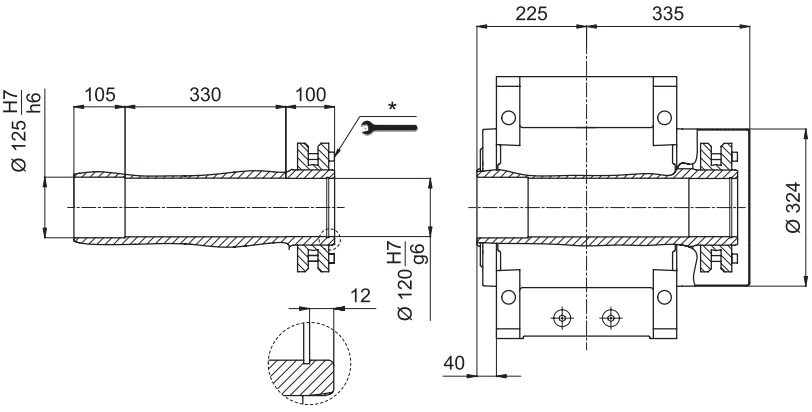
LP



H



S

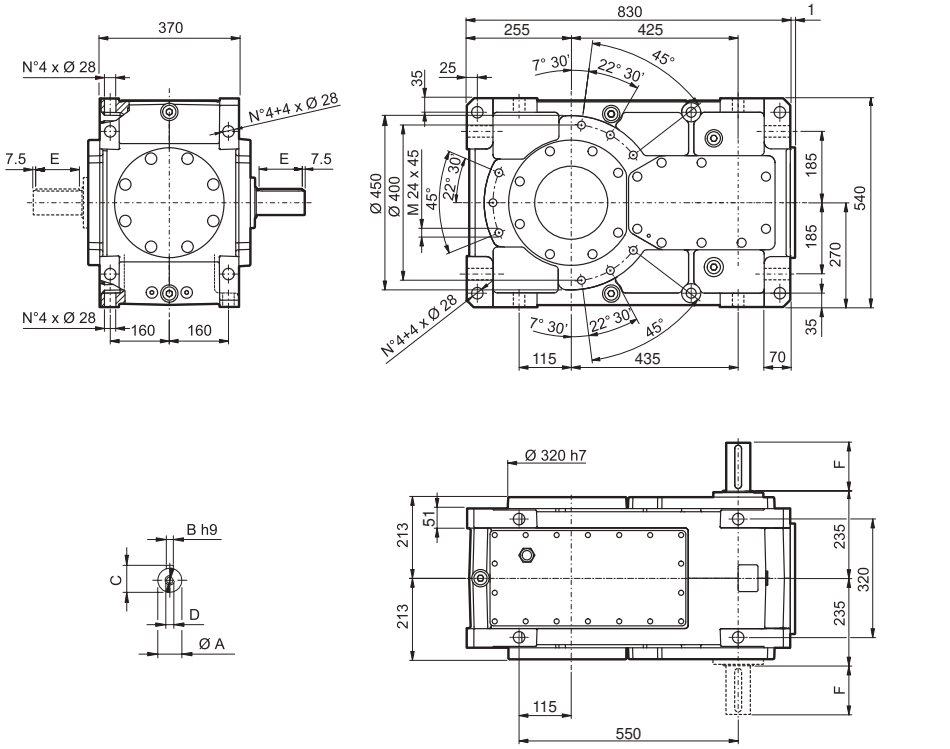


* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

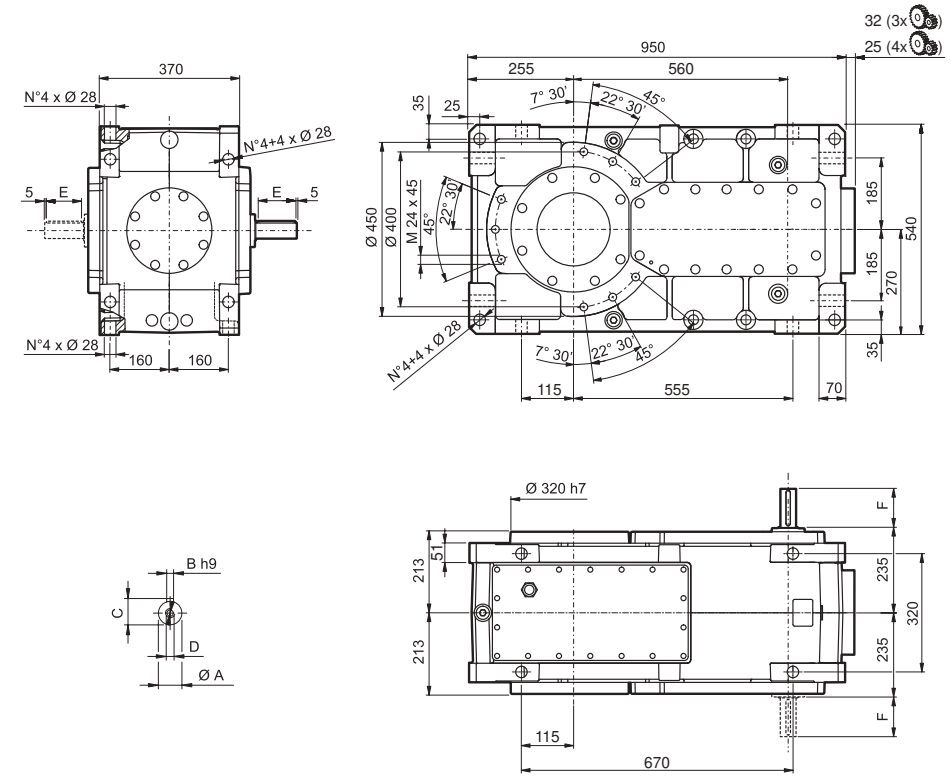
Dimensions are in [mm].

HDP 110

HDP 110 2



HDP 110 3
HDP 110 4

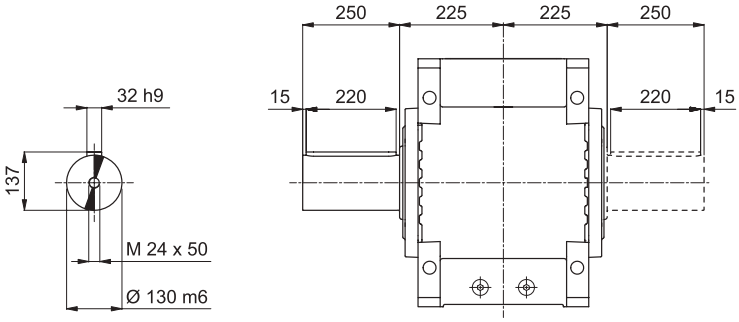


Dimensions are in [mm].

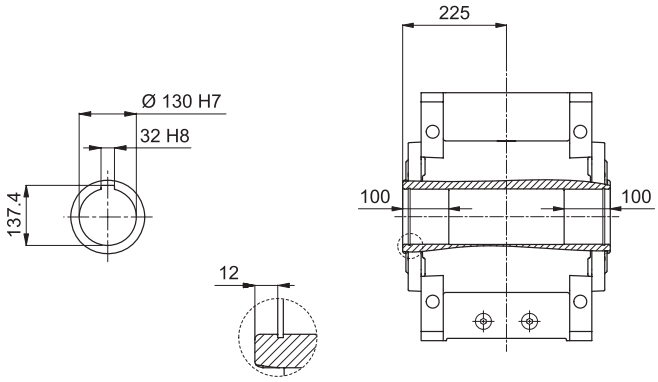
VP	i =	A	B	C	D	E	F	LP
HDP 110 2	**8.1 … 25.0**	60 m6	18	64	M20x42	125	140	670
HDP 110 3	**24.9 … 54.5**	48 k6	14	51.5	M16x36	100	110	740
HDP 110 3	**60.7 … 123.5**	45 k6	14	48.5	M16x36	100	110	740
HDP 110 4	**120.9 … 499.4**	32 k6	10	35	M12x28	70	80	730

HDP 110

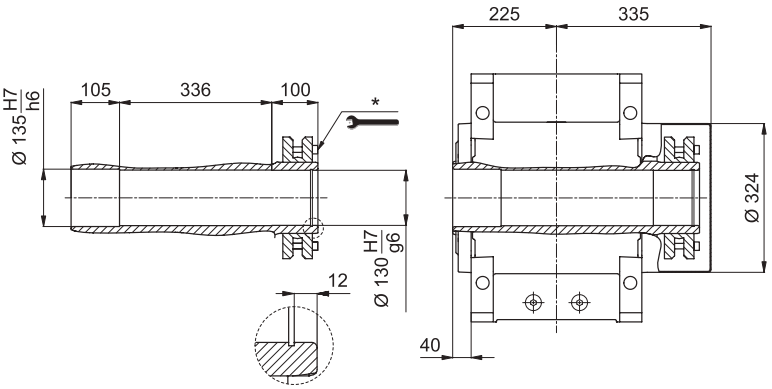
LP



H



S

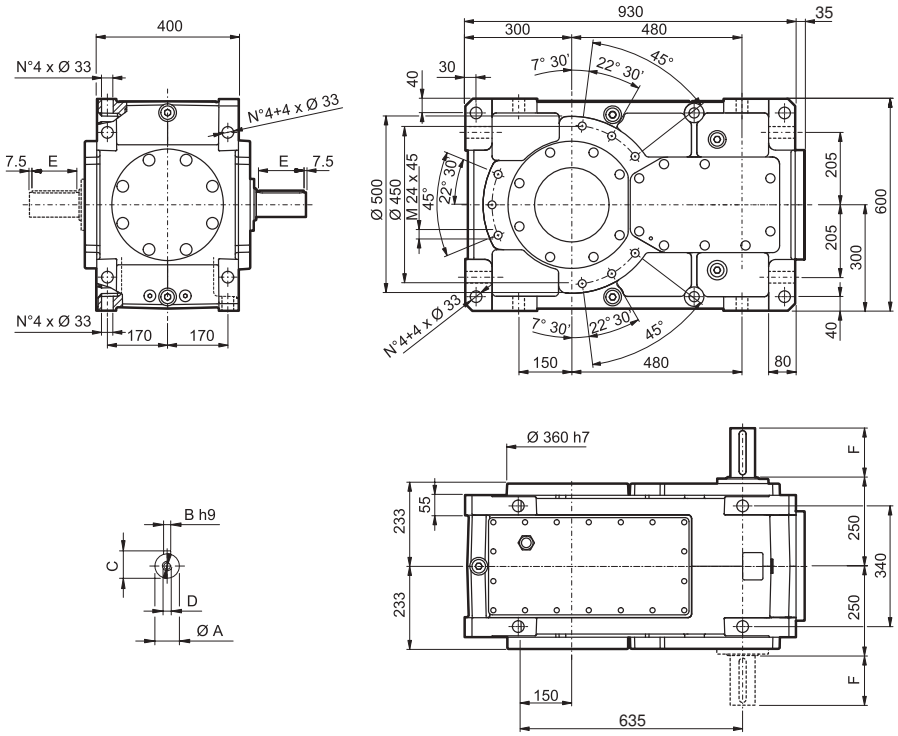


* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

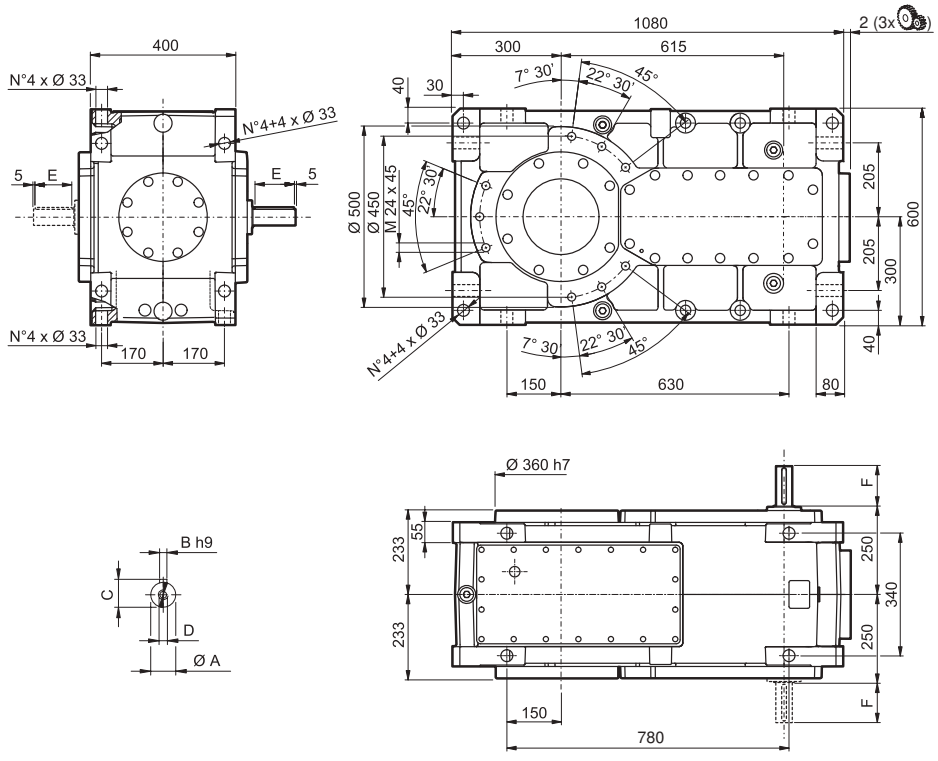
Dimensions are in [mm].

HDP 120

HDP 120 2



HDP 120 3
HDP 120 4

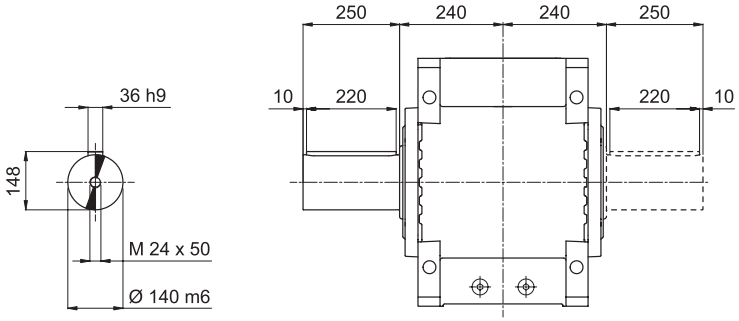


Dimensions are in [mm].

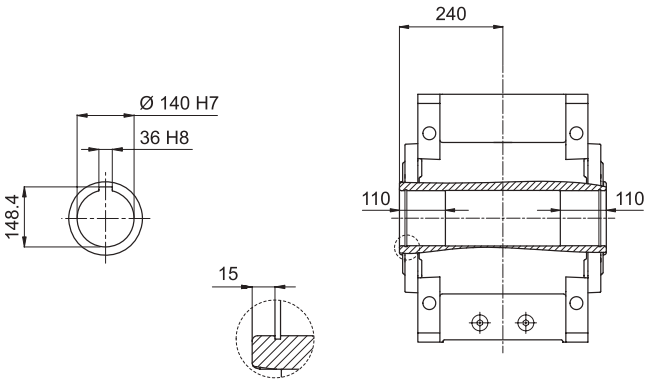
VP	i =	A	B	C	D	E	F	LP
HDP 120 2	**7.9 … 25.4**	70 m6	20	74.5	M20x42	125	140	890
HDP 120 3	**25.8 … 56.1**	48 k6	14	51.5	M16x36	100	110	995
HDP 120 3	**64.3 … 125.2**	45 k6	14	48.5	M16x36	100	110	995
HDP 120 4	**128 … 523.7**	32 k6	10	35	M12x36	70	80	985

HDP 120

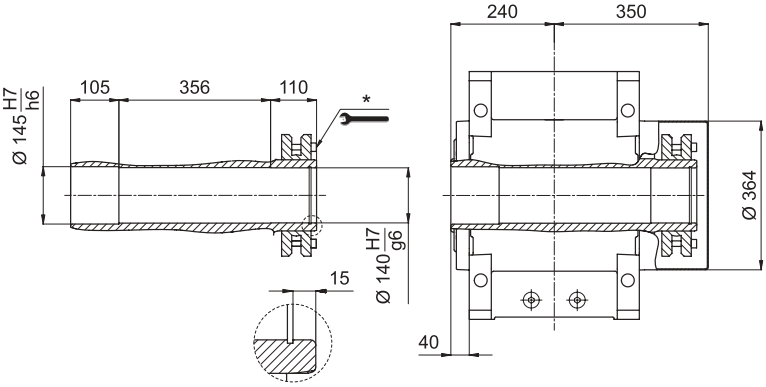
LP



H



S

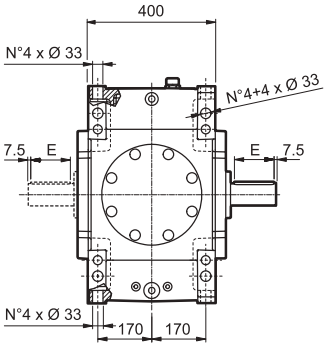


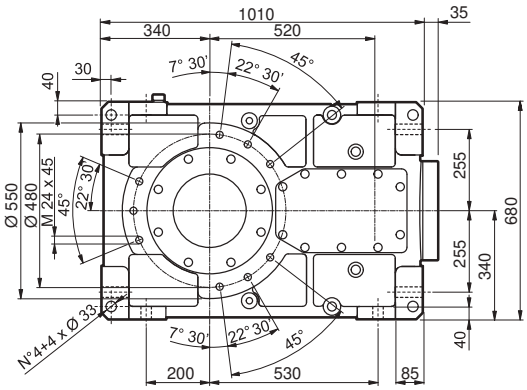
* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

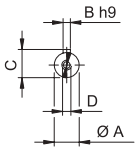
Dimensions are in [mm].

