



BREVINI®
Motion Systems

DC1K1A1_000000R0
07 2024

Product Catalog

Brevini® Compact Plano-Helical Drives **PH - BPH Series**

Torques from 230 Nm to 36.600 Nm



Compact industrial solutions

Brevini® PH - BPH Series Plano-Helical drives.
The patented design strongly reduces weights and dimensions, achieving the same performance and reliability in comparison to traditional gearboxes, thus leading to important advantages, both applicative and economical.



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Helical gears - bevel helical gears - compact gears

Overview

This gearboxes are designed for shaft mounting, introducing specific advantages for this fitting solution, which is widely appreciated in many industrial applications.

This gearboxes come up with a innovative mix of planetary and helical gears. Matching the best features of these technologies these products turn out to be compact, reliable, easy to assemble and maintain.

The original design strongly reduces weights and dimensions, achieving the same performance and reliability in comparison to helical and bevel-helical traditional gearboxes, thus leading to important advantages, both applicative and economical.

3D design lead us to the generation of 'virtual' prototypes which were analyzed and optimized with FEM (Finite Element Analysis) techniques. Each designed size is then submitted to tests on our test benches, simulating the real working condition.

Technical features

- Compact design for shaft mounting, with monolithic casing in nodular cast iron GS400-15 (UNI EN 1083)
- Modular design, with many ratio available.
- Gears of the helical stage are case hardened and profile ground. The teeth correction and crowning design guarantee optimum performances under load.
- Planetary gears: ring-gear is nitrided, pinion and planet gears are case hardened with profile ground. Planetary gears are optimized for maximum performance and quiet operation.
- Bearings from the major manufacturers, designed for long life and the maximum efficiency.
- Prevention of lubricant leakages and contamination by means of seals, with the option of labyrinth seals and double seals with separate grease filled chamber.
- Output hollow shafts in alloy steel, available as standard:
 - K: cylindric with feather keyhole
 - D: cylindric hollow shaft for shrink Disc
 - S: splined shaft according DIN 5480/5482
- Many inputs and couplings available:
 - Adaptors for IEC electric motors with splined joint
 - Adaptors for NEMA electric motors with splined joint
 - Adaptors for hydraulic motors
 - Flexible and fluid couplings
 - Clutches and torque limiters
 - Belt couplings
- Many accessories available, both standard and tailor-made:
 - Torque arms
 - Shrink discs
 - Common bed frame
 - Backstops and brakes
 - Auxiliary drives
 - Auxiliary cooling and lubrication systems
- High efficiency due to the high quality of gearing and bearing choices
 - η $\eta > 97\%$ for 2 stages gearboxes
 - η $\eta > 96\%$ for 3 stages gearboxes
 - η $\eta > 95\%$ for 4 stages gearboxes
- Compact drives as bevel helical gear units
- Compact drives as bevel helical gear units with vertical output shafts

Referenced standards

Gearing performance calculated according ISO 6336-96

Bearing life calculated according ISO 281-95

Motor couplings according IEC 72.2

Keyhole and keyway as for UNI 6604

Splined shafts as for DIN 5480 / 5482

Male input shafts as for DIN 332

Same torque, less weight, less space

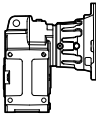
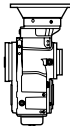
This gearboxes are designed for shaft mounting, introducing specific advantages for this fitting solution, which is widely appreciated in many industrial applications.

This gearboxes come up with a innovative mix of planetary and helical gears. Matching the best features of these technologies these gearboxes turn out to be compact, reliable, easy to assemble and maintain.



General:

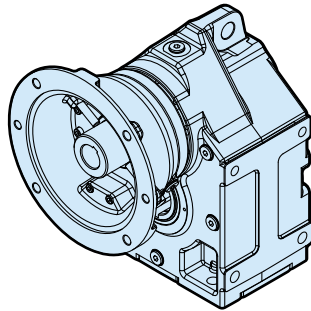
- Ultra compact design
- Computer programs for drive selection.
- Higher torque vs. traditional solutions of same weight and dimensions
- Adaptors with included joint for IEC/NEMA motors and hydraulic motors
- Customized versions and complete driving solutions
- Excellent price performance ratio

Symbolology	
Symbol referring to gear unit type PH	
Symbol referring to gear unit type BPH	
Symbols describing kind of output shaft: K = Hollow shaft with key S = Hollow spline shaft D = Hollow shaft with shrink disc	 K  S  D
IEC input adapter	
Male input shaft	
00 input flange	
Gear unit weight [kg]	
Oil quantity in liters [l]	
Oil breather and filling plug	
Oil level	
Oil drain	
Reference to page	

