

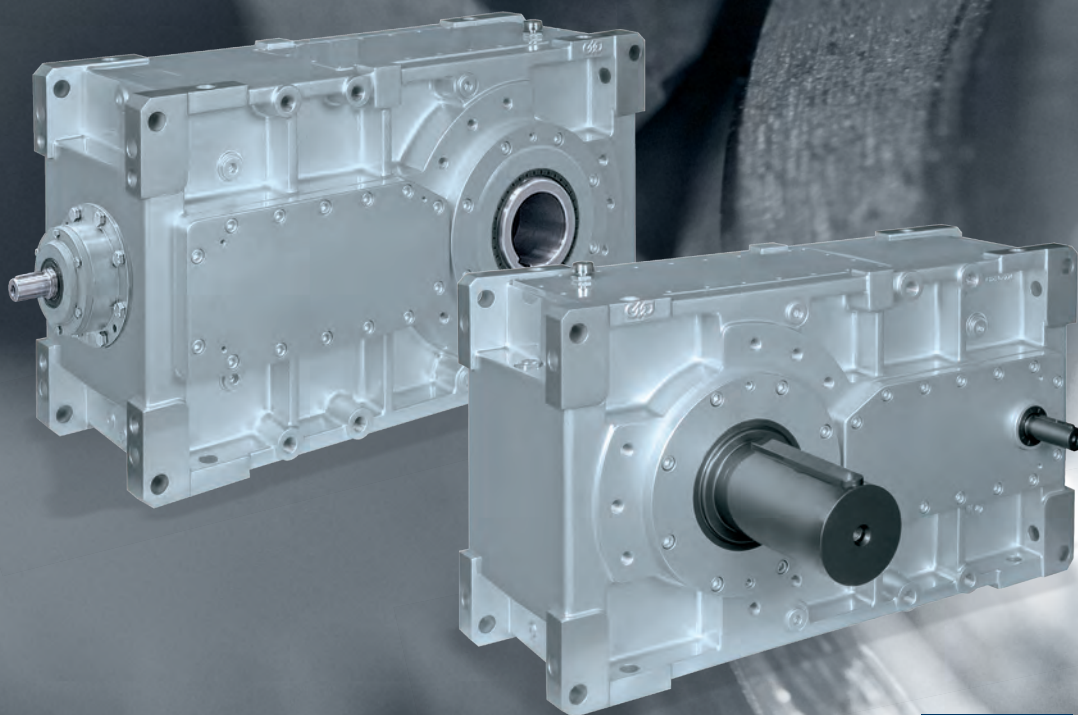
# **Bonfiglioli** **Riduttori**

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## **HDP-HDO series**

Parallel shaft gear units HDP series

Bevel helical gear units HDO series



PRODUCT

 INCLUDED

 **Bonfiglioli**  
*Forever Forward*





Chapter	Description	Page	Chapter	Description	Page
<b>GENERAL INFORMATION</b>			<b>PARALLEL SHAFT GEAR UNIT SERIES HDP ATEX CONFIGURATION</b>		
1	Symbols and units of measure	2	21	Installation, use and maintenance	175
2	General design features	3	22	Design features	175
3	Allowed temperature limits	3	23	Designation	176
4	Installation	4	24	Other information	178
5	Lubrication	5	<b>BEVEL HELICAL GEAR UNITS SERIES HDO</b>		
6	Storage	7	25	Design features	180
7	Conditions of supply	7	26	Product configurations	182
8	Paint coating	7	26.1	Base variants	182
9	Service factor	8	26.2	Optional variants	183
<b>SELECTING THE GEAR UNIT</b>			26.3	Mounting position	184
10	Engineering selection	12	26.4	Input and output configuration	184
11	Verifications	13	26.5	Execution	189
12	Sample application	22	26.6	Motor availability	190
<b>GEAR UNITS ATEX CONFIGURATION</b>			26.7	Optional variants	193
13	Introduction to the ATEX directives	24	27	Reference torque	215
<b>PARALLEL SHAFT GEAR UNITS SERIES HDP</b>			28	Thermal capacity and rating charts	216
14	Design features	28	29	Mass moment of inertia	298
15	Product configurations	30	30	Exact ratios	299
15.1	Base variants	30	31	Dimensions and weight	300
15.2	Optional variants	31	31.1	Motor mounting with bell housing and flexible coupling	329
15.3	Mounting position	32	31.2	Mounting flange	332
15.4	Input and output configuration	32	31.3	Manifold flange	332
15.5	Motor availability	35	31.4	Customer's shaft	333
15.6	Optional variants	37	<b>BEVEL HELICAL GEAR UNITS SERIES HDO ATEX CONFIGURATION</b>		
15.7	Execution for extruder	54	32	Installation, use and maintenance	335
16	Reference torque	55	33	Design features	335
17	Thermal capacity and rating charts	56	34	Designation	336
18	Mass moment of inertia	138	35	Other information	337
19	Exact ratios	139			
20	Dimensions and weight	140			
20.1	Motor mounting with bell housing and flexible coupling	169			
20.2	Mounting flange	172			
20.3	Manifold flange	172			
20.4	Customer's shaft	173			

#### Revisions

Refer to page 338 for the catalogue revision index. Visit [www.bonfiglioli.com](http://www.bonfiglioli.com) to search for catalogues with up-to-date revisions.



## GENERAL INFORMATION

### 1 SYMBOLS AND UNITS OF MEASUREMENT

Symbols	Units of Measure	Description	Symbols	Units of Measure	Description
<b>An</b> <sub>1,2</sub>	[kN]	Permissible axial force	<b>P</b> <sub>TFAN...</sub>	[kW]	Thermal capacity with the contribution of forced ventilation
<b>f</b> <sub>s</sub>	–	Service factor	<b>P</b> <sub>TSR</sub>	[kW]	Thermal capacity inclusive of contribution from cooling coil
<b>i</b>	–	Gear ratio	<b>P</b> <sub>TMCRA...</sub>	[kW]	Thermal capacity inclusive of contribution from air/oil exchanger cooling unit
<b>l</b>	–	Cyclic duration factor	<b>P</b> <sub>TMCRW...</sub>	[kW]	Thermal capacity inclusive of contribution from water/oil exchanger cooling unit
<b>J</b>	[Kgm <sup>2</sup> ]	Mass moment of inertia	<b>Rc</b> <sub>1,2</sub>	[kN]	Calculated radial force
<b>M</b> <sub>1,2</sub>	[Nm]	Torque	<b>Rn</b> <sub>1,2</sub>	[kN]	Permissible overhung load
<b>Mc</b> <sub>1,2</sub>	[Nm]	Calculated torque	<b>t</b> <sub>a</sub>	[°C]	Ambient temperature
<b>Mn</b> <sub>1,2</sub>	[Nm]	Rated torque	<b>t</b> <sub>s</sub>	[°C]	Surface temperature
<b>Mr</b> <sub>1,2</sub>	[Nm]	Torque demand	<b>t</b> <sub>o</sub>	[°C]	Oil temperature
<b>n</b> <sub>1,2</sub>	[min <sup>-1</sup> ]	Speed	<b>η</b>	–	Efficiency
<b>P</b> <sub>1,2</sub>	[kW]	Power			<sub>1</sub> value applies to input shaft
<b>Pn</b> <sub>1,2</sub>	[kW]	Rated power			<sub>2</sub> value applies to output shaft
<b>Pr</b> <sub>1,2</sub>	[kW]	Power demand			
<b>P<sub>T</sub></b>	[kW]	Overall thermal capacity			




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

(\*) = 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  $t_a < -20^\circ\text{C}$  and  $t_s, t_o > 80^\circ\text{C}$ , 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  $80^\circ\text{C}$  to  $95^\circ\text{C}$ .

(#) = 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](http://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)

		Operating ambient temperature [C°]																			
		-40	-35	-30	-25	-20	-15	-10	-5	0	+5	+10	+15	+20	+25	+30	+35	+40	+45	+50	
		suitability seals check			standard seals provided in the catalog																
Splash lubrication	Mineral oil	150 VG							*												
		220 VG	⊘	☎					*											☎	
		320 VG	⊘	☎						*											☎
		460 VG	⊘	☎							*										☎
	Synthetic oil (PAG)	150 VG				*															☎
		220 VG	⊘	☎		*															☎
320 VG		⊘	☎		*															☎	
Synthetic oil (PAO)	150 VG				*															☎	
	220 VG	⊘	☎		*															☎	
	320 VG	⊘	☎		*															☎	
Forced lubrication	Mineral oil	150 VG																			
		220 VG	⊘	☎																☎	
		320 VG	⊘	☎																	☎
		460 VG	⊘	☎																	☎
	Synthetic oil (PAG)	150 VG				*															☎
		220 VG	⊘	☎		*															☎
320 VG		⊘	☎		*															☎	
Synthetic oil (PAO)	150 VG				*															☎	
	220 VG	⊘	☎		*															☎	
	320 VG	⊘	☎		*															☎	

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  $1 \text{ min}^{-1}$  or the input speed greater than  $1800 \text{ min}^{-1}$ , 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  $1 \text{ min}^{-1}$  or the input speed greater than  $1800 \text{ min}^{-1}$ , please contact Bonfiglioli Technical Service for advise.

In mounting position V5, 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 position V5 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
<b>AGITATORS, MIXERS</b>		
Pure liquids	1.25	1.50
Liquids and solids	1.25	1.50
Liquids - variable density	1.50	1.75
<b>BLOWERS</b>		
Centrifugal	1.00	1.25
Lobe	1.25	1.50
Vane	1.25	1.50
<b>CLARIFIERS</b>	1.00	1.25
<b>CLAY WORKING MACHINERY</b>		
Brick press	1.75	2.00
Briquette machine	1.75	2.00
Pug mill	1.25	1.50
<b>COMPACTORS</b>	2.00	2.00
<b>COMPRESSORS</b>		
Centrifugal	1.25	1.50
Lobe	1.25	1.50
Reciprocating, multi-cylinder	1.50	1.75
Reciprocating, single-cylinder	1.75	2.00
<b>CONVEYORS - GENERAL PURPOSE</b>		
Uniformly loaded or fed	1.15	1.25
- Heavy duty		
Not uniformly fed	1.25	1.50
- Reciprocating or shaker	1.75	2.00
<b>CRANES (*)</b>		
<b>Dry dock</b>		
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
<b>Trolley Drive</b>		
Gantry Drive	3.00	3.00
Traction Drive	2.00	2.00
<b>Industrial duty</b>		
Main hoist	2.50	3.00
Auxiliary hoist	2.50	3.00
Bridge and	3.00	3.00
Trolley travel	3.00	3.00
<b>CRUSHER</b>		
Stone or ore	2.00	2.00
<b>DREDGES</b>		
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
<b>ELEVATORS</b>		
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
<b>EXTRUDERS</b>		
General	1.50	1.50
<b>Plastics</b>		
Variable speed drive	1.50	1.50
Fixed speed drive	1.75	1.75
<b>Rubber</b>		
Continuous screw operation	1.75	1.75
Intermittent screw operation	1.75	1.75
<b>FANS</b>		
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
<b>FEEDERS</b>		
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
<b>FOOD INDUSTRY</b>		
Dough mixer	1.25	1.50
Meat grinders	1.25	1.50
Slicers	1.25	1.50
<b>GENERATORS AND EXCITERS</b>		
	1.00	1.25
<b>HAMMER MILLS</b>		
	1.75	2.00
<b>HOISTS (*)</b>		
Heavy duty	1.75	2.00
Medium duty	1.25	1.50
Skip hoist	1.25	1.50
<b>LUMBER INDUSTRY</b>		
Barkers - spindle feed	1.25	1.50
Main drive	1.75	1.75
<b>Conveyors - burner</b>	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
<b>Conveyors</b>		
Slab	1.75	2.00
Transfer	1.25	1.50
<b>Chains</b>		
Floor	1.50	1.50
Green	1.50	1.75
<b>Cut-off saws</b>		
Chain	1.50	1.75
Drag	1.50	1.75
Debarking drums	1.75	2.00
<b>Feeds</b>		
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
<b>Transfers</b>		
Chain	1.50	1.75
Craneways	1.50	1.75
Tray drives	1.25	1.50
Veneer lathe drives	1.25	1.50
<b>METAL MILLS</b>		
Slab pushers	1.50	1.50
Shears	2.00	2.00
Wire drawing	1.25	1.50
Wire winding machine	1.50	1.50
<b>MILLS, ROTARY TYPE</b>		
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
<b>MIXERS</b>		
Concrete	1.50	1.75
<b>PAPER MILLS</b>		
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
<b>Conveyors</b>		
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
<b>Dryers</b>		
Paper machine	1.25	1.25
Conveyors type	1.25	1.25
Embossers	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
<b>Screens</b>		
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
<b>PLASTICS INDUSTRY</b>		
Batch mixers	1.75	1.75
Continuous mixers	1.50	1.50
Compounding mill	1.25	1.25
Calendars	1.50	1.50
<b>Secondary processing</b>		
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
<b>PUMPS</b>		
Centrifugal	1.15	1.25
<b>Reciprocating</b>		
Single acting, three or more cylinders	1.25	1.50
Double acting, two or more cylinders	1.25	1.50
<b>Rotary</b>		
Gear type	1.15	1.25
Lobe	1.15	1.25
Vane	1.15	1.25
<b>RUBBER INDUSTRY</b>		
<b>Intensive internal mixer</b>		
Batch mixers	1.75	1.75
Continuous mixers	1.50	1.50
Refiner - two rolls	1.50	1.50
Calendars	1.50	1.50
<b>SAND MULLER</b>	1.25	1.50
<b>SEWAGE DISPOSAL EQUIPMENT</b>		
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
<b>SCREENS</b>		
Air washing	1.00	1.25
Rotary - stone or gravel	1.25	1.50
Travelling water intake	1.00	1.25
<b>SUGAR INDUSTRY</b>		
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
<b>TEXTILE MACHINERY</b>	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.

<b>Bonfiglioli</b> <small>Forever Forward</small>		<b>TECHNICAL DATA REQUIRED FOR THE SELECTION OF HDP - HDO</b>			Nr: _____		
					Date: _____		
					Rev_	Date: _____	
<b>A ) GENERAL DATA</b>							
#	1	Company / Customer					
#	2	Contact					
#	3	Branch / Distributor					
#	4	Order quantity					
#	5	Delivery time					
<b>B ) ELECTRIC MOTOR</b>							
#	6	Motor Type					
#	7	$P_{n1}$	Rated motor power		[kW]		
#	8	$P_{r1}$	Motor power demand		[kW]		
#	9	$n_1$	Input speed		[min <sup>-1</sup> ]		
#	10	Pole number					
#	11	Motor mounting: B3 - B5 - B14					
<b>C<sub>1</sub>) GEARBOX</b>				<b>C<sub>2</sub>) ATEX CONDITION [GROUPII] - 2014/34/EU</b>			
#	12	Gearbox configuration					
#	13	$i$	Gear ratio		Category: [2 = standard / 3 = special]		
#	14	$n_2$	Output speed	[min <sup>-1</sup> ]	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 ]:		<b>CW</b>			
#	19	$L_{10H}$	Bearings lifetime		[h]	<b>CCW</b>	
#	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)			
<b>D ) ADDITIONAL LOADS</b>							
#	23	$R_{c2}$	Radial load on output shaft		[N]	<p style="font-size: small;">Angle Position <math>\alpha^\circ</math> + = Push - = Pull</p>	
#	24	$x_2$	Load application distance from shaft shoulder		[mm]		
#	25	$\alpha_{Rc2}$	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	$\alpha_{Rc1}$	Angle of application of the input Radial load		[° ' '']		
#	29	$A_{n2}$	Thrust load on output shaft ( + / - )		[N]		
#	30	$A_{n1}$	Thrust load on input shaft ( + / - )		[N]		
<b>E ) APPLICATION</b>							
#	31	Type of application					
#	32	<p style="font-size: x-small;"> <math>M_{2a}</math> <math>M_{2b}</math> <math>M_{2c}</math> <math>n_{2a}</math> <math>n_{2b}</math> <math>n_{2c}</math>  <math>(n_2 \times h)_a</math> <math>(n_2 \times h)_b</math> <math>(n_2 \times h)_c</math> <math>n_2 \times h</math> </p>		Time phase	Time phase	Gearbox output torque	Gearbox output speed
				%	hours	[Nm]	[min <sup>-1</sup> ]
				****	****		
				****	****		
				****	****		
#	33	Notes about Duty Cycle:					
		Duty type		<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4-S8</b>
#	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-	
<b>F ) OPTIONS OR ADDITIONAL REQUESTS</b>							
#	38	Lubrication					
#	39	Supplementary cooling systems					
#	40	Paint coating					
#	41	To specific requests for testing					
<b>G ) NOTES</b>							
#	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  $P_{r1}$  required at the input shaft:

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

	$\eta$
2x	0.96
3x	0.94
4x	0.92

3. Determine the applicable service factor  $f_s$  and the adjusting factor  $f_m$  depending on prime mover:

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

4. Use the rating charts to select the gear unit with the gear ratio nearest to that calculated, and with a rated power  $P_{n1}$ , 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  $M_p$  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  $P_{r1}$  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.




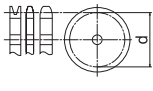
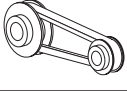
Resulting shaft loading must be compatible with both the bearing and the shaft capacity.

Namely shaft loading ( $R_{c1}$  for input shaft,  $R_{c2}$  for output shaft), must be equal or lower than admissible overhung load capacity for shaft under study ( $R_{x1}$  for input shaft,  $R_{x2}$  for output shaft). OHL capability listed in the rating chart section.

The procedure described above applies to both the input shaft and the output shaft, but care must be taken to apply factor  $K_1$  or factor  $K_2$  to suit the particular shaft.

The load generated by an external transmission can be calculated, to a good approximation, by the following equation:

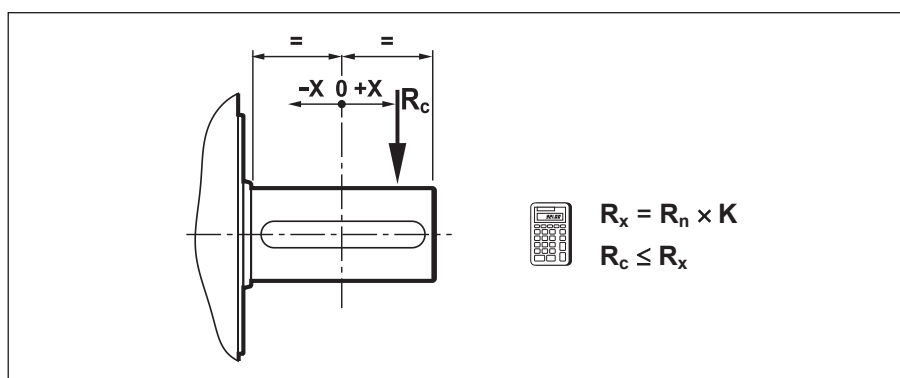
$$R_c = \frac{2000 \times M \times K_r}{d}$$

$K_r = 1$		$M$ [Nm]	
$K_r = 1.25$		$d$ [mm]	
$K_r = 1.5 - 2.0$			



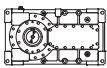


## 11,5 OVERHUNG LOADING VERIFICATION

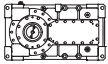



The  $R_{n1 \max}$  values listed in the table are the maximum permissible overhung loads; these loads may have to be reduced in certain applications.

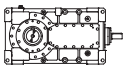
For an exact value, please contact Bonfiglioli's Technical Service.

	i =	R <sub>n1 max</sub> [kN]	K <sub>1</sub>													
			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	—	—	—	—	

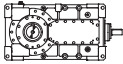



	i =	Rn1 max [kN]	K <sub>1</sub>												
			x [mm] =												
				-100	-75	-50	-25	0	25	50	75	100	150	200	250
HDP 120 2	7.9 ... 25.4	17.8	—	—	1.37	1.16	1.00	0.88	0.79	0.71	0.65	0.55	0.48	—	—
	25.8 ... 56.1	6.3	—	—	1.48	1.19	1.00	0.86	0.76	0.67	0.61	0.51	—	—	—
HDP 120 3	64.3 ... 125.2	6.9	—	—	1.54	1.21	1.00	0.85	0.74	0.65	0.59	0.49	—	—	—
	128 ... 277.2	2.1	—	—	—	1.18	1.00	0.87	0.76	0.68	0.62	—	—	—	—
HDP 120 4	323.2 ... 523.7	2.7	—	—	—	1.25	1.00	0.83	0.71	0.63	0.56	—	—	—	—
	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 2	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 3	144.4 ... 506.5	2.1	—	—	—	1.18	1.00	0.87	0.76	0.68	0.62	—	—	—	—
HDP 125 4	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 2	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 3	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 130 4	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 2	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 3	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 140 4	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 2	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 3	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 150 4	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 2	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 3	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 160 4															
HDP 170	 <b>BONFIGLIOLI TECHNICAL SERVICE</b>														
HDP 180															

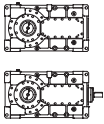



	i =	Rn1 max [kN]	K <sub>1</sub>												
			x [mm] =												
			-100	-75	-50	-25	0	25	50	75	100	150	200	250	300
HDO 71 3	21.8 ... 71.9	6.1	—	—	—	1.56	1.00	0.70	0.51	0.39	0.33	—	—	—	—
HDO 71 4	77.0 ... 475.4	4.8	—	—	—	1.88	1.00	0.54	0.38	0.29	0.23	—	—	—	—
HDO 81 3	25.9 ... 71.9	11.7	—	—	2.61	1.56	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 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 =	Rn1 max [kN]	K <sub>1</sub>												
			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	 BONFIGLIOLI TECHNICAL SERVICE														
HDO 180															

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

	Rn2 max [kN]	K <sub>2</sub>																An2 max [kN]	
		x [mm] =																	
		-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	 BONFIGLIOLI TECHNICAL SERVICE																		
HDP 180 HDO 180																			



## 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 gearbox sizes 60 through 90 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.


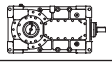



To check overhung load capacity, refer to the figure in section 11.5 and compare the actual overhung load  $R_c$  on the shaft with the maximum permissible overhung load  $R_x$  for the distance from the centre of the shaft at which the load is applied. Maximum permissible overhung load  $R_{x2}$  for the output shaft is obtained by multiplying the nominal overhung load  $R_{n2}$ , as listed in the technical data section, by the load location factor  $K_2$ .

Rated overhung loads  $R_n$  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  $\geq 1.25$

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

	$R_{n2}$ [kN]					
	HDP/HD0 ... 2		HDP/HD0 ... 3		HDP/HD0 ... 4	
$n_2$	$\leq 150$ [min <sup>-1</sup> ]		$\leq 75$ [min <sup>-1</sup> ]		$\leq 25$ [min <sup>-1</sup> ]	
	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 **R<sub>x</sub>** that is relevant to the distance the force applies from shaft midpoint and compare this with the force **R<sub>c</sub>** that acts onto the shaft. Multiply the nominal radial load **R<sub>n1</sub>**, as listed in the technical data section, for the load location factor **K<sub>1</sub>** to get the permissible overhung load **R<sub>x1</sub>** for the output shaft.

Rated overhung loads **R<sub>n</sub>** 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 **A<sub>n1</sub> ≤ 0.2 x R<sub>n1</sub>** 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:

<b>HDP</b>			2x	3x	4x
<b>LL</b>		<b>LR</b>		<b>LD</b>	
<b>RL</b>		<b>RR</b>		<b>RD</b>	
<b>DL</b>		<b>DR</b>		<b>DD</b>	

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	
	$n_1 = 1500 \text{ min}^{-1}$	$f_s = 1.5$
	$n_2 = 83 \text{ min}^{-1}$	$Mr_2 = 7850 \text{ Nm}$
	Mounting position: <b>B3</b>	
	Environmental conditions	
Ambient temperature = $40^\circ\text{C}$		
Installation in large areas		

### Product selection:

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

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

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



**HDP 80 2 18.0 LP LR VP B3**

[ $Pn_1 = 108.7 \text{ kW @ } n_1 = 1500 \text{ min}^{-1}$ ]

### Thermal capacity check:

$$P_T = 55 \text{ kW} < Pr_1 = 71.1 \text{ kW}$$



#### Option 1

- Fan cooling

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

$$P_{TFANL/R} > Pr_1$$

✓ OK

#### Option 2

- Cooling coil

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

$$P_{TSR} > Pr_1$$

✓ OK





	Application data	
	$n_1 = 1500 \text{ min}^{-1}$	$f_s = 1.5$
	$n_2 = 120 \text{ min}^{-1}$	$Mr_2 = 13500 \text{ Nm}$
	Mounting position: <b>B3</b>	
	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)  $Pr_1 = \frac{Mr_2 \times n_2}{9550 \times \eta} = \frac{13500 \times 120}{9550 \times 0.96} \approx 176.7 \text{ kW}$     c)  $Pn_1 \geq Pr_1 \cdot f_s \approx 265.1 \text{ kW}$



**HDO 110 2 12.5 LP L 1 VP B3**

[ $Pn_1 = 329.4 \text{ kW @ } n_1 = 1500 \text{ min}^{-1}$ ]

### Thermal capacity check:

$P_T = 52 \text{ kW} < Pr_1 = 176.7 \text{ kW}$



### Option 1

- Cooling units with air/oil heat exchanger

$P_{TMCR A9} = 184 \text{ kW @ } n_1 = 1500 \text{ min}^{-1}$

$P_{TMCR A9} > Pr_1$

✓ OK

### Option 2

- Cooling units with water/oil heat exchanger

$P_{TMCR W5} = 250 \text{ kW @ } n_1 = 1500 \text{ min}^{-1}$

$P_{TMCR W5} > Pr_1$

✓ OK



## GEAR UNITS ATEX CONFIGURATION

### 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:

- of **flammable substances**, in the form of gases, vapours, mists or dusts;
- with **air**;
- under atmospheric conditions;
- 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 (marking and data on the plate) and are suitable for installation in zones 1, 21, as highlighted in light gray in the above diagram. With the same marking they may of course also be installed in areas (minor risk) 2 and 22, highlighted in dark gray in the above diagram. Contacting our sales department, a special marking on the plate for the same zones 2 and 22 can be requested.**

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 with the 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 be endangered by fire damp and/or combustible dust.

**Group II** Applies to equipment intended for use in other places liable to be endangered 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		II					
	mines, firedamp		other potentially explosive areas (gas, dust)					
Category	M1	M2	1		2		3	
Atmosphere <sup>(1)</sup>			G	D	G	D	G	D
Zone			0	20	1	21	2	22
Type of protection gear unit <sup>(2)</sup>					c, k	c, k	c, k	c, k



(1) G = gas D = DUST

(2) as per EN13463

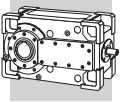
### 13.5 Declaration of conformity

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](http://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.

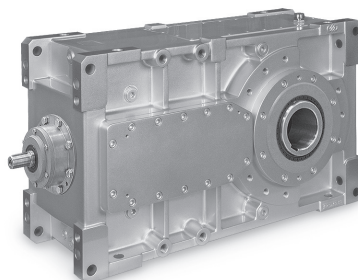
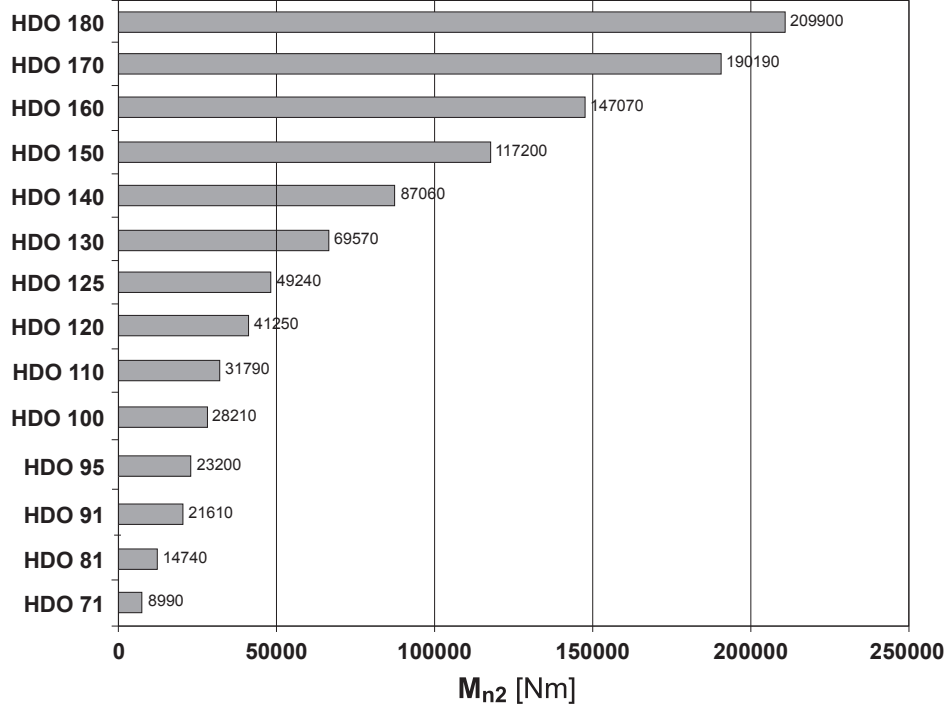


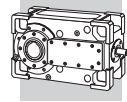
## BEVEL HELICAL GEAR UNITS SERIES HDO

### 25 DESIGN FEATURES

The main design features of the HDO bevel helical range are:

- 8 frame sizes: HDO 100, 110, 120, 125, 130, 140, 150 and 160, with 2, 3, and 4 reduction stages.
- 6 frame sizes: HDO 71, 81, 91, 95, 170, 180, with 3, and 4 reduction stages.
- Excellent distribution of rated torque values across the entire ratio range.
- Gear ratios with constant 12% escalation.
- HDO 71, 81, 91, 95, 100, 110, 120 and 125: monobloc casing in rigid, strong and precision machined spheroidal graphite cast iron, with internal and external paint finish. Universal mounting thanks to large number of machined and drilled surfaces. Casing shapes and thicknesses optimised by FEM analysis for superior structural rigidity, low acoustic emissions and reduced weight.
- HDO 130 ... HDO 180: spheroidal graphite cast iron or electrically-welded steel body made up of two half-casings, split along the same plane as the shafts. This design makes maintenance operations quick and economical. Casing shapes and thicknesses optimised by FEM analysis for superior structural rigidity, low acoustic emissions and reduced weight.
- Case hardened, tempered and ground finished alloyed steel bevel and helical gears, with corrected profiles for:
  - more silent operation and smoother running of input gears
  - maximum transmissible torque from final reduction stages
- Casehardened and ground finished input shafts; output shafts in extremely rigid hardened and tempered steel.





- Input shaft configurations:

Solid input shaft on same plane as or orthogonal to gear shafts, even simultaneously. Shaft end according to UNI/ISO 775-88 standards.

Provision for motor mounting with coupling bell and flexible joint.

- Output shaft configurations:

- solid, single or double-extension output shaft with ends conforming to UNI/ISO 775-88 standards

- hollow shaft with keyway

- hollow shaft with shrink disc

- Large, leading brand taper roller or self aligning roller bearings capable of withstanding high external loads.

- A wide range of gearbox customisation options available upon request, including:

- auxiliary cooling/heating devices

- forced lubrication systems

- backstop device

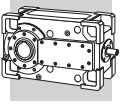
- mounting flanges or sleeves

- seals and gaskets in various types and materials

- sensors

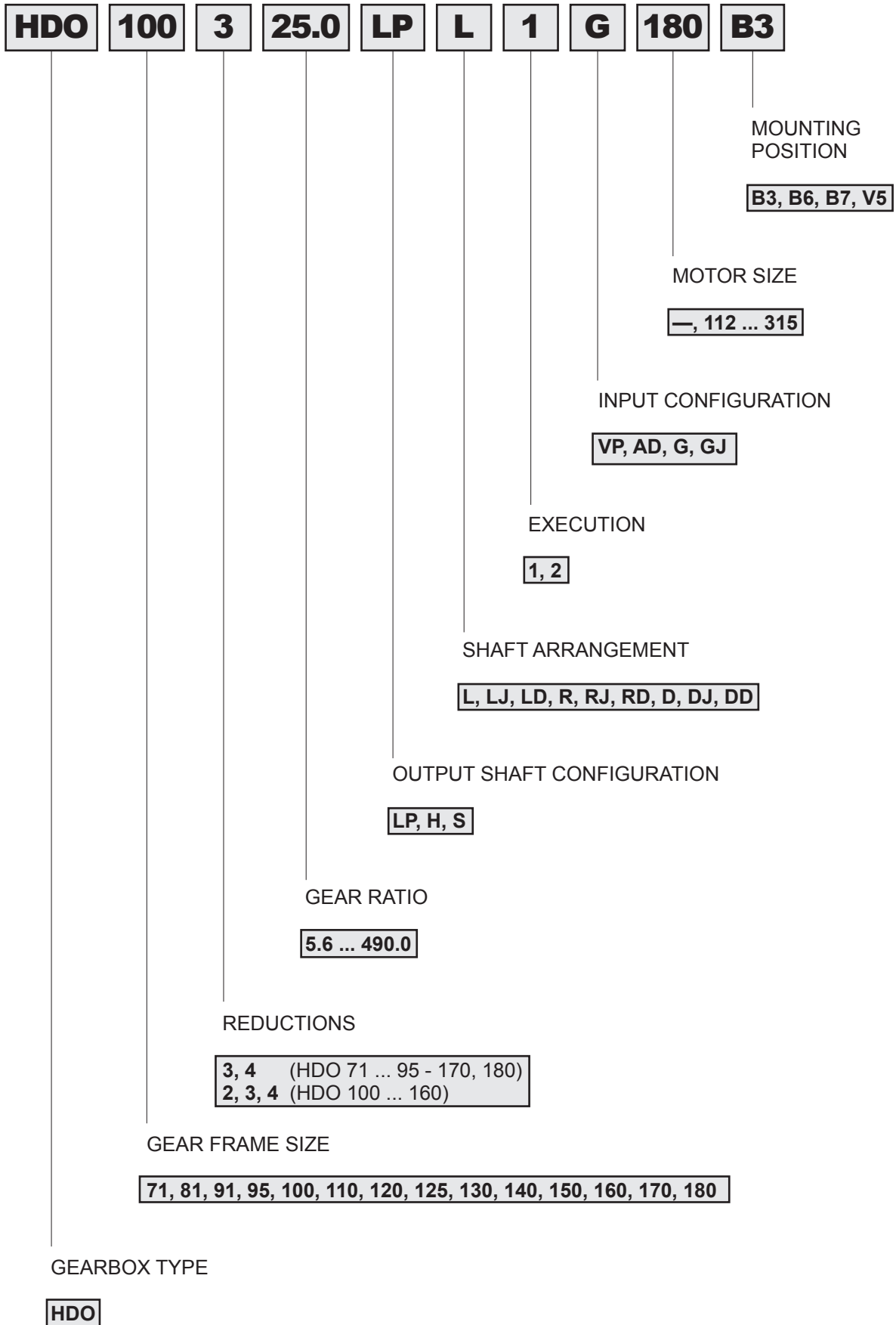
- dry-well device for vertical shaft installations

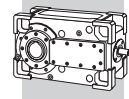
- fixing elements



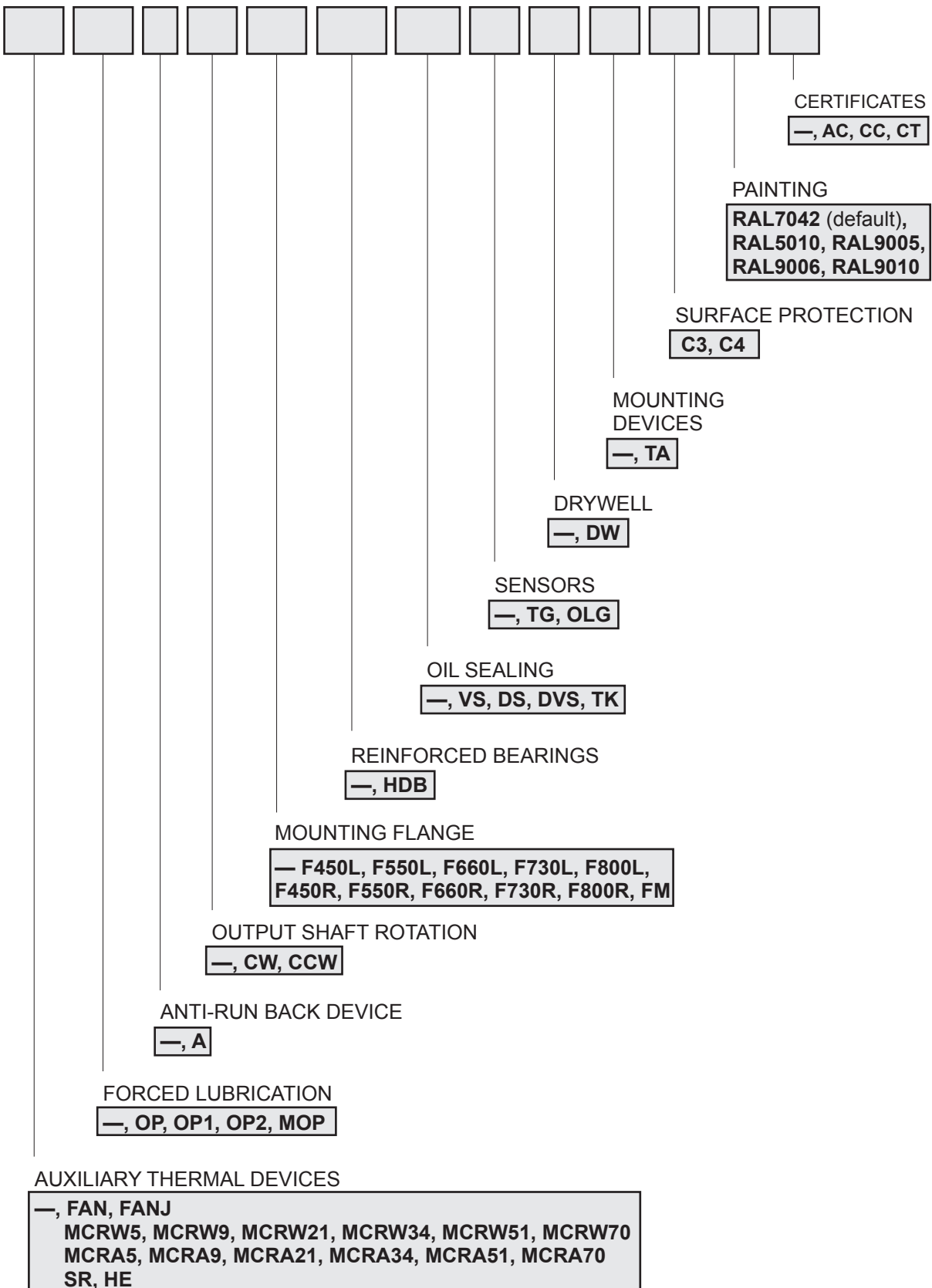
## 26 PRODUCT CONFIGURATIONS

### 26.1 BASE VARIANTS





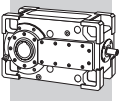
## 26.2 OPTIONAL VARIANTS



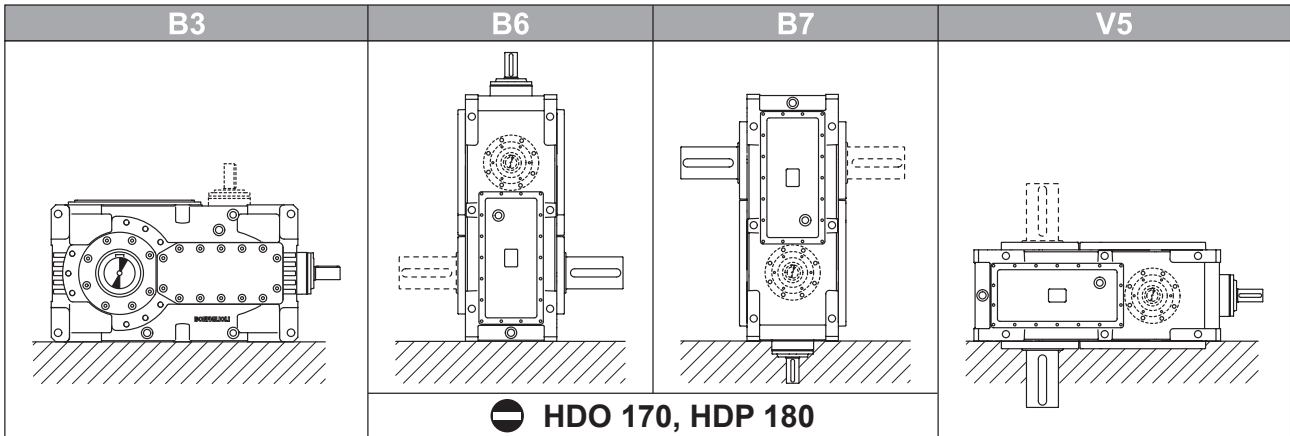
HDO

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.





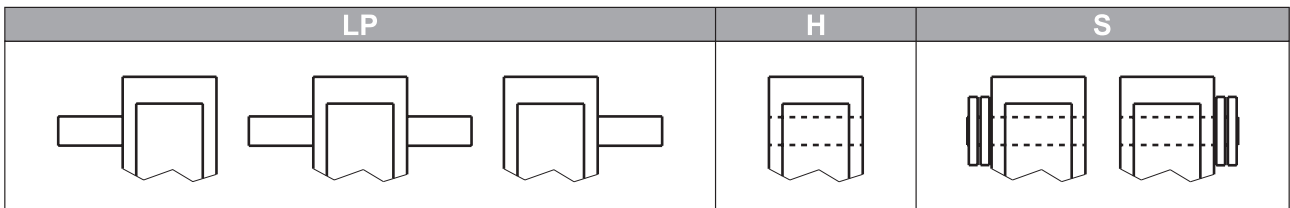
## 26.3 MOUNTING POSITION



If necessary, the sizes HDO 71-81-91-95 in position B3 can be used with the inspection cover on the bottom side. In this case it will be necessary for the installer to reverse the position of some plugs to ensure proper lubrication. For this operation please refer to the Operation and Maintenance Manual. This operation has to be evaluated taking into consideration its compatibility with the individual variants (fast part **J** configuration) and options (**SR, HE, TG, OLG**) by consulting our Technical Service.

## 26.4 INPUT AND OUTPUT CONFIGURATION

### 26.4.1 OUTPUT SHAFT CONFIGURATION

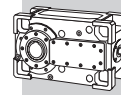


### 26.4.2 INPUT CONFIGURATION

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 mounting through bell housing and flexible coupling**. The option is designated **G** or **GJ** depending on what side of the gear unit the coupling is mounted. The flexible coupling is within the scope for supply.

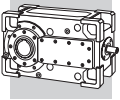
<b>VP</b>			
<b>G</b>			
<b>GJ</b>			
		HDO 71 ... 95	HDO 71 ... 95



### 26.4.3 SHAFT ARRANGEMENT

		VP							
B3	LP		L		R		LJ (*)		LD (*)
			R		RJ (*)		RD (*)		
			D		DJ (*)		DD (*)		
	S		L		LJ (*)		LD (*)		
			R		RJ (*)		RD (*)		
			L		LJ (*)		LD (*)		

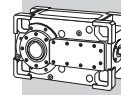
		G		GJ		HDO 71 ... 95			
B3	LP		L		LD (*)		LJ (*)		LD (*)
			R		RD (*)		RJ (*)		RD (*)
			D		DD (*)		DJ (*)		DD (*)
	S		L		LD (*)		LJ (*)		LD (*)
			R		RD (*)		RJ (*)		RD (*)
			L		LD (*)		LJ (*)		LD (*)



HDO

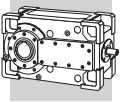
		VP					
B6	LP						
	H						
	S						

		G		GJ		HDO 71 ... 95
B6	LP					
	H					
	S					



		VP					
B7	LP	L	LJ (*)	LD (*)	R	RJ (*)	RD (*)
		D	DJ (*)	DD (*)			
	H	L	LJ (*)	LD (*)			
	S	L	LJ (*)	LD (*)	R	RJ (*)	RD (*)

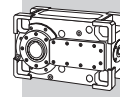
		G		GJ		HDO 71 ... 95	
B7	LP	L	LD (*)	LJ (*)	LD (*)	R	RD (*)
		D	DD (*)	DJ (*)	DD (*)		
	H	L	LD (*)	LJ (*)	LD (*)		
	S	L	LD (*)	LJ (*)	LD (*)	R	RD (*)



HDO

		VP					
V5	LP	L		LJ (*)		LD (*)	
		R		RJ (*)		RD (*)	
		D		DJ (*)		DD (*)	
	H	L		LJ (*)		LD (*)	
		R		RJ (*)		RD (*)	
	S	L		LJ (*)		LD (*)	
R			RJ (*)		RD (*)		

		G	GJ  HDO 71 ... 95		
V5	LP	L		LJ (*)	
		R		RJ (*)	
		D		DJ (*)	
	H	L		LJ (*)	
		R		RJ (*)	
	S	L		LJ (*)	
R			RJ (*)		

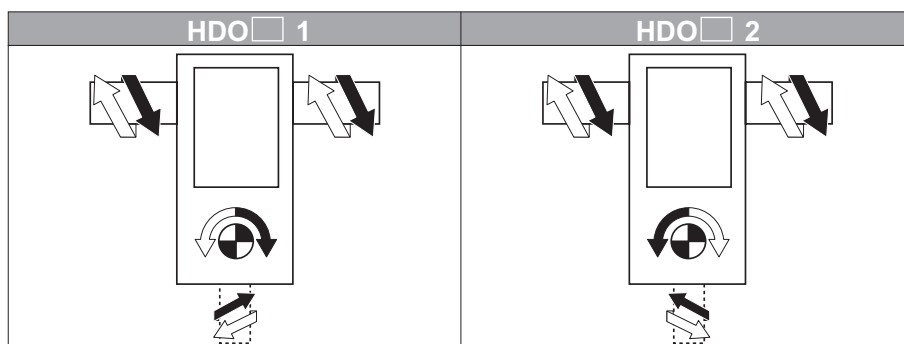


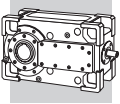
The gear ratios listed below are those that are not available for the configurations marked with (\*) in the charts here before.

(*)	Configurations not possible
	i
HDO 71 4	⊖
HDO 81 4	⊖
HDO 91 3	$i = 30.6$
HDO 91 4	⊖
HDO 95 3	$34.9 \leq i \leq 40.5$
HDO 95 4	⊖
HDO 100 2	⊖
HDO 100 4	⊖
HDO 110 2	⊖
HDO 110 4	⊖
HDO 120 2	⊖
HDO 120 3	$i = 24.6$
HDO 120 4	⊖
HDO 125 2	⊖
HDO 125 3	$27.7 \leq i \leq 35.8$
HDO 125 4	⊖
HDO 130 2	⊖
HDO 130 4	⊖
HDO 140 2	⊖
HDO 140 4	⊖
HDO 150 2	⊖
HDO 150 3	$15.6 \leq i \leq 25.4$
HDO 150 4	⊖
HDO 160 2	⊖
HDO 160 3	$17.7 \leq i \leq 31.3$
HDO 160 4	⊖
HDO 170	⊖
HDO 180	⊖

HDO

## 26.5 EXECUTION





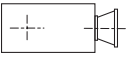
## 26.6 MOTOR AVAILABILITY

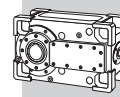
The following charts list the motor/gearbox combinations that are geometrically feasible. Variants are only applicable if either an AD (direct motor mounting) or a G/GJ input configuration (coupling through bell housing and flexible coupling) were previously specified within the ordering code.

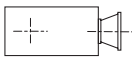



Because of standardisation, the rated power of the electric motor selected might be greater than nominal power  $P_{n1}$  of chosen gearbox. Make sure that the electric motor will never develop the extra power at any stage of the operating cycle. If you have any doubts about the validity of the application data, or uncertainty concerning the actual load pattern, install a torque limiting device or proportionally revise the applicable service factor.

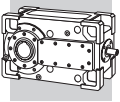
	Input configuration				
	AD				
	112	132	160	180	200
HDO 71 3	—	X	X	X	X
HDO 81 3	—	—	X	X	X
HDO 91 3	—	—	—	X	X
HDO 91 4	—	—	X	X	X
HDO 95 3	—	—	—	X	X
HDO 95 4	—	—	X	X	X

	Input configuration							
	G							
	112	132	160	180	200	225	250	280
HDO 71 3	—	21.8_71.9	21.8_71.9	21.8_71.9	21.8_71.9	21.8_71.9	—	—
HDO 81 3	—	—	25.9_71.9	25.9_71.9	25.9_71.9	25.9_71.9	25.9_71.9	25.9_71.9
HDO 91 3	—	—	18.6_66.1	18.6_66.1	18.6_66.1	18.6_66.1	18.6_66.1	18.6_66.1
HDO 91 4	82.0_489.3	82.0_489.3	82.0_489.3	82.0_489.3	82.0_489.3	82.0_489.3	—	—
HDO 95 3	—	—	21.2_72.3	21.2_72.3	21.2_72.3	21.2_72.3	21.2_72.3	21.2_72.3
HDO 95 4	81.6_489.7	81.6_489.7	81.6_489.7	81.6_489.7	81.6_489.7	81.6_489.7	—	—




	Input configuration								
	G								
	112	132	160	180	200	225	250	280	315
HDO 100_2	—	—	—	—	—	—	5.8_13.5	5.8_13.5	5.8_13.5
HDO 100_3	—	—	20.2_67.5	20.2_67.5	20.2_67.5	20.2_67.5	14.0_67.5	14.0_67.5	14.0_67.5
HDO 100_4	160.0_344.2	70.8_344.2	70.8_344.2	70.8_344.2	70.8_139.8	70.8_139.8	—	—	—
HDO 110_2	—	—	—	—	—	—	—	6.4_15.5	6.4_15.5
HDO 110_3	—	—	22.0_77.5	22.0_77.5	22.0_77.5	22.0_77.5	22.0_77.5	18.9_77.5	18.9_77.5
HDO 110_4	137.1_395.0	137.1_395.0	77.4_395.0	77.4_395.0	77.4_121.7	77.4_121.7	—	—	—
HDO 120_2	—	—	—	—	—	—	—	—	6.6_15.5
HDO 120_3	—	—	—	—	28.3_78.6	28.3_78.6	28.3_78.6	17.3_78.6	17.3_78.6
HDO 120_4	—	79.7_400.6	87.0_400.6	87.0_400.6	87.0_162.2	87.0_162.2	—	—	—
HDO 125_2	—	—	—	—	—	—	—	—	7.4_16.9
HDO 125_3	—	—	—	—	38.8_85.9	38.8_85.9	38.8_85.9	19.2_85.9	19.2_85.9
HDO 125_4	—	97.0_438.0	97.0_438.0	97.0_438.0	97.0_178.0	97.0_178.0	—	—	—
HDO 130_2	—	—	—	—	—	—	—	—	5.7_13.6
HDO 130_3	—	—	—	—	—	—	15.2_67.1	15.2_67.1	15.2_67.1
HDO 130_4	—	—	71.5_335.6	71.5_335.6	71.5_335.6	71.5_335.6	71.5_335.6	71.5_335.6	—
HDO 140_2	—	—	—	—	—	—	—	—	6.6_15.7
HDO 140_3	—	—	—	—	—	—	17.7_77.3	17.7_77.3	17.7_77.3
HDO 140_4	—	—	82.3_386.6	82.3_386.6	82.3_386.6	82.3_386.6	82.3_386.6	82.3_386.6	—
HDO 150_2	—	—	—	—	—	—	—	—	—
HDO 150_3	—	—	—	—	—	—	—	15.6_60.8	15.6_60.8
HDO 150_4	—	—	—	101.8_238.8	101.8_238.8	101.8_238.8	66.9_238.8	66.9_238.8	66.9_238.8
HDO 160_2	—	—	—	—	—	—	—	—	—
HDO 160_3	—	—	—	—	—	—	—	17.7_68.6	17.7_68.6
HDO 160_4	—	—	—	115.2_269.7	115.2_269.7	115.2_269.7	75.9_269.7	75.9_269.7	75.9_269.7
HDO 170	 <b>BONFIGLIOLI TECHNICAL SERVICE</b>								
HDO 180									

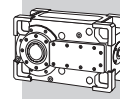




**HDO**

	Input configuration						
	GJ						
	160	180	200	225	250	280	315
HDO 100_2	⊖						
HDO 100_3	20.2_67.5	20.2_67.5	20.2_67.5	20.2_67.5	14.0_67.5	14.0_67.5	14.0_67.5
HDO 100_4	⊖						
HDO 110_2	⊖						
HDO 110_3	22.0_77.5	22.0_77.5	22.0_77.5	22.0_77.5	22.0_77.5	18.9_77.5	18.9_77.5
HDO 110_4	⊖						
HDO 120_2	⊖						
HDO 120_3	—	—	28.3_78.6	28.3_78.6	28.3_78.6	17.3_78.6 ⊖ (24.6)	17.3_78.6 ⊖ (24.6)
HDO 120_4	⊖						
HDO 125_2	⊖						
HDO 125_3	—	—	38.8_85.9	38.8_85.9	38.8_85.9	19.2_85.9 ⊖ (27.7 33.0 35.8)	19.2_85.9 ⊖ (27.7 33.0 35.8)
HDO 125_4	⊖						
HDO 130_2	⊖						
HDO 130_3	—	—	—	—	15.2_67.1	15.2_67.1	15.2_67.1
HDO 130_4	⊖						
HDO 140_2	⊖						
HDO 140_3	—	—	—	—	17.7_77.3	17.7_77.3	17.7_77.3
HDO 140_4	⊖						
HDO 150_2	⊖						
HDO 150_3	—	—	—	—	—	28.2_60.8	28.2_60.8
HDO 150_4	⊖						
HDO 160_2	⊖						
HDO 160_3	—	—	—	—	—	34.9_68.6	34.9_68.6
HDO 160_4	⊖						
HDO 170	⊖						
HDO 180	⊖						

i =



## 26.7 OPTIONAL VARIANTS

### 26.7.1 AUXILIARY THERMAL DEVICES

#### 26.7.1.1 FORCED VENTILATION

Improved heat dissipation can be achieved on HDO gearboxes by keying a cooling fan on to the gearbox input shaft.

Specify the **FAN** option to have the fan installed on the shaft in the same plane. The alternative option, **FANJ**, with an orthogonally mounted fan, is only available with three stage gearboxes.

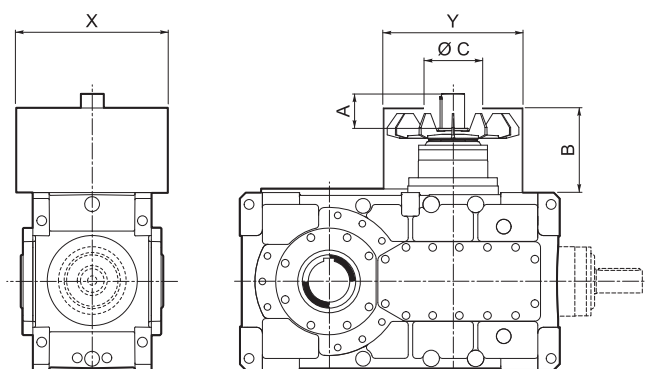
In combination with some configuration or mounting position forced ventilation may not be available along with forced lubrication devices - option OP... or MOP.

The increased cooling effect is shown by the thermal capacity value  $P_{TFAN}$  listed in section 28. This value is only significant with continuous duty applications.

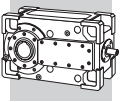
The effectiveness of forced ventilation is drastically reduced in intermittent duty applications and also below drive speeds of  $n_1 = 900 \text{ min}^{-1}$ .

In such cases, other auxiliary cooling devices should be used to increase the thermal capacity of the gearbox.

#### FANJ

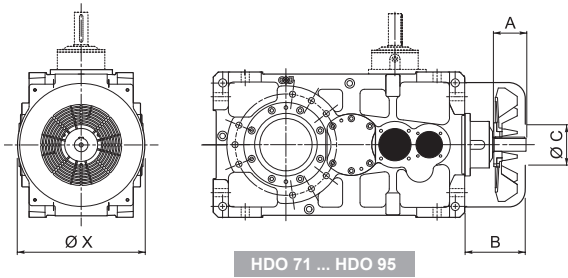


	A	B	C	X	Y
HDO 100 3	82	207	180	460	440
HDO 110 3	82	207	180	460	440
HDO 120 3	82	172	180	480	480
HDO 125 3	82	172	180	480	480
HDO 130 3	105	222	230	600	600
HDO 140 3	105	222	230	600	600
HDO 150 3	⊖				
HDO 160 3					
HDO 170					
HDO 180					

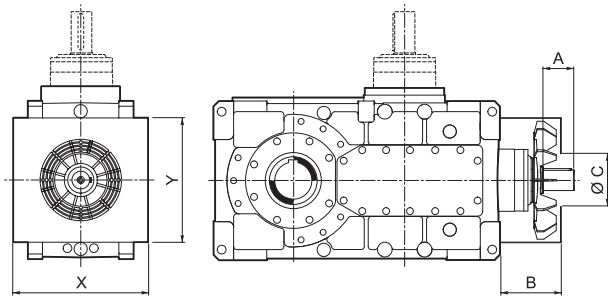


# FAN

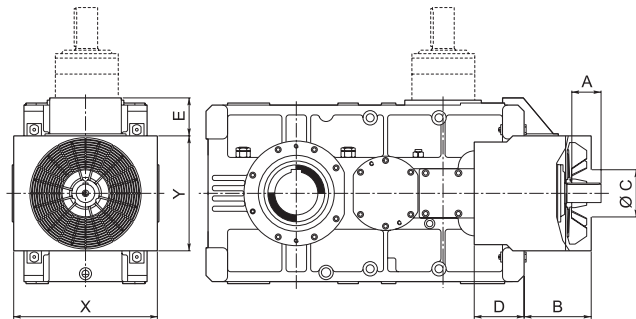
HDO




HDO 71 ... HDO 95

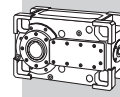


HDO 100 ... HDO 140



HDO 150 - HDO 160

	A	B	C	D	E	X	Y
HDO 71_3	58	152	140	—	—	345	—
HDO 81_3	82	162	140	—	—	345	—
HDO 91_3	82	209	140	—	—	440	—
HDO 91_4	58	209	140	—	—	440	—
HDO 95_3	82	209	140	—	—	440	—
HDO 95_4	58	209	140	—	—	440	—
HDO 100_2	105	207	180	—	—	460	424
HDO 100_3	82	207	180	—	—	460	424
HDO 100_4	58	207	180	—	—	460	424
HDO 110_2	105	207	180	—	—	460	424
HDO 110_3	82	207	180	—	—	460	424
HDO 110_4	58	207	180	—	—	460	424
HDO 120_2	105	232	180	—	—	480	460
HDO 120_3	82	172	180	—	—	480	460
HDO 120_4	58	172	180	—	—	480	460
HDO 125_2	105	232	180	—	—	480	460
HDO 125_3	82	172	180	—	—	480	460
HDO 125_4	58	172	180	—	—	480	460
HDO 130_2	140	327	230	—	—	600	600
HDO 130_3	105	222	230	—	—	600	600
HDO 130_4	82	287	230	—	—	600	600
HDO 140_2	140	327	230	—	—	600	600
HDO 140_3	105	222	230	—	—	600	600
HDO 140_4	82	287	230	—	—	600	600
HDO 150_2	165	387	230	243	185	700	560
HDO 150_3	130	327	230	243	185	700	560
HDO 150_4	82	297	230	243	185	700	560
HDO 160_2	165	387	230	243	185	700	560
HDO 160_3	130	327	230	243	185	700	560
HDO 160_4	82	297	230	243	185	700	560
HDO 170	 <b>BONFIGLIOLI TECHNICAL SERVICE</b>						
HDO 180							

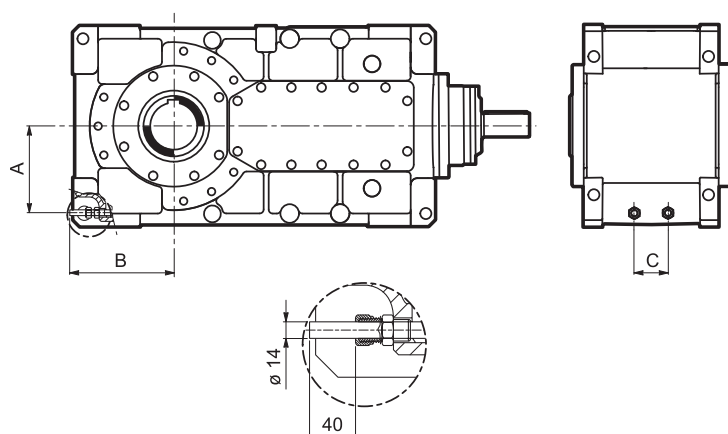



### 26.7.1.2 HEAT DISSIPATION THROUGH COOLING COIL

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 HDO 71 ... HDO 95
- min flow rate 10 l/min for HDO 100 ... HDO 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 28




	A	B	C
HDO 71_SR	147	170	60
HDO 81_SR	173	190	60
HDO 91_SR	190	210	60
HDO 95_SR	215	259	60
HDO 100_SR	230	285	100
HDO 110_SR	230	270	100
HDO 120_SR	258	305	100
HDO 125_SR	258	305	100
HDO 130_SR	325	340	100
HDO 140_SR	325	365	100
HDO 150	 <b>BONFIGLIOLI TECHNICAL SERVICE</b>		
HDO 160			
HDO 170			
HDO 180			

**HDO**

### 26.7.1.3 AUXILIARY COOLING WITH AUTONOMOUS COOLING UNIT

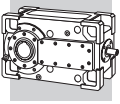
Two types of cooling unit are available, each in a range of sizes providing different cooling capacities. The two types use different cooling media for the oil: MCRW... – water/oil heat exchanger and MCRA... – air/oil heat exchanger.

If an autonomous cooling unit is installed on the advice of the Bonfiglioli Technical Service, no additional forced lubrication devices are required. See section 26.7.2. The following chart shows device availability according to gearbox size. Your selection must take into account the deficit in thermal power that must be made up by contribution  $P_{TMCRW}$  or  $P_{TMCRA}$  as shown in the chart in section 28.

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

(\*) not available for mounting position B3.

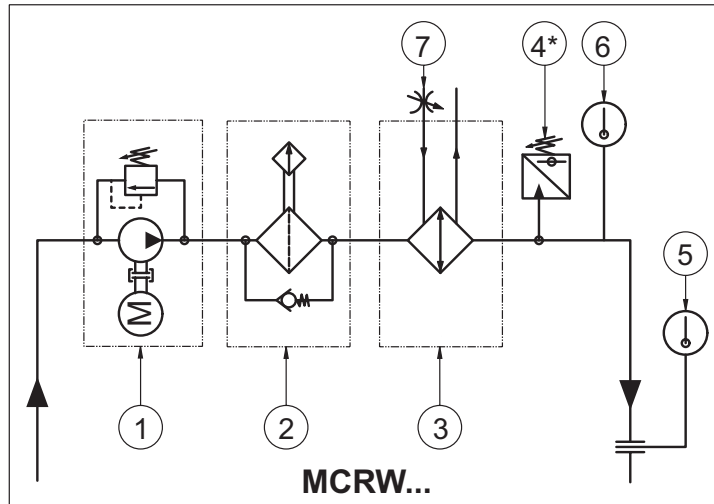
(\*\*) not available for double reduction units in the mounting position B3.