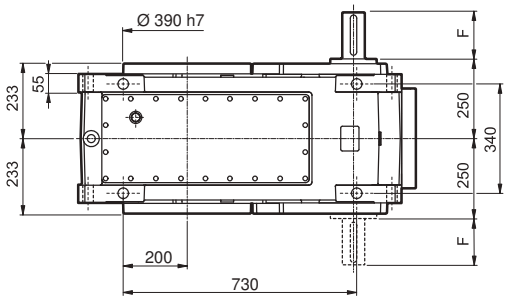
HDP 125

HDP 125 2

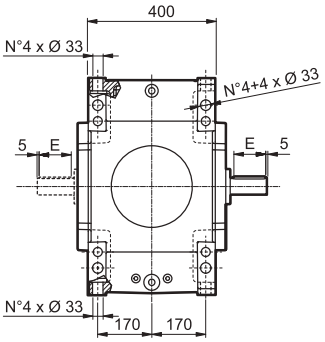


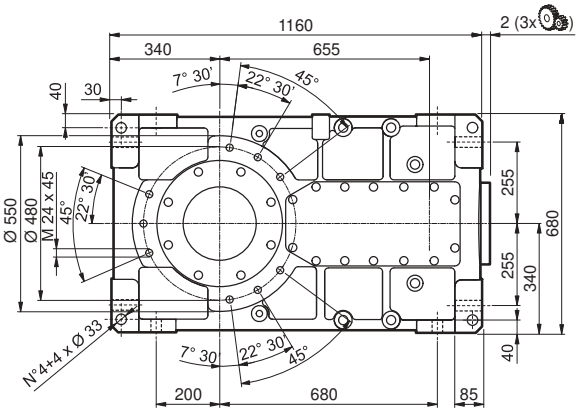


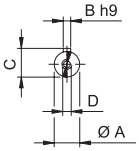


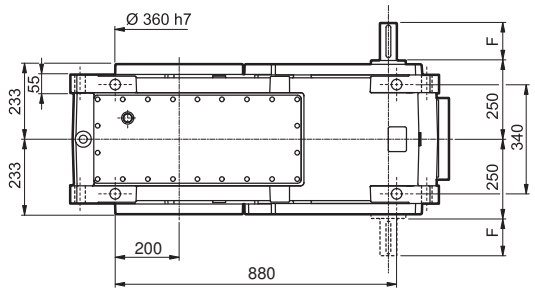


HDP 125 3
HDP 125 4







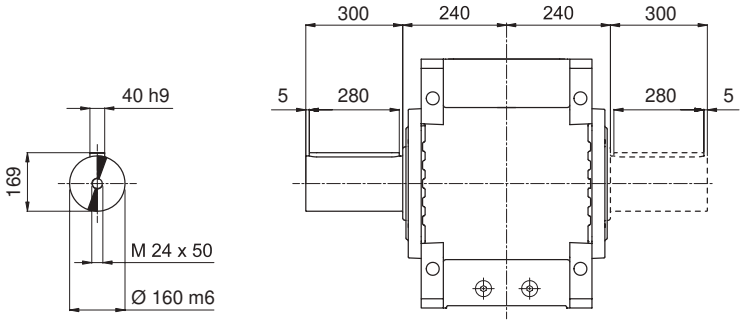


Dimensions are in [mm].

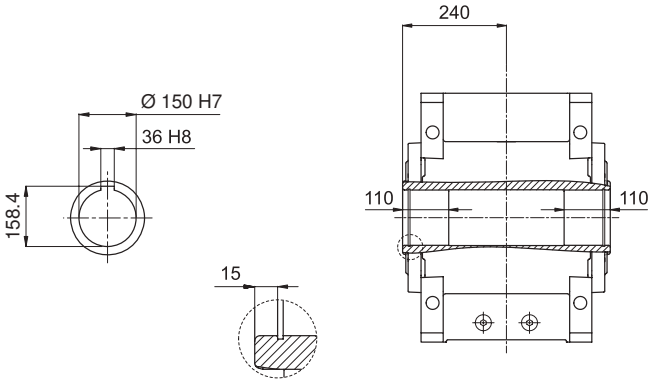
VP	i =	A	B	C	D	E	F	LP
HDP 125 2	**8.9 ... 25.0**	70 m6	20	74.5	M20x42	125	140	1075
HDP 125 3	**29.1 … 62.6**	48 k6	14	51.5	M16x36	100	110	1175
HDP 125 3	**72.5 … 123.6**	45 k6	14	48.5	M16x36	100	110	1175
HDP 125 4	**144.4 … 506.5**	32 k6	10	35	M12x28	70	80	1160

HDP 125

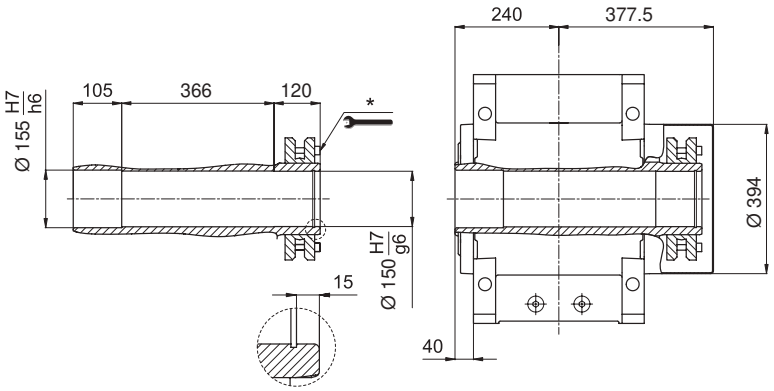
LP



H



S

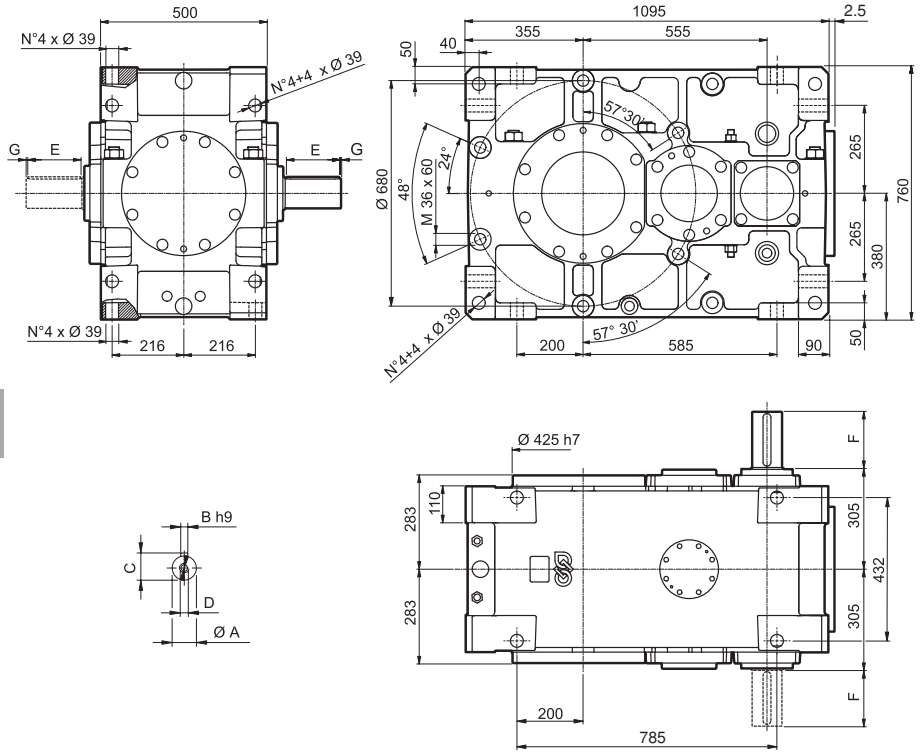


* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

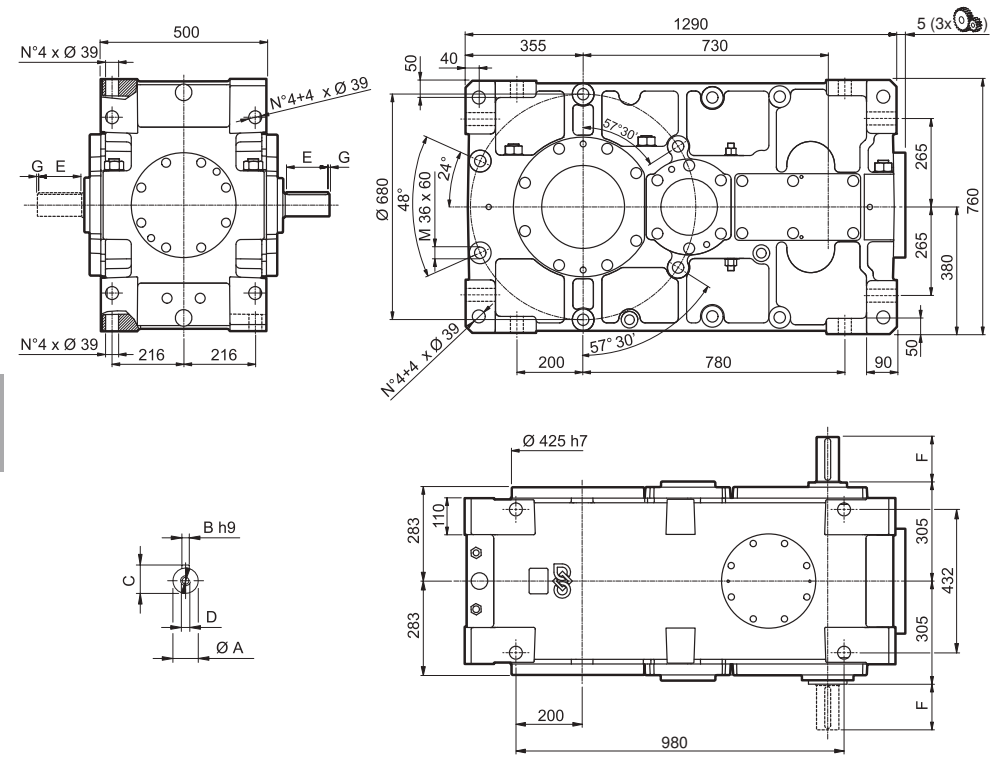
Dimensions are in [mm].

HDP 130

HDP 130 2



HDP 130 3
HDP 130 4

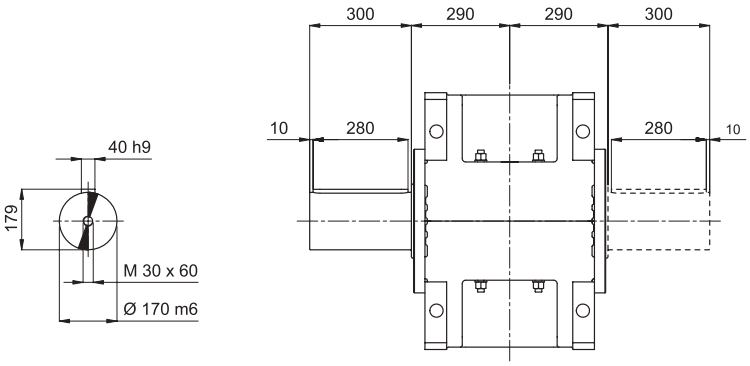


Dimensions are in [mm].

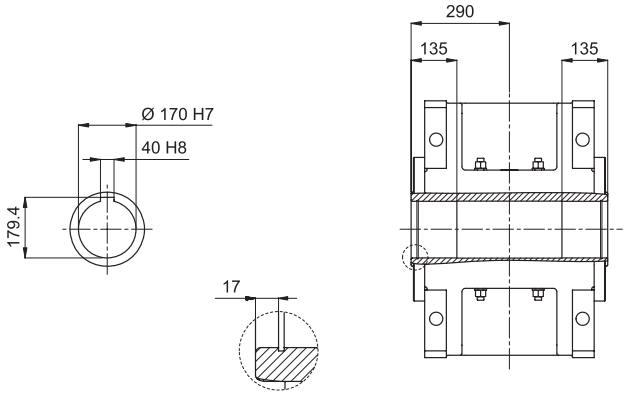
VP	i =	A	B	C	D	E	F	G	LP
HDP 130 2	**7.3 … 12.3**	90 m6	25	95	M24x50	160	170	5	1500
HDP 130 2	**14.1 … 21.7**	70 m6	20	74.5	M20x42	125	140	7.5	1500
HDP 130 3	**21.8 … 48.1**	65 m6	18	69	M20x42	125	140	7.5	1705
HDP 130 3	**56.5 … 108.3**	50 k6	14	53.5	M16x36	100	110	5	1705
HDP 130 4	**111.2 … 237.9**	42 k6	12	45	M16x36	100	110	5	1740
HDP 130 4	**274.5 … 534.5**	32 k6	10	35	M12x28	70	80	5	1740

HDP 130

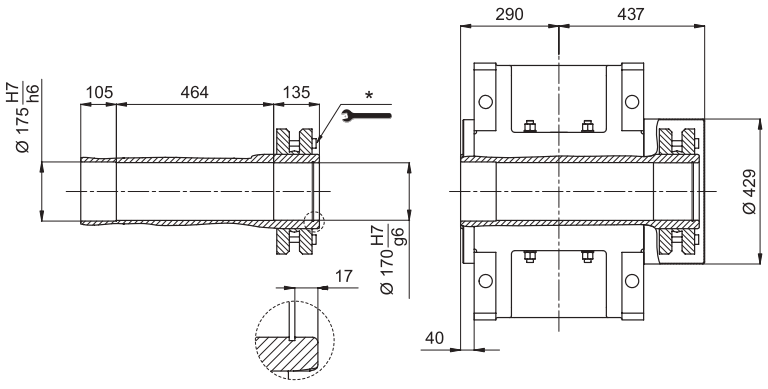
LP



H



S

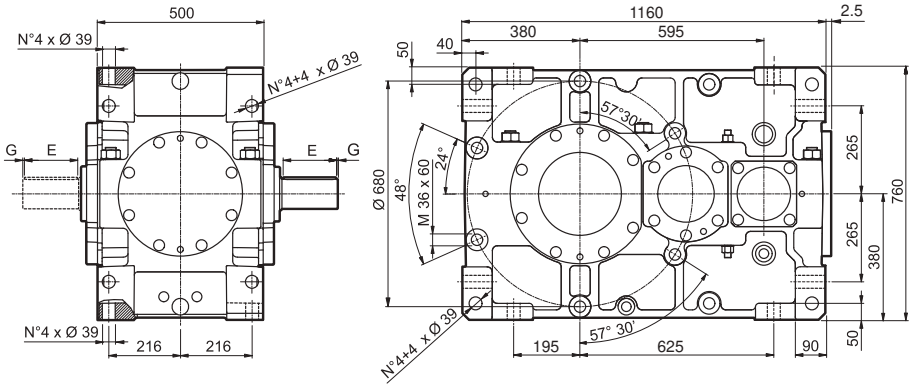


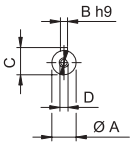
* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

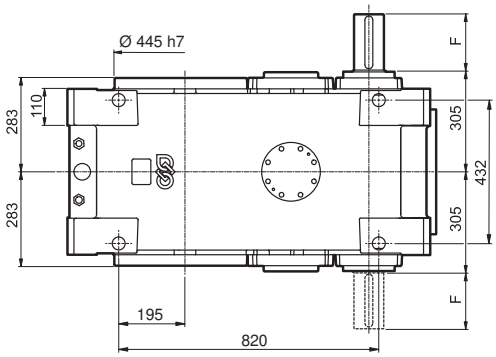
Dimensions are in [mm].

HDP 140

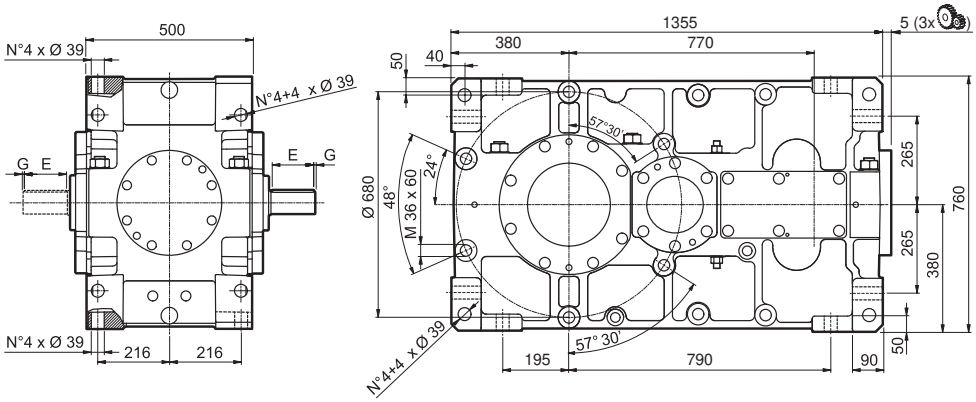
HDP 140 2

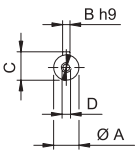


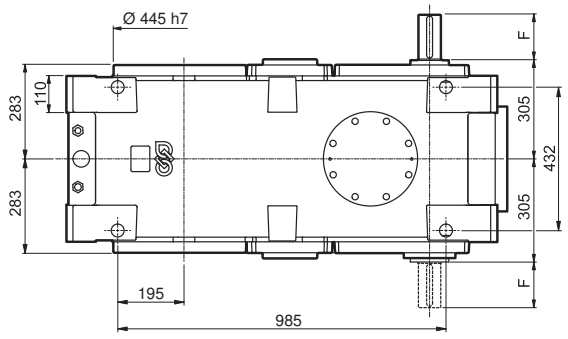




HDP 140 3
HDP 140 4





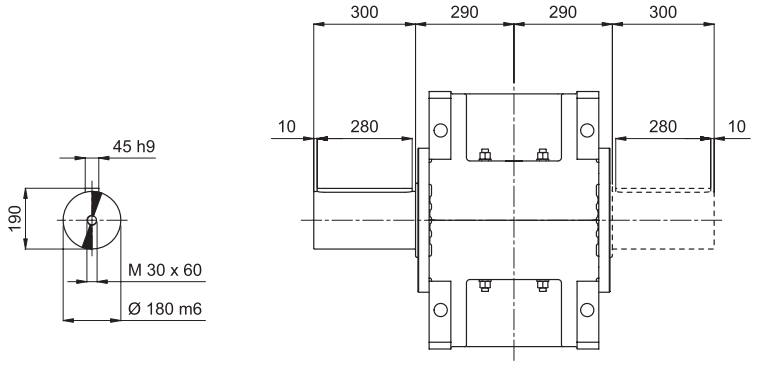


Dimensions are in [mm].