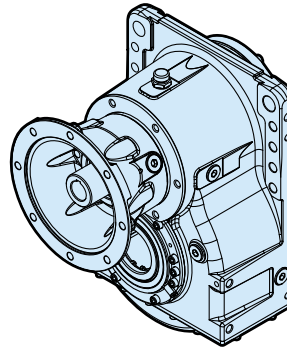
PH

HELICAL GEARBOX

size 13



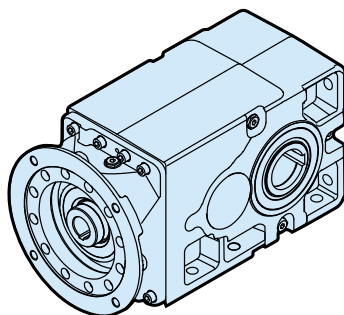
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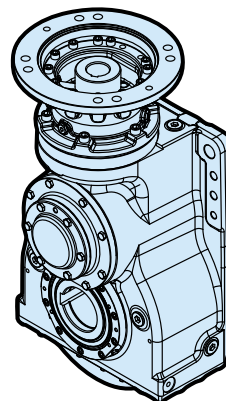
BPH

BEVEL HELICAL GEARBOX

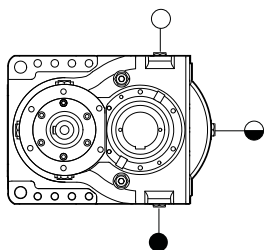
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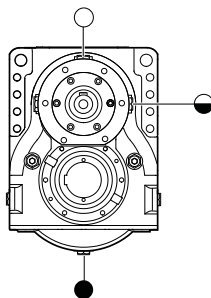
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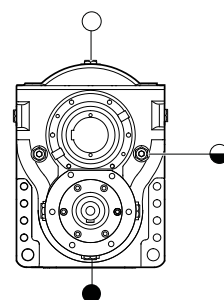
PH



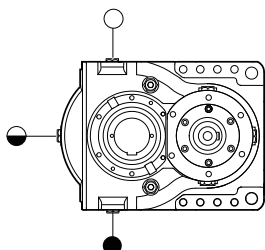
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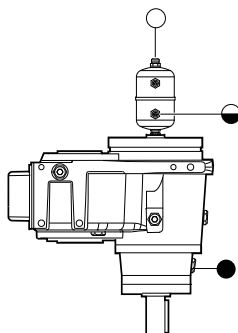
B6



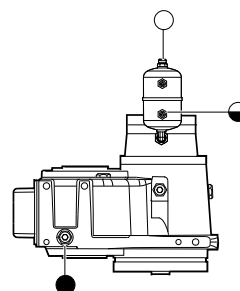
B7



B8

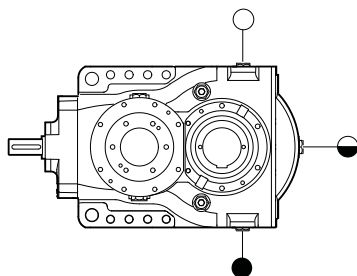


V5

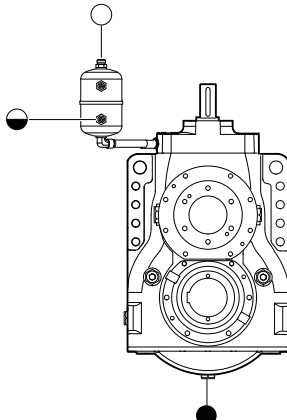


V6

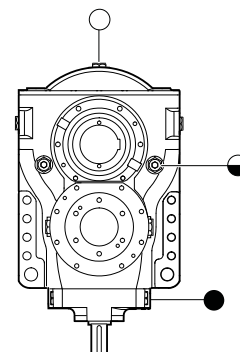
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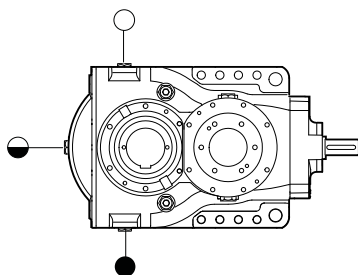
B3



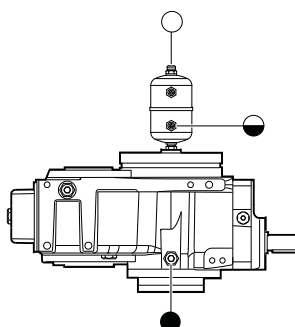
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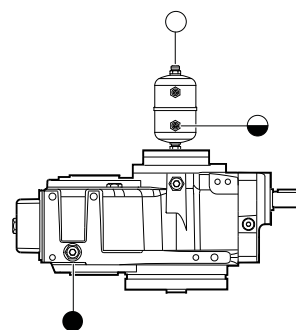
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B8