The main components of the cooling units are as follows:

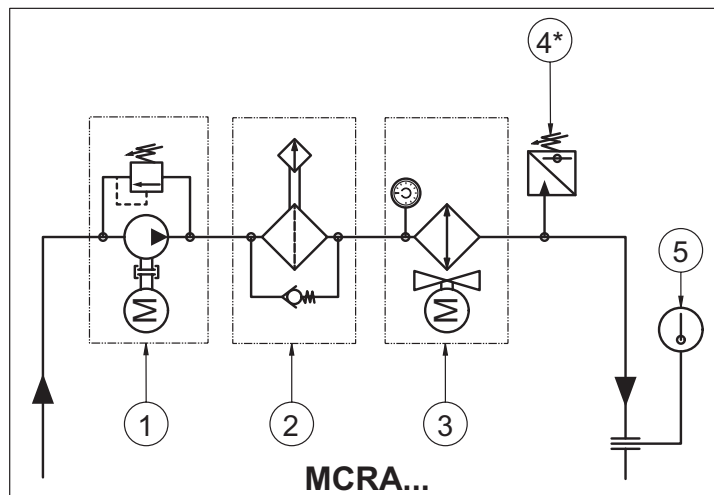
**MCRW...**

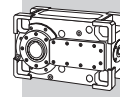
- 1) motorpump complete with by-pass circuit
- 2) filter with clogging visual indicator
- 3) water/oil heat exchanger
- 4) minimum pressure switch (only available in combination with forced lubrication)
- 5) maximum temperature thermostat
- 6) minimum temperature switch
- 7) electro-valve



**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:**

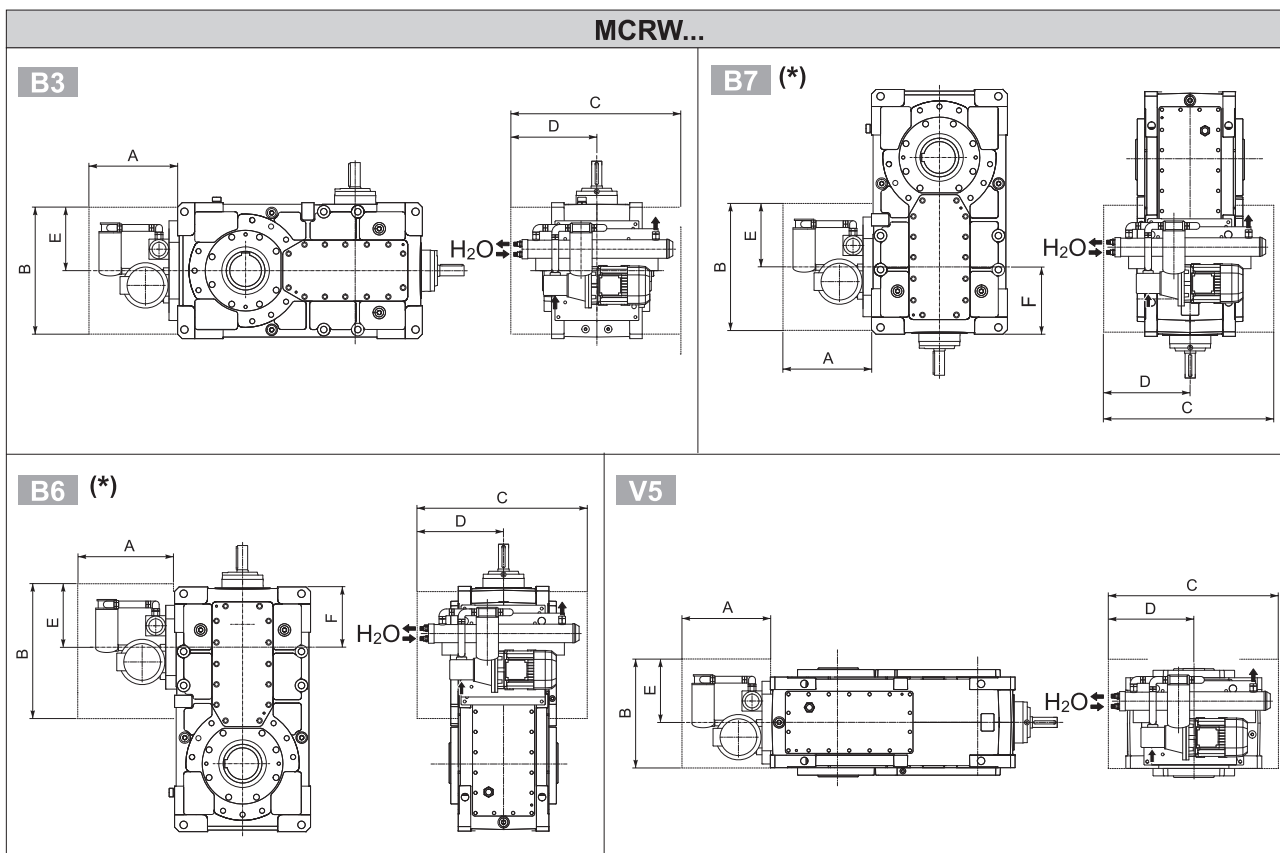
**MCRW...** : provide a water supply system that corresponds to the following specifications:

- max. pressure, 10 bar
- maximum delivery temperature, 20°C
- minimum flow rate  $Q_{H_2O}$  as per the chart:

	MCRW5	MCRW9	MCRW21	MCRW34	MCRW51	MCRW70
$Q_{H_2O}$ [l/min]	10	18	31	56	81	BONFIGLIOLI TECHNICAL SERVICE

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

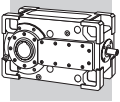
The cooling units are installed on the gearboxes as shown in the figure below.



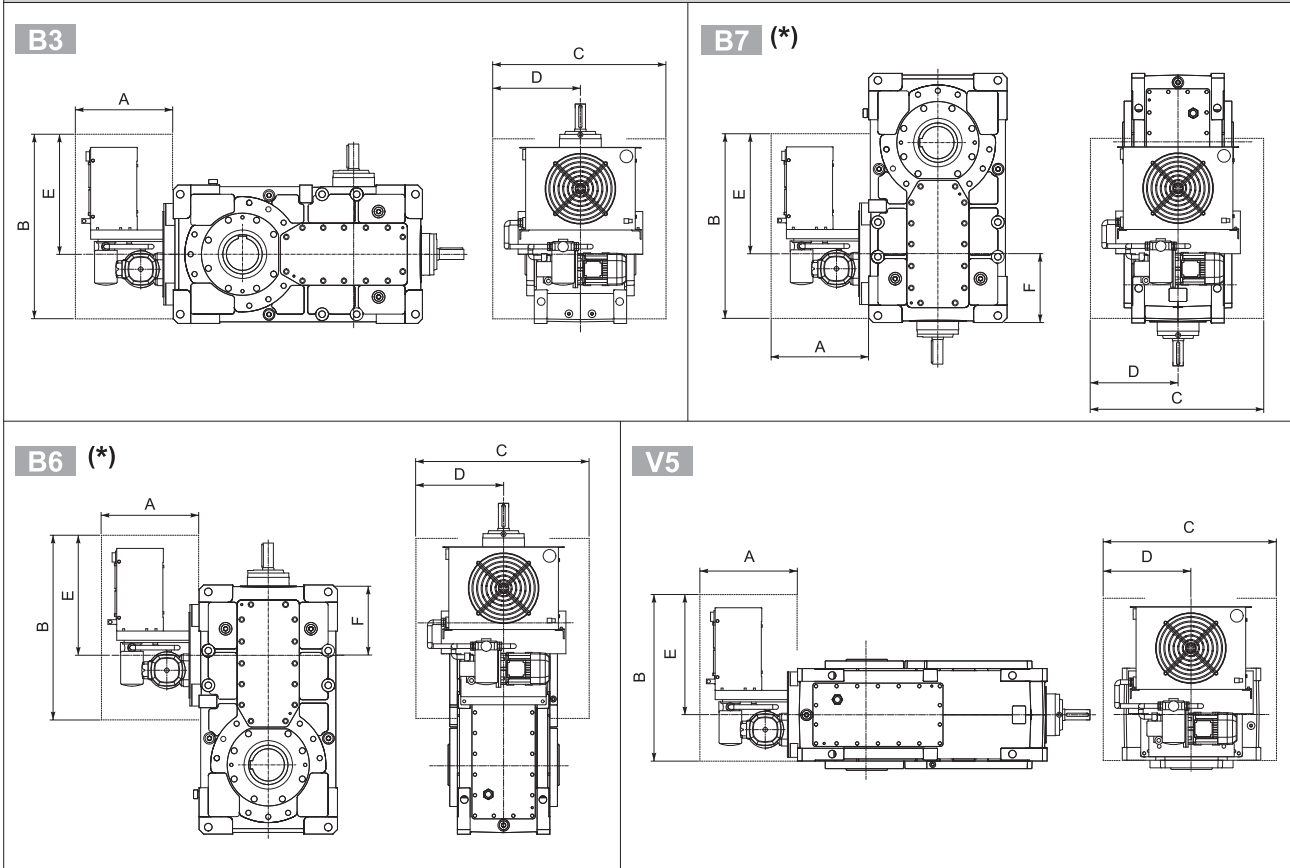
	A	B	C	D	E	F									
						HDO 100 - HDO 110		HDO 120		HDO 125		HDO 130 - HDO 140		HDO 150 - HDO 160	
						2x	3x/4x	2x	3x/4x	2x	3x/4x	2x	3x/4x	2x	3x/4x
MCRW5	360	415	730	365	230										
MCRW9	360	380	870	435	195										
MCRW21	400	425	780	390	240	325	270	350	300	BONFIGLIOLI TECHNICAL SERVICE	420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

(\*) Units featuring the "J" input configuration have the cooling unit fitted on opposite side as shown.

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



MCRA...



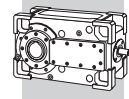
	A	B	C	D	E	F													
						HDO 100 - HDO 110		HDO 120		HDO 125		HDO 130 - HDO 140		HDO 150 - HDO 160					
						2x	3x/4x	2x	3x/4x	2x	3x/4x	2x	3x/4x	2x	3x/4x				
MCRA5	400	560	500	250	375														
MCRA9	435	650	640	320	465														
MCRA21	440	815	700	350	630	325	270	350	300	BONFIGLIOLI TECHNICAL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

(\*) Units featuring the "J" input configuration have the cooling unit fitted on opposite side as shown.

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

26.7.1.4 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.



## 26.7.2 FORCED LUBRICATION

Pattern for MANDATORY specification of forced lubrication devices.

HDO 71 ... HDO 95					
		B3	B6	B7	V5
	L R D	⊘	OP MOP	⊘	⊘
	LJ RJ DJ	OP MOP	⊘	⊘	⊘
	LD RD DD	OP MOP	OP MOP	⊘	⊘

HDO 100 ... HDO 180					
		B3	B6	B7	V5
	L R D	⊘	OP MOP	⊘	OP... MOP
	LJ RJ DJ	OP MOP	⊘	⊘	OP... MOP
	LD RD DD	OP MOP	OP MOP	⊘	OP... MOP

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

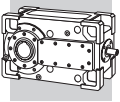
### 26.7.2.1 PUMP FOR MOUNTING POSITIONS B3 and B6

In continuous duty applications and, when required, for B3 or B6 mounting positions (see section [26.7.2](#)), an optional forced lubrication circuit is available with a mechanically driven pump keyed on to the intermediate shaft.

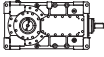
This circuit only guarantees lubrication of the top bearings that are not immersed in oil.

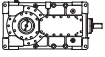
Before specifying the OP option in your order, check the chart to make sure that the device is fully compatible with the drive speed  $n_1$  and reduction ratio. See the following diagram.



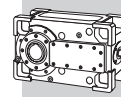


**HDO**

	i	n <sub>1</sub>		
		1000 min <sup>-1</sup>	1200 min <sup>-1</sup>	1500 min <sup>-1</sup>
HDO 71 3	21.8 ≤ i ≤ 48.7	OP	OP	OP
	54.2 ≤ i ≤ 71.9	⊖	⊖	OP
HDO 71 4	77.0 ≤ i ≤ 197.0 i=237.7	OP	OP	OP
	i=228.2 308.9 ≤ i ≤ 475.4	⊖	⊖	⊖
HDO 81 3	25.9 ≤ i ≤ 39.9 i=48.1	OP	OP	OP
	i=44.9 55.1 ≤ i ≤ 71.9	⊖	⊖	OP
HDO 81 4	78.3 ≤ i ≤ 181.4 i=227.8	OP	OP	OP
	i=196.5 254.8 ≤ i ≤ 473.3	⊖	⊖	⊖
HDO 91 3	18.6 ≤ i ≤ 30.6	OP	OP	OP
	36.9 ≤ i ≤ 66.1	⊖	⊖	OP
HDO 91 4	82.0 ≤ i ≤ 225.4	OP	OP	OP
	256.3 ≤ i ≤ 489.3	⊖	⊖	⊖
HDO 95 3	21.2 ≤ i ≤ 40.5	OP	OP	OP
	44.0 ≤ i ≤ 72.3	⊖	⊖	OP
HDO 95 4	81.6 ≤ i ≤ 231.1	OP	OP	OP
	256.6 ≤ i ≤ 489.7	⊖	⊖	⊖
HDO 100 2	5.8 ≤ i ≤ 8.7	OP	OP	OP
	i = 10.0; 10.9	⊖	OP	OP
	i = 12.4; 13.5	⊖	⊖	OP
HDO 100 3	14.0 ≤ i ≤ 40.0	OP	OP	OP
	43.9 ≤ i ≤ 67.5	⊖	⊖	OP
HDO 100 4	70.8 ≤ i ≤ 139.8	OP	OP	OP
	160.0 ≤ i ≤ 344.2	⊖	⊖	OP
HDO 110 2	6.4 ≤ i ≤ 10.0	OP	OP	OP
	i = 10.9; 12.5	⊖	OP	OP
	i = 13.5; 15.5	⊖	⊖	OP
HDO 110 3	18.9 ≤ i ≤ 43.6	OP	OP	OP
	48.0 ≤ i ≤ 77.5	⊖	⊖	OP
HDO 110 4	77.4 ≤ i ≤ 121.7	OP	OP	OP
	137.1 ≤ i ≤ 395.0	⊖	⊖	OP
HDO 120 2	6.6 ≤ i ≤ 10.0	OP	OP	OP
	i = 11.1; 12.5	⊖	OP	OP
	i = 13.7; 15.5	⊖	⊖	OP
HDO 120 3	17.3 ≤ i ≤ 44.9	OP	OP	OP
	49.5 ≤ i ≤ 78.6	⊖	⊖	OP
HDO 120 4	87.0 ≤ i ≤ 162.2	OP	OP	OP
	179.7 ≤ i ≤ 400.6	⊖	⊖	OP
HDO 125 2	7.4 ≤ i ≤ 9.9	OP	OP	OP
	i = 11.5; 12.3	⊖	OP	OP
	i = 14.2; 15.3; 16.9	⊖	⊖	OP
HDO 125 3	19.2 ≤ i ≤ 55.5	OP	OP	OP
	60.1 ≤ i ≤ 85.9	OP	⊖	⊖
HDO 125 4	90.1 ≤ i ≤ 178.0	OP	OP	OP
	200.3 ≤ i ≤ 438.0	OP	⊖	⊖

	i	n <sub>1</sub>		
		1000 min <sup>-1</sup>	1200 min <sup>-1</sup>	1500 min <sup>-1</sup>
HDO 130 2	5.7 ≤ i ≤ 7.1	⊖	OP	OP
	i = 7.7; 8.8	⊖	⊖	OP
HDO 130 3	9.6 ≤ i ≤ 13.6	⊖	⊖	⊖
	15.2 ≤ i ≤ 34.9	OP	OP	OP
HDO 130 4	38.3 ≤ i ≤ 67.1	⊖	⊖	OP
	71.5 ≤ i ≤ 190.3	OP	OP	OP
HDO 140 2	219.1 ≤ i ≤ 335.6	⊖	⊖	OP
	6.6 ≤ i ≤ 8.2	⊖	OP	OP
HDO 140 3	i = 9.0; 10.1	⊖	⊖	OP
	11.3 ≤ i ≤ 15.7	⊖	⊖	⊖
HDO 140 4	17.7 ≤ i ≤ 44.4	OP	OP	OP
	50.4 ≤ i ≤ 77.3	⊖	⊖	OP
HDO 150 2	82.3 ≤ i ≤ 180.0	OP	OP	OP
	198.3 ≤ i ≤ 386.6	⊖	⊖	OP
HDO 150 3	5.5 ≤ i ≤ 7.0	⊖	OP	OP
	i = 8.1; 8.9	⊖	⊖	OP
	10.0 ≤ i ≤ 13.7	⊖	⊖	⊖
HDO 150 4	15.6 ≤ i ≤ 25.4	⊖	OP	OP
	28.2 ≤ i ≤ 36.0	⊖	⊖	OP
HDO 160 2	40.2 ≤ i ≤ 60.8	⊖	⊖	⊖
	66.9 ≤ i ≤ 92.9	OP	OP	OP
	101.8 ≤ i ≤ 141.5	⊖	OP	OP
HDO 160 3	157.9 ≤ i ≤ 238.8	⊖	⊖	⊖
	i = 7.3; 7.9	⊖	OP	OP
	8.9 ≤ i ≤ 11.3	⊖	⊖	OP
HDO 160 4	12.2 ≤ i ≤ 15.4	⊖	⊖	⊖
	17.7 ≤ i ≤ 31.3	⊖	OP	OP
HDO 170	34.9 ≤ i ≤ 44.3	⊖	⊖	OP
	49.4 ≤ i ≤ 68.6	⊖	⊖	⊖
HDO 180	75.9 ≤ i ≤ 96.3	OP	OP	OP
	115.2 ≤ i ≤ 174.0	⊖	OP	OP
		⊖	⊖	⊖
		⊖	⊖	⊖

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



HDO ... G ... B6  
HDO ... VP ... B6

**HDO 71 ... 95**

- 3x ... 2
- 4x ... 2

**HDO 71 ... 95**

- 3x ... 1
- 4x ... 1

**HDO 100 ... 140**

- 2x ... 2
- 3x ... 2
- 4x ... 2

**HDO 100 ... 140**

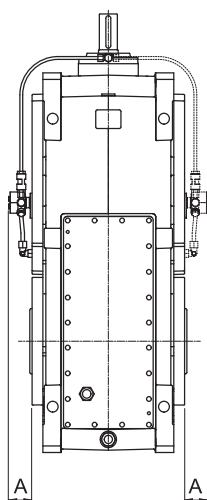
- 2x ... 1
- 3x ... 1
- 4x ... 1

**HDO 150 - 160**

- 2x ... 2
- 3x ... 2
- 4x ... 1

**HDO 150 - 160**

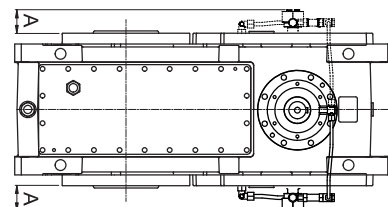
- 2x ... 1
- 3x ... 1
- 4x ... 2



HDO ... VP ... B3

**HDO 71 ... 95**

- 3x ... 2



**HDO 71 ... 95**

- 3x ... 1

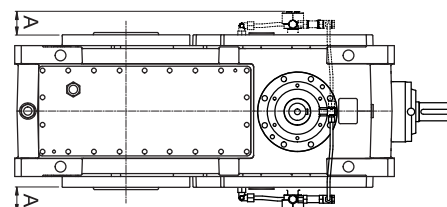
HDO ... GJ ... B3  
HDO ... VP ... B3

**HDO 100 ... 140**

- 2x ... 2
- 3x ... 2
- 4x ... 2

**HDO 150 - 160**

- 2x ... 2
- 3x ... 2
- 4x ... 1



**HDO 100 ... 140**

- 2x ... 1
- 3x ... 1
- 4x ... 1

**HDO 150 - 160**

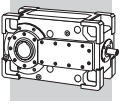
- 2x ... 1
- 3x ... 1
- 4x ... 2

	A (min) [mm]
HDO 71 3_OP	78
HDO 71 4_OP	85
HDO 81 3_OP	78
HDO 81 4_OP	78
HDO 91 3_OP	78
HDO 91 4_OP	75
HDO 95 3_OP	53
HDO 95 4_OP	50

	A (min) [mm]
HDO 95 3_OP	53
HDO 95 4_OP	50
HDO 100 2_OP	100
HDO 100 3_OP	95
HDO 100 4_OP	95
HDO 110 2_OP	130
HDO 110 3_OP	95
HDO 110 4_OP	95

	A (min) [mm]
HDO 120 2_OP	125
HDO 120 3_OP	105
HDO 120 4_OP	100
HDO 125 2_OP	125
HDO 125 3_OP	105
HDO 125 4_OP	100
HDO 130 2_OP	120
HDO 130 3_OP	110
HDO 130 4_OP	110

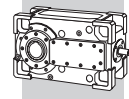
	A (min) [mm]
HDO 140 2_OP	125
HDO 140 3_OP	110
HDO 140 4_OP	110
HDO 150 2_OP	125
HDO 150 3_OP	110
HDO 150 4_OP	110
HDO 160 2_OP	125
HDO 160 3_OP	110
HDO 160 4_OP	110



The following chart specifies the availability of the pump on the basis of mounting position, shaft arrangement and input configuration.

Mounting position	Shaft arrangement	Input configuration
<b>B3</b>	LJ - RJ - DJ - LD - RD - DD	VP - GJ *
<b>B6</b>	L - R - D - LD - RD - DD	VP - G

(\*) HDO 71 ... HDO 95 excluded

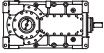


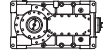

### 26.7.2.2 PUMP FOR MOUNTING POSITION V5

In continuous duty applications and with V5 mounting positions version 1 (version 2 for 4-stage HDO 150 ... HDO 180), an optional forced lubrication circuit is available with a mechanically driven pump keyed on to the intermediate shaft.

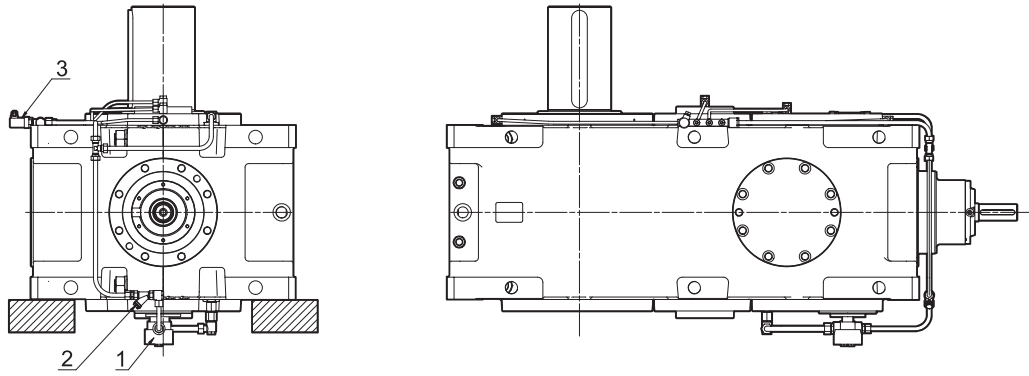
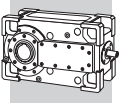
This circuit only guarantees lubrication of the top bearings that are not immersed in oil. If this device is required in conjunction with the Drywell device, consult the Bonfiglioli Technical Service.

When ordering, specify the OP1 or OP2 option in your order after first checking the chart to make sure that the device is fully compatible with drive speed  $n_1$  and the reduction ratio. See the following diagram.

	i	$n_1$		
		1000 min <sup>-1</sup>	1200 min <sup>-1</sup>	1500 min <sup>-1</sup>
HDO 100 2	$5.8 \leq i \leq 7.0$	OP1	OP1	OP1
	i = 8.0; 8.7	⊖	OP1	OP1
	i = 10.0; 10.9	⊖	⊖	OP1
	i = 12.4; 13.5	⊖	⊖	⊖
HDO 100 3	$14.0 \leq i \leq 17.3$	OP2	OP1	OP1
	$20.2 \leq i \leq 40.0$	⊖	OP2	OP1
	$43.9 \leq i \leq 67.5$	⊖	⊖	⊖
HDO 100 4	$70.8 \leq i \leq 139.8$	⊖	OP2	OP1
	$160.0 \leq i \leq 344.2$	⊖	⊖	⊖
HDO 110 2	$6.4 \leq i \leq 8.1$	OP2	OP2	OP1
	i = 8.7; 10.0	⊖	OP2	OP2
	i = 10.9; 12.5	⊖	⊖	OP2
	i = 13.5; 15.5	⊖	⊖	⊖
HDO 110 3	i = 18.9; 20.9	OP2	OP1	OP1
	$22.0 \leq i \leq 43.6$	⊖	OP2	OP1
	$48.0 \leq i \leq 77.5$	⊖	⊖	⊖
HDO 110 4	$77.4 \leq i \leq 121.7$	⊖	OP2	OP2
	$137.1 \leq i \leq 395.0$	⊖	⊖	⊖
HDO 120 2	$6.6 \leq i \leq 8.1$	OP2	OP2	OP1
	i = 8.9; 10.0	⊖	OP2	OP2
	i = 11.1; 12.5	⊖	⊖	OP2
	i = 13.7; 15.5	⊖	⊖	⊖
HDO 120 3	$17.3 \leq i \leq 28.3$	OP2	OP2	OP1
	$32.0 \leq i \leq 44.9$	⊖	OP2	OP2
	$49.5 \leq i \leq 78.6$	⊖	⊖	⊖
HDO 120 4	$87.0 \leq i \leq 162.2$	⊖	OP2	OP2
	$179.0 \leq i \leq 400.6$	⊖	⊖	⊖
HDO 125 2	$7.4 \leq i \leq 8.8$	OP2	OP2	OP1
	i = 9.9	⊖	OP2	OP2
	i = 11.5; 12.3	⊖	⊖	OP2
	$14.2 \leq i \leq 16.9$	⊖	⊖	⊖
HDO 125 3	$19.2 \leq i \leq 35.8$	OP2	OP2	OP1
	$38.8 \leq i \leq 55.4$	⊖	OP2	OP2
	$60.1 \leq i \leq 85.9$	⊖	⊖	⊖
HDO 125 4	$97.0 \leq i \leq 178.0$	⊖	OP2	OP2
	$200.3 \leq i \leq 438.0$	⊖	⊖	⊖
HDO 130 2	$5.7 \leq i \leq 7.1$	OP2	OP1	OP1
	i = 7.7; 8.8	⊖	OP2	OP1
	i = 9.6; 11.0	⊖	⊖	OP2
	i = 12.0; 13.6	⊖	⊖	⊖
HDO 130 3	$15.2 \leq i \leq 19.9$	OP2	OP2	OP1
	$22.6 \leq i \leq 34.9$	⊖	OP2	OP2
	$38.3 \leq i \leq 67.1$	⊖	⊖	⊖
HDO 130 4	$71.5 \leq i \leq 190.3$	⊖	OP2	OP1
	$219.1 \leq i \leq 335.6$	⊖	⊖	⊖

	i	$n_1$		
		1000 min <sup>-1</sup>	1200 min <sup>-1</sup>	1500 min <sup>-1</sup>
HDO 140 2	$6.6 \leq i \leq 8.2$	OP2	OP2	OP1
	i = 9.0; 10.1	⊖	OP2	OP2
	i = 11.3; 12.6	⊖	⊖	OP2
	i = 14.0; 15.7	⊖	⊖	⊖
HDO 140 3	$17.7 \leq i \leq 23.3$	OP2	OP2	OP1
	$26.0 \leq i \leq 44.4$	⊖	OP2	OP2
	$50.4 \leq i \leq 77.3$	⊖	⊖	⊖
HDO 140 4	$82.3 \leq i \leq 180.0$	⊖	OP2	OP1
	$198.3 \leq i \leq 386.6$	⊖	⊖	⊖
HDO 150 2	$5.5 \leq i \leq 7.0$	OP2	OP2	OP1
	i = 8.1; 8.9	⊖	OP2	OP2
	$10.0 \leq i \leq 10.9$	⊖	⊖	OP2
	$12.6 \leq i \leq 13.7$	⊖	⊖	⊖
HDO 150 3	$15.6 \leq i \leq 25.4$	OP2	OP2	OP1
	$28.2 \leq i \leq 36.0$	⊖	OP2	OP2
	$40.2 \leq i \leq 60.8$	⊖	⊖	⊖
HDO 150 4	$66.9 \leq i \leq 92.9$	OP2	OP2	OP1
	$101.8 \leq i \leq 141.5$	⊖	OP2	OP2
HDO 160 2	$157.9 \leq i \leq 238.8$	⊖	⊖	⊖
	i = 7.3; 7.9	OP2	OP2	OP1
	$8.9 \leq i \leq 11.3$	⊖	⊖	OP2
	$12.2 \leq i \leq 15.4$	⊖	⊖	⊖
HDO 160 3	$17.7 \leq i \leq 31.3$	OP2	OP2	OP1
	$34.9 \leq i \leq 44.3$	⊖	OP2	OP2
	$49.4 \leq i \leq 68.6$	⊖	⊖	⊖
HDO 160 4	$75.9 \leq i \leq 96.3$	OP2	OP2	OP1
	$115.2 \leq i \leq 174.0$	⊖	OP2	OP2
	$194.1 \leq i \leq 269.7$	⊖	⊖	⊖
HDO 170	 BONFIGLIOLI TECHNICAL SERVICE			
HDO 180				

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

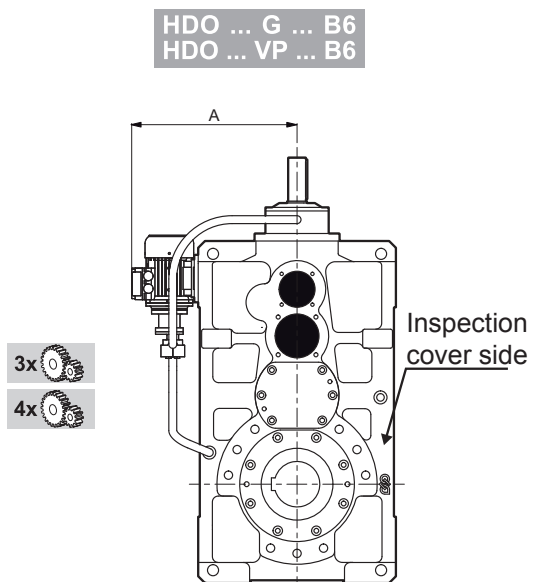


- 1 - Pump
- 2 - Filter
- 3 - Minimum pressure switch

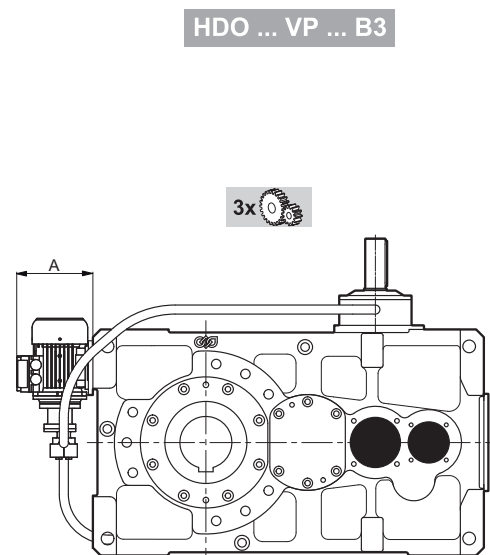
Contact the Bonfiglioli Technical Service for overall dimensions.

### 26.7.2.3 ELECTRIC PUMP FOR MOUNTING POSITIONS B3 and B6

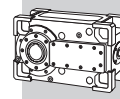
In intermittent duty applications, if speeds are incompatible with the use of the OP pump option, and when required for B3 and B6 mounting positions (see section [26.7.2](#)), the MOP optional forced lubrication circuit is available with an independently powered electric pump. This system ensures a constant flow of oil to the top bearings.



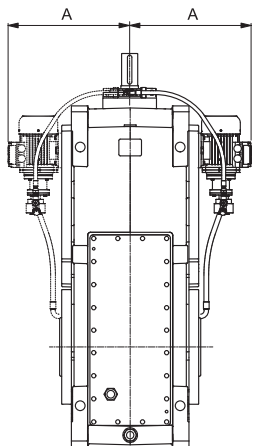
	A (min) [mm]
HDO 71	345
HDO 81	370
HDO 91	395
HDO 95	420



	A (min) [mm]
HDO 71	170
HDO 81	170
HDO 91	170
HDO 95	170



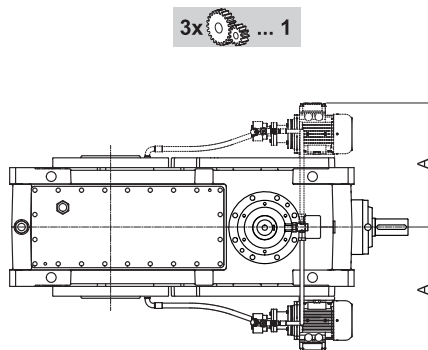
HDO ... G ... B6  
HDO ... VP ... B6



- 2x ... 2
- 3x ... 1
- 4x ... 2

- 2x ... 1
- 3x ... 2
- 4x ... 1

HDO ... GJ ... B3  
HDO ... VP ... B3



- 3x ... 1

- 3x ... 2

	A (min) [mm]
HDO 100	410
HDO 110	410
HDO 120	430
HDO 125	430
HDO 130	480
HDO 140	480
HDO 150	☎ BONFIGLIOLI TECHNICAL SERVICE
HDO 160	
HDO 170	●
HDO 180	

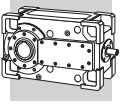
The electric pump arrangements shown above are purely indicative. Pump positions may vary depending on the presence of other options

The chart specifies electric pump availability on the basis of mounting position and shaft arrangement.

Mounting position	Shaft arrangement	Input configuration
<b>B3</b>	LJ - RJ - DJ - LD - RD - DD	VP - GJ *
<b>B6</b>	L - R - D - LD - RD - DD	VP - G

(\* ) HDO 71 ... HDO 95 excluded

**HDO**

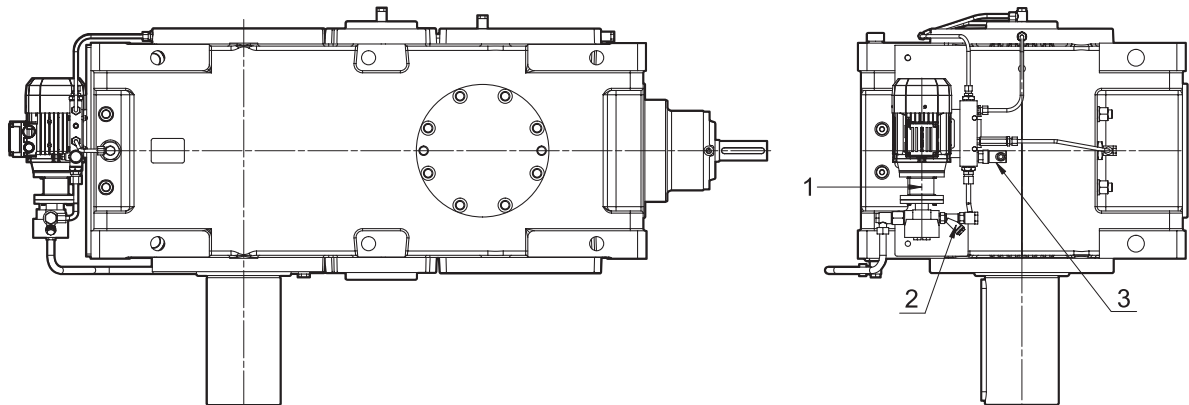


### 26.7.2.4 ELECTRIC PUMP FOR MOUNTING POSITION V5

In intermittent duty applications or when speeds are incompatible with the use of the OP pump option, and when required for mounting position V5, the MOP optional forced lubrication circuit is available with an independently powered electric pump.

If this device is required in conjunction with the Drywell device, consult the Bonfiglioli Technical Service. This system ensures a constant flow of oil to the top bearings.

HDO

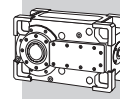


● HDO 71 ... HDO 95

- 1 - Motorpump
- 2 - Filter
- 3 - Minimum pressure switch

The electric pump arrangements shown above are purely indicative. Pump positions may vary depending on the presence of other options at the same time.

Contact the Bonfiglioli Technical Service for overall dimensions.



### 26.7.3 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.

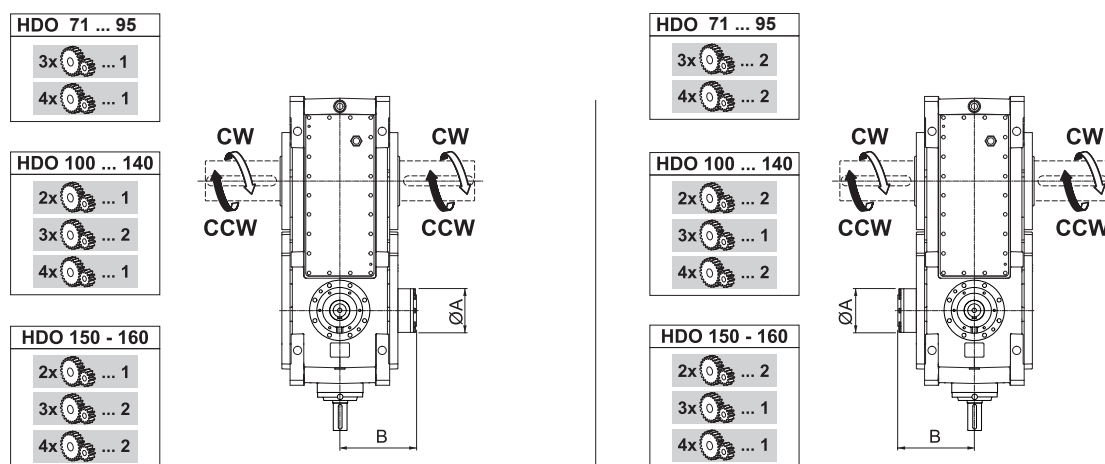
In addition to verifying the shock loads shown in section 11.1, also make sure that the torque transmitted to the backstop  $M_1 = M_2 / (i \times \eta)$  is less than the admissible torque  $M_{1max}$  listed in the chart below. Along with the specification of the backstop device, option **A**, the direction of free rotation for the output shaft (**CW** or **CCW**) must also be specified in the order.

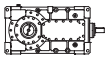
If special operating conditions require it, the user can reverse the direction of rotation of the backstop device by opening the backstop compartment and reversing the direction of the freewheel. If you need to perform this operation, contact Bonfiglioli's Technical Service for the necessary instructions. The type of backstop device used, based on centrifugally released shoes, does not require any regular maintenance.

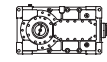
This option is not available with other configurations that use the same shaft end.



**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.**

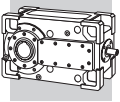


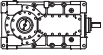
	i	A	B	$M_{1max}$ [Nm]	$n_{1min}$ [min <sup>-1</sup> ]
<b>HDO 71 3_A</b>	$21.8 \leq i \leq 48.7$	110	204	260	1500
	$54.2 \leq i \leq 71.9$	110	204	183	(*)
<b>HDO 71 4_A</b>	$77.0 \leq i \leq 197.0$ $i=237.7$	91	199	108	1500
	$i=228.2$ $308.9 \leq i \leq 475.4$	91	199	54	(*)
<b>HDO 81 3_A</b>	$25.9 \leq i \leq 39.9$ $i=48.1$	110	231	273	1500
	$i=44.9$ $55.1 \leq i \leq 71.9$	110	231	183	(*)
<b>HDO 81 4_A</b>	$78.3 \leq i \leq 181.4$ $i=227.8$	95	231	159	1500
	$i=196.5$ $254.8 \leq i \leq 473.3$	95	231	80	(*)

	i	A	B	$M_{1max}$ [Nm]	$n_{1min}$ [min <sup>-1</sup> ]
<b>HDO 91 3_A</b>	$18,6 \leq i \leq 30,6$	130	259	612	997
	$36,9 \leq i \leq 66,1$	130	259	343	1500
<b>HDO 91 4_A</b>	$82,0 \leq i \leq 225,4$	110	250	274	1500
	$256,3 \leq i \leq 489,3$	110	250	137	(*)
<b>HDO 95 3_A</b>	$21,2 \leq i \leq 40,5$	130	259	612	997
	$44,0 \leq i \leq 72,3$	130	259	343	1500
<b>HDO 95 4_A</b>	$81,6 \leq i \leq 231,1$	110	250	274	1500
	$256,6 \leq i \leq 489,7$	110	250	137	(*)

(\*) Contact the Bonfiglioli Technical Service.

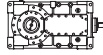



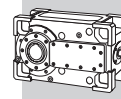


	i	A	B	M <sub>1max</sub> [Nm]	n <sub>1min</sub> [min <sup>-1</sup> ]
<b>HDO 100 2_A</b>	5.8 ≤ i ≤ 7.0	210	335	2840	720
	i = 8.0; 8.7			2290	900
	i = 10.0; 10.9			1830	1120
	i = 12.4; 13.5			1480	1390
<b>HDO 100 3_A</b>	14.0 ≤ i ≤ 17.3	175	285	1550	750
	20.2 ≤ i ≤ 40.0			1190	980
	43.9 ≤ i ≤ 67.5			770	1400
<b>HDO 100 4_A</b>	70.8 ≤ i ≤ 139.8	125	278	400	1400
	160.0 ≤ i ≤ 344.2			250	(*)
<b>HDO 110 2_A</b>	6.4 ≤ i ≤ 8.1	210	335	2840	720
	8.7 ≤ i ≤ 10.0			2290	900
	10.9 ≤ i ≤ 12.5			1830	1120
	13.5 ≤ i ≤ 15.5			1480	1390
<b>HDO 110 3_A</b>	18.9 ≤ i ≤ 20.9	175	285	1550	750
	22.0 ≤ i ≤ 43.6			1190	980
	48.0 ≤ i ≤ 77.5			770	1400
<b>HDO 110 4_A</b>	77.4 ≤ i ≤ 121.7	125	278	400	1400
	137.1 ≤ i ≤ 395.0			250	(*)
<b>HDO 120 2_A</b>	6.6 ≤ i ≤ 8.1	230	336	3530	670
	8.9 ≤ i ≤ 10.0			2850	840
	11.1 ≤ i ≤ 12.5			2280	1050
	13.7 ≤ i ≤ 15.5			1840	1300
<b>HDO 120 3_A</b>	17.3 ≤ i ≤ 24.6	175	305	1550	750
	28.3 ≤ i ≤ 44.9			1190	980
	49.5 ≤ i ≤ 78.6			770	1400
<b>HDO 120 4_A</b>	87.0 ≤ i ≤ 162.2	125	279	400	1400
	179.7 ≤ i ≤ 400.6			250	(*)
<b>HDO 125 2_A</b>	7.4 ≤ i ≤ 8.8	230	336	3530	670
	i = 9.9			2850	840
	11.5 ≤ i ≤ 12.3			2280	1050
	14.2 ≤ i ≤ 16.9			1840	1300
<b>HDO 125 3_A</b>	19.2 ≤ i ≤ 35.8	175	305	1550	750
	38.8 ≤ i ≤ 55.4			1190	980
	60.1 ≤ i ≤ 85.9			770	1400
<b>HDO 125 4_A</b>	97.0 ≤ i ≤ 178.0	125	279	400	1400
	200.3 ≤ i ≤ 438.0			250	(*)

(\*) Contact the Bonfiglioli Technical Service.

(\*\*) Option not available in configuration  
...S-L-1... e ...S-R-2...

	i	A	B	M <sub>1max</sub> [Nm]	n <sub>1min</sub> [min <sup>-1</sup> ]
<b>HDO 130 2_A</b>	5.7 ≤ i ≤ 7.1	290	437	6630	730
	i = 7.7; 8.8			5350	910
	i = 9.6; 11.0			4280	1130
	i = 12.0; 13.6			3450	1400
<b>HDO 130 3_A</b>	15.2 ≤ i ≤ 19.9	210	402	2840	720
	22.6 ≤ i ≤ 34.9			2290	900
	38.3 ≤ i ≤ 67.1			1480	1390
<b>HDO 130 4_A</b>	71.5 ≤ i ≤ 190.3	175	366	1190	980
	219.1 ≤ i ≤ 335.6			770	1400
<b>HDO 140 2_A (**)</b>	6.6 ≤ i ≤ 8.2	290	437	6630	730
	i = 9.0; 10.1			5350	910
	i = 11.3; 12.6			4280	1130
	i = 14.0; 15.7			3450	1400
<b>HDO 140 3_A</b>	17.7 ≤ i ≤ 23.3	210	402	2840	720
	26.0 ≤ i ≤ 44.4			2290	900
	50.4 ≤ i ≤ 77.3			1480	1390
<b>HDO 140 4_A</b>	82.3 ≤ i ≤ 180.0	175	366	1190	980
	198.3 ≤ i ≤ 386.6			770	1400
<b>HDO 150 2_A</b>	5.5 ≤ i ≤ 7.0	322	447	10110	650
	i = 8.1; 8.9			8030	830
	i = 10.0; 10.9			6520	1020
	i = 12.6; 13.7			5180	1280
<b>HDO 150 3_A</b>	15.6 ≤ i ≤ 25.4	230	440	4040	590
	28.2 ≤ i ≤ 36.0			2850	840
	40.2 ≤ i ≤ 60.8			1840	1300
<b>HDO 150 4_A</b>	66.9 ≤ i ≤ 92.9	—	333	15550	750
	101.8 ≤ i ≤ 141.5			1190	980
	157.9 ≤ i ≤ 238.8			770	1400
<b>HDO 160 2_A</b>	i = 7.3; 7.9	322	447	10100	650
	8.9 ≤ i ≤ 11.3			7070	940
<b>HDO 160 3_A</b>	12.2 ≤ i ≤ 15.4	230	440	5210	1270
	17.7 ≤ i ≤ 31.3			4040	590
	34.9 ≤ i ≤ 44.3			2850	840
<b>HDO 160 4_A</b>	49.4 ≤ i ≤ 68.6	—	333	1840	1300
	75.9 ≤ i ≤ 96.3			15550	750
	115.2 ≤ i ≤ 174.0			1190	980
	194.1 ≤ i ≤ 269.7			770	1400
<b>HDO 170</b>	 <b>BONFIGLIOLI TECHNICAL SERVICE</b>				
<b>HDO 180</b>					



#### 26.7.4 REINFORCED BEARINGS

Optional heavy-duty bearings are also available, with increased overhung load capacity. The HDB option can only be applied to HDO 71, 81, 91 units with the LP shaft arrangement (solid shaft).

#### 26.7.5 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.

**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.

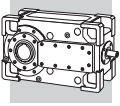
#### 26.7.6 SENSORS

**Bimetal thermostat** – If the **TG** option is specified, a bimetallic thermostat detects when the oil temperature exceeds  $90^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .

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 permitting the remote checking 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.



### 26.7.7 DRYWELL

The “drywell” - option **DW** - is a device providing output shaft sealing for units with output shaft laying vertically in the V5 position.

The “drywell” - option is not available for HDO 71 to 95 gearboxes.

When specified, for HDO 100 to 180 gearboxes, 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.

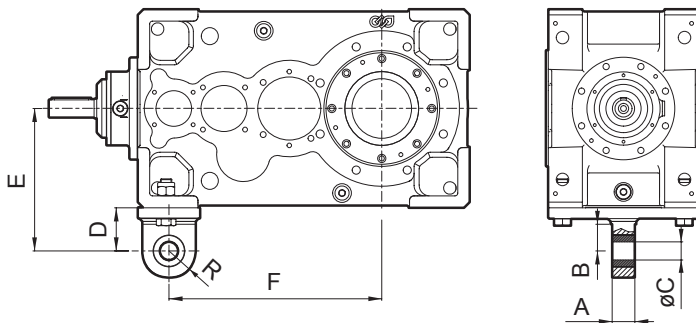
At scheduled intervals, check and refill the grease in the vane underneath the output shaft's bottom bearing.

Availability of the Drywell may be subject to limitations, depending on the contemporary specification of other devices. Please consult with Bonfiglioli Technical Service.

HDO

### 26.7.8 FIXING ELEMENTS

For shaft-mounted installations, **HDO 71 ... HDO 95** gearboxes can be fitted with an electro-welded steel torque arm, complete with anti-vibration bushing.



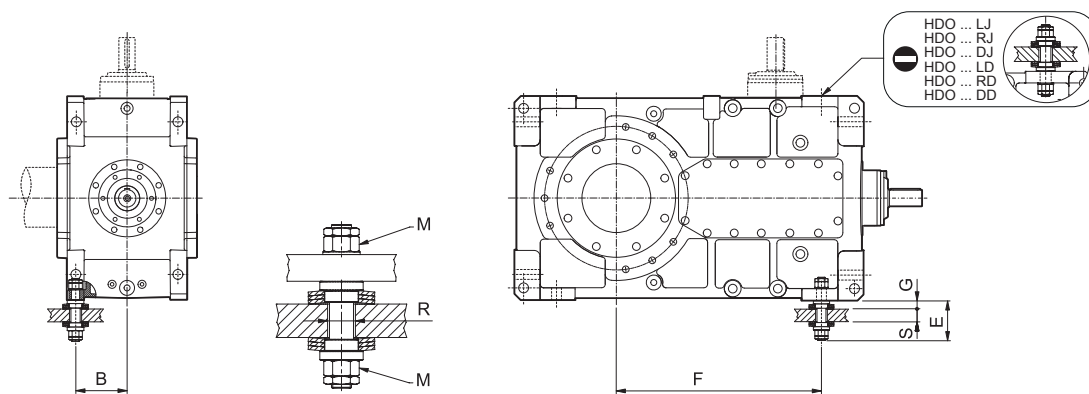
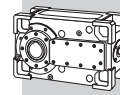
	A	B	C	D	E	F	R
HDO 71_TA	40	47	32	76	251	375	47
HDO 81_TA	60	60	42	97	297	413	60
HDO 91_TA	60	68	42	113	338	525	68
HDO 95_TA	60	68	42	113	363	520	68


For shaft mounted HDO gearboxes, a specially shaped hardened steel bolt is available to secure the unit to the supporting structure.

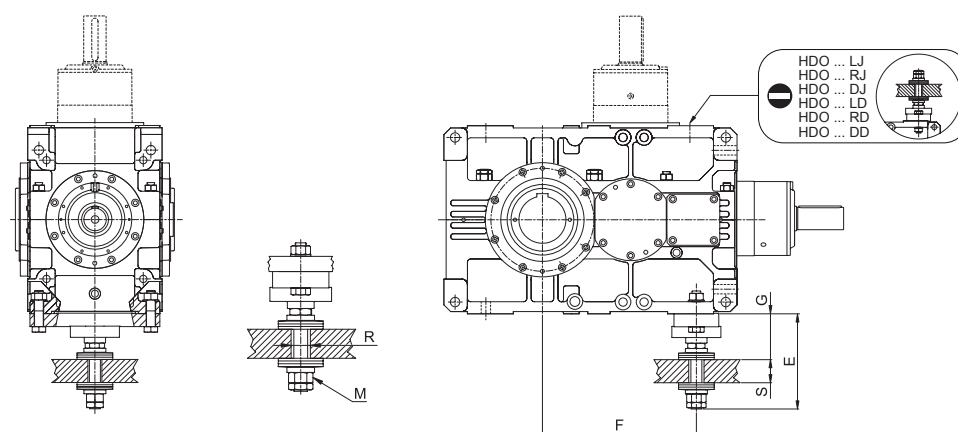
Vibration damping cup springs are also supplied in the kit. The customer must adjust the preload of these springs during installation, respecting the value G given in the following chart.



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).

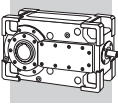
Fitting the bolt on same side as the inspection cover is not possible. In this case please contact Bonfiglioli Technical Service for advise.



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



	F	E	G	M	R	S	 DIN2093
HDO 150 2_TA	687.5	405	204.3	M48x2	52	70 - 80	A160
HDO 150 3_TA	877.5						
HDO 150 4_TA	877.5						
HDO 160 2_TA	727.5	405	204.3	M48x2	52	70 - 80	A160
HDO 160 3_TA	927.5						
HDO 160 4_TA	927.5						
HDO 170	 BONFIGLIOLI TECHNICAL SERVICE						
HDO 180							



## 26.7.9 SURFACE PROTECTION

### HDO 71 ... 95

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.

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

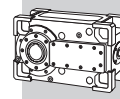
Gearboxes with optional protection to class C3 or C4 are available in a choice of colours. If no specific colour is requested (see the "PAINTING" option) gearboxes are finished in RAL 7042. Gearboxes can also be supplied with surface protection for corrosivity class C5 according to UNI EN ISO 12944-2.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

### HDO 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.

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

Gearboxes with optional protection to class 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.



## 26.7.10 PAINTING

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

PAINTING	Colour	RAL number
<b>RAL7042*</b>	Traffic Grey A	7042
<b>RAL5010</b>	Gentian Blue	5010
<b>RAL9005</b>	Jet Black	9005
<b>RAL9006</b>	White Aluminium	9006
<b>RAL9010</b>	Pure White	9010

\* 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.

## 26.7.11 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

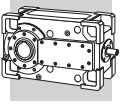
The document entails checking on order compliance, the visual inspection of external conditions and of mating dimensions. Checking on main functional parameters in unloaded conditions is also performed along with oil seal proofing, both in static and in running conditions. Units inspected are sampled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

### CT - Type certificate

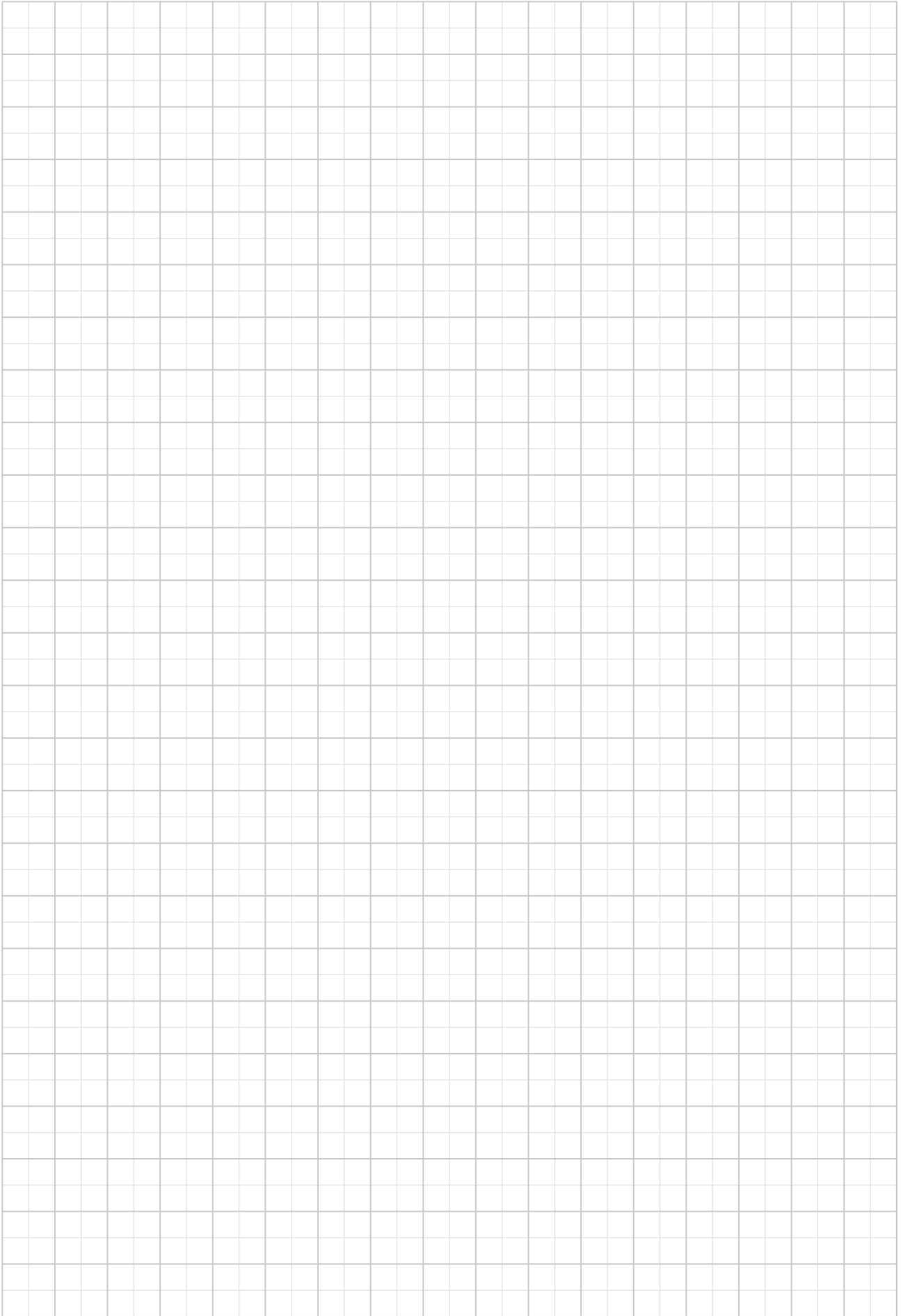
Further to the activities relevant to the Inspection certificate the following checks are also conducted:

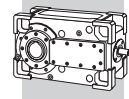
- noise
- surface temperature
- tightness of external hardware
- functionality of ancillary devices, if fitted

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






HDO





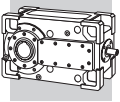
## 27 REFERENCE TORQUE

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”).

HDO															
	$i_N$	$Mn_{2ref}$ [Nm]													
		HDO 71	HDO 81	HDO 91	HDO 95	HDO 100	HDO 110	HDO 120	HDO 125	HDO 130	HDO 140	HDO 150	HDO 160	HDO 170	HDO 180
<b>2x</b> 	5.6	—	—	—	—	20910	—	—	—	60700	—	89750	—	—	—
	6.3	—	—	—	—	22620	22220	31520	—	66260	69850	105160	—	—	—
	7.1	—	—	—	—	23610	23580	32970	35500	65220	77290	114290	118960	—	—
	8.0	—	—	—	—	22820	25740	35120	36890	65900	81460	113280	129300	—	—
	9.0	—	—	—	—	23430	23790	34440	39420	65400	80240	113290	121910	—	—
	10.0	—	—	—	—	22070	25960	36600	38520	62660	81680	104620	131940	—	—
	11.2	—	—	—	—	23110	23040	33350	35910	65440	73090	112410	137750	—	—
	12.5	—	—	—	—	21490	25180	35500	37300	59310	80740	105820	116840	—	—
	14.0	—	—	—	—	22530	22480	32500	34960	64980	69190	111480	126850	—	—
	16.0	—	—	—	—	—	24600	34640	36350	—	77730	—	132600	—	—
18.0	—	—	—	—	—	—	—	38880	—	—	—	—	—	—	
<b>3x</b> 	14.0	—	—	—	—	26470	—	—	—	—	—	—	—	—	—
	16.0	—	—	—	—	24580	—	—	—	58850	—	99460	—	179960	—
	18.0	—	—	16760	—	26310	30740	32720	—	65750	68660	114150	111830	190190	199920
	20.0	—	—	17750	20040	24400	29890	35300	36480	63770	77140	110100	131830	182320	202450
	22.4	6800	—	16690	21290	26130	29850	38530	39920	65610	82910	117200	141170	188900	202480
	25.0	7260	8120	18260	19320	24270	30740	40340	43390	63380	75510	113000	136270	190190	209900
	28.0	7540	9430	16590	20680	25990	29690	36250	45510	65810	82850	108950	146300	182320	202450
	31.5	7230	9240	18160	19200	24140	31130	38110	46950	63010	84810	116920	139750	188900	200290
	35.5	7200	10730	17520	20940	25860	29540	39350	47750	65470	82360	111930	132770	190190	209900
	40.0	7490	10470	16480	19110	24020	31240	40590	46730	62680	82170	107250	146300	190190	202450
	45.0	7170	9670	18030	19070	25750	29390	39130	46650	65130	81940	107700	138440	181730	198560
	50.0	7160	11590	16400	20680	23930	31120	37620	49240	62370	82500	114010	131890	188900	197890
	56.0	6680	10960	17960	18980	25640	29280	38990	46390	64840	81520	110770	129470	189370	209900
	63.0	7140	10670	17360	20940	23830	30990	40250	48720	62100	82170	106900	144850	180390	202450
	71.0	6660	11520	16330	18910	22260	29160	38800	47750	62420	81170	—	137030	—	196430
80.0	—	—	—	—	—	26350	35760	49240	—	78870	—	—	—	—	—
90.0	—	—	—	—	—	—	—	46010	—	—	—	—	—	—	—
<b>4x</b> 	71.0	—	—	—	—	25930	—	—	—	65760	—	109890	—	180330	—
	80.0	7530	11500	18190	21220	24100	31130	—	—	63000	84810	111250	124790	190190	200360
	90.0	7220	12570	17590	20330	26910	29490	39240	—	67870	82350	117200	135850	182320	202450
	100.0	7830	11750	17710	21370	24880	30740	41250	48720	65030	82170	112750	137650	188900	199380
	112.0	7510	11790	18340	19300	27820	30610	40820	47750	69570	85000	111670	127540	190190	209900
	125.0	7010	12060	17260	21370	24880	31130	41250	49240	66770	84810	117200	137260	182320	202450
	140.0	—	13000	16540	19980	28210	31750	40920	47230	69570	87060	117090	142460	183700	207020
	160.0	8260	12070	19230	21370	24880	31350	41250	48720	66770	84810	116600	146300	190190	204100
	180.0	8100	13910	19250	20680	28210	31790	40920	47700	69570	87060	114780	147070	182320	202450
	200.0	8010	12070	20310	21370	24880	31570	41250	49240	66770	84810	117200	143330	188900	205480
	224.0	8430	14530	19250	20940	28210	31790	40920	47700	69570	87060	117090	141140	190190	209900
	250.0	7890	12070	19360	21370	24880	31570	41250	48720	66770	84810	114780	146300	182320	202450
	280.0	—	13000	20210	22400	28210	31790	40920	47230	69570	87060	—	147070	—	—
	315.0	8260	11980	18950	19420	25080	31570	41250	49240	66770	80940	—	—	—	—
	355.0	—	13910	19740	20680	23870	31790	40920	47750	63140	87060	—	—	—	—
	400.0	8150	13190	20550	23200	—	28490	37730	49240	—	78870	—	—	—	—
	450.0	8990	14740	20460	20940	—	—	—	49240	—	—	—	—	—	—
500.0	8890	12990	21610	21940	—	—	—	—	—	—	—	—	—	—	

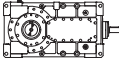
HDO



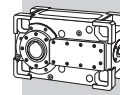


28 THERMAL CAPACITY AND RATING CHARTS

HDO

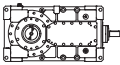
HDO 71					$n_1 = 1800 \text{ min}^{-1}$					
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$			$t_a = 40^\circ\text{C}$		
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TSR}$ [kW]	$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TSR}$ [kW]
HDO 71 3	21.8	83	5960	55						
HDO 71 3	25.3	71	6920	55						
HDO 71 3	27.1	66	6660	49						
HDO 71 3	31.4	57	7250	46						
HDO 71 3	38.1	47	7230	38						
HDO 71 3	41.9	43	7510	36						
HDO 71 3	48.7	37	7190	30						
HDO 71 3	54.2	33	7180	27						
HDO 71 3	56.3	32	6700	24						
HDO 71 3	69.2	26	7150	21						
HDO 71 3	71.9	25	6680	19						
HDO 71 4	77.0	23	7420	20						
HDO 71 4	89.4	20	7130	16						
HDO 71 4	98.3	18	7600	16						
HDO 71 4	114.1	16	7290	13						
HDO 71 4	118.5	15	6810	12						
HDO 71 4	154.4	12	8190	11						
HDO 71 4	179.3	10	7860	9						
HDO 71 4	197.0	9	8040	8						
HDO 71 4	228.2	8	8180	7						
HDO 71 4	237.7	8	7650	7						
HDO 71 4	308.9	6	8260	5						
HDO 71 4	394.1	5	7960	4						
HDO 71 4	457.5	4	8750	4						
HDO 71 4	475.4	4	8620	4						

Thermal Power values available on request.

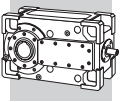


# HDO 71

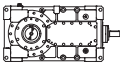
$n_1 = 1500 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 71 3	21.8	69	6300	48						
HDO 71 3	25.3	59	7260	48						
HDO 71 3	27.1	55	7030	43						
HDO 71 3	31.4	48	7230	38						
HDO 71 3	38.1	39	7200	32						
HDO 71 3	41.9	36	7490	30						
HDO 71 3	48.7	31	7170	25						
HDO 71 3	54.2	28	7160	22						
HDO 71 3	56.3	27	6680	20						
HDO 71 3	69.2	22	7140	17						
HDO 71 3	71.9	21	6660	15						
HDO 71 4	77.0	19	7530	17						
HDO 71 4	89.4	17	7220	14						
HDO 71 4	98.3	15	7830	14						
HDO 71 4	114.1	13	7510	11						
HDO 71 4	118.5	13	7010	10						
HDO 71 4	154.4	10	8260	9						
HDO 71 4	179.3	8	8100	8						
HDO 71 4	197.0	8	8010	7						
HDO 71 4	228.2	7	8430	6						
HDO 71 4	237.7	6	7890	6						
HDO 71 4	308.9	5	8260	5						
HDO 71 4	394.1	4	8150	4						
HDO 71 4	457.5	3	8990	3						
HDO 71 4	475.4	3	8890	3						

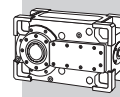
Thermal Power values available on request.



HDO

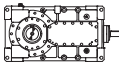
HDO 71					n <sub>1</sub> = 1200 min <sup>-1</sup>					
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 71 3	21.8	55	6730	41						
HDO 71 3	25.3	47	7230	38						
HDO 71 3	27.1	44	7510	37						
HDO 71 3	31.4	38	7200	31						
HDO 71 3	38.1	31	7180	25						
HDO 71 3	41.9	29	7460	24						
HDO 71 3	48.7	25	7150	20						
HDO 71 3	54.2	22	7140	18						
HDO 71 3	56.3	21	6660	16						
HDO 71 3	69.2	17	7180	14						
HDO 71 3	71.9	17	6700	12						
HDO 71 4	77.0	16	7810	14						
HDO 71 4	89.4	13	7490	11						
HDO 71 4	98.3	12	8080	11						
HDO 71 4	114.1	11	7800	9						
HDO 71 4	118.5	10	7280	8						
HDO 71 4	154.4	8	8260	7						
HDO 71 4	179.3	7	8410	6						
HDO 71 4	197.0	6	7990	6						
HDO 71 4	228.2	5	8430	5						
HDO 71 4	237.7	5	8200	5						
HDO 71 4	308.9	4	8260	4						
HDO 71 4	394.1	3	8380	3						
HDO 71 4	457.5	3	9160	3						
HDO 71 4	475.4	3	9250	3						

Thermal Power values available on request.