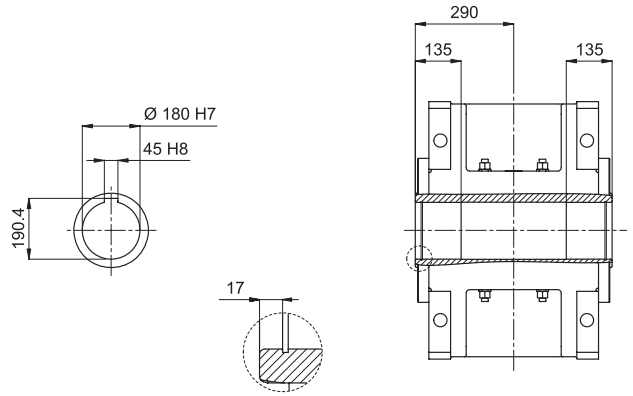
VP	i =	A	B	C	D	E	F	G	LP
HDP 140 2	**8.4 … 14.4**	90 m6	25	95	M24x50	160	170	5	1640
HDP 140 2	**16.3 … 24.9**	70 m6	20	74.5	M20x42	125	140	7.5	1640
HDP 140 3	**25.1 … 56.2**	65 m6	18	69	M20x42	125	140	7.5	1915
HDP 140 3	**65.1 … 124.7**	50 k6	14	53.5	M16x36	100	110	5	1915
HDP 140 4	**141.6 … 277.5**	42 k6	12	45	M16x36	100	110	5	1935
HDP 140 4	**315.9 … 495.3**	32 k6	10	35	M12x28	70	80	5	1935

HDP 140

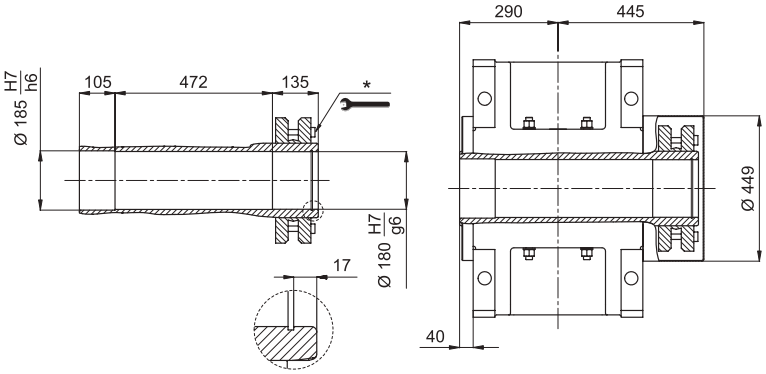
LP



H



S

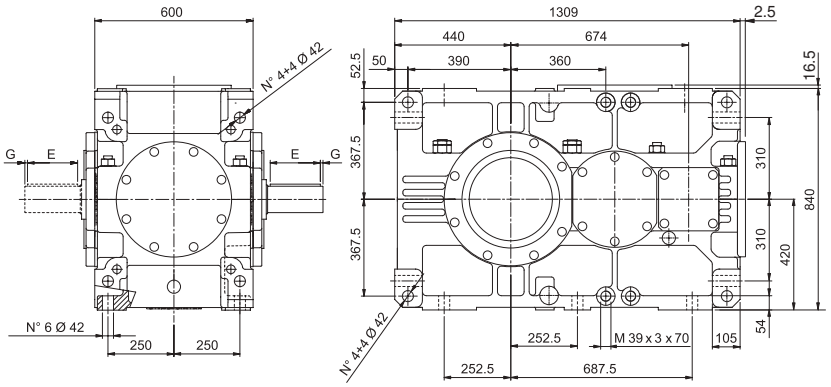


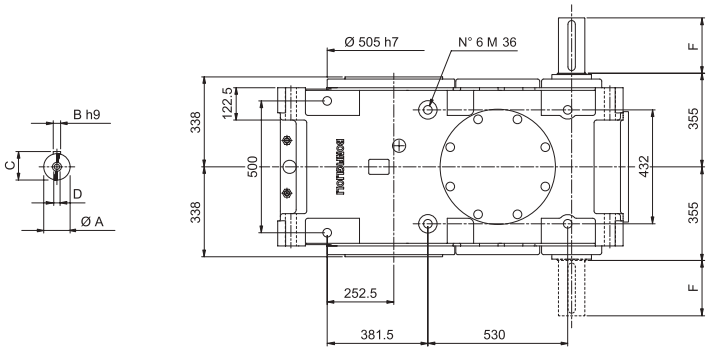
* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

Dimensions are in [mm].

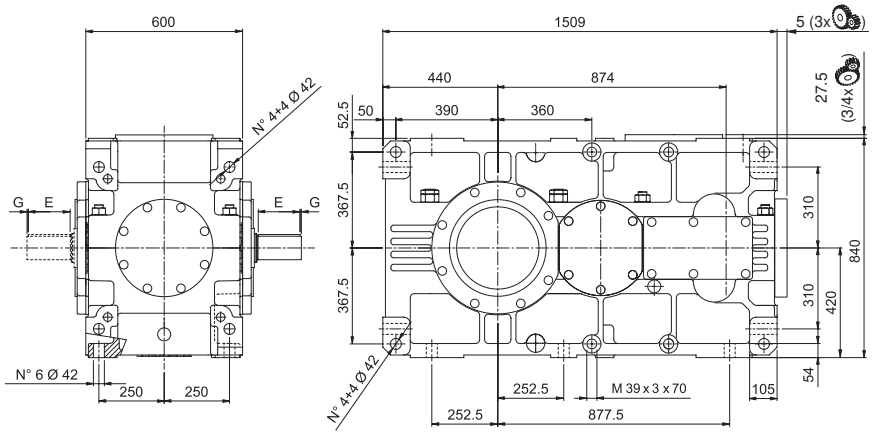
HDP 150

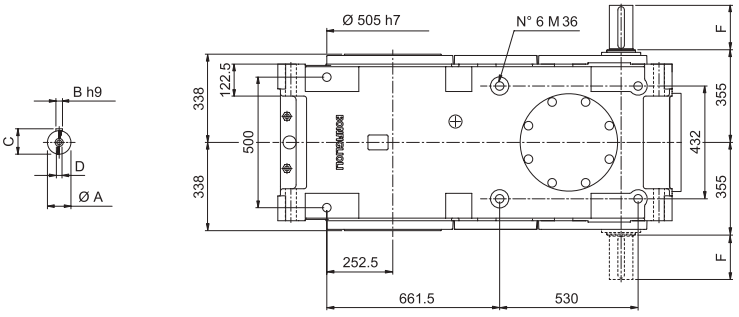
HDP 150 2





HDP 150 3
HDP 150 4



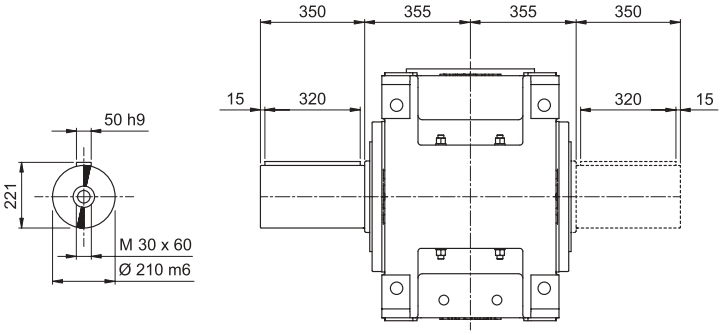


Dimensions are in [mm].

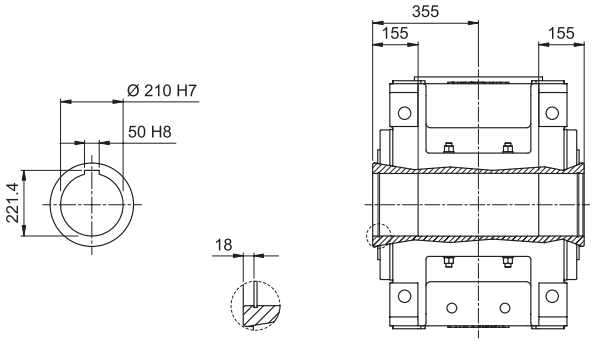
VP	i =	A	B	C	D	E	F	G	LP
HDP 150 2	**7.9 … 14.1**	100 m6	28	106	M24x50	190	210	10	2585
HDP 150 2	**15.4 … 19.6**	90 m6	25	95	M24x50	160	170	5	2585
HDP 150 3	**21.5 … 38.1**	90 m6	25	95	M24x50	160	170	5	2835
HDP 150 3	**43.5 … 77.0**	70 m6	20	74.5	M20x42	125	140	7.5	2835
HDP 150 4	**89.0 … 157.8**	55 m6	16	59	M20x42	90	110	10	2870
HDP 150 4	**170.9 … 303.1**	45 k6	14	48.5	M16x36	100	110	5	2870

HDP 150

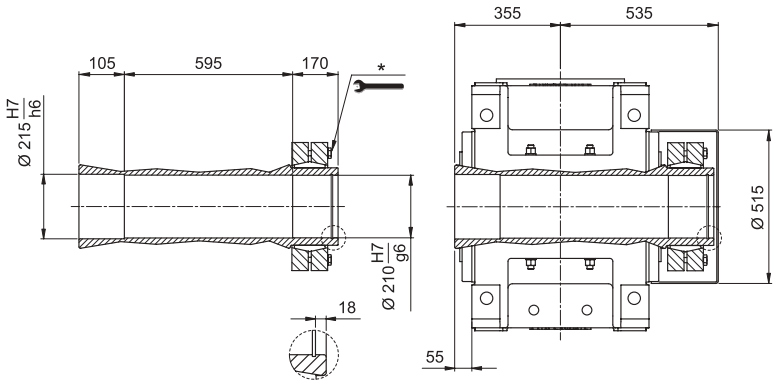
LP



H



S

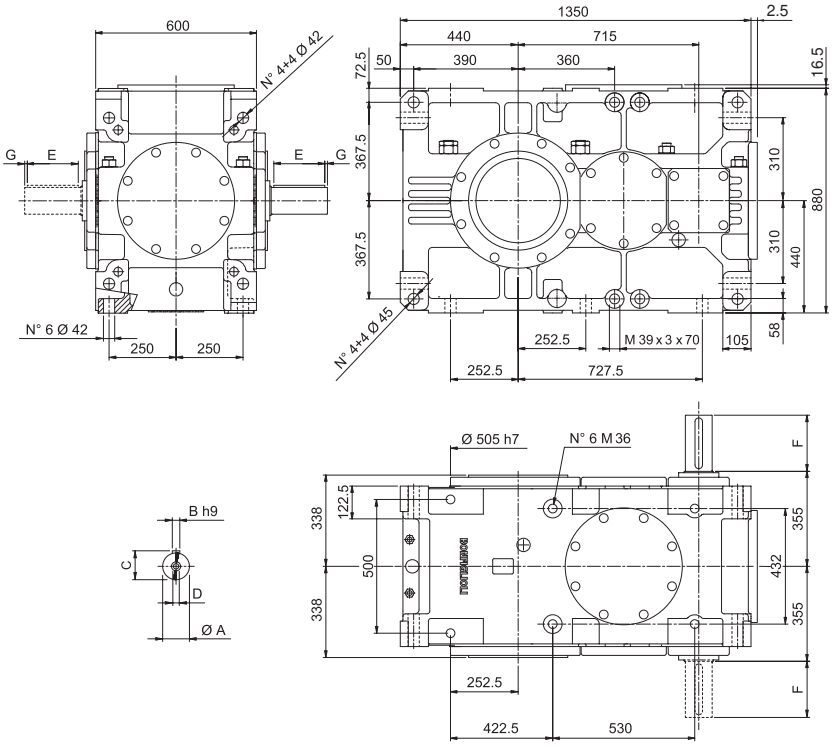


* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

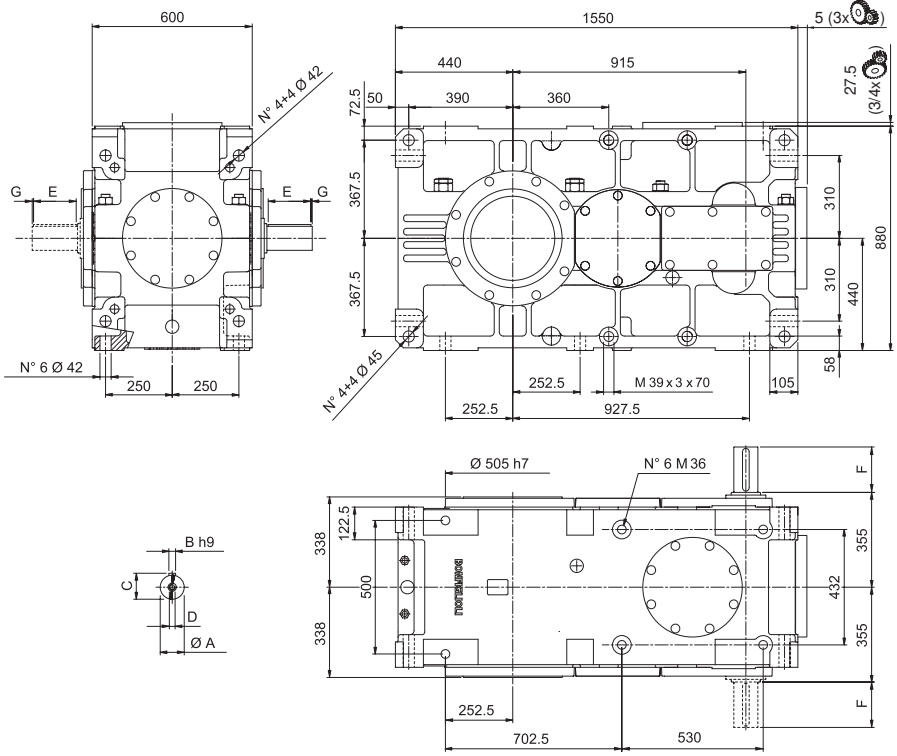
Dimensions are in [mm].

HDP 160

HDP 160 2



HDP 160 3
HDP 160 4

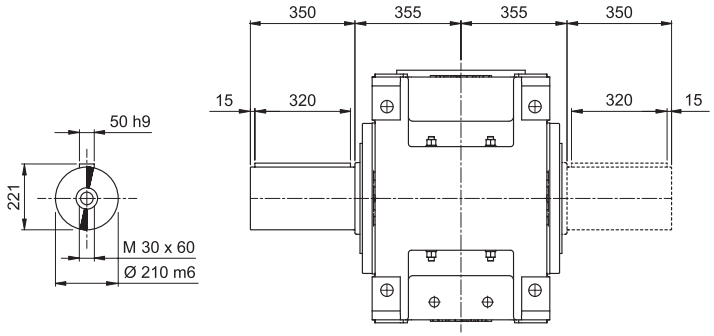


Dimensions are in [mm].

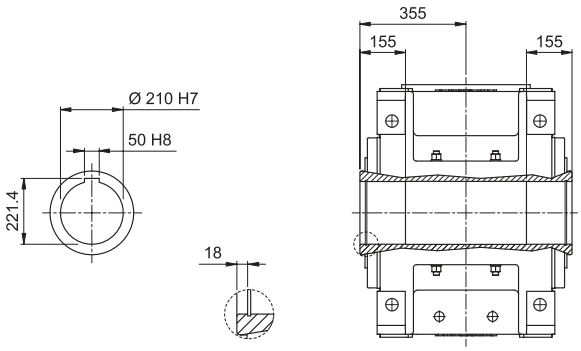
VP	i =	A	B	C	D	E	F	G	LP
HDP 160 2	**9.0 … 15.9**	100 m6	28	106	M24x50	190	210	10	2860
HDP 160 2	**17.5 … 22.1**	90 m6	25	95	M24x50	160	170	5	2860
HDP 160 3	**24.4 … 43.1**	90 m6	25	95	M24x50	160	170	5	3120
HDP 160 3	**49.4 … 87.0**	70 m6	20	74.5	M20x42	125	140	7.5	3120
HDP 160 4	**101.1 … 178.1**	55 m6	16	59	M20x42	90	110	10	3145
HDP 160 4	**194.1 … 342.2**	45 k6	14	48.5	M16x36	100	110	5	3145

HDP 160

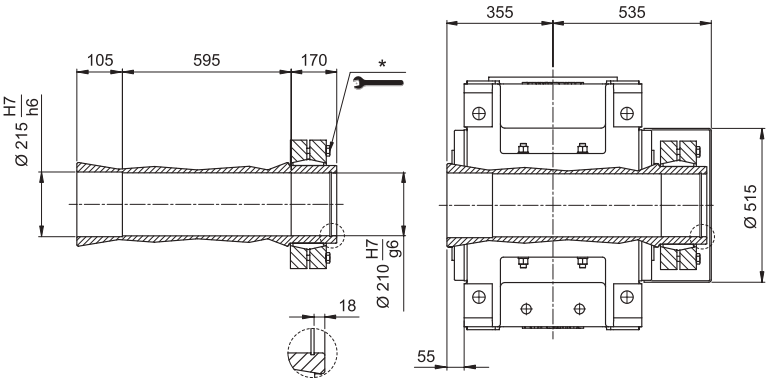
LP



H



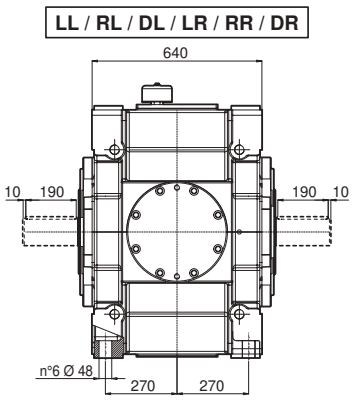
S

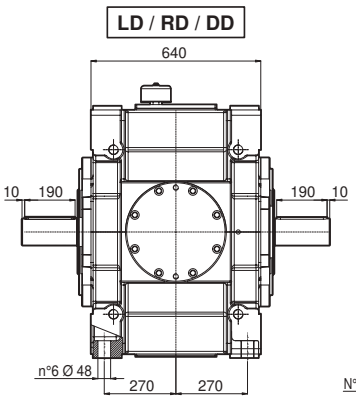


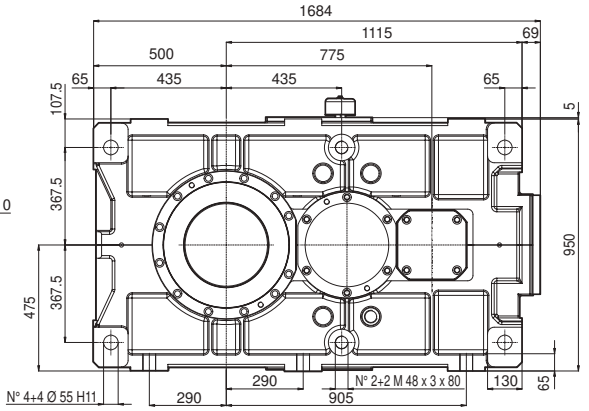
* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

Dimensions are in [mm].