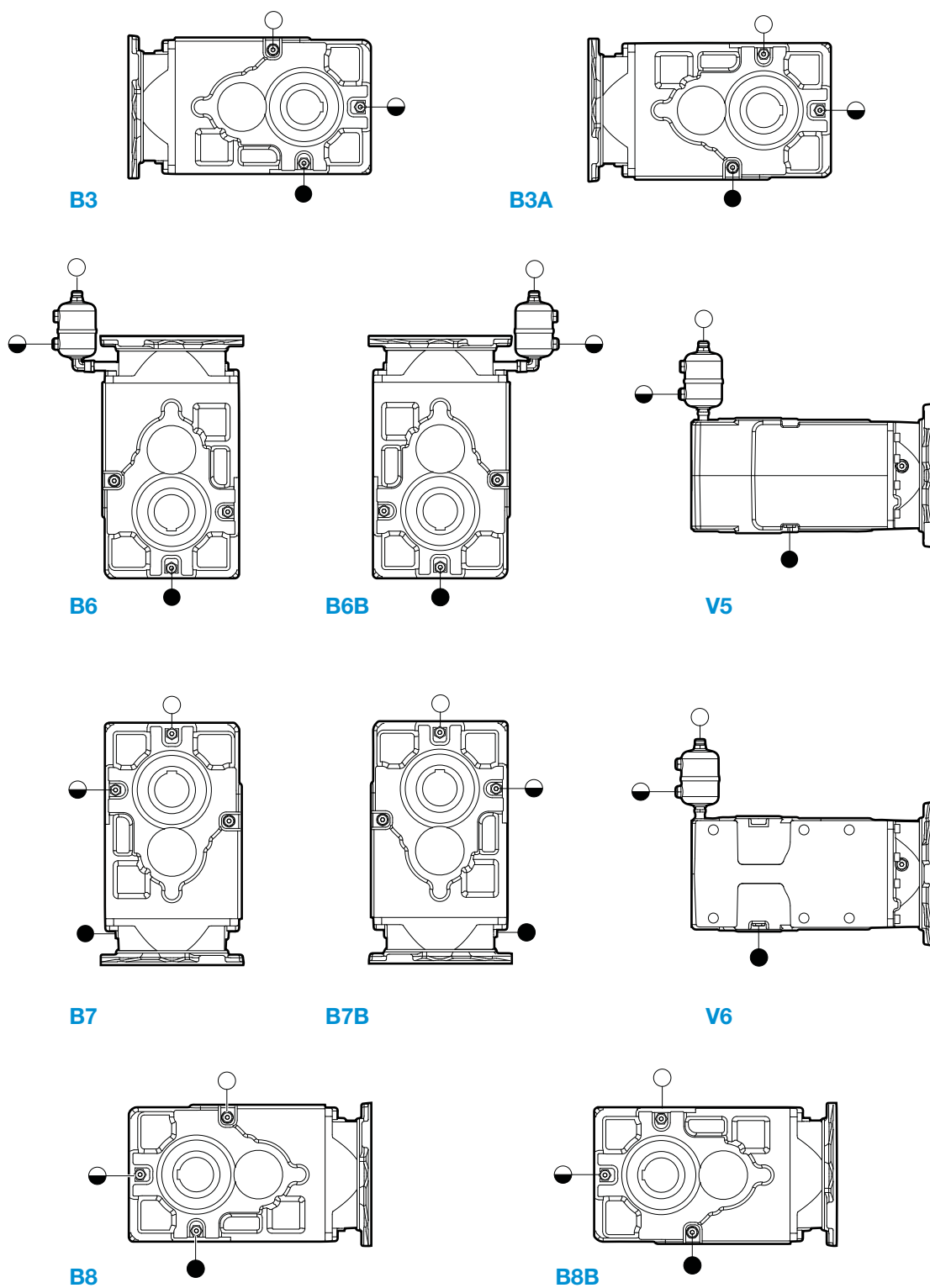
V5



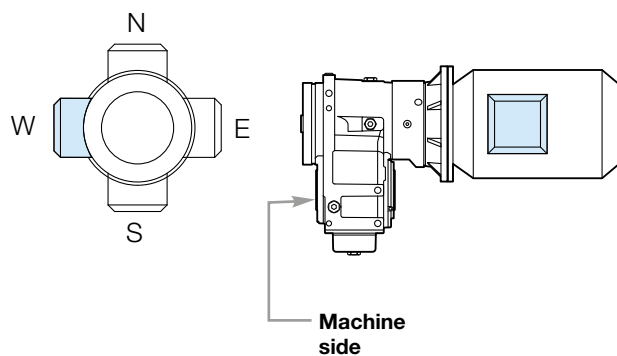
V6

Oil tank mounting position to be indicated during order/selection process

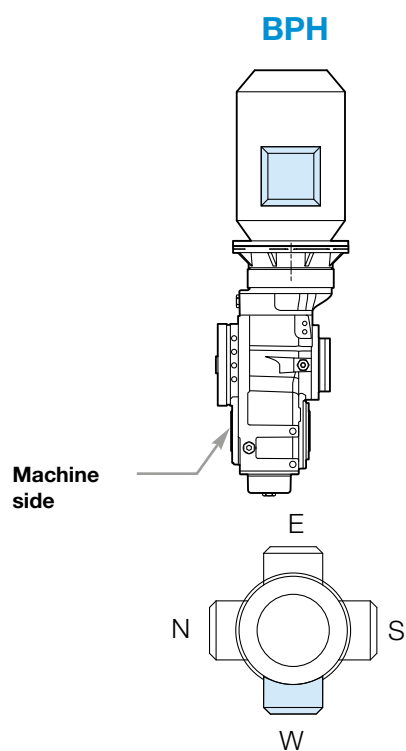
BPH 13



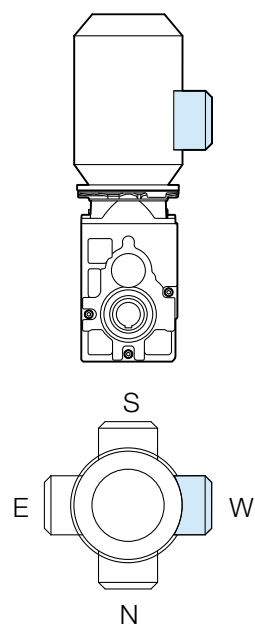
PH



BPH



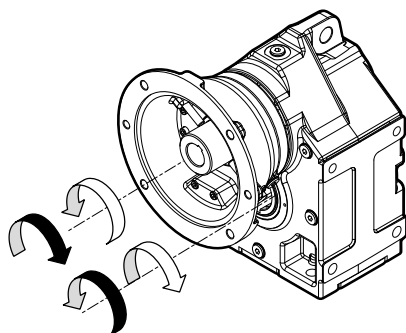
BPH13