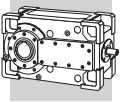
# HDO 71

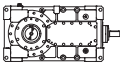
$n_1 = 1000 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 71 3	21.8	46	6870	35						
HDO 71 3	25.3	40	7200	32						
HDO 71 3	27.1	37	7490	31						
HDO 71 3	31.4	32	7180	25						
HDO 71 3	38.1	26	7160	21						
HDO 71 3	41.9	24	7440	20						
HDO 71 3	48.7	21	7130	16						
HDO 71 3	54.2	18	7120	15						
HDO 71 3	56.3	18	6650	13						
HDO 71 3	69.2	14	7400	12						
HDO 71 3	71.9	14	6910	11						
HDO 71 4	77.0	13	8050	12						
HDO 71 4	89.4	11	7720	10						
HDO 71 4	98.3	10	8050	9						
HDO 71 4	114.1	9	8040	8						
HDO 71 4	118.5	8	7510	7						
HDO 71 4	154.4	6	8260	6						
HDO 71 4	179.3	6	8430	5						
HDO 71 4	197.0	5	7970	5						
HDO 71 4	228.2	4	8600	4						
HDO 71 4	237.7	4	8460	4						
HDO 71 4	308.9	3	8260	3						
HDO 71 4	394.1	3	8380	2						
HDO 71 4	457.5	2	9160	2						
HDO 71 4	475.4	2	9480	2						

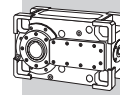
HDO

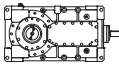
Thermal Power values available on request.



HDO 81					n <sub>1</sub> = 1800 min <sup>-1</sup>					
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 81 3	25.9	70	7820	61						
HDO 81 3	30.0	60	9080	61						
HDO 81 3	31.8	57	9240	58						
HDO 81 3	36.9	49	10730	58						
HDO 81 3	39.9	45	10470	53						
HDO 81 3	44.9	40	9620	43						
HDO 81 3	48.1	37	11630	48						
HDO 81 3	55.1	33	10960	40						
HDO 81 3	59.6	30	10670	36						
HDO 81 3	71.9	25	11550	32						
HDO 81 4	78.3	23	11530	30						
HDO 81 4	94.5	19	12300	27						
HDO 81 4	98.2	18	11500	24						
HDO 81 4	105.6	17	11790	23						
HDO 81 4	127.4	14	11900	19						
HDO 81 4	132.6	14	13000	20						
HDO 81 4	159.9	11	12060	15						
HDO 81 4	181.4	10	13570	15						
HDO 81 4	196.5	9	12070	13						
HDO 81 4	227.8	8	14100	13						
HDO 81 4	254.8	7	12070	10						
HDO 81 4	265.1	7	13000	10						
HDO 81 4	312.6	6	11980	8						
HDO 81 4	362.9	5	13910	8						
HDO 81 4	392.4	5	13190	7						
HDO 81 4	455.5	4	14740	7						
HDO 81 4	473.3	4	12610	5						

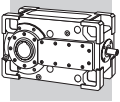
Thermal Power values available on request.



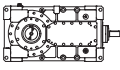
HDO 81					n <sub>1</sub> = 1500 min <sup>-1</sup>					
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 81 3	25.9	58	8120	52						
HDO 81 3	30.0	50	9430	52						
HDO 81 3	31.8	47	9240	49						
HDO 81 3	36.9	41	10730	49						
HDO 81 3	39.9	38	10470	44						
HDO 81 3	44.9	33	9670	36						
HDO 81 3	48.1	31	11590	40						
HDO 81 3	55.1	27	10960	33						
HDO 81 3	59.6	25	10670	30						
HDO 81 3	71.9	21	11520	27						
HDO 81 4	78.3	19	11500	25						
HDO 81 4	94.5	16	12570	23						
HDO 81 4	98.2	15	11750	20						
HDO 81 4	105.6	14	11790	19						
HDO 81 4	127.4	12	12060	16						
HDO 81 4	132.6	11	13000	17						
HDO 81 4	159.9	9	12070	13						
HDO 81 4	181.4	8	13910	13						
HDO 81 4	196.5	8	12070	10						
HDO 81 4	227.8	7	14530	11						
HDO 81 4	254.8	6	12070	8						
HDO 81 4	265.1	6	13000	8						
HDO 81 4	312.6	5	11980	7						
HDO 81 4	362.9	4	13910	7						
HDO 81 4	392.4	4	13190	6						
HDO 81 4	455.5	3	14740	6						
HDO 81 4	473.3	3	12990	5						

HDO

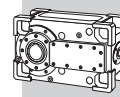
Thermal Power values available on request.

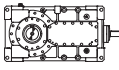


HDO

HDO 81					n <sub>1</sub> = 1200 min <sup>-1</sup>					
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 81 3	25.9	46	8120	42						
HDO 81 3	30.0	40	9430	42						
HDO 81 3	31.8	38	9240	39						
HDO 81 3	36.9	33	10730	39						
HDO 81 3	39.9	30	10470	35						
HDO 81 3	44.9	27	9670	29						
HDO 81 3	48.1	25	11550	32						
HDO 81 3	55.1	22	10960	27						
HDO 81 3	59.6	20	10670	24						
HDO 81 3	71.9	17	11580	21						
HDO 81 4	78.3	15	11740	20						
HDO 81 4	94.5	13	13040	19						
HDO 81 4	98.2	12	12060	17						
HDO 81 4	105.6	11	11790	15						
HDO 81 4	127.4	9	12070	13						
HDO 81 4	132.6	9	13000	13						
HDO 81 4	159.9	8	12070	10						
HDO 81 4	181.4	7	13910	10						
HDO 81 4	196.5	6	12070	8						
HDO 81 4	227.8	5	14740	9						
HDO 81 4	254.8	5	12180	7						
HDO 81 4	265.1	5	13000	7						
HDO 81 4	312.6	4	11980	5						
HDO 81 4	362.9	3	13910	5						
HDO 81 4	392.4	3	13190	5						
HDO 81 4	455.5	3	14740	4						
HDO 81 4	473.3	3	13470	4						

Thermal Power values available on request.

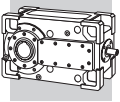


HDO 81					n <sub>1</sub> = 1000 min <sup>-1</sup>					
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 81 3	25.9	39	8120	35						
HDO 81 3	30.0	33	9430	35						
HDO 81 3	31.8	31	9240	32						
HDO 81 3	36.9	27	10730	32						
HDO 81 3	39.9	25	10470	29						
HDO 81 3	44.9	22	9670	24						
HDO 81 3	48.1	21	11520	27						
HDO 81 3	55.1	18	10960	22						
HDO 81 3	59.6	17	10670	20						
HDO 81 3	71.9	14	11930	18						
HDO 81 4	78.3	13	12060	17						
HDO 81 4	94.5	11	13430	16						
HDO 81 4	98.2	10	12070	14						
HDO 81 4	105.6	9	11790	13						
HDO 81 4	127.4	8	12070	11						
HDO 81 4	132.6	8	13000	11						
HDO 81 4	159.9	6	12070	9						
HDO 81 4	181.4	6	13910	9						
HDO 81 4	196.5	5	12070	7						
HDO 81 4	227.8	4	14740	7						
HDO 81 4	254.8	4	12550	6						
HDO 81 4	265.1	4	13000	6						
HDO 81 4	312.6	3	11980	4						
HDO 81 4	362.9	3	13910	4						
HDO 81 4	392.4	3	13190	4						
HDO 81 4	455.5	2	14740	4						
HDO 81 4	473.3	2	13870	3						

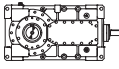
HDO

Thermal Power values available on request.

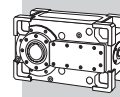




**HDO**

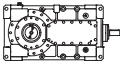
<b>HDO 91</b>					<b><math>n_1 = 1800 \text{ min}^{-1}</math></b>					
	<b>i</b>	<b><math>n_2</math></b> [ $\text{min}^{-1}$ ]	<b><math>Mn_2</math></b> [Nm]	<b><math>Pn_1</math></b> [kW]	<b><math>t_a = 20^\circ\text{C}</math></b>			<b><math>t_a = 40^\circ\text{C}</math></b>		
					<b><math>P_T</math></b> [kW]	<b><math>P_{TFAN}</math></b> [kW]	<b><math>P_{TSR}</math></b> [kW]	<b><math>P_T</math></b> [kW]	<b><math>P_{TFAN}</math></b> [kW]	<b><math>P_{TSR}</math></b> [kW]
HDO 91 3	18.6	97	15070	162						
HDO 91 3	20.7	87	16780	162						
HDO 91 3	22.5	80	16770	149						
HDO 91 3	24.1	75	16660	139						
HDO 91 3	29.1	62	16660	114						
HDO 91 3	30.6	59	17820	117						
HDO 91 3	36.9	49	17580	95						
HDO 91 3	40.2	45	16540	82						
HDO 91 3	42.9	42	18100	84						
HDO 91 3	52.0	35	16450	63						
HDO 91 3	54.5	33	18020	66						
HDO 91 3	60.7	30	17410	57						
HDO 91 3	66.1	27	16380	50						
HDO 91 4	82.0	22	15940	40						
HDO 91 4	91.3	20	17300	39						
HDO 91 4	95.3	19	17290	37						
HDO 91 4	118.1	15	17810	31						
HDO 91 4	128.5	14	16760	27						
HDO 91 4	137.1	13	16620	25						
HDO 91 4	159.3	11	19310	25						
HDO 91 4	177.4	10	19020	22						
HDO 91 4	202.5	9	20370	21						
HDO 91 4	225.4	8	19250	17						
HDO 91 4	256.3	7	18780	15						
HDO 91 4	268.8	7	20270	15						
HDO 91 4	317.8	6	19020	12						
HDO 91 4	353.8	5	19260	11						
HDO 91 4	403.8	4	20150	10						
HDO 91 4	449.6	4	19910	9						
HDO 91 4	489.3	4	20950	9						

Thermal Power values available on request.



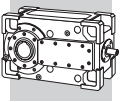
# HDO 91

$n_1 = 1500 \text{ min}^{-1}$

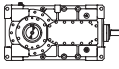
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 91 3	18.6	81	15920	143						
HDO 91 3	20.7	72	17720	143						
HDO 91 3	22.5	67	16690	124						
HDO 91 3	24.1	62	17600	122						
HDO 91 3	29.1	51	16590	95						
HDO 91 3	30.6	49	18160	99						
HDO 91 3	36.9	41	17520	79						
HDO 91 3	40.2	37	16480	68						
HDO 91 3	42.9	35	18030	70						
HDO 91 3	52.0	29	16400	53						
HDO 91 3	54.5	28	17960	55						
HDO 91 3	60.7	25	17360	48						
HDO 91 3	66.1	23	16330	41						
HDO 91 4	82.0	18	16840	35						
HDO 91 4	91.3	16	17590	33						
HDO 91 4	95.3	16	17710	32						
HDO 91 4	118.1	13	18340	26						
HDO 91 4	128.5	12	17260	23						
HDO 91 4	137.1	11	16540	21						
HDO 91 4	159.3	9	19230	21						
HDO 91 4	177.4	8	19250	18						
HDO 91 4	202.5	7	20310	17						
HDO 91 4	225.4	7	19250	15						
HDO 91 4	256.3	6	19360	13						
HDO 91 4	268.8	6	20210	13						
HDO 91 4	317.8	5	18950	10						
HDO 91 4	353.8	4	19740	10						
HDO 91 4	403.8	4	20550	9						
HDO 91 4	449.6	3	20460	8						
HDO 91 4	489.3	3	21610	8						

Thermal Power values available on request.

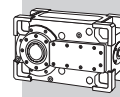
HDO



**HDO**

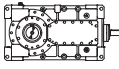
<b>HDO 91</b>					<b>n<sub>1</sub> = 1200 min<sup>-1</sup></b>					
	<b>i</b>	<b>n<sub>2</sub></b> [min <sup>-1</sup> ]	<b>Mn<sub>2</sub></b> [Nm]	<b>Pn<sub>1</sub></b> [kW]	<b>t<sub>a</sub> = 20°C</b>			<b>t<sub>a</sub> = 40°C</b>		
					<b>P<sub>T</sub></b> [kW]	<b>P<sub>TFAN</sub></b> [kW]	<b>P<sub>TSR</sub></b> [kW]	<b>P<sub>T</sub></b> [kW]	<b>P<sub>TFAN</sub></b> [kW]	<b>P<sub>TSR</sub></b> [kW]
HDO 91 3	18.6	65	16760	120						
HDO 91 3	20.7	58	17650	114						
HDO 91 3	22.5	53	16600	98						
HDO 91 3	24.1	50	18170	101						
HDO 91 3	29.1	41	16510	76						
HDO 91 3	30.6	39	18080	79						
HDO 91 3	36.9	33	17440	63						
HDO 91 3	40.2	30	16410	55						
HDO 91 3	42.9	28	17960	56						
HDO 91 3	52.0	23	16340	42						
HDO 91 3	54.5	22	17890	44						
HDO 91 3	60.7	20	17300	38						
HDO 91 3	66.1	18	16280	33						
HDO 91 4	82.0	15	18000	30						
HDO 91 4	91.3	13	18230	27						
HDO 91 4	95.3	13	18360	26						
HDO 91 4	118.1	10	19010	22						
HDO 91 4	128.5	9	17910	19						
HDO 91 4	137.1	9	16460	16						
HDO 91 4	159.3	8	19130	16						
HDO 91 4	177.4	7	19250	15						
HDO 91 4	202.5	6	20230	14						
HDO 91 4	225.4	5	19260	12						
HDO 91 4	256.3	5	20110	11						
HDO 91 4	268.8	4	20150	10						
HDO 91 4	317.8	4	18870	8						
HDO 91 4	353.8	3	20410	8						
HDO 91 4	403.8	3	21440	7						
HDO 91 4	449.6	3	21160	6						
HDO 91 4	489.3	2	22350	6						

Thermal Power values available on request.



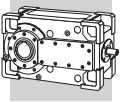
# HDO 91

$n_1 = 1000 \text{ min}^{-1}$

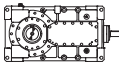
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 91 3	18.6	54	16760	100						
HDO 91 3	20.7	48	17580	95						
HDO 91 3	22.5	44	16540	82						
HDO 91 3	24.1	42	18100	84						
HDO 91 3	29.1	34	16450	63						
HDO 91 3	30.6	33	18010	66						
HDO 91 3	36.9	27	17390	52						
HDO 91 3	40.2	25	16360	45						
HDO 91 3	42.9	23	17910	46						
HDO 91 3	52.0	19	16290	35						
HDO 91 3	54.5	18	18180	37						
HDO 91 3	60.7	16	17590	32						
HDO 91 3	66.1	15	16550	28						
HDO 91 4	82.0	12	19010	26						
HDO 91 4	91.3	11	18780	23						
HDO 91 4	95.3	10	18910	23						
HDO 91 4	118.1	8	19250	19						
HDO 91 4	128.5	8	18460	16						
HDO 91 4	137.1	7	16400	14						
HDO 91 4	159.3	6	19060	14						
HDO 91 4	177.4	6	19260	12						
HDO 91 4	202.5	5	20180	11						
HDO 91 4	225.4	4	19610	10						
HDO 91 4	256.3	4	20740	9						
HDO 91 4	268.8	4	20550	9						
HDO 91 4	317.8	3	18820	7						
HDO 91 4	353.8	3	20950	7						
HDO 91 4	403.8	2	22190	6						
HDO 91 4	449.6	2	21750	5						
HDO 91 4	489.3	2	22820	5						

HDO

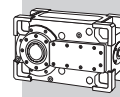
Thermal Power values available on request.



**HDO**

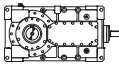
<b>HDO 95</b>					<b><math>n_1 = 1800 \text{ min}^{-1}</math></b>					
	<b>i</b>	<b><math>n_2</math></b> [ $\text{min}^{-1}$ ]	<b><math>Mn_2</math></b> [Nm]	<b><math>Pn_1</math></b> [kW]	<b><math>t_a = 20^\circ\text{C}</math></b>			<b><math>t_a = 40^\circ\text{C}</math></b>		
					<b><math>P_T</math></b> [kW]	<b><math>P_{TFAN}</math></b> [kW]	<b><math>P_{TSR}</math></b> [kW]	<b><math>P_T</math></b> [kW]	<b><math>P_{TFAN}</math></b> [kW]	<b><math>P_{TSR}</math></b> [kW]
<b>HDO 95 3</b>	<b>21.2</b>	85	17710	167						
<b>HDO 95 3</b>	<b>22.5</b>	80	18290	163						
<b>HDO 95 3</b>	<b>24.7</b>	73	18900	154						
<b>HDO 95 3</b>	<b>27.5</b>	66	19580	143						
<b>HDO 95 3</b>	<b>31.9</b>	56	19290	121						
<b>HDO 95 3</b>	<b>34.9</b>	52	20940	120						
<b>HDO 95 3</b>	<b>40.5</b>	44	19180	95						
<b>HDO 95 3</b>	<b>44.0</b>	41	19150	87						
<b>HDO 95 3</b>	<b>49.0</b>	37	20680	85						
<b>HDO 95 3</b>	<b>56.9</b>	32	19050	67						
<b>HDO 95 3</b>	<b>62.2</b>	29	20940	67						
<b>HDO 95 3</b>	<b>72.3</b>	25	18960	53						
<b>HDO 95 4</b>	<b>81.6</b>	22	20650	52						
<b>HDO 95 4</b>	<b>93.6</b>	19	18190	40						
<b>HDO 95 4</b>	<b>103.7</b>	17	21200	42						
<b>HDO 95 4</b>	<b>113.5</b>	16	18830	34						
<b>HDO 95 4</b>	<b>128.7</b>	14	21370	34						
<b>HDO 95 4</b>	<b>140.7</b>	13	19400	28						
<b>HDO 95 4</b>	<b>163.5</b>	11	21370	27						
<b>HDO 95 4</b>	<b>181.9</b>	10	20680	23						
<b>HDO 95 4</b>	<b>211.3</b>	9	20730	20						
<b>HDO 95 4</b>	<b>231.1</b>	8	20940	19						
<b>HDO 95 4</b>	<b>256.6</b>	7	21370	17						
<b>HDO 95 4</b>	<b>280.6</b>	6	21730	16						
<b>HDO 95 4</b>	<b>325.7</b>	6	19490	12						
<b>HDO 95 4</b>	<b>362.7</b>	5	20680	12						
<b>HDO 95 4</b>	<b>421.4</b>	4	23200	11						
<b>HDO 95 4</b>	<b>460.9</b>	4	20940	9						
<b>HDO 95 4</b>	<b>489.7</b>	4	21940	9						

Thermal Power values available on request.



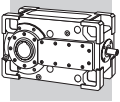
# HDO 95

$n_1 = 1500 \text{ min}^{-1}$

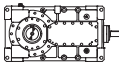
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 95 3	21.2	71	18710	147						
HDO 95 3	22.5	67	19320	143						
HDO 95 3	24.7	61	19320	131						
HDO 95 3	27.5	55	20680	126						
HDO 95 3	31.9	47	19200	100						
HDO 95 3	34.9	43	20940	100						
HDO 95 3	40.5	37	19110	79						
HDO 95 3	44.0	34	19070	72						
HDO 95 3	49.0	31	20680	70						
HDO 95 3	56.9	26	18980	56						
HDO 95 3	62.2	24	20940	56						
HDO 95 3	72.3	21	18910	44						
HDO 95 4	81.6	18	21220	44						
HDO 95 4	93.6	16	19220	35						
HDO 95 4	103.7	14	21370	35						
HDO 95 4	113.5	13	19300	29						
HDO 95 4	128.7	12	21370	28						
HDO 95 4	140.7	11	19980	24						
HDO 95 4	163.5	9	21370	22						
HDO 95 4	181.9	8	20680	19						
HDO 95 4	211.3	7	21370	17						
HDO 95 4	231.1	6	20940	15						
HDO 95 4	256.6	6	21370	14						
HDO 95 4	280.6	5	22400	14						
HDO 95 4	325.7	5	19420	10						
HDO 95 4	362.7	4	20680	10						
HDO 95 4	421.4	4	23200	9						
HDO 95 4	460.9	3	20940	8						
HDO 95 4	489.7	3	21940	8						

HDO

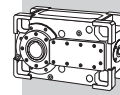
Thermal Power values available on request.



HDO

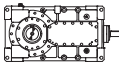
HDO 95					n <sub>1</sub> = 1200 min <sup>-1</sup>					
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 95 3	21.2	57	20000	126						
HDO 95 3	22.5	53	20660	122						
HDO 95 3	24.7	49	19220	104						
HDO 95 3	27.5	44	20680	101						
HDO 95 3	31.9	38	19110	80						
HDO 95 3	34.9	34	20940	80						
HDO 95 3	40.5	30	19020	63						
HDO 95 3	44.0	27	19000	58						
HDO 95 3	49.0	25	20680	56						
HDO 95 3	56.9	21	18910	44						
HDO 95 3	62.2	19	20940	45						
HDO 95 3	72.3	17	18840	35						
HDO 95 4	81.6	15	21370	36						
HDO 95 4	93.6	13	20330	30						
HDO 95 4	103.7	12	21370	28						
HDO 95 4	113.5	11	20010	24						
HDO 95 4	128.7	9	21370	23						
HDO 95 4	140.7	9	20730	20						
HDO 95 4	163.5	7	21370	18						
HDO 95 4	181.9	7	20680	15						
HDO 95 4	211.3	6	22180	14						
HDO 95 4	231.1	5	20940	12						
HDO 95 4	256.6	5	21610	11						
HDO 95 4	280.6	4	23200	11						
HDO 95 4	325.7	4	19340	8						
HDO 95 4	362.7	3	20680	8						
HDO 95 4	421.4	3	23200	8						
HDO 95 4	460.9	3	20940	6						
HDO 95 4	489.7	2	21940	6						

Thermal Power values available on request.



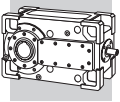
# HDO 95

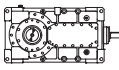
$n_1 = 1000 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C			t <sub>a</sub> = 40°C		
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TSR</sub> [kW]
HDO 95 3	21.2	47	20040	105						
HDO 95 3	22.5	44	21290	105						
HDO 95 3	24.7	41	19140	86						
HDO 95 3	27.5	36	20680	84						
HDO 95 3	31.9	31	19040	66						
HDO 95 3	34.9	29	20940	67						
HDO 95 3	40.5	25	18960	52						
HDO 95 3	44.0	23	18940	48						
HDO 95 3	49.0	20	20680	47						
HDO 95 3	56.9	18	18860	37						
HDO 95 3	62.2	16	20940	37						
HDO 95 3	72.3	14	19160	29						
HDO 95 4	81.6	12	21370	30						
HDO 95 4	93.6	11	20330	25						
HDO 95 4	103.7	10	21370	23						
HDO 95 4	113.5	9	20620	21						
HDO 95 4	128.7	8	21370	19						
HDO 95 4	140.7	7	21360	17						
HDO 95 4	163.5	6	21370	15						
HDO 95 4	181.9	5	20680	13						
HDO 95 4	211.3	5	22870	12						
HDO 95 4	231.1	4	20940	10						
HDO 95 4	256.6	4	21700	10						
HDO 95 4	280.6	4	23200	9						
HDO 95 4	325.7	3	19290	7						
HDO 95 4	362.7	3	20680	6						
HDO 95 4	421.4	2	23200	6						
HDO 95 4	460.9	2	20940	5						
HDO 95 4	489.7	2	21940	5						

Thermal Power values available on request.

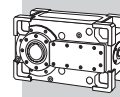




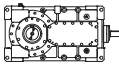
HDO 100					$n_1 = 1800 \text{ min}^{-1}$							
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$							
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR\Delta 5}$ [kW]	$P_{TMCR\Delta 9}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]	
HDO 100 2	5.8	310	14190	479	*	249	282	360	195	223	317	
HDO 100 2	6.5	279	16170	491	*	253	286	364	199	227	321	
HDO 100 2	7.0	256	16790	468	*	255	288	366	201	229	323	
HDO 100 2	8.0	225	16440	403	*	261	294	372	207	235	329	
HDO 100 2	8.7	207	17000	383	*	263	296	374	209	237	331	
HDO 100 2	10.0	180	16640	327	*	272	305	383	218	246	340	
HDO 100 2	10.9	165	17250	311	132	274	307	385	220	248	342	
HDO 100 2	12.4	145	17020	269	138	280	313	—	226	254	348	
HDO 100 2	13.5	133	17680	257	139	281	314	—	227	255	349	
HDO 100 3	14.0	128	19080	273	*	187	216	273	152	173	241	
HDO 100 3	15.6	116	20950	270	*	188	217	274	153	174	242	
HDO 100 3	17.3	104	20070	232	94	192	221	278	157	178	246	
HDO 100 3	20.2	89	22110	219	101	199	228	—	164	185	253	
HDO 100 3	22.5	80	21720	193	104	202	231	—	167	188	256	
HDO 100 3	25.0	72	24090	193	104	202	231	—	167	188	256	
HDO 100 3	28.3	64	22710	161	107	205	234	—	170	191	—	
HDO 100 3	31.5	57	23480	149	107	205	234	—	170	191	—	
HDO 100 3	36.0	50	23760	132	109	207	236	—	172	193	—	
HDO 100 3	40.0	45	23480	118	110	208	237	—	173	194	—	
HDO 100 3	43.9	41	24090	110	—	—	—	—	—	—	—	
HDO 100 3	48.8	37	23480	96	—	—	—	—	—	—	—	
HDO 100 3	55.8	32	25730	92	—	—	—	—	—	—	—	
HDO 100 3	62.0	29.0	23480	76	—	—	—	—	—	—	—	
HDO 100 3	67.5	26.7	22050	65	—	—	—	—	—	—	—	
HDO 100 4	70.8	25.4	25620	74	—	—	—	—	—	—	—	
HDO 100 4	78.7	22.9	23480	61	—	—	—	—	—	—	—	
HDO 100 4	90.0	20.0	26160	59	—	—	—	—	—	—	—	
HDO 100 4	100.0	18.0	23480	48	—	—	—	—	—	—	—	
HDO 100 4	111.4	16.2	26450	49	—	—	—	—	—	—	—	
HDO 100 4	123.8	14.5	23480	39	—	—	—	—	—	—	—	
HDO 100 4	139.8	12.9	26450	39	—	—	—	—	—	—	—	
HDO 100 4	160.0	11.3	23480	30	—	—	—	—	—	—	—	
HDO 100 4	178.2	10.1	26450	30	—	—	—	—	—	—	—	
HDO 100 4	198.0	9.1	23480	24	—	—	—	—	—	—	—	
HDO 100 4	223.7	8.0	26450	24	—	—	—	—	—	—	—	
HDO 100 4	248.6	7.2	24880	20	—	—	—	—	—	—	—	
HDO 100 4	284.4	6.3	28210	20	—	—	—	—	—	—	—	
HDO 100 4	316.0	5.7	24880	16.1	—	—	—	—	—	—	—	
HDO 100 4	344.2	5.2	23870	14.2	—	—	—	—	—	—	—	

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

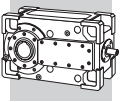


**HDO**

HDO 100					n <sub>1</sub> = 1800 min <sup>-1</sup>						
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 100 2	5.8	310	14190	479	*	*	*	204	*	*	273
HDO 100 2	6.5	279	16170	491	*	*	*	207	*	*	276
HDO 100 2	7.0	256	16790	468	*	*	*	210	*	*	279
HDO 100 2	8.0	225	16440	403	*	178	171	215	162	190	284
HDO 100 2	8.7	207	17000	383	*	180	173	217	164	192	286
HDO 100 2	10.0	180	16640	327	*	190	183	227	174	202	296
HDO 100 2	10.9	165	17250	311	*	191	184	228	175	203	297
HDO 100 2	12.4	145	17020	269	*	198	191	235	182	210	304
HDO 100 2	13.5	133	17680	257	*	199	192	236	183	211	305
HDO 100 3	14.0	128	19080	273	*	127	126	157	118	139	207
HDO 100 3	15.6	116	20950	270	*	128	127	158	119	140	208
HDO 100 3	17.3	104	20070	232	*	132	131	162	123	144	212
HDO 100 3	20.2	89	22110	219	*	139	138	169	130	151	219
HDO 100 3	22.5	80	21720	193	*	142	141	172	133	154	222
HDO 100 3	25.0	72	24090	193	*	142	141	172	133	154	222
HDO 100 3	28.3	64	22710	161	73	145	144	175	136	157	225
HDO 100 3	31.5	57	23480	149	73	145	144	175	136	157	—
HDO 100 3	36.0	50	23760	132	75	147	146	—	138	159	—
HDO 100 3	40.0	45	23480	118	76	148	147	—	139	160	—
HDO 100 3	43.9	41	24090	110	81	153	152	—	144	165	—
HDO 100 3	48.8	37	23480	96	81	153	152	—	144	165	—
HDO 100 3	55.8	32	25730	92	82	154	153	—	145	166	—
HDO 100 3	62.0	29.0	23480	76	—	—	—	—	—	—	—
HDO 100 3	67.5	26.7	22050	65	—	—	—	—	—	—	—
HDO 100 4	70.8	25.4	25620	74	60	114	115	—	108	126	—
HDO 100 4	78.7	22.9	23480	61	60	114	115	—	108	126	—
HDO 100 4	90.0	20.0	26160	59	—	—	—	—	—	—	—
HDO 100 4	100.0	18.0	23480	48	—	—	—	—	—	—	—
HDO 100 4	111.4	16.2	26450	49	—	—	—	—	—	—	—
HDO 100 4	123.8	14.5	23480	39	—	—	—	—	—	—	—
HDO 100 4	139.8	12.9	26450	39	—	—	—	—	—	—	—
HDO 100 4	160.0	11.3	23480	30	—	—	—	—	—	—	—
HDO 100 4	178.2	10.1	26450	30	—	—	—	—	—	—	—
HDO 100 4	198.0	9.1	23480	24	—	—	—	—	—	—	—
HDO 100 4	223.7	8.0	26450	24	—	—	—	—	—	—	—
HDO 100 4	248.6	7.2	24880	20	—	—	—	—	—	—	—
HDO 100 4	284.4	6.3	28210	20	—	—	—	—	—	—	—
HDO 100 4	316.0	5.7	24880	16.1	—	—	—	—	—	—	—
HDO 100 4	344.2	5.2	23870	14.2	—	—	—	—	—	—	—

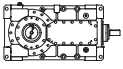
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



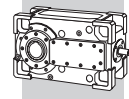
# HDO 100

$n_1 = 1500 \text{ min}^{-1}$

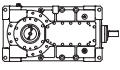
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 100 2	5.8	258	14990	422	*	244	295	373	208	236	330
HDO 100 2	6.5	232	17080	432	*	247	298	376	211	239	333
HDO 100 2	7.0	213	17740	412	*	249	300	378	213	241	335
HDO 100 2	8.0	188	17370	355	*	253	304	382	217	245	339
HDO 100 2	8.7	172	17950	337	*	255	306	384	219	247	341
HDO 100 2	10.0	150	17580	288	138	262	313	—	226	254	348
HDO 100 2	10.9	138	18220	274	139	263	314	—	227	255	349
HDO 100 2	12.4	121	17980	237	144	268	319	—	232	260	—
HDO 100 2	13.5	111	18670	226	145	269	320	—	233	261	—
HDO 100 3	14.0	107	20240	241	98	183	225	282	161	182	250
HDO 100 3	15.6	96	22210	238	98	183	225	282	161	182	250
HDO 100 3	17.3	87	21300	205	102	187	229	—	165	186	254
HDO 100 3	20.2	74	23650	195	107	192	234	—	170	191	259
HDO 100 3	22.5	67	23040	171	109	194	236	—	172	193	—
HDO 100 3	25.0	60	24270	162	109	194	236	—	172	193	—
HDO 100 3	28.3	53	24080	142	111	196	238	—	174	195	—
HDO 100 3	31.5	48	24140	128	112	197	239	—	175	196	—
HDO 100 3	36.0	42	25230	117	113	198	240	—	176	197	—
HDO 100 3	40.0	38	24020	100	—	—	—	—	—	—	—
HDO 100 3	43.9	34	25580	97	—	—	—	—	—	—	—
HDO 100 3	48.8	31	23930	82	—	—	—	—	—	—	—
HDO 100 3	55.8	26.9	25640	77	—	—	—	—	—	—	—
HDO 100 3	62.0	24.2	23830	64	—	—	—	—	—	—	—
HDO 100 3	67.5	22.2	22260	55	—	—	—	—	—	—	—
HDO 100 4	70.8	21.2	25930	62	—	—	—	—	—	—	—
HDO 100 4	78.7	19.1	24100	52	—	—	—	—	—	—	—
HDO 100 4	90.0	16.7	26910	51	—	—	—	—	—	—	—
HDO 100 4	100.0	15.0	24880	42	—	—	—	—	—	—	—
HDO 100 4	111.4	13.5	27820	43	—	—	—	—	—	—	—
HDO 100 4	123.8	12.1	24880	34	—	—	—	—	—	—	—
HDO 100 4	139.8	10.7	28210	34	—	—	—	—	—	—	—
HDO 100 4	160.0	9.4	24880	26	—	—	—	—	—	—	—
HDO 100 4	178.2	8.4	28210	27	—	—	—	—	—	—	—
HDO 100 4	198.0	7.6	24880	21	—	—	—	—	—	—	—
HDO 100 4	223.7	6.7	28210	21	—	—	—	—	—	—	—
HDO 100 4	248.6	6.0	24880	17.0	—	—	—	—	—	—	—
HDO 100 4	284.4	5.3	28210	16.9	—	—	—	—	—	—	—
HDO 100 4	316.0	4.7	25080	13.5	—	—	—	—	—	—	—
HDO 100 4	344.2	4.4	23870	11.8	—	—	—	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

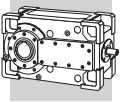


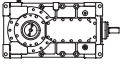
**HDO**

HDO 100					n <sub>1</sub> = 1500 min <sup>-1</sup>						
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 100 2	5.8	258	14990	422	*	*	173	217	*	192	286
HDO 100 2	6.5	232	17080	432	*	*	176	220	*	195	289
HDO 100 2	7.0	213	17740	412	*	172	178	222	169	197	291
HDO 100 2	8.0	188	17370	355	*	176	182	226	173	201	295
HDO 100 2	8.7	172	17950	337	*	177	183	227	174	202	296
HDO 100 2	10.0	150	17580	288	*	185	191	235	182	210	304
HDO 100 2	10.9	138	18220	274	*	186	192	236	183	211	305
HDO 100 2	12.4	121	17980	237	100	191	197	241	188	216	310
HDO 100 2	13.5	111	18670	226	101	192	198	242	189	217	311
HDO 100 3	14.0	107	20240	241	*	126	135	166	127	148	216
HDO 100 3	15.6	96	22210	238	*	126	135	166	127	148	216
HDO 100 3	17.3	87	21300	205	*	130	139	170	131	152	220
HDO 100 3	20.2	74	23650	195	*	135	144	175	136	157	225
HDO 100 3	22.5	67	23040	171	75	137	146	177	138	159	227
HDO 100 3	25.0	60	24270	162	75	137	146	177	138	159	227
HDO 100 3	28.3	53	24080	142	77	139	148	—	140	161	—
HDO 100 3	31.5	48	24140	128	78	140	149	—	141	162	—
HDO 100 3	36.0	42	25230	117	79	141	150	—	142	163	—
HDO 100 3	40.0	38	24020	100	79	141	150	—	142	163	—
HDO 100 3	43.9	34	25580	97	83	145	154	—	146	167	—
HDO 100 3	48.8	31	23930	82	—	—	—	—	—	—	—
HDO 100 3	55.8	26.9	25640	77	—	—	—	—	—	—	—
HDO 100 3	62.0	24.2	23830	64	—	—	—	—	—	—	—
HDO 100 3	67.5	22.2	22260	55	—	—	—	—	—	—	—
HDO 100 4	70.8	21.2	25930	62	62	109	117	—	110	128	—
HDO 100 4	78.7	19.1	24100	52	—	—	—	—	—	—	—
HDO 100 4	90.0	16.7	26910	51	—	—	—	—	—	—	—
HDO 100 4	100.0	15.0	24880	42	—	—	—	—	—	—	—
HDO 100 4	111.4	13.5	27820	43	—	—	—	—	—	—	—
HDO 100 4	123.8	12.1	24880	34	—	—	—	—	—	—	—
HDO 100 4	139.8	10.7	28210	34	—	—	—	—	—	—	—
HDO 100 4	160.0	9.4	24880	26	—	—	—	—	—	—	—
HDO 100 4	178.2	8.4	28210	27	—	—	—	—	—	—	—
HDO 100 4	198.0	7.6	24880	21	—	—	—	—	—	—	—
HDO 100 4	223.7	6.7	28210	21	—	—	—	—	—	—	—
HDO 100 4	248.6	6.0	24880	17.0	—	—	—	—	—	—	—
HDO 100 4	284.4	5.3	28210	16.9	—	—	—	—	—	—	—
HDO 100 4	316.0	4.7	25080	13.5	—	—	—	—	—	—	—
HDO 100 4	344.2	4.4	23870	11.8	—	—	—	—	—	—	—

\*  BONFIGLIOLI  
TECHNICAL SERVICE

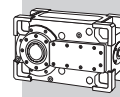
— Thermal verification not necessary



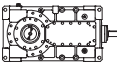
HDO 100					$n_1 = 1200 \text{ min}^{-1}$							
	i	$n_2$ [ $\text{min}^{-1}$ ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$							
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCRAS}$ [kW]	$P_{TMCRAS9}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]	
HDO 100 2	5.8	206	16030	361	*	241	305	383	218	246	340	
HDO 100 2	6.5	186	18260	370	*	243	307	385	220	248	342	
HDO 100 2	7.0	170	18970	353	*	245	309	387	222	250	344	
HDO 100 2	8.0	150	18570	304	137	248	312	—	225	253	347	
HDO 100 2	8.7	138	19200	288	138	249	313	—	226	254	348	
HDO 100 2	10.0	120	18800	246	144	255	319	—	232	260	—	
HDO 100 2	10.9	110	19490	234	145	256	320	—	233	261	—	
HDO 100 2	12.4	97	19220	203	148	259	323	—	236	264	—	
HDO 100 2	13.5	89	19970	193	149	260	324	—	237	265	—	
HDO 100 3	14.0	86	21640	206	104	180	231	—	167	188	256	
HDO 100 3	15.6	77	23750	204	105	181	232	—	168	189	257	
HDO 100 3	17.3	69	22770	176	107	183	234	—	170	191	—	
HDO 100 3	20.2	59	23650	156	111	187	238	—	174	195	—	
HDO 100 3	22.5	53	24640	146	113	189	240	—	176	197	—	
HDO 100 3	25.0	48	24140	129	113	189	240	—	176	197	—	
HDO 100 3	28.3	42	25740	121	115	191	242	—	178	199	—	
HDO 100 3	31.5	38	24030	102	—	—	—	—	—	—	—	
HDO 100 3	36.0	33	25740	95	—	—	—	—	—	—	—	
HDO 100 3	40.0	30	23920	80	—	—	—	—	—	—	—	
HDO 100 3	43.9	27.3	25650	78	—	—	—	—	—	—	—	
HDO 100 3	48.8	24.6	23830	65	—	—	—	—	—	—	—	
HDO 100 3	55.8	21.5	25870	62	—	—	—	—	—	—	—	
HDO 100 3	62.0	19.4	24040	52	—	—	—	—	—	—	—	
HDO 100 3	67.5	17.8	22460	44	—	—	—	—	—	—	—	
HDO 100 4	70.8	16.9	26840	52	—	—	—	—	—	—	—	
HDO 100 4	78.7	15.3	24880	43	—	—	—	—	—	—	—	
HDO 100 4	90.0	13.3	27860	42	—	—	—	—	—	—	—	
HDO 100 4	100.0	12.0	24880	34	—	—	—	—	—	—	—	
HDO 100 4	111.4	10.8	28210	35	—	—	—	—	—	—	—	
HDO 100 4	123.8	9.7	24880	27	—	—	—	—	—	—	—	
HDO 100 4	139.8	8.6	28210	27	—	—	—	—	—	—	—	
HDO 100 4	160.0	7.5	24880	21	—	—	—	—	—	—	—	
HDO 100 4	178.2	6.7	28210	22	—	—	—	—	—	—	—	
HDO 100 4	198.0	6.1	24880	17.1	—	—	—	—	—	—	—	
HDO 100 4	223.7	5.4	28210	17.2	—	—	—	—	—	—	—	
HDO 100 4	248.6	4.8	25020	13.7	—	—	—	—	—	—	—	
HDO 100 4	284.4	4.2	28210	13.5	—	—	—	—	—	—	—	
HDO 100 4	316.0	3.8	25410	11.0	—	—	—	—	—	—	—	
HDO 100 4	344.2	3.5	23870	9.4	—	—	—	—	—	—	—	

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

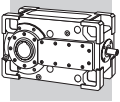


**HDO**

HDO 100					n <sub>1</sub> = 1200 min <sup>-1</sup>						
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 100 2	5.8	206	16030	361	*	168	183	227	174	202	296
HDO 100 2	6.5	186	18260	370	*	170	185	229	176	204	298
HDO 100 2	7.0	170	18970	353	*	171	186	230	177	205	299
HDO 100 2	8.0	150	18570	304	*	175	190	234	181	209	303
HDO 100 2	8.7	138	19200	288	*	176	191	235	182	210	304
HDO 100 2	10.0	120	18800	246	99	181	196	240	187	215	309
HDO 100 2	10.9	110	19490	234	100	182	197	241	188	216	310
HDO 100 2	12.4	97	19220	203	104	186	201	245	192	220	—
HDO 100 2	13.5	89	19970	193	105	187	202	—	193	221	—
HDO 100 3	14.0	86	21640	206	*	126	141	172	133	154	222
HDO 100 3	15.6	77	23750	204	*	127	142	173	134	155	223
HDO 100 3	17.3	69	22770	176	73	129	144	175	136	157	225
HDO 100 3	20.2	59	23650	156	77	133	148	179	140	161	—
HDO 100 3	22.5	53	24640	146	79	135	150	—	142	163	—
HDO 100 3	25.0	48	24140	129	79	135	150	—	142	163	—
HDO 100 3	28.3	42	25740	121	81	137	152	—	144	165	—
HDO 100 3	31.5	38	24030	102	81	137	152	—	144	165	—
HDO 100 3	36.0	33	25740	95	82	138	153	—	145	166	—
HDO 100 3	40.0	30	23920	80	—	—	—	—	—	—	—
HDO 100 3	43.9	27.3	25650	78	—	—	—	—	—	—	—
HDO 100 3	48.8	24.6	23830	65	—	—	—	—	—	—	—
HDO 100 3	55.8	21.5	25870	62	—	—	—	—	—	—	—
HDO 100 3	62.0	19.4	24040	52	—	—	—	—	—	—	—
HDO 100 3	67.5	17.8	22460	44	—	—	—	—	—	—	—
HDO 100 4	70.8	16.9	26840	52	—	—	—	—	—	—	—
HDO 100 4	78.7	15.3	24880	43	—	—	—	—	—	—	—
HDO 100 4	90.0	13.3	27860	42	—	—	—	—	—	—	—
HDO 100 4	100.0	12.0	24880	34	—	—	—	—	—	—	—
HDO 100 4	111.4	10.8	28210	35	—	—	—	—	—	—	—
HDO 100 4	123.8	9.7	24880	27	—	—	—	—	—	—	—
HDO 100 4	139.8	8.6	28210	27	—	—	—	—	—	—	—
HDO 100 4	160.0	7.5	24880	21	—	—	—	—	—	—	—
HDO 100 4	178.2	6.7	28210	22	—	—	—	—	—	—	—
HDO 100 4	198.0	6.1	24880	17.1	—	—	—	—	—	—	—
HDO 100 4	223.7	5.4	28210	17.2	—	—	—	—	—	—	—
HDO 100 4	248.6	4.8	25020	13.7	—	—	—	—	—	—	—
HDO 100 4	284.4	4.2	28210	13.5	—	—	—	—	—	—	—
HDO 100 4	316.0	3.8	25410	11.0	—	—	—	—	—	—	—
HDO 100 4	344.2	3.5	23870	9.4	—	—	—	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

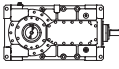
— Thermal verification not necessary



HDO

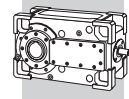
HDO 100

$n_1 = 1000 \text{ min}^{-1}$

	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$						
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]
HDO 100 2	5.8	172	16930	317	136	223	311	389	224	252	346
HDO 100 2	6.5	155	19290	325	138	225	313	391	226	254	348
HDO 100 2	7.0	142	20030	310	139	226	314	—	227	255	349
HDO 100 2	8.0	125	19610	267	142	229	317	—	230	258	352
HDO 100 2	8.7	115	20280	254	143	230	318	—	231	259	—
HDO 100 2	10.0	100	19850	216	148	235	323	—	236	264	—
HDO 100 2	10.9	92	20580	206	148	235	323	—	236	264	—
HDO 100 2	12.4	81	20300	178	151	238	326	—	239	267	—
HDO 100 2	13.5	74	21090	170	152	239	327	—	240	268	—
HDO 100 3	14.0	71	22860	182	108	167	235	—	171	192	—
HDO 100 3	15.6	64	24310	174	109	168	236	—	172	193	—
HDO 100 3	17.3	58	24060	155	111	170	238	—	174	195	—
HDO 100 3	20.2	49	24160	133	114	173	241	—	177	198	—
HDO 100 3	22.5	44	25890	128	115	174	242	—	178	199	—
HDO 100 3	25.0	40	24050	107	—	—	—	—	—	—	—
HDO 100 3	28.3	35	25770	101	—	—	—	—	—	—	—
HDO 100 3	31.5	32	23940	85	—	—	—	—	—	—	—
HDO 100 3	36.0	27.8	25660	79	—	—	—	—	—	—	—
HDO 100 3	40.0	25.0	23840	66	—	—	—	—	—	—	—
HDO 100 3	43.9	22.8	25640	65	—	—	—	—	—	—	—
HDO 100 3	48.8	20.5	23830	54	—	—	—	—	—	—	—
HDO 100 3	55.8	17.9	26600	53	—	—	—	—	—	—	—
HDO 100 3	62.0	16.1	24740	44	—	—	—	—	—	—	—
HDO 100 3	67.5	14.8	23120	38	—	—	—	—	—	—	—
HDO 100 4	70.8	14.1	27610	44	—	—	—	—	—	—	—
HDO 100 4	78.7	12.7	24880	36	—	—	—	—	—	—	—
HDO 100 4	90.0	11.1	28210	36	—	—	—	—	—	—	—
HDO 100 4	100.0	10.0	24880	28	—	—	—	—	—	—	—
HDO 100 4	111.4	9.0	28210	29	—	—	—	—	—	—	—
HDO 100 4	123.8	8.1	24880	23	—	—	—	—	—	—	—
HDO 100 4	139.8	7.2	28210	23	—	—	—	—	—	—	—
HDO 100 4	160.0	6.3	24880	17.7	—	—	—	—	—	—	—
HDO 100 4	178.2	5.6	28210	18.0	—	—	—	—	—	—	—
HDO 100 4	198.0	5.0	24880	14.3	—	—	—	—	—	—	—
HDO 100 4	223.7	4.5	28210	14.3	—	—	—	—	—	—	—
HDO 100 4	248.6	4.0	25410	11.6	—	—	—	—	—	—	—
HDO 100 4	284.4	3.5	28210	11.3	—	—	—	—	—	—	—
HDO 100 4	316.0	3.2	25410	9.1	—	—	—	—	—	—	—
HDO 100 4	344.2	2.9	23870	7.9	—	—	—	—	—	—	—

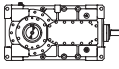
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 100

$n_1 = 1000 \text{ min}^{-1}$

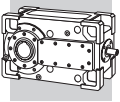
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 100 2	5.8	172	16930	317	*	156	189	233	180	208	302
HDO 100 2	6.5	155	19290	325	*	158	191	235	182	210	304
HDO 100 2	7.0	142	20030	310	*	159	192	236	183	211	305
HDO 100 2	8.0	125	19610	267	*	162	195	239	186	214	308
HDO 100 2	8.7	115	20280	254	*	163	196	240	187	215	309
HDO 100 2	10.0	100	19850	216	103	167	200	244	191	219	—
HDO 100 2	10.9	92	20580	206	104	168	201	245	192	220	—
HDO 100 2	12.4	81	20300	178	107	171	204	—	195	223	—
HDO 100 2	13.5	74	21090	170	108	172	205	—	196	224	—
HDO 100 3	14.0	71	22860	182	74	118	145	176	137	158	226
HDO 100 3	15.6	64	24310	174	75	119	146	177	138	159	227
HDO 100 3	17.3	58	24060	155	77	121	148	179	140	161	—
HDO 100 3	20.2	49	24160	133	80	124	151	—	143	164	—
HDO 100 3	22.5	44	25890	128	81	125	152	—	144	165	—
HDO 100 3	25.0	40	24050	107	81	125	152	—	144	165	—
HDO 100 3	28.3	35	25770	101	83	127	154	—	146	167	—
HDO 100 3	31.5	32	23940	85	83	127	154	—	146	167	—
HDO 100 3	36.0	27.8	25660	79	—	—	—	—	—	—	—
HDO 100 3	40.0	25.0	23840	66	—	—	—	—	—	—	—
HDO 100 3	43.9	22.8	25640	65	—	—	—	—	—	—	—
HDO 100 3	48.8	20.5	23830	54	—	—	—	—	—	—	—
HDO 100 3	55.8	17.9	26600	53	—	—	—	—	—	—	—
HDO 100 3	62.0	16.1	24740	44	—	—	—	—	—	—	—
HDO 100 3	67.5	14.8	23120	38	—	—	—	—	—	—	—
HDO 100 4	70.8	14.1	27610	44	—	—	—	—	—	—	—
HDO 100 4	78.7	12.7	24880	36	—	—	—	—	—	—	—
HDO 100 4	90.0	11.1	28210	36	—	—	—	—	—	—	—
HDO 100 4	100.0	10.0	24880	28	—	—	—	—	—	—	—
HDO 100 4	111.4	9.0	28210	29	—	—	—	—	—	—	—
HDO 100 4	123.8	8.1	24880	23	—	—	—	—	—	—	—
HDO 100 4	139.8	7.2	28210	23	—	—	—	—	—	—	—
HDO 100 4	160.0	6.3	24880	17.7	—	—	—	—	—	—	—
HDO 100 4	178.2	5.6	28210	18.0	—	—	—	—	—	—	—
HDO 100 4	198.0	5.0	24880	14.3	—	—	—	—	—	—	—
HDO 100 4	223.7	4.5	28210	14.3	—	—	—	—	—	—	—
HDO 100 4	248.6	4.0	25410	11.6	—	—	—	—	—	—	—
HDO 100 4	284.4	3.5	28210	11.3	—	—	—	—	—	—	—
HDO 100 4	316.0	3.2	25410	9.1	—	—	—	—	—	—	—
HDO 100 4	344.2	2.9	23870	7.9	—	—	—	—	—	—	—

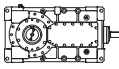
HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

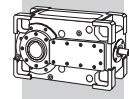




HDO 110					$n_1 = 1800 \text{ min}^{-1}$							
	i	$n_2$ [ $\text{min}^{-1}$ ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$							
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCRA5}$ [kW]	$P_{TMCRA9}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]	
HDO 110 2	6.4	283	19920	615	*	*	254	332	*	*	289	
HDO 110 2	7.0	256	20970	585	*	*	258	336	*	*	293	
HDO 110 2	8.1	223	22600	549	*	230	263	341	*	*	298	
HDO 110 2	8.7	207	22470	506	*	234	267	345	*	208	302	
HDO 110 2	10.0	180	24220	475	*	238	271	349	*	212	306	
HDO 110 2	10.9	165	23040	415	*	250	283	361	196	224	318	
HDO 110 2	12.5	144	25180	395	*	253	286	364	199	227	321	
HDO 110 2	13.5	133	21820	317	*	262	295	373	208	236	330	
HDO 110 2	15.5	116	23570	298	122	264	297	375	210	238	332	
HDO 110 3	18.9	95	23370	247	*	191	220	277	156	177	245	
HDO 110 3	20.9	86	24470	234	94	192	221	278	157	178	246	
HDO 110 3	22.0	82	24090	219	100	198	227	—	163	184	252	
HDO 110 3	24.6	73	24360	198	103	201	230	—	166	187	255	
HDO 110 3	27.2	66	26510	195	103	201	230	—	166	187	255	
HDO 110 3	30.9	58	26450	171	106	204	233	—	169	190	—	
HDO 110 3	34.3	53	28210	165	107	205	234	—	170	191	—	
HDO 110 3	39.3	46	27660	141	109	207	236	—	172	193	—	
HDO 110 3	43.6	41	29500	136	109	207	236	—	172	193	—	
HDO 110 3	48.0	38	30190	126	114	212	241	—	177	198	—	
HDO 110 3	53.1	34	29040	109	—	—	—	—	—	—	—	
HDO 110 3	61.0	29.5	29090	96	—	—	—	—	—	—	—	
HDO 110 3	67.5	26.7	29040	86	—	—	—	—	—	—	—	
HDO 110 3	77.5	23.2	26010	67	—	—	—	—	—	—	—	
HDO 110 4	77.4	23.3	29530	78	—	—	—	—	—	—	—	
HDO 110 4	85.7	21.0	29040	69	—	—	—	—	—	—	—	
HDO 110 4	96.7	18.6	28930	61	—	—	—	—	—	—	—	
HDO 110 4	108.9	16.5	29040	54	—	—	—	—	—	—	—	
HDO 110 4	121.7	14.8	30300	51	—	—	—	—	—	—	—	
HDO 110 4	137.1	13.1	28650	43	—	—	—	—	—	—	—	
HDO 110 4	154.7	11.6	30850	41	—	—	—	—	—	—	—	
HDO 110 4	174.3	10.3	29040	34	—	—	—	—	—	—	—	
HDO 110 4	194.7	9.2	31570	33	—	—	—	—	—	—	—	
HDO 110 4	215.7	8.3	29040	28	—	—	—	—	—	—	—	
HDO 110 4	244.4	7.4	31570	26	—	—	—	—	—	—	—	
HDO 110 4	274.2	6.6	29040	22	—	—	—	—	—	—	—	
HDO 110 4	310.7	5.8	29090	19.1	—	—	—	—	—	—	—	
HDO 110 4	344.2	5.2	31790	18.9	—	—	—	—	—	—	—	
HDO 110 4	395.0	4.6	28490	14.7	—	—	—	—	—	—	—	

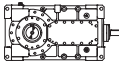
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 110

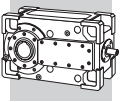
$n_1 = 1800 \text{ min}^{-1}$

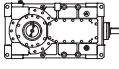
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 40^\circ\text{C}$						
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]
HDO 110 2	6.4	283	19920	615	*	*	*	*	*	*	*
HDO 110 2	7.0	256	20970	585	*	*	*	*	*	*	249
HDO 110 2	8.1	223	22600	549	*	*	*	*	*	*	254
HDO 110 2	8.7	207	22470	506	*	*	*	*	*	*	257
HDO 110 2	10.0	180	24220	475	*	*	*	192	*	*	261
HDO 110 2	10.9	165	23040	415	*	168	*	205	*	180	274
HDO 110 2	12.5	144	25180	395	*	171	164	208	*	183	277
HDO 110 2	13.5	133	21820	317	*	180	173	217	164	192	286
HDO 110 2	15.5	116	23570	298	*	182	175	219	166	194	288
HDO 110 3	18.9	95	23370	247	*	131	130	161	122	143	211
HDO 110 3	20.9	86	24470	234	*	132	131	162	123	144	212
HDO 110 3	22.0	82	24090	219	*	138	137	168	129	150	218
HDO 110 3	24.6	73	24360	198	*	141	140	171	132	153	221
HDO 110 3	27.2	66	26510	195	*	141	140	171	132	153	221
HDO 110 3	30.9	58	26450	171	72	144	143	174	135	156	224
HDO 110 3	34.3	53	28210	165	73	145	144	175	136	157	225
HDO 110 3	39.3	46	27660	141	75	147	146	—	138	159	—
HDO 110 3	43.6	41	29500	136	75	147	146	—	138	159	—
HDO 110 3	48.0	38	30190	126	80	152	151	—	143	164	—
HDO 110 3	53.1	34	29040	109	80	152	151	—	143	164	—
HDO 110 3	61.0	29.5	29090	96	82	154	153	—	145	166	—
HDO 110 3	67.5	26.7	29040	86	82	154	153	—	145	166	—
HDO 110 3	77.5	23.2	26010	67	—	—	—	—	—	—	—
HDO 110 4	77.4	23.3	29530	78	60	114	115	—	108	126	—
HDO 110 4	85.7	21.0	29040	69	60	114	115	—	108	126	—
HDO 110 4	96.7	18.6	28930	61	—	—	—	—	—	—	—
HDO 110 4	108.9	16.5	29040	54	—	—	—	—	—	—	—
HDO 110 4	121.7	14.8	30300	51	—	—	—	—	—	—	—
HDO 110 4	137.1	13.1	28650	43	—	—	—	—	—	—	—
HDO 110 4	154.7	11.6	30850	41	—	—	—	—	—	—	—
HDO 110 4	174.3	10.3	29040	34	—	—	—	—	—	—	—
HDO 110 4	194.7	9.2	31570	33	—	—	—	—	—	—	—
HDO 110 4	215.7	8.3	29040	28	—	—	—	—	—	—	—
HDO 110 4	244.4	7.4	31570	26	—	—	—	—	—	—	—
HDO 110 4	274.2	6.6	29040	22	—	—	—	—	—	—	—
HDO 110 4	310.7	5.8	29090	19.1	—	—	—	—	—	—	—
HDO 110 4	344.2	5.2	31790	18.9	—	—	—	—	—	—	—
HDO 110 4	395.0	4.6	28490	14.7	—	—	—	—	—	—	—

HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

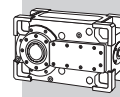
— Thermal verification not necessary



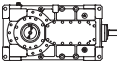
HDO 110					n <sub>1</sub> = 1500 min <sup>-1</sup>						
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCR45</sub> [kW]	P <sub>TMCR49</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 110 2	6.4	236	21050	542	*	222	273	351	*	*	308
HDO 110 2	7.0	213	22150	515	*	226	277	355	*	218	312
HDO 110 2	8.1	186	23880	484	*	230	281	359	194	222	316
HDO 110 2	8.7	172	23730	445	*	232	283	361	196	224	318
HDO 110 2	10.0	150	25580	418	*	235	286	364	199	227	321
HDO 110 2	10.9	138	23040	346	*	245	296	374	209	237	331
HDO 110 2	12.5	120	25180	329	*	247	298	376	211	239	333
HDO 110 2	13.5	111	22480	272	130	254	305	—	218	246	340
HDO 110 2	15.5	97	24600	260	132	256	307	—	220	248	342
HDO 110 3	18.9	79	24850	219	101	186	228	—	164	185	253
HDO 110 3	20.9	72	25980	207	101	186	228	—	164	185	253
HDO 110 3	22.0	68	25740	195	106	191	233	—	169	190	258
HDO 110 3	24.6	61	26070	177	108	193	235	—	171	192	—
HDO 110 3	27.2	55	28100	172	109	194	236	—	172	193	—
HDO 110 3	30.9	48	28060	151	111	196	238	—	174	195	—
HDO 110 3	34.3	44	29540	144	111	196	238	—	174	195	—
HDO 110 3	39.3	38	29350	125	113	198	240	—	176	197	—
HDO 110 3	43.6	34	29390	113	—	—	—	—	—	—	—
HDO 110 3	48.0	31	31120	108	—	—	—	—	—	—	—
HDO 110 3	53.1	28.2	29280	92	—	—	—	—	—	—	—
HDO 110 3	61.0	24.6	30990	85	—	—	—	—	—	—	—
HDO 110 3	67.5	22.2	29160	72	—	—	—	—	—	—	—
HDO 110 3	77.5	19.4	26350	57	—	—	—	—	—	—	—
HDO 110 4	77.4	19.4	31130	69	—	—	—	—	—	—	—
HDO 110 4	85.7	17.5	29490	59	—	—	—	—	—	—	—
HDO 110 4	96.7	15.5	30690	54	—	—	—	—	—	—	—
HDO 110 4	108.9	13.8	30610	48	—	—	—	—	—	—	—
HDO 110 4	121.7	12.3	31130	44	—	—	—	—	—	—	—
HDO 110 4	137.1	10.9	30410	38	—	—	—	—	—	—	—
HDO 110 4	154.7	9.7	31350	35	—	—	—	—	—	—	—
HDO 110 4	174.3	8.6	31790	31	—	—	—	—	—	—	—
HDO 110 4	194.7	7.7	31570	28	—	—	—	—	—	—	—
HDO 110 4	215.7	7.0	31790	25	—	—	—	—	—	—	—
HDO 110 4	244.4	6.1	31570	22	—	—	—	—	—	—	—
HDO 110 4	274.2	5.5	31790	19.7	—	—	—	—	—	—	—
HDO 110 4	310.7	4.8	31570	17.3	—	—	—	—	—	—	—
HDO 110 4	344.2	4.4	31790	15.7	—	—	—	—	—	—	—
HDO 110 4	395.0	3.8	28490	12.3	—	—	—	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

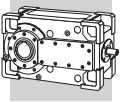


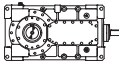
**HDO**

HDO 110					n <sub>1</sub> = 1500 min <sup>-1</sup>							
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C							
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	
HDO 110 2	6.4	236	21050	542	*	*	*	*	*	*	*	264
HDO 110 2	7.0	213	22150	515	*	*	*	*	*	*	*	267
HDO 110 2	8.1	186	23880	484	*	*	*	202	*	*	*	271
HDO 110 2	8.7	172	23730	445	*	*	*	205	*	*	180	274
HDO 110 2	10.0	150	25580	418	*	*	*	208	*	*	183	277
HDO 110 2	10.9	138	23040	346	*	168	174	218	165	193	287	
HDO 110 2	12.5	120	25180	329	*	170	176	220	167	195	289	
HDO 110 2	13.5	111	22480	272	*	177	183	227	174	202	296	
HDO 110 2	15.5	97	24600	260	*	179	185	229	176	204	298	
HDO 110 3	18.9	79	24850	219	*	129	138	169	130	151	219	
HDO 110 3	20.9	72	25980	207	*	129	138	169	130	151	219	
HDO 110 3	22.0	68	25740	195	*	134	143	174	135	156	224	
HDO 110 3	24.6	61	26070	177	74	136	145	176	137	158	226	
HDO 110 3	27.2	55	28100	172	75	137	146	177	138	159	227	
HDO 110 3	30.9	48	28060	151	77	139	148	179	140	161	—	
HDO 110 3	34.3	44	29540	144	77	139	148	—	140	161	—	
HDO 110 3	39.3	38	29350	125	79	141	150	—	142	163	—	
HDO 110 3	43.6	34	29390	113	79	141	150	—	142	163	—	
HDO 110 3	48.0	31	31120	108	83	145	154	—	146	167	—	
HDO 110 3	53.1	28.2	29280	92	83	145	154	—	146	167	—	
HDO 110 3	61.0	24.6	30990	85	84	146	155	—	147	168	—	
HDO 110 3	67.5	22.2	29160	72	—	—	—	—	—	—	—	
HDO 110 3	77.5	19.4	26350	57	—	—	—	—	—	—	—	
HDO 110 4	77.4	19.4	31130	69	62	109	117	—	110	128	—	
HDO 110 4	85.7	17.5	29490	59	—	—	—	—	—	—	—	
HDO 110 4	96.7	15.5	30690	54	—	—	—	—	—	—	—	
HDO 110 4	108.9	13.8	30610	48	—	—	—	—	—	—	—	
HDO 110 4	121.7	12.3	31130	44	—	—	—	—	—	—	—	
HDO 110 4	137.1	10.9	30410	38	—	—	—	—	—	—	—	
HDO 110 4	154.7	9.7	31350	35	—	—	—	—	—	—	—	
HDO 110 4	174.3	8.6	31790	31	—	—	—	—	—	—	—	
HDO 110 4	194.7	7.7	31570	28	—	—	—	—	—	—	—	
HDO 110 4	215.7	7.0	31790	25	—	—	—	—	—	—	—	
HDO 110 4	244.4	6.1	31570	22	—	—	—	—	—	—	—	
HDO 110 4	274.2	5.5	31790	19.7	—	—	—	—	—	—	—	
HDO 110 4	310.7	4.8	31570	17.3	—	—	—	—	—	—	—	
HDO 110 4	344.2	4.4	31790	15.7	—	—	—	—	—	—	—	
HDO 110 4	395.0	3.8	28490	12.3	—	—	—	—	—	—	—	