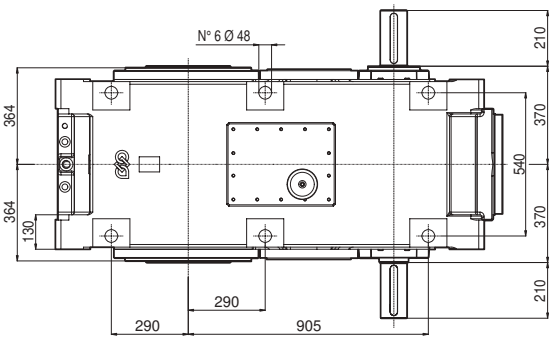
HDP 170

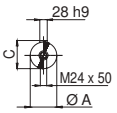


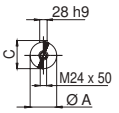


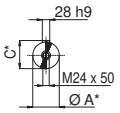


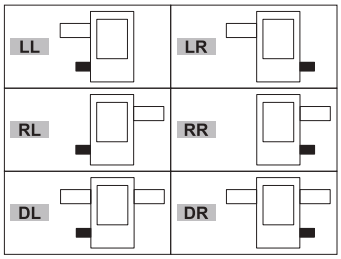
HDP 170 2



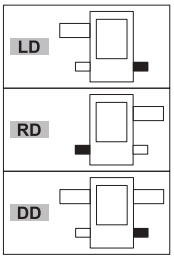








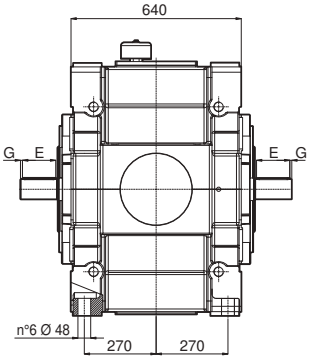
■ A/C single extension

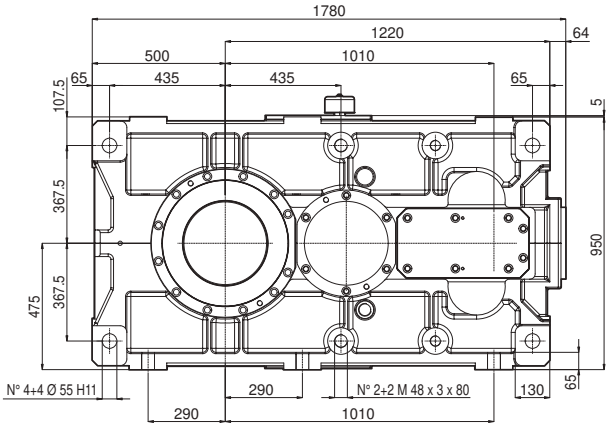


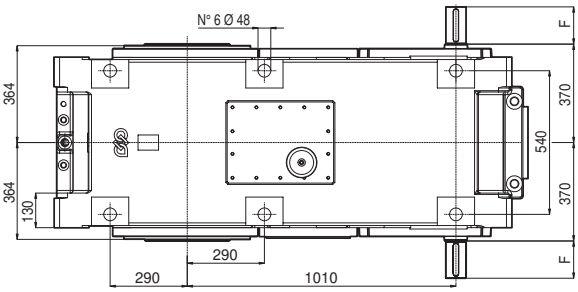
■ A/C primary extension
□ A*/C* secondary extension

VP	i =	A	A*	C	C*	LP
HDP 170 2	**7.8 ... 14.2**	110 m6	100 m6	116	106	3495
HDP 170 2	**15.4 ... 19.3**	100 m6		106		3495

HDP 170 3
HDP 170 4





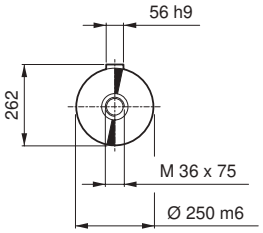


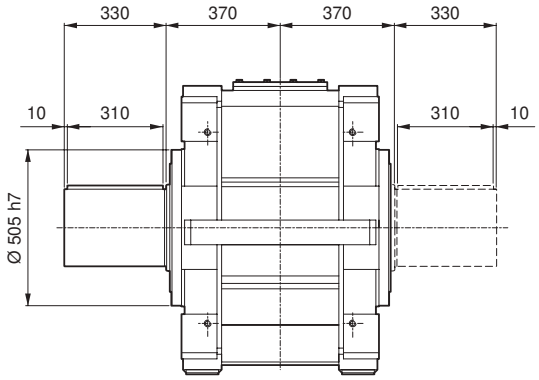
Dimensions are in [mm].

VP	i =	A	B	C	D	E	F	G	LP
HDP 170 3	**23.2 ... 39.7**	90 m6	25	95	M24x50	160	170	5	3765
HDP 170 3	**45.1 ... 77.2**	75 m6	20	79.5	M20x42	125	140	7.5	3765
HDP 170 4	**92.7 ... 158.8**	55 m6	16	59	M20x42	90	110	10	3795
HDP 170 4	**177.4 ... 303.8**	50 k6	14	53.5	M16x36	100	110	5	3795

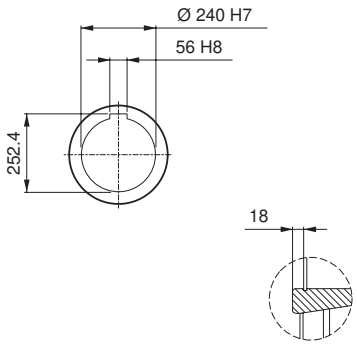
HDP 170

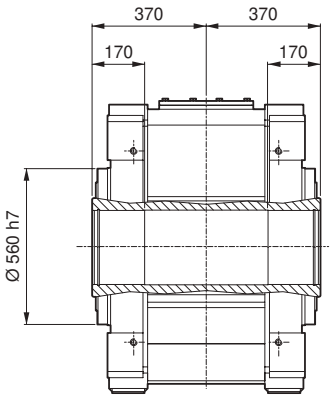
LP



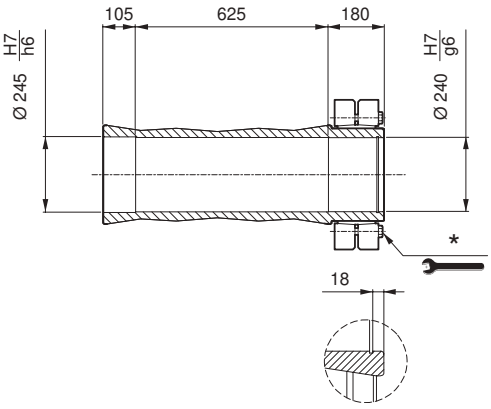


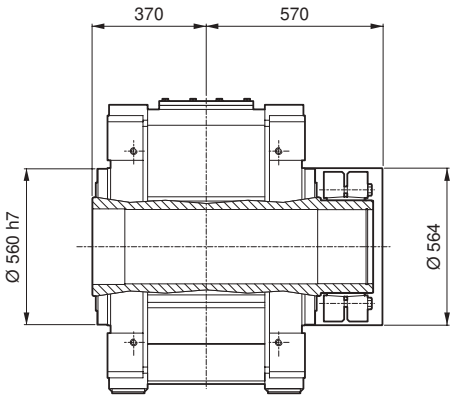
H





S



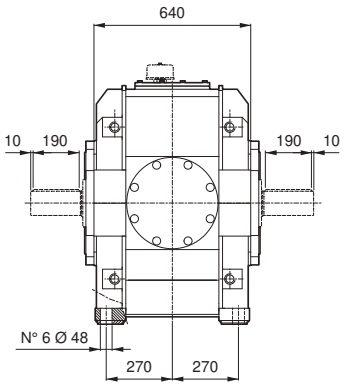


* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

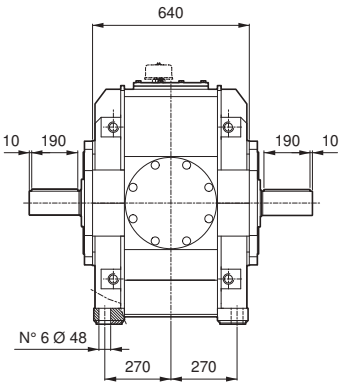
Dimensions are in [mm].

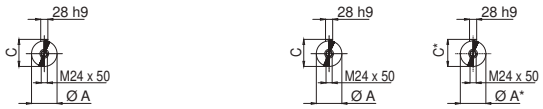
HDP 180

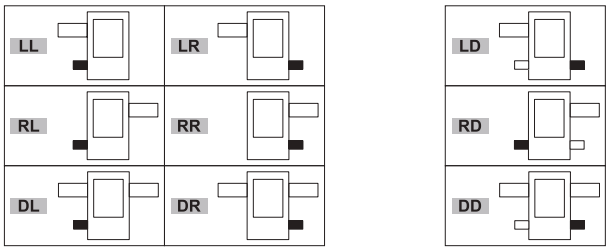
LL / RL / DL / LR / RR / DR



LD / RD / DD





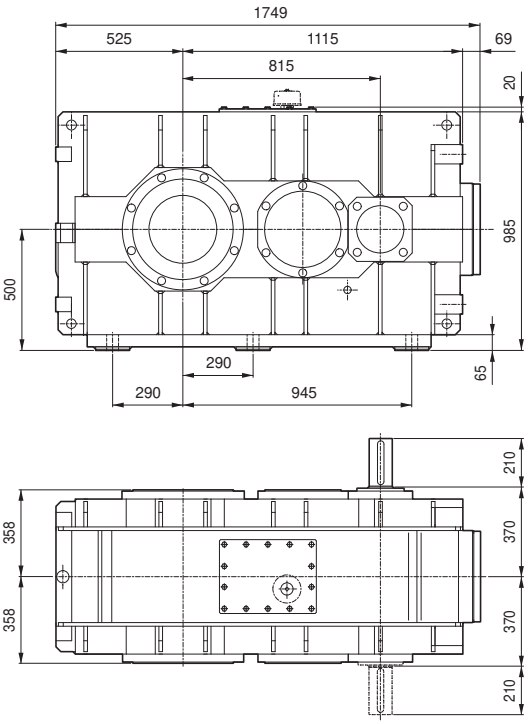


■ A/C single extension

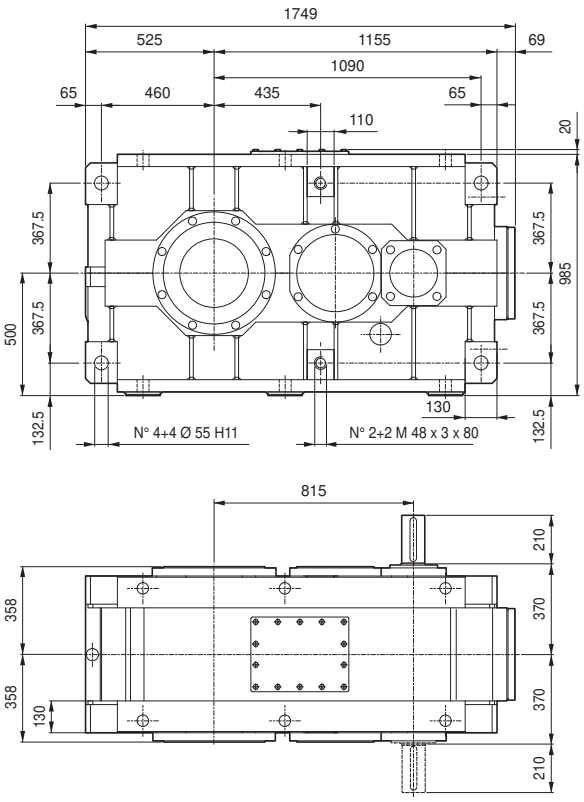
■ A/C primary extension
□ A*/C* secondary extension

VP	i =	A	A*	C	C*	LP
HDP 180 2	**8.7 ... 15.7**	110 m6	100 m6	116	106	3640
HDP 180 2	**17.1 ... 21.4**	100 m6		106		3640

HDP 180 2 B3



HDP 180 2 V5

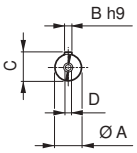


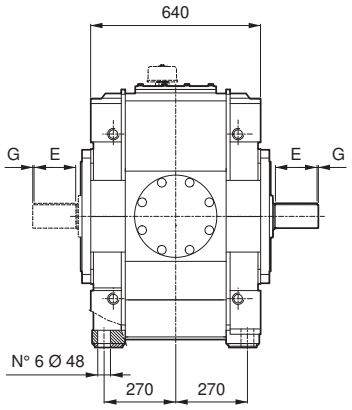
Dimensions are in [mm].

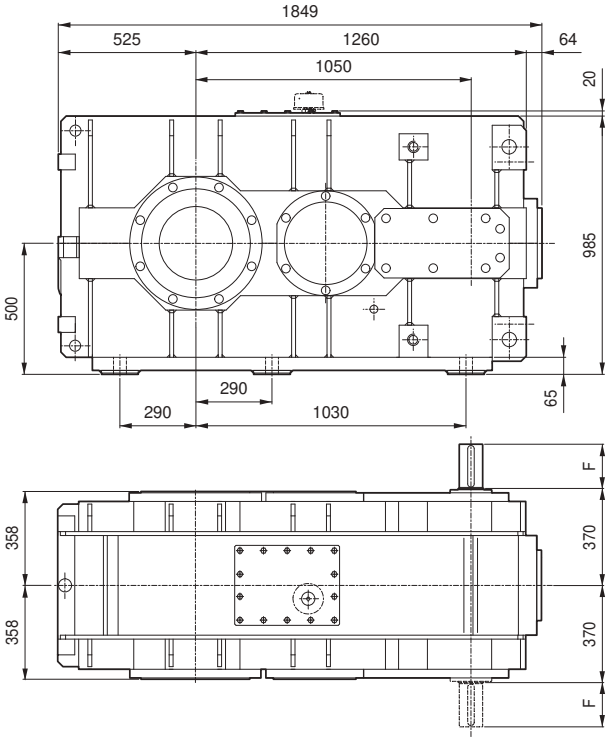
HDP 180

HDP 180 3/4

B3

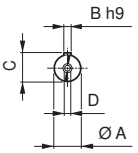


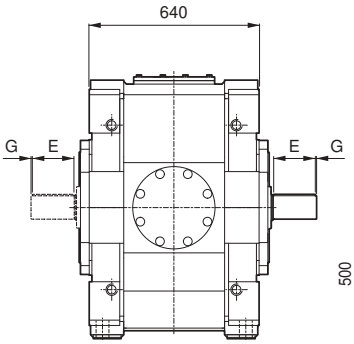


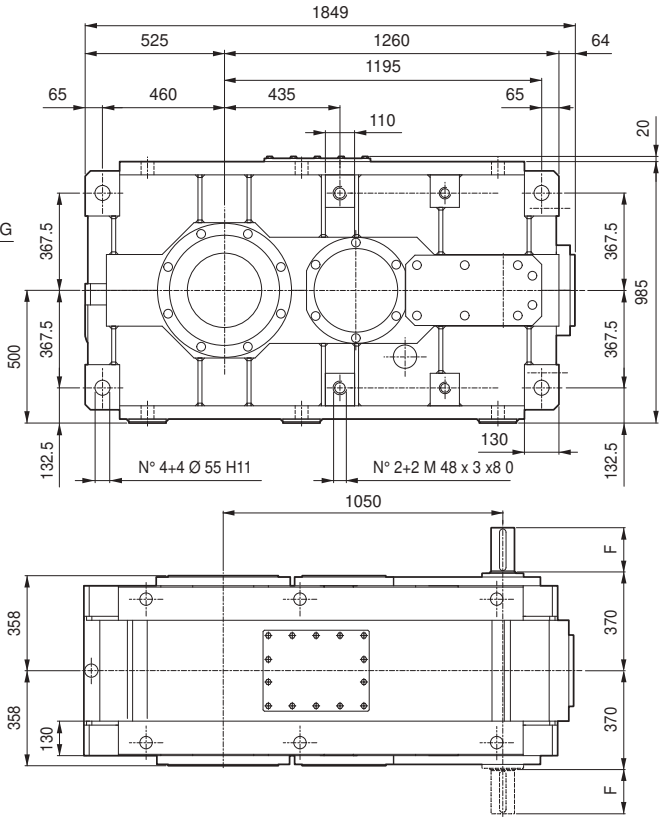


HDP 180 3/4

V5





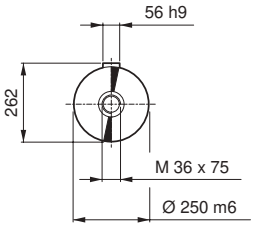


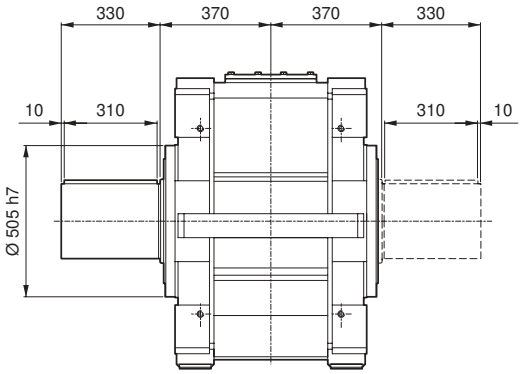
Dimensions are in [mm].