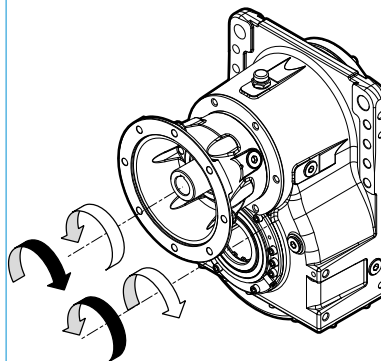
PH

HELICAL GEARBOX

size 13



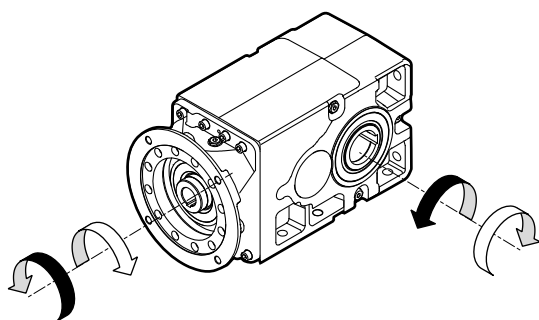
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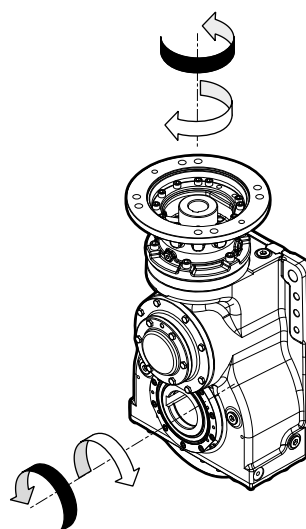
BPH

BEVEL HELICAL GEARBOX

size 13



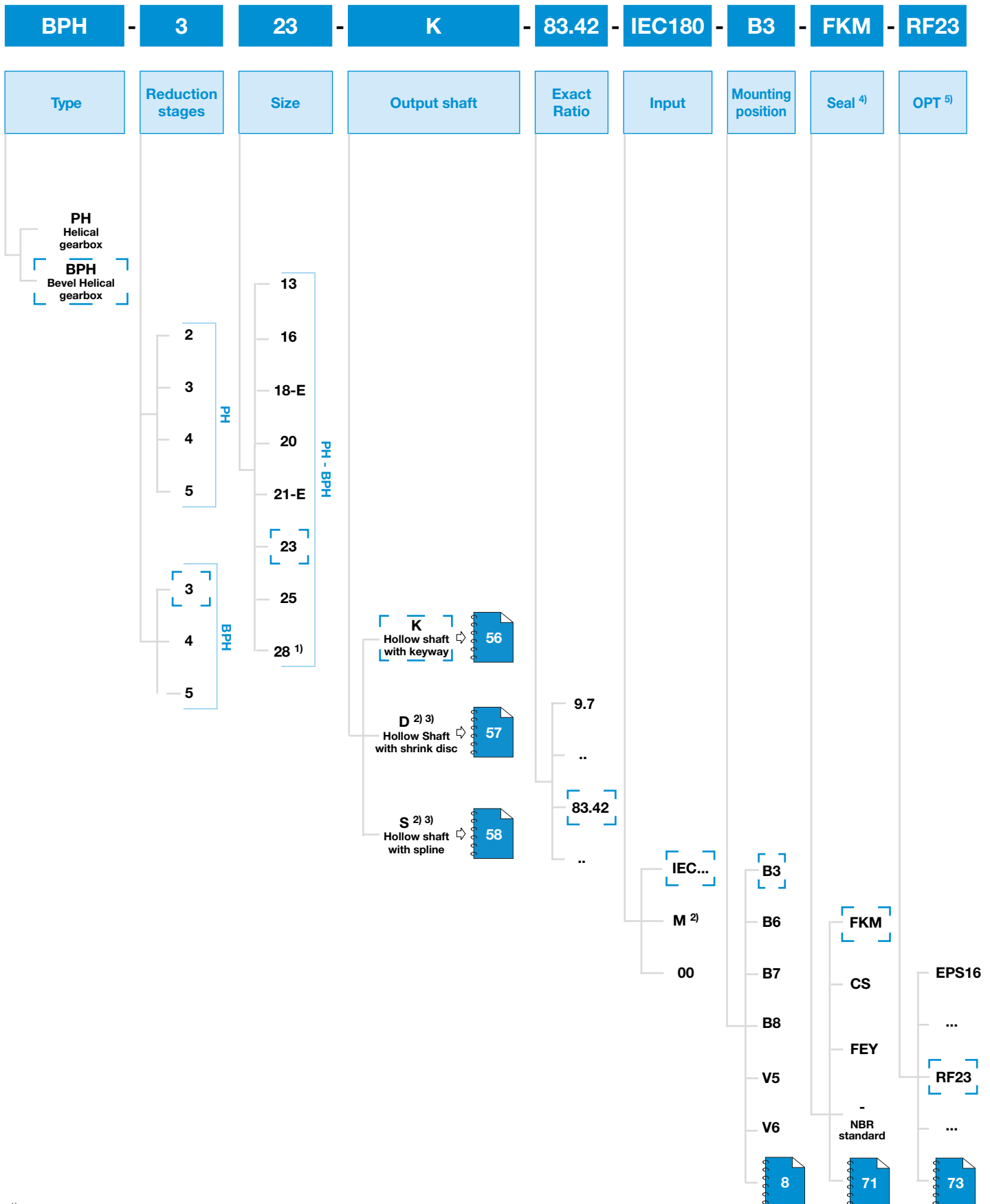
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¹⁾ Only for BPH