\*  BONFIGLIOLI TECHNICAL SERVICE

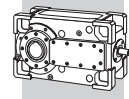
— Thermal verification not necessary



HDO 110					$n_1 = 1200 \text{ min}^{-1}$							
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$							
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]	
HDO 110 2	6.4	189	22220	458	*	224	288	366	201	229	323	
HDO 110 2	7.0	170	23580	438	*	226	290	368	203	231	325	
HDO 110 2	8.1	149	25530	414	*	229	293	371	206	234	328	
HDO 110 2	8.7	138	23790	357	*	232	296	374	209	237	331	
HDO 110 2	10.0	120	25960	340	*	234	298	376	211	239	333	
HDO 110 2	10.9	110	23040	277	130	241	305	—	218	246	340	
HDO 110 2	12.5	96	25180	264	132	243	307	—	220	248	342	
HDO 110 2	13.5	89	22480	218	138	249	313	—	226	254	—	
HDO 110 2	15.5	77	24600	208	139	250	314	—	227	255	—	
HDO 110 3	18.9	63	26570	188	106	182	233	—	169	190	—	
HDO 110 3	20.9	57	27780	177	107	183	234	—	170	191	—	
HDO 110 3	22.0	54	27660	168	110	186	237	—	173	194	—	
HDO 110 3	24.6	49	27990	152	112	188	239	—	175	196	—	
HDO 110 3	27.2	44	29540	145	112	188	239	—	175	196	—	
HDO 110 3	30.9	39	30000	129	114	190	241	—	177	198	—	
HDO 110 3	34.3	35	29400	115	114	190	241	—	177	198	—	
HDO 110 3	39.3	31	31100	106	—	—	—	—	—	—	—	
HDO 110 3	43.6	27.5	29270	90	—	—	—	—	—	—	—	
HDO 110 3	48.0	25.0	30990	86	—	—	—	—	—	—	—	
HDO 110 3	53.1	22.6	29160	73	—	—	—	—	—	—	—	
HDO 110 3	61.0	19.7	31260	68	—	—	—	—	—	—	—	
HDO 110 3	67.5	17.8	29420	58	—	—	—	—	—	—	—	
HDO 110 3	77.5	15.5	26590	46	—	—	—	—	—	—	—	
HDO 110 4	77.4	15.5	31130	55	—	—	—	—	—	—	—	
HDO 110 4	85.7	14.0	30530	49	—	—	—	—	—	—	—	
HDO 110 4	96.7	12.4	30740	43	—	—	—	—	—	—	—	
HDO 110 4	108.9	11.0	31710	40	—	—	—	—	—	—	—	
HDO 110 4	121.7	9.9	31130	35	—	—	—	—	—	—	—	
HDO 110 4	137.1	8.8	31790	32	—	—	—	—	—	—	—	
HDO 110 4	154.7	7.8	31350	28	—	—	—	—	—	—	—	
HDO 110 4	174.3	6.9	31790	25	—	—	—	—	—	—	—	
HDO 110 4	194.7	6.2	31570	22	—	—	—	—	—	—	—	
HDO 110 4	215.7	5.6	31790	20	—	—	—	—	—	—	—	
HDO 110 4	244.4	4.9	31570	17.6	—	—	—	—	—	—	—	
HDO 110 4	274.2	4.4	31790	15.8	—	—	—	—	—	—	—	
HDO 110 4	310.7	3.9	31570	13.8	—	—	—	—	—	—	—	
HDO 110 4	344.2	3.5	31790	12.6	—	—	—	—	—	—	—	
HDO 110 4	395.0	3.0	28490	9.8	—	—	—	—	—	—	—	

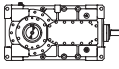
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 110

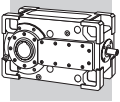
$n_1 = 1200 \text{ min}^{-1}$

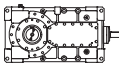
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 110 2	6.4	189	22220	458	*	*	*	210	*	185	279
HDO 110 2	7.0	170	23580	438	*	*	*	212	*	187	281
HDO 110 2	8.1	149	25530	414	*	*	171	215	*	190	284
HDO 110 2	8.7	138	23790	357	*	158	173	217	164	192	286
HDO 110 2	10.0	120	25960	340	*	161	176	220	167	195	289
HDO 110 2	10.9	110	23040	277	*	168	183	227	174	202	296
HDO 110 2	12.5	96	25180	264	*	170	185	229	176	204	298
HDO 110 2	13.5	89	22480	218	93	175	190	234	181	209	303
HDO 110 2	15.5	77	24600	208	95	177	192	236	183	211	—
HDO 110 3	18.9	63	26570	188	*	128	143	174	135	156	224
HDO 110 3	20.9	57	27780	177	73	129	144	175	136	157	225
HDO 110 3	22.0	54	27660	168	76	132	147	178	139	160	228
HDO 110 3	24.6	49	27990	152	78	134	149	180	141	162	—
HDO 110 3	27.2	44	29540	145	78	134	149	—	141	162	—
HDO 110 3	30.9	39	30000	129	80	136	151	—	143	164	—
HDO 110 3	34.3	35	29400	115	80	136	151	—	143	164	—
HDO 110 3	39.3	31	31100	106	82	138	153	—	145	166	—
HDO 110 3	43.6	27.5	29270	90	82	138	153	—	145	166	—
HDO 110 3	48.0	25.0	30990	86	85	141	156	—	148	169	—
HDO 110 3	53.1	22.6	29160	73	—	—	—	—	—	—	—
HDO 110 3	61.0	19.7	31260	68	—	—	—	—	—	—	—
HDO 110 3	67.5	17.8	29420	58	—	—	—	—	—	—	—
HDO 110 3	77.5	15.5	26590	46	—	—	—	—	—	—	—
HDO 110 4	77.4	15.5	31130	55	—	—	—	—	—	—	—
HDO 110 4	85.7	14.0	30530	49	—	—	—	—	—	—	—
HDO 110 4	96.7	12.4	30740	43	—	—	—	—	—	—	—
HDO 110 4	108.9	11.0	31710	40	—	—	—	—	—	—	—
HDO 110 4	121.7	9.9	31130	35	—	—	—	—	—	—	—
HDO 110 4	137.1	8.8	31790	32	—	—	—	—	—	—	—
HDO 110 4	154.7	7.8	31350	28	—	—	—	—	—	—	—
HDO 110 4	174.3	6.9	31790	25	—	—	—	—	—	—	—
HDO 110 4	194.7	6.2	31570	22	—	—	—	—	—	—	—
HDO 110 4	215.7	5.6	31790	20	—	—	—	—	—	—	—
HDO 110 4	244.4	4.9	31570	17.6	—	—	—	—	—	—	—
HDO 110 4	274.2	4.4	31790	15.8	—	—	—	—	—	—	—
HDO 110 4	310.7	3.9	31570	13.8	—	—	—	—	—	—	—
HDO 110 4	344.2	3.5	31790	12.6	—	—	—	—	—	—	—
HDO 110 4	395.0	3.0	28490	9.8	—	—	—	—	—	—	—

HDO

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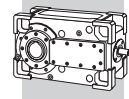
— Thermal verification not necessary



HDO 110					n <sub>1</sub> = 1000 min <sup>-1</sup>						
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 110 2	6.4	157	22220	381	*	210	298	376	211	239	333
HDO 110 2	7.0	142	23580	365	*	212	300	378	213	241	335
HDO 110 2	8.1	124	25740	347	*	214	302	380	215	243	337
HDO 110 2	8.7	115	23790	298	129	216	304	—	217	245	339
HDO 110 2	10.0	100	25960	283	131	218	306	—	219	247	341
HDO 110 2	10.9	92	23040	231	137	224	312	—	225	253	—
HDO 110 2	12.5	80	25180	220	138	225	313	—	226	254	—
HDO 110 2	13.5	74	22480	181	143	230	318	—	231	259	—
HDO 110 2	15.5	65	24600	173	144	231	319	—	232	260	—
HDO 110 3	18.9	53	28060	165	110	169	237	—	173	194	—
HDO 110 3	20.9	48	29340	156	110	169	237	—	173	194	—
HDO 110 3	22.0	45	29370	148	113	172	240	—	176	197	—
HDO 110 3	24.6	41	29750	135	115	174	242	—	178	199	—
HDO 110 3	27.2	37	29430	120	115	174	242	—	178	199	—
HDO 110 3	30.9	32	31130	112	—	—	—	—	—	—	—
HDO 110 3	34.3	29.2	29300	95	—	—	—	—	—	—	—
HDO 110 3	39.3	25.4	31000	88	—	—	—	—	—	—	—
HDO 110 3	43.6	23.0	29170	74	—	—	—	—	—	—	—
HDO 110 3	48.0	20.9	30980	72	—	—	—	—	—	—	—
HDO 110 3	53.1	18.8	29160	61	—	—	—	—	—	—	—
HDO 110 3	61.0	16.4	31460	57	—	—	—	—	—	—	—
HDO 110 3	67.5	14.8	30260	50	—	—	—	—	—	—	—
HDO 110 3	77.5	12.9	27370	39	—	—	—	—	—	—	—
HDO 110 4	77.4	12.9	31130	46	—	—	—	—	—	—	—
HDO 110 4	85.7	11.7	31420	42	—	—	—	—	—	—	—
HDO 110 4	96.7	10.3	30740	36	—	—	—	—	—	—	—
HDO 110 4	108.9	9.2	31790	33	—	—	—	—	—	—	—
HDO 110 4	121.7	8.2	31130	29	—	—	—	—	—	—	—
HDO 110 4	137.1	7.3	31790	26	—	—	—	—	—	—	—
HDO 110 4	154.7	6.5	31350	23	—	—	—	—	—	—	—
HDO 110 4	174.3	5.7	31790	21	—	—	—	—	—	—	—
HDO 110 4	194.7	5.1	31570	18.4	—	—	—	—	—	—	—
HDO 110 4	215.7	4.6	31790	16.7	—	—	—	—	—	—	—
HDO 110 4	244.4	4.1	31570	14.7	—	—	—	—	—	—	—
HDO 110 4	274.2	3.6	31790	13.2	—	—	—	—	—	—	—
HDO 110 4	310.7	3.2	31570	11.5	—	—	—	—	—	—	—
HDO 110 4	344.2	2.9	31790	10.5	—	—	—	—	—	—	—
HDO 110 4	395.0	2.5	28490	8.2	—	—	—	—	—	—	—

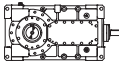
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 110

$n_1 = 1000 \text{ min}^{-1}$

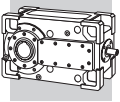
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 110 2	6.4	157	22220	381	*	*	175	219	166	194	288
HDO 110 2	7.0	142	23580	365	*	*	178	222	169	197	291
HDO 110 2	8.1	124	25740	347	*	147	180	224	171	199	293
HDO 110 2	8.7	115	23790	298	*	149	182	226	173	201	295
HDO 110 2	10.0	100	25960	283	*	151	184	228	175	203	297
HDO 110 2	10.9	92	23040	231	93	157	190	234	181	209	303
HDO 110 2	12.5	80	25180	220	94	158	191	235	182	210	304
HDO 110 2	13.5	74	22480	181	98	162	195	—	186	214	—
HDO 110 2	15.5	65	24600	173	99	163	196	—	187	215	—
HDO 110 3	18.9	53	28060	165	76	120	147	178	139	160	228
HDO 110 3	20.9	48	29340	156	76	120	147	178	139	160	—
HDO 110 3	22.0	45	29370	148	79	123	150	—	142	163	—
HDO 110 3	24.6	41	29750	135	81	125	152	—	144	165	—
HDO 110 3	27.2	37	29430	120	81	125	152	—	144	165	—
HDO 110 3	30.9	32	31130	112	82	126	153	—	145	166	—
HDO 110 3	34.3	29.2	29300	95	83	127	154	—	146	167	—
HDO 110 3	39.3	25.4	31000	88	84	128	155	—	147	168	—
HDO 110 3	43.6	23.0	29170	74	—	—	—	—	—	—	—
HDO 110 3	48.0	20.9	30980	72	—	—	—	—	—	—	—
HDO 110 3	53.1	18.8	29160	61	—	—	—	—	—	—	—
HDO 110 3	61.0	16.4	31460	57	—	—	—	—	—	—	—
HDO 110 3	67.5	14.8	30260	50	—	—	—	—	—	—	—
HDO 110 3	77.5	12.9	27370	39	—	—	—	—	—	—	—
HDO 110 4	77.4	12.9	31130	46	—	—	—	—	—	—	—
HDO 110 4	85.7	11.7	31420	42	—	—	—	—	—	—	—
HDO 110 4	96.7	10.3	30740	36	—	—	—	—	—	—	—
HDO 110 4	108.9	9.2	31790	33	—	—	—	—	—	—	—
HDO 110 4	121.7	8.2	31130	29	—	—	—	—	—	—	—
HDO 110 4	137.1	7.3	31790	26	—	—	—	—	—	—	—
HDO 110 4	154.7	6.5	31350	23	—	—	—	—	—	—	—
HDO 110 4	174.3	5.7	31790	21	—	—	—	—	—	—	—
HDO 110 4	194.7	5.1	31570	18.4	—	—	—	—	—	—	—
HDO 110 4	215.7	4.6	31790	16.7	—	—	—	—	—	—	—
HDO 110 4	244.4	4.1	31570	14.7	—	—	—	—	—	—	—
HDO 110 4	274.2	3.6	31790	13.2	—	—	—	—	—	—	—
HDO 110 4	310.7	3.2	31570	11.5	—	—	—	—	—	—	—
HDO 110 4	344.2	2.9	31790	10.5	—	—	—	—	—	—	—
HDO 110 4	395.0	2.5	28490	8.2	—	—	—	—	—	—	—

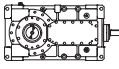
**HDO**

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

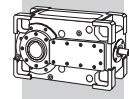




HDO 120					$n_1 = 1800 \text{ min}^{-1}$						
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$						
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]
HDO 120 2	6.6	274	26000	777	*	*	*	347	*	*	*
HDO 120 2	7.2	252	28310	777	*	*	*	352	*	*	*
HDO 120 2	8.1	223	31120	756	*	*	*	358	*	*	315
HDO 120 2	8.9	203	32170	713	*	*	*	343	*	*	300
HDO 120 2	10.0	180	33950	666	*	*	269	347	*	*	304
HDO 120 2	11.1	163	33350	591	*	287	293	371	*	*	328
HDO 120 2	12.5	144	35500	557	*	290	296	374	*	237	331
HDO 120 2	13.7	131	32500	465	*	304	310	388	223	251	345
HDO 120 2	15.5	116	34640	439	*	307	313	391	226	254	348
HDO 120 3	17.3	104	29590	343	*	225	236	293	172	193	261
HDO 120 3	19.5	92	32780	337	*	226	237	294	173	194	262
HDO 120 3	21.8	83	31460	289	117	233	244	301	180	201	269
HDO 120 3	24.6	73	32560	265	121	237	248	305	184	205	273
HDO 120 3	28.3	64	31840	225	128	244	255	—	191	212	280
HDO 120 3	32.0	56	35200	221	131	247	258	—	194	215	283
HDO 120 3	34.8	52	35750	206	132	248	259	—	195	216	—
HDO 120 3	41.2	44	37510	182	135	251	262	—	198	219	—
HDO 120 3	44.9	40	38110	170	135	251	262	—	198	219	—
HDO 120 3	49.5	36	34480	139	—	—	—	—	—	—	—
HDO 120 3	53.9	33	37560	139	—	—	—	—	—	—	—
HDO 120 3	63.9	28.2	38880	122	—	—	—	—	—	—	—
HDO 120 3	69.6	25.9	38500	111	—	—	—	—	—	—	—
HDO 120 3	78.6	22.9	34920	89	—	—	—	—	—	—	—
HDO 120 4	87.0	20.7	33220	78	—	—	—	—	—	—	—
HDO 120 4	103.1	17.5	35970	71	—	—	—	—	—	—	—
HDO 120 4	112.3	16.0	38500	70	—	—	—	—	—	—	—
HDO 120 4	125.7	14.3	36240	59	—	—	—	—	—	—	—
HDO 120 4	136.9	13.2	38500	57	—	—	—	—	—	—	—
HDO 120 4	162.2	11.1	38880	49	—	—	—	—	—	—	—
HDO 120 4	179.7	10.0	37560	43	—	—	—	—	—	—	—
HDO 120 4	201.1	9.0	38880	40	—	—	—	—	—	—	—
HDO 120 4	219.0	8.2	38500	36	—	—	—	—	—	—	—
HDO 120 4	252.4	7.1	38880	31	—	—	—	—	—	—	—
HDO 120 4	282.7	6.4	38500	28	—	—	—	—	—	—	—
HDO 120 4	325.9	5.5	38880	24	—	—	—	—	—	—	—
HDO 120 4	354.9	5.1	40920	24	—	—	—	—	—	—	—
HDO 120 4	400.6	4.5	37730	19.2	—	—	—	—	—	—	—

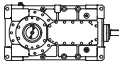
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 120

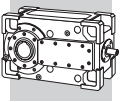
$n_1 = 1800 \text{ min}^{-1}$

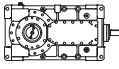
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 120 2	6.6	274	26000	777	*	*	*	*	*	*	*
HDO 120 2	7.2	252	28310	777	*	*	*	*	*	*	*
HDO 120 2	8.1	223	31120	756	*	*	*	*	*	*	*
HDO 120 2	8.9	203	32170	713	*	*	*	*	*	*	*
HDO 120 2	10.0	180	33950	666	*	*	*	*	*	*	*
HDO 120 2	11.1	163	33350	591	*	*	*	*	*	*	273
HDO 120 2	12.5	144	35500	557	*	*	*	*	*	*	276
HDO 120 2	13.7	131	32500	465	*	205	*	222	*	197	291
HDO 120 2	15.5	116	34640	439	*	207	180	224	*	199	293
HDO 120 3	17.3	104	29590	343	*	152	138	169	*	151	219
HDO 120 3	19.5	92	32780	337	*	154	140	171	*	153	221
HDO 120 3	21.8	83	31460	289	*	160	146	177	138	159	227
HDO 120 3	24.6	73	32560	265	*	164	150	181	142	163	231
HDO 120 3	28.3	64	31840	225	*	171	157	188	149	170	238
HDO 120 3	32.0	56	35200	221	89	174	160	191	152	173	241
HDO 120 3	34.8	52	35750	206	90	175	161	192	153	174	242
HDO 120 3	41.2	44	37510	182	93	178	164	195	156	177	245
HDO 120 3	44.9	40	38110	170	94	179	165	196	157	178	—
HDO 120 3	49.5	36	34480	139	99	184	170	—	162	183	—
HDO 120 3	53.9	33	37560	139	99	184	170	—	162	183	—
HDO 120 3	63.9	28.2	38880	122	101	186	172	—	164	185	—
HDO 120 3	69.6	25.9	38500	111	101	186	172	—	164	185	—
HDO 120 3	78.6	22.9	34920	89	—	—	—	—	—	—	—
HDO 120 4	87.0	20.7	33220	78	75	140	130	—	123	141	—
HDO 120 4	103.1	17.5	35970	71	—	—	—	—	—	—	—
HDO 120 4	112.3	16.0	38500	70	—	—	—	—	—	—	—
HDO 120 4	125.7	14.3	36240	59	—	—	—	—	—	—	—
HDO 120 4	136.9	13.2	38500	57	—	—	—	—	—	—	—
HDO 120 4	162.2	11.1	38880	49	—	—	—	—	—	—	—
HDO 120 4	179.7	10.0	37560	43	—	—	—	—	—	—	—
HDO 120 4	201.1	9.0	38880	40	—	—	—	—	—	—	—
HDO 120 4	219.0	8.2	38500	36	—	—	—	—	—	—	—
HDO 120 4	252.4	7.1	38880	31	—	—	—	—	—	—	—
HDO 120 4	282.7	6.4	38500	28	—	—	—	—	—	—	—
HDO 120 4	325.9	5.5	38880	24	—	—	—	—	—	—	—
HDO 120 4	354.9	5.1	40920	24	—	—	—	—	—	—	—
HDO 120 4	400.6	4.5	37730	19.2	—	—	—	—	—	—	—

HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

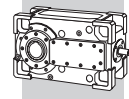
— Thermal verification not necessary



HDO 120					$n_1 = 1500 \text{ min}^{-1}$							
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$							
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]	
HDO 120 2	6.6	228	27460	684	*	*	294	372	*	*	329	
HDO 120 2	7.2	210	29900	684	*	*	298	376	*	*	333	
HDO 120 2	8.1	186	32870	666	*	274	302	380	*	*	337	
HDO 120 2	8.9	169	33980	627	*	263	291	369	*	*	326	
HDO 120 2	10.0	150	35860	586	*	266	294	372	*	235	329	
HDO 120 2	11.1	135	33350	493	*	284	312	390	225	253	347	
HDO 120 2	12.5	120	35500	464	*	287	315	393	228	256	350	
HDO 120 2	13.7	109	32500	387	*	298	326	404	239	267	361	
HDO 120 2	15.5	97	34640	365	153	300	328	406	241	269	363	
HDO 120 3	17.3	87	31620	306	*	221	247	304	183	204	272	
HDO 120 3	19.5	77	34750	298	121	222	248	305	184	205	273	
HDO 120 3	21.8	69	33390	256	126	227	253	310	189	210	278	
HDO 120 3	24.6	61	34510	234	129	230	256	—	192	213	281	
HDO 120 3	28.3	53	33780	199	134	235	261	—	197	218	—	
HDO 120 3	32.0	47	37340	195	137	238	264	—	200	221	—	
HDO 120 3	34.8	43	37920	182	137	238	264	—	200	221	—	
HDO 120 3	41.2	36	39780	161	140	241	267	—	203	224	—	
HDO 120 3	44.9	33	39130	145	140	241	267	—	203	224	—	
HDO 120 3	49.5	30	36900	124	—	—	—	—	—	—	—	
HDO 120 3	53.9	27.8	38990	121	—	—	—	—	—	—	—	
HDO 120 3	63.9	23.5	40250	105	—	—	—	—	—	—	—	
HDO 120 3	69.6	21.5	38800	93	—	—	—	—	—	—	—	
HDO 120 3	78.6	19.1	35760	76	—	—	—	—	—	—	—	
HDO 120 4	87.0	17.2	35210	69	—	—	—	—	—	—	—	
HDO 120 4	103.1	14.5	38150	63	—	—	—	—	—	—	—	
HDO 120 4	112.3	13.4	40820	62	—	—	—	—	—	—	—	
HDO 120 4	125.7	11.9	38460	52	—	—	—	—	—	—	—	
HDO 120 4	136.9	11.0	40920	51	—	—	—	—	—	—	—	
HDO 120 4	162.2	9.2	41250	43	—	—	—	—	—	—	—	
HDO 120 4	179.7	8.3	39850	38	—	—	—	—	—	—	—	
HDO 120 4	201.1	7.5	41250	35	—	—	—	—	—	—	—	
HDO 120 4	219.0	6.8	40920	32	—	—	—	—	—	—	—	
HDO 120 4	252.4	5.9	41250	28	—	—	—	—	—	—	—	
HDO 120 4	282.7	5.3	40920	25	—	—	—	—	—	—	—	
HDO 120 4	325.9	4.6	41250	22	—	—	—	—	—	—	—	
HDO 120 4	354.9	4.2	40920	19.6	—	—	—	—	—	—	—	
HDO 120 4	400.6	3.7	37730	16.0	—	—	—	—	—	—	—	

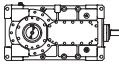
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 120

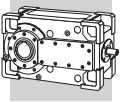
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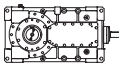
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C							
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	
HDO 120 2	6.6	228	27460	684	*	*	*	*	*	*	*	275
HDO 120 2	7.2	210	29900	684	*	*	*	*	*	*	*	278
HDO 120 2	8.1	186	32870	666	*	*	*	*	*	*	*	283
HDO 120 2	8.9	169	33980	627	*	*	*	*	*	*	*	271
HDO 120 2	10.0	150	35860	586	*	*	*	*	*	*	*	274
HDO 120 2	11.1	135	33350	493	*	*	*	224	*	199	293	
HDO 120 2	12.5	120	35500	464	*	193	*	226	*	201	295	
HDO 120 2	13.7	109	32500	387	*	204	193	237	184	212	306	
HDO 120 2	15.5	97	34640	365	*	206	195	239	186	214	308	
HDO 120 3	17.3	87	31620	306	*	152	149	180	141	162	230	
HDO 120 3	19.5	77	34750	298	*	153	150	181	142	163	231	
HDO 120 3	21.8	69	33390	256	*	158	155	186	147	168	236	
HDO 120 3	24.6	61	34510	234	*	161	158	189	150	171	239	
HDO 120 3	28.3	53	33780	199	92	166	163	194	155	176	244	
HDO 120 3	32.0	47	37340	195	95	169	166	197	158	179	247	
HDO 120 3	34.8	43	37920	182	95	169	166	197	158	179	247	
HDO 120 3	41.2	36	39780	161	98	172	169	—	161	182	—	
HDO 120 3	44.9	33	39130	145	98	172	169	—	161	182	—	
HDO 120 3	49.5	30	36900	124	102	176	173	—	165	186	—	
HDO 120 3	53.9	27.8	38990	121	102	176	173	—	165	186	—	
HDO 120 3	63.9	23.5	40250	105	104	178	175	—	167	188	—	
HDO 120 3	69.6	21.5	38800	93	—	—	—	—	—	—	—	
HDO 120 3	78.6	19.1	35760	76	—	—	—	—	—	—	—	
HDO 120 4	87.0	17.2	35210	69	—	—	—	—	—	—	—	
HDO 120 4	103.1	14.5	38150	63	—	—	—	—	—	—	—	
HDO 120 4	112.3	13.4	40820	62	—	—	—	—	—	—	—	
HDO 120 4	125.7	11.9	38460	52	—	—	—	—	—	—	—	
HDO 120 4	136.9	11.0	40920	51	—	—	—	—	—	—	—	
HDO 120 4	162.2	9.2	41250	43	—	—	—	—	—	—	—	
HDO 120 4	179.7	8.3	39850	38	—	—	—	—	—	—	—	
HDO 120 4	201.1	7.5	41250	35	—	—	—	—	—	—	—	
HDO 120 4	219.0	6.8	40920	32	—	—	—	—	—	—	—	
HDO 120 4	252.4	5.9	41250	28	—	—	—	—	—	—	—	
HDO 120 4	282.7	5.3	40920	25	—	—	—	—	—	—	—	
HDO 120 4	325.9	4.6	41250	22	—	—	—	—	—	—	—	
HDO 120 4	354.9	4.2	40920	19.6	—	—	—	—	—	—	—	
HDO 120 4	400.6	3.7	37730	16.0	—	—	—	—	—	—	—	

HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

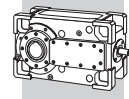
— Thermal verification not necessary



HDO 120					$n_1 = 1200 \text{ min}^{-1}$							
	i	$n_2$ [ $\text{min}^{-1}$ ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$							
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]	
HDO 120 2	6.6	183	29360	585	*	269	312	390	*	253	347	
HDO 120 2	7.2	168	31970	585	*	272	315	393	*	256	350	
HDO 120 2	8.1	149	35120	569	*	276	319	397	232	260	354	
HDO 120 2	8.9	135	34440	509	*	267	310	388	223	251	345	
HDO 120 2	10.0	120	36600	479	*	269	312	390	225	253	347	
HDO 120 2	11.1	108	33350	394	*	283	326	404	239	267	361	
HDO 120 2	12.5	96	35500	372	153	285	328	406	241	269	363	
HDO 120 2	13.7	87	32500	310	162	294	337	—	250	278	372	
HDO 120 2	15.5	77	34640	292	163	295	338	—	251	279	373	
HDO 120 3	17.3	70	32720	253	127	218	254	—	190	211	279	
HDO 120 3	19.5	62	35370	242	128	219	255	—	191	212	280	
HDO 120 3	21.8	55	35700	219	132	223	259	—	195	216	284	
HDO 120 3	24.6	49	36900	200	135	226	262	—	198	219	—	
HDO 120 3	28.3	42	36120	170	139	230	266	—	202	223	—	
HDO 120 3	32.0	38	38110	159	141	232	268	—	204	225	—	
HDO 120 3	34.8	34	39150	150	141	232	268	—	204	225	—	
HDO 120 3	41.2	29.1	40410	131	—	—	—	—	—	—	—	
HDO 120 3	44.9	26.7	38960	116	—	—	—	—	—	—	—	
HDO 120 3	49.5	24.2	37620	101	—	—	—	—	—	—	—	
HDO 120 3	53.9	22.2	38830	96	—	—	—	—	—	—	—	
HDO 120 3	63.9	18.8	40680	85	—	—	—	—	—	—	—	
HDO 120 3	69.6	17.2	39240	75	—	—	—	—	—	—	—	
HDO 120 3	78.6	15.3	36170	61	—	—	—	—	—	—	—	
HDO 120 4	87.0	13.8	37650	59	—	—	—	—	—	—	—	
HDO 120 4	103.1	11.6	38940	51	—	—	—	—	—	—	—	
HDO 120 4	112.3	10.7	38720	47	—	—	—	—	—	—	—	
HDO 120 4	125.7	9.5	40970	44	—	—	—	—	—	—	—	
HDO 120 4	136.9	8.8	40920	41	—	—	—	—	—	—	—	
HDO 120 4	162.2	7.4	41250	35	—	—	—	—	—	—	—	
HDO 120 4	179.7	6.7	40200	30	—	—	—	—	—	—	—	
HDO 120 4	201.1	6.0	41250	28	—	—	—	—	—	—	—	
HDO 120 4	219.0	5.5	40920	25	—	—	—	—	—	—	—	
HDO 120 4	252.4	4.8	41250	22	—	—	—	—	—	—	—	
HDO 120 4	282.7	4.2	40920	19.7	—	—	—	—	—	—	—	
HDO 120 4	325.9	3.7	41250	17.2	—	—	—	—	—	—	—	
HDO 120 4	354.9	3.4	40920	15.7	—	—	—	—	—	—	—	
HDO 120 4	400.6	3.0	37730	12.8	—	—	—	—	—	—	—	

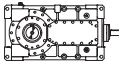
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 120

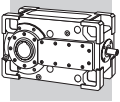
$n_1 = 1200 \text{ min}^{-1}$

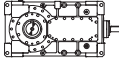
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C							
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	
HDO 120 2	6.6	183	29360	585	*	*	*	*	*	*	*	293
HDO 120 2	7.2	168	31970	585	*	*	*	*	*	*	*	296
HDO 120 2	8.1	149	35120	569	*	*	*	230	*	*	*	299
HDO 120 2	8.9	135	34440	509	*	*	*	221	*	*	*	290
HDO 120 2	10.0	120	36600	479	*	*	*	224	*	*	199	293
HDO 120 2	11.1	108	33350	394	*	194	194	238	185	213	307	
HDO 120 2	12.5	96	35500	372	*	196	196	240	187	215	309	
HDO 120 2	13.7	87	32500	310	*	204	204	248	195	223	317	
HDO 120 2	15.5	77	34640	292	*	206	206	250	197	225	319	
HDO 120 3	17.3	70	32720	253	*	153	157	188	149	170	238	
HDO 120 3	19.5	62	35370	242	*	153	157	188	149	170	238	
HDO 120 3	21.8	55	35700	219	90	157	161	192	153	174	242	
HDO 120 3	24.6	49	36900	200	93	160	164	195	156	177	245	
HDO 120 3	28.3	42	36120	170	97	164	168	199	160	181	—	
HDO 120 3	32.0	38	38110	159	99	166	170	—	162	183	—	
HDO 120 3	34.8	34	39150	150	99	166	170	—	162	183	—	
HDO 120 3	41.2	29.1	40410	131	101	168	172	—	164	185	—	
HDO 120 3	44.9	26.7	38960	116	101	168	172	—	164	185	—	
HDO 120 3	49.5	24.2	37620	101	—	—	—	—	—	—	—	
HDO 120 3	53.9	22.2	38830	96	—	—	—	—	—	—	—	
HDO 120 3	63.9	18.8	40680	85	—	—	—	—	—	—	—	
HDO 120 3	69.6	17.2	39240	75	—	—	—	—	—	—	—	
HDO 120 3	78.6	15.3	36170	61	—	—	—	—	—	—	—	
HDO 120 4	87.0	13.8	37650	59	—	—	—	—	—	—	—	
HDO 120 4	103.1	11.6	38940	51	—	—	—	—	—	—	—	
HDO 120 4	112.3	10.7	38720	47	—	—	—	—	—	—	—	
HDO 120 4	125.7	9.5	40970	44	—	—	—	—	—	—	—	
HDO 120 4	136.9	8.8	40920	41	—	—	—	—	—	—	—	
HDO 120 4	162.2	7.4	41250	35	—	—	—	—	—	—	—	
HDO 120 4	179.7	6.7	40200	30	—	—	—	—	—	—	—	
HDO 120 4	201.1	6.0	41250	28	—	—	—	—	—	—	—	
HDO 120 4	219.0	5.5	40920	25	—	—	—	—	—	—	—	
HDO 120 4	252.4	4.8	41250	22	—	—	—	—	—	—	—	
HDO 120 4	282.7	4.2	40920	19.7	—	—	—	—	—	—	—	
HDO 120 4	325.9	3.7	41250	17.2	—	—	—	—	—	—	—	
HDO 120 4	354.9	3.4	40920	15.7	—	—	—	—	—	—	—	
HDO 120 4	400.6	3.0	37730	12.8	—	—	—	—	—	—	—	

HDO

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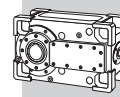
— Thermal verification not necessary



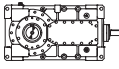
HDO 120					n <sub>1</sub> = 1000 min <sup>-1</sup>						
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRAS</sub> [kW]	P <sub>TMCRAS9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 120 2	6.6	152	31010	515	*	253	325	403	238	266	360
HDO 120 2	7.2	140	32970	502	*	255	327	405	240	268	362
HDO 120 2	8.1	124	35120	474	*	258	330	408	243	271	365
HDO 120 2	8.9	113	34450	424	*	251	323	401	236	264	358
HDO 120 2	10.0	100	36600	399	*	253	325	403	238	266	360
HDO 120 2	11.1	90	33350	328	161	264	336	—	249	277	371
HDO 120 2	12.5	80	35500	310	163	266	338	—	251	279	373
HDO 120 2	13.7	73	32500	258	170	273	345	—	258	286	—
HDO 120 2	15.5	65	34640	244	171	274	346	—	259	287	—
HDO 120 3	17.3	58	32720	211	133	204	260	—	196	217	—
HDO 120 3	19.5	51	35200	201	133	204	260	—	196	217	—
HDO 120 3	21.8	46	37700	192	136	207	263	—	199	220	—
HDO 120 3	24.6	41	38980	176	139	210	266	—	202	223	—
HDO 120 3	28.3	35	36250	142	142	213	269	—	205	226	—
HDO 120 3	32.0	31	38110	133	—	—	—	—	—	—	—
HDO 120 3	34.8	28.7	39010	125	—	—	—	—	—	—	—
HDO 120 3	41.2	24.2	40270	109	—	—	—	—	—	—	—
HDO 120 3	44.9	22.3	38830	96	—	—	—	—	—	—	—
HDO 120 3	49.5	20.2	37620	85	—	—	—	—	—	—	—
HDO 120 3	53.9	18.5	38800	80	—	—	—	—	—	—	—
HDO 120 3	63.9	15.6	41250	72	—	—	—	—	—	—	—
HDO 120 3	69.6	14.4	40360	64	—	—	—	—	—	—	—
HDO 120 3	78.6	12.7	37220	53	—	—	—	—	—	—	—
HDO 120 4	87.0	11.5	39760	52	—	—	—	—	—	—	—
HDO 120 4	103.1	9.7	41250	45	—	—	—	—	—	—	—
HDO 120 4	112.3	8.9	40920	41	—	—	—	—	—	—	—
HDO 120 4	125.7	8.0	41250	37	—	—	—	—	—	—	—
HDO 120 4	136.9	7.3	40920	34	—	—	—	—	—	—	—
HDO 120 4	162.2	6.2	41250	29	—	—	—	—	—	—	—
HDO 120 4	179.7	5.6	40920	26	—	—	—	—	—	—	—
HDO 120 4	201.1	5.0	41250	23	—	—	—	—	—	—	—
HDO 120 4	219.0	4.6	40920	21	—	—	—	—	—	—	—
HDO 120 4	252.4	4.0	41250	18.6	—	—	—	—	—	—	—
HDO 120 4	282.7	3.5	40920	16.4	—	—	—	—	—	—	—
HDO 120 4	325.9	3.1	41250	14.4	—	—	—	—	—	—	—
HDO 120 4	354.9	2.8	40920	13.1	—	—	—	—	—	—	—
HDO 120 4	400.6	2.5	37730	10.7	—	—	—	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



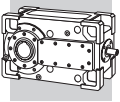
**HDO**

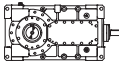
HDO 120					$n_1 = 1000 \text{ min}^{-1}$							
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 40^\circ\text{C}$							
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]	
HDO 120 2	6.6	152	31010	515	*	*	*	236	*	211	305	
HDO 120 2	7.2	140	32970	502	*	*	*	239	*	214	308	
HDO 120 2	8.1	124	35120	474	*	*	197	241	*	216	310	
HDO 120 2	8.9	113	34450	424	*	*	190	234	181	209	303	
HDO 120 2	10.0	100	36600	399	*	170	192	236	183	211	305	
HDO 120 2	11.1	90	33350	328	*	182	204	248	195	223	317	
HDO 120 2	12.5	80	35500	310	*	183	205	249	196	224	318	
HDO 120 2	13.7	73	32500	258	115	190	212	256	203	231	325	
HDO 120 2	15.5	65	34640	244	116	191	213	257	204	232	326	
HDO 120 3	17.3	58	32720	211	91	143	162	193	154	175	243	
HDO 120 3	19.5	51	35200	201	92	144	163	194	155	176	244	
HDO 120 3	21.8	46	37700	192	95	147	166	197	158	179	247	
HDO 120 3	24.6	41	38980	176	97	149	168	199	160	181	—	
HDO 120 3	28.3	35	36250	142	100	152	171	—	163	184	—	
HDO 120 3	32.0	31	38110	133	102	154	173	—	165	186	—	
HDO 120 3	34.8	28.7	39010	125	102	154	173	—	165	186	—	
HDO 120 3	41.2	24.2	40270	109	103	155	174	—	166	187	—	
HDO 120 3	44.9	22.3	38830	96	—	—	—	—	—	—	—	
HDO 120 3	49.5	20.2	37620	85	—	—	—	—	—	—	—	
HDO 120 3	53.9	18.5	38800	80	—	—	—	—	—	—	—	
HDO 120 3	63.9	15.6	41250	72	—	—	—	—	—	—	—	
HDO 120 3	69.6	14.4	40360	64	—	—	—	—	—	—	—	
HDO 120 3	78.6	12.7	37220	53	—	—	—	—	—	—	—	
HDO 120 4	87.0	11.5	39760	52	—	—	—	—	—	—	—	
HDO 120 4	103.1	9.7	41250	45	—	—	—	—	—	—	—	
HDO 120 4	112.3	8.9	40920	41	—	—	—	—	—	—	—	
HDO 120 4	125.7	8.0	41250	37	—	—	—	—	—	—	—	
HDO 120 4	136.9	7.3	40920	34	—	—	—	—	—	—	—	
HDO 120 4	162.2	6.2	41250	29	—	—	—	—	—	—	—	
HDO 120 4	179.7	5.6	40920	26	—	—	—	—	—	—	—	
HDO 120 4	201.1	5.0	41250	23	—	—	—	—	—	—	—	
HDO 120 4	219.0	4.6	40920	21	—	—	—	—	—	—	—	
HDO 120 4	252.4	4.0	41250	18.6	—	—	—	—	—	—	—	
HDO 120 4	282.7	3.5	40920	16.4	—	—	—	—	—	—	—	
HDO 120 4	325.9	3.1	41250	14.4	—	—	—	—	—	—	—	
HDO 120 4	354.9	2.8	40920	13.1	—	—	—	—	—	—	—	
HDO 120 4	400.6	2.5	37730	10.7	—	—	—	—	—	—	—	

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— Thermal verification not necessary

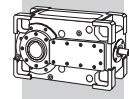




HDO 125					$n_1 = 1800 \text{ min}^{-1}$							
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$							
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]	
HDO 125 2	7.4	243	29330	777	*	330	336	414	*	*	371	
HDO 125 2	8.0	226	31560	777	*	334	340	418	*	*	375	
HDO 125 2	8.8	204	34940	776	*	338	344	422	*	*	379	
HDO 125 2	9.9	182	36250	720	*	339	345	423	*	*	380	
HDO 125 2	11.5	157	35910	614	*	353	359	437	272	300	394	
HDO 125 2	12.3	146	37300	593	*	356	362	440	275	303	397	
HDO 125 2	14.2	127	34960	482	*	342	348	426	261	289	383	
HDO 125 2	15.3	118	36350	466	*	343	349	427	262	290	384	
HDO 125 2	16.9	106	38880	450	190	359	365	443	278	306	400	
HDO 125 3	19.2	94	33640	350	*	254	265	322	201	222	290	
HDO 125 3	22.6	80	35190	312	144	260	271	328	207	228	296	
HDO 125 3	24.3	74	37860	312	148	264	275	332	211	232	300	
HDO 125 3	27.7	65	38150	275	155	271	282	—	218	239	307	
HDO 125 3	33.0	54	41240	250	159	275	286	—	222	243	311	
HDO 125 3	35.8	50	41760	234	159	275	286	—	222	243	—	
HDO 125 3	38.8	46	43250	223	160	276	287	—	223	244	—	
HDO 125 3	43.0	42	44620	208	160	276	287	—	223	244	—	
HDO 125 3	50.1	36	46050	184	163	279	290	—	226	247	—	
HDO 125 3	55.4	32	46570	168	163	279	290	—	226	247	—	
HDO 125 3	60.1	29.9	42420	141	—	—	—	—	—	—	—	
HDO 125 3	72.1	25.0	47620	132	—	—	—	—	—	—	—	
HDO 125 3	77.6	23.2	49240	127	—	—	—	—	—	—	—	
HDO 125 3	85.9	20.9	46160	108	—	—	—	—	—	—	—	
HDO 125 4	97.0	18.6	37170	78	—	—	—	—	—	—	—	
HDO 125 4	116.3	15.5	44590	78	—	—	—	—	—	—	—	
HDO 125 4	125.2	14.4	47980	78	—	—	—	—	—	—	—	
HDO 125 4	141.8	12.7	42600	61	—	—	—	—	—	—	—	
HDO 125 4	152.6	11.8	45850	61	—	—	—	—	—	—	—	
HDO 125 4	178.0	10.1	46190	53	—	—	—	—	—	—	—	
HDO 125 4	200.3	9.0	42070	43	—	—	—	—	—	—	—	
HDO 125 4	226.9	7.9	47230	43	—	—	—	—	—	—	—	
HDO 125 4	244.1	7.4	48720	41	—	—	—	—	—	—	—	
HDO 125 4	284.8	6.3	47230	34	—	—	—	—	—	—	—	
HDO 125 4	315.2	5.7	49240	32	—	—	—	—	—	—	—	
HDO 125 4	367.6	4.9	47750	27	—	—	—	—	—	—	—	
HDO 125 4	395.6	4.5	49240	25	—	—	—	—	—	—	—	
HDO 125 4	438.0	4.1	49240	23	—	—	—	—	—	—	—	

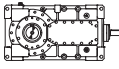
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 125

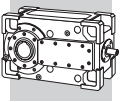
$n_1 = 1800 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 125 2	7.4	243	29330	777	*	*	*	*	*	*	*
HDO 125 2	8.0	226	31560	777	*	*	*	*	*	*	*
HDO 125 2	8.8	204	34940	776	*	*	*	*	*	*	314
HDO 125 2	9.9	182	36250	720	*	*	*	*	*	*	316
HDO 125 2	11.5	157	35910	614	*	*	*	261	*	*	330
HDO 125 2	12.3	146	37300	593	*	246	*	263	*	238	332
HDO 125 2	14.2	127	34960	482	*	232	205	249	196	224	318
HDO 125 2	15.3	118	36350	466	*	233	206	250	197	225	319
HDO 125 2	16.9	106	38880	450	*	250	223	267	214	242	336
HDO 125 3	19.2	94	33640	350	*	174	160	191	152	173	241
HDO 125 3	22.6	80	35190	312	*	180	166	197	158	179	247
HDO 125 3	24.3	74	37860	312	*	184	170	201	162	183	251
HDO 125 3	27.7	65	38150	275	*	191	177	208	169	190	258
HDO 125 3	33.0	54	41240	250	109	194	180	211	172	193	261
HDO 125 3	35.8	50	41760	234	109	194	180	211	172	193	261
HDO 125 3	38.8	46	43250	223	111	196	182	213	174	195	263
HDO 125 3	43.0	42	44620	208	111	196	182	213	174	195	263
HDO 125 3	50.1	36	46050	184	113	198	184	—	176	197	—
HDO 125 3	55.4	32	46570	168	113	198	184	—	176	197	—
HDO 125 3	60.1	29.9	42420	141	119	204	190	—	182	203	—
HDO 125 3	72.1	25.0	47620	132	119	204	190	—	182	203	—
HDO 125 3	77.6	23.2	49240	127	121	206	192	—	184	205	—
HDO 125 3	85.9	20.9	46160	108	—	—	—	—	—	—	—
HDO 125 4	97.0	18.6	37170	78	—	—	—	—	—	—	—
HDO 125 4	116.3	15.5	44590	78	—	—	—	—	—	—	—
HDO 125 4	125.2	14.4	47980	78	—	—	—	—	—	—	—
HDO 125 4	141.8	12.7	42600	61	—	—	—	—	—	—	—
HDO 125 4	152.6	11.8	45850	61	—	—	—	—	—	—	—
HDO 125 4	178.0	10.1	46190	53	—	—	—	—	—	—	—
HDO 125 4	200.3	9.0	42070	43	—	—	—	—	—	—	—
HDO 125 4	226.9	7.9	47230	43	—	—	—	—	—	—	—
HDO 125 4	244.1	7.4	48720	41	—	—	—	—	—	—	—
HDO 125 4	284.8	6.3	47230	34	—	—	—	—	—	—	—
HDO 125 4	315.2	5.7	49240	32	—	—	—	—	—	—	—
HDO 125 4	367.6	4.9	47750	27	—	—	—	—	—	—	—
HDO 125 4	395.6	4.5	49240	25	—	—	—	—	—	—	—
HDO 125 4	438.0	4.1	49240	23	—	—	—	—	—	—	—

HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

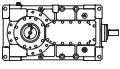
— Thermal verification not necessary



# HDO 125

$n_1 = 1500 \text{ min}^{-1}$

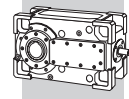
$t_a = 20^\circ\text{C}$

	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$						
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]
HDO 125 2	7.4	202	30980	684	*	326	354	432	*	295	389
HDO 125 2	8.0	188	33330	683	*	329	357	435	*	298	392
HDO 125 2	8.8	170	36910	684	*	332	360	438	*	301	395
HDO 125 2	9.9	152	38280	634	*	333	361	439	274	302	396
HDO 125 2	11.5	131	35910	512	*	344	372	450	285	313	407
HDO 125 2	12.3	122	37300	494	199	346	374	452	287	315	409
HDO 125 2	14.2	105	34970	402	188	335	363	441	276	304	398
HDO 125 2	15.3	98	36350	388	189	336	364	442	277	305	399
HDO 125 2	16.9	89	38880	375	201	348	376	—	289	317	411
HDO 125 3	19.2	78	35530	308	148	249	275	332	211	232	300
HDO 125 3	22.6	66	37160	275	153	254	280	—	216	237	305
HDO 125 3	24.3	62	39990	275	156	257	283	—	219	240	308
HDO 125 3	27.7	54	40300	243	161	262	288	—	224	245	—
HDO 125 3	33.0	45	43560	220	164	265	291	—	227	248	—
HDO 125 3	35.8	42	44100	206	164	265	291	—	227	248	—
HDO 125 3	38.8	39	45680	197	165	266	292	—	228	249	—
HDO 125 3	43.0	35	46650	181	165	266	292	—	228	249	—
HDO 125 3	50.1	30	48640	162	—	—	—	—	—	—	—
HDO 125 3	55.4	27.1	46390	140	—	—	—	—	—	—	—
HDO 125 3	60.1	24.9	44800	124	—	—	—	—	—	—	—
HDO 125 3	72.1	20.8	47750	110	—	—	—	—	—	—	—
HDO 125 3	77.6	19.3	49240	106	—	—	—	—	—	—	—
HDO 125 3	85.9	17.5	46010	89	—	—	—	—	—	—	—
HDO 125 4	97.0	15.5	39260	69	—	—	—	—	—	—	—
HDO 125 4	116.3	12.9	47090	69	—	—	—	—	—	—	—
HDO 125 4	125.2	12.0	49240	67	—	—	—	—	—	—	—
HDO 125 4	141.8	10.6	45000	54	—	—	—	—	—	—	—
HDO 125 4	152.6	9.8	48420	54	—	—	—	—	—	—	—
HDO 125 4	178.0	8.4	47230	45	—	—	—	—	—	—	—
HDO 125 4	200.3	7.5	44430	38	—	—	—	—	—	—	—
HDO 125 4	226.9	6.6	47230	35	—	—	—	—	—	—	—
HDO 125 4	244.1	6.1	48720	34	—	—	—	—	—	—	—
HDO 125 4	284.8	5.3	47230	28	—	—	—	—	—	—	—
HDO 125 4	315.2	4.8	49240	27	—	—	—	—	—	—	—
HDO 125 4	367.6	4.1	47750	22	—	—	—	—	—	—	—
HDO 125 4	395.6	3.8	49240	21	—	—	—	—	—	—	—
HDO 125 4	438.0	3.4	49240	19.1	—	—	—	—	—	—	—

HDO

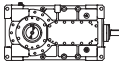
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 125

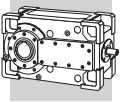
$n_1 = 1500 \text{ min}^{-1}$

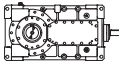
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 125 2	7.4	202	30980	684	*	*	*	*	*	*	324
HDO 125 2	8.0	188	33330	683	*	*	*	*	*	*	327
HDO 125 2	8.8	170	36910	684	*	*	*	*	*	*	330
HDO 125 2	9.9	152	38280	634	*	*	*	262	*	*	331
HDO 125 2	11.5	131	35910	512	*	240	229	273	220	248	342
HDO 125 2	12.3	122	37300	494	*	242	231	275	222	250	344
HDO 125 2	14.2	105	34970	402	*	231	220	264	211	239	333
HDO 125 2	15.3	98	36350	388	*	232	221	265	212	240	334
HDO 125 2	16.9	89	38880	375	*	245	234	278	225	253	347
HDO 125 3	19.2	78	35530	308	*	173	170	201	162	183	251
HDO 125 3	22.6	66	37160	275	*	178	175	206	167	188	256
HDO 125 3	24.3	62	39990	275	*	181	178	209	170	191	259
HDO 125 3	27.7	54	40300	243	112	186	183	214	175	196	264
HDO 125 3	33.0	45	43560	220	115	189	186	217	178	199	267
HDO 125 3	35.8	42	44100	206	115	189	186	217	178	199	267
HDO 125 3	38.8	39	45680	197	116	190	187	218	179	200	—
HDO 125 3	43.0	35	46650	181	116	190	187	—	179	200	—
HDO 125 3	50.1	30	48640	162	118	192	189	—	181	202	—
HDO 125 3	55.4	27.1	46390	140	118	192	189	—	181	202	—
HDO 125 3	60.1	24.9	44800	124	122	196	193	—	185	206	—
HDO 125 3	72.1	20.8	47750	110	—	—	—	—	—	—	—
HDO 125 3	77.6	19.3	49240	106	—	—	—	—	—	—	—
HDO 125 3	85.9	17.5	46010	89	—	—	—	—	—	—	—
HDO 125 4	97.0	15.5	39260	69	—	—	—	—	—	—	—
HDO 125 4	116.3	12.9	47090	69	—	—	—	—	—	—	—
HDO 125 4	125.2	12.0	49240	67	—	—	—	—	—	—	—
HDO 125 4	141.8	10.6	45000	54	—	—	—	—	—	—	—
HDO 125 4	152.6	9.8	48420	54	—	—	—	—	—	—	—
HDO 125 4	178.0	8.4	47230	45	—	—	—	—	—	—	—
HDO 125 4	200.3	7.5	44430	38	—	—	—	—	—	—	—
HDO 125 4	226.9	6.6	47230	35	—	—	—	—	—	—	—
HDO 125 4	244.1	6.1	48720	34	—	—	—	—	—	—	—
HDO 125 4	284.8	5.3	47230	28	—	—	—	—	—	—	—
HDO 125 4	315.2	4.8	49240	27	—	—	—	—	—	—	—
HDO 125 4	367.6	4.1	47750	22	—	—	—	—	—	—	—
HDO 125 4	395.6	3.8	49240	21	—	—	—	—	—	—	—
HDO 125 4	438.0	3.4	49240	19.1	—	—	—	—	—	—	—

HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

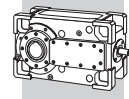
— Thermal verification not necessary



HDO 125					n <sub>1</sub> = 1200 min <sup>-1</sup>						
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 125 2	7.4	162	33130	585	*	324	367	445	280	308	402
HDO 125 2	8.0	150	35650	585	*	327	370	448	283	311	405
HDO 125 2	8.8	136	39430	584	*	329	372	450	285	313	407
HDO 125 2	9.9	122	38520	510	*	330	373	451	286	314	408
HDO 125 2	11.5	105	35910	410	206	338	381	459	294	322	416
HDO 125 2	12.3	97	37300	395	208	340	383	461	296	324	418
HDO 125 2	14.2	84	34970	322	199	331	374	—	287	315	409
HDO 125 2	15.3	78	36350	311	200	332	375	—	288	316	—
HDO 125 2	16.9	71	38880	300	210	342	385	—	298	326	—
HDO 125 3	19.2	62	36480	253	156	247	283	—	219	240	308
HDO 125 3	22.6	53	39740	235	159	250	286	—	222	243	—
HDO 125 3	24.3	49	42760	235	162	253	289	—	225	246	—
HDO 125 3	27.7	43	43090	207	166	257	293	—	229	250	—
HDO 125 3	33.0	36	46570	188	168	259	295	—	231	252	—
HDO 125 3	35.8	34	47160	176	168	259	295	—	231	252	—
HDO 125 3	38.8	31	46270	159	—	—	—	—	—	—	—
HDO 125 3	43.0	27.9	46420	144	—	—	—	—	—	—	—
HDO 125 3	50.1	24.0	49240	131	—	—	—	—	—	—	—
HDO 125 3	55.4	21.6	46190	111	—	—	—	—	—	—	—
HDO 125 3	60.1	20.0	47910	106	—	—	—	—	—	—	—
HDO 125 3	72.1	16.6	47750	88	—	—	—	—	—	—	—
HDO 125 3	77.6	15.5	49240	85	—	—	—	—	—	—	—
HDO 125 3	85.9	14.0	46530	72	—	—	—	—	—	—	—
HDO 125 4	97.0	12.4	41970	59	—	—	—	—	—	—	—
HDO 125 4	116.3	10.3	47750	56	—	—	—	—	—	—	—
HDO 125 4	125.2	9.6	49240	54	—	—	—	—	—	—	—
HDO 125 4	141.8	8.5	47230	45	—	—	—	—	—	—	—
HDO 125 4	152.6	7.9	48720	43	—	—	—	—	—	—	—
HDO 125 4	178.0	6.7	47230	36	—	—	—	—	—	—	—
HDO 125 4	200.3	6.0	47510	32	—	—	—	—	—	—	—
HDO 125 4	226.9	5.3	47230	28	—	—	—	—	—	—	—
HDO 125 4	244.1	4.9	48720	27	—	—	—	—	—	—	—
HDO 125 4	284.8	4.2	47230	23	—	—	—	—	—	—	—
HDO 125 4	315.2	3.8	49240	21	—	—	—	—	—	—	—
HDO 125 4	367.6	3.3	47750	17.7	—	—	—	—	—	—	—
HDO 125 4	395.6	3.0	49240	17.0	—	—	—	—	—	—	—
HDO 125 4	438.0	2.7	49240	15.3	—	—	—	—	—	—	—

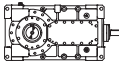
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 125

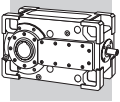
$n_1 = 1200 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 125 2	7.4	162	33130	585	*	*	*	269	*	244	338
HDO 125 2	8.0	150	35650	585	*	*	*	271	*	246	340
HDO 125 2	8.8	136	39430	584	*	*	*	273	*	248	342
HDO 125 2	9.9	122	38520	510	*	230	230	274	221	249	343
HDO 125 2	11.5	105	35910	410	*	239	239	283	230	258	352
HDO 125 2	12.3	97	37300	395	*	240	240	284	231	259	353
HDO 125 2	14.2	84	34970	322	135	232	232	276	223	251	345
HDO 125 2	15.3	78	36350	311	135	232	232	276	223	251	345
HDO 125 2	16.9	71	38880	300	145	242	242	286	233	261	355
HDO 125 3	19.2	62	36480	253	106	173	177	208	169	190	258
HDO 125 3	22.6	53	39740	235	110	177	181	212	173	194	262
HDO 125 3	24.3	49	42760	235	113	180	184	215	176	197	265
HDO 125 3	27.7	43	43090	207	116	183	187	218	179	200	268
HDO 125 3	33.0	36	46570	188	119	186	190	—	182	203	—
HDO 125 3	35.8	34	47160	176	119	186	190	—	182	203	—
HDO 125 3	38.8	31	46270	159	120	187	191	—	183	204	—
HDO 125 3	43.0	27.9	46420	144	119	186	190	—	182	203	—
HDO 125 3	50.1	24.0	49240	131	121	188	192	—	184	205	—
HDO 125 3	55.4	21.6	46190	111	—	—	—	—	—	—	—
HDO 125 3	60.1	20.0	47910	106	—	—	—	—	—	—	—
HDO 125 3	72.1	16.6	47750	88	—	—	—	—	—	—	—
HDO 125 3	77.6	15.5	49240	85	—	—	—	—	—	—	—
HDO 125 3	85.9	14.0	46530	72	—	—	—	—	—	—	—
HDO 125 4	97.0	12.4	41970	59	—	—	—	—	—	—	—
HDO 125 4	116.3	10.3	47750	56	—	—	—	—	—	—	—
HDO 125 4	125.2	9.6	49240	54	—	—	—	—	—	—	—
HDO 125 4	141.8	8.5	47230	45	—	—	—	—	—	—	—
HDO 125 4	152.6	7.9	48720	43	—	—	—	—	—	—	—
HDO 125 4	178.0	6.7	47230	36	—	—	—	—	—	—	—
HDO 125 4	200.3	6.0	47510	32	—	—	—	—	—	—	—
HDO 125 4	226.9	5.3	47230	28	—	—	—	—	—	—	—
HDO 125 4	244.1	4.9	48720	27	—	—	—	—	—	—	—
HDO 125 4	284.8	4.2	47230	23	—	—	—	—	—	—	—
HDO 125 4	315.2	3.8	49240	21	—	—	—	—	—	—	—
HDO 125 4	367.6	3.3	47750	17.7	—	—	—	—	—	—	—
HDO 125 4	395.6	3.0	49240	17.0	—	—	—	—	—	—	—
HDO 125 4	438.0	2.7	49240	15.3	—	—	—	—	—	—	—

HDO

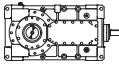
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 125

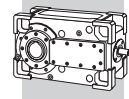
$n_1 = 1000 \text{ min}^{-1}$

	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$						
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR45}$ [kW]	$P_{TMCR49}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]
HDO 125 2	7.4	135	34990	515	*	304	376	454	289	317	411
HDO 125 2	8.0	125	36890	504	203	306	378	456	291	319	413
HDO 125 2	8.8	113	39430	487	205	308	380	458	293	321	415
HDO 125 2	9.9	101	38520	425	206	309	381	459	294	322	416
HDO 125 2	11.5	87	35910	341	213	316	388	—	301	329	423
HDO 125 2	12.3	81	37300	329	214	317	389	—	302	330	—
HDO 125 2	14.2	70	34970	268	207	310	382	—	295	323	—
HDO 125 2	15.3	65	36350	259	208	311	383	—	296	324	—
HDO 125 2	16.9	59	38880	250	215	318	390	—	303	331	—
HDO 125 3	19.2	52	36480	211	161	232	288	—	224	245	—
HDO 125 3	22.6	44	39920	197	164	235	291	—	227	248	—
HDO 125 3	24.3	41	42960	197	166	237	293	—	229	250	—
HDO 125 3	27.7	36	45510	183	169	240	296	—	232	253	—
HDO 125 3	33.0	30	46500	157	—	—	—	—	—	—	—
HDO 125 3	35.8	27.9	47750	148	—	—	—	—	—	—	—
HDO 125 3	38.8	25.8	46270	133	—	—	—	—	—	—	—
HDO 125 3	43.0	23.3	46250	120	—	—	—	—	—	—	—
HDO 125 3	50.1	20.0	49240	109	—	—	—	—	—	—	—
HDO 125 3	55.4	18.0	46040	92	—	—	—	—	—	—	—
HDO 125 3	60.1	16.6	48720	90	—	—	—	—	—	—	—
HDO 125 3	72.1	13.9	47750	74	—	—	—	—	—	—	—
HDO 125 3	77.6	12.9	49240	71	—	—	—	—	—	—	—
HDO 125 3	85.9	11.6	47860	62	—	—	—	—	—	—	—
HDO 125 4	97.0	10.3	44330	52	—	—	—	—	—	—	—
HDO 125 4	116.3	8.6	47750	47	—	—	—	—	—	—	—
HDO 125 4	125.2	8.0	49240	45	—	—	—	—	—	—	—
HDO 125 4	141.8	7.1	47230	38	—	—	—	—	—	—	—
HDO 125 4	152.6	6.6	49210	37	—	—	—	—	—	—	—
HDO 125 4	178.0	5.6	47230	30	—	—	—	—	—	—	—
HDO 125 4	200.3	5.0	49240	28	—	—	—	—	—	—	—
HDO 125 4	226.9	4.4	47230	24	—	—	—	—	—	—	—
HDO 125 4	244.1	4.1	48720	23	—	—	—	—	—	—	—
HDO 125 4	284.8	3.5	47230	18.8	—	—	—	—	—	—	—
HDO 125 4	315.2	3.2	49240	17.7	—	—	—	—	—	—	—
HDO 125 4	367.6	2.7	47750	14.7	—	—	—	—	—	—	—
HDO 125 4	395.6	2.5	49730	14.3	—	—	—	—	—	—	—
HDO 125 4	438.0	2.3	49240	12.8	—	—	—	—	—	—	—

HDO

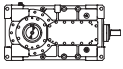
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 125

$n_1 = 1000 \text{ min}^{-1}$

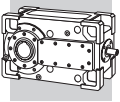
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C						
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]
HDO 125 2	7.4	135	34990	515	*	212	234	278	225	253	347
HDO 125 2	8.0	125	36890	504	*	214	236	280	227	255	349
HDO 125 2	8.8	113	39430	487	*	215	237	281	228	256	350
HDO 125 2	9.9	101	38520	425	*	216	238	282	229	257	351
HDO 125 2	11.5	87	35910	341	148	223	245	289	236	264	358
HDO 125 2	12.3	81	37300	329	149	224	246	290	237	265	359
HDO 125 2	14.2	70	34970	268	142	217	239	283	230	258	352
HDO 125 2	15.3	65	36350	259	143	218	240	284	231	259	—
HDO 125 2	16.9	59	38880	250	151	226	248	292	239	267	—
HDO 125 3	19.2	52	36480	211	112	164	183	214	175	196	264
HDO 125 3	22.6	44	39920	197	115	167	186	217	178	199	—
HDO 125 3	24.3	41	42960	197	116	168	187	218	179	200	—
HDO 125 3	27.7	36	45510	183	120	172	191	—	183	204	—
HDO 125 3	33.0	30	46500	157	122	174	193	—	185	206	—
HDO 125 3	35.8	27.9	47750	148	122	174	193	—	185	206	—
HDO 125 3	38.8	25.8	46270	133	122	174	193	—	185	206	—
HDO 125 3	43.0	23.3	46250	120	—	—	—	—	—	—	—
HDO 125 3	50.1	20.0	49240	109	—	—	—	—	—	—	—
HDO 125 3	55.4	18.0	46040	92	—	—	—	—	—	—	—
HDO 125 3	60.1	16.6	48720	90	—	—	—	—	—	—	—
HDO 125 3	72.1	13.9	47750	74	—	—	—	—	—	—	—
HDO 125 3	77.6	12.9	49240	71	—	—	—	—	—	—	—
HDO 125 3	85.9	11.6	47860	62	—	—	—	—	—	—	—
HDO 125 4	97.0	10.3	44330	52	—	—	—	—	—	—	—
HDO 125 4	116.3	8.6	47750	47	—	—	—	—	—	—	—
HDO 125 4	125.2	8.0	49240	45	—	—	—	—	—	—	—
HDO 125 4	141.8	7.1	47230	38	—	—	—	—	—	—	—
HDO 125 4	152.6	6.6	49210	37	—	—	—	—	—	—	—
HDO 125 4	178.0	5.6	47230	30	—	—	—	—	—	—	—
HDO 125 4	200.3	5.0	49240	28	—	—	—	—	—	—	—
HDO 125 4	226.9	4.4	47230	24	—	—	—	—	—	—	—
HDO 125 4	244.1	4.1	48720	23	—	—	—	—	—	—	—
HDO 125 4	284.8	3.5	47230	18.8	—	—	—	—	—	—	—
HDO 125 4	315.2	3.2	49240	17.7	—	—	—	—	—	—	—
HDO 125 4	367.6	2.7	47750	14.7	—	—	—	—	—	—	—
HDO 125 4	395.6	2.5	49730	14.3	—	—	—	—	—	—	—
HDO 125 4	438.0	2.3	49240	12.8	—	—	—	—	—	—	—

HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

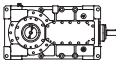
— Thermal verification not necessary





# HDO 130

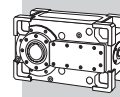
$n_1 = 1800 \text{ min}^{-1}$

	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$										
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]
HDO 130 2	5.7	315	41480	1426	*	*	*	*	592	●	*	*	*	*	●
HDO 130 2	6.2	289	42950	1353	*	*	*	*	601		*	*	*	*	
HDO 130 2	7.1	254	44500	1232	*	*	*	*	612		*	*	*	*	
HDO 130 2	7.7	233	46060	1172	*	*	*	*	617		*	*	*	491	
HDO 130 2	8.8	205	47690	1066	*	*	*	*	625		*	*	*	499	
HDO 130 2	9.6	187	48330	984	*	447	*	421	664		*	*	*	538	
HDO 130 2	11.0	164	50120	896	*	454	*	428	671		*	*	385	545	
HDO 130 2	12.0	151	50800	834	*	479	375	453	696		*	*	410	570	
HDO 130 2	13.6	132	52750	761	*	484	380	458	701		312	321	415	575	
HDO 130 3	15.2	119	55160	727	*	*	*	*	411	537	*	*	*	319	541
HDO 130 3	18.3	99	56980	625	*	310	*	303	479	605	*	*	271	387	609
HDO 130 3	19.9	90	62200	625	*	312	*	305	481	607	*	*	273	389	611
HDO 130 3	22.6	80	59950	531	*	339	275	332	508	634	250	232	300	416	638
HDO 130 3	24.7	73	62590	508	*	341	277	334	510	—	252	234	302	418	640
HDO 130 3	28.3	64	65230	462	*	352	288	345	521	—	263	245	313	429	651
HDO 130 3	30.9	58	62590	406	*	353	289	346	522	—	264	246	314	430	—
HDO 130 3	34.9	52	64510	371	170	361	297	354	530	—	272	254	322	438	—
HDO 130 3	38.3	47	62590	328	193	384	320	377	—	—	295	277	345	—	—
HDO 130 3	43.8	41	64790	296	200	391	327	—	—	—	302	284	352	—	—
HDO 130 3	47.8	38	62590	262	200	391	327	—	—	—	302	284	—	—	—
HDO 130 3	54.0	33	61210	227	205	396	332	—	—	—	307	289	—	—	—
HDO 130 3	59.0	31	62330	212	206	397	333	—	—	—	308	290	—	—	—
HDO 130 3	67.1	26.8	58960	176	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	71.5	25.2	64720	185	159	305	259	—	—	—	237	225	—	—	—
HDO 130 4	78.1	23.1	61990	162	159	305	259	—	—	—	237	225	—	—	—
HDO 130 4	88.2	20.4	64510	149	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	96.3	18.7	62590	133	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	111.2	16.2	65230	120	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	121.4	14.8	62590	105	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	141.3	12.7	65230	94	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	154.3	11.7	66770	88	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	174.3	10.3	69570	82	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	190.3	9.5	66770	72	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	219.1	8.2	65230	61	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	239.1	7.5	66770	57	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	270.2	6.7	69570	53	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	294.9	6.1	66770	46	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	335.6	5.4	63140	38	—	—	—	—	—	—	—	—	—	—	—

HDO

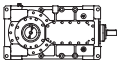
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



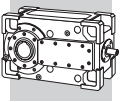
**HDO**

**HDO 130** **n<sub>1</sub> = 1800 min<sup>-1</sup>**

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C										
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCR A5</sub> [kW]	P <sub>TMCR A9</sub> [kW]	P <sub>TMCR A21</sub> [kW]	P <sub>TMCR A34</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCR W5</sub> [kW]	P <sub>TMCR W9</sub> [kW]	P <sub>TMCR W21</sub> [kW]	P <sub>TMCR W34</sub> [kW]
HDO 130 2	5.7	315	41480	1426	*	*	*	*	*	●	*	*	*	*	●
HDO 130 2	6.2	289	42950	1353	*	*	*	*	*		*	*	*	*	
HDO 130 2	7.1	254	44500	1232	*	*	*	*	*		*	*	*	*	
HDO 130 2	7.7	233	46060	1172	*	*	*	*	*		*	*	*	*	
HDO 130 2	8.8	205	47690	1066	*	*	*	*	*		*	*	*	*	
HDO 130 2	9.6	187	48330	984	*	*	*	*	*		*	*	*	456	
HDO 130 2	11.0	164	50120	896	*	*	*	*	369		*	*	*	463	
HDO 130 2	12.0	151	50800	834	*	*	*	*	394		*	*	*	488	
HDO 130 2	13.6	132	52750	761	*	328	*	*	399		*	*	333	493	
HDO 130 3	15.2	119	55160	727	*	*	*	*	*	*	*	*	*	477	
HDO 130 3	18.3	99	56980	625	*	*	*	*	255	325	*	*	*	323	545
HDO 130 3	19.9	90	62200	625	*	*	*	*	257	327	*	*	*	325	547
HDO 130 3	22.6	80	59950	531	*	224	*	*	284	354	*	*	236	352	574
HDO 130 3	24.7	73	62590	508	*	225	*	*	285	355	*	*	237	353	575
HDO 130 3	28.3	64	65230	462	*	237	*	199	297	367	199	*	249	365	587
HDO 130 3	30.9	58	62590	406	*	238	169	200	298	368	200	182	250	366	588
HDO 130 3	34.9	52	64510	371	*	246	177	208	306	376	208	190	258	374	—
HDO 130 3	38.3	47	62590	328	*	268	199	230	328	—	230	212	280	396	—
HDO 130 3	43.8	41	64790	296	135	275	206	237	335	—	237	219	287	403	—
HDO 130 3	47.8	38	62590	262	136	276	207	238	336	—	238	220	288	—	—
HDO 130 3	54.0	33	61210	227	141	281	212	243	—	—	243	225	293	—	—
HDO 130 3	59.0	31	62330	212	142	282	213	—	—	—	244	226	—	—	—
HDO 130 3	67.1	26.8	58960	176	142	282	213	—	—	—	244	226	—	—	—
HDO 130 4	71.5	25.2	64720	185	110	217	165	190	—	—	188	176	229	—	—
HDO 130 4	78.1	23.1	61990	162	110	217	165	—	—	—	188	176	—	—	—
HDO 130 4	88.2	20.4	64510	149	111	218	166	—	—	—	189	177	—	—	—
HDO 130 4	96.3	18.7	62590	133	112	219	167	—	—	—	190	178	—	—	—
HDO 130 4	111.2	16.2	65230	120	116	223	171	—	—	—	194	182	—	—	—
HDO 130 4	121.4	14.8	62590	105	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	141.3	12.7	65230	94	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	154.3	11.7	66770	88	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	174.3	10.3	69570	82	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	190.3	9.5	66770	72	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	219.1	8.2	65230	61	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	239.1	7.5	66770	57	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	270.2	6.7	69570	53	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	294.9	6.1	66770	46	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	335.6	5.4	63140	38	—	—	—	—	—	—	—	—	—	—	—

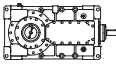
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 130

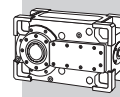
$n_1 = 1500 \text{ min}^{-1}$

	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$										
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]
HDO 130 2	5.7	263	43810	1255	*	*	*	*	640	●	*	*	*	514	●
HDO 130 2	6.2	241	45370	1191	*	*	*	*	647		*	*	*	521	
HDO 130 2	7.1	212	47000	1084	*	*	*	*	656		*	*	*	530	
HDO 130 2	7.7	194	48650	1031	*	*	*	416	659		*	*	*	533	
HDO 130 2	8.8	171	50380	939	*	413	*	423	666		*	*	380	540	
HDO 130 2	9.6	156	51050	866	*	443	375	453	696		*	*	410	570	
HDO 130 2	11.0	137	52950	789	*	448	380	458	701		*	321	415	575	
HDO 130 2	12.0	125	53660	734	*	467	399	477	720		331	340	434	594	
HDO 130 2	13.6	110	55730	670	*	471	403	481	724		335	344	438	598	
HDO 130 3	15.2	99	58470	642	*	260	*	278	454	580	*	*	*	362	584
HDO 130 3	18.3	82	60430	552	*	313	274	331	507	633	249	231	299	415	637
HDO 130 3	19.9	75	63770	534	*	314	275	332	508	634	250	232	300	416	638
HDO 130 3	22.6	66	63570	469	*	335	296	353	529	—	271	253	321	437	659
HDO 130 3	24.7	61	63380	428	*	336	297	354	530	—	272	254	322	438	—
HDO 130 3	28.3	53	65810	389	179	345	306	363	539	—	281	263	331	447	—
HDO 130 3	30.9	49	63010	341	179	345	306	363	—	—	281	263	331	447	—
HDO 130 3	34.9	43	65470	313	186	352	313	370	—	—	288	270	338	—	—
HDO 130 3	38.3	39	62680	273	203	369	330	—	—	—	305	287	—	—	—
HDO 130 3	43.8	34	65130	248	208	374	335	—	—	—	310	292	—	—	—
HDO 130 3	47.8	31	62370	218	209	375	336	—	—	—	311	293	—	—	—
HDO 130 3	54.0	27.8	64840	200	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	59.0	25.4	62100	176	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	67.1	22.3	62420	155	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	71.5	21.0	65760	157	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	78.1	19.2	63000	137	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	88.2	17.0	67870	131	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	96.3	15.6	65030	115	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	111.2	13.5	69570	107	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	121.4	12.4	66770	94	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	141.3	10.6	69570	84	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	154.3	9.7	66770	74	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	174.3	8.6	69570	68	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	190.3	7.9	66770	60	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	219.1	6.8	69570	54	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	239.1	6.3	66770	48	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	270.2	5.6	69570	44	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	294.9	5.1	66770	39	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	335.6	4.5	63140	32	—	—	—	—	—	—	—	—	—	—	—

HDO

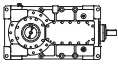
\* 

— Thermal verification not necessary



# HDO 130

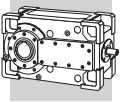
$n_1 = 1500 \text{ min}^{-1}$

	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 40^\circ\text{C}$										
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]
HDO 130 2	5.7	263	43810	1255	*	*	*	*	*	●	*	*	*	*	●
HDO 130 2	6.2	241	45370	1191	*	*	*	*	*		*	*	*	*	
HDO 130 2	7.1	212	47000	1084	*	*	*	*	*		*	*	*	448	
HDO 130 2	7.7	194	48650	1031	*	*	*	*	*		*	*	*	451	
HDO 130 2	8.8	171	50380	939	*	*	*	*	*		*	*	*	458	
HDO 130 2	9.6	156	51050	866	*	*	*	*	394		*	*	*	488	
HDO 130 2	11.0	137	52950	789	*	*	*	*	399		*	*	333	493	
HDO 130 2	12.0	125	53660	734	*	320	*	*	418		*	*	352	512	
HDO 130 2	13.6	110	55730	670	*	324	*	287	422		*	*	356	516	
HDO 130 3	15.2	99	58470	642	*	*	*	*	*	300	*	*	*	298	520
HDO 130 3	18.3	82	60430	552	*	*	*	*	283	353	*	*	235	351	573
HDO 130 3	19.9	75	63770	534	*	*	*	*	284	354	*	*	236	352	574
HDO 130 3	22.6	66	63570	469	*	227	*	207	305	375	207	189	257	373	595
HDO 130 3	24.7	61	63380	428	*	228	177	208	306	376	208	190	258	374	596
HDO 130 3	28.3	53	65810	389	*	236	185	216	314	384	216	198	266	382	604
HDO 130 3	30.9	49	63010	341	*	237	186	217	315	385	217	199	267	383	—
HDO 130 3	34.9	43	65470	313	*	244	193	224	322	—	224	206	274	390	—
HDO 130 3	38.3	39	62680	273	139	261	210	241	339	—	241	223	291	—	—
HDO 130 3	43.8	34	65130	248	144	266	215	246	344	—	246	228	296	—	—
HDO 130 3	47.8	31	62370	218	145	267	216	247	—	—	247	229	—	—	—
HDO 130 3	54.0	27.8	64840	200	149	271	220	—	—	—	251	233	—	—	—
HDO 130 3	59.0	25.4	62100	176	149	271	220	—	—	—	251	233	—	—	—
HDO 130 3	67.1	22.3	62420	155	149	271	220	—	—	—	251	233	—	—	—
HDO 130 4	71.5	21.0	65760	157	115	208	170	—	—	—	193	181	—	—	—
HDO 130 4	78.1	19.2	63000	137	115	208	170	—	—	—	193	181	—	—	—
HDO 130 4	88.2	17.0	67870	131	116	209	171	—	—	—	194	182	—	—	—
HDO 130 4	96.3	15.6	65030	115	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	111.2	13.5	69570	107	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	121.4	12.4	66770	94	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	141.3	10.6	69570	84	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	154.3	9.7	66770	74	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	174.3	8.6	69570	68	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	190.3	7.9	66770	60	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	219.1	6.8	69570	54	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	239.1	6.3	66770	48	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	270.2	5.6	69570	44	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	294.9	5.1	66770	39	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	335.6	4.5	63140	32	—	—	—	—	—	—	—	—	—	—	—

**HDO**

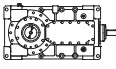
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 130

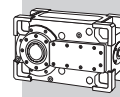
$n_1 = 1200 \text{ min}^{-1}$

	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$										
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]
HDO 130 2	5.7	210	46840	1074	*	*	*	432	675	●	*	*	*	549	●
HDO 130 2	6.2	193	48520	1019	*	*	*	438	681		*	*	*	555	
HDO 130 2	7.1	169	50250	927	*	410	*	445	688		*	*	402	562	
HDO 130 2	7.7	156	52030	882	*	412	369	447	690		*	*	404	564	
HDO 130 2	8.8	137	53860	803	*	418	375	453	696		*	*	410	570	
HDO 130 2	9.6	124	54590	741	*	441	398	476	719		330	339	433	593	
HDO 130 2	11.0	109	56600	675	*	445	402	480	723		334	343	437	597	
HDO 130 2	12.0	100	57380	628	*	460	417	495	738		349	358	452	612	
HDO 130 2	13.6	88	59580	573	245	463	420	498	741		352	361	455	615	
HDO 130 3	15.2	79	58850	517	*	276	253	310	486	612	228	210	278	394	616
HDO 130 3	18.3	66	64610	472	*	317	294	351	527	—	269	251	319	435	657
HDO 130 3	19.9	60	63370	424	*	318	295	352	528	—	270	252	320	436	—
HDO 130 3	22.6	53	65610	387	184	334	311	368	544	—	286	268	336	452	—
HDO 130 3	24.7	49	63010	341	185	335	312	369	—	—	287	269	337	453	—
HDO 130 3	28.3	42	65450	309	192	342	319	—	—	—	294	276	344	—	—
HDO 130 3	30.9	39	62670	271	192	342	319	—	—	—	294	276	—	—	—
HDO 130 3	34.9	34	65130	249	197	347	324	—	—	—	299	281	—	—	—
HDO 130 3	38.3	31	62370	218	211	361	338	—	—	—	313	295	—	—	—
HDO 130 3	43.8	27.4	64820	198	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	47.8	25.1	62090	173	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	54.0	22.2	65210	161	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	59.0	20.3	62470	141	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	67.1	17.9	62800	125	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	71.5	16.8	68000	130	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	78.1	15.4	65160	114	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	88.2	13.6	69570	107	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	96.3	12.5	66770	94	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	111.2	10.8	69570	85	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	121.4	9.9	66770	75	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	141.3	8.5	69570	67	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	154.3	7.8	66770	59	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	174.3	6.9	69570	54	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	190.3	6.3	66770	48	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	219.1	5.5	69570	43	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	239.1	5.0	66770	38	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	270.2	4.4	69570	35	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	294.9	4.1	66770	31	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	335.6	3.6	63140	26	—	—	—	—	—	—	—	—	—	—	—

HDO

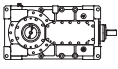
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



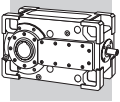
**HDO**

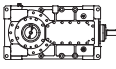
# HDO 130 n<sub>1</sub> = 1200 min<sup>-1</sup>

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C										
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCR A5</sub> [kW]	P <sub>TMCR A9</sub> [kW]	P <sub>TMCR A21</sub> [kW]	P <sub>TMCR A34</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCR W5</sub> [kW]	P <sub>TMCR W9</sub> [kW]	P <sub>TMCR W21</sub> [kW]	P <sub>TMCR W34</sub> [kW]
HDO 130 2	5.7	210	46840	1074	*	*	*	*	*	●	*	*	*	467	●
HDO 130 2	6.2	193	48520	1019	*	*	*	*	*		*	*	*	472	
HDO 130 2	7.1	169	50250	927	*	*	*	*	385		*	*	*	479	
HDO 130 2	7.7	156	52030	882	*	*	*	*	388		*	*	*	482	
HDO 130 2	8.8	137	53860	803	*	*	*	*	393		*	*	327	487	
HDO 130 2	9.6	124	54590	741	*	301	*	*	417		*	*	351	511	
HDO 130 2	11.0	109	56600	675	*	305	*	286	421		*	*	355	515	
HDO 130 2	12.0	100	57380	628	*	320	257	301	436		267	276	370	530	
HDO 130 2	13.6	88	59580	573	*	323	260	304	439		270	279	373	533	
HDO 130 3	15.2	79	58850	517	*	*	*	*	261	331	*	*	213	329	551
HDO 130 3	18.3	66	64610	472	*	213	*	205	303	373	205	*	255	371	593
HDO 130 3	19.9	60	63370	424	*	214	175	206	304	374	206	188	256	372	594
HDO 130 3	22.6	53	65610	387	*	230	191	222	320	390	222	204	272	388	—
HDO 130 3	24.7	49	63010	341	*	231	192	223	321	391	223	205	273	389	—
HDO 130 3	28.3	42	65450	309	127	237	198	229	327	—	229	211	279	395	—
HDO 130 3	30.9	39	62670	271	128	238	199	230	328	—	230	212	280	—	—
HDO 130 3	34.9	34	65130	249	133	243	204	235	333	—	235	217	285	—	—
HDO 130 3	38.3	31	62370	218	147	257	218	249	—	—	249	231	—	—	—
HDO 130 3	43.8	27.4	64820	198	151	261	222	—	—	—	253	235	—	—	—
HDO 130 3	47.8	25.1	62090	173	151	261	222	—	—	—	253	235	—	—	—
HDO 130 3	54.0	22.2	65210	161	154	264	225	—	—	—	256	238	—	—	—
HDO 130 3	59.0	20.3	62470	141	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	67.1	17.9	62800	125	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	71.5	16.8	68000	130	119	203	174	—	—	—	197	185	—	—	—
HDO 130 4	78.1	15.4	65160	114	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	88.2	13.6	69570	107	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	96.3	12.5	66770	94	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	111.2	10.8	69570	85	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	121.4	9.9	66770	75	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	141.3	8.5	69570	67	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	154.3	7.8	66770	59	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	174.3	6.9	69570	54	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	190.3	6.3	66770	48	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	219.1	5.5	69570	43	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	239.1	5.0	66770	38	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	270.2	4.4	69570	35	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	294.9	4.1	66770	31	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	335.6	3.6	63140	26	—	—	—	—	—	—	—	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

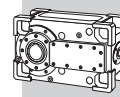
— Thermal verification not necessary



HDO 130					n <sub>1</sub> = 1000 min <sup>-1</sup>										
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C										
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCR A5</sub> [kW]	P <sub>TMCR A9</sub> [kW]	P <sub>TMCR A21</sub> [kW]	P <sub>TMCR A34</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCR W5</sub> [kW]	P <sub>TMCR W9</sub> [kW]	P <sub>TMCR W21</sub> [kW]	P <sub>TMCR W34</sub> [kW]
HDO 130 2	5.7	175	49480	945	*	*	378	456	699	●	*	*	413	573	●
HDO 130 2	6.2	160	51240	897	*	378	383	461	704		*	*	418	578	
HDO 130 2	7.1	141	53080	816	*	384	389	467	710		*	330	424	584	
HDO 130 2	7.7	130	54940	776	*	386	391	469	712		323	332	426	586	
HDO 130 2	8.8	114	56890	707	*	390	395	473	716		327	336	430	590	
HDO 130 2	9.6	104	57650	652	*	409	414	492	735		346	355	449	609	
HDO 130 2	11.0	91	59790	594	242	412	417	495	738		349	358	452	612	
HDO 130 2	12.0	84	59760	545	254	424	429	507	750		361	370	464	624	
HDO 130 2	13.6	73	62940	504	257	427	432	510	—		364	373	467	627	
HDO 130 3	15.2	66	58850	431	*	263	274	331	507	—	249	231	299	415	637
HDO 130 3	18.3	55	65100	397	181	297	308	365	541	—	283	265	333	449	—
HDO 130 3	19.9	50	63060	352	181	297	308	365	—	—	283	265	333	449	—
HDO 130 3	22.6	44	65510	322	195	311	322	379	—	—	297	279	347	—	—
HDO 130 3	24.7	41	62730	283	195	311	322	—	—	—	297	279	347	—	—
HDO 130 3	28.3	35	65170	257	201	317	328	—	—	—	303	285	—	—	—
HDO 130 3	30.9	32	62410	225	201	317	328	—	—	—	303	285	—	—	—
HDO 130 3	34.9	28.7	64880	207	205	321	332	—	—	—	307	289	—	—	—
HDO 130 3	38.3	26.1	62140	181	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	43.8	22.8	64950	165	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	47.8	20.9	62210	145	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	54.0	18.5	67010	138	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	59.0	17.0	64200	121	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	67.1	14.9	63140	105	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	71.5	14.0	69570	110	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	78.1	12.8	66770	97	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	88.2	11.3	69570	90	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	96.3	10.4	66770	79	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	111.2	9.0	69570	71	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	121.4	8.2	66770	62	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	141.3	7.1	69570	56	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	154.3	6.5	66770	49	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	174.3	5.7	69570	45	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	190.3	5.3	66770	40	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	219.1	4.6	69570	36	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	239.1	4.2	66770	32	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	270.2	3.7	69570	29	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	294.9	3.4	66770	26	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	335.6	3.0	63140	21	—	—	—	—	—	—	—	—	—	—	—

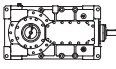
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 130

$n_1 = 1000 \text{ min}^{-1}$

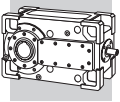
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 40^\circ\text{C}$										
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]
HDO 130 2	5.7	175	49480	945	*	*	*	*	397	●	*	*	*	491	●
HDO 130 2	6.2	160	51240	897	*	*	*	*	402		*	*	*	496	
HDO 130 2	7.1	141	53080	816	*	*	*	*	407		*	*	341	501	
HDO 130 2	7.7	130	54940	776	*	*	*	*	409		*	*	343	503	
HDO 130 2	8.8	114	56890	707	*	*	*	*	414		*	*	348	508	
HDO 130 2	9.6	104	57650	652	*	281	*	297	432		263	272	366	526	
HDO 130 2	11.0	91	59790	594	*	285	257	301	436		267	276	370	530	
HDO 130 2	12.0	84	59760	545	*	297	269	313	448		279	288	382	542	
HDO 130 2	13.6	73	62940	504	*	299	271	315	450		281	290	384	544	
HDO 130 3	15.2	66	58850	431	*	*	*	185	283	353	185	*	235	351	573
HDO 130 3	18.3	55	65100	397	*	201	187	218	316	386	218	200	268	384	606
HDO 130 3	19.9	50	63060	352	*	202	188	219	317	387	219	201	269	385	—
HDO 130 3	22.6	44	65510	322	130	215	201	232	330	—	232	214	282	398	—
HDO 130 3	24.7	41	62730	283	131	216	202	233	331	—	233	215	283	—	—
HDO 130 3	28.3	35	65170	257	136	221	207	238	336	—	238	220	288	—	—
HDO 130 3	30.9	32	62410	225	137	222	208	239	—	—	239	221	289	—	—
HDO 130 3	34.9	28.7	64880	207	141	226	212	—	—	—	243	225	—	—	—
HDO 130 3	38.3	26.1	62140	181	152	237	223	—	—	—	254	236	—	—	—
HDO 130 3	43.8	22.8	64950	165	155	240	226	—	—	—	257	239	—	—	—
HDO 130 3	47.8	20.9	62210	145	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	54.0	18.5	67010	138	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	59.0	17.0	64200	121	—	—	—	—	—	—	—	—	—	—	—
HDO 130 3	67.1	14.9	63140	105	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	71.5	14.0	69570	110	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	78.1	12.8	66770	97	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	88.2	11.3	69570	90	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	96.3	10.4	66770	79	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	111.2	9.0	69570	71	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	121.4	8.2	66770	62	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	141.3	7.1	69570	56	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	154.3	6.5	66770	49	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	174.3	5.7	69570	45	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	190.3	5.3	66770	40	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	219.1	4.6	69570	36	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	239.1	4.2	66770	32	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	270.2	3.7	69570	29	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	294.9	3.4	66770	26	—	—	—	—	—	—	—	—	—	—	—
HDO 130 4	335.6	3.0	63140	21	—	—	—	—	—	—	—	—	—	—	—

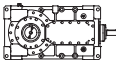
**HDO**

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

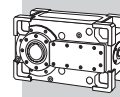




HDO 140					$n_1 = 1800 \text{ min}^{-1}$										
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 20^\circ\text{C}$										
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]
HDO 140 2	6.6	274	49490	1478	*	*	*	*	*	●	*	*	*	*	●
HDO 140 2	7.3	248	54750	1478	*	*	*	*	600		*	*	*	*	
HDO 140 2	8.2	220	61300	1473	*	*	*	*	613		*	*	*	*	
HDO 140 2	9.0	200	64270	1401	*	*	*	*	620		*	*	*	*	
HDO 140 2	10.1	178	65720	1276	*	*	*	*	629		*	*	*	*	
HDO 140 2	11.3	160	67420	1176	*	*	*	*	670		*	*	*	544	
HDO 140 2	12.6	142	69060	1072	*	460	*	434	677		*	*	*	551	
HDO 140 2	14.0	129	66760	939	*	487	383	461	704		*	*	418	578	
HDO 140 2	15.7	115	72680	910	*	492	388	466	709		*	*	423	583	
HDO 140 3	17.7	102	64350	727	*	*	*	*	404	530	*	*	*	312	534
HDO 140 3	19.9	90	72270	727	*	*	*	*	407	533	*	*	*	315	537
HDO 140 3	23.3	77	72600	625	*	310	*	303	479	605	*	*	271	387	609
HDO 140 3	26.0	69	69020	531	*	337	273	330	506	632	248	230	298	414	636
HDO 140 3	28.8	63	76390	531	*	339	275	332	508	634	250	232	300	416	638
HDO 140 3	32.5	55	76280	470	*	352	288	345	521	—	263	245	313	429	651
HDO 140 3	36.0	50	80850	450	*	354	290	347	523	—	265	247	315	431	653
HDO 140 3	40.1	45	74300	371	172	363	299	356	532	—	274	256	324	440	—
HDO 140 3	44.4	41	80850	365	173	364	300	357	533	—	275	257	325	441	—
HDO 140 3	50.4	36	81510	324	203	394	330	—	—	—	305	287	355	—	—
HDO 140 3	55.8	32	80850	290	204	395	331	—	—	—	306	288	356	—	—
HDO 140 3	62.2	28.9	74300	239	210	401	337	—	—	—	312	294	—	—	—
HDO 140 3	68.8	26.2	80850	235	211	402	338	—	—	—	313	295	—	—	—
HDO 140 3	77.3	23.3	73920	191	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	82.3	21.9	76010	189	164	310	264	—	—	—	242	230	—	—	—
HDO 140 4	91.1	19.8	80850	181	165	311	265	—	—	—	243	231	—	—	—
HDO 140 4	101.5	17.7	74300	150	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	112.3	16.0	80850	147	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	128.0	14.1	81510	130	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	141.6	12.7	80850	117	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	162.7	11.1	81510	102	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	180.0	10.0	80850	92	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	198.3	9.1	81510	84	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	219.5	8.2	80850	75	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	252.1	7.1	81510	66	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	279.0	6.5	87060	64	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	311.0	5.8	81180	53	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	344.1	5.2	87060	52	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	386.6	4.7	78870	42	—	—	—	—	—	—	—	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



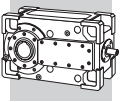
HDO

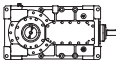
# HDO 140 n<sub>1</sub> = 1800 min<sup>-1</sup>

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C										
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCR A5</sub> [kW]	P <sub>TMCR A9</sub> [kW]	P <sub>TMCR A21</sub> [kW]	P <sub>TMCR A34</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCR W5</sub> [kW]	P <sub>TMCR W9</sub> [kW]	P <sub>TMCR W21</sub> [kW]	P <sub>TMCR W34</sub> [kW]
HDO 140 2	6.6	274	49490	1478	*	*	*	*	*	●	*	*	*	*	●
HDO 140 2	7.3	248	54750	1478	*	*	*	*	*		*	*	*	*	
HDO 140 2	8.2	220	61300	1473	*	*	*	*	*		*	*	*	*	
HDO 140 2	9.0	200	64270	1401	*	*	*	*	*		*	*	*	*	
HDO 140 2	10.1	178	65720	1276	*	*	*	*	*		*	*	*	*	
HDO 140 2	11.3	160	67420	1176	*	*	*	*	*		*	*	*	*	
HDO 140 2	12.6	142	69060	1072	*	*	*	*	*		*	*	*	465	
HDO 140 2	14.0	129	66760	939	*	*	*	*	398		*	*	*	492	
HDO 140 2	15.7	115	72680	910	*	*	*	*	403		*	*	*	497	
HDO 140 3	17.7	102	64350	727	*	*	*	*	*	*	*	*	*	467	
HDO 140 3	19.9	90	72270	727	*	*	*	*	*	*	*	*	*	471	
HDO 140 3	23.3	77	72600	625	*	*	*	*	252	322	*	*	*	320	542
HDO 140 3	26.0	69	69020	531	*	220	*	*	280	350	*	*	232	348	570
HDO 140 3	28.8	63	76390	531	*	221	*	*	281	351	*	*	233	349	571
HDO 140 3	32.5	55	76280	470	*	235	*	197	295	365	197	*	247	363	585
HDO 140 3	36.0	50	80850	450	*	236	*	198	296	366	198	*	248	364	586
HDO 140 3	40.1	45	74300	371	*	246	177	208	306	376	208	190	258	374	—
HDO 140 3	44.4	41	80850	365	*	247	178	209	307	377	209	191	259	375	—
HDO 140 3	50.4	36	81510	324	137	277	208	239	337	—	239	221	289	405	—
HDO 140 3	55.8	32	80850	290	137	277	208	239	337	—	239	221	289	405	—
HDO 140 3	62.2	28.9	74300	239	143	283	214	245	—	—	245	227	295	—	—
HDO 140 3	68.8	26.2	80850	235	144	284	215	246	—	—	246	228	296	—	—
HDO 140 3	77.3	23.3	73920	191	145	285	216	—	—	—	247	229	—	—	—
HDO 140 4	82.3	21.9	76010	189	114	221	169	194	—	—	192	180	233	—	—
HDO 140 4	91.1	19.8	80850	181	114	221	169	194	—	—	192	180	233	—	—
HDO 140 4	101.5	17.7	74300	150	115	222	170	—	—	—	193	181	—	—	—
HDO 140 4	112.3	16.0	80850	147	116	223	171	—	—	—	194	182	—	—	—
HDO 140 4	128.0	14.1	81510	130	120	227	175	—	—	—	198	186	—	—	—
HDO 140 4	141.6	12.7	80850	117	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	162.7	11.1	81510	102	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	180.0	10.0	80850	92	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	198.3	9.1	81510	84	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	219.5	8.2	80850	75	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	252.1	7.1	81510	66	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	279.0	6.5	87060	64	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	311.0	5.8	81180	53	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	344.1	5.2	87060	52	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	386.6	4.7	78870	42	—	—	—	—	—	—	—	—	—	—	—

\* BONFIGLIOLI TECHNICAL SERVICE

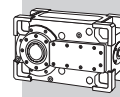
— Thermal verification not necessary



HDO 140					$n_1 = 1500 \text{ min}^{-1}$										
					$t_a = 20^\circ\text{C}$										
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]
HDO 140 2	6.6	228	52260	1301	*	*	*	*	640	●	*	*	*	*	●
HDO 140 2	7.3	206	57840	1301	*	*	*	*	650		*	*	*	524	
HDO 140 2	8.2	184	64740	1296	*	*	*	*	659		*	*	*	533	
HDO 140 2	9.0	167	67890	1234	*	*	*	*	665		*	*	*	539	
HDO 140 2	10.1	148	69410	1123	*	*	*	*	672		*	*	*	546	
HDO 140 2	11.3	133	71210	1035	*	450	*	460	703		*	*	417	577	
HDO 140 2	12.6	119	72940	944	*	456	388	466	709		*	*	423	583	
HDO 140 2	14.0	108	69190	811	*	476	408	486	729		340	349	443	603	
HDO 140 2	15.7	96	76770	801	*	480	412	490	733		344	353	447	607	
HDO 140 3	17.7	85	68210	642	*	*	*	275	451	577	*	*	*	359	581
HDO 140 3	19.9	75	76630	642	*	259	*	277	453	579	*	*	*	361	583
HDO 140 3	23.3	64	76960	552	*	314	275	332	508	634	250	232	300	416	638
HDO 140 3	26.0	58	73170	469	*	336	297	354	530	—	272	254	322	438	660
HDO 140 3	28.8	52	80970	469	*	337	298	355	531	—	273	255	323	439	661
HDO 140 3	32.5	46	80860	415	181	347	308	365	541	—	283	265	333	449	—
HDO 140 3	36.0	42	82360	382	182	348	309	366	542	—	284	266	334	450	—
HDO 140 3	40.1	37	79400	330	190	356	317	374	—	—	292	274	342	—	—
HDO 140 3	44.4	34	81940	308	190	356	317	—	—	—	292	274	342	—	—
HDO 140 3	50.4	29.7	82500	273	213	379	340	—	—	—	315	297	—	—	—
HDO 140 3	55.8	26.9	81520	244	214	380	341	—	—	—	316	298	—	—	—
HDO 140 3	62.2	24.1	82170	220	219	385	346	—	—	—	321	303	—	—	—
HDO 140 3	68.8	21.8	81170	197	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	77.3	19.4	78870	170	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	82.3	18.2	80550	167	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	91.1	16.5	82350	154	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	101.5	14.8	82170	138	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	112.3	13.4	85000	129	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	128.0	11.7	84810	113	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	141.6	10.6	87060	105	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	162.7	9.2	84810	89	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	180.0	8.3	87060	82	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	198.3	7.6	84810	73	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	219.5	6.8	87060	68	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	252.1	5.9	84810	57	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	279.0	5.4	87060	53	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	311.0	4.8	80940	44	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	344.1	4.4	87060	43	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	386.6	3.9	78870	35	—	—	—	—	—	—	—	—	—	—	—

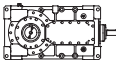
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 140

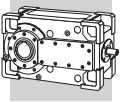
$n_1 = 1500 \text{ min}^{-1}$

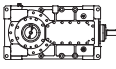
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 40^\circ\text{C}$											
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCRA5}$ [kW]	$P_{TMCRA9}$ [kW]	$P_{TMCRA21}$ [kW]	$P_{TMCRA34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCRW5}$ [kW]	$P_{TMCRW9}$ [kW]	$P_{TMCRW21}$ [kW]	$P_{TMCRW34}$ [kW]	
HDO 140 2	6.6	228	52260	1301	*	*	*	*	*	●	*	*	*	*	●	
HDO 140 2	7.3	206	57840	1301	*	*	*	*	*		*	*	*	*		
HDO 140 2	8.2	184	64740	1296	*	*	*	*	*		*	*	*	*		
HDO 140 2	9.0	167	67890	1234	*	*	*	*	*		*	*	*	*		
HDO 140 2	10.1	148	69410	1123	*	*	*	*	*		*	*	*	460		
HDO 140 2	11.3	133	71210	1035	*	*	*	*	*		*	*	*	491		
HDO 140 2	12.6	119	72940	944	*	*	*	*	403		*	*	*	497		
HDO 140 2	14.0	108	69190	811	*	325	*	*	423		*	*	357	517		
HDO 140 2	15.7	96	76770	801	*	329	*	*	427		*	*	361	521		
HDO 140 3	17.7	85	68210	642	*	*	*	*	*	294	*	*	*	292	514	
HDO 140 3	19.9	75	76630	642	*	*	*	*	*	297	*	*	*	295	517	
HDO 140 3	23.3	64	76960	552	*	*	*	*	*	282	352	*	*	234	350	572
HDO 140 3	26.0	58	73170	469	*	225	*	205	303	373	205	*	255	371	593	
HDO 140 3	28.8	52	80970	469	*	226	*	206	304	374	206	188	256	372	594	
HDO 140 3	32.5	46	80860	415	*	236	185	216	314	384	216	198	266	382	604	
HDO 140 3	36.0	42	82360	382	*	237	186	217	315	385	217	199	267	383	—	
HDO 140 3	40.1	37	79400	330	*	245	194	225	323	393	225	207	275	391	—	
HDO 140 3	44.4	34	81940	308	124	246	195	226	324	—	226	208	276	392	—	
HDO 140 3	50.4	29.7	82500	273	147	269	218	249	347	—	249	231	299	—	—	
HDO 140 3	55.8	26.9	81520	244	147	269	218	249	—	—	249	231	299	—	—	
HDO 140 3	62.2	24.1	82170	220	152	274	223	—	—	—	254	236	—	—	—	
HDO 140 3	68.8	21.8	81170	197	152	274	223	—	—	—	254	236	—	—	—	
HDO 140 3	77.3	19.4	78870	170	153	275	224	—	—	—	255	237	—	—	—	
HDO 140 4	82.3	18.2	80550	167	119	212	174	—	—	—	197	185	—	—	—	
HDO 140 4	91.1	16.5	82350	154	119	212	174	—	—	—	197	185	—	—	—	
HDO 140 4	101.5	14.8	82170	138	120	213	175	—	—	—	198	186	—	—	—	
HDO 140 4	112.3	13.4	85000	129	121	214	176	—	—	—	199	187	—	—	—	
HDO 140 4	128.0	11.7	84810	113	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	141.6	10.6	87060	105	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	162.7	9.2	84810	89	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	180.0	8.3	87060	82	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	198.3	7.6	84810	73	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	219.5	6.8	87060	68	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	252.1	5.9	84810	57	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	279.0	5.4	87060	53	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	311.0	4.8	80940	44	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	344.1	4.4	87060	43	—	—	—	—	—	—	—	—	—	—	—	
HDO 140 4	386.6	3.9	78870	35	—	—	—	—	—	—	—	—	—	—	—	

HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

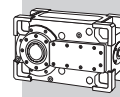
— Thermal verification not necessary



HDO 140					$n_1 = 1200 \text{ min}^{-1}$										
					$t_a = 20^\circ\text{C}$										
	i	$n_2$ [min <sup>-1</sup> ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]
HDO 140 2	6.6	183	55900	1113	*	*	*	*	678	●	*	*	*	552	●
HDO 140 2	7.3	165	61830	1113	*	*	*	*	686		*	*	*	560	
HDO 140 2	8.2	147	69240	1109	*	*	*	450	693		*	*	*	567	
HDO 140 2	9.0	133	72580	1055	*	*	*	455	698		*	*	*	572	
HDO 140 2	10.1	119	74230	961	*	425	*	460	703		*	*	417	577	
HDO 140 2	11.3	107	73570	856	*	450	407	485	728		*	348	442	602	
HDO 140 2	12.6	95	78000	807	*	454	411	489	732		343	352	446	606	
HDO 140 2	14.0	86	69510	652	*	470	427	505	748		359	368	462	622	
HDO 140 2	15.7	77	78080	652	*	473	430	508	751		362	371	465	625	
HDO 140 3	17.7	68	68660	517	*	275	252	309	485	611	227	209	277	393	615
HDO 140 3	19.9	60	77140	517	*	277	254	311	487	613	229	211	279	395	617
HDO 140 3	23.3	52	82290	472	*	320	297	354	530	—	272	254	322	438	660
HDO 140 3	26.0	46	75510	387	187	337	314	371	547	—	289	271	339	455	—
HDO 140 3	28.8	42	82360	382	188	338	315	372	548	—	290	272	340	456	—
HDO 140 3	32.5	37	84810	348	196	346	323	380	—	—	298	280	348	464	—
HDO 140 3	36.0	33	81910	304	196	346	323	—	—	—	298	280	348	—	—
HDO 140 3	40.1	29.9	82170	273	202	352	329	—	—	—	304	286	—	—	—
HDO 140 3	44.4	27.0	81530	245	203	353	330	—	—	—	305	287	—	—	—
HDO 140 3	50.4	23.8	82500	218	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	55.8	21.5	81150	194	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	62.2	19.3	82170	176	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	68.8	17.4	81650	158	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	77.3	15.5	78870	136	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	82.3	14.6	84810	140	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	91.1	13.2	85170	127	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	101.5	11.8	82170	110	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	112.3	10.7	87060	106	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	128.0	9.4	84810	90	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	141.6	8.5	87060	84	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	162.7	7.4	84810	71	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	180.0	6.7	87060	66	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	198.3	6.1	84810	58	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	219.5	5.5	87060	54	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	252.1	4.8	84810	46	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	279.0	4.3	87060	43	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	311.0	3.9	81700	36	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	344.1	3.5	87060	34	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	386.6	3.1	78870	28	—	—	—	—	—	—	—	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



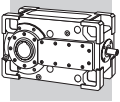
**HDO**

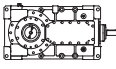
# HDO 140 n<sub>1</sub> = 1200 min<sup>-1</sup>

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCR A5</sub> [kW]	P <sub>TMCR A9</sub> [kW]	P <sub>TMCR A21</sub> [kW]	P <sub>TMCR A34</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCR W5</sub> [kW]	P <sub>TMCR W9</sub> [kW]	P <sub>TMCR W21</sub> [kW]	P <sub>TMCR W34</sub> [kW]	
HDO 140 2	6.6	183	55900	1113	*	*	*	*	*			*	*	*	466	
HDO 140 2	7.3	165	61830	1113	*	*	*	*	*			*	*	*	474	
HDO 140 2	8.2	147	69240	1109	*	*	*	*	*			*	*	*	482	
HDO 140 2	9.0	133	72580	1055	*	*	*	*	*			*	*	*	486	
HDO 140 2	10.1	119	74230	961	*	*	*	*	397	●		*	*	*	491	●
HDO 140 2	11.3	107	73570	856	*	*	*	*	422			*	*	356	516	
HDO 140 2	12.6	95	78000	807	*	*	*	*	426			*	*	360	520	
HDO 140 2	14.0	86	69510	652	*	326	263	307	442			273	282	376	536	
HDO 140 2	15.7	77	78080	652	*	329	266	310	445			276	285	379	539	
HDO 140 3	17.7	68	68660	517	*	*	*	*	259	329		*	*	211	327	549
HDO 140 3	19.9	60	77140	517	*	*	*	*	260	330		*	*	212	328	550
HDO 140 3	23.3	52	82290	472	*	213	*	205	303	373		205	*	255	371	593
HDO 140 3	26.0	46	75510	387	*	230	191	222	320	390		222	204	272	388	—
HDO 140 3	28.8	42	82360	382	*	231	192	223	321	391		223	205	273	389	—
HDO 140 3	32.5	37	84810	348	*	239	200	231	329	399		231	213	281	397	—
HDO 140 3	36.0	33	81910	304	130	240	201	232	330	—		232	214	282	398	—
HDO 140 3	40.1	29.9	82170	273	135	245	206	237	335	—		237	219	287	—	—
HDO 140 3	44.4	27.0	81530	245	136	246	207	238	336	—		238	220	288	—	—
HDO 140 3	50.4	23.8	82500	218	154	264	225	—	—	—		256	238	—	—	—
HDO 140 3	55.8	21.5	81150	194	154	264	225	—	—	—		256	238	—	—	—
HDO 140 3	62.2	19.3	82170	176	158	268	229	—	—	—		260	242	—	—	—
HDO 140 3	68.8	17.4	81650	158	—	—	—	—	—	—		—	—	—	—	—
HDO 140 3	77.3	15.5	78870	136	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	82.3	14.6	84810	140	123	207	178	—	—	—		201	189	—	—	—
HDO 140 4	91.1	13.2	85170	127	123	207	178	—	—	—		201	189	—	—	—
HDO 140 4	101.5	11.8	82170	110	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	112.3	10.7	87060	106	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	128.0	9.4	84810	90	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	141.6	8.5	87060	84	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	162.7	7.4	84810	71	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	180.0	6.7	87060	66	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	198.3	6.1	84810	58	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	219.5	5.5	87060	54	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	252.1	4.8	84810	46	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	279.0	4.3	87060	43	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	311.0	3.9	81700	36	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	344.1	3.5	87060	34	—	—	—	—	—	—		—	—	—	—	—
HDO 140 4	386.6	3.1	78870	28	—	—	—	—	—	—		—	—	—	—	—

\* BONFIGLIOLI TECHNICAL SERVICE

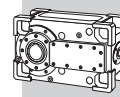
— Thermal verification not necessary



HDO 140					$n_1 = 1000 \text{ min}^{-1}$										
					$t_a = 20^\circ\text{C}$										
	i	$n_2$ [ $\text{min}^{-1}$ ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TSR}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]
HDO 140 2	6.6	152	59030	980	*	*	*	461	704	●	*	*	418	578	●
HDO 140 2	7.3	138	65330	980	*	*	*	467	710		*	*	424	584	
HDO 140 2	8.2	122	73120	976	*	391	396	474	717		*	*	431	591	
HDO 140 2	9.0	111	76670	929	*	394	399	477	720		*	*	434	594	
HDO 140 2	10.1	99	78400	845	*	398	403	481	724		*	344	438	598	
HDO 140 2	11.3	89	73880	716	*	418	423	501	744		355	364	458	618	
HDO 140 2	12.6	79	80740	697	*	422	427	505	748		359	368	462	622	
HDO 140 2	14.0	72	69720	545	265	435	440	518	761		372	381	475	635	
HDO 140 2	15.7	64	78320	545	267	437	442	520	763		374	383	477	637	
HDO 140 3	17.7	56	68660	431	*	265	276	333	509	—	251	233	301	417	639
HDO 140 3	19.9	50	77140	431	*	266	277	334	510	—	252	234	302	418	640
HDO 140 3	23.3	43	82420	394	185	301	312	369	545	—	287	269	337	453	—
HDO 140 3	26.0	38	75510	323	198	314	325	—	—	—	300	282	350	—	—
HDO 140 3	28.8	35	81990	317	199	315	326	—	—	—	301	283	351	—	—
HDO 140 3	32.5	31	84810	290	205	321	332	—	—	—	307	289	357	—	—
HDO 140 3	36.0	27.8	81580	252	206	322	333	—	—	—	308	290	—	—	—
HDO 140 3	40.1	24.9	82170	228	211	327	338	—	—	—	313	295	—	—	—
HDO 140 3	44.4	22.5	81220	204	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	50.4	19.8	82500	182	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	55.8	17.9	81320	162	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	62.2	16.1	82170	147	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	68.8	14.5	83920	136	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	77.3	12.9	78870	113	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	82.3	12.2	84810	117	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	91.1	11.0	87060	109	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	101.5	9.9	82000	92	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	112.3	8.9	87060	88	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	128.0	7.8	84810	75	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	141.6	7.1	87060	70	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	162.7	6.1	84810	59	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	180.0	5.6	87060	55	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	198.3	5.0	84810	49	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	219.5	4.6	87060	45	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	252.1	4.0	84810	38	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	279.0	3.6	87060	35	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	311.0	3.2	82170	30	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	344.1	2.9	87060	29	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	386.6	2.6	78870	23	—	—	—	—	—	—	—	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



**HDO**

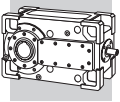
# HDO 140 n<sub>1</sub> = 1000 min<sup>-1</sup>

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C										
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TSR</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]
HDO 140 2	6.6	152	59030	980	*	*	*	*	398	●	*	*	*	492	●
HDO 140 2	7.3	138	65330	980	*	*	*	*	405		*	*	*	499	
HDO 140 2	8.2	122	73120	976	*	*	*	*	411		*	*	*	505	
HDO 140 2	9.0	111	76670	929	*	*	*	*	414		*	*	*	508	
HDO 140 2	10.1	99	78400	845	*	*	*	*	419		*	*	353	513	
HDO 140 2	11.3	89	73880	716	*	287	*	303	438		*	*	372	532	
HDO 140 2	12.6	79	80740	697	*	291	*	307	442		*	282	376	536	
HDO 140 2	14.0	72	69720	545	*	304	276	320	455		286	295	389	549	
HDO 140 2	15.7	64	78320	545	*	306	278	322	457		288	297	391	551	
HDO 140 3	17.7	56	68660	431	*	*	*	184	282	352	184	*	234	350	572
HDO 140 3	19.9	50	77140	431	*	*	*	186	284	354	186	*	236	352	574
HDO 140 3	23.3	43	82420	394	*	203	189	220	318	388	220	202	270	386	608
HDO 140 3	26.0	38	75510	323	132	217	203	234	332	—	234	216	284	400	—
HDO 140 3	28.8	35	81990	317	132	217	203	234	332	—	234	216	284	400	—
HDO 140 3	32.5	31	84810	290	139	224	210	241	339	—	241	223	291	—	—
HDO 140 3	36.0	27.8	81580	252	139	224	210	241	339	—	241	223	291	—	—
HDO 140 3	40.1	24.9	82170	228	144	229	215	246	—	—	246	228	—	—	—
HDO 140 3	44.4	22.5	81220	204	145	230	216	—	—	—	247	229	—	—	—
HDO 140 3	50.4	19.8	82500	182	159	244	230	—	—	—	261	243	—	—	—
HDO 140 3	55.8	17.9	81320	162	159	244	230	—	—	—	261	243	—	—	—
HDO 140 3	62.2	16.1	82170	147	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	68.8	14.5	83920	136	—	—	—	—	—	—	—	—	—	—	—
HDO 140 3	77.3	12.9	78870	113	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	82.3	12.2	84810	117	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	91.1	11.0	87060	109	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	101.5	9.9	82000	92	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	112.3	8.9	87060	88	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	128.0	7.8	84810	75	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	141.6	7.1	87060	70	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	162.7	6.1	84810	59	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	180.0	5.6	87060	55	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	198.3	5.0	84810	49	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	219.5	4.6	87060	45	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	252.1	4.0	84810	38	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	279.0	3.6	87060	35	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	311.0	3.2	82170	30	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	344.1	2.9	87060	29	—	—	—	—	—	—	—	—	—	—	—
HDO 140 4	386.6	2.6	78870	23	—	—	—	—	—	—	—	—	—	—	—

\* BONFIGLIOLI TECHNICAL SERVICE

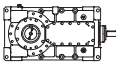
— Thermal verification not necessary





# HDO 150

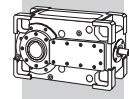
$n_1 = 1800 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 150 2	5.5	327	64090	2282	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	6.5	279	75090	2282	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	7.0	256	77410	2160	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	8.1	221	79760	1925	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	8.9	203	82270	1823	*	*	*	*	*	749	⊖	*	*	*	754	⊖
HDO 150 2	10.0	180	83380	1635	*	*	*	*	*	827		*	*	*	832	
HDO 150 2	10.9	165	86080	1550	*	*	*	*	660	835		*	*	*	840	
HDO 150 2	12.6	143	87980	1370	*	622	*	*	719	894		*	*	593	899	
HDO 150 2	13.7	131	90900	1299	*	628	*	*	725	900		*	*	599	905	
HDO 150 3	15.6	115	85410	1095	*	*	*	*	501	627	691	*	*	*	631	841
HDO 150 3	18.3	98	96850	1060	*	*	*	*	506	632	696	*	*	*	636	846
HDO 150 3	19.9	90	99110	996	*	421	*	*	508	634	698	*	*	416	638	848
HDO 150 3	21.7	83	98890	913	*	440	*	*	527	653	717	*	*	435	657	867
HDO 150 3	25.4	71	107800	849	*	444	*	355	531	657	721	*	*	439	661	871
HDO 150 3	28.2	64	99160	703	*	509	363	420	596	722	—	320	388	504	726	—
HDO 150 3	30.7	59	93720	611	248	521	375	432	608	734	—	332	400	516	738	—
HDO 150 3	36.0	50	109830	611	250	523	377	434	610	736	—	334	402	518	740	—
HDO 150 3	40.2	45	94980	473	268	541	395	452	628	—	—	352	420	536	—	—
HDO 150 3	43.8	41	103400	473	269	542	396	453	629	—	—	353	421	537	—	—
HDO 150 3	47.6	38	104500	439	276	549	403	460	—	—	—	360	428	544	—	—
HDO 150 3	55.8	32	111230	399	278	551	405	—	—	—	—	362	430	—	—	—
HDO 150 3	60.8	29.6	107330	354	278	551	405	—	—	—	—	362	—	—	—	—
HDO 150 4	66.9	26.9	89590	274	190	398	290	—	—	—	—	256	309	—	—	—
HDO 150 4	78.3	23.0	104990	274	191	399	291	—	—	—	—	257	310	—	—	—
HDO 150 4	92.9	19.4	117200	258	199	407	299	—	—	—	—	265	—	—	—	—
HDO 150 4	101.8	17.7	111430	224	204	412	304	—	—	—	—	270	—	—	—	—
HDO 150 4	110.9	16.2	108670	200	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	120.8	14.9	117200	198	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	141.5	12.7	117090	169	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	157.9	11.4	107360	139	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	171.9	10.5	114780	136	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	187.2	9.6	117200	128	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	219.3	8.2	117090	109	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	238.8	7.5	114780	98	—	—	—	—	—	—	—	—	—	—	—	—

HDO

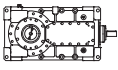
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 150

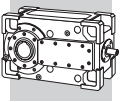
$n_1 = 1500 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCR A5</sub> [kW]	P <sub>TMCR A9</sub> [kW]	P <sub>TMCR A21</sub> [kW]	P <sub>TMCR A34</sub> [kW]	P <sub>TMCR A51</sub> [kW]	P <sub>TMCR W5</sub> [kW]	P <sub>TMCR W9</sub> [kW]	P <sub>TMCR W21</sub> [kW]	P <sub>TMCR W34</sub> [kW]	P <sub>TMCR W51</sub> [kW]
HDO 150 2	5.5	272	67710	2009	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	6.5	232	79310	2008	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	7.0	213	81770	1901	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	8.1	184	84250	1694	*	*	*	*	*	817		*	*	*	822	
HDO 150 2	8.9	169	86910	1605	*	*	*	*	650	825	⊖	*	*	*	830	⊖
HDO 150 2	10.0	150	88070	1439	*	*	*	*	710	885		*	*	584	890	
HDO 150 2	10.9	138	90930	1364	*	568	*	*	717	892		*	*	591	897	
HDO 150 2	12.6	119	92930	1206	*	613	*	519	762	937		*	*	636	942	
HDO 150 2	13.7	109	96020	1144	*	618	*	524	767	942		*	481	641	947	
HDO 150 3	15.6	96	90530	967	*	419	*	*	541	667	731	*	*	449	671	881
HDO 150 3	18.3	82	102670	936	*	423	*	*	545	671	735	*	*	453	675	885
HDO 150 3	19.9	75	105070	880	*	425	*	371	547	673	737	*	*	455	677	887
HDO 150 3	21.7	69	104840	806	*	439	328	385	561	687	751	*	353	469	691	901
HDO 150 3	25.4	59	113000	742	*	442	331	388	564	690	754	*	356	472	694	904
HDO 150 3	28.2	53	105090	621	254	492	381	438	614	740	—	338	406	522	744	—
HDO 150 3	30.7	49	99350	539	263	501	390	447	623	—	—	347	415	531	753	—
HDO 150 3	36.0	42	111930	519	265	503	392	449	625	—	—	349	417	533	—	—
HDO 150 3	40.2	37	100660	418	279	517	406	463	—	—	—	363	431	—	—	—
HDO 150 3	43.8	34	107700	411	280	518	407	464	—	—	—	364	432	—	—	—
HDO 150 3	47.6	31	110750	388	285	523	412	—	—	—	—	369	437	—	—	—
HDO 150 3	55.8	26.9	110770	331	286	524	413	—	—	—	—	370	—	—	—	—
HDO 150 3	60.8	24.7	106900	293	287	525	414	—	—	—	—	371	—	—	—	—
HDO 150 4	66.9	22.4	94970	242	202	383	302	—	—	—	—	268	—	—	—	—
HDO 150 4	78.3	19.1	111250	242	202	383	302	—	—	—	—	268	—	—	—	—
HDO 150 4	92.9	16.1	117200	215	208	389	308	—	—	—	—	274	—	—	—	—
HDO 150 4	101.8	14.7	111630	187	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	110.9	13.5	111670	171	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	120.8	12.4	117200	165	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	141.5	10.6	117090	141	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	157.9	9.5	113780	123	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	171.9	8.7	114780	114	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	187.2	8.0	117200	107	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	219.3	6.8	117090	91	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	238.8	6.3	114780	82	—	—	—	—	—	—	—	—	—	—	—	—

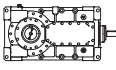
HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

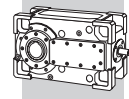


HDO

HDO 150					n <sub>1</sub> = 1500 min <sup>-1</sup>											
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCR A5</sub> [kW]	P <sub>TMCR A9</sub> [kW]	P <sub>TMCR A21</sub> [kW]	P <sub>TMCR A34</sub> [kW]	P <sub>TMCR A51</sub> [kW]	P <sub>TMCR W5</sub> [kW]	P <sub>TMCR W9</sub> [kW]	P <sub>TMCR W21</sub> [kW]	P <sub>TMCR W34</sub> [kW]	P <sub>TMCR W51</sub> [kW]
HDO 150 2	5.5	272	67710	2009	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	6.5	232	79310	2008	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	7.0	213	81770	1901	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	8.1	184	84250	1694	*	*	*	*	*	817		*	*	*	822	
HDO 150 2	8.9	169	86910	1605	*	*	*	*	650	825	⊖	*	*	*	830	⊖
HDO 150 2	10.0	150	88070	1439	*	*	*	*	710	885		*	*	584	890	
HDO 150 2	10.9	138	90930	1364	*	568	*	*	717	892		*	*	591	897	
HDO 150 2	12.6	119	92930	1206	*	613	*	519	762	937		*	*	636	942	
HDO 150 2	13.7	109	96020	1144	*	618	*	524	767	942		*	481	641	947	
HDO 150 3	15.6	96	90530	967	*	419	*	*	541	667	731	*	*	449	671	881
HDO 150 3	18.3	82	102670	936	*	423	*	*	545	671	735	*	*	453	675	885
HDO 150 3	19.9	75	105070	880	*	425	*	371	547	673	737	*	*	455	677	887
HDO 150 3	21.7	69	104840	806	*	439	328	385	561	687	751	*	353	469	691	901
HDO 150 3	25.4	59	113000	742	*	442	331	388	564	690	754	*	356	472	694	904
HDO 150 3	28.2	53	105090	621	254	492	381	438	614	740	—	338	406	522	744	—
HDO 150 3	30.7	49	99350	539	263	501	390	447	623	—	—	347	415	531	753	—
HDO 150 3	36.0	42	111930	519	265	503	392	449	625	—	—	349	417	533	—	—
HDO 150 3	40.2	37	100660	418	279	517	406	463	—	—	—	363	431	—	—	—
HDO 150 3	43.8	34	107700	411	280	518	407	464	—	—	—	364	432	—	—	—
HDO 150 3	47.6	31	110750	388	285	523	412	—	—	—	—	369	437	—	—	—
HDO 150 3	55.8	26.9	110770	331	286	524	413	—	—	—	—	370	—	—	—	—
HDO 150 3	60.8	24.7	106900	293	287	525	414	—	—	—	—	371	—	—	—	—
HDO 150 4	66.9	22.4	94970	242	202	383	302	—	—	—	—	268	—	—	—	—
HDO 150 4	78.3	19.1	111250	242	202	383	302	—	—	—	—	268	—	—	—	—
HDO 150 4	92.9	16.1	117200	215	208	389	308	—	—	—	—	274	—	—	—	—
HDO 150 4	101.8	14.7	111630	187	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	110.9	13.5	111670	171	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	120.8	12.4	117200	165	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	141.5	10.6	117090	141	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	157.9	9.5	113780	123	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	171.9	8.7	114780	114	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	187.2	8.0	117200	107	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	219.3	6.8	117090	91	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	238.8	6.3	114780	82	—	—	—	—	—	—	—	—	—	—	—	—

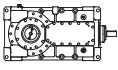
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 150

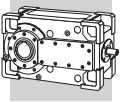
$n_1 = 1500 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 150 2	5.5	272	67710	2009	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	6.5	232	79310	2008	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	7.0	213	81770	1901	*	*	*	*	*	*		*	*	*	*	
HDO 150 2	8.1	184	84250	1694	*	*	*	*	*	*		*	*	*	711	
HDO 150 2	8.9	169	86910	1605	*	*	*	*	*	*	⊖	*	*	*	720	⊖
HDO 150 2	10.0	150	88070	1439	*	*	*	*	*	*		*	*	*	780	
HDO 150 2	10.9	138	90930	1364	*	*	*	*	*	*		*	*	*	786	
HDO 150 2	12.6	119	92930	1206	*	*	*	*	*	529		*	*	526	832	
HDO 150 2	13.7	109	96020	1144	*	*	*	*	*	533		*	*	530	836	
HDO 150 3	15.6	96	90530	967	*	*	*	*	*	*	396	*	*	*	586	796
HDO 150 3	18.3	82	102670	936	*	*	*	*	*	*	400	*	*	*	590	800
HDO 150 3	19.9	75	105070	880	*	*	*	*	*	*	402	*	*	370	592	802
HDO 150 3	21.7	69	104840	806	*	*	*	*	*	*	416	*	*	384	606	816
HDO 150 3	25.4	59	113000	742	*	*	*	*	319	389	419	*	*	387	609	819
HDO 150 3	28.2	53	105090	621	*	343	*	271	369	439	469	253	321	437	659	—
HDO 150 3	30.7	49	99350	539	*	352	249	280	378	448	478	262	330	446	668	—
HDO 150 3	36.0	42	111930	519	*	354	251	282	380	450	480	264	332	448	670	—
HDO 150 3	40.2	37	100660	418	194	368	265	296	394	464	—	278	346	462	—	—
HDO 150 3	43.8	34	107700	411	195	369	266	297	395	465	—	279	347	463	—	—
HDO 150 3	47.6	31	110750	388	200	374	271	302	400	—	—	284	352	468	—	—
HDO 150 3	55.8	26.9	110770	331	201	375	272	303	401	—	—	285	353	—	—	—
HDO 150 3	60.8	24.7	106900	293	202	376	273	304	—	—	—	286	354	—	—	—
HDO 150 4	66.9	22.4	94970	242	137	270	192	217	294	—	—	203	256	—	—	—
HDO 150 4	78.3	19.1	111250	242	138	271	193	218	295	—	—	204	257	—	—	—
HDO 150 4	92.9	16.1	117200	215	143	276	198	223	—	—	—	209	262	—	—	—
HDO 150 4	101.8	14.7	111630	187	148	281	203	—	—	—	—	214	—	—	—	—
HDO 150 4	110.9	13.5	111670	171	148	281	203	—	—	—	—	214	—	—	—	—
HDO 150 4	120.8	12.4	117200	165	152	285	207	—	—	—	—	218	—	—	—	—
HDO 150 4	141.5	10.6	117090	141	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	157.9	9.5	113780	123	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	171.9	8.7	114780	114	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	187.2	8.0	117200	107	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	219.3	6.8	117090	91	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	238.8	6.3	114780	82	—	—	—	—	—	—	—	—	—	—	—	—

HDO

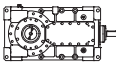
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 150