VP	i =	A	B	C	D	E	F	G	LP
HDP 180 3	**25.8 ... 43.9**	90 m6	25	95	M24x50	160	170	5	3860
HDP 180 3	**50.1 ... 85.4**	75 m6	20	79.5	M20x42	125	140	7.5	3860
HDP 180 4	**103.0 ... 175.6**	55 m6	16	59	M20x42	90	110	10	3890
HDP 180 4	**197.2 ... 336.1**	50 k6	14	53.5	M16x36	100	110	5	3890

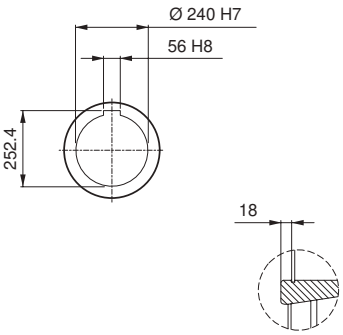
HDP 180

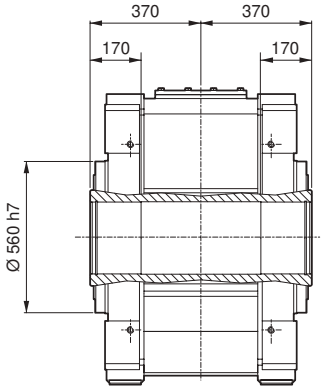
LP



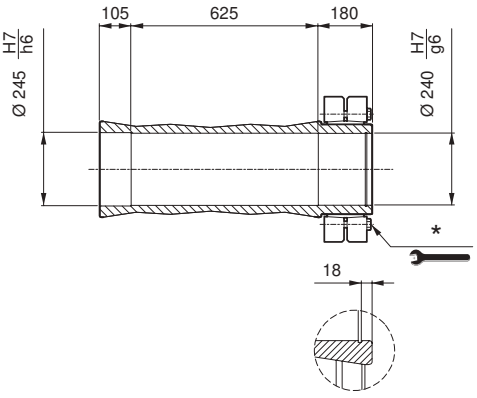


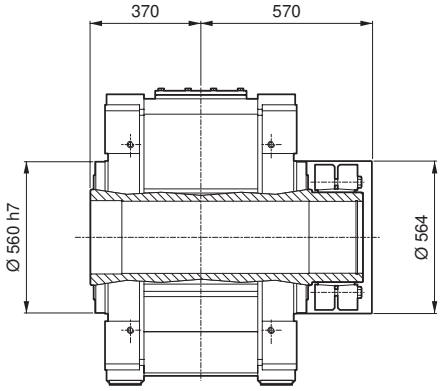
H





S

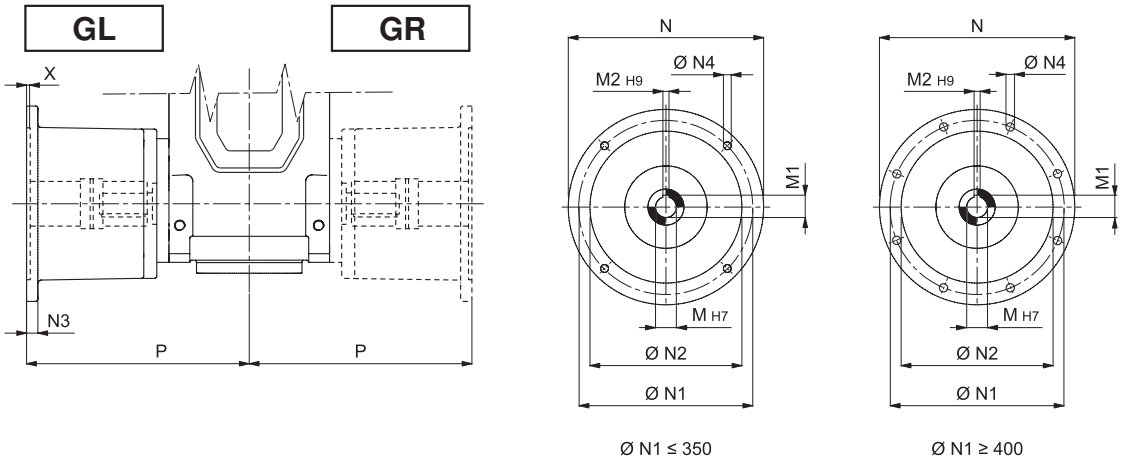




* For correct use, refer to the “OPERATION AND MAINTENANCE MANUAL”.

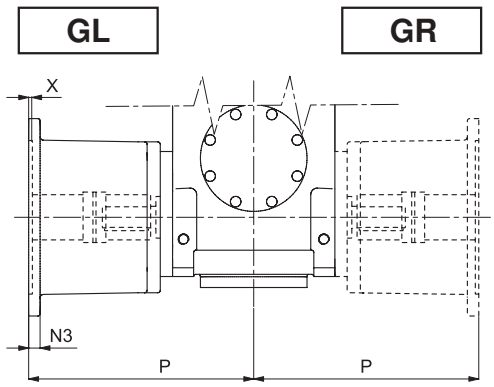
Dimensions are in [mm].

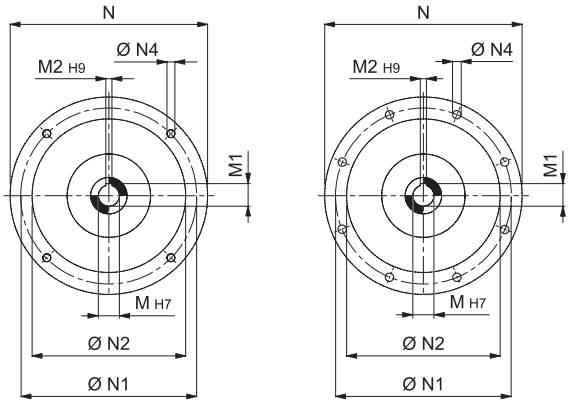
20.1 MOTOR MOUNTING WITH BELL HOUSING AND FLEXIBLE COUPLING



	M	M1	M2	N	N1	N2	N3	N4	X	P
HDP 60_132	38	41.3	10	300	265	230	16	14	5	311
HDP 60_160	42	45.3	12	350	300	250	23	18	6	341
HDP 60_180	48	51.8	14	350	300	250	23	18	6	341
HDP 60_200	55	59.3	16	400	350	300	—	M16x23	7	366
HDP 60_225	60	64.4	18	450	400	350	25	18	7	374
HDP 70_132	38	41.3	10	300	265	230	16	14	5	311
HDP 70_160	42	45.3	12	350	300	250	23	18	6	341
HDP 70_180	48	51.8	14	350	300	250	23	18	6	341
HDP 70_200	55	59.3	16	400	350	300	—	M16x23	7	366
HDP 70_225	60	64.4	18	450	400	350	25	18	7	374
HDP 80_160	42	45.3	12	350	300	250	23	18	6	371
HDP 80_180	48	51.8	14	350	300	250	23	18	6	371
HDP 80_200	55	59.3	16	400	350	300	—	M16x23	7	396
HDP 80_225	60	64.4	18	450	400	350	25	18	7	432
HDP 80_250	65	69.4	18	550	500	450	30	18	6	462
HDP 80_280	75	79.9	20	550	500	450	30	18	6	462
HDP 90_160	42	45.3	12	350	300	250	23	18	6	427
HDP 90_180	48	51.8	14	350	300	250	23	18	6	427
HDP 90_200	55	59.3	16	400	350	300	—	M16x23	7	452
HDP 90_225	60	64.4	18	450	400	350	25	18	7	457
HDP 90_250	65	69.4	18	550	500	450	30	18	6	487
HDP 90_280	75	79.9	20	550	500	450	30	18	6	487

Dimensions are in [mm].

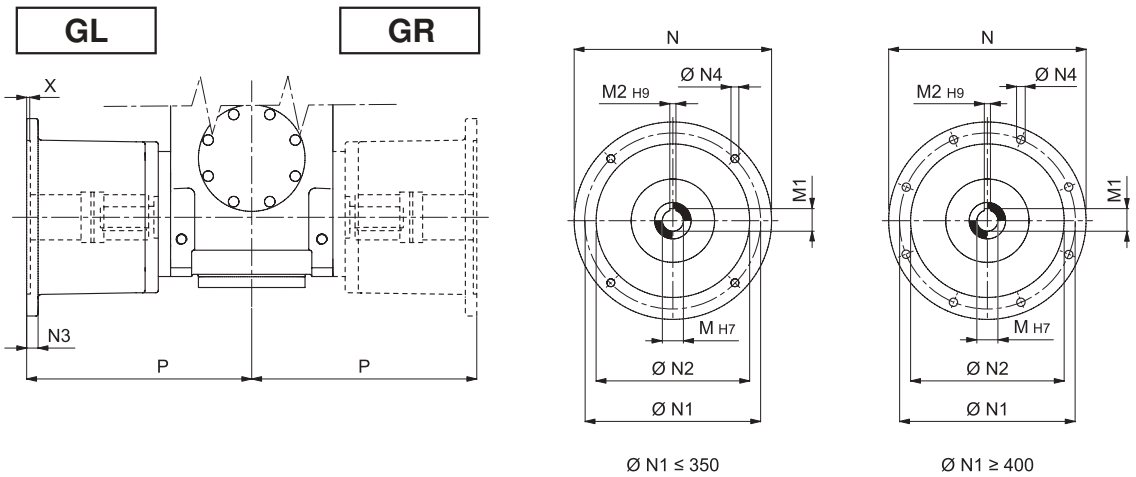




Ø N1 ≤ 350 Ø N1 ≥ 400

	M	M1	M2	N	N1	N2	N3	N4	X	P
HDP 100_112	28	31.3	8	250	215	180	15	14	5	395
HDP 100_132	38	41.3	10	300	265	230	—	M12x20	6	415
HDP 100_160	42	45.3	12	350	300	250	23	18	6	481
HDP 100_180	48	51.8	14	350	300	250	23	18	6	481
HDP 100_200	55	59.3	16	400	350	300	—	M16x23	7	506
HDP 100_225	60	64.4	18	450	400	350	26	18	7	513
HDP 100_250	65	69.4	18	550	500	450	30	18	6	543
HDP 100_280	75	79.9	20	550	500	450	30	18	6	543
HDP 100_315	80	85.4	22	660	600	550	22	22	10	579.5
HDP 110_112	28	31.3	8	250	215	180	15	14	5	395
HDP 110_132	38	41.3	10	300	265	230	—	M12x20	6	415
HDP 110_160	42	45.3	12	350	300	250	23	18	6	481
HDP 110_180	48	51.8	14	350	300	250	23	18	6	481
HDP 110_200	55	59.3	16	400	350	300	—	M16x23	7	506
HDP 110_225	60	64.4	18	450	400	350	26	18	7	513
HDP 110_250	65	69.4	18	550	500	450	30	18	6	543
HDP 110_280	75	79.9	20	550	500	450	30	18	6	543
HDP 110_315	80	85.4	22	660	600	550	22	22	10	579.5
HDP 120_132	38	41.3	10	300	265	230	—	M12x20	6	430
HDP 120_160	42	45.3	12	350	300	250	23	18	6	496
HDP 120_180	48	51.8	14	350	300	250	23	18	6	496
HDP 120_200	55	59.3	16	400	350	300	—	M16x23	7	521
HDP 120_225	60	64.4	18	450	400	350	26	18	7	528
HDP 120_250	65	69.4	18	550	500	450	30	18	6	558
HDP 120_280	75	79.9	20	550	500	450	30	18	6	558
HDP 120_315	80	85.4	22	660	600	550	22	22	10	594.5
HDP 125_132	38	41.3	10	300	265	230	—	M12x20	6	430
HDP 125_160	42	45.3	12	350	300	250	23	18	6	496
HDP 125_180	48	51.8	14	350	300	250	23	18	6	496
HDP 125_200	55	59.3	16	400	350	300	—	M16x23	7	521
HDP 125_225	60	64.4	18	450	400	350	26	18	7	528
HDP 125_250	65	69.4	18	550	500	450	30	18	6	558
HDP 125_280	75	79.9	20	550	500	450	30	18	6	558
HDP 125_315	80	85.4	22	660	600	550	22	22	10	594.5

Dimensions are in [mm].

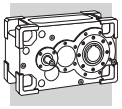


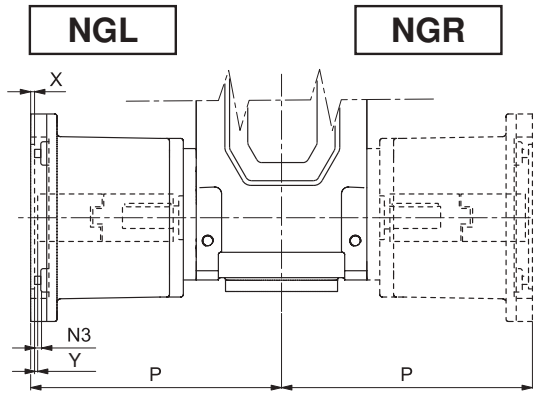
Ø N1 ≤ 350

Ø N1 ≥ 400

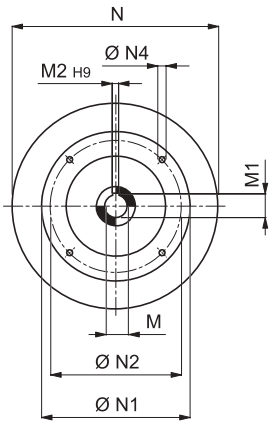
	M	M1	M2	N	N1	N2	N3	N4	X	P
HDP 130_160	42	45.3	12	350	300	250	23	18	6	551
HDP 130_180	48	51.8	14	350	300	250	23	18	6	551
HDP 130_200	55	59.3	16	400	350	300	—	M16x23	7	576
HDP 130_225	60	64.4	18	450	400	350	26	18	7	583
HDP 130_250	65	69.4	18	550	500	450	30	18	6	613
HDP 130_280	75	79.9	20	550	500	450	30	18	6	613
HDP 130_315	80	85.4	22	660	600	550	22	22	10	649.5
HDP 140_160	42	45.3	12	350	300	250	23	18	6	551
HDP 140_180	48	51.8	14	350	300	250	23	18	6	551
HDP 140_200	55	59.3	16	400	350	300	—	M16x23	7	576
HDP 140_225	60	64.4	18	450	400	350	26	18	7	583
HDP 140_250	65	69.4	18	550	500	450	30	18	6	613
HDP 140_280	75	79.9	20	550	500	450	30	18	6	613
HDP 140_315	80	85.4	22	660	600	550	22	22	10	649.5
HDP 150_160	42	45.3	12	350	300	250	23	18	6	601
HDP 150_180	48	51.8	14	350	300	250	23	18	6	601
HDP 150_200	55	59.3	16	400	350	300	—	M16x23	7	626
HDP 150_225	60	64.4	18	450	400	350	26	18	7	633
HDP 150_250	65	69.4	18	550	500	450	30	18	6	663
HDP 150_280	75	79.9	20	550	500	450	30	18	6	663
HDP 150_315	80	85.4	22	660	600	550	22	22	10	699.5
HDP 160_160	42	45.3	12	350	300	250	23	18	6	601
HDP 160_180	48	51.8	14	350	300	250	23	18	6	601
HDP 160_200	55	59.3	16	400	350	300	—	M16x23	7	626
HDP 160_225	60	64.4	18	450	400	350	26	18	7	633
HDP 160_250	65	69.4	18	550	500	450	30	18	6	663
HDP 160_280	75	79.9	20	550	500	450	30	18	6	663
HDP 160_315	80	85.4	22	660	600	550	22	22	10	699.5
HDP 170	BONFIGLIOLI TECHNICAL SERVICE									
HDP 180										

Dimensions are in [mm].

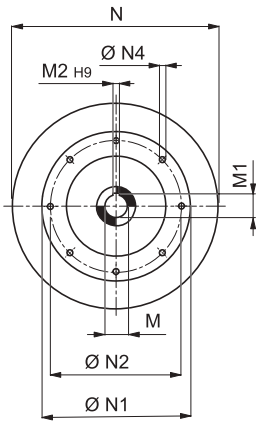




N180TC ... N360TC



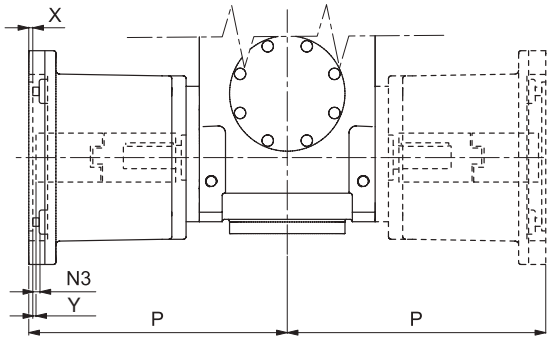
N400TC ... N440TC



	M	M1	M2	N	N1	N2	N3	N4	X	Y	P
HDP 60_N210TC	1.375 $^{+0.0014}_{+0.0006}$	1.518	0.312 $^{+0.0014}_{0}$	11.811	7.25	8.520	0.413	0.551	0.217	0.128	13.012
	34.925 $^{+0.035}_{+0.015}$	*38.557*	*7.925* $^{+0.036}_{0}$	*300*	*184.15*	*215.9*	*10.5*	*14*	*5.5*	*3.25*	*330.5*
HDP 60_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	14.193
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*360.5*
HDP 60_N280TC	1.875 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	14.39
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.3*	*365.5*
HDP 60_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	15.768
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*400.5*
HDP 60_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	15.768
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*400.5*
HDP 70_N210TC	1.375 $^{+0.0014}_{+0.0006}$	1.518	0.312 $^{+0.0014}_{0}$	11.811	7.25	8.520	0.413	0.551	0.217	0.128	13.012
	34.925 $^{+0.035}_{+0.015}$	*38.557*	*7.925* $^{+0.036}_{0}$	*300*	*184.15*	*215.9*	*10.5*	*14*	*5.5*	*3.25*	*330.5*
HDP 70_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	14.193
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*360.5*
HDP 70_N280TC	1.875 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	14.39
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.3*	*365.5*
HDP 70_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	15.768
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*400.5*
HDP 70_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	15.768
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*400.5*
HDP 80_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	15.374
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*390.5*
HDP 80_N280TC	1.875 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	15.571
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.25*	*395.5*
HDP 80_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	18.051
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*458.5*
HDP 80_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	18.051
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*458.5*
HDP 80_N400TC	2.875 $^{+0.0022}_{+0.0010}$	3.205	0.75 $^{+0.002}_{0}$	17.677	11	12.5	0.669	0.669	0.217	1.488	18.642
	73.025 $^{+0.055}_{+0.025}$	*81.407*	*19.05* $^{+0.05}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*37.8*	*473.5*
HDP 90_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	17.579
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*446.5*
HDP 90_N280TC	1.875 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	17.776
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.25*	*451.5*
HDP 90_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	19.035
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*483.5*
HDP 90_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	19.035
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*483.5*
HDP 90_N400TC	2.875 $^{+0.0022}_{+0.0010}$	3.205	0.75 $^{+0.002}_{0}$	17.677	11	12.5	0.669	0.669	0.217	1.488	19.626
	73.025 $^{+0.055}_{+0.025}$	*81.407*	*19.05* $^{+0.05}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*37.8*	*498.5*

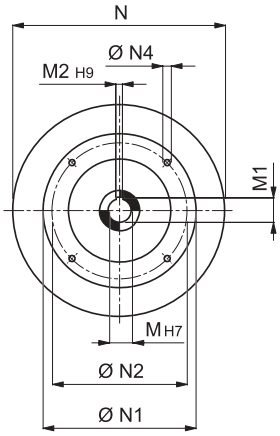
Dimensions are in Inch except when shown in *italic [mm]*