²⁾ Feasibility on request

³⁾ Specify D and D1 dimensions show on page 57-58 after output shaft code

⁴⁾ Specify correct seal arrangement indicating 1- machine side and 2-end plate side i.e: 1-FEY and 2-CS

⁵⁾ Add all needed accessories and opt codes for a correct product selection

i_d Desired reduction ratio

It is the ratio between input speed n_1 and desired output speed n_2 and shall be used to search a suitable i_{eff} .

i_{eff} Exact reduction ratio of the gearbox

It is the relationship between input speed n_1 and output speed n_2 .
Standard values of i_{eff} can be found on the datasheet, other values may be available on request.

n_1 Gearbox input speed [min^{-1}]

It is related to high speed shaft (i.e. motor speed or pulley speed).

n_2 Gearbox output speed [min^{-1}]

It's the speed of the hollow shaft and it's given by the relation:

$$n_2 = \frac{n_1}{i_{eff}}$$

P_m Installed Power [kW]

It is the motor rated power, even if not completely used in the application.

P_1 Power supplied by the motor [kW]

It is the operating power transmitted by the motor to the gearbox input.

P_2 Power transmitted to the driven machine [kW]

It is the power transmitted by the gearbox to the driven machine.
Knowledge of this value is fundamental for a correct gearbox selection.
The required power can be determined by means of calculation, experience or comparison.
If this is not possible then assume $P_1 = P_m$ and use the formula:

$$P_2 = \eta \cdot P_1$$

where η is the gearbox efficiency.

P_{N1} Gearbox rated power [kW]

The rated power is the input power that assures a life of 10000 hours ($K_L = 1$) calculated at the most frequent input speed n_1 (1500 min^{-1} , 1000 min^{-1} , 750 min^{-1}).

P_T Gearbox thermal power [kW]

The thermal ratings of the gear units are given in the tables.
The values given refer to a continuous use of the gear unit:

- With splash lubrication
- Horizontally mounted
- At a gear unit input speed of 1500 rpm
- For a max. oil temperature of 90 °C
- At an ambient temperature of 20 °C
- In the "large ambient" condition of use.

With work cycles requiring an intermittent use of the gear unit and/or the presence of an ambient temperature different from 20 °C, the gear unit thermal rating can be adjusted to the specific application by means of the K factor.

T₁ Torque supplied by the motor [Nm]

It is the torque transmitted by the motor to the input of the gearbox, it is related to **P₁** and **n₁** via the formula:

$$T_1 = \frac{9550 \cdot P_1}{n_1}$$

T₂ Torque transmitted to the driven machine [Nm]

It is the torque transmitted by the output shaft of the gearbox to the driven machine.

Knowledge of this value is fundamental for a correct gearbox selection. The required torque can be determined by means of calculation, experience or comparison.

If this is not possible then assume **P₁ = P_m** and use the formula:

$$T_2 = \frac{9550 \cdot P_1}{n_2} \cdot \eta$$

T_{2N} Gearbox rated output torque [Nm]

The torque is the output torque **T₂** that assures a life of 10000 hours (**K_L = 1**) calculated at the most frequent input speed **n₁** (1500 min⁻¹, 1000 min⁻¹, 750 min⁻¹).

$$T_{2N} = \frac{9550 \cdot P_{N1}}{n_2} \cdot \eta$$

T_{2ISO} Limit torque [Nm]

This is the value of the output torque of the gear unit calculated for stress on gears and equivalent to the threshold value under ISO 6336, which generally equals to 50x10⁶ cycles. The value takes into account both the bending strength and the surface resistance of the side of the tooth, normally more restrictive.