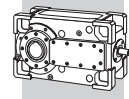
$n_1 = 1200 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 150 2	5.5	218	72390	1718	*	*	*	*	*	797	⊖	*	*	*	802	⊖
HDO 150 2	6.5	186	84810	1718	*	*	*	*	*	817		*	*	*	822	
HDO 150 2	7.0	171	87430	1626	*	*	*	*	651	826		*	*	*	831	
HDO 150 2	8.1	148	90090	1449	*	*	*	*	700	875		*	*	*	880	
HDO 150 2	8.9	135	92910	1372	*	*	*	*	707	882		*	*	581	887	
HDO 150 2	10.0	120	94180	1231	*	570	*	511	754	929		*	*	628	934	
HDO 150 2	10.9	110	97220	1167	*	574	*	515	758	933		*	472	632	938	
HDO 150 2	12.6	95	99370	1031	*	610	473	551	794	969		414	508	668	974	
HDO 150 2	13.7	87	102660	978	*	614	477	555	798	973		418	512	672	978	
HDO 150 3	15.6	77	96800	827	*	424	337	394	570	696	760	*	362	478	700	910
HDO 150 3	18.3	66	109780	801	*	427	340	397	573	699	763	*	365	481	703	913
HDO 150 3	19.9	60	109340	732	*	429	342	399	575	701	765	299	367	483	705	915
HDO 150 3	21.7	55	112090	690	*	440	353	410	586	712	—	310	378	494	716	—
HDO 150 3	25.4	47	112300	590	*	442	355	412	588	714	—	312	380	496	718	—
HDO 150 3	28.2	43	108280	512	267	481	394	451	627	—	—	351	419	535	—	—
HDO 150 3	30.7	39	106230	461	274	488	401	458	634	—	—	358	426	542	—	—
HDO 150 3	36.0	33	111310	413	276	490	403	460	—	—	—	360	428	—	—	—
HDO 150 3	40.2	29.9	107250	356	287	501	414	—	—	—	—	371	—	—	—	—
HDO 150 3	43.8	27.4	107150	327	287	501	414	—	—	—	—	371	—	—	—	—
HDO 150 3	47.6	25.2	114010	319	291	505	418	—	—	—	—	375	—	—	—	—
HDO 150 3	55.8	21.5	110260	264	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 3	60.8	19.7	106420	234	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	66.9	17.9	101540	207	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	78.3	15.3	114980	200	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	92.9	12.9	117200	172	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	101.8	11.8	112750	151	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	110.9	10.8	114780	141	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	120.8	9.9	117200	132	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	141.5	8.5	117090	113	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	157.9	7.6	116600	101	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	171.9	7.0	114780	91	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	187.2	6.4	117200	85	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	219.3	5.5	117090	73	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	238.8	5.0	114780	65	—	—	—	—	—	—	—	—	—	—	—	—

HDO

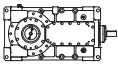
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

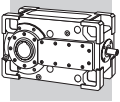


# HDO 150

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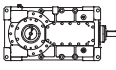
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCR45</sub> [kW]	P <sub>TMCR49</sub> [kW]	P <sub>TMCR421</sub> [kW]	P <sub>TMCR434</sub> [kW]	P <sub>TMCR451</sub> [kW]	P <sub>TMCR45</sub> [kW]	P <sub>TMCR49</sub> [kW]	P <sub>TMCR421</sub> [kW]	P <sub>TMCR434</sub> [kW]	P <sub>TMCR451</sub> [kW]
HDO 150 2	5.5	218	72390	1718	*	*	*	*	*	*		*	*	*	691	
HDO 150 2	6.5	186	84810	1718	*	*	*	*	*	*		*	*	*	711	
HDO 150 2	7.0	171	87430	1626	*	*	*	*	*	*		*	*	*	720	
HDO 150 2	8.1	148	90090	1449	*	*	*	*	*	*		*	*	*	769	
HDO 150 2	8.9	135	92910	1372	*	*	*	*	*	*	⊖	*	*	*	776	⊖
HDO 150 2	10.0	120	94180	1231	*	*	*	*	*	520		*	*	517	823	
HDO 150 2	10.9	110	97220	1167	*	*	*	*	*	525		*	*	522	828	
HDO 150 2	12.6	95	99370	1031	*	416	*	*	463	560		*	*	557	863	
HDO 150 2	13.7	87	102660	978	*	420	*	*	467	564		*	401	561	867	
HDO 150 3	15.6	77	96800	827	*	*	*	*	*	395	425	*	*	393	615	825
HDO 150 3	18.3	66	109780	801	*	*	*	*	328	398	428	*	*	396	618	828
HDO 150 3	19.9	60	109340	732	*	*	*	*	330	400	430	*	*	398	620	830
HDO 150 3	21.7	55	112090	690	*	298	*	*	341	411	441	*	293	409	631	841
HDO 150 3	25.4	47	112300	590	*	300	*	245	343	413	443	*	295	411	633	—
HDO 150 3	28.2	43	108280	512	*	339	253	284	382	452	482	266	334	450	672	—
HDO 150 3	30.7	39	106230	461	189	346	260	291	389	459	489	273	341	457	679	—
HDO 150 3	36.0	33	111310	413	191	348	262	293	391	461	—	275	343	459	—	—
HDO 150 3	40.2	29.9	107250	356	202	359	273	304	402	—	—	286	354	470	—	—
HDO 150 3	43.8	27.4	107150	327	202	359	273	304	402	—	—	286	354	—	—	—
HDO 150 3	47.6	25.2	114010	319	207	364	278	309	407	—	—	291	359	—	—	—
HDO 150 3	55.8	21.5	110260	264	207	364	278	—	—	—	—	291	—	—	—	—
HDO 150 3	60.8	19.7	106420	234	208	365	279	—	—	—	—	292	—	—	—	—
HDO 150 4	66.9	17.9	101540	207	145	264	200	225	—	—	—	211	—	—	—	—
HDO 150 4	78.3	15.3	114980	200	146	265	201	—	—	—	—	212	—	—	—	—
HDO 150 4	92.9	12.9	117200	172	150	269	205	—	—	—	—	216	—	—	—	—
HDO 150 4	101.8	11.8	112750	151	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	110.9	10.8	114780	141	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	120.8	9.9	117200	132	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	141.5	8.5	117090	113	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	157.9	7.6	116600	101	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	171.9	7.0	114780	91	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	187.2	6.4	117200	85	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	219.3	5.5	117090	73	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	238.8	5.0	114780	65	—	—	—	—	—	—	—	—	—	—	—	—

**HDO**



# HDO 150

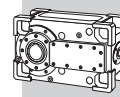
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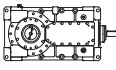
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 150 2	5.5	181	76470	1513	*	*	*	*	677	852	—	*	*	*	857	—
HDO 150 2	6.5	155	89570	1512	*	*	*	*	693	868	—	*	*	*	873	—
HDO 150 2	7.0	142	92350	1432	*	*	*	*	700	875	—	*	*	574	880	—
HDO 150 2	8.1	123	95150	1276	*	*	*	*	740	915	—	*	*	614	920	—
HDO 150 2	8.9	113	98150	1208	*	492	*	502	745	920	—	*	*	619	925	—
HDO 150 2	10.0	100	99460	1083	*	530	462	540	783	958	—	*	497	657	963	—
HDO 150 2	10.9	92	102690	1027	*	534	466	544	787	962	—	*	501	661	967	—
HDO 150 2	12.6	79	104950	908	*	563	495	573	816	991	—	436	530	690	996	—
HDO 150 2	13.7	73	108440	861	*	565	497	575	818	993	—	438	532	692	998	—
HDO 150 3	15.6	64	98480	702	*	396	357	414	590	716	—	314	382	498	720	—
HDO 150 3	18.3	55	112750	685	*	399	360	417	593	719	—	317	385	501	723	—
HDO 150 3	19.9	50	108770	607	*	400	361	418	594	720	—	318	386	502	724	—
HDO 150 3	21.7	46	117200	601	243	409	370	427	603	—	—	327	395	511	733	—
HDO 150 3	25.4	39	111770	489	245	411	372	429	605	—	—	329	397	513	—	—
HDO 150 3	28.2	35	107790	425	276	442	403	460	—	—	—	360	428	—	—	—
HDO 150 3	30.7	33	112200	406	282	448	409	—	—	—	—	366	434	—	—	—
HDO 150 3	36.0	27.8	110850	342	283	449	410	—	—	—	—	367	—	—	—	—
HDO 150 3	40.2	24.9	107250	297	292	458	419	—	—	—	—	376	—	—	—	—
HDO 150 3	43.8	22.9	106730	271	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 3	47.6	21.0	114010	266	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 3	55.8	17.9	112350	224	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 3	60.8	16.4	108450	198	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	66.9	15.0	107250	182	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	78.3	12.8	117090	170	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	92.9	10.8	117200	143	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	101.8	9.8	111630	124	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	110.9	9.0	114780	117	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	120.8	8.3	117200	110	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	141.5	7.1	117090	94	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	157.9	6.3	116600	84	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	171.9	5.8	114780	76	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	187.2	5.3	117200	71	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	219.3	4.6	117090	61	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	238.8	4.2	114780	55	—	—	—	—	—	—	—	—	—	—	—	—

HDO

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

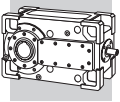


HDO 150					$n_1 = 1000 \text{ min}^{-1}$											
	i	$n_2$ [ $\text{min}^{-1}$ ]	$Mn_2$ [Nm]	$Pn_1$ [kW]	$t_a = 40^\circ\text{C}$											
					$P_T$ [kW]	$P_{TFAN}$ [kW]	$P_{TMCR A5}$ [kW]	$P_{TMCR A9}$ [kW]	$P_{TMCR A21}$ [kW]	$P_{TMCR A34}$ [kW]	$P_{TMCR A51}$ [kW]	$P_{TMCR W5}$ [kW]	$P_{TMCR W9}$ [kW]	$P_{TMCR W21}$ [kW]	$P_{TMCR W34}$ [kW]	$P_{TMCR W51}$ [kW]
HDO 150 2	5.5	181	76470	1513	*	*	*	*	*	*		*	*	*	746	
HDO 150 2	6.5	155	89570	1512	*	*	*	*	*	*		*	*	*	762	
HDO 150 2	7.0	142	92350	1432	*	*	*	*	*	*		*	*	*	769	
HDO 150 2	8.1	123	95150	1276	*	*	*	*	*	*		*	*	*	809	
HDO 150 2	8.9	113	98150	1208	*	*	*	*	*	511	⊖	*	*	508	814	⊖
HDO 150 2	10.0	100	99460	1083	*	*	*	*	452	549		*	*	546	852	
HDO 150 2	10.9	92	102690	1027	*	*	*	*	456	553		*	*	550	856	
HDO 150 2	12.6	79	104950	908	*	387	*	*	485	582		*	419	579	885	
HDO 150 2	13.7	73	108440	861	*	390	*	353	488	585		*	422	582	888	
HDO 150 3	15.6	64	98480	702	*	*	*	*	345	415	445	*	297	413	635	845
HDO 150 3	18.3	55	112750	685	*	*	*	*	348	418	448	*	300	416	638	848
HDO 150 3	19.9	50	108770	607	*	271	*	251	349	419	449	*	301	417	639	—
HDO 150 3	21.7	46	117200	601	*	280	*	260	358	428	458	242	310	426	648	—
HDO 150 3	25.4	39	111770	489	*	282	231	262	360	430	460	244	312	428	650	—
HDO 150 3	28.2	35	107790	425	191	313	262	293	391	461	—	275	343	459	—	—
HDO 150 3	30.7	33	112200	406	197	319	268	299	397	467	—	281	349	465	—	—
HDO 150 3	36.0	27.8	110850	342	198	320	269	300	398	—	—	282	350	—	—	—
HDO 150 3	40.2	24.9	107250	297	207	329	278	309	—	—	—	291	359	—	—	—
HDO 150 3	43.8	22.9	106730	271	208	330	279	—	—	—	—	292	—	—	—	—
HDO 150 3	47.6	21.0	114010	266	211	333	282	—	—	—	—	295	—	—	—	—
HDO 150 3	55.8	17.9	112350	224	212	334	283	—	—	—	—	296	—	—	—	—
HDO 150 3	60.8	16.4	108450	198	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	66.9	15.0	107250	182	151	244	206	—	—	—	—	217	—	—	—	—
HDO 150 4	78.3	12.8	117090	170	151	244	206	—	—	—	—	217	—	—	—	—
HDO 150 4	92.9	10.8	117200	143	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	101.8	9.8	111630	124	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	110.9	9.0	114780	117	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	120.8	8.3	117200	110	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	141.5	7.1	117090	94	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	157.9	6.3	116600	84	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	171.9	5.8	114780	76	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	187.2	5.3	117200	71	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	219.3	4.6	117090	61	—	—	—	—	—	—	—	—	—	—	—	—
HDO 150 4	238.8	4.2	114780	55	—	—	—	—	—	—	—	—	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

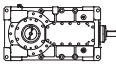
— Thermal verification not necessary





# HDO 160

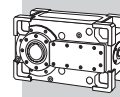
$n_1 = 1800 \text{ min}^{-1}$

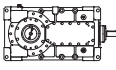
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 160 2	7.3	246	84950	2282	*	*	*	*	*	*		*	*	*	*	
HDO 160 2	7.9	227	89700	2217	*	*	*	*	*	*		*	*	*	*	
HDO 160 2	8.9	201	90600	1990	*	*	*	*	*	*		*	*	*	*	
HDO 160 2	10.4	173	97920	1843	*	*	*	*	*	*		*	*	*	*	
HDO 160 2	11.3	159	100750	1745	*	*	*	*	*	*	●	*	*	*	*	●
HDO 160 2	12.2	148	92930	1501	*	*	*	*	638	813		*	*	*	818	
HDO 160 2	14.2	127	104970	1452	*	*	*	*	653	828		*	*	*	833	
HDO 160 2	15.4	117	108140	1377	*	564	*	*	661	836		*	*	*	841	
HDO 160 3	17.7	101	97020	1096	*	*	*	*	512	638	702	*	*	*	642	852
HDO 160 3	20.7	87	113190	1095	*	*	*	*	518	644	708	*	*	*	648	858
HDO 160 3	22.5	80	123030	1095	*	*	*	*	521	647	711	*	*	*	651	861
HDO 160 3	24.6	73	112310	913	*	454	*	*	541	667	731	*	*	449	671	881
HDO 160 3	28.8	63	131120	913	*	458	*	369	545	671	735	*	*	453	675	885
HDO 160 3	31.3	58	138760	889	*	460	*	371	547	673	737	*	*	455	677	887
HDO 160 3	34.9	52	110880	636	262	535	389	446	622	748	—	346	414	530	752	—
HDO 160 3	40.7	44	129410	636	265	538	392	449	625	751	—	349	417	533	755	—
HDO 160 3	44.3	41	134530	608	267	540	394	451	627	—	—	351	419	535	757	—
HDO 160 3	49.4	36	116760	473	285	558	412	469	645	—	—	369	437	553	—	—
HDO 160 3	54.1	33	118630	439	292	565	419	476	—	—	—	376	444	—	—	—
HDO 160 3	63.2	28.5	138490	439	294	567	421	478	—	—	—	378	446	—	—	—
HDO 160 3	68.6	26.2	137580	401	295	568	422	—	—	—	—	379	447	—	—	—
HDO 160 4	75.9	23.7	101750	274	203	411	303	—	—	—	—	269	322	—	—	—
HDO 160 4	88.6	20.3	118740	274	204	412	304	—	—	—	—	270	323	—	—	—
HDO 160 4	96.3	18.7	129080	274	205	413	305	—	—	—	—	271	324	—	—	—
HDO 160 4	115.2	15.6	126060	224	217	425	317	—	—	—	—	283	—	—	—	—
HDO 160 4	125.2	14.4	137000	224	218	426	318	—	—	—	—	284	—	—	—	—
HDO 160 4	137.1	13.1	143080	213	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	160.1	11.2	146300	187	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	174.0	10.3	146330	172	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	194.1	9.3	132000	139	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	212.6	8.5	141660	136	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	248.1	7.3	146300	121	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	269.7	6.7	147070	111	—	—	—	—	—	—	—	—	—	—	—	—

HDO

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— Thermal verification not necessary

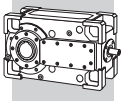


HDO 160					n <sub>1</sub> = 1800 min <sup>-1</sup>												
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C												
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]	
HDO 160 2	7.3	246	84950	2282	*	*	*	*	*	*	*	*	*	*	*	*	*
HDO 160 2	7.9	227	89700	2217	*	*	*	*	*	*	*	*	*	*	*	*	*
HDO 160 2	8.9	201	90600	1990	*	*	*	*	*	*	*	*	*	*	*	*	*
HDO 160 2	10.4	173	97920	1843	*	*	*	*	*	*	*	*	*	*	*	*	*
HDO 160 2	11.3	159	100750	1745	*	*	*	*	*	*	*	*	*	*	*	*	*
HDO 160 2	12.2	148	92930	1501	*	*	*	*	*	*	*	*	*	*	*	700	*
HDO 160 2	14.2	127	104970	1452	*	*	*	*	*	*	*	*	*	*	*	715	*
HDO 160 2	15.4	117	108140	1377	*	*	*	*	*	*	*	*	*	*	*	723	*
HDO 160 3	17.7	101	97020	1096	*	*	*	*	*	*	*	*	*	*	*	552	762
HDO 160 3	20.7	87	113190	1095	*	*	*	*	*	*	*	*	*	*	*	558	768
HDO 160 3	22.5	80	123030	1095	*	*	*	*	*	*	*	*	*	*	*	561	771
HDO 160 3	24.6	73	112310	913	*	*	*	*	*	*	391	*	*	*	*	581	791
HDO 160 3	28.8	63	131120	913	*	*	*	*	*	*	395	*	*	*	*	585	795
HDO 160 3	31.3	58	138760	889	*	*	*	*	*	367	397	*	*	365	587	797	*
HDO 160 3	34.9	52	110880	636	*	374	*	275	373	443	473	257	325	441	663	—	*
HDO 160 3	40.7	44	129410	636	*	377	*	278	376	446	476	260	328	444	666	—	*
HDO 160 3	44.3	41	134530	608	*	378	248	279	377	447	477	261	329	445	667	—	*
HDO 160 3	49.4	36	116760	473	195	396	266	297	395	465	495	279	347	463	685	—	*
HDO 160 3	54.1	33	118630	439	203	404	274	305	403	473	—	287	355	471	—	—	*
HDO 160 3	63.2	28.5	138490	439	204	405	275	306	404	474	—	288	356	472	—	—	*
HDO 160 3	68.6	26.2	137580	401	205	406	276	307	405	—	—	289	357	473	—	—	*
HDO 160 4	75.9	23.7	101750	274	135	288	190	215	292	—	—	201	254	345	—	—	*
HDO 160 4	88.6	20.3	118740	274	136	289	191	216	293	—	—	202	255	346	—	—	*
HDO 160 4	96.3	18.7	129080	274	137	290	192	217	294	—	—	203	256	347	—	—	*
HDO 160 4	115.2	15.6	126060	224	149	302	204	229	—	—	—	215	268	—	—	—	*
HDO 160 4	125.2	14.4	137000	224	149	302	204	229	—	—	—	215	268	—	—	—	*
HDO 160 4	137.1	13.1	143080	213	155	308	210	235	—	—	—	221	—	—	—	—	*
HDO 160 4	160.1	11.2	146300	187	155	308	210	—	—	—	—	221	—	—	—	—	*
HDO 160 4	174.0	10.3	146330	172	156	309	211	—	—	—	—	222	—	—	—	—	*
HDO 160 4	194.1	9.3	132000	139	—	—	—	—	—	—	—	—	—	—	—	—	*
HDO 160 4	212.6	8.5	141660	136	—	—	—	—	—	—	—	—	—	—	—	—	*
HDO 160 4	248.1	7.3	146300	121	—	—	—	—	—	—	—	—	—	—	—	—	*
HDO 160 4	269.7	6.7	147070	111	—	—	—	—	—	—	—	—	—	—	—	—	*

\*  BONFIGLIOLI  
TECHNICAL SERVICE

— Thermal verification not necessary

**HDO**



# HDO 160

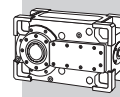
$n_1 = 1500 \text{ min}^{-1}$

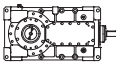
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 160 2	7.3	205	89730	2009	*	*	*	*	*	*		*	*	*	*	
HDO 160 2	7.9	189	94750	1951	*	*	*	*	*	*		*	*	*	*	
HDO 160 2	8.9	168	95690	1752	*	*	*	*	*	755		*	*	*	760	
HDO 160 2	10.4	144	103430	1622	*	*	*	*	*	773		*	*	*	778	
HDO 160 2	11.3	132	106410	1536	*	*	*	*	*	781	●	*	*	*	786	●
HDO 160 2	12.2	123	98150	1321	*	557	*	*	706	881		*	*	580	886	
HDO 160 2	14.2	106	110890	1279	*	569	*	*	718	893		*	*	592	898	
HDO 160 2	15.4	97	114230	1212	*	574	*	*	723	898		*	*	597	903	
HDO 160 3	17.7	85	102810	967	*	431	*	*	553	679	743	*	*	461	683	893
HDO 160 3	20.7	72	119990	967	*	436	*	*	558	684	748	*	*	466	688	898
HDO 160 3	22.5	67	130430	967	*	438	*	*	560	686	750	*	*	468	690	900
HDO 160 3	24.6	61	119050	806	*	454	343	400	576	702	766	*	368	484	706	916
HDO 160 3	28.8	52	138950	806	*	457	346	403	579	705	769	*	371	487	709	919
HDO 160 3	31.3	48	139750	746	*	458	347	404	580	706	770	304	372	488	710	920
HDO 160 3	34.9	43	118520	567	278	516	405	462	638	—	—	362	430	546	768	—
HDO 160 3	40.7	37	138380	567	281	519	408	465	641	—	—	365	433	549	771	—
HDO 160 3	44.3	34	138440	522	282	520	409	466	642	—	—	366	434	550	—	—
HDO 160 3	49.4	30	123770	418	296	534	423	—	—	—	—	380	448	—	—	—
HDO 160 3	54.1	27.7	125770	388	301	539	428	—	—	—	—	385	453	—	—	—
HDO 160 3	63.2	23.8	144850	383	303	541	430	—	—	—	—	387	—	—	—	—
HDO 160 3	68.6	21.9	137030	333	303	541	430	—	—	—	—	387	—	—	—	—
HDO 160 4	75.9	19.8	107850	242	215	396	315	—	—	—	—	281	—	—	—	—
HDO 160 4	88.6	16.9	125870	242	216	397	316	—	—	—	—	282	—	—	—	—
HDO 160 4	96.3	15.6	136820	242	216	397	316	—	—	—	—	282	—	—	—	—
HDO 160 4	115.2	13.0	126280	187	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	125.2	12.0	138630	189	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	137.1	10.9	142460	177	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	160.1	9.4	146300	156	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	174.0	8.6	147070	144	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	194.1	7.7	139890	123	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	212.6	7.1	141140	113	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	248.1	6.0	146300	100	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	269.7	5.6	147070	93	—	—	—	—	—	—	—	—	—	—	—	—

HDO

\* BONFIGLIOLI TECHNICAL SERVICE

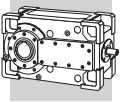
— Thermal verification not necessary



HDO 160					n <sub>1</sub> = 1500 min <sup>-1</sup>											
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 160 2	7.3	205	89730	2009	*	*	*	*	*	*		*	*	*	*	
HDO 160 2	7.9	189	94750	1951	*	*	*	*	*	*		*	*	*	*	
HDO 160 2	8.9	168	95690	1752	*	*	*	*	*	*		*	*	*	*	
HDO 160 2	10.4	144	103430	1622	*	*	*	*	*	*		*	*	*	660	
HDO 160 2	11.3	132	106410	1536	*	*	*	*	*	*	●	*	*	*	668	●
HDO 160 2	12.2	123	98150	1321	*	*	*	*	*	*		*	*	*	768	
HDO 160 2	14.2	106	110890	1279	*	*	*	*	*	*		*	*	*	780	
HDO 160 2	15.4	97	114230	1212	*	*	*	*	*	*		*	*	*	785	
HDO 160 3	17.7	85	102810	967	*	*	*	*	*	*	404	*	*	*	594	804
HDO 160 3	20.7	72	119990	967	*	*	*	*	*	*	408	*	*	*	598	808
HDO 160 3	22.5	67	130430	967	*	*	*	*	*	*	411	*	*	*	601	811
HDO 160 3	24.6	61	119050	806	*	*	*	*	326	396	426	*	*	394	616	826
HDO 160 3	28.8	52	138950	806	*	*	*	*	329	399	429	*	*	397	619	829
HDO 160 3	31.3	48	139750	746	*	305	*	*	331	401	431	*	*	399	621	831
HDO 160 3	34.9	43	118520	567	*	363	260	291	389	459	489	273	341	457	679	—
HDO 160 3	40.7	37	138380	567	*	365	262	293	391	461	491	275	343	459	681	—
HDO 160 3	44.3	34	138440	522	*	366	263	294	392	462	492	276	344	460	682	—
HDO 160 3	49.4	30	123770	418	206	380	277	308	406	476	—	290	358	474	—	—
HDO 160 3	54.1	27.7	125770	388	212	386	283	314	412	—	—	296	364	480	—	—
HDO 160 3	63.2	23.8	144850	383	213	387	284	315	413	—	—	297	365	481	—	—
HDO 160 3	68.6	21.9	137030	333	214	388	285	316	414	—	—	298	366	—	—	—
HDO 160 4	75.9	19.8	107850	242	147	280	202	227	304	—	—	213	266	—	—	—
HDO 160 4	88.6	16.9	125870	242	147	280	202	227	304	—	—	213	266	—	—	—
HDO 160 4	96.3	15.6	136820	242	148	281	203	228	305	—	—	214	267	—	—	—
HDO 160 4	115.2	13.0	126280	187	157	290	212	—	—	—	—	223	—	—	—	—
HDO 160 4	125.2	12.0	138630	189	158	291	213	—	—	—	—	224	—	—	—	—
HDO 160 4	137.1	10.9	142460	177	162	295	217	—	—	—	—	228	—	—	—	—
HDO 160 4	160.1	9.4	146300	156	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	174.0	8.6	147070	144	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	194.1	7.7	139890	123	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	212.6	7.1	141140	113	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	248.1	6.0	146300	100	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	269.7	5.6	147070	93	—	—	—	—	—	—	—	—	—	—	—	—

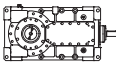
\*  BONFIGLIOLI  
TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 160

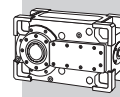
$n_1 = 1200 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 160 2	7.3	164	95950	1718	*	*	*	*	*	822	●	*	*	*	827	●
HDO 160 2	7.9	151	101300	1669	*	*	*	*	*	833		*	*	*	838	
HDO 160 2	8.9	134	102330	1499	*	*	*	*	657	832		*	*	*	837	
HDO 160 2	10.4	115	110590	1388	*	*	*	*	672	847		*	*	*	852	
HDO 160 2	11.3	106	113790	1314	*	*	*	*	678	853		*	*	552	858	
HDO 160 2	12.2	99	104960	1130	*	572	*	513	756	931		*	470	630	936	
HDO 160 2	14.2	85	118570	1094	*	581	444	522	765	940		*	479	639	945	
HDO 160 2	15.4	78	122130	1036	*	586	449	527	770	945		*	484	644	950	
HDO 160 3	17.7	68	109930	828	*	438	351	408	584	710	774	*	376	492	714	924
HDO 160 3	20.7	58	128300	827	*	442	355	412	588	714	778	*	380	496	718	928
HDO 160 3	22.5	53	139460	827	*	443	356	413	589	715	779	*	381	497	719	929
HDO 160 3	24.6	49	127290	690	*	455	368	425	601	727	—	325	393	509	731	—
HDO 160 3	28.8	42	146300	679	*	458	371	428	604	730	—	328	396	512	734	—
HDO 160 3	31.3	38	138890	593	245	459	372	429	605	—	—	329	397	513	735	—
HDO 160 3	34.9	34	127430	487	290	504	417	474	650	—	—	374	442	558	—	—
HDO 160 3	40.7	29.5	145570	477	292	506	419	476	652	—	—	376	444	560	—	—
HDO 160 3	44.3	27.1	137690	415	293	507	420	—	—	—	—	377	445	—	—	—
HDO 160 3	49.4	24.3	131890	356	304	518	431	—	—	—	—	388	—	—	—	—
HDO 160 3	54.1	22.2	129470	319	308	522	435	—	—	—	—	392	—	—	—	—
HDO 160 3	63.2	19.0	144180	305	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 3	68.6	17.5	136410	265	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	75.9	15.8	115310	207	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	88.6	13.5	134500	207	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	96.3	12.5	142280	201	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	115.2	10.4	126280	149	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	125.2	9.6	137260	149	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	137.1	8.8	141760	141	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	160.1	7.5	146300	125	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	174.0	6.9	147070	115	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	194.1	6.2	143330	101	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	212.6	5.6	140570	90	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	248.1	4.8	146300	80	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	269.7	4.4	147070	74	—	—	—	—	—	—	—	—	—	—	—	—

HDO

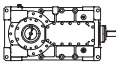
\* 

— Thermal verification not necessary



# HDO 160

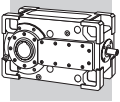
$n_1 = 1200 \text{ min}^{-1}$

	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 160 2	7.3	164	95950	1718	*	*	*	*	*	*		*	*	*	709	
HDO 160 2	7.9	151	101300	1669	*	*	*	*	*	*		*	*	*	720	
HDO 160 2	8.9	134	102330	1499	*	*	*	*	*	*		*	*	*	719	
HDO 160 2	10.4	115	110590	1388	*	*	*	*	*	*		*	*	*	734	
HDO 160 2	11.3	106	113790	1314	*	*	*	*	*	*	●	*	*	*	740	●
HDO 160 2	12.2	99	104960	1130	*	*	*	*	*	515		*	*	512	818	
HDO 160 2	14.2	85	118570	1094	*	*	*	*	*	524		*	*	521	827	
HDO 160 2	15.4	78	122130	1036	*	*	*	*	432	529		*	*	526	832	
HDO 160 3	17.7	68	109930	828	*	*	*	*	334	404	434	*	*	402	624	834
HDO 160 3	20.7	58	128300	827	*	*	*	*	338	408	438	*	*	406	628	838
HDO 160 3	22.5	53	139460	827	*	*	*	*	340	410	440	*	*	408	630	840
HDO 160 3	24.6	49	127290	690	*	308	*	*	351	421	451	*	303	419	641	851
HDO 160 3	28.8	42	146300	679	*	311	*	*	354	424	454	*	306	422	644	854
HDO 160 3	31.3	38	138890	593	*	312	*	257	355	425	455	239	307	423	645	—
HDO 160 3	34.9	34	127430	487	201	358	272	303	401	471	501	285	353	469	691	—
HDO 160 3	40.7	29.5	145570	477	202	359	273	304	402	472	502	286	354	470	692	—
HDO 160 3	44.3	27.1	137690	415	203	360	274	305	403	473	—	287	355	471	—	—
HDO 160 3	49.4	24.3	131890	356	214	371	285	316	414	—	—	298	366	—	—	—
HDO 160 3	54.1	22.2	129470	319	218	375	289	320	—	—	—	302	370	—	—	—
HDO 160 3	63.2	19.0	144180	305	220	377	291	322	—	—	—	304	372	—	—	—
HDO 160 3	68.6	17.5	136410	265	220	377	291	—	—	—	—	304	—	—	—	—
HDO 160 4	75.9	15.8	115310	207	155	274	210	—	—	—	—	221	—	—	—	—
HDO 160 4	88.6	13.5	134500	207	156	275	211	—	—	—	—	222	—	—	—	—
HDO 160 4	96.3	12.5	142280	201	156	275	211	—	—	—	—	222	—	—	—	—
HDO 160 4	115.2	10.4	126280	149	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	125.2	9.6	137260	149	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	137.1	8.8	141760	141	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	160.1	7.5	146300	125	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	174.0	6.9	147070	115	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	194.1	6.2	143330	101	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	212.6	5.6	140570	90	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	248.1	4.8	146300	80	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	269.7	4.4	147070	74	—	—	—	—	—	—	—	—	—	—	—	—

**HDO**

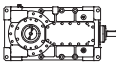
\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary



# HDO 160

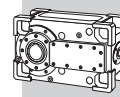
$n_1 = 1000 \text{ min}^{-1}$

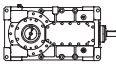
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 160 2	7.3	137	101350	1513	*	*	*	*	702	877	●	*	*	*	882	●
HDO 160 2	7.9	126	107010	1469	*	*	*	*	711	886		*	*	*	891	
HDO 160 2	8.9	112	108070	1319	*	*	*	*	710	885		*	*	584	890	
HDO 160 2	10.4	96	116810	1221	*	*	*	*	722	897		*	*	596	902	
HDO 160 2	11.3	88	120180	1156	*	474	*	484	727	902		*	*	601	907	
HDO 160 2	12.2	82	110850	995	*	537	469	547	790	965		410	504	664	970	
HDO 160 2	14.2	71	125230	963	*	545	477	555	798	973		418	512	672	978	
HDO 160 2	15.4	65	129010	912	*	548	480	558	801	976		421	515	675	981	
HDO 160 3	17.7	56	111830	702	*	411	372	429	605	731	—	329	397	513	735	—
HDO 160 3	20.7	48	130520	701	*	414	375	432	608	734	—	332	400	516	738	—
HDO 160 3	22.5	44	139450	690	*	415	376	433	609	735	—	333	401	517	739	—
HDO 160 3	24.6	41	134450	607	259	425	386	443	619	—	—	343	411	527	749	—
HDO 160 3	28.8	35	146160	565	261	427	388	445	621	—	—	345	413	529	751	—
HDO 160 3	31.3	32	138240	492	262	428	389	446	622	—	—	346	414	530	—	—
HDO 160 3	34.9	28.6	132770	423	298	464	425	—	—	—	—	382	450	—	—	—
HDO 160 3	40.7	24.5	144960	396	300	466	427	—	—	—	—	384	452	—	—	—
HDO 160 3	44.3	22.6	137130	344	300	466	427	—	—	—	—	384	—	—	—	—
HDO 160 3	49.4	20.2	131890	297	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 3	54.1	18.5	129470	266	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 3	63.2	15.8	146300	258	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 3	68.6	14.6	139010	225	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	75.9	13.2	121800	182	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	88.6	11.3	134500	172	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	96.3	10.4	146200	172	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	115.2	8.7	126280	124	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	125.2	8.0	138630	126	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	137.1	7.3	141230	117	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	160.1	6.2	146300	104	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	174.0	5.7	147070	96	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	194.1	5.2	143330	84	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	212.6	4.7	140490	75	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	248.1	4.0	146300	67	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	269.7	3.7	147070	62	—	—	—	—	—	—	—	—	—	—	—	—

HDO

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— Thermal verification not necessary



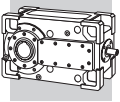
HDO 160					n <sub>1</sub> = 1000 min <sup>-1</sup>											
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 40°C											
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>TMCRA5</sub> [kW]	P <sub>TMCRA9</sub> [kW]	P <sub>TMCRA21</sub> [kW]	P <sub>TMCRA34</sub> [kW]	P <sub>TMCRA51</sub> [kW]	P <sub>TMCRW5</sub> [kW]	P <sub>TMCRW9</sub> [kW]	P <sub>TMCRW21</sub> [kW]	P <sub>TMCRW34</sub> [kW]	P <sub>TMCRW51</sub> [kW]
HDO 160 2	7.3	137	101350	1513	*	*	*	*	*	*		*	*	*	764	
HDO 160 2	7.9	126	107010	1469	*	*	*	*	*	*		*	*	*	773	
HDO 160 2	8.9	112	108070	1319	*	*	*	*	*	*		*	*	*	772	
HDO 160 2	10.4	96	116810	1221	*	*	*	*	*	*		*	*	*	784	
HDO 160 2	11.3	88	120180	1156	*	*	*	*	*	486	●	*	*	483	789	●
HDO 160 2	12.2	82	110850	995	*	*	*	*	452	549		*	*	546	852	
HDO 160 2	14.2	71	125230	963	*	*	*	*	460	557		*	394	554	860	
HDO 160 2	15.4	65	129010	912	*	365	*	*	463	560		*	397	557	863	
HDO 160 3	17.7	56	111830	702	*	*	*	*	355	425	455	*	307	423	645	855
HDO 160 3	20.7	48	130520	701	*	*	*	*	358	428	458	*	310	426	648	858
HDO 160 3	22.5	44	139450	690	*	281	*	*	359	429	459	*	311	427	649	859
HDO 160 3	24.6	41	134450	607	*	291	*	271	369	439	469	253	321	437	659	—
HDO 160 3	28.8	35	146160	565	*	293	242	273	371	441	471	255	323	439	661	—
HDO 160 3	31.3	32	138240	492	*	294	243	274	372	442	472	256	324	440	662	—
HDO 160 3	34.9	28.6	132770	423	209	331	280	311	409	479	—	293	361	477	—	—
HDO 160 3	40.7	24.5	144960	396	210	332	281	312	410	—	—	294	362	478	—	—
HDO 160 3	44.3	22.6	137130	344	211	333	282	313	411	—	—	295	363	—	—	—
HDO 160 3	49.4	20.2	131890	297	220	342	291	322	—	—	—	304	—	—	—	—
HDO 160 3	54.1	18.5	129470	266	223	345	294	—	—	—	—	307	—	—	—	—
HDO 160 3	63.2	15.8	146300	258	224	346	295	—	—	—	—	308	—	—	—	—
HDO 160 3	68.6	14.6	139010	225	224	346	295	—	—	—	—	308	—	—	—	—
HDO 160 4	75.9	13.2	121800	182	161	254	216	—	—	—	—	227	—	—	—	—
HDO 160 4	88.6	11.3	134500	172	161	254	216	—	—	—	—	227	—	—	—	—
HDO 160 4	96.3	10.4	146200	172	161	254	216	—	—	—	—	227	—	—	—	—
HDO 160 4	115.2	8.7	126280	124	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	125.2	8.0	138630	126	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	137.1	7.3	141230	117	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	160.1	6.2	146300	104	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	174.0	5.7	147070	96	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	194.1	5.2	143330	84	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	212.6	4.7	140490	75	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	248.1	4.0	146300	67	—	—	—	—	—	—	—	—	—	—	—	—
HDO 160 4	269.7	3.7	147070	62	—	—	—	—	—	—	—	—	—	—	—	—

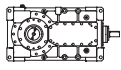
\*  BONFIGLIOLI  
TECHNICAL SERVICE

— Thermal verification not necessary

**HDO**

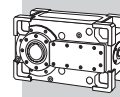


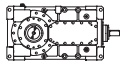


HDO 170					n <sub>1</sub> = 1500 min <sup>-1</sup>			
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C		t <sub>a</sub> = 40°C	
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]
HDO 170 3	15.9	94	130010	1364	*	*	*	*
HDO 170 3	18.5	81	150910	1364	*	*	*	*
HDO 170 3	20.0	75	163440	1364	*	*	*	*
HDO 170 3	21.7	69	146900	1132	*	469	*	*
HDO 170 3	26.2	57	165080	1052	*	554	*	*
HDO 170 3	28.4	53	178800	1052	*	556	*	*
HDO 170 3	30.7	49	158700	862	*	570	*	396
HDO 170 3	35.7	42	184210	862	*	572	*	398
HDO 170 3	38.6	37	183140	753	322	596	*	422
HDO 170 3	44.0	34	181730	690	323	597	*	423
HDO 170 3	47.6	31	176740	619	331	605	*	431
HDO 170 3	55.3	27.1	189370	572	333	607	232	433
HDO 170 3	59.9	25.1	180390	503	334	608	232	433
HDO 170 4	72.9	20.6	172210	402	251	450	171	317
HDO 170 4	84.6	17.7	190190	383	264	463	184	330
HDO 170 4	91.6	16.4	182320	339	265	464	184	330
HDO 170 4	99.3	15.1	188900	324	258	457	178	324
HDO 170 4	115.2	13.0	190190	281	268	467	187	333
HDO 170 4	124.8	12.0	182320	249	—	—	187	333
HDO 170 4	139.8	10.7	183700	224	—	—	195	341
HDO 170 4	162.3	9.2	190190	200	—	—	—	—
HDO 170 4	175.8	8.5	182320	177	—	—	—	—
HDO 170 4	190.5	7.9	188900	169	—	—	—	—
HDO 170 4	221.1	6.8	190190	146	—	—	—	—
HDO 170 4	239.5	6.3	182320	130	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

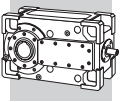


HDO 180					n <sub>1</sub> = 1500 min <sup>-1</sup>			
	i	n <sub>2</sub> [min <sup>-1</sup> ]	Mn <sub>2</sub> [Nm]	Pn <sub>1</sub> [kW]	t <sub>a</sub> = 20°C		t <sub>a</sub> = 40°C	
					P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]	P <sub>T</sub> [kW]	P <sub>TFAN</sub> [kW]
HDO 180 3	17.7	85	144460	1363	*	*	*	*
HDO 180 3	20.5	73	167160	1363	*	*	*	*
HDO 180 3	22.1	68	180780	1363	*	*	*	*
HDO 180 3	24.1	62	163220	1130	*	498	*	*
HDO 180 3	27.9	54	188870	1130	*	502	*	*
HDO 180 3	31.4	48	197760	1052	*	585	*	*
HDO 180 3	34.1	44	176340	862	*	598	*	417
HDO 180 3	39.5	38	202450	855	*	601	*	419
HDO 180 3	42.7	35	198560	776	324	602	*	420
HDO 180 3	48.6	31	197890	679	348	626	*	444
HDO 180 3	52.9	28.3	196380	619	355	633	248	452
HDO 180 3	61.2	24.5	202450	552	357	635	249	453
HDO 180 3	66.2	22.7	196430	495	358	636	250	454
HDO 180 4	81.0	18.5	191340	402	270	472	184	332
HDO 180 4	93.7	16.0	202450	368	283	485	197	345
HDO 180 4	101.3	14.8	199380	335	283	485	197	345
HDO 180 4	110.3	13.6	209900	324	277	479	191	339
HDO 180 4	127.6	11.8	202450	270	—	—	201	349
HDO 180 4	138.0	10.9	207020	255	—	—	201	349
HDO 180 4	155.4	9.7	204100	224	—	—	208	356
HDO 180 4	179.8	8.3	202450	192	—	—	—	—
HDO 180 4	194.5	7.7	205480	180	—	—	—	—
HDO 180 4	211.6	7.1	209900	169	—	—	—	—
HDO 180 4	244.9	6.1	202450	141	—	—	—	—

\*  BONFIGLIOLI TECHNICAL SERVICE

— Thermal verification not necessary

HDO

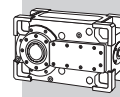


## 29 MASS MOMENT OF INERTIA




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

	$i_N$	$J \cdot 10^{-4} \text{ [kg m}^2\text{]}$													
		HDO 71	HDO 81	HDO 91	HDO 95	HDO 100	HDO 110	HDO 120	HDO 125	HDO 130	HDO 140	HDO 150	HDO 160	HDO 170	HDO 180
<b>2x</b> 	5.6	—	—	—	—	1862	—	—	—	8268	—	23425	—	—	—
	6.3	—	—	—	—	1780	1893	2869	—	7943	9161	21737	—	—	—
	7.1	—	—	—	—	1725	1803	2757	3116	10164	8677	20949	23848	—	—
	8.0	—	—	—	—	1578	1692	2592	2991	6959	8104	16297	22841	—	—
	9.0	—	—	—	—	1543	1566	2774	2922	8408	7438	15670	19669	—	—
	10.0	—	—	—	—	1204	1494	2666	2920	5207	7065	12076	18609	—	—
	11.2	—	—	—	—	1182	1168	2056	2206	6135	5514	12006	18114	—	—
	12.5	—	—	—	—	967	1121	1987	2154	4070	5275	9091	12785	—	—
	14.0	—	—	—	—	952	996	1572	1670	4673	4269	8884	12212	—	—
	16.0	—	—	—	—	—	966	1528	1636	—	4114	—	11945	—	—
18.0	—	—	—	—	—	—	—	1617	—	—	—	—	—	—	
<b>3x</b> 	14.0	—	—	—	—	940	—	—	—	—	—	—	—	—	—
	16.0	—	—	—	—	926	—	—	—	3156	—	9690	—	—	—
	18.0	—	—	621	—	836	849	1233	—	2675	3280	9480	10012	—	—
	20.0	—	—	615	626	540	839	1205	1273	2643	3184	9382	9743	—	—
	22.4	119	—	612	622	487	550	1013	1052	1913	2716	8401	9618	—	—
	25.0	118	218	575	617	481	494	917	1038	1893	1970	8292	8568	—	—
	28.0	112	216	569	577	443	488	592	934	1728	1940	5067	8428	—	—
	31.5	111	206	548	572	440	448	534	920	1714	1764	4578	8363	—	—
	35.5	107	204	355	549	415	444	530	808	1612	1744	4524	4661	—	—
	40.0	103	197	354	546	413	418	464	540	1137	1636	3114	4592	—	—
	45.0	103	156	343	356	240	415	461	537	1069	1623	3093	4559	—	—
	50.0	87	196	341	343	239	242	278	467	1063	1084	2890	3142	—	—
	56.0	87	151	334	342	228	241	276	465	1021	1076	2867	2924	—	—
	63.0	85	148	334	335	227	230	249	280	1017	1031	2857	2895	—	—
71.0	85	147	333	334	227	229	248	251	1042	1025	—	2882	—	—	
80.0	—	—	—	—	—	227	246	250	—	1019	—	—	—	—	—
90.0	—	—	—	—	—	—	—	249	—	—	—	—	—	—	—
<b>4x</b> 	71.0	—	—	—	—	168	—	—	—	553	—	1023	—	—	—
	80.0	26	76	120	132	167	169	—	—	551	558	1011	1040	—	—
	90.0	26	75	120	120	163	168	182	—	535	555	952	1025	—	—
	100.0	26	75	130	130	163	143	171	183	533	538	589	1019	—	—
	112.0	26	70	118	130	139	163	171	172	447	536	586	597	—	—
	125.0	26	69	118	118	139	140	145	172	446	449	554	593	—	—
	140.0	—	69	113	118	132	70	145	146	410	448	550	559	—	—
	160.0	22	69	112	117	68	60	141	146	410	412	301	555	—	—
	180.0	22	67	112	112	59	68	71	136	406	411	300	553	—	—
	200.0	22	48	112	112	59	59	61	72	405	243	287	303	—	—
	224.0	16	66	112	112	56	59	61	62	227	242	285	289	—	—
	250.0	22	47	77	77	56	56	58	62	226	227	284	287	—	—
	280.0	—	47	77	77	56	58	60	58	225	227	—	286	—	—
	315.0	15	47	76	76	56	56	57	58	225	225	—	—	—	—
	355.0	—	46	76	76	56	56	57	57	226	225	—	—	—	—
	400.0	15	46	76	76	—	56	56	57	—	225	—	—	—	—
450.0	15	46	76	76	—	—	—	57	—	—	—	—	—	—	
500.0	15	46	76	76	—	—	—	—	—	—	—	—	—	—	—

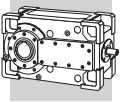
BONFIGLIOLI TECHNICAL SERVICE



30 EXACT RATIOS

	i <sub>N</sub>	i													
		HDO 71	HDO 81	HDO 91	HDO 95	HDO 100	HDO 110	HDO 120	HDO 125	HDO 130	HDO 140	HDO 150	HDO 160	HDO 170	HDO 180
<b>2x</b> 	5.6	—	—	—	—	5.815	—	—	—	5.708	—	5.512	—	—	—
	6.3	—	—	—	—	6.462	6.354	6.569	—	6.231	6.569	6.459	—	—	—
	7.1	—	—	—	—	7.038	7.038	7.154	7.412	7.090	7.269	7.034	7.306	—	—
	8.0	—	—	—	—	8.000	8.077	8.077	7.976	7.714	8.167	8.133	7.941	—	—
	9.0	—	—	—	—	8.714	8.714	8.857	8.831	8.778	9.000	8.857	8.933	—	—
	10.0	—	—	—	—	10.000	10.000	10.000	9.875	9.643	10.111	10.010	10.427	—	—
	11.2	—	—	—	—	10.893	10.893	11.071	11.471	10.972	11.250	10.901	11.333	—	—
	12.5	—	—	—	—	12.400	12.500	12.500	12.344	11.957	12.639	12.607	12.152	—	—
	14.0	—	—	—	—	13.507	13.507	13.729	14.224	13.606	13.950	13.729	14.183	—	—
	16.0	—	—	—	—	—	15.500	15.500	15.306	—	15.672	—	15.417	—	—
18.0	—	—	—	—	—	—	—	16.947	—	—	—	—	—	—	
<b>3x</b> 	14.0	—	—	—	—	14.009	—	—	—	—	—	—	—	—	—
	16.0	—	—	—	—	15.566	—	—	—	15.188	—	15.618	—	15.902	—
	18.0	—	—	18.587	—	17.308	18.910	17.260	—	18.265	17.719	18.300	17.735	18.457	17.691
	20.0	—	—	20.696	21.215	20.235	20.948	19.487	19.244	19.938	19.906	19.929	20.700	19.991	20.471
	22.4	21.773	—	22.522	22.541	22.500	22.042	21.802	22.588	22.613	23.262	21.698	22.500	21.659	22.139
	25.0	25.278	25.863	24.054	24.652	25.000	24.583	24.579	24.308	24.686	26.027	25.425	24.641	26.181	24.096
	28.0	27.083	30.027	29.146	27.454	28.320	27.232	28.343	27.731	28.267	28.800	28.232	28.760	28.356	27.882
	31.5	31.444	31.790	30.565	31.903	31.467	30.942	31.952	33.040	30.857	32.533	30.739	31.261	30.722	31.363
	35.5	38.143	36.908	36.914	34.887	36.000	34.276	34.796	35.798	34.862	36.000	36.019	34.908	35.660	34.136
	40.0	41.917	39.906	40.171	40.539	40.000	39.333	41.248	38.795	38.263	40.124	40.184	40.743	38.622	39.500
	45.0	48.666	44.861	42.904	43.971	43.896	43.571	44.918	42.952	43.813	44.400	43.760	44.286	43.951	42.719
	50.0	54.207	48.141	51.987	48.970	48.773	47.960	49.526	50.080	47.829	50.427	47.646	49.406	47.619	48.613
	56.0	56.324	55.142	54.518	56.904	55.800	53.128	53.934	55.448	54.036	55.800	55.830	54.107	55.273	52.910
	63.0	69.161	59.620	60.703	62.226	62.000	60.967	63.934	60.132	58.989	62.193	60.798	63.151	59.864	61.225
71.0	71.862	71.923	66.060	72.309	67.536	67.536	69.623	72.134	67.121	68.820	—	68.643	—	66.214	
80.0	—	—	—	—	—	77.500	78.607	77.625	—	77.316	—	—	—	—	
90.0	—	—	—	—	—	—	—	85.944	—	—	—	—	—	—	
<b>4x</b> 	71.0	—	—	—	—	70.800	—	—	—	71.498	—	66.861	—	72.872	—
	80.0	77.021	78.252	81.978	81.642	78.667	77.356	—	—	78.050	82.290	78.345	75.927	84.583	80.969
	90.0	89.421	94.536	91.278	93.568	90.000	85.690	86.990	—	88.181	91.059	92.894	88.620	91.610	93.692
	100.0	98.268	98.229	95.251	103.743	100.000	96.694	103.119	96.987	96.262	101.491	101.848	96.326	99.256	101.326
	112.0	114.089	105.597	118.125	113.461	111.392	108.929	112.296	116.345	111.182	112.306	110.912	115.205	115.208	110.285
	125.0	118.545	127.386	128.548	128.656	123.769	121.706	125.679	125.201	121.371	127.964	120.762	125.223	124.779	127.615
	140.0	---	132.555	137.096	140.708	139.830	137.105	136.864	141.798	141.333	141.600	141.503	137.137	139.844	138.014
	160.0	154.425	159.908	159.341	163.484	160.000	154.711	162.241	152.592	154.286	162.667	157.865	160.061	162.319	155.383
	180.0	179.287	181.444	177.418	181.869	178.227	174.286	179.673	177.999	174.311	180.000	171.914	173.980	175.804	179.800
	200.0	197.025	196.458	202.476	211.337	198.030	194.730	201.087	200.321	190.286	198.345	187.182	194.096	190.478	194.450
	225.0	228.177	227.766	225.447	231.102	223.728	215.711	218.982	226.877	219.067	219.480	219.330	212.562	221.090	211.642
	250.0	237.681	254.773	256.348	256.564	248.587	244.444	252.424	244.148	239.143	252.133	238.849	248.095	239.458	244.900
	280.0	—	265.110	268.832	280.597	284.400	274.210	282.686	284.798	270.182	279.000	—	269.668	—	—
	315.0	308.850	312.566	317.756	325.662	316.000	310.733	325.856	315.172	294.943	310.964	—	—	—	—
	355.0	—	362.888	353.805	362.681	344.214	344.214	354.855	367.649	335.604	344.100	—	—	—	—
	400.0	394.050	392.363	403.774	421.444	—	395.000	400.643	395.635	—	386.581	—	—	—	—
	450.0	457.491	455.532	449.583	460.861	—	—	—	438.036	—	—	—	—	—	—
500.0	475.362	473.327	489.252	489.665	—	—	—	—	—	—	—	—	—	—	

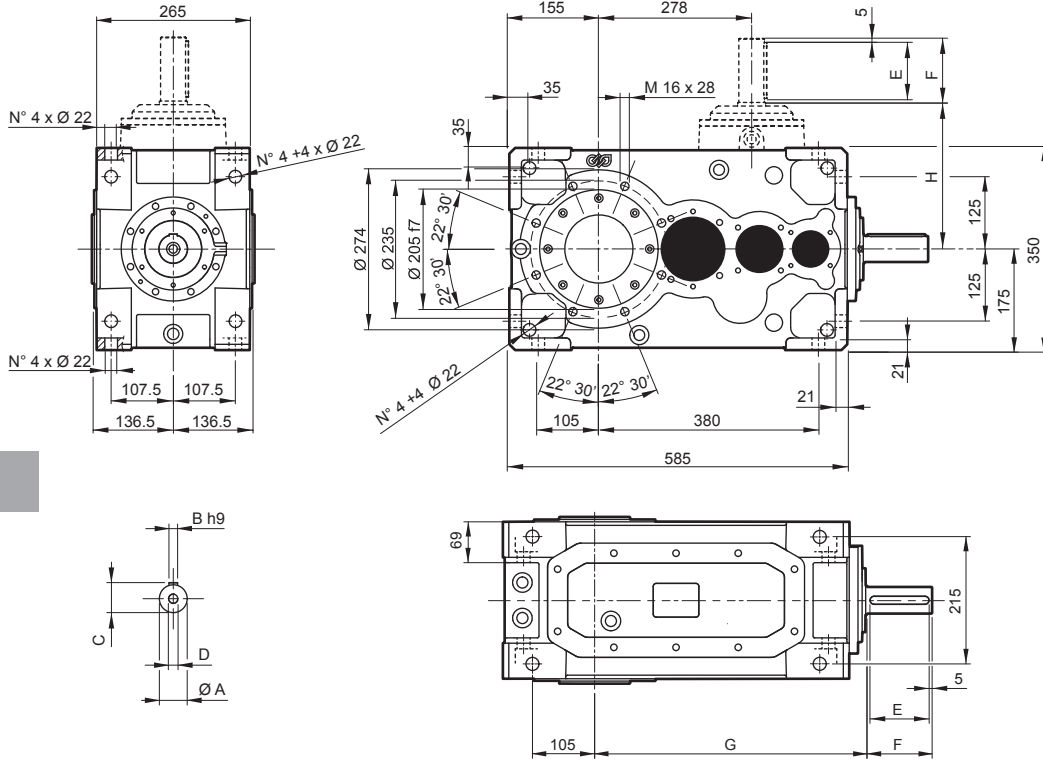
HDO



31 DIMENSIONS AND WEIGHT

**HDO 71**

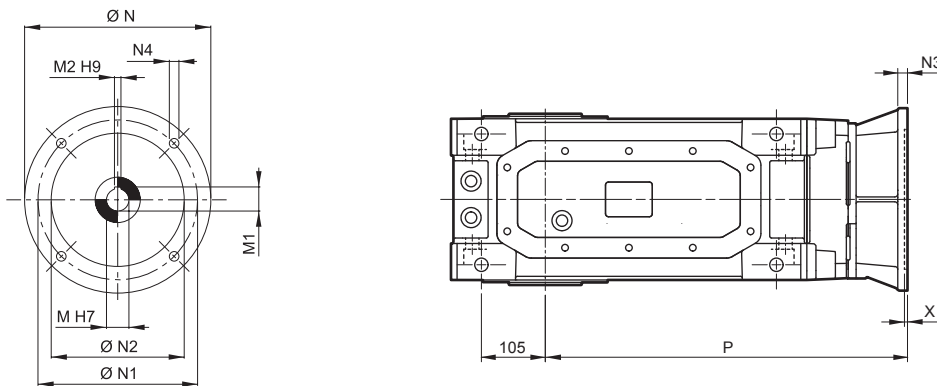
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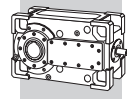
VP

VP	i =	A	B	C	D	E	F	G	H	Kg LP
HDO 71 3	21.8 ... 71.9	32 k6	10	35	M12x28	70	80	507	229	195
HDO 71 4	77 ... 475.4	24 j6	8	27	M8x19	50	60	543	—	215

AD

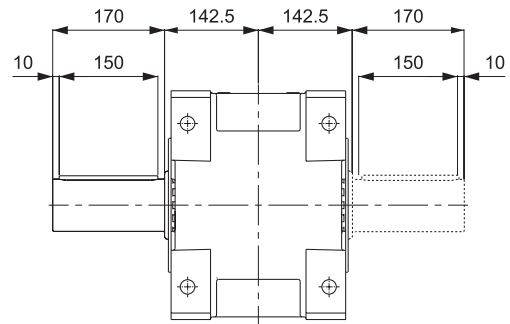
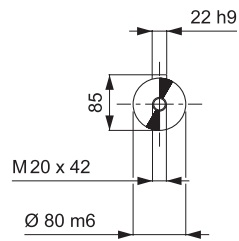


AD	M	M1	M2	N	N1	N2	N3	N4	X	P
HDO 71 3_132	38	41.3	10	300	265	230	16	14	5	595.5
HDO 71 3_160	42	45.3	12	350	300	250	23	18	6	626.5
HDO 71 3_180	48	51.8	14	350	300	250	23	18	6	626.5
HDO 71 3_200	55	59.3	16	400	350	300	—	M16x23	7	651.5

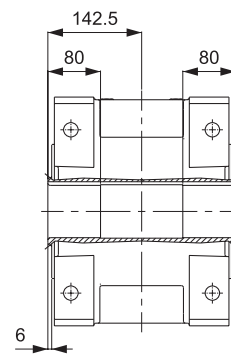
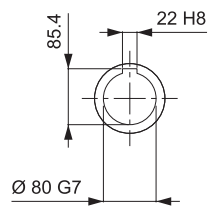


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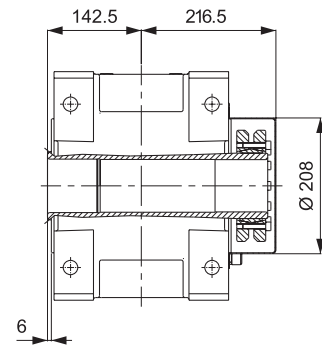
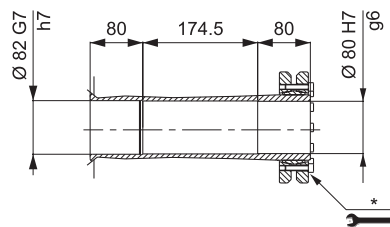
LP



H

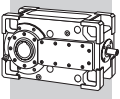


S



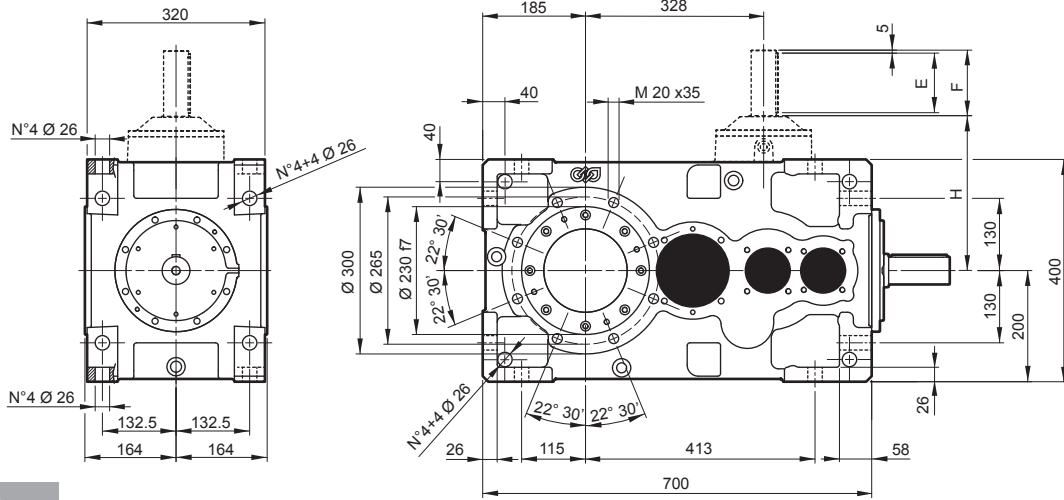
HDO

\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".

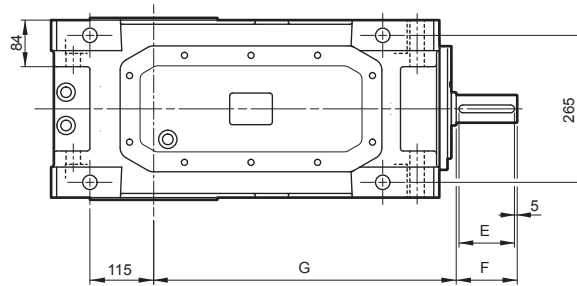
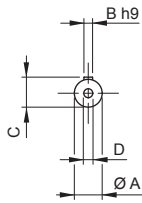


# HDO 81

HDO

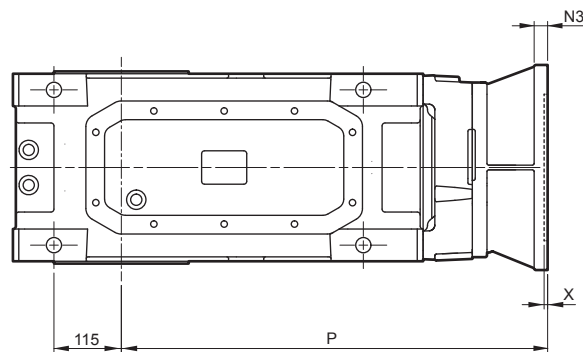
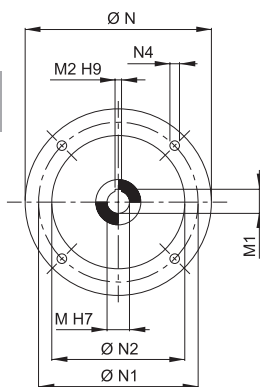


VP

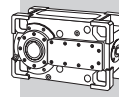


VP	i =	A	B	C	D	E	F	G	H	LP
HDO 81 3	25.9 ... 71.9	42 k6	12	45	M16x36	100	110	600	272	330
HDO 81 4	78.3 ... 473.3	28 j6	8	31	M10x22	50	60	645	—	340

AD

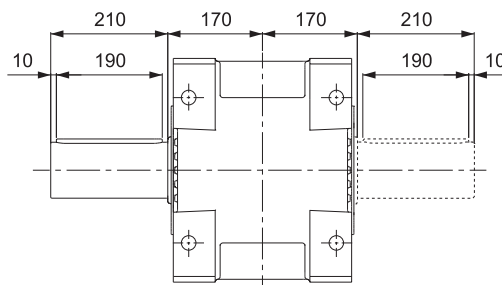
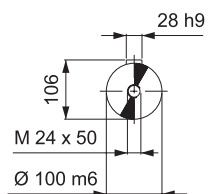


AD	M	M1	M2	N	N1	N2	N3	N4	X	P
HDO 81 3_160	42	45.3	12	350	300	250	23	18	6	727.5
HDO 81 3_180	48	51.8	14	350	300	250	23	18	6	727.5
HDO 81 3_200	55	59.3	16	400	350	300	—	M16x23	7	752.5

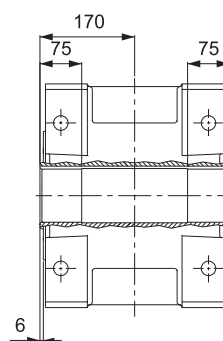
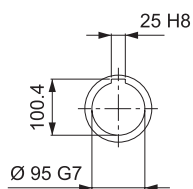


# HDO 81

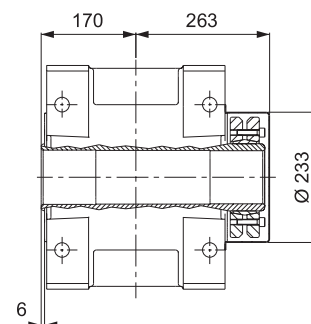
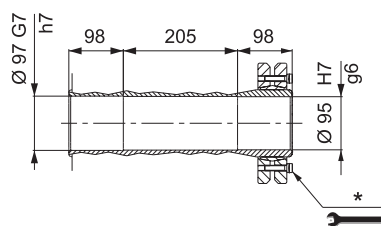
LP



H



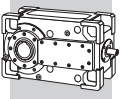
S



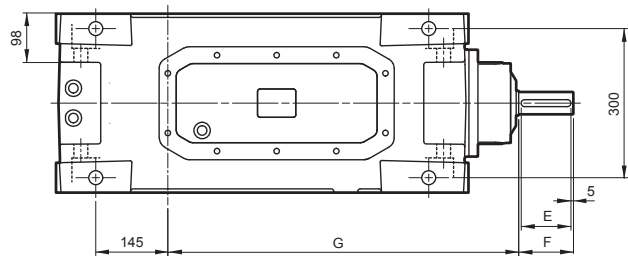
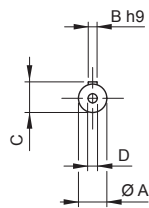
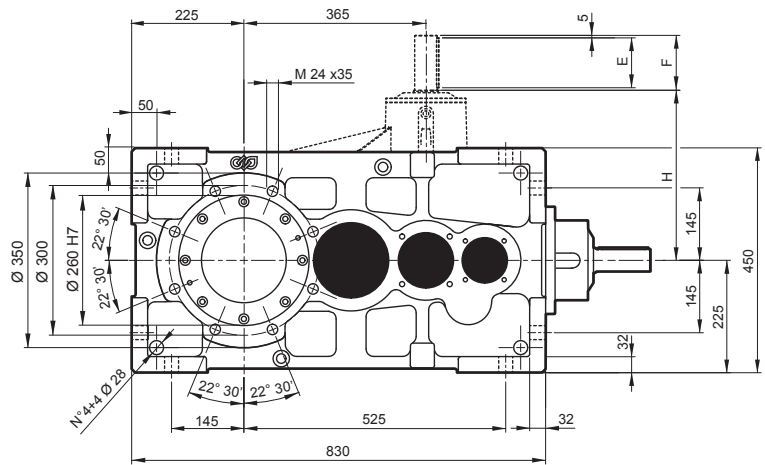
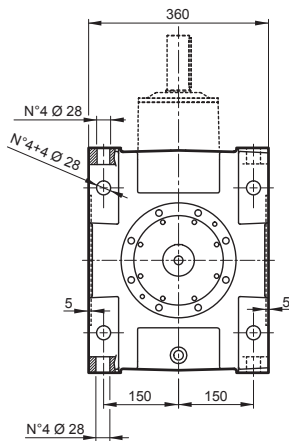
HDO

\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".