NGL

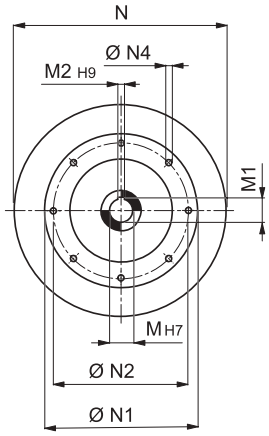


NGR

N180TC ... N360TC

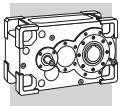


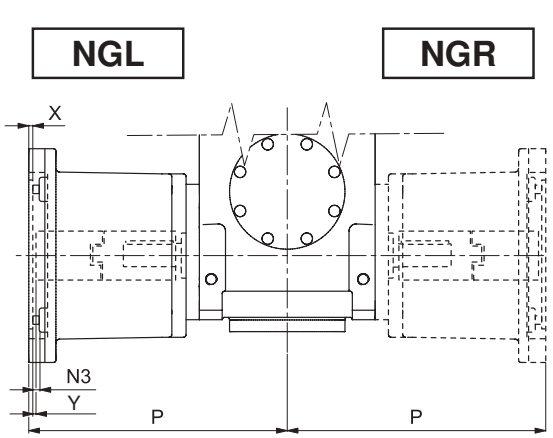
N400TC ... N440TC



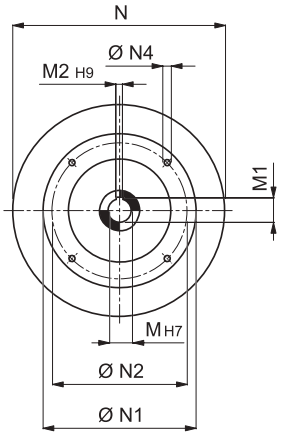
	M	M1	M2	N	N1	N2	N3	N4	X	Y	P
HDP 100_N180TC	1.125 $^{+0.0014}_{+0.0006}$	1.241	0.25 $^{+0.0014}_{0}$	9.843	7.25	8.5	0.453	0.551	0.217	0.061	16.535
	28.575 $^{+0.035}_{+0.015}$	*31.521*	*6.35* $^{+0.036}_{0}$	*250*	*184.15*	*215.9*	*11.5*	*14*	*5.5*	*1.55*	*420*
HDP 100_N210TC	1.375 $^{+0.0014}_{+0.0006}$	1.518	0.312 $^{+0.0014}_{0}$	9.843	7.25	8.5	0.453	0.551	0.217	0.128	16.535
	34.925 $^{+0.035}_{+0.015}$	*38.557*	*7.925* $^{+0.036}_{0}$	*250*	*184.15*	*215.9*	*11.5*	*14*	*5.5*	*3.25*	*420*
HDP 100_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	19.705
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*500.5*
HDP 100_N280TC	1.875 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	19.902
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.25*	*505.5*
HDP 100_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	21.24
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*539.5*
HDP 100_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	21.24
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*539.5*
HDP 100_N400TC	2.875 $^{+0.0022}_{+0.0010}$	3.205	0.75 $^{+0.002}_{0}$	17.677	11	12.5	0.669	0.669	0.217	1.488	21.831
	73.025 $^{+0.055}_{+0.025}$	*81.407*	*19.05* $^{+0.05}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*37.8*	*554.5*
HDP 110_N180TC	1.125 $^{+0.0014}_{+0.0006}$	1.241	0.25 $^{+0.0014}_{0}$	9.843	7.25	8.5	0.453	0.551	0.217	0.061	16.535
	28.575 $^{+0.035}_{+0.015}$	*31.521*	*6.35* $^{+0.036}_{0}$	*250*	*184.15*	*215.9*	*11.5*	*14*	*5.5*	*1.55*	*420*
HDP 110_N210TC	1.375 $^{+0.0014}_{+0.0006}$	1.518	0.312 $^{+0.0014}_{0}$	9.843	7.25	8.5	0.453	0.551	0.217	0.128	16.535
	34.925 $^{+0.035}_{+0.015}$	*38.557*	*7.925* $^{+0.036}_{0}$	*250*	*184.15*	*215.9*	*11.5*	*14*	*5.5*	*3.25*	*420*
HDP 110_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	19.705
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*500.5*
HDP 110_N280TC	1.87 5 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	19.902
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.25*	*505.5*
HDP 110_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	21.24
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*539.5*
HDP 110_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	21.24
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*539.5*
HDP 110_N400TC	2.875 $^{+0.0022}_{+0.0010}$	3.205	0.75 $^{+0.002}_{0}$	17.677	11	12.5	0.669	0.669	0.217	1.488	21.831
	73.025 $^{+0.055}_{+0.025}$	*81.407*	*19.05* $^{+0.05}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*37.8*	*554.5*
HDP 120_N210TC	1.375 $^{+0.0014}_{+0.0006}$	1.518	0.312 $^{+0.0014}_{0}$	9.843	7.25	8.5	0.453	0.551	0.217	0.128	17.126
	34.925 $^{+0.035}_{+0.015}$	*38.557*	*7.925* $^{+0.036}_{0}$	*250*	*184.15*	*215.9*	*11.5*	*14*	*5.5*	*3.25*	*435*
HDP 120_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	20.295
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*515.5*
HDP 120_N280TC	1.875 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	20.492
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.25*	*520.5*
HDP 120_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	21.831
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*554.5*
HDP 120_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	21.831
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*554.5*
HDP 120_N400TC	2.875 $^{+0.0022}_{+0.0010}$	3.205	0.75 $^{+0.002}_{0}$	17.677	11	12.5	0.669	0.669	0.217	1.488	22.421
	73.025 $^{+0.055}_{+0.025}$	*81.407*	*19.05* $^{+0.05}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*37.8*	*569.5*
HDP 120_N440TC	3.375 $^{+0.0026}_{+0.0012}$	3.76	0.875 $^{+0.002}_{0}$	25.984	14	16	0.748	0.709	0.236	1.56	24.882
	85.725 $^{+0.065}_{+0.030}$	*95.504*	*22.225* $^{+0.05}_{0}$	*660*	*355.6*	*406.4*	*19*	*18*	*6*	*39.6*	*632*

Dimensions are in Inch except when shown in *italic [mm]*

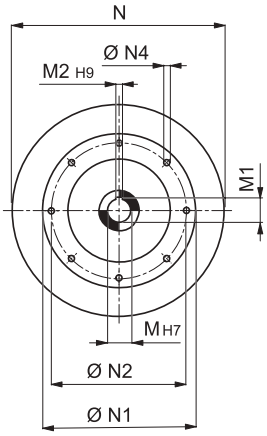




N180TC ... N360TC



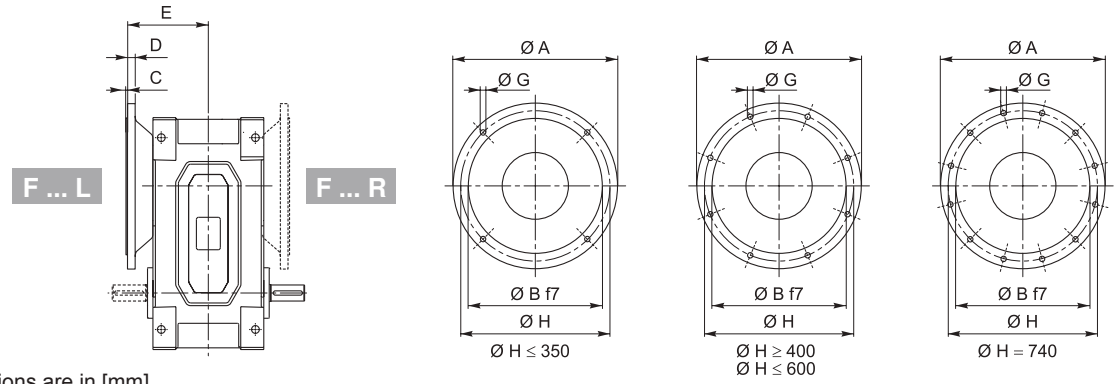
N400TC ... N440TC



	M	M1	M2	N	N1	N2	N3	N4	X	Y	P
HDP 125_N210TC	1.375 $^{+0.0014}_{+0.0006}$	1.518	0.312 $^{+0.0014}_{0}$	9.843	7.25	8.5	0.453	0.551	0.217	0.128	17.126
	34.925 $^{+0.035}_{+0.015}$	*38.557*	*7.925* $^{+0.036}_{0}$	*250*	*184.15*	*215.9*	*11.5*	*14*	*5.5*	*3.25*	*435*
HDP 125_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	20.295
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*515.5*
HDP 125_N280TC	1.875 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	20.492
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.25*	*520.5*
HDP 125_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	21.831
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*554.5*
HDP 125_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	21.831
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*554.5*
HDP 125_N400TC	2.875 $^{+0.0022}_{+0.0010}$	3.205	0.75 $^{+0.002}_{0}$	17.677	11	12.5	0.669	0.669	0.217	1.488	22.421
	73.025 $^{+0.055}_{+0.025}$	*81.407*	*19.05* $^{+0.05}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*37.8*	*569.5*
HDP 125_N440TC	3.375 $^{+0.0026}_{+0.0012}$	3.76	0.875 $^{+0.002}_{0}$	25.984	14	16	0.748	0.709	0.236	1.56	24.882
	85.725 $^{+0.065}_{+0.030}$	*95.504*	*22.225* $^{+0.05}_{0}$	*660*	*355.6*	*406.4*	*19*	*18*	*6*	*39.6*	*632*
HDP 130_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	22.461
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*570.5*
HDP 130_N280TC	1.875 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	22.657
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.25*	*575.5*
HDP 130_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	23.996
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*609.5*
HDP 130_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	23.996
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*609.5*
HDP 130_N400TC	2.875 $^{+0.0022}_{+0.0010}$	3.205	0.75 $^{+0.002}_{0}$	17.677	11	12.5	0.669	0.669	0.217	1.488	24.587
	73.025 $^{+0.055}_{+0.025}$	*81.407*	*19.05* $^{+0.05}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*37.8*	*624.5*
HDP 130_N440TC	3.375 $^{+0.0026}_{+0.0012}$	3.76	0.875 $^{+0.002}_{0}$	25.984	14	16	0.748	0.709	0.236	1.56	27.047
	85.725 $^{+0.065}_{+0.030}$	*95.504*	*22.225* $^{+0.05}_{0}$	*660*	*355.6*	*406.4*	*19*	*18*	*6*	*39.6*	*687*
HDP 140_N250TC	1.625 $^{+0.0018}_{+0.0008}$	1.796	0.375 $^{+0.0014}_{0}$	13.78	7.25	8.5	0.65	0.551	0.217	0.09	22.461
	41.275 $^{+0.045}_{+0.020}$	*45.618*	*9.525* $^{+0.036}_{0}$	*350*	*184.15*	*215.9*	*16.5*	*14*	*5.5*	*2.25*	*570.5*
HDP 140_N280TC	1.875 $^{+0.0018}_{+0.0008}$	2.102	0.5 $^{+0.0017}_{0}$	13.74	9	10.5	0.512	0.551	0.217	0.09	22.657
	47.625 $^{+0.045}_{+0.020}$	*53.381*	*12.7* $^{+0.043}_{0}$	*349*	*228.6*	*266.7*	*13*	*14*	*5.5*	*2.25*	*575.5*
HDP 140_N320TC	2.125 $^{+0.0022}_{+0.0010}$	2.35	0.5 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.079	23.996
	53.975 $^{+0.055}_{+0.025}$	*59.690*	*12.7* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2*	*609.5*
HDP 140_N360TC	2.375 $^{+0.0022}_{+0.0010}$	2.651	0.625 $^{+0.0017}_{0}$	17.677	11	12.5	0.669	0.669	0.217	0.108	23.996
	60.325 $^{+0.055}_{+0.025}$	*67.335*	*15.875* $^{+0.043}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*2.75*	*609.5*
HDP 140_N400TC	2.875 $^{+0.0022}_{+0.0010}$	3.205	0.75 $^{+0.002}_{0}$	17.677	11	12.5	0.669	0.669	0.217	1.488	24.587
	73.025 $^{+0.055}_{+0.025}$	*81.407*	*19.05* $^{+0.05}_{0}$	*449*	*279.4*	*317.5*	*17*	*17*	*5.5*	*37.8*	*624.5*
HDP 140_N440TC	3.375 $^{+0.0026}_{+0.0012}$	3.76	0.875 $^{+0.002}_{0}$	25.984	14	16	0.748	0.709	0.236	1.56	27.047
	85.725 $^{+0.065}_{+0.030}$	*95.504*	*22.225* $^{+0.05}_{0}$	*660*	*355.6*	*406.4*	*19*	*18*	*6*	*39.6*	*687*

Dimensions are in Inch except when shown in *italic [mm]*

20.2 MOUNTING FLANGE

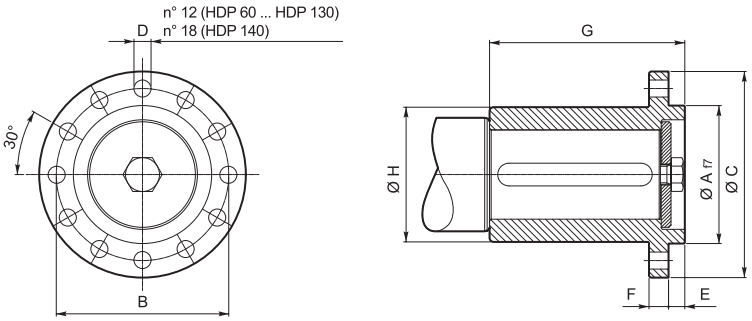


Dimensions are in [mm].

		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 125	**F730**	730	580	7	35	360	26	660
HDP 130	**F800**	800	680	7	40	460	26	740
HDP 140	**F800**	800	680	7	40	460	26	740
HDP 150		BONFIGLIOLI TECHNICAL SERVICE						
HDP 160								
HDP 170								
HDP 180								

20.3 MANIFOLD FLANGE

Available for shaft arrangement: LL, LR, LD, RL, RR and RD, all featuring a single output shaft extension.

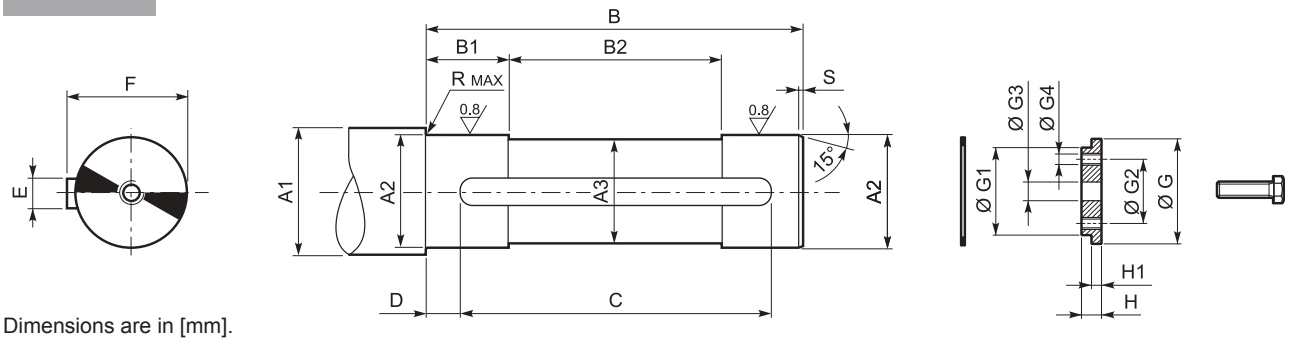


Dimensions are in [mm].

	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 125_ FM	220	320	384	32	19	31	344	240
HDP 130_ FM	220	320	384	32	19	31	344	250
HDP 140_ FM	250	380	450	32	19	40	344	310
HDP 150	BONFIGLIOLI TECHNICAL SERVICE							
HDP 160								
HDP 170								
HDP 180								

20.4 CUSTOMER'S SHAFT

H

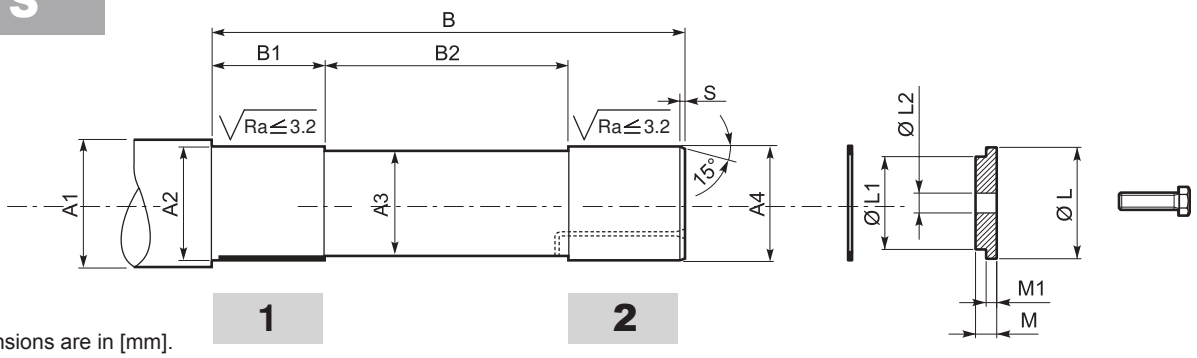


Dimensions are in [mm].

	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 125	≥ 163	150 h6	149.5	444	110	260	400	40	36 h9	158	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
HDP 150	≥ 223	210 h6	209.5	667	155	400	500	100	50 h9	221	3	3	50x28x450B
HDP 160	≥ 223	210 h6	209.5	667	155	400	500	100	50 h9	221	3	3	50x28x450B
HDP 170	≥ 255	240 h6	239.5	697	170	400	506	100	56 h9	252	3	3	56x32x450B
HDP 180	BONFIGLIOLI TECHNICAL SERVICE												

	Out of scope for supply								
	UNI7437	G	G1	G2	G3	G4	H	H1	UNI5739
HDP 60	—	90	70 d9	—	22	—	10	8.5	M20x50
HDP 70	—	100	80 d9	—	22	—	10	8.5	M20x50
HDP 80	—	115	95 d9	—	26	—	15	13.5	M24x60
HDP 90	—	130	110 d9	—	26	—	15	13.5	M24x60
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 125	150x4	150 d9	122	86	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
HDP 150	210x5	210 d9	178	140	33	M24	36	18	M30x100
HDP 160	210x5	210 d9	178	140	33	M24	36	18	M30x100
HDP 170	240x5	240 d9	208	160	39	M24	36	18	M36x110
HDP 180	BONFIGLIOLI TECHNICAL SERVICE								

S



Dimensions are in [mm].