T_{2MAX} Max torque [Nm]

Max. permissible output torque, as peak or for short periods.

For drives involving a high number of starts or reversals, also the max.

operational torque must be opportunely limited according to the fatigue resistance of the gears or shafts and all the active elements of the gear unit.

$$T_{2MAX} = T_{2ISO} \cdot 2$$

T_{P2} Maximum estimated peak torque [Nm]

Peak torque **T_{P2}** is the higher torque foreseen in the machine cycle. This value can be reached, as example, during start or stop of the machine, specially when high inertia mass are present and start/stop succeed at full load. Presence of torque controlling devices (elastic joints, hydraulic joints, frictions, particular types of inverter, etc.) can positively influence the application, refer to us for a more detailed analysis.

$$T_{P2} \leq T_{2MAX}$$

η Gearbox efficiency

Gearbox overall efficiency is given by the relation:

$$\eta = \frac{P_2}{P_1}$$

Gearbox selection can be done with the following criteria and factors.

Design shall take in account exceptional conditions such as: instantaneous peak loads, emergency stops, power failures, hostile environment and any

other event that can be risk of injuries.

If you suspect that any event can cause the gear unit to work outside the planned requirements please consult the DANA area contact person for a detailed analysis.

Application factor K_A is an empirical value that depends on historic experience in different kind of applications. K_A takes into account working characteristic and typology of the driven machine, overload severity and frequency, and also uncertainty relative to the nature and the parameters of the application.

K_A values reported below refers to prime mover that are electric or hydraulic motors.

More accurate values of K_A can be determined where precise knowledge of load spectrum and working conditions is available, refer to us for a detailed analysis.

Table 1: Gear unit application factor K_A	K_A
Agitators / Mixers	
Pure liquids	1.00
Liquids-variable density or liquids and solids	1.25
Heavy duty blunger	1.50
Feeders / Batchers	
Rotary for dust or prill	1.00
Rotary for not uniform materials	1.25
Belt, screw, plate	1.00
Reciprocating, vibrator	1.75
Elevators / Conveyors	
Belt,centrifugal or gravity discharge	1.25
Bucket	1.25~1.50
Escalators	1.25~1.50
Man lift, hoisting towers, mobile scaffolding, passenger transport	*
Crushers / Granulators	
Rubber, plastics, recycling	1.25
Minerals, stone,cement	1.75
Mining industry	
Conveyors,winches,desilting and dewatering machine	1.25
Cutters, excavators	1.50
Vehicles on rails	1.25
Rotary mills (rod,roller,ball)	1.50
Hammer mills	1.75
Rotary screening	1.25
Cranes / Winches / Travelling lift	
Travel cranes	1.50
Hoist	*
Slewing	1.50
Food industry	
Mixers and meat grinders	1.00
Mill roll train, extruder,dough mixers	1.25
Bottle washing machine	1.00
Sugar cane knives	1.50
Beet slicer,washer and cookers	1.25

* See standard specification

Table 1: Gear unit application factor K_A	K_A
Lumber and woodworking industries	
Loaders, pallet stackers, boards and chip conveyors	1.00
Logs conveyors	1.50
Tools machines	1.25
Mechanical barkers	1.50
Drum barkers	1.75
Textile industry	
Cards, spinners, washers, frames	1.00
Clay working machinery	
Pug mills, rotary deslimers and filters	1.25
Drive rollers and extruders	1.50
Brick and tile presses	1.75
Rubber and plastics industries	
Plastics extruders	1.25
Rubber extruders	1.50
Mixing mills, tubers, calenders, rolling mills	1.25
Crackers	1.75
Wrapping and stacking machinery	
Palletizing and stacking machinery	1.25
Sewage disposal equipment	
Biological tanks (revolving disk)	1.00
Dewatering screws, collectors, rotary screens	1.25
Aerators, rotary breakers	1.50
Metallurgy and metal mills	
Shears, croppers, straightening presses	1.50
Drive rollers, bending and flattening roll	1.25
Roller ways	1.25
Continuous casting machinery	1.25
Reversing and pushers	1.75
Ladle pushers	1.50
Paper mills	
Agitators, mixers, chip feeders, coating rolls	1.25
Winders and suction rolls	1.25
Chippers, calenders, glazing machines, presses	1.75
Rotating drums	
Dryers, chillers, rotary kilns, washing machines	1.00
Tumblers, cement kilns	1.75
For application different from those indicated, we suggest to use the followings factors	
Uniform load	1.00
Moderate overloads	1.25~1.50
Heavy overloads	1.50~1.75
Very heavy overloads or frequent inversion	1.75~2.00

K_Z Required life factor

Start / stop frequency factor **K_Z** reported below keeps in count the frequency of starts and stops.