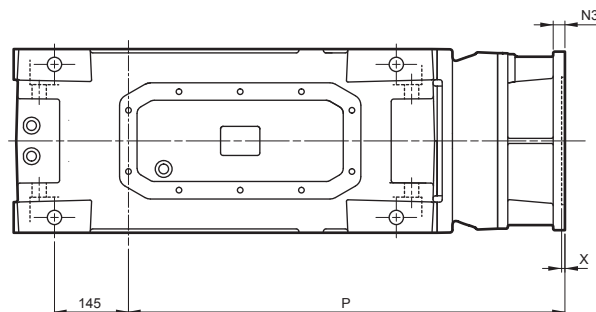
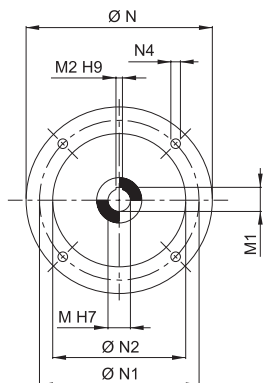
# HDO 91



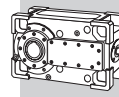
**HDO 91 3**  
**HDO 91 4**

VP	i =	A	B	C	D	E	F	G	H	LP
HDO 91 3	18.6 ... 66.1	45 k6	14	48.5	M16x36	100	110	706	341	490
HDO 91 4	82 ... 489.3	32 k6	10	35	M12x28	70	80	711	—	495

**AD**

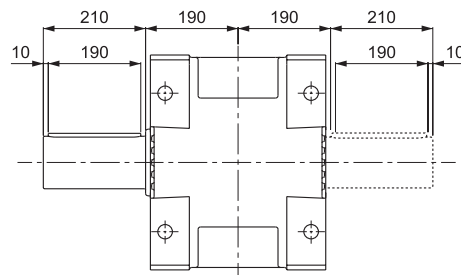
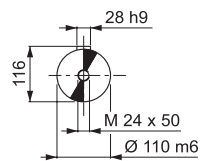


AD	M	M1	M2	N	N1	N2	N3	N4	X	P
HDO 91 3_180	42	45.3	12	350	300	250	23	18	6	855.5
HDO 91 3_200	48	51.8	14	350	300	250	—	18	7	880.5
HDO 91 4_160	38	41.3	10	300	265	230	23	14	6	855.5
HDO 91 4_180	42	45.3	12	350	300	250	23	18	6	855.5
HDO 91 4_200	48	51.8	14	350	300	250	—	18	7	880.5

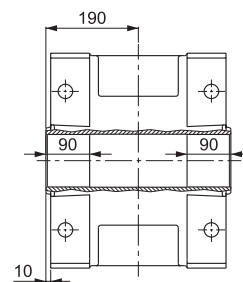
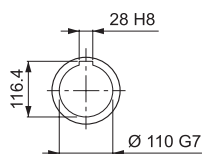


# HDO 91

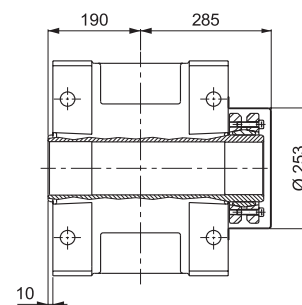
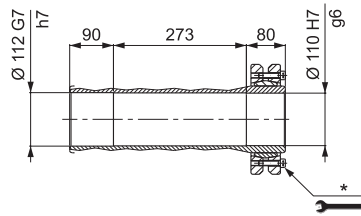
LP



H

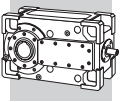


S

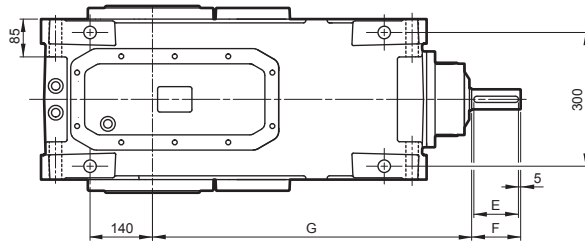
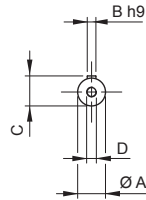
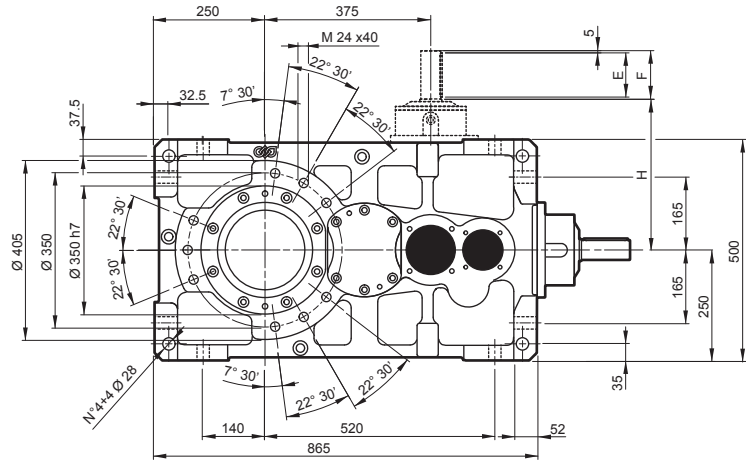
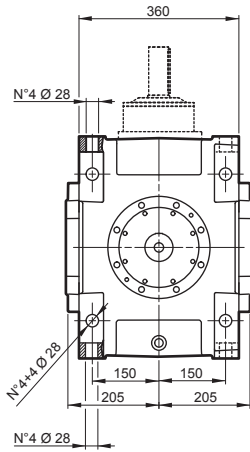


HDO

\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".



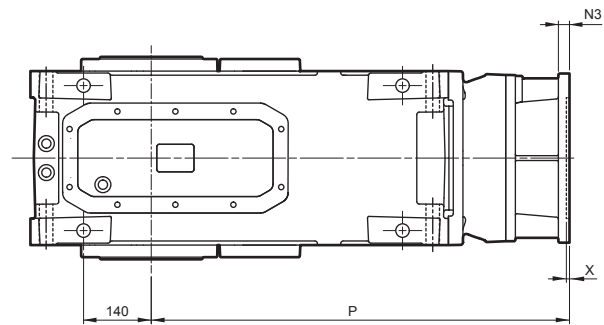
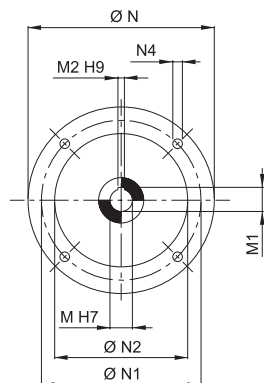
# HDO 95



**HDO 95 3**  
**HDO 95 4**

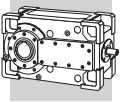
VP	i =	A	B	C	D	E	F	G	H	LP
HDO 95 3	21.2 ... 72.3	45 k6	14	48.5	M16x36	100	110	716	341	560
HDO 95 4	81.6 ... 489.7	32 k6	10	35	M12x28	70	80	711	—	565

**AD**

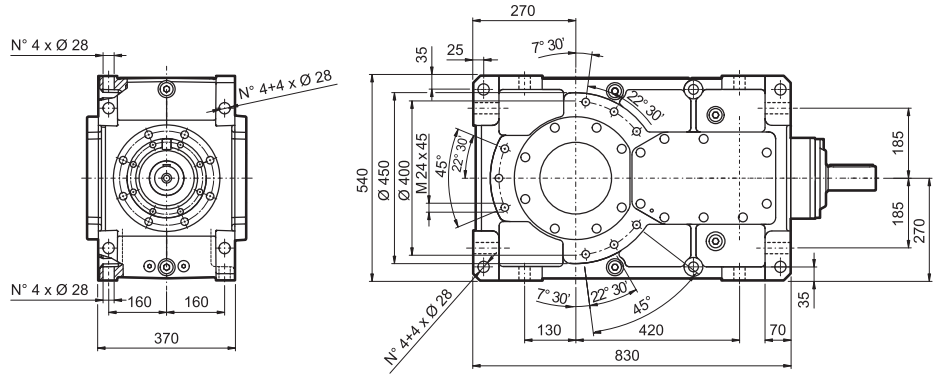


AD	M	M1	M2	N	N1	N2	N3	N4	X	P
HDO 95 3_180	42	45.3	12	350	300	250	23	18	6	865.5
HDO 95 3_200	48	51.8	14	350	300	250	—	18	7	890.5
HDO 95 4_160	38	41.3	10	300	265	230	23	14	6	865.5
HDO 95 4_180	42	45.3	12	350	300	250	23	18	6	865.5
HDO 95 4_200	48	51.8	14	350	300	250	—	18	7	890.5

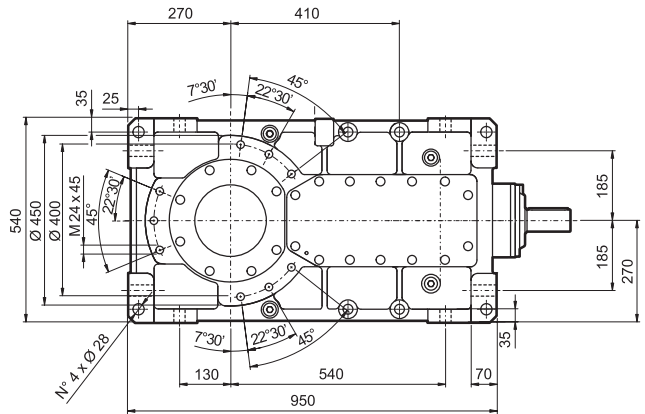
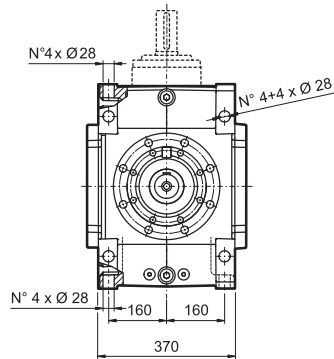
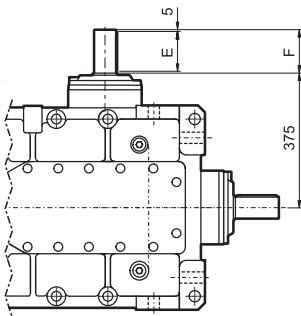
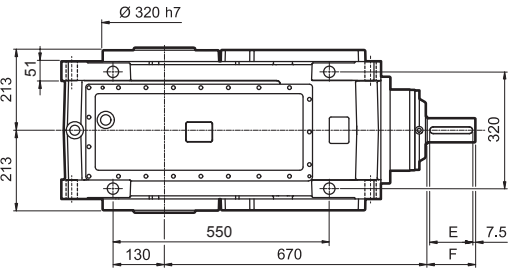
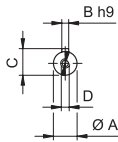




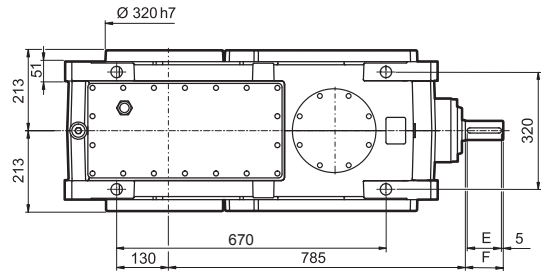
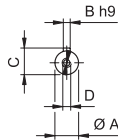
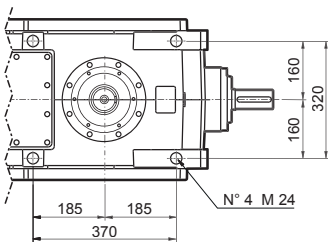
# HDO 100



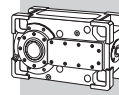
## HDO 100 2



## HDO 100 3 HDO 100 4

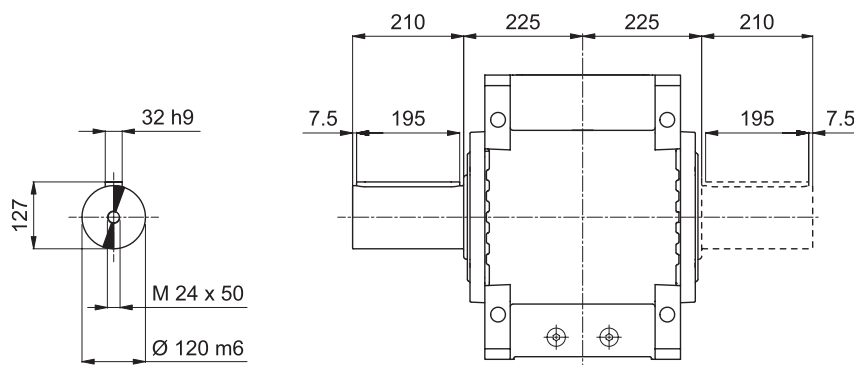


VP	i =	A	B	C	D	E	F	LP
HDO 100 2	5.8 ... 13.5	70 m6	20	74.5	M20x42	125	140	640
HDO 100 3	14 ... 17.3	55 m6	16	59	M20x42	100	110	715
HDO 100 3	20.2 ... 67.5	45 k6	14	48.5	M16x36	100	110	715
HDO 100 4	70.8 ... 139.8	35 k6	10	38	M12x28	70	80	730
HDO 100 4	160 ... 344.2	32 k6	10	35	M12x28	70	80	730

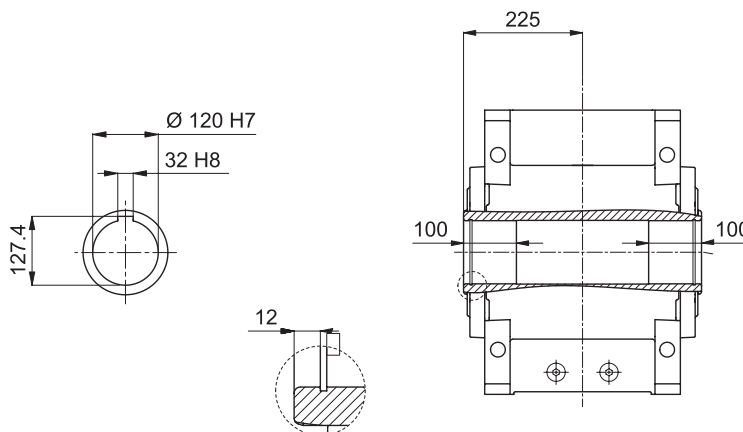


# HDO 100

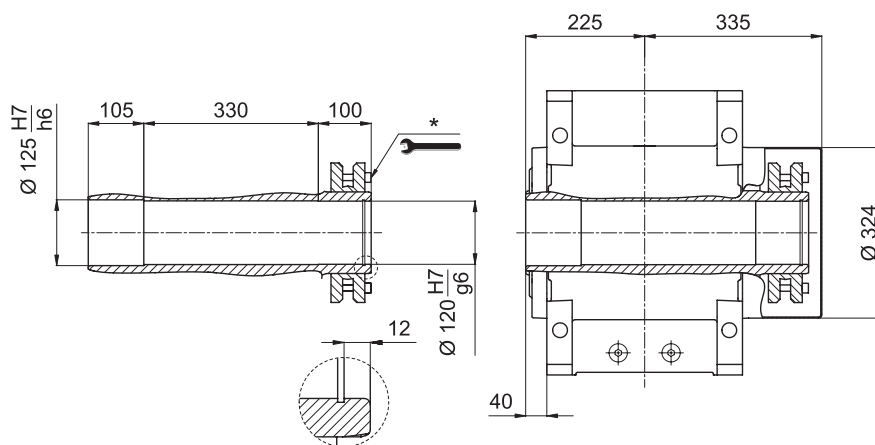
LP



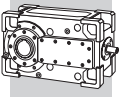
H



S



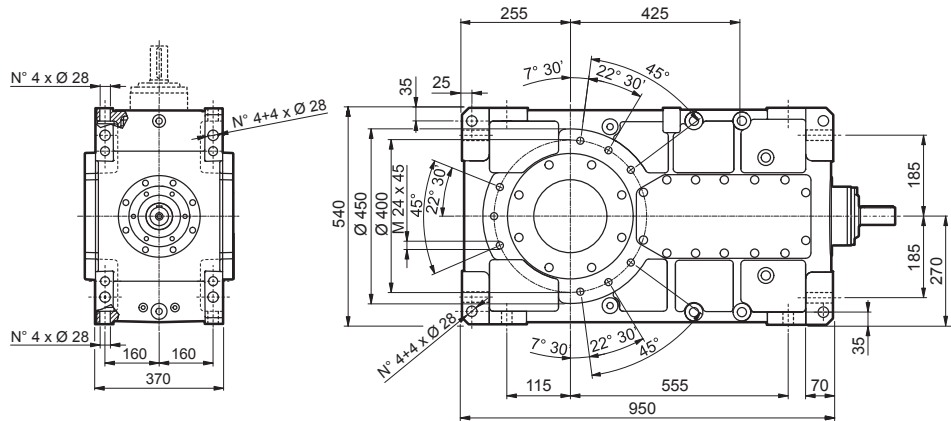
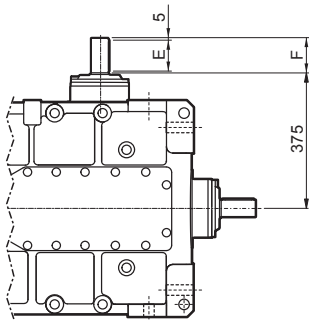
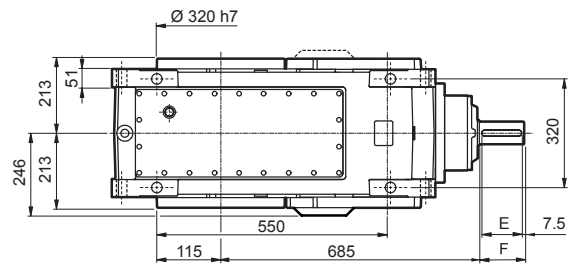
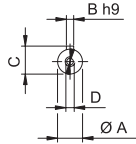
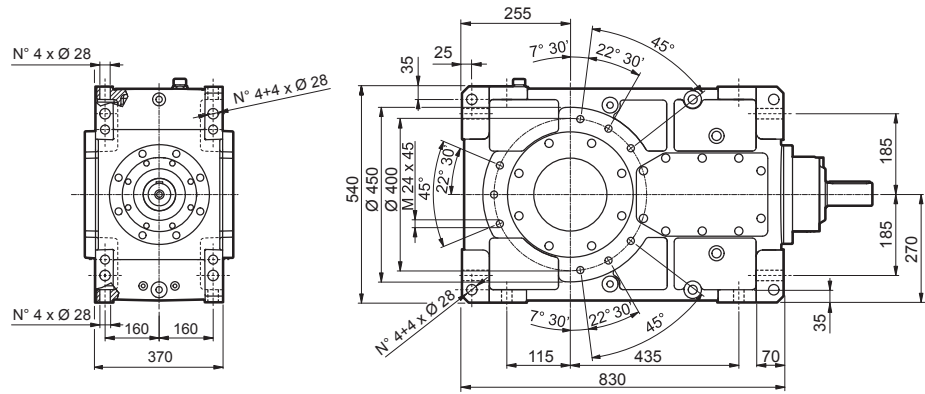
\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".



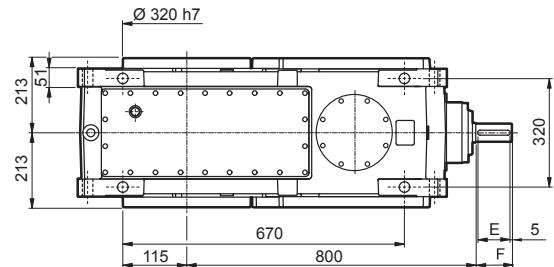
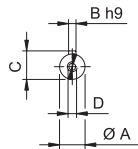
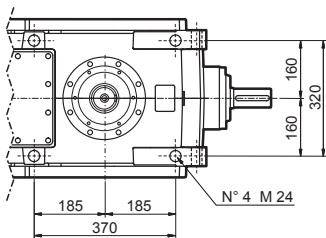
# HDO 110

HDO

## HDO 110 2



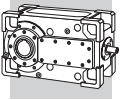
## HDO 110 3 HDO 110 4



VP	i =	A	B	C	D	E	F	LP
HDO 110 2	6.4 ... 15.5	70 m6	20	74.5	M20x42	125	140	695
HDO 110 3	18.9 ... 20.9	55 m6	16	59	M20x42	100	110	770
HDO 110 3	22 ... 77.5	45 k6	14	48.5	M16x36	100	110	770
HDO 110 4	77.4 ... 121.7	35 k6	10	38	M12x28	70	80	765
HDO 110 4	137.1 ... 395	32 k6	10	35	M12x28	70	80	765



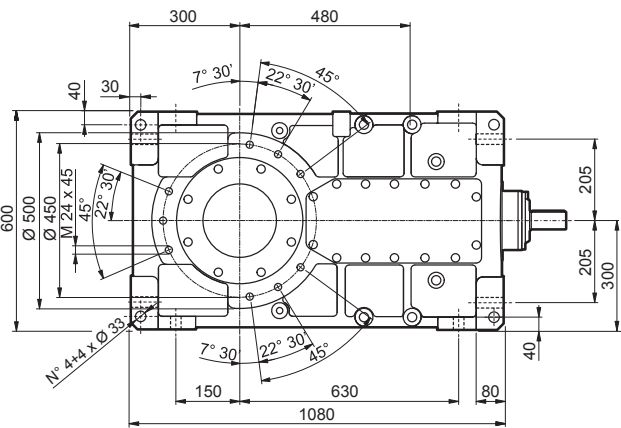
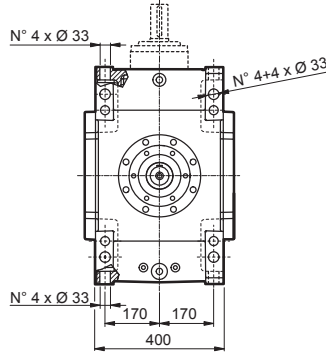
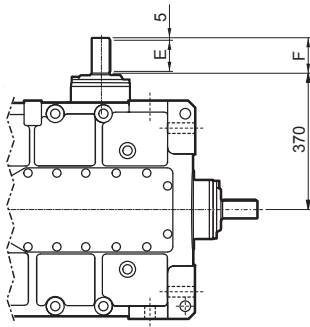
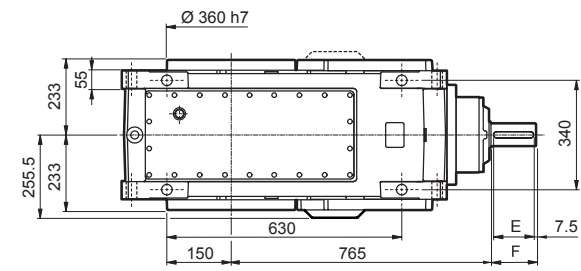
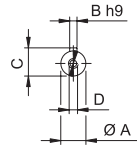
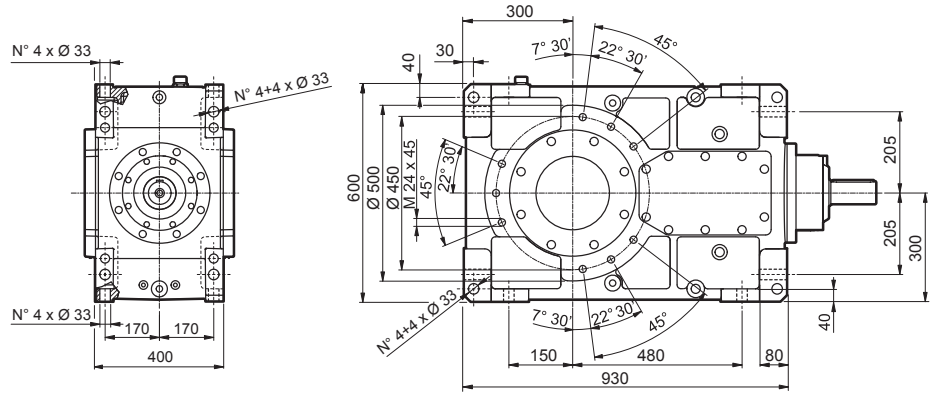




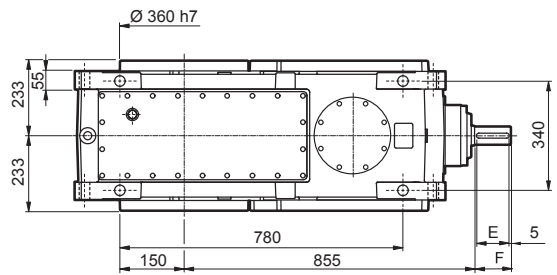
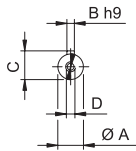
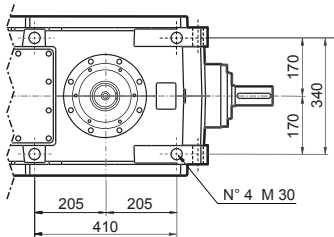
# HDO 120

HDO

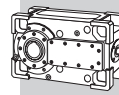
## HDO 120 2



## HDO 120 3 HDO 120 4

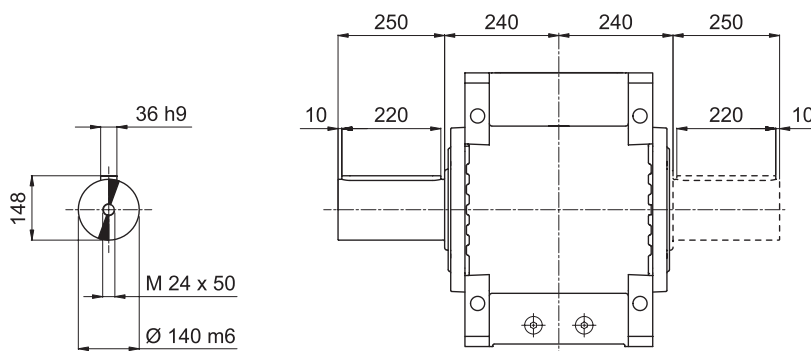


VP	i =	A	B	C	D	E	F	LP
HDO 120 2	6.6 ... 15.5	70 m6	20	74.5	M20x42	125	140	945
HDO 120 3	17.3 ... 24.6	55 m6	16	59	M20x42	100	110	1025
HDO 120 3	28.3 ... 78.6	45 k6	14	48.5	M16x36	100	110	1025
HDO 120 4	87 ... 162.2	35 k6	10	38	M12x28	70	80	990
HDO 120 4	179.7 ... 400.6	32 k6	10	35	M12x28	70	80	990

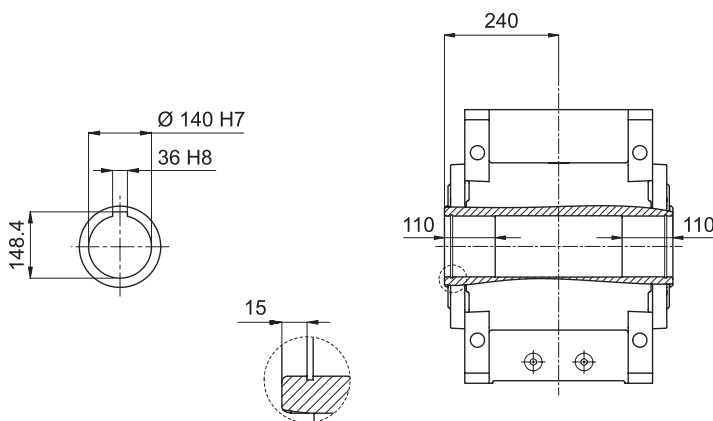


# HDO 120

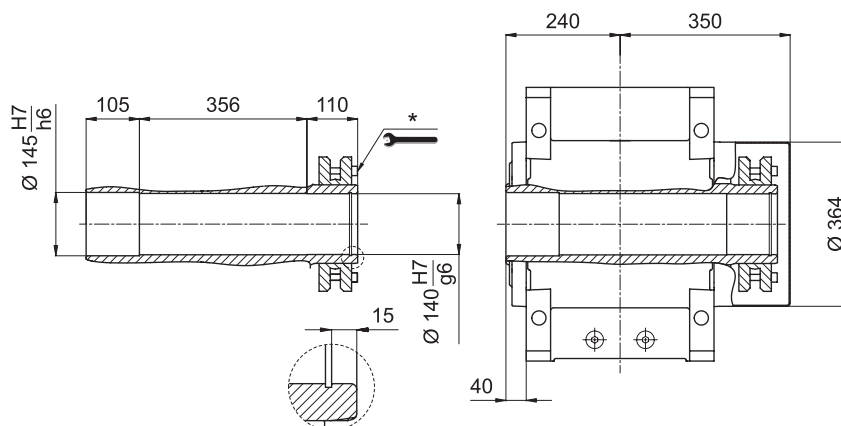
LP



H

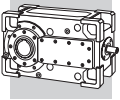


S



HDO

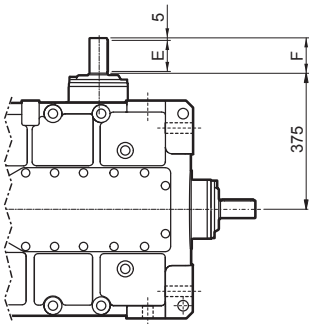
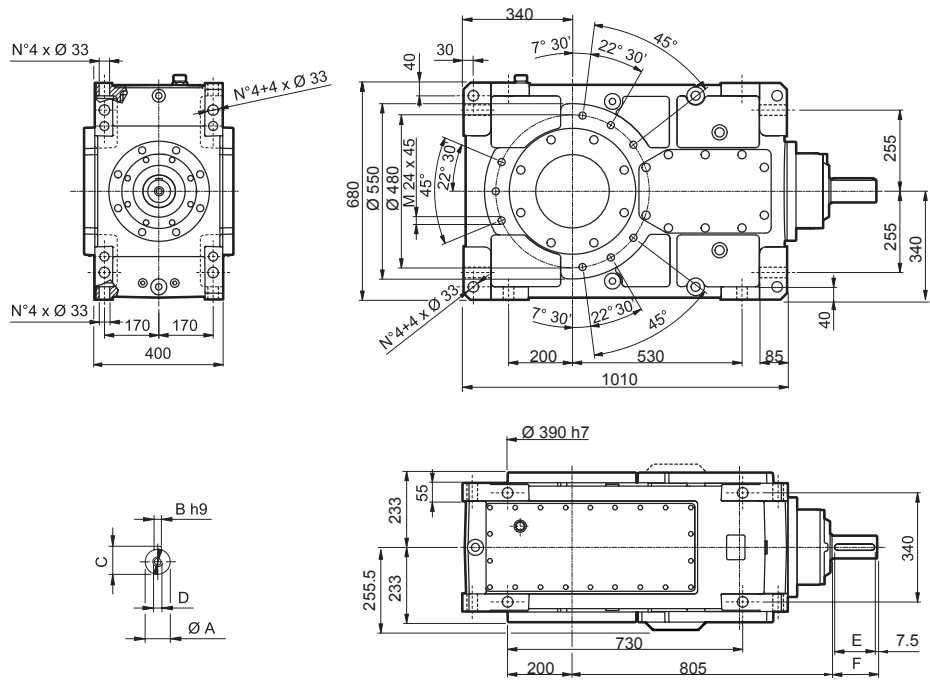
\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".



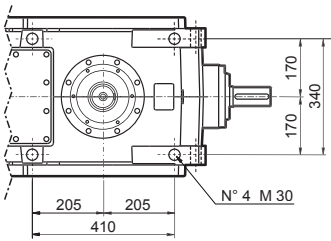
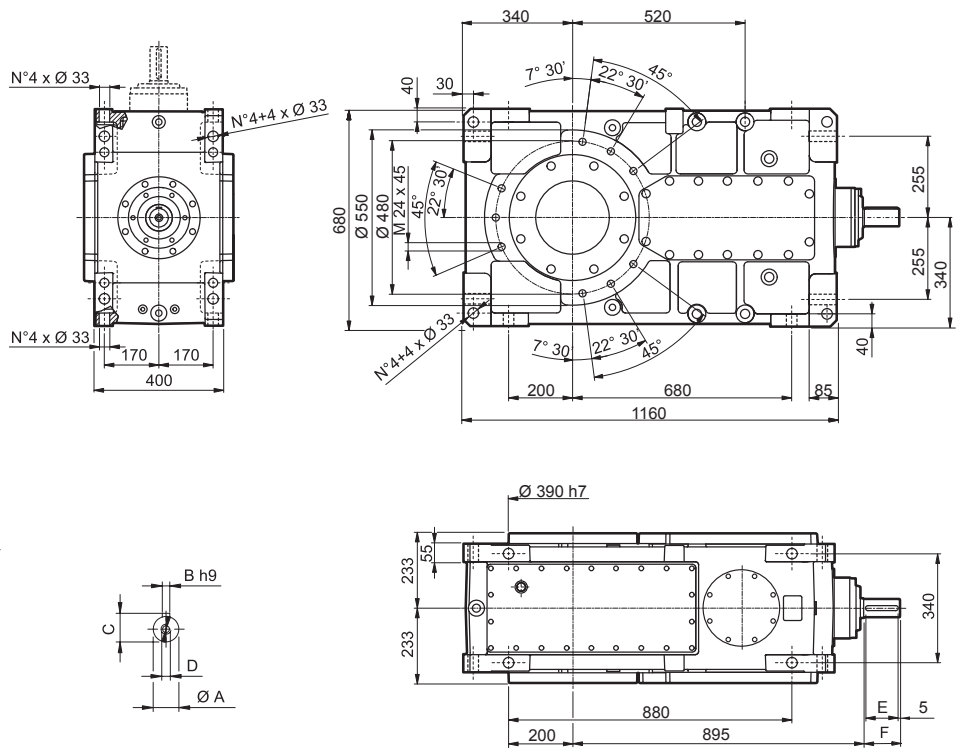
# HDO 125

HDO

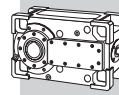
## HDO 125 2



## HDO 125 3 HDO 125 4

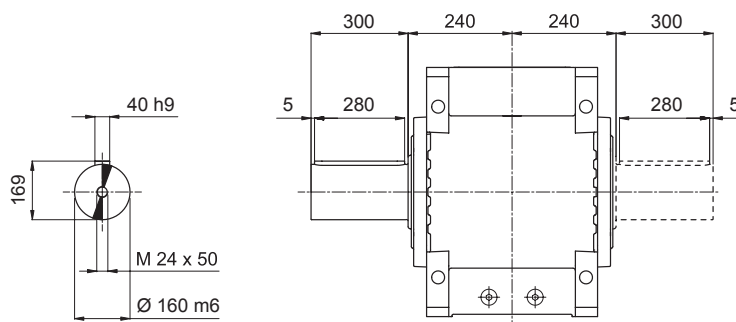


VP	i =	A	B	C	D	E	F	LP
HDO 125 2	7.4...17.0	70 m6	20	74.5	M20x42	125	140	1130
HDO 125 3	19.2...35.8	55 m6	16	59	M20x43	100	110	1205
HDO 125 3	38.8...85.9	45 k6	14	48.5	M16x36	100	110	1205
HDO 125 4	97.0...178.0	35 k6	10	38	M12x28	70	80	1165
HDO 125 4	200.3...438.0	32 k6	10	35	M12x28	70	80	1165

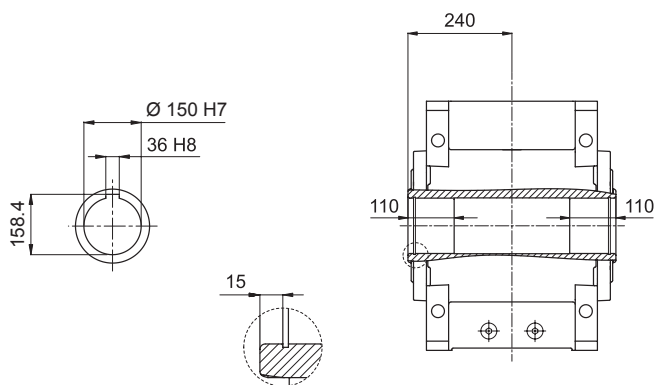


# HDO 125

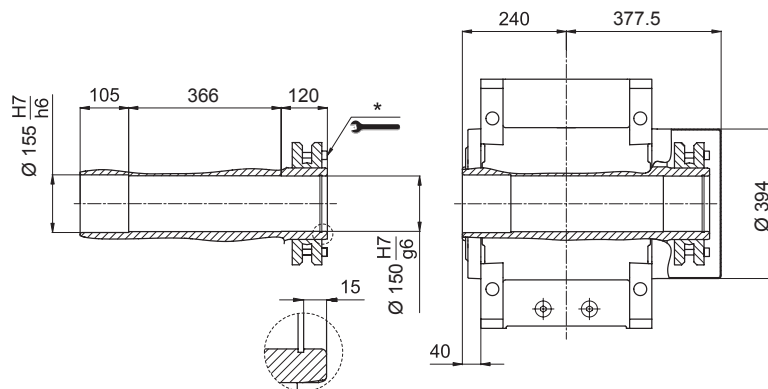
LP



H

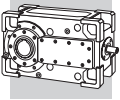


S



HDO

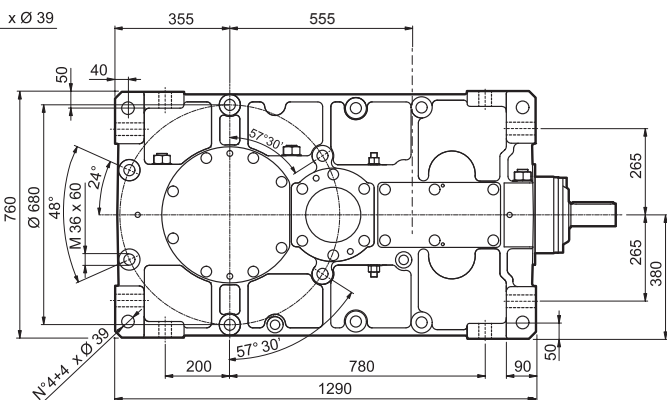
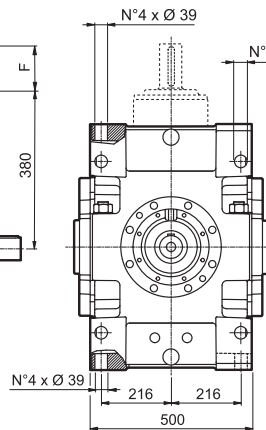
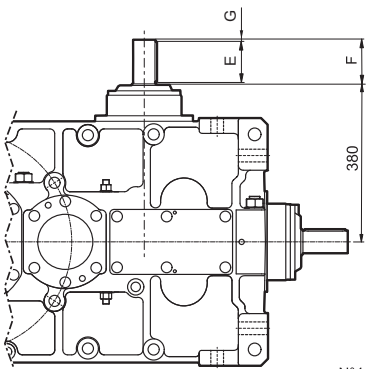
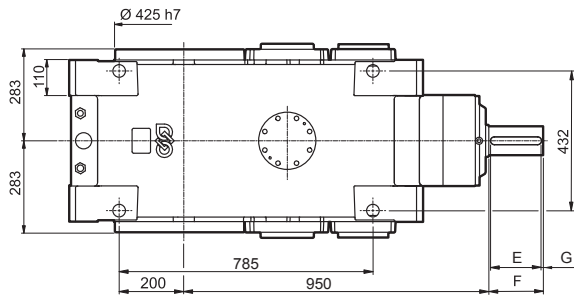
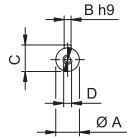
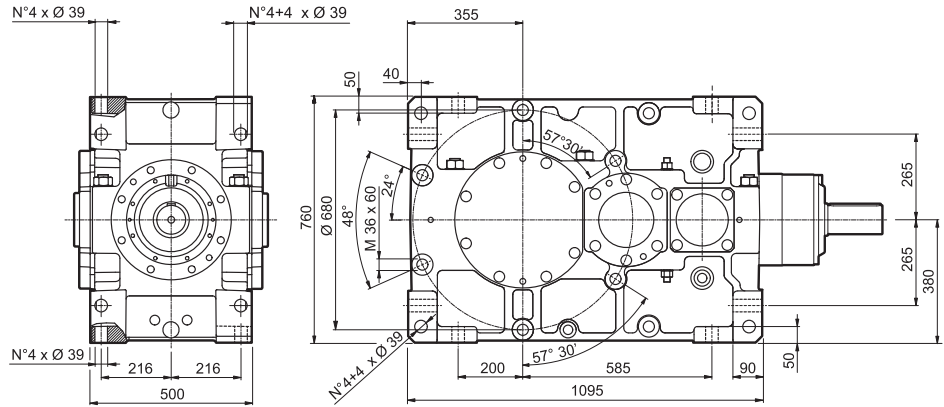
\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".



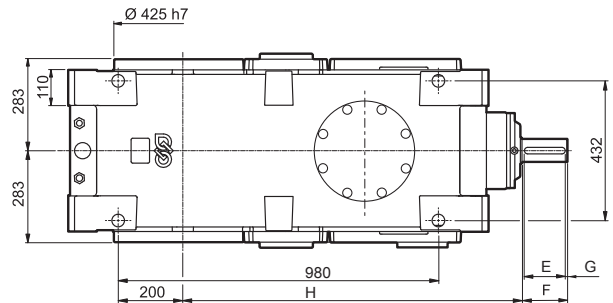
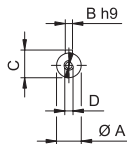
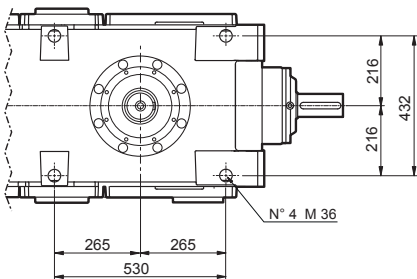
# HDO 130

HDO

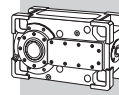
## HDO 130 2



## HDO 130 3 HDO 130 4

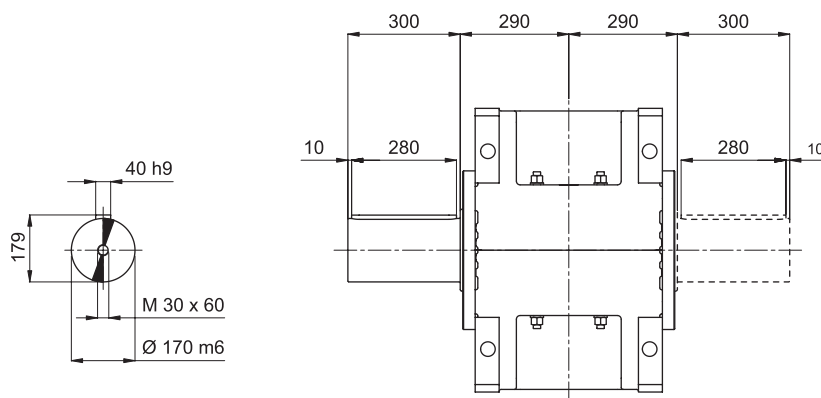


VP	i =	A	B	C	D	E	F	G	H	LP
HDO 130 2	5.7 ... 13.6	90 m6	25	95	M24x50	160	170	5	—	1570
HDO 130 3	15.2 ... 67.1	70 m6	20	74.5	M20x42	125	140	7.5	1040	1730
HDO 130 4	71.5 ... 335.6	45 k6	14	48.5	M16x36	100	110	5	1105	1700

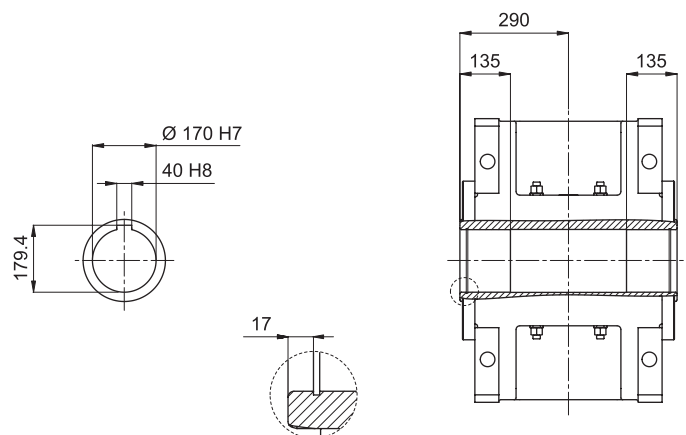


# HDO 130

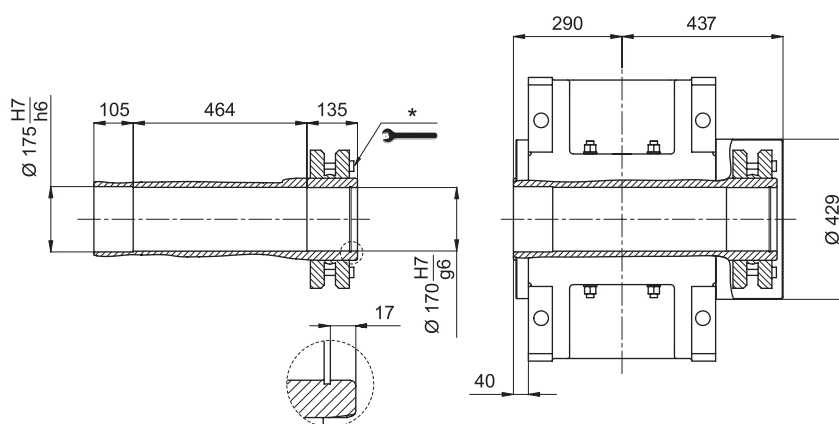
LP



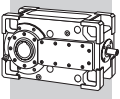
H



S



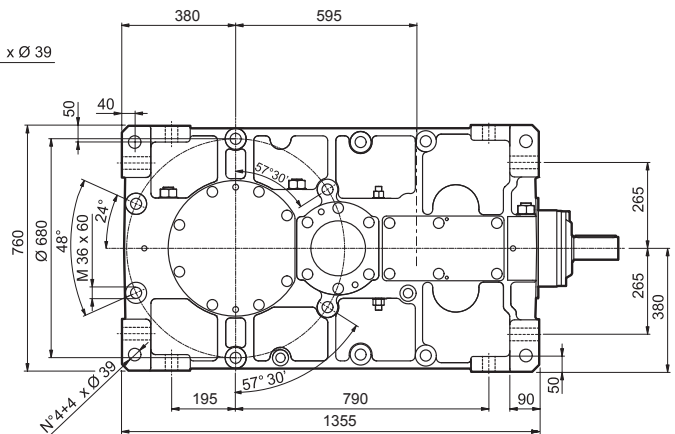
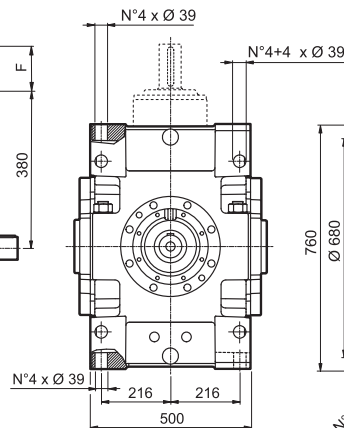
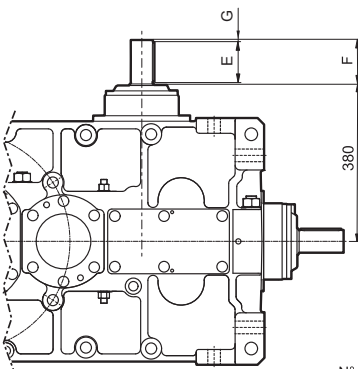
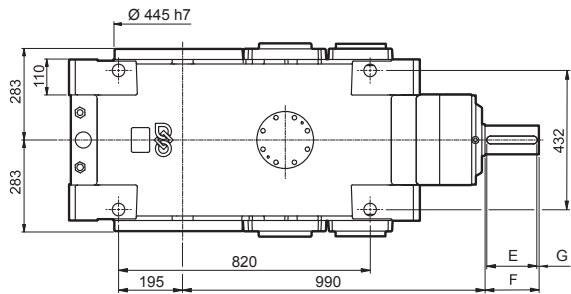
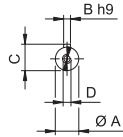
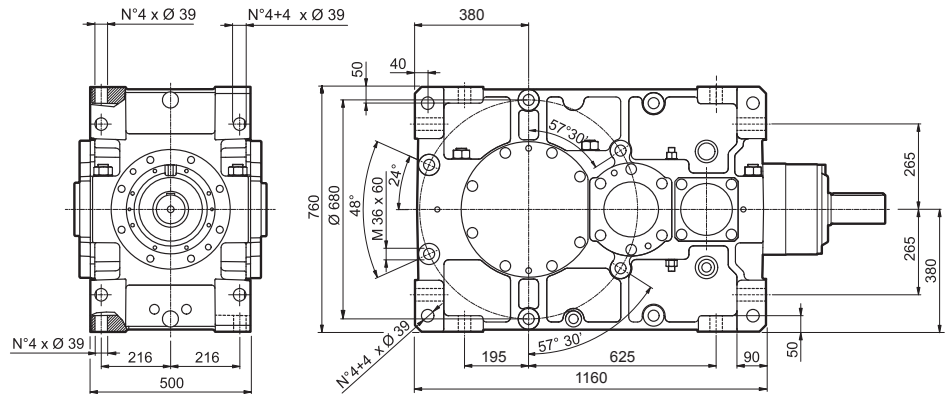
\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".



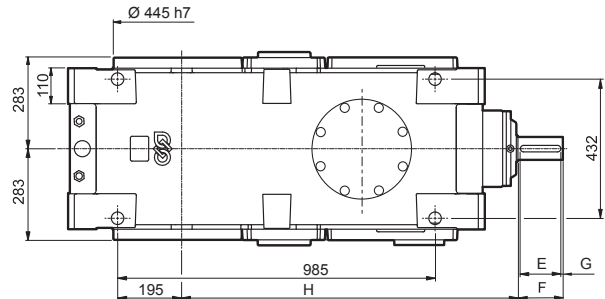
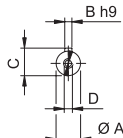
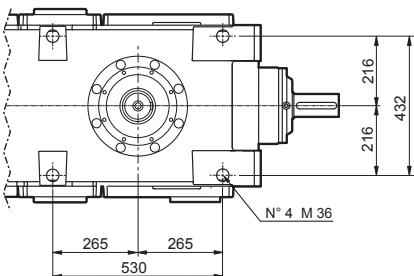
# HDO 140

HDO

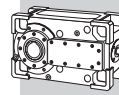
## HDO 140 2



## HDO 140 3 HDO 140 4

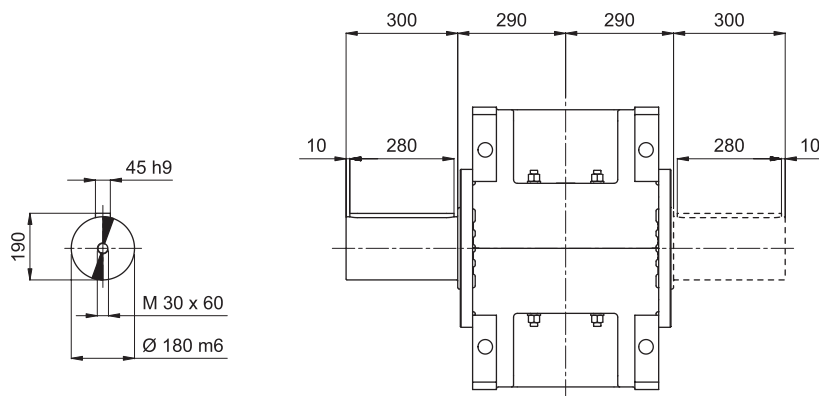


VP	i =	A	B	C	D	E	F	G	H	LP
HDO 140 2	6.6 ... 15.7	90 m6	25	95	M24x50	160	170	5	—	1710
HDO 140 3	17.7 ... 77.3	70 m6	20	74.5	M20x42	125	140	7.5	1080	1960
HDO 140 4	82.3 ... 386.6	45 k6	14	48.5	M16x36	100	110	5	1145	1925

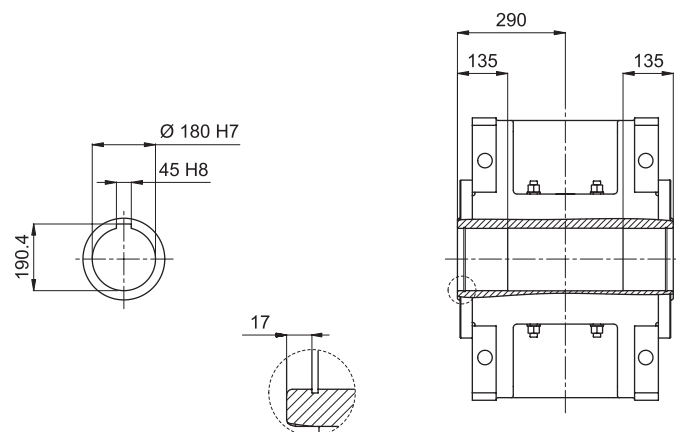


# HDO 140

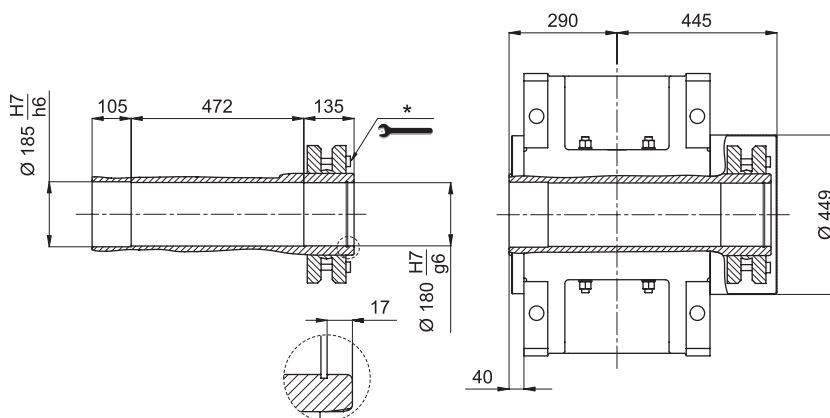
LP



H

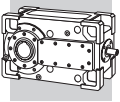


S



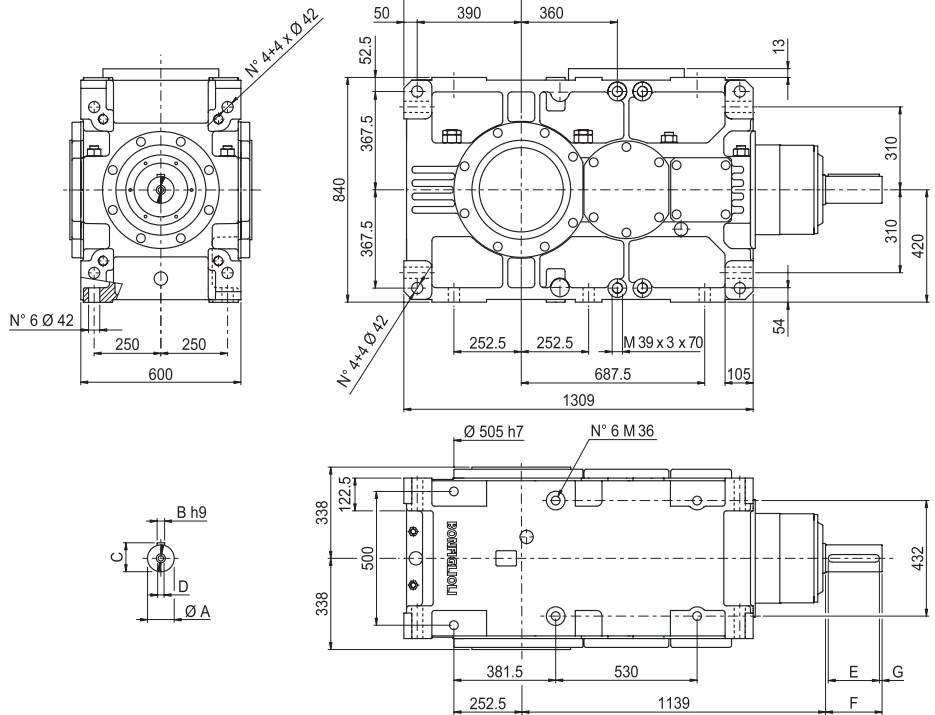
\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".



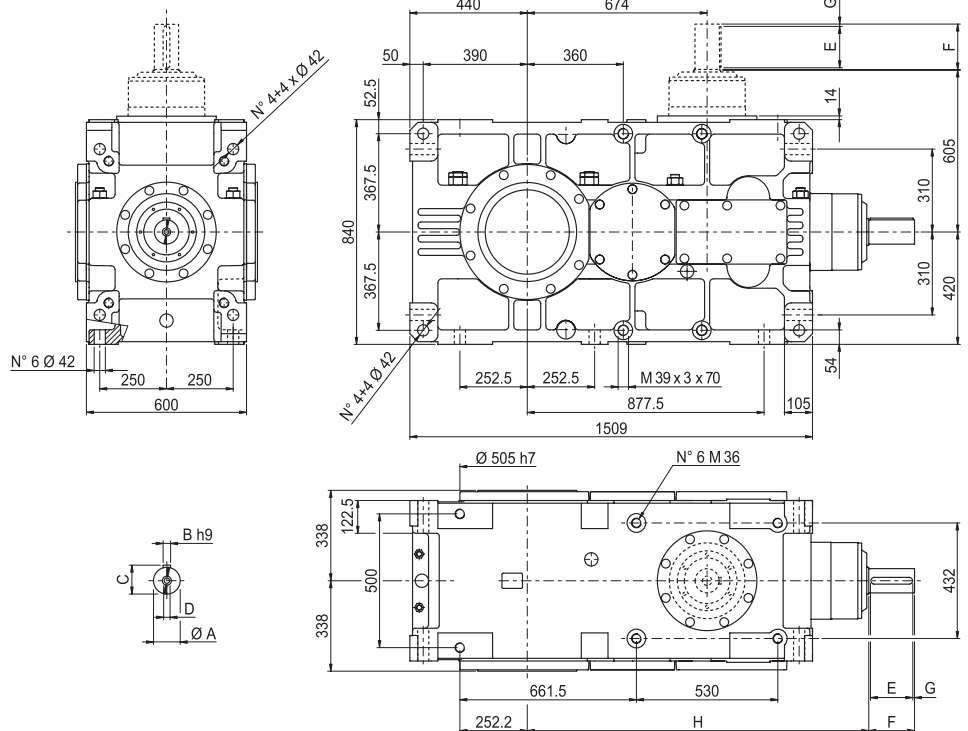


# HDO 150

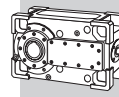
## HDO 150 2



## HDO 150 3 HDO 150 4

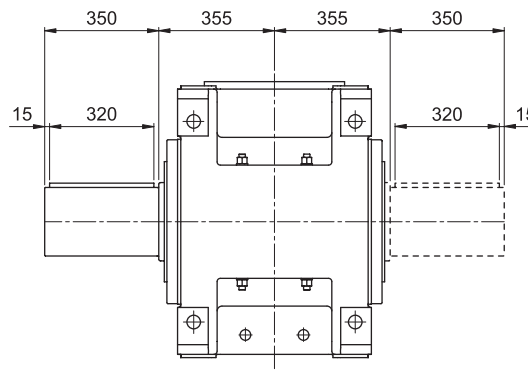
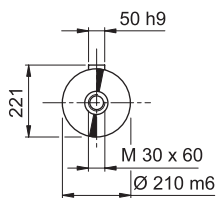


VP	i =	A	B	C	D	E	F	G	H	LP
HDO 150 2	5.5 ... 7.0	110 m6	28	116	M24x50	190	210	10	—	2795
HDO 150 2	8.1 ... 13.7	100 m6	28	106	M24x50	190	210	10	—	2795
HDO 150 3	15.6 ... 60.8	90 m6	25	95	M24x50	160	170	5	1279	2895
HDO 150 4	66.9 ... 92.9	55 m6	16	59	M20x42	90	110	5	1249	2875
HDO 150 4	101.8 ... 238.8	45 k6	14	48.5	M16x36	100	110	5	1249	2875

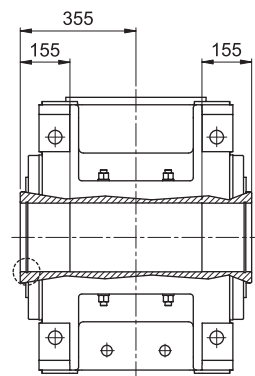
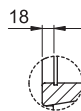
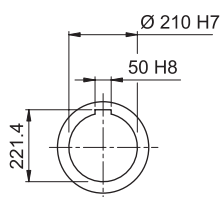


# HDO 150

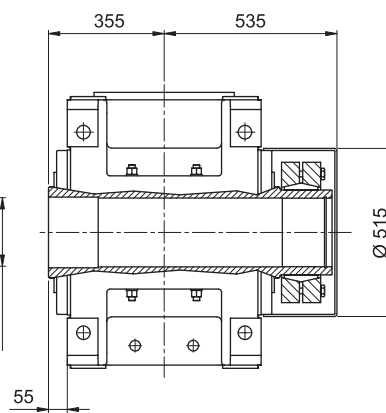
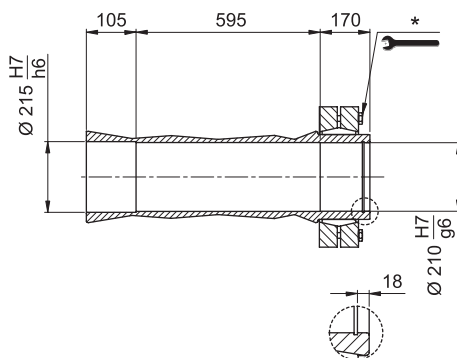
LP



H

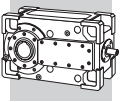


S



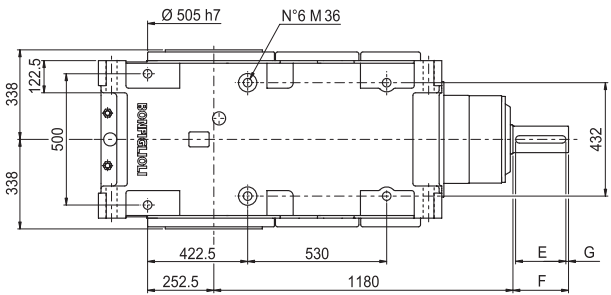
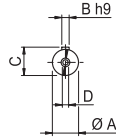
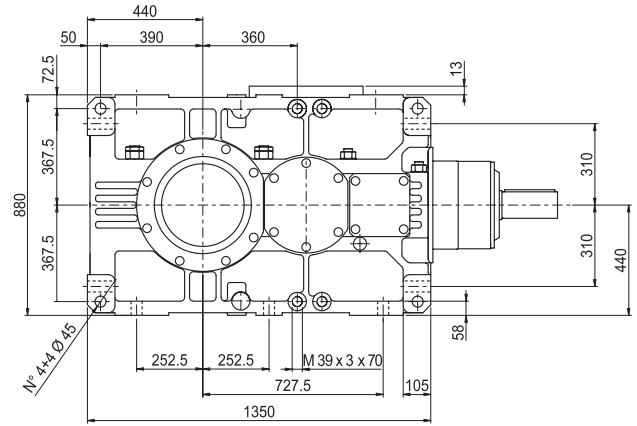
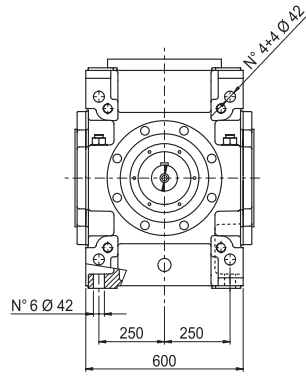
HDO

\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".