	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 125	≥ 168	155 h6	149.5	150 g6	570	104	363	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
HDP 150	≥ 228	215 h6	209.5	210 g6	839	104	593	3	3
HDP 160	≥ 228	215 h6	209.5	210 g6	839	104	593	3	3
HDP 170	BONFIGLIOLI TECHNICAL SERVICE								
HDP 180									

	Out of scope for supply						
	UNI7437	L	L1	L2	M	M1	UNI5739
HDP 60	—	90	70 d9	22	10	8.5	M20x50
HDP 70	—	100	80 d9	22	10	8.5	M20x50
HDP 80	—	115	95 d9	26	15	13.5	M24x60
HDP 90	—	130	110 d9	26	15	13.5	M24x60
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 125	150x4	150 d9	122	26	19	15	M24x70
HDP 130	170x4	170 d9	142	33	21	17	M30x80
HDP 140	180x4	180 d9	150	33	21	17	M30x80
HDP 150	210x5	210 d9	178	33	29	18	M30x90
HDP 160	210x5	210 d9	178	33	29	18	M30x90
HDP 170	BONFIGLIOLI TECHNICAL SERVICE						
HDP 180							

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.

PARALLEL SHAFT GEAR UNIT SERIES HDP ATEX CONFIGURATION

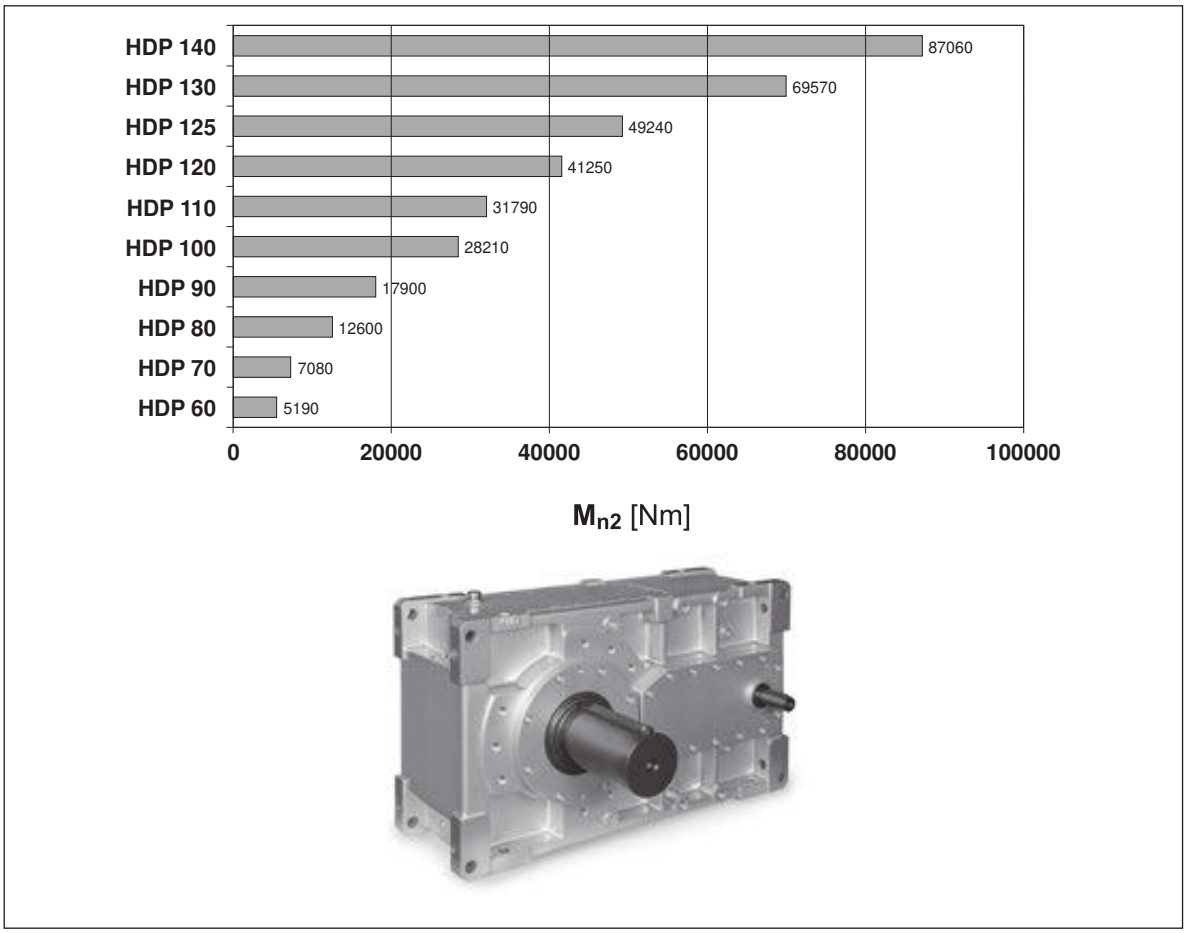
Selection of the the product must fit through the compilation of the selection form (see page 11). For a safe selection it is strongly recommended to rely on the long time experience of the Bonfiglioli Technical Service Dept.

21 INSTALLATION, USE AND MAINTENANCE

All the instructions for installation, use and maintenance of the product are given in the unit's Manual. This can be downloaded from www.bonfiglioli.com where the manual is available in PDF format in a number of languages.
This document must be kept in a suitable place, in the vicinity of the installed gear unit, as a reference for all persons authorised to work with or on the product throughout its service life.

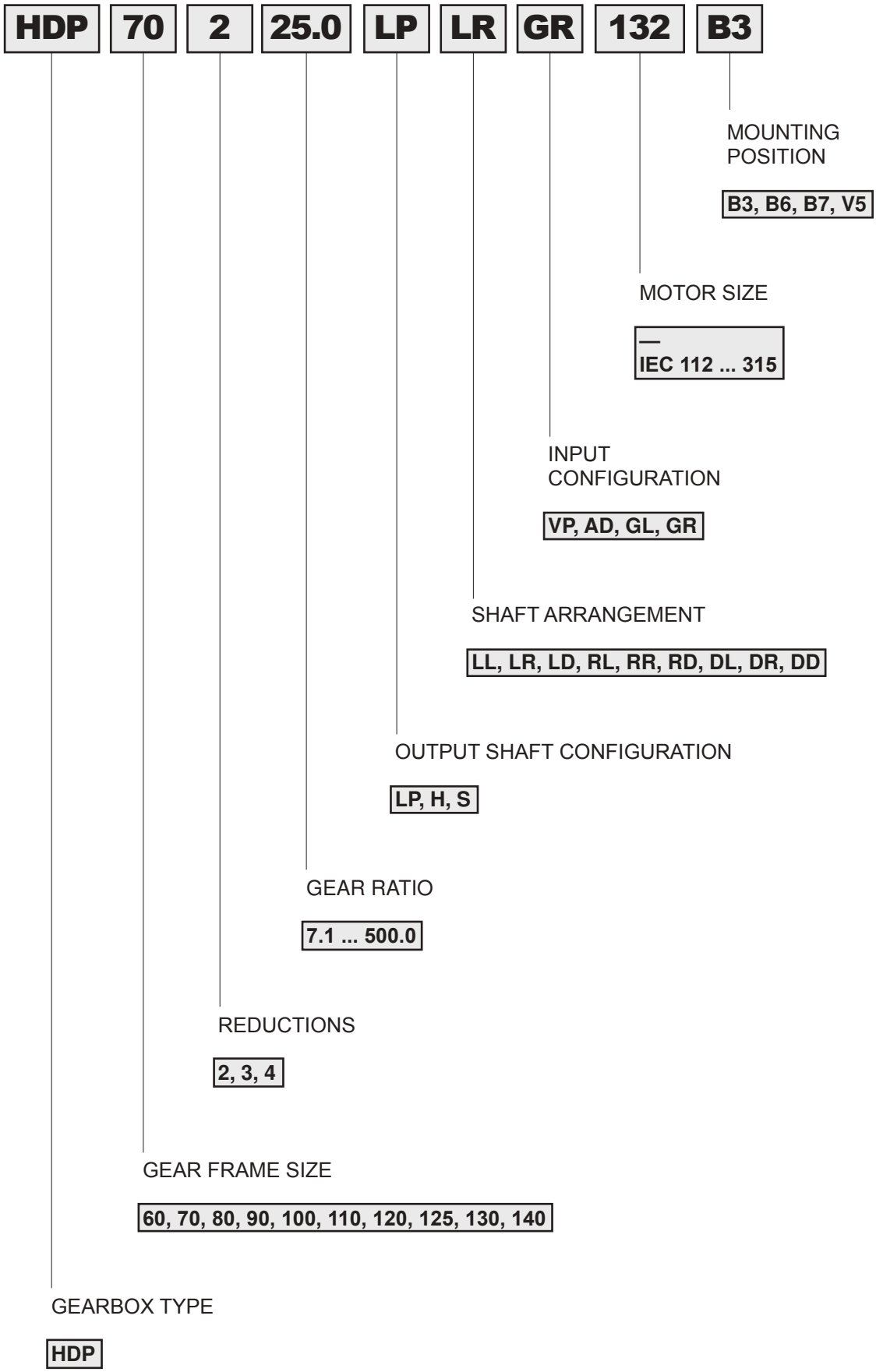
22 CONSTRUCTION OF ATEX-SPECIFIED EQUIPMENT

- Equipped with service plugs for periodic lubricant level checks.
- Equipped with vent caps with anti-intrusion valve.
- Fluoro elastomer seal rings as standard.
- No plastic component parts..
- Nameplate indication of the product category and type of protection.
- Components operable at above the operating temperature.
- Temperature indicator supplied along with each unit.

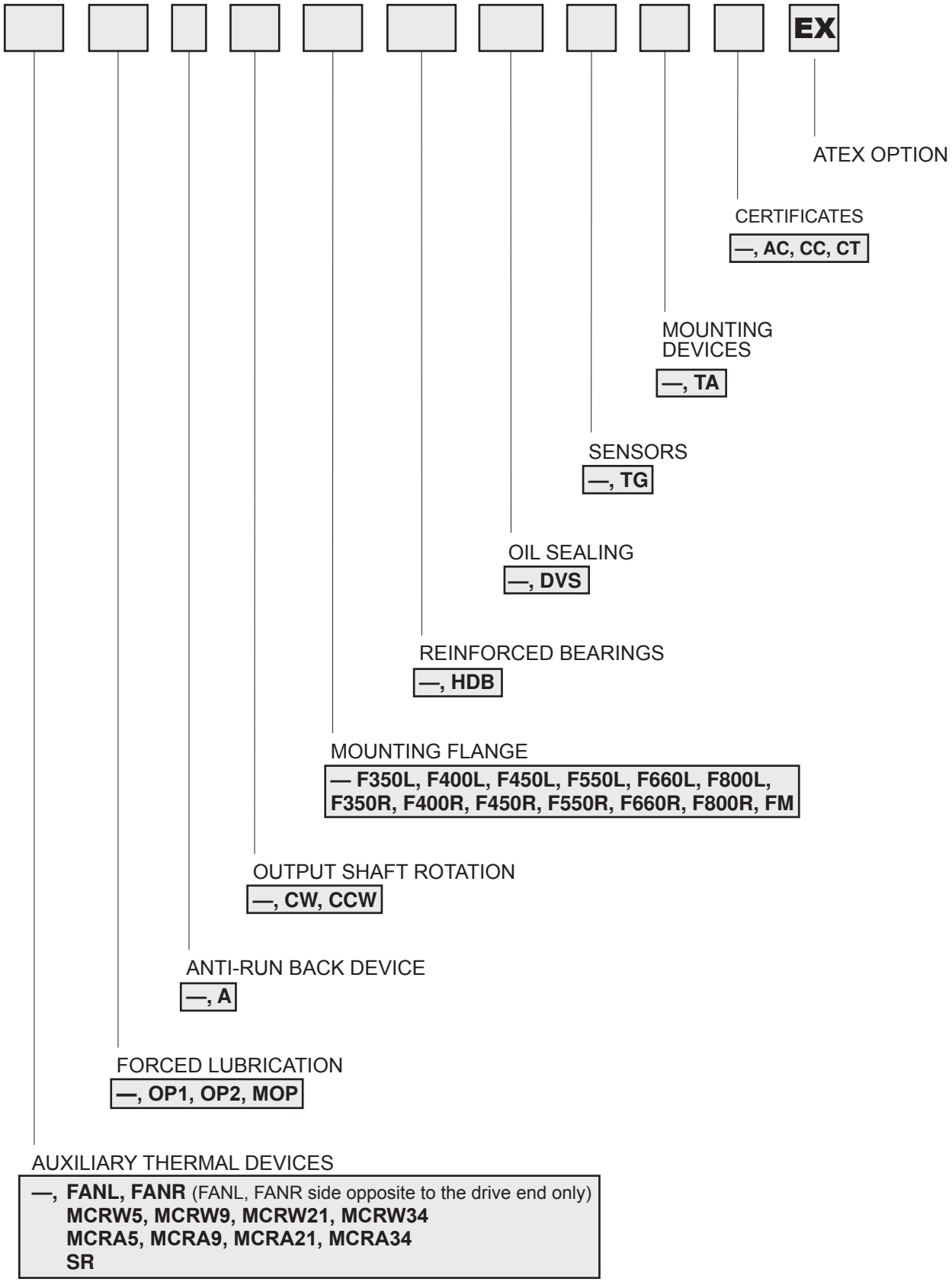


23 DESIGNATION

23.1 BASE VARIANTS



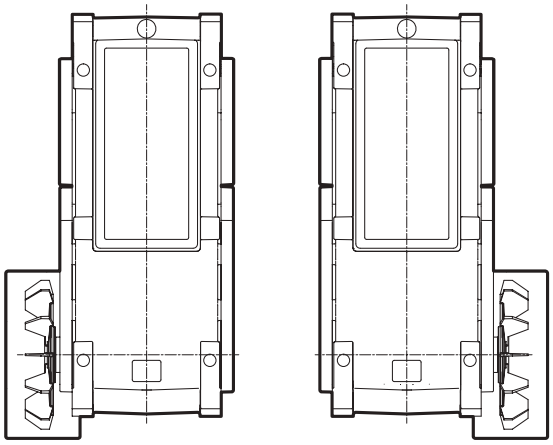
23.2 OPTIONAL VARIANTS



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.

23.3 FAN COOLING

Greater heat dissipation capacity can be achieved by installing cooling fans, which are keyed on to the gearbox input shaft. Gear units HDP 60 ... HDP 90 featuring a solid input shaft (VP), except for configuration LD – RD – DD and HDP 100 ... HDP 160 with lantern type motor adapter (GL/GR) may have an auxiliary fan fitted to the side opposite the drive end. Specify code **FANL** or **FANR.**



FANL **FANR**

23.4 AUXILIARY COOLING WITH AUTONOMOUS COOLING UNIT

Two types of cooling units are available, each in a range of sizes providing different cooling capacities. The two types use different cooling media for the oil: MCRW…EX – water/oil heat exchanger and MCRA…EX – 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 15.6.2. The following chart shows device availability according to gearbox size.
Your selection must take into account the deficit in thermal capacity that must be made up by contribution P_{TMCRW} or P_{TMCRA} as shown in the chart in section 17.

	MCRW5_EX MCRA5_EX	MCRW9_EX MCRA9_EX	MCRW21_EX MCRA21_EX	MCRW34_EX MCRA34_EX
HDP 100_EX	**X**	**X**		
HDP 110_EX	**X**	**X**		
HDP 120_EX	**X**	**X**	**X (*)**	
HDP 125_EX	**X**	**X**	**X (**)**	
HDP 130_EX	**X**	**X**	**X**	**X (**)**
HDP 140_EX	**X**	**X**	**X**	**X (**)**

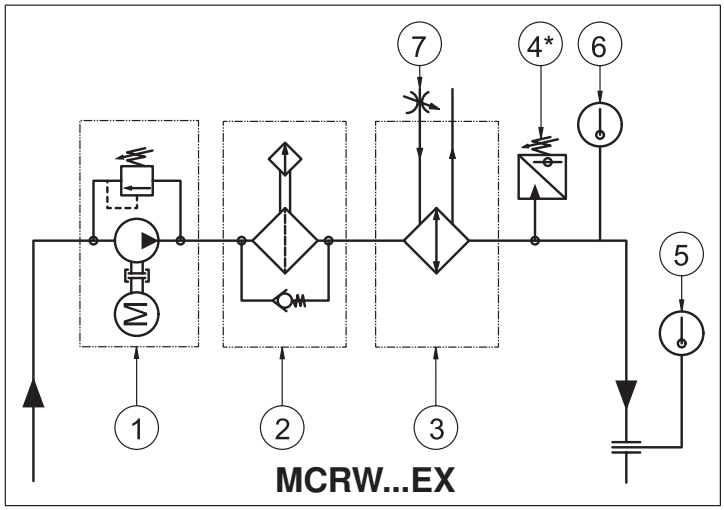
(*) not available for mounting position B3.

(**) not available for double reduction units in the mounting position B3.