Table 2: Start/stop frequency factor	Start/stop frequency (Start or stop/hour)				
	<5	6~25	26~100	101~200	>200
K_Z	1.00	1.05	1.15	1.25	Refer to us

K_L Required life factor

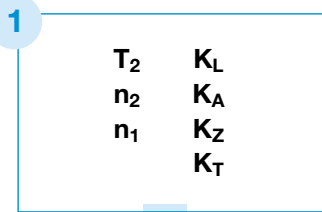
Life factor **K_L** values reported below is a corrective factor that keeps in count life requirements in condition of good level of maintenance and normal level of reliability. For applications that present inadequate maintenance or that requires high reliability (personnel safety, key importance in the production chain, difficulty in repairs, etc.) **K_L** shall be multiplied by 1.3.

Table 3: Life factor	Running life requirement						
	2500 h	5000 h	10000 h	15000 h	20000 h	30000 h	50000 h
K_L	0.80	0.90	1.00	1.07	1.12	1.20	1.32

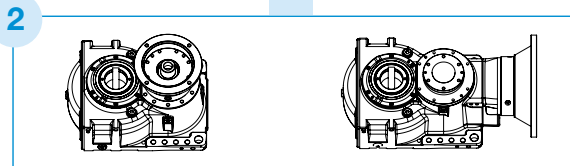
K_T Thermal factor

The thermal factor **K_T** is an adjustment factor for thermal power and keeps in count for environment temperature and machine duty cycle. In case of ventilation induced by the electric motor fan **K_T** value shall be multiplied by 1.3.

Table 4: thermal factor K_T		DUTY CYCLE (working minutes/hour)					
		60	50	40	30	20	10
ENV. TEMPERATURE T _E [°C]	10°C	1.14	1.23	1.28	1.43	1.71	2.00
	20°C	1.00	1.08	1.12	1.25	1.50	1.75
	30°C	0.86	0.93	0.96	1.07	1.29	1.50
	40°C	0.71	0.77	0.80	0.89	1.07	1.25
	50°C	0.57	0.62	0.64	0.71	0.86	1.00



Gather data and factors of the application



Select type

Planetary Helical gearboxes
PH

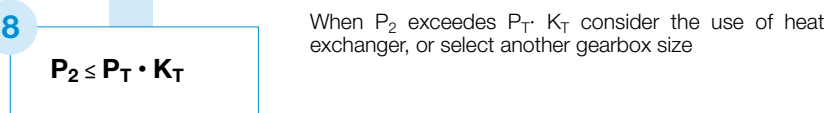
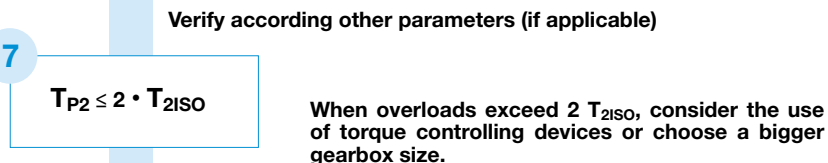
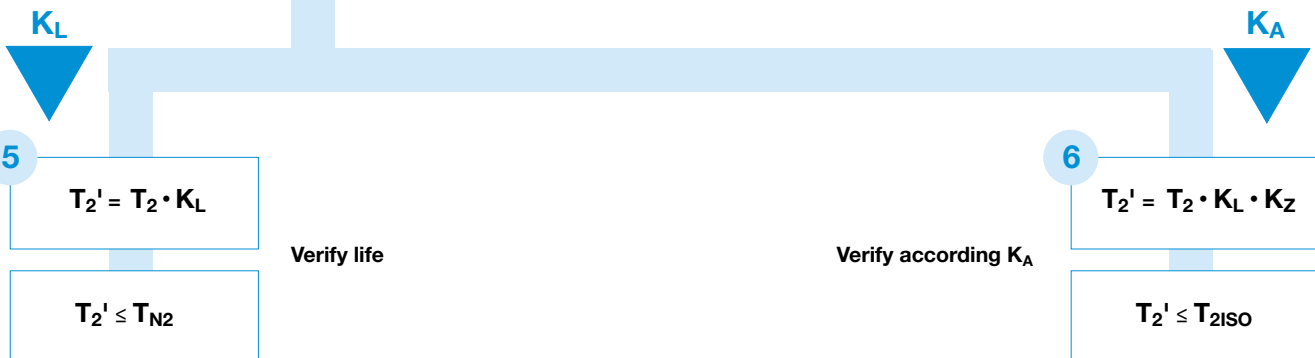
Bevel Planetary Helical gearboxes
BPH

3

i_{eff}	1500			1000			750			n_{MAX} [rpm]	T_{2ISO} [Nm]	P_T [kW]
	n_2	T_{2N}	P_{N1}	n_2	T_{2N}	P_{N1}	n_2	T_{2N}	P_{N1}			
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]			
PH 221-E												
13.42	112	7170	85.6	74.5	8100	64.5	55.9	8920	53.0	3000	12640	50+
15.84	94.7	6460	85.6	63.1	9060	64.5	47.3	10520	52.2			
18.32	81.9	9130	79.9	54.6	10310	60.2	40.9	11350	48.7			
22.28	67.3	9470	68.1	44.9	10700	61.3	33.7	11780	41.5			
26.46	56.7	9785	59.3	37.8	11050	44.6	28.3	12180	36.1			
31.85	47.1	9730	50.0	31.4	9980	33.6	23.5	10950	27.1			

4

$$i_{eff} \sim \frac{n_1}{n_2}$$



1 Gather application data

Application: liquids and solid agitator.