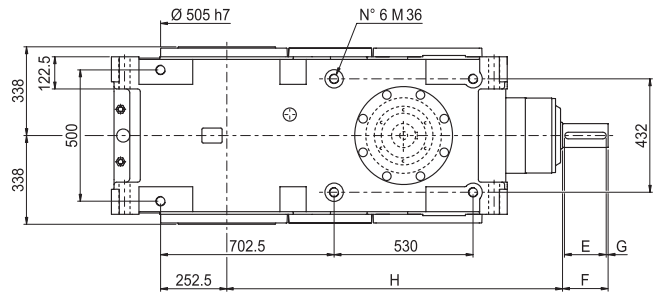
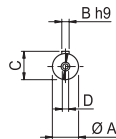
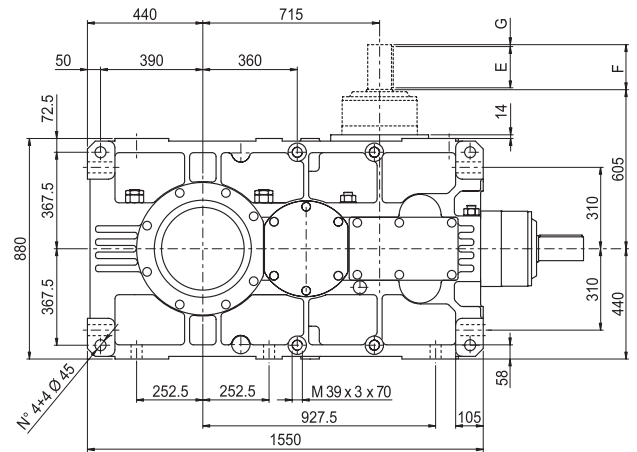
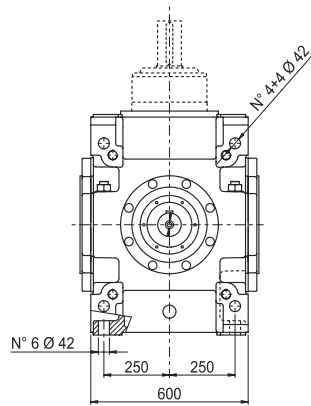


# HDO 160

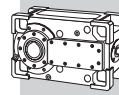
## HDO 160 2



## HDO 160 3 HDO 160 4

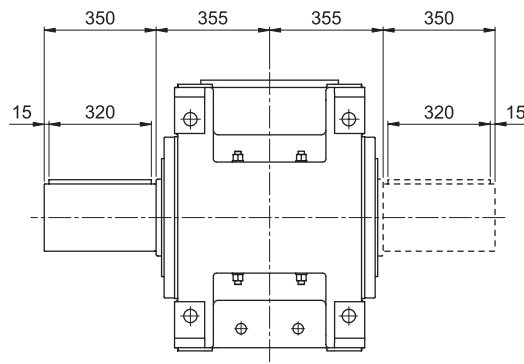
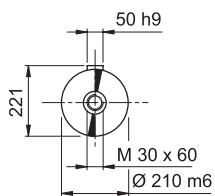


VP	i =	A	B	C	D	E	F	G	H	LP
HDO 160 2	7.3 ... 7.9	110 m6	28	116	M24x50	190	210	10	—	3075
HDO 160 2	8.9 ... 15.4	100 m6	28	106	M24x50	190	210	10	—	3075
HDO 160 3	17.7 ... 68.6	90 m6	25	95	M24x50	160	170	5	1320	3175
HDO 160 4	75.9 ... 96.3	55 m6	16	59	M20x42	90	110	10	1290	3160
HDO 160 4	115.2 ... 269.7	45 k6	14	48.5	M16x36	100	110	5	1290	3160

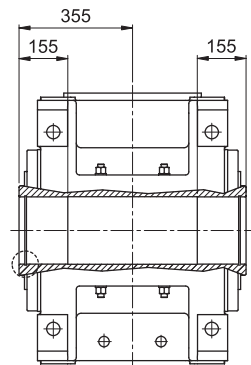
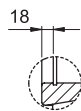
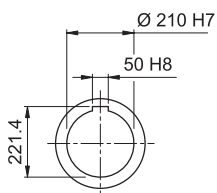


# HDO 160

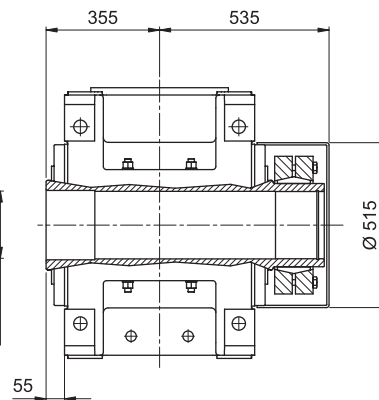
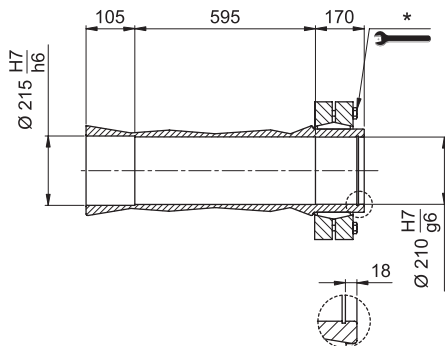
LP



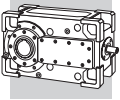
H



S

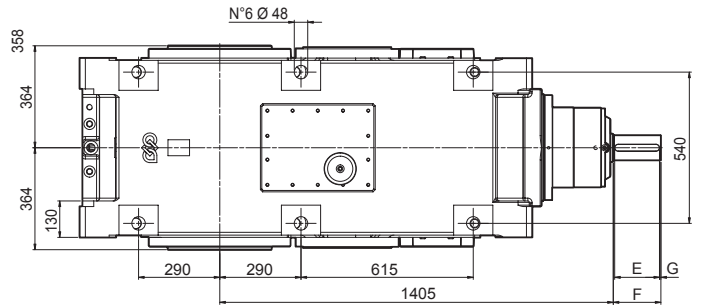
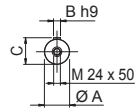
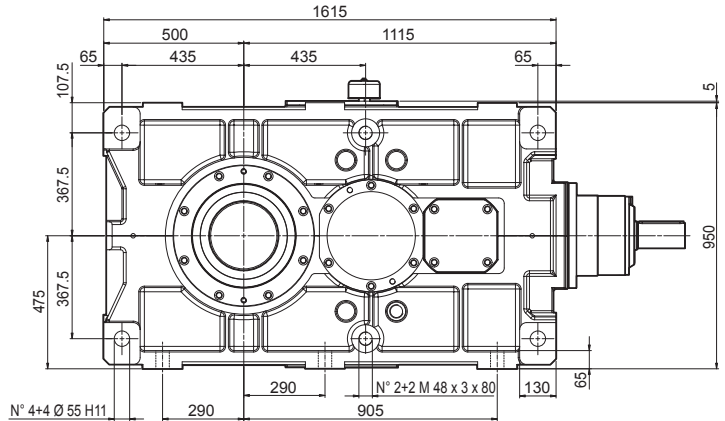
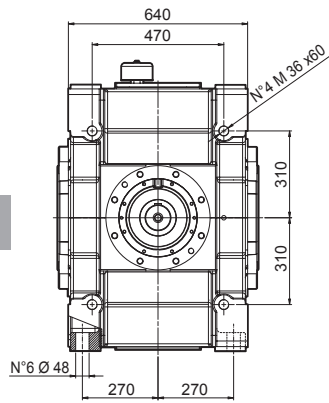


\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".



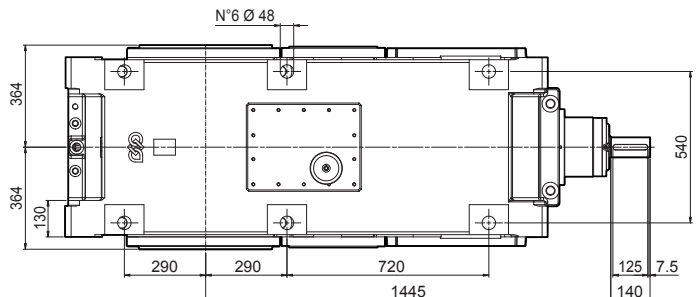
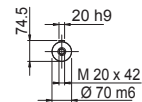
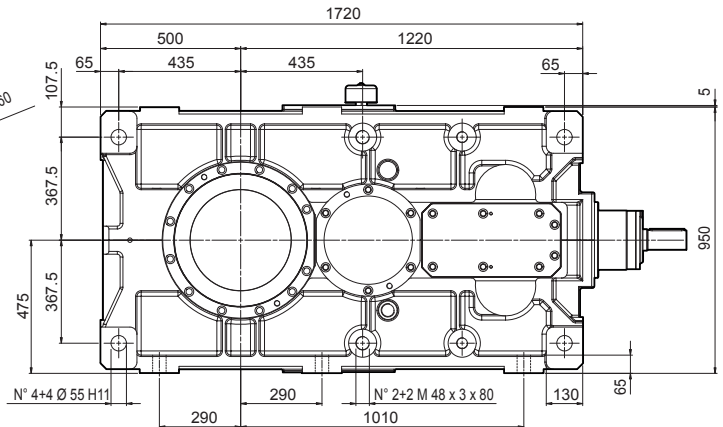
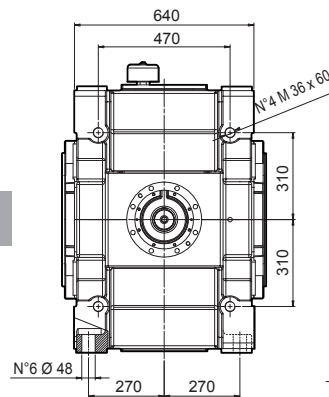
# HDO 170

## HDO 170 3

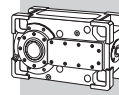


VP	i =	A	B	C	E	F	G	LP
HDO 170 3	15.9 ... 21.7	100 m6	28	106	190	210	10	3675
HDO 170 3	26.2 ... 59.9	90 m6	25	95	160	170	5	3675

## HDO 170 4

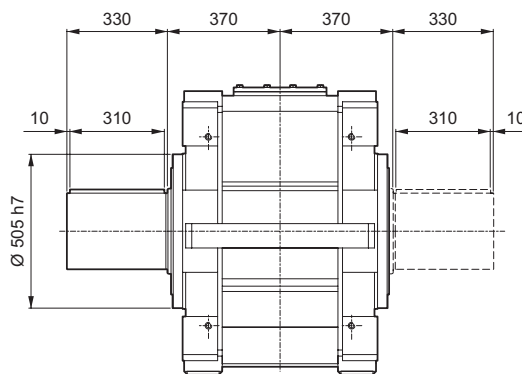
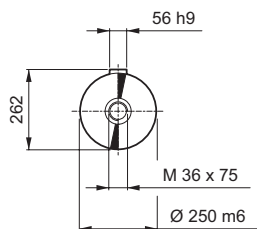


VP	LP
HDO 170 4	3780

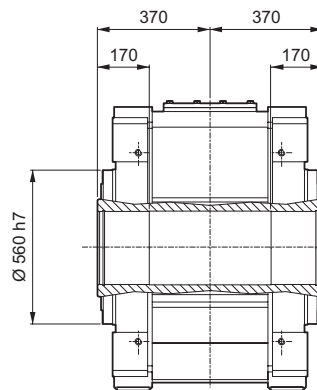
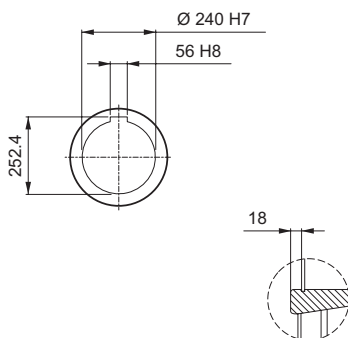


# HDO 170

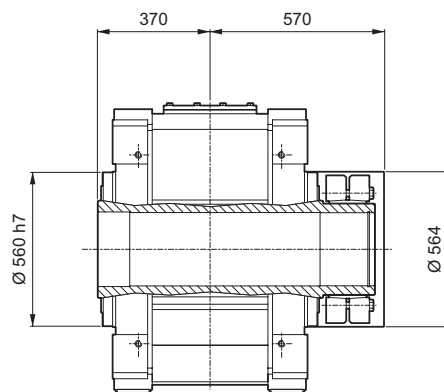
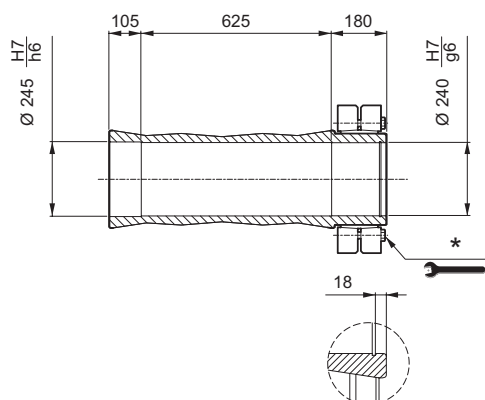
LP



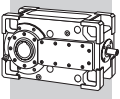
H



S



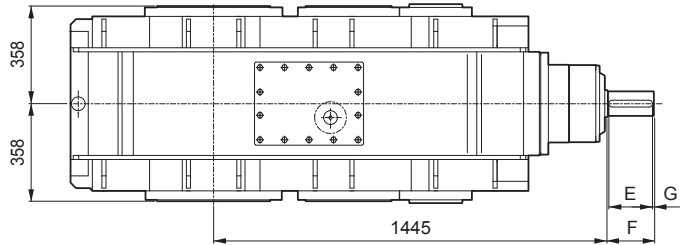
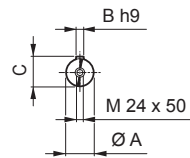
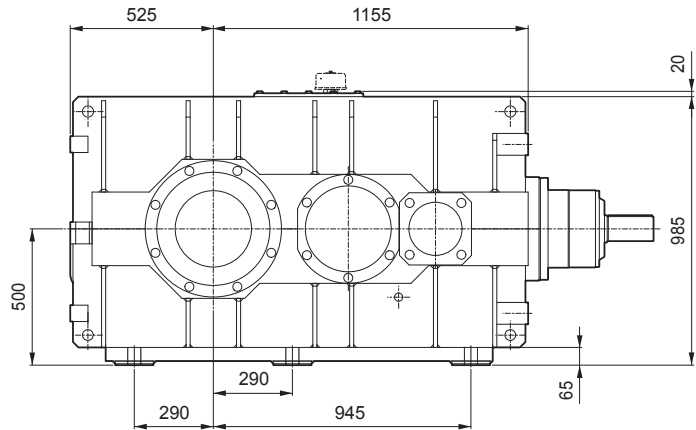
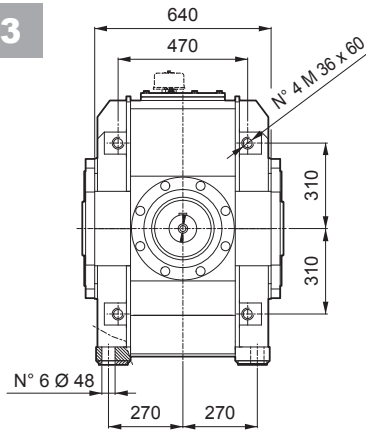
\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".



# HDO 180

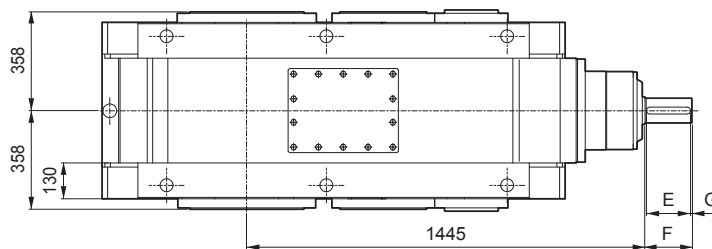
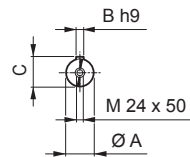
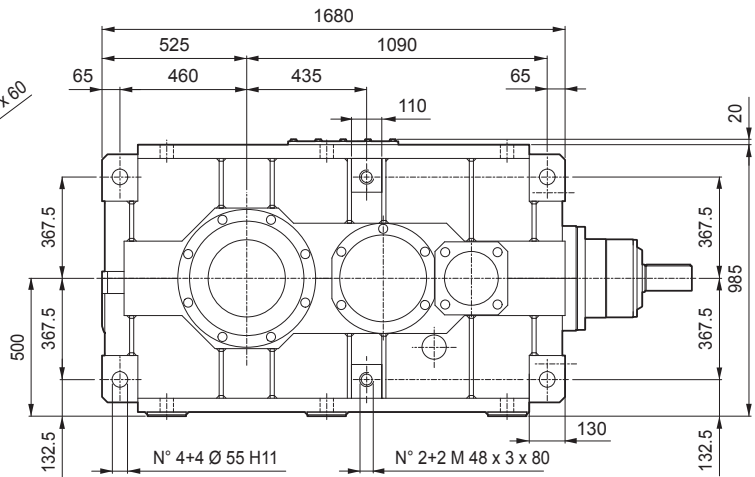
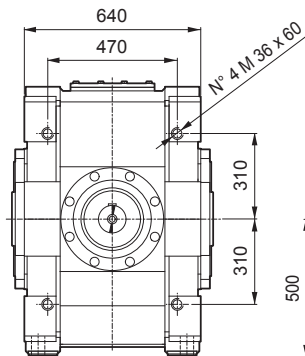
## HDO 180 3

**B3**



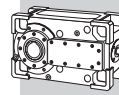
## HDO 180 3

**V5**



VP	i =	A	B	C	E	F	G	<b>LP</b>
HDO 180 3	17.7 ... 27.9	100 m6	28	106	190	210	10	3820
HDO 180 3	31.4 ... 66.2	90 m6	25	95	160	170	5	3820

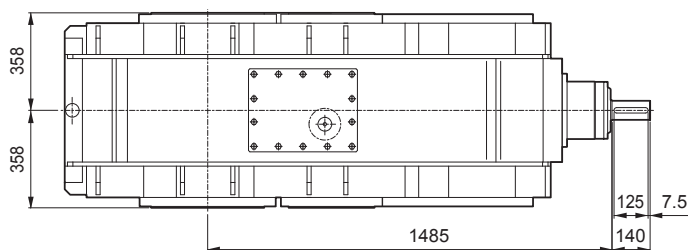
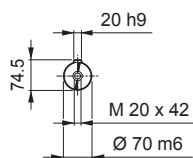
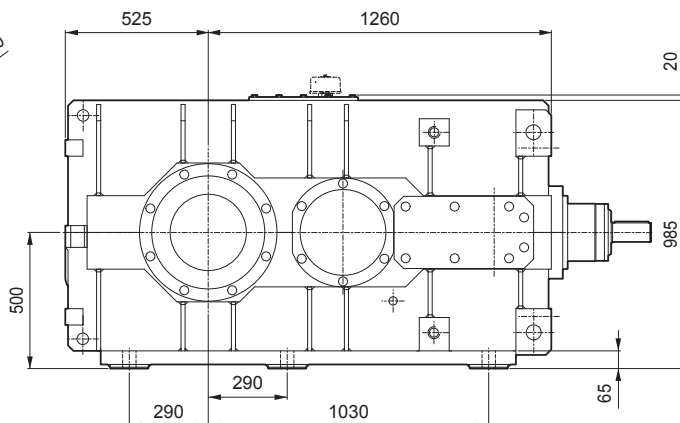
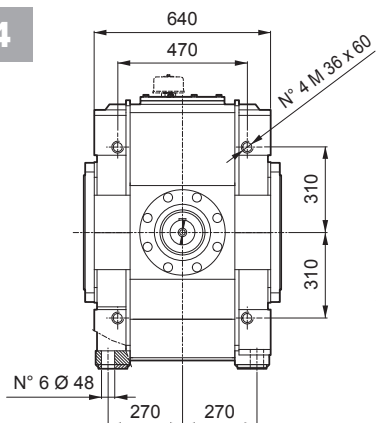
**HDO**



# HDO 180

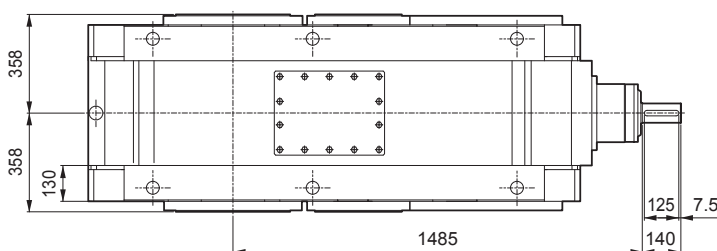
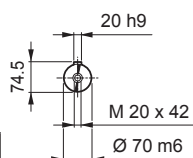
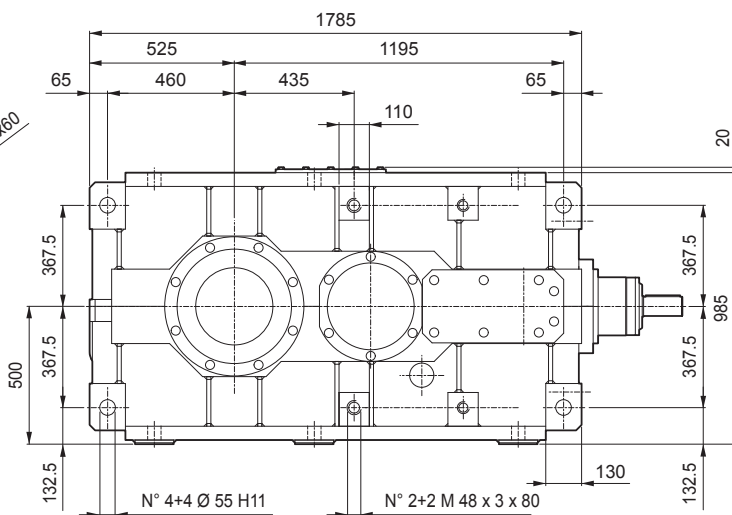
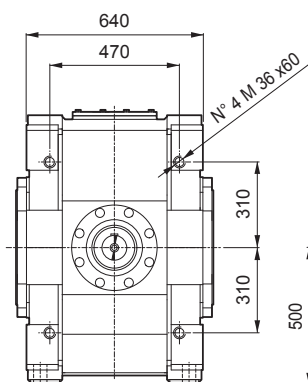
## HDO 180 4

**B3**



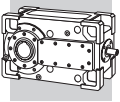
## HDO 180 4

**V5**



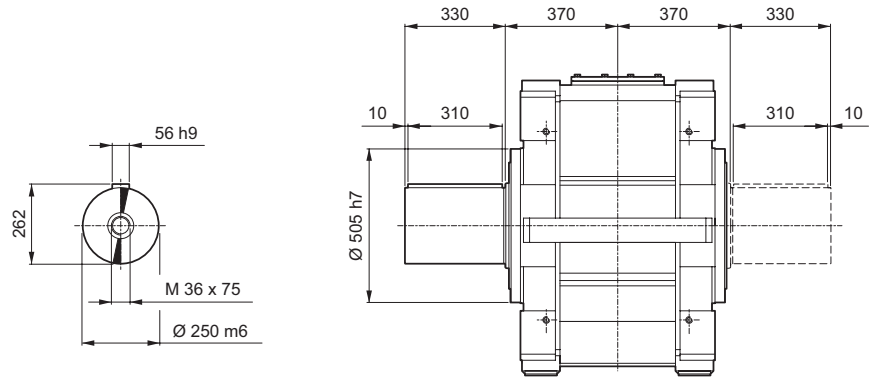
<b>VP</b>	<b>LP</b>
<b>HDO 180 4</b>	<b>3875</b>



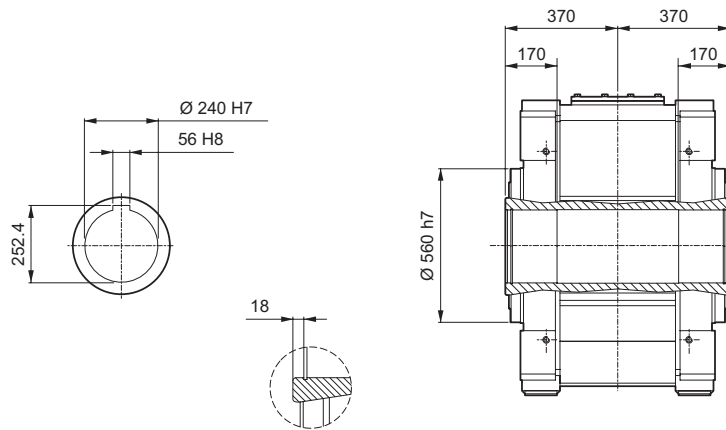


# HDO 180

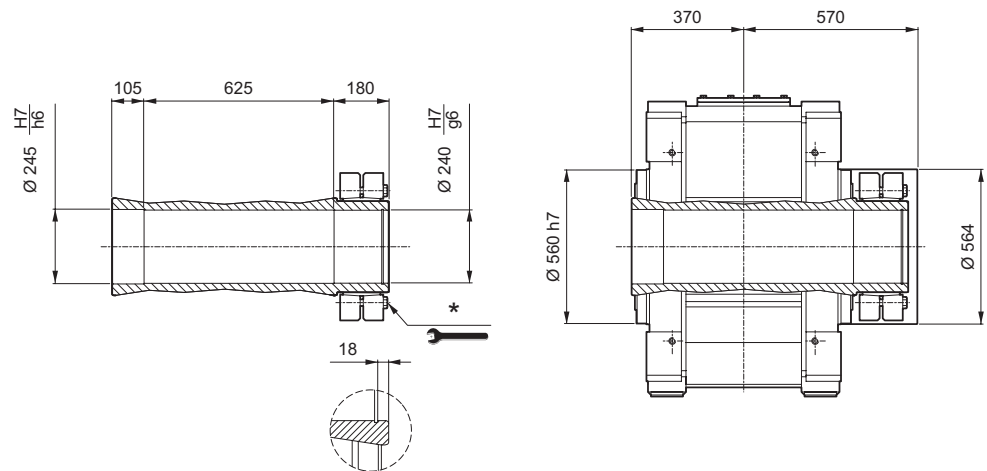
LP



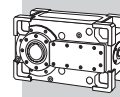
H



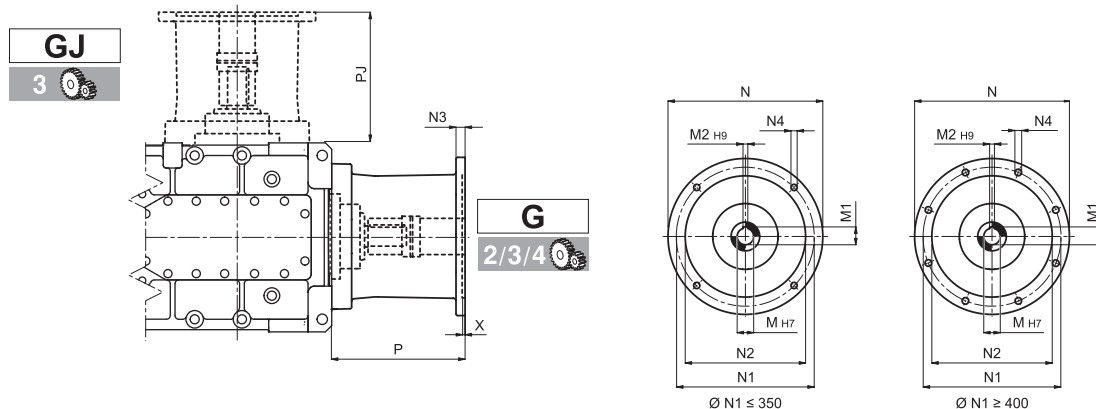
S



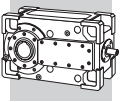
\* For correct use, refer to the "OPERATION AND MAINTENANCE MANUAL".



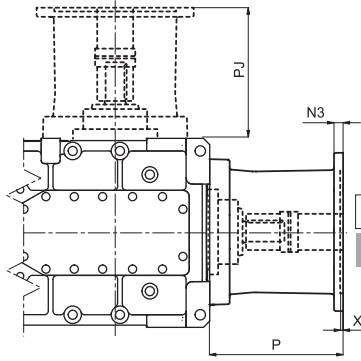
### 31.1 MOTOR MOUNTING WITH BELL HOUSING AND FLEXIBLE COUPLING



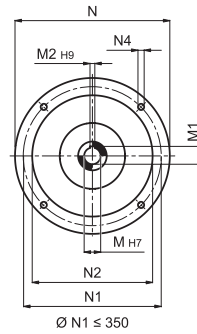
	M	M1	M2	N	N1	N2	N3	N4	X	P	PJ
HDO 71 3_132	38	41.3	10	300	265	230	16	M12x20	5	246.5	—
HDO 71 3_160	42	45.3	12	350	300	250	23	18	6	276.5	—
HDO 71 3_180	48	51.8	14	350	300	250	23	18	6	276.5	—
HDO 71 3_200	55	59.3	16	400	350	300	—	M16x23	7	301.5	—
HDO 71 3_225	60	64.4	18	450	400	350	25	18	7	309.5	—
HDO 81 3_160	42	45.3	12	350	300	250	48	18	7	320	—
HDO 81 3_180	48	51.8	14	350	300	250	48	18	7	320	—
HDO 81 3_200	55	59.3	16	400	350	300	—	M16x23	7	320	—
HDO 81 3_225	60	64.4	18	450	400	350	25	18	7	356	—
HDO 81 3_250	65	69.4	18	550	500	450	30	18	6	386	—
HDO 81 3_280	75	79.9	20	550	500	450	30	18	6	386	—
HDO 91 4_112	28	31.3	8	250	215	180	15	14	5	260	—
HDO 91 4_132	38	41.3	10	300	265	230	—	M12x20	6	280	—
HDO 91 3/4_160	42	45.3	12	350	300	250	23	18	6	346	—
HDO 91 3/4_180	48	51.8	14	350	300	250	23	18	6	346	—
HDO 91 3/4_200	55	59.3	16	400	350	300	—	M16x23	7	371	—
HDO 91 3/4_225	60	64.4	18	450	400	350	26	18	7	378	—
HDO 91 3_250	65	69.4	18	550	500	450	30	18	6	408	—
HDO 91 3_280	75	79.9	20	550	500	450	30	18	6	408	—
HDO 95 4_112	28	31.3	8	250	215	180	15	14	5	260	—
HDO 95 4_132	38	41.3	10	300	265	230	—	M12x20	6	280	—
HDO 95 3/4_160	42	45.3	12	350	300	250	23	18	6	346	—
HDO 95 3/4_180	48	51.8	14	350	300	250	23	18	6	346	—
HDO 95 3/4_200	55	59.3	16	400	350	300	—	M16x23	7	371	—
HDO 95 3/4_225	60	64.4	18	450	400	350	26	18	7	378	—
HDO 95 3_250	65	69.4	18	550	500	450	30	18	6	408	—
HDO 95 3_280	75	79.9	20	550	500	450	30	18	6	408	—
HDO 100 2_250	65	69.4	18	550	500	450	30	18	6	420.5	—
HDO 100 2_280	75	79.9	20	550	500	450	30	18	6	420.5	—
HDO 100 2_315	80	85.4	22	660	600	550	22	22	10	457	—
HDO 100 3_160	42	45.3	12	350	300	250	23	18	6	351	351
HDO 100 3_180	48	51.8	14	350	300	250	23	18	6	351	351
HDO 100 3_200	55	59.3	16	400	350	300	—	M16x23	7	376	376
HDO 100 3_225	60	64.4	18	450	400	350	26	18	7	383	383
HDO 100 3_250	65	69.4	18	550	500	450	30	18	6	413	413
HDO 100 3_280	75	79.9	20	550	500	450	30	18	6	413	413
HDO 100 3_315	80	85.4	22	660	600	550	22	22	10	449.5	449.5



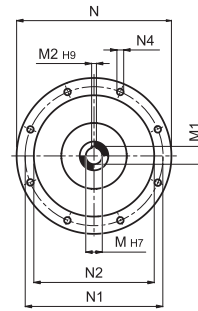
**GJ**  
3



**G**  
2/3/4



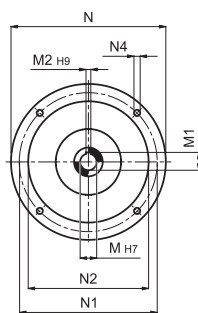
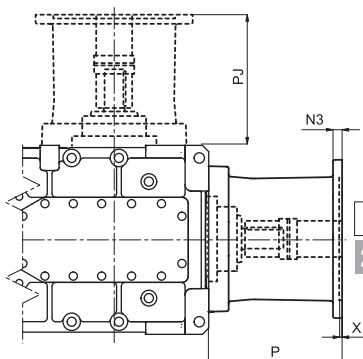
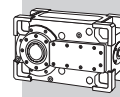
Ø N1 ≤ 350



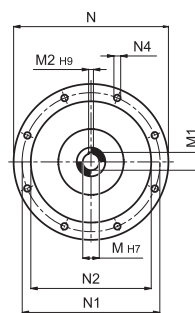
Ø N1 ≥ 400

**HDO**

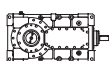

	M	M1	M2	N	N1	N2	N3	N4	X	P	PJ
HDO 100 4 112	28	31.3	8	250	215	180	15	14	5	265	—
HDO 100 4 132	38	41.3	10	300	265	230	—	M12x20	6	285	—
HDO 100 4 160	42	45.3	12	350	300	250	23	18	6	351	—
HDO 100 4 180	48	51.8	14	350	300	250	23	18	6	351	—
HDO 100 4 200	55	59.3	16	400	350	300	—	M16x23	7	376	—
HDO 100 4 225	60	64.4	18	450	400	350	26	18	7	383	—
HDO 110 2 280	75	79.9	20	550	500	450	30	18	6	420.5	—
HDO 110 2 315	80	85.4	22	660	600	550	22	22	10	457	—
HDO 110 3 160	42	45.3	12	350	300	250	23	18	6	351	351
HDO 110 3 180	48	51.8	14	350	300	250	23	18	6	351	351
HDO 110 3 200	55	59.3	16	400	350	300	—	M16x23	7	376	376
HDO 110 3 225	60	64.4	18	450	400	350	26	18	7	383	383
HDO 110 3 250	65	69.4	18	550	500	450	30	18	6	413	413
HDO 110 3 280	75	79.9	20	550	500	450	30	18	6	413	413
HDO 110 3 315	80	85.4	22	660	600	550	22	22	10	449.5	449.5
HDO 110 4 112	28	31.3	8	250	215	180	15	14	5	265	—
HDO 110 4 132	38	41.3	10	300	265	230	—	M12x20	6	285	—
HDO 110 4 160	42	45.3	12	350	300	250	23	18	6	351	—
HDO 110 4 180	48	51.8	14	350	300	250	23	18	6	351	—
HDO 110 4 200	55	59.3	16	400	350	300	—	M16x23	7	376	—
HDO 110 4 225	60	64.4	18	450	400	350	26	18	7	383	—
HDO 120 2 315	80	85.4	22	660	600	550	22	22	10	482	—
HDO 120 3 200	55	59.3	16	400	350	300	—	M16x23	7	346	—
HDO 120 3 225	60	64.4	18	450	400	350	26	18	7	353	353
HDO 120 3 250	65	69.4	18	550	500	450	30	18	6	383	383
HDO 120 3 280	75	79.9	20	550	500	450	30	18	6	383	383
HDO 120 3 315	80	85.4	22	660	600	550	22	22	10	419.5	419.5
HDO 120 4 132	38	41.3	10	300	265	230	—	M12x40	6	255	—
HDO 120 4 160	42	45.3	12	350	300	250	23	18	6	321	—
HDO 120 4 180	48	51.8	14	350	300	250	23	18	6	321	—
HDO 120 4 200	55	59.3	16	400	350	300	—	M16x23	7	346	—
HDO 120 4 225	60	64.4	18	450	400	350	26	18	7	353	—
HDO 125 2 315	80	85.4	22	660	600	550	22	22	10	482	—
HDO 125 3 200	55	59.3	16	400	350	300	—	M16x23	7	346	306
HDO 125 3 225	60	64.4	18	450	400	350	26	18	7	353	313
HDO 125 3 250	65	69.4	18	550	500	450	30	18	6	383	343
HDO 125 3 280	75	79.9	20	550	500	450	30	18	6	383	343
HDO 125 3 315	80	85.4	22	660	600	550	22	22	10	419.5	375.5
HDO 125 4 132	38	41.3	10	300	265	230	—	M12x40	6	255	—
HDO 125 4 160	42	45.3	12	350	300	250	23	18	6	321	—
HDO 125 4 180	48	51.8	14	350	300	250	23	18	6	321	—
HDO 125 4 200	55	59.3	16	400	350	300	—	M16x23	7	346	—
HDO 125 4 225	60	64.4	18	450	400	350	26	18	7	353	—



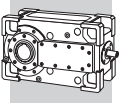
Ø N1 ≤ 350



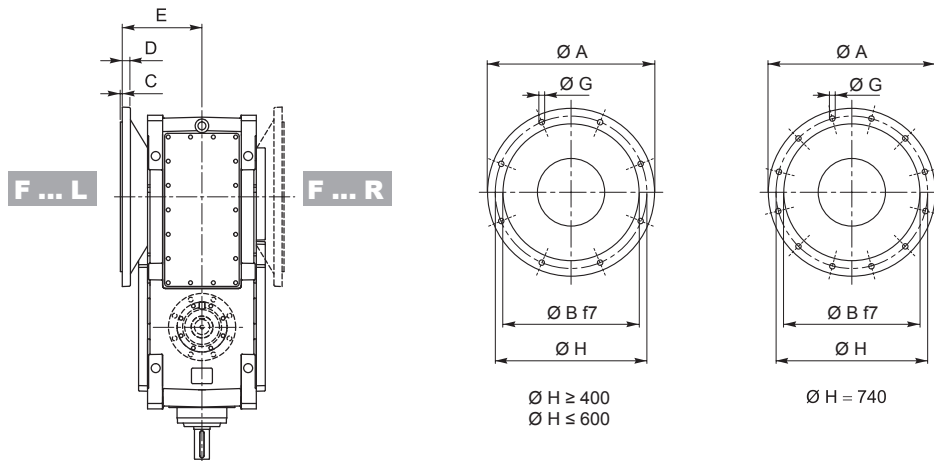
Ø N1 ≥ 400


	M	M1	M2	N	N1	N2	N3	N4	X	P	PJ
 HDO 130 2 315	80	85.4	22	660	600	550	22	22	10	590	—
HDO 130 3 250	65	69.4	18	550	500	450	30	18	6	415.5	413
HDO 130 3 280	75	79.9	20	550	500	450	30	18	6	415.5	413
HDO 130 3 315	80	85.4	22	660	600	550	22	22	10	452	449.5
HDO 130 4 160	42	45.3	12	350	300	250	23	18	6	416	—
HDO 130 4 180	48	51.8	14	350	300	250	23	18	6	416	—
HDO 130 4 200	55	59.3	16	400	350	300	—	M16x23	7	441	—
HDO 130 4 225	60	64.4	18	450	400	350	26	18	7	448	—
HDO 130 4 250	65	69.4	18	550	500	450	30	18	6	478	—
HDO 130 4 280	75	79.9	20	550	500	450	30	18	6	478	—
HDO 140 2 315	80	85.4	22	660	600	550	22	22	10	590	—
HDO 140 3 250	65	69.4	18	550	500	450	30	18	6	415.5	413
HDO 140 3 280	75	79.9	20	550	500	450	30	18	6	415.5	413
HDO 140 3 315	80	85.4	22	660	600	550	22	22	10	452	449.5
HDO 140 4 160	42	45.3	12	350	300	250	23	18	6	416	—
HDO 140 4 180	48	51.8	14	350	300	250	23	18	6	416	—
HDO 140 4 200	55	59.3	16	400	350	300	—	M16x23	7	441	—
HDO 140 4 225	60	64.4	18	450	400	350	26	18	7	448	—
HDO 140 4 250	65	69.4	18	550	500	450	30	18	6	478	—
HDO 140 4 280	75	79.9	20	550	500	450	30	18	6	478	—
HDO 150 3 280	75	79.9	20	550	500	450	30	18	6	553.5	528.5
HDO 150 3 315	80	85.4	22	660	600	550	22	22	10	590	565
HDO 150 4 180	48	51.8	14	350	300	250	23	18	6	426	—
HDO 150 4 200	55	59.3	16	400	350	300	—	M16x23	7	451	—
HDO 150 4 225	60	64.4	18	450	400	350	26	18	7	458	—
HDO 150 4 250	65	69.4	18	550	500	450	30	18	6	488	—
HDO 150 4 280	75	79.9	20	550	500	450	30	18	6	488	—
HDO 150 4 315	80	85.4	22	660	600	550	22	22	10	524.5	—
HDO 160 3 280	75	79.9	20	550	500	450	30	18	6	553.5	508.5
HDO 160 3 315	80	85.4	22	660	600	550	22	22	10	590	545
HDO 160 4 180	48	51.8	14	350	300	250	23	18	6	426	—
HDO 160 4 200	55	59.3	16	400	350	300	—	M16x23	7	451	—
HDO 160 4 225	60	64.4	18	450	400	350	26	18	7	458	—
HDO 160 4 250	65	69.4	18	550	500	450	30	18	6	488	—
HDO 160 4 280	75	79.9	20	550	500	450	30	18	6	488	—
HDO 160 4 315	80	85.4	22	660	600	550	22	22	10	524.5	—
HDO 170	 <b>BONFIGLIOLI TECHNICAL SERVICE</b>										
HDO 180											

**HDO**



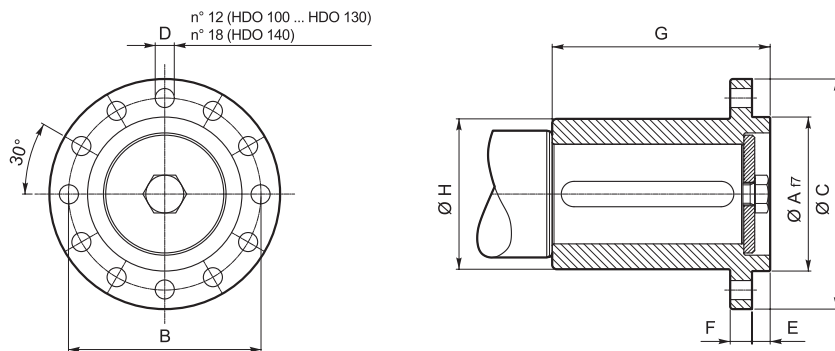
### 31.2 MOUNTING FLANGE




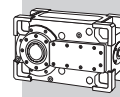
		A	B	C	D	E	G	H
HDO 71	F450	450	350	5	22	210	18	400
	F550	550	450	5	24	210	18	500
HDO 81	F450	450	350	5	22	240	18	400
	F550	550	450	5	24	240	18	500
HDO 91	F550	550	450	5	24	260	18	500
HDO 91	F550	550	450	5	24	315	18	500
HDO 100	F660	660	550	7	30	335	22	600
HDO 110	F660	660	550	7	30	335	22	600
HDO 120	F660	660	550	7	30	355	26	600
HDO 125	F730	730	580	7	35	360	26	660
HDO 130	F800	800	680	7	40	460	26	740
HDO 140	F800	800	680	7	40	460	26	740
HDO 150		 <b>BONFIGLIOLI TECHNICAL SERVICE</b>						
HDO 160								
HDO 170								
HDO 180								

### 31.3 MANIFOLD FLANGE

Available for shaft arrangement: L, LJ, LD, R, RJ and RD, all featuring a single output shaft extension.

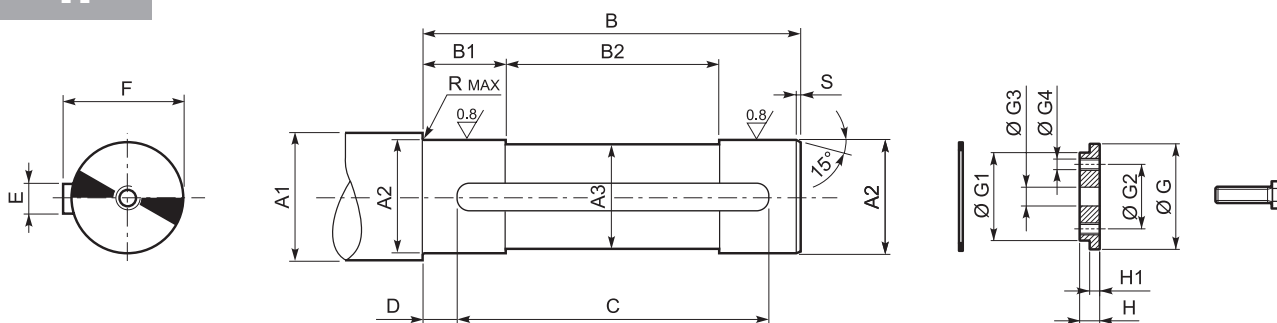




	A	B	C	D	E	F	G	H
HDO 71 FM	125	175	208	19	14	21	195	135
HDO 81 FM	170	212	254	21	20	24	240	166
HDO 91 FM	170	212	254	21	20	24	240	166
HDO 95 FM	200	260	309	25	19	31	244	200
HDO 100 FM	200	260	309	25	19	31	244	200
HDO 110 FM	200	260	309	25	19	31	289	200
HDO 120 FM	200	260	309	25	19	31	289	200
HDO 125 FM	220	320	384	32	19	31	344	240
HDO 130 FM	220	320	384	32	19	31	344	250
HDO 140 FM	250	380	450	32	19	40	344	310
HDO 150		 <b>BONFIGLIOLI TECHNICAL SERVICE</b>						
HDO 160								
HDO 170								
HDO 180								







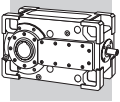
### 31.4 CUSTOMER'S SHAFT

## H

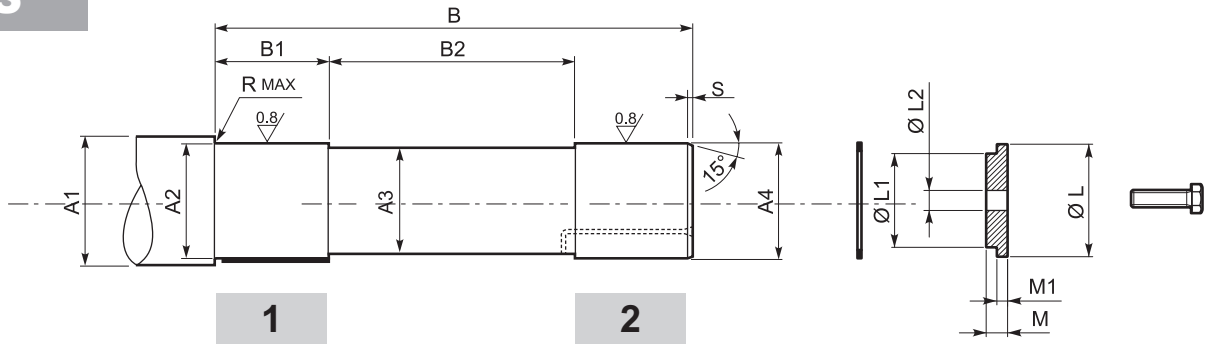


	A1	A2	A3	B	B1	B2	C	D	E	F	R	S	 UNI6604
<b>HDO 71</b>	≥ 89	80 h6	79	283	78	127	220	30	22 h9	85	2.5	2.5	22x14x220A
<b>HDO 81</b>	≥ 104	95 h6	94	338	73	192	280	30	25 h9	100	2.5	2.5	25x14x280A
<b>HDO 91</b>	≥ 121	110 h6	109	378	88	202	320	30	28 h9	116	2.5	2.5	28x16x320A
<b>HDO 95</b>	≥ 128	115 h6	114	398	100	228	340	30	32 h9	122	2.5	2.5	32x18x340A
<b>HDO 100</b>	≥ 133	120 h6	119.5	420	100	250	360	30	32 h9	127	3	2.5	32x18x360A
<b>HDO 110</b>	≥ 143	130 h6	129.5	420	100	250	360	30	32 h9	137	3	2.5	32x18x360A
<b>HDO 120</b>	≥ 153	140 h6	139.5	444	110	260	400	40	36 h9	148	3	2.5	36x20x400A
<b>HDO 125</b>	≥ 163	150 h6	149.5	444	110	260	400	40	36 h9	158	3	2.5	36x20x400A
<b>HDO 130</b>	≥ 183	170 h6	169.5	540	135	310	400	80	40 h9	179	3	2.5	40x22x400A
<b>HDO 140</b>	≥ 193	180 h6	179.5	540	135	310	400	80	45 h9	190	3	2.5	45x25x400A
<b>HDO 150</b>	≥ 223	210 h6	209.5	667	155	400	500	100	50 h9	221	3	3	50x28x450B
<b>HDO 160</b>	≥ 223	210 h6	209.5	667	155	400	500	100	50 h9	221	3	3	50x28x450B
<b>HDO 170</b>	≥ 255	240 h6	239.5	697	170	400	506	100	56 h9	252	3	3	56x32x450B
<b>HDO 180</b>	 BONFIGLIOLI TECHNICAL SERVICE												

Out of scope for supply									
	 UNI7437	G	G1	G2	 G3	G4	H	H1	 UNI5739
<b>HDO 71</b>	—	100	80 d9	—	22	—	10	8.5	M20x50
<b>HDO 81</b>	—	115	95 d9	—	26	—	15	13.5	M24x60
<b>HDO 91</b>	—	130	110 d9	—	26	—	15	13.5	M24x60
<b>HDO 95</b>	115x4	115 d9	91	59	26	M16	24	12	M24x70
<b>HDO 100</b>	120x4	120 d9	96	64	26	M16	24	12	M24x70
<b>HDO 110</b>	130x4	130 d9	105	69	26	M20	24	12	M24x70
<b>HDO 120</b>	140x4	140 d9	115	79	26	M20	30	15	M24x80
<b>HDO 125</b>	150x4	150 d9	122	86	26	M20	30	15	M24x80
<b>HDO 130</b>	170x4	170 d9	142	102	33	M24	34	17	M30x90
<b>HDO 140</b>	180x4	180 d9	150	110	33	M24	34	17	M30x90
<b>HDO 150</b>	210x5	210 d9	178	140	33	M24	36	18	M30x100
<b>HDO 160</b>	210x5	210 d9	178	140	33	M24	36	18	M30x100
<b>HDO 170</b>	240x5	240 d9	208	160	39	M24	36	18	M36x110
<b>HDO 180</b>	 BONFIGLIOLI TECHNICAL SERVICE								



S



1

2

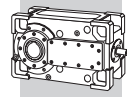
HDO

	A1	A2	A3	A4	B	B1	B2	R	S
HDO 71	≥ 104	82 h7	79	80 g6	332	77	174	2.5	2.5
HDO 81	≥ 119	97 h7	94	95 g6	398	95	205	2.5	2.5
HDO 91	≥ 128	112 h7	109	110 g6	440	87	273	2.5	2.5
HDO 95	≥ 133	120 h6	114.5	115 g6	498	104	309	2.5	2.5
HDO 100	≥ 138	125 h6	119.5	120 g6	517	104	328	3	2.5
HDO 110	≥ 148	135 h6	129.5	130 g6	523	104	334	3	2.5
HDO 120	≥ 158	145 h6	139.5	140 g6	550	104	354	3	2.5
HDO 125	≥ 168	155 h6	149.5	150 g6	570	104	363	3	2.5
HDO 130	≥ 188	175 h6	169.5	170 g6	681	104	462	3	2.5
HDO 140	≥ 198	185 h6	179.5	180 g6	689	104	470	3	2.5
HDO 150	≥ 228	215 h6	209.5	210 g6	839	104	593	3	3
HDO 160	≥ 228	215 h6	209.5	210 g6	839	104	593	3	3
HDO 170	BONFIGLIOLI TECHNICAL SERVICE								
HDO 180	BONFIGLIOLI TECHNICAL SERVICE								

Out of scope for supply

	 UNI7437	L	L1	 L2	M	M1	 UNI5739
HDO 71	—	100	80 d9	22	10	8.5	M20x50
HDO 81	—	115	95 d9	26	15	13.5	M24x60
HDO 91	—	130	110 d9	26	15	13.5	M24x60
HDO 95	115x4	115 d9	91	26	16	12	M24x65
HDO 100	120x4	120 d9	96	26	16	12	M24x65
HDO 110	130x4	130 d9	105	26	16	12	M24x65
HDO 120	140x4	140 d9	115	26	19	15	M24x70
HDO 125	150x4	150 d9	122	26	19	15	M24x70
HDO 130	170x4	170 d9	142	33	21	17	M30x80
HDO 140	180x4	180 d9	150	33	21	17	M30x80
HDO 150	210x5	210 d9	178	33	29	18	M30x90
HDO 160	210x5	210 d9	178	33	29	18	M30x90
HDO 170	BONFIGLIOLI TECHNICAL SERVICE						
HDO 180	BONFIGLIOLI TECHNICAL SERVICE						

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.



## BEVEL HELICAL GEAR UNITS SERIES HDO 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.

### 32 INSTALLATION, USE AND MAINTENANCE

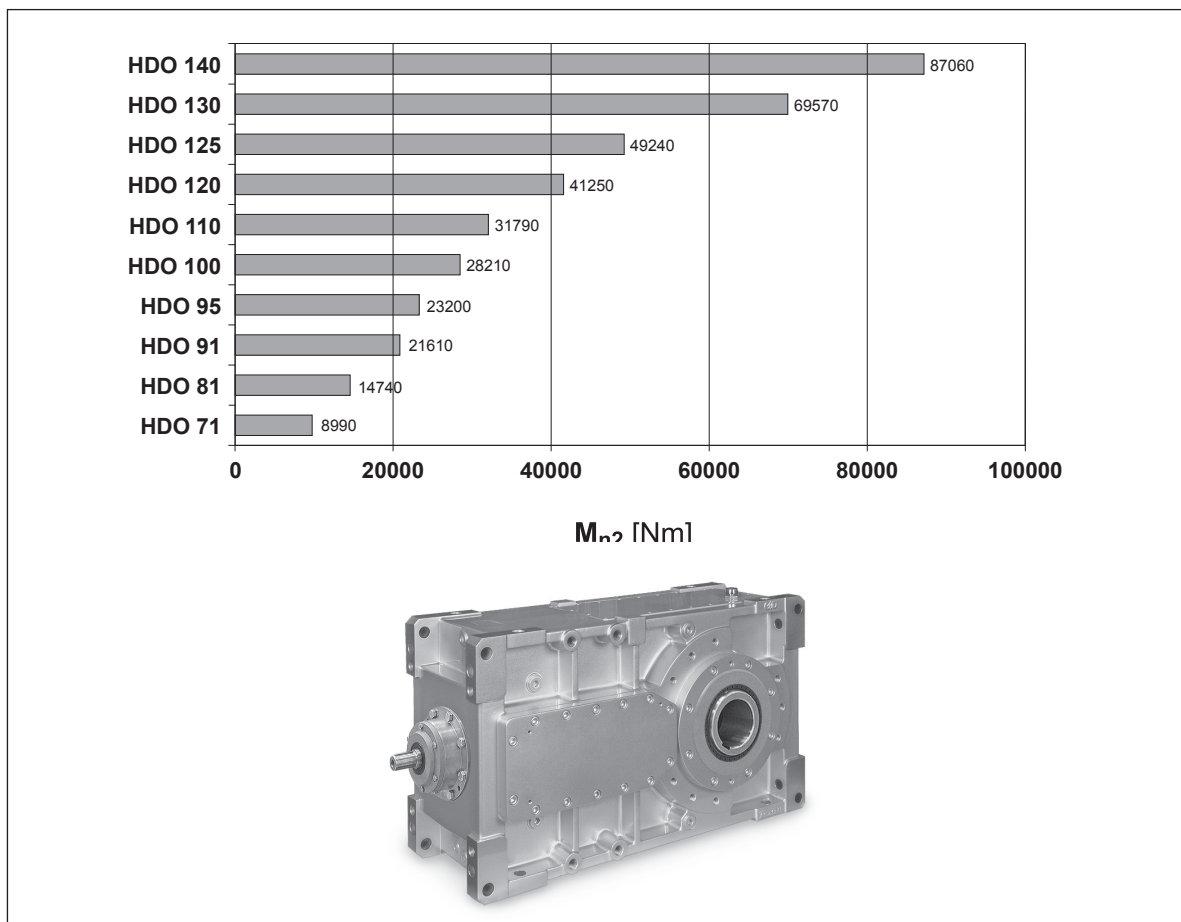
All the instructions for installation, use and maintenance of the product are given in the unit's Manual.

This can be downloaded from [www.bonfiglioli.com](http://www.bonfiglioli.com) where the manual is available in PDF format in a number of languages.

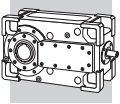
This document must be kept in a suitable place, in the vicinity of the installed gear unit, as a reference for all persons authorised to work with or on the product throughout its service life.

### 33 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.

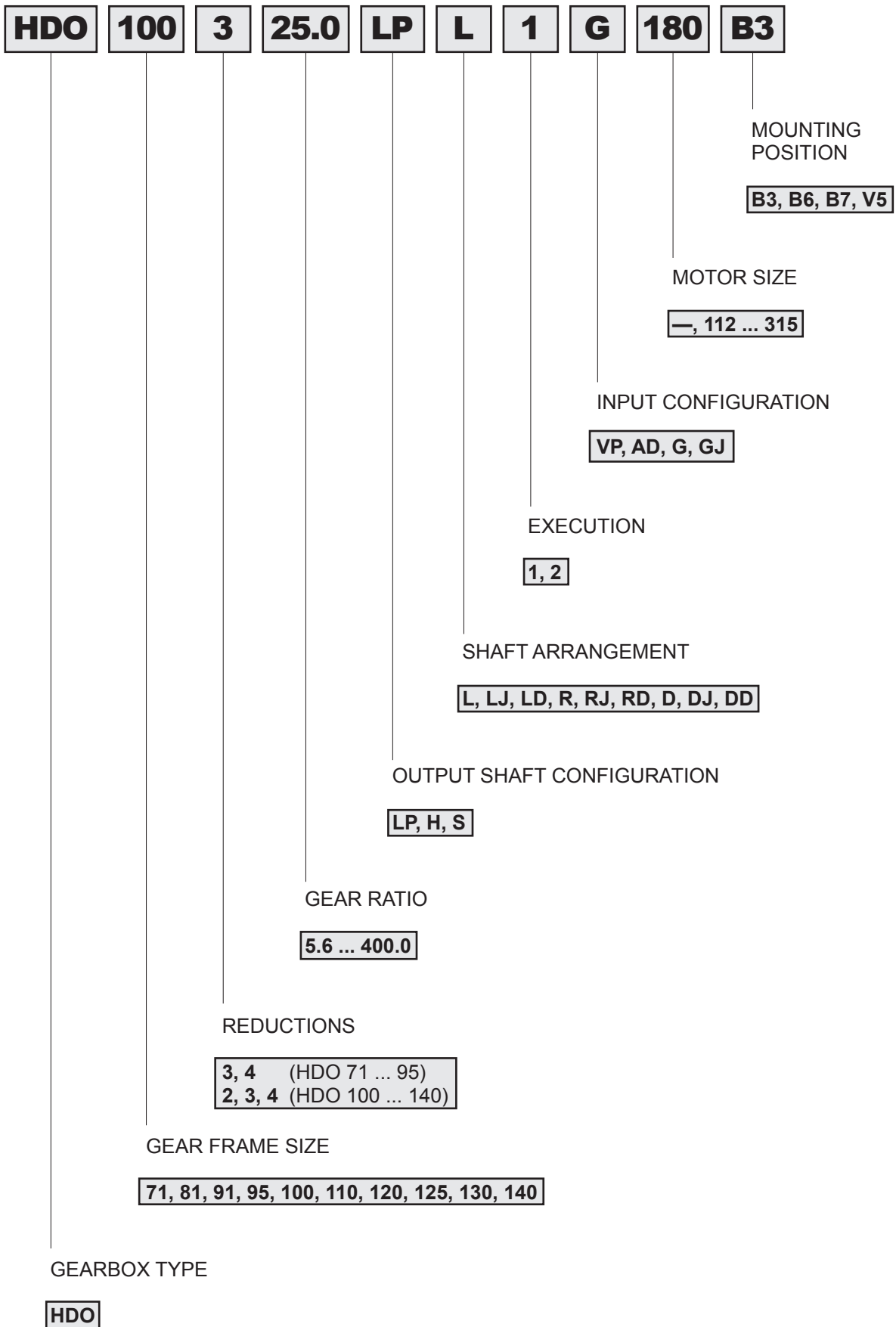




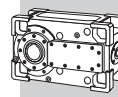


34 DESIGNATION

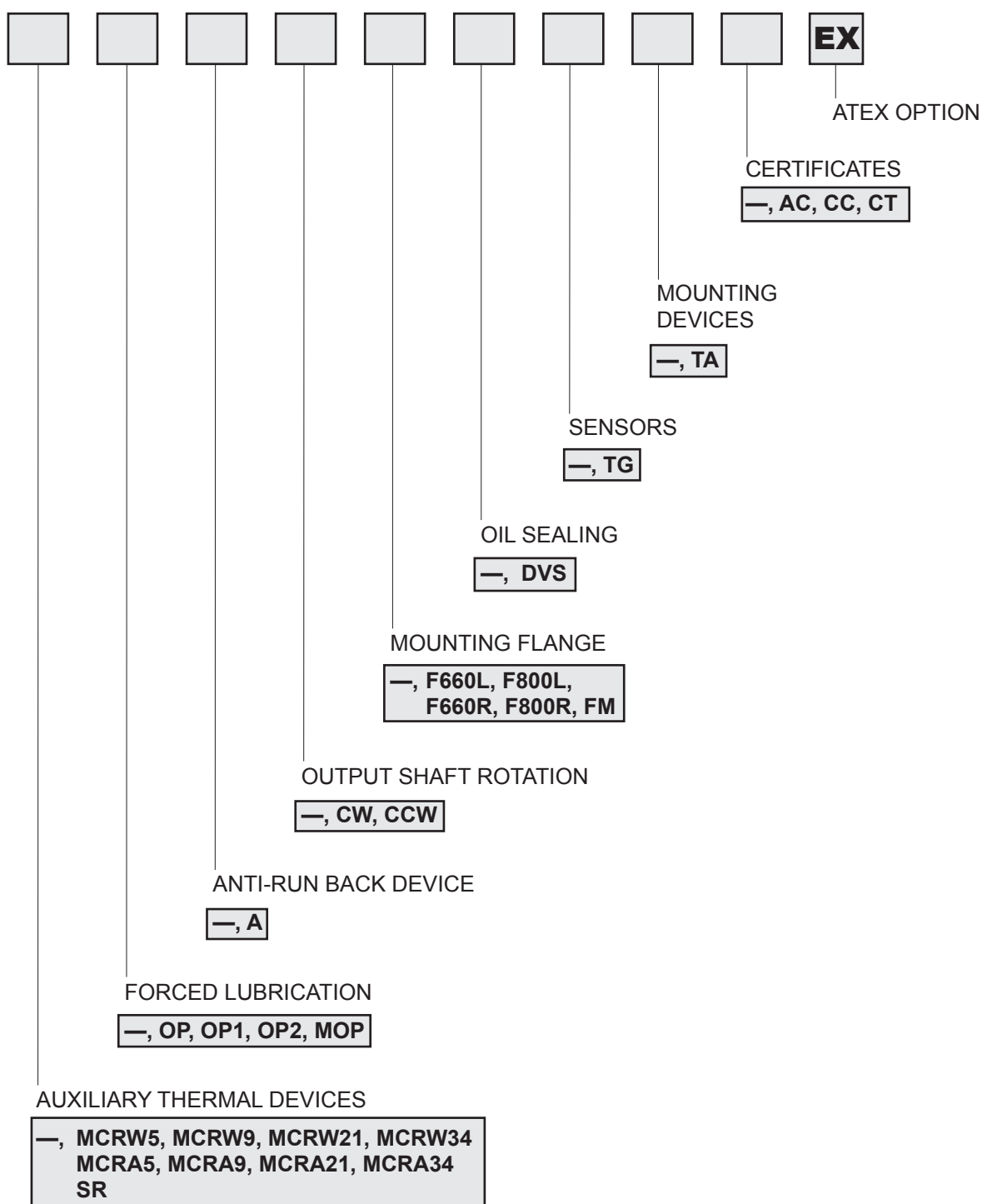
34.1 BASE VARIANTS



HDO



### 34.2 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.

### 35 OTHER INFORMATION ABOUT GEARBOX AND GEARMOTOR

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