The main components of the cooling units are as follows:

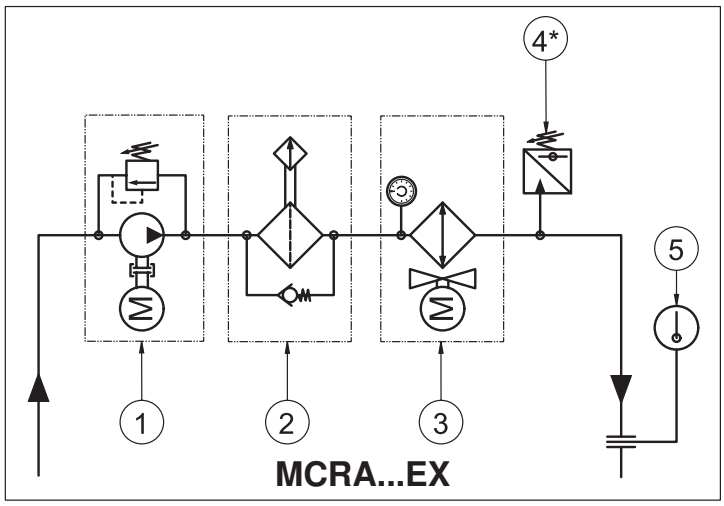
MCRW...EX

1) motorpump complete with by-pass circuit
2) filter with clogging visual indicator
3) water/oil heat exchanger
4) minimum pressure switch (only available in combination with forced lubrication)
5) maximum temperature thermostat
6) minimum temperature switch
7) electro-valve



MCRA...EX

1) motorpump complete with by-pass circuit
2) filter with clogging visual indicator
3) air/oil heat exchanger with thermostat
4) minimum pressure switch (only available in combination with forced lubrication)
5) maximum temperature thermostat

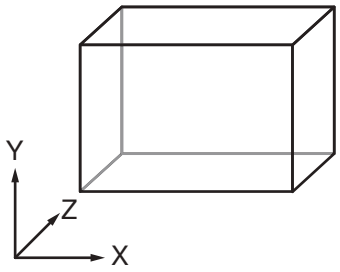


General warnings:
MCRW...EX : provide a water supply system that corresponds to the following specifications:
- max. pressure 10 bar
- maximum delivery temperature 20°C
- minimum flow rate Q_{H2O} as per the chart:

	MCRW5_EX	MCRW9_EX	MCRW21_EX	MCRW34_EX
Q_{H2O} [l/min]	10	18	31	56

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

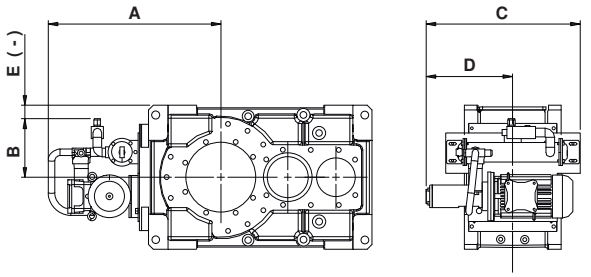
Cooling units maximum dimensions



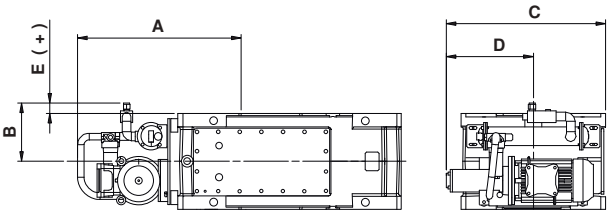
	X	Y	Z
MCRW5_EX	500	288	432
MCRW9_EX	565	328	409
MCRW21_EX	641	382	429
MCRW34_EX	811	430	551
MCRA5_EX	630	505	788
MCRA9_EX	808	605	648
MCRA21_EX	640	605	921
MCRA34_EX	921	605	699

MCRW...EX

B3



V5



B3 - MCRW5_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x ; 3x ; 4x	596	247	500	295	-23
	110	2x ; 3x ; 4x	581				-23
	120	2x ; 3x ; 4x	626				-53
	125	2x ; 3x ; 4x	666				-93
	130	2x ; 3x ; 4x	681				-133
	140	2x ; 3x ; 4x	706				-133

V5 - MCRW5_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x ; 3x ; 4x	596	247	500	295	62
	110	2x ; 3x ; 4x	581				62
	120	2x ; 3x ; 4x	626				47
	125	2x ; 3x ; 4x	666				47
	130	2x ; 3x ; 4x	681				-3
	140	2x ; 3x ; 4x	706				-3

B3 - MCRW9_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x ; 3x ; 4x	610.5	224	565	295	-46
	110	2x ; 3x ; 4x	595.5				-46
	120	2x ; 3x ; 4x	640.5				-76
	125	2x ; 3x ; 4x	680.5				-116
	130	2x ; 3x ; 4x	695.5				-156
	140	2x ; 3x ; 4x	720.5				-156

V5 - MCRW9_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x ; 3x ; 4x	610.5	224	565	295	39
	110	2x ; 3x ; 4x	595.5				39
	120	2x ; 3x ; 4x	640.5				24
	125	2x ; 3x ; 4x	680.5				24
	130	2x ; 3x ; 4x	695.5				-26
	140	2x ; 3x ; 4x	720.5				-26

B3 - MCRW21_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	120	2x ; 3x ; 4x	—	—	—	—	—
	125	2x	—	—	—	—	—
		3x ; 4x	760	244	641.5	361.5	-96
	130	2x ; 3x ; 4x	775				-136
	140	2x ; 3x ; 4x	800				-136

V5 - MCRW21_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	120	2x ; 3x ; 4x	720	244	641.5	361.5	44
	125	2x ; 3x ; 4x	760				44
	130	2x ; 3x ; 4x	775				-6
	140	2x ; 3x ; 4x	800				-6

B3 - MCRW34_EX

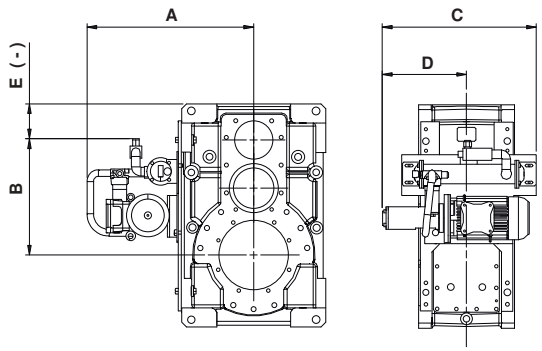
			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	130	2x	—	—	—	—	—
		3x ; 4x	823	366	811	431	-14
	140	2x	—	—	—	—	—
		3x ; 4x	848	366	811	431	-14

V5 - MCRW34_EX

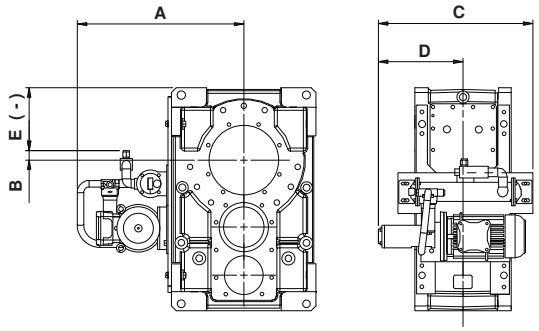
			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	130	2x ; 3x ; 4x	823	366	811	431	116
	140	2x ; 3x ; 4x	848				116

MCRW...EX

B6



B7



B6 - MCRW5_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x	573	465	500	295	-95
		3x ; 4x	573	585			-95
	110	2x	573	480			-95
		3x ; 4x	573	600			-95
	120	2x	603	473			-157
		3x ; 4x	603	608			-172
	125	2x	643	473			-197
		3x ; 4x	643	608			-212
	130	2x	683	479.5			-260.5
		3x ; 4x	683	575.8			-359.3
	140	2x	683	501.5			-278.5
		3x ; 4x	683	585.8			-389.3

B7 - MCRW5_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x	573	29	500	295	-241
		3x ; 4x	573	-91			-361
	110	2x	573	14			-241
		3x ; 4x	573	-106			-361
	120	2x	603	21			-279
		3x ; 4x	603	-114			-414
	125	2x	643	21			-319
		3x ; 4x	643	-114			-454
	130	2x	683	14.5			-340.5
		3x ; 4x	683	-86			-441
	140	2x	683	-8.5			-388.5
		3x ; 4x	683	-91			-471

B6 - MCRW9_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x	587.5	442	565	295	-118
		3x ; 4x	587.5	562			-118
	110	2x	587.5	457			-118
		3x ; 4x	587.5	577			-118
	120	2x	617.5	450			-180
		3x ; 4x	617.5	585			-195
	125	2x	657.5	450			-220
		3x ; 4x	657.5	585			-235
	130	2x	697.5	456.5			-283.5
		3x ; 4x	697.5	552.8			-382.3
	140	2x	697.5	478.5			-301.5
		3x ; 4x	697.5	562.8			-412.3

B7 - MCRW9_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x	587.5	6	565	295	-264
		3x ; 4x	587.5	-114			-384
	110	2x	587.5	-9			-264
		3x ; 4x	587.5	-129			-384
	120	2x	617.5	-2			-302
		3x ; 4x	617.5	-137			-437
	125	2x	657.5	-2			-342
		3x ; 4x	657.5	-137			-477
	130	2x	697.5	-8.5			-363.5
		3x ; 4x	697.5	-109			-464
	140	2x	697.5	-31.5			-411.5
		3x ; 4x	697.5	-114			-494

B6 - MCRW21_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	120	2x	697	470	641.2	361.2	-160
		3x ; 4x	697	605			-175
	125	2x	737	470			-200
		3x ; 4x	737	605			-215
	130	2x	777	476.5			263.5
		3x ; 4x	777	572.8			-362.3
	140	2x	777	498.5			-281.5
		3x ; 4x	777	582.8			-392.3

B7 - MCRW21_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	120	2x	697	18	641.2	361.2	-282
		3x ; 4x	697	-117			-417
	125	2x	737	18			-322
		3x ; 4x	737	-117			-457
	130	2x	777	11.5			-343.5
		3x ; 4x	777	-89			-444
	140	2x	777	-11.5			-391.5
		3x ; 4x	777	-94			-474

B6 - MCRW34_EX

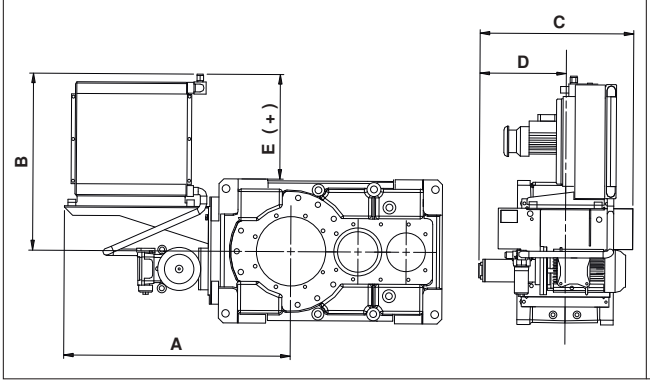
			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	130	2x	825	618.5	811	431	-121.5
		3x ; 4x	825	714.8			-220.3
	140	2x	825	640.5			-139.5
		3x ; 4x	825	724.8			-250.3

B7 - MCRW34_EX

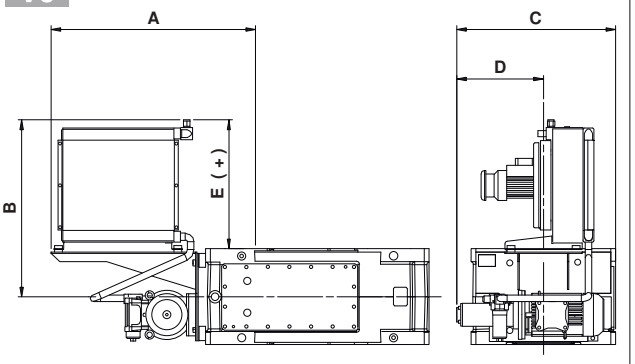
			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	130	2x	825	153.5	811	431	-201.5
		3x ; 4x	825	53			-302
	140	2x	825	130.5			-249.5
		3x ; 4x	825	48			-332

MCRA...EX

B3



V5



B3 - MCRA5_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x ; 3x ; 4x	813	603	642	430	333
	110	2x ; 3x ; 4x	798				333
	120	2x ; 3x ; 4x	843				303
	125	2x ; 3x ; 4x	883				263
	130	2x ; 3x ; 4x	898				223
	140	2x ; 3x ; 4x	923				223

V5 - MCRA5_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x ; 3x ; 4x	813	603	642	430	418
	110	2x ; 3x ; 4x	798				418
	120	2x ; 3x ; 4x	843				403
	125	2x ; 3x ; 4x	883				403
	130	2x ; 3x ; 4x	898				353
	140	2x ; 3x ; 4x	923				353

B3 - MCRA9_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x ; 3x ; 4x	913	623	678	295.5	353
	110	2x ; 3x ; 4x	898				353
	120	2x ; 3x ; 4x	943				323
	125	2x ; 3x ; 4x	983				283
	130	2x ; 3x ; 4x	998				243
	140	2x ; 3x ; 4x	1023				243

V5 - MCRA9_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x ; 3x ; 4x	913	623	678	295.5	438
	110	2x ; 3x ; 4x	898				438
	120	2x ; 3x ; 4x	943				423
	125	2x ; 3x ; 4x	983				423
	130	2x ; 3x ; 4x	998				373
	140	2x ; 3x ; 4x	1023				373

B3 - MCRA21_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	120	2x ; 3x ; 4x	—	—	—	—	—
	125	2x	—	—	—	—	—
		3x ; 4x	983	736	640.5	360.5	396
	130	2x ; 3x ; 4x	998				356
	140	2x ; 3x ; 4x	1023				356

V5 - MCRA21_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	120	2x ; 3x ; 4x	943	736	640.5	360.5	536
	125	2x ; 3x ; 4x	983				536
	130	2x ; 3x ; 4x	998				486
	140	2x ; 3x ; 4x	1023				486

B3 - MCRA34_EX

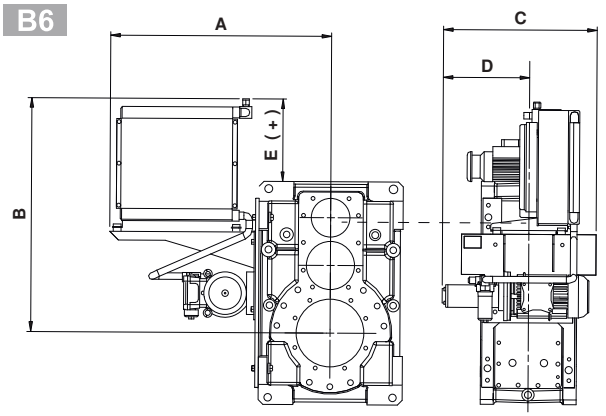
			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	130	2x	—	—	—	—	—
		3x ; 4x	998	736	701	416	356
	140	2x	—	—	—	—	—
		3x ; 4x	1023	736	701	416	356

V5 - MCRA34_EX

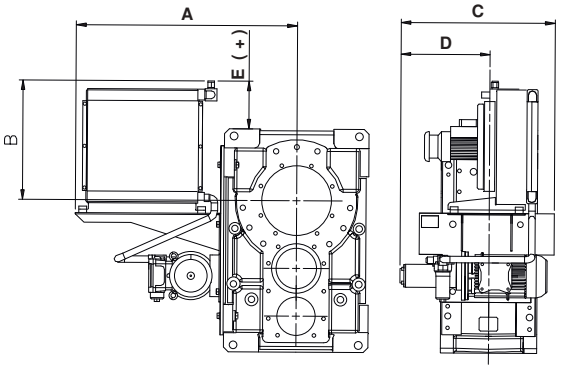
			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	130	2x ; 3x ; 4x	998	736	701	416	486
	140	2x ; 3x ; 4x	1023				486

MCRA...EX

B6



B7



B6 - MCRA5_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x	790	820.5	641.7	430	260.5
		3x ; 4x	790	940.5			260.5
	110	2x	790	835.5			260.5
		3x ; 4x	790	955.5			260.5
	120	2x	820	828.5			198.5
		3x ; 4x	820	963.5			183.5
	125	2x	860	828.5			158.5
		3x ; 4x	860	963.5			143.5
	130	2x	900	835			95
		3x ; 4x	900	931.3			-3.8
	140	2x	900	857			77
		3x ; 4x	900	941.3			-33.8

B7 - MCRA5_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x	790	384.5	641.7	430	114.5
		3x ; 4x	790	264.5			-5.5
	110	2x	790	369.5			114.5
		3x ; 4x	790	249.5			-5.5
	120	2x	820	376.5			76.5
		3x ; 4x	820	241.5			-58.5
	125	2x	860	376.5			36.5
		3x ; 4x	860	241.5			-98.5
	130	2x	900	370			15
		3x ; 4x	900	269.5			-85.5
	140	2x	900	347			-33
		3x ; 4x	900	264.5			-115.5

B6 - MCRA9_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x	890	840.5	680	295.2	280.5
		3x ; 4x	890	960.5			280.5
	110	2x	890	855.5			280.5
		3x ; 4x	890	975.5			280.5
	120	2x	920	848.5			218.5
		3x ; 4x	920	983.5			203.5
	125	2x	960	848.5			178.5
		3x ; 4x	960	983.5			163.5
	130	2x	1000	855			115
		3x ; 4x	1000	951.3			16.3
	140	2x	1000	877			97
		3x ; 4x	1000	961.3			-13.8

B7 - MCRA9_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	100	2x	890	404.5	680	295.2	134.5
		3x ; 4x	890	284.5			14.5
	110	2x	890	389.5			134.5
		3x ; 4x	890	269.5			14.5
	120	2x	920	396.5			96.5
		3x ; 4x	920	261.5			-38.5
	125	2x	960	396.5			56.5
		3x ; 4x	960	261.5			-78.5
	130	2x	1000	390			35
		3x ; 4x	1000	289.5			-65.5
	140	2x	1000	367			-13
		3x ; 4x	1000	284.5			-95.5

B6 - MCRA21_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	120	2x	920	962	640.2	360.2	332
		3x ; 4x	920	1097			317
	125	2x	960	962			292
		3x ; 4x	960	1097			277
	130	2x	1000	968.5			228.5
		3x ; 4x	1000	1064.8			129.8
	140	2x	1000	990.5			210.5
		3x ; 4x	1000	1074.8			99.8

B7 - MCRA21_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	120	2x	920	510	640.2	360.2	210
		3x ; 4x	920	375			75
	125	2x	960	510			170
		3x ; 4x	960	375			35
	130	2x	1000	503.5			148.5
		3x ; 4x	1000	403			48
	140	2x	1000	480.5			100.5
		3x ; 4x	1000	398			18

B6 - MCRA34_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	130	2x	1000	966	701	416	226
		3x ; 4x	1000	1062.3			127.3
	140	2x	1000	988			208
		3x ; 4x	1000	1072.3			97.3

B7 - MCRA34_EX

			A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
HDP	130	2x	1000	501	701	416	146
		3x ; 4x	1000	400.5			45.5
	140	2x	1000	478			98
		3x ; 4x	1000	395.5			15.5

24 OTHER INFORMATION ABOUT GEARBOX AND GEARMOTOR

Mounting positions, technical data, motor availability,moments of inertia and dimensions of **HDP-EX (Atex)** series don't change among equivalent **HDP** product series. All of these information can be obtained in the related chapters of this catalogue.

Bonfiglioli

We have a relentless commitment to excellence, innovation & sustainability. Our team creates, distributes and services world-class power transmission & drive solutions to keep the world in motion.

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