Required life is 20000 hours, with a good level of maintenance.

Motor data:

Electric 4 poles asynchronous motor IEC180L

Installed power:

$P_m = 22 \text{ kW}$

Motor speed

$n_1 = 1470 \text{ min}^{-1}$

Required output speed:

$n_2 \sim 22 \text{ min}^{-1}$

Power transmitted to the driven machine:

$P_1 = 80\% \text{ di } P_m = 17.6 \text{ kW}$

Duty cycle (working minutes/hour):

60

Environment temp:

20 °C

Start/stop frequency:

1 start per hour

Factors:

$K_Z = 1$

$K_A = 1.25$

$K_Z = 1.12$

$K_T = 1$

$$T_2 = \frac{9550 \cdot P_1}{n_2} \cdot \eta = \frac{9550 \cdot 17.6}{22} \cdot 0.96 = 7334 \text{ Nm}$$

$$i_d = \frac{n_1}{n_2} = \frac{1470}{22} = 66.8$$

2 Select version

Planetary helical gearbox (parallel axis): **PH**

3 Select

$i_{\text{eff}} - T_{2N} - T_{\text{ISO}} - P_T$

4

i_{eff}	1500			1000			750			$n_{1\text{MAX}}$ [rpm]	$T_{2\text{ISO}}$ [Nm]	P_T [kW]
	n_2 [rpm]	T_{2N} [Nm]	P_{N1} [kW]	n_2 [rpm]	T_{2N} [Nm]	P_{N1} [kW]	n_2 [rpm]	T_{2N} [Nm]	P_{N1} [kW]			
PH 220												
11.74	128	4150	57.3	85	4700	43.2	64	5100	35.1	3000	8100	45
13.86	108	4900	57.2	72	5550	43.1	54	6050	35.2		9500	
15.75	95	5350	54.9	63	6050	41.3	48	6600	33.8		9300	
18.59	81	5550	48.2	54	6250	36.2	40	6800	29.5		8500	
23.27	64	5750	39.9	43	5850	27.1	32	5950	20.6		7200	
27.00	56	5350	32	37	5450	21.7	28	5550	16.6		6700	
32.63	45	4650	23.1	31	4700	15.5	23	4800	11.9		5800	
PH 320												
39.69	38	5900	24.1	25	6650	18.1	19	7250	14.7	3000	10900	34
46.85	32	6950	24	21	7850	18	16	8550	14.7			
53.24	28	7900	23.9	19	8900	18	14	9700	14.7		10100	
62.82	24	8650	22.2	16	9300	15.9	12	9450	12.1			
69.14	22	8300	19.4	14	9400	14.6	10.8	10200	11.9			
78.64	19	7600	15.6	13	7800	10.7	9.5	7900	8.1		9000	
81.59	18	9200	18.2	12	9450	12.4	9.2	9600	9.5	3000		
94.50	16	8350	14.3	10.6	8450	9.6	7.9	8600	7.3		10100	
111.5	12	6400	13.8	8	6650	9.3	6.7	6800	7.1			

5 Verify life

$$T_2' = T_2 \cdot K_L = 7334 \cdot 1.12 = 8214 \text{ Nm}$$

$$T_2' (8214 \text{ Nm}) < T_{2N} (8300 \text{ Nm})$$

6 Verify according KA

$$T_2' = T_2 \cdot K_A \cdot K_Z = 7334 \cdot 1.25 \cdot 1 = 9168 \text{ Nm}$$

$$T_2' (9168 \text{ Nm}) < T_{ISO} (10100 \text{ Nm})$$

7 Verify overloads

Not applicable (no significant overloads)

8 Verify thermal power

$$P_2 = \eta \cdot P_1 = 0.96 \cdot 17.6 = 16.9 \text{ Kw}$$

$$P_2 (16.9 \text{ Kw}) < P_T \cdot K_T (34 \text{ Kw})$$

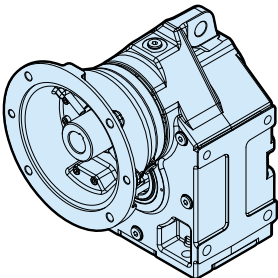
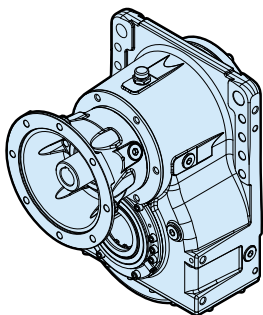
Selected gearbox is:

PH	-	3		20	-	K	-	69.14	-	IEC180
Type		Reduction stages		Size		Output shaft		Exact Ratio		Input



BREVINI[®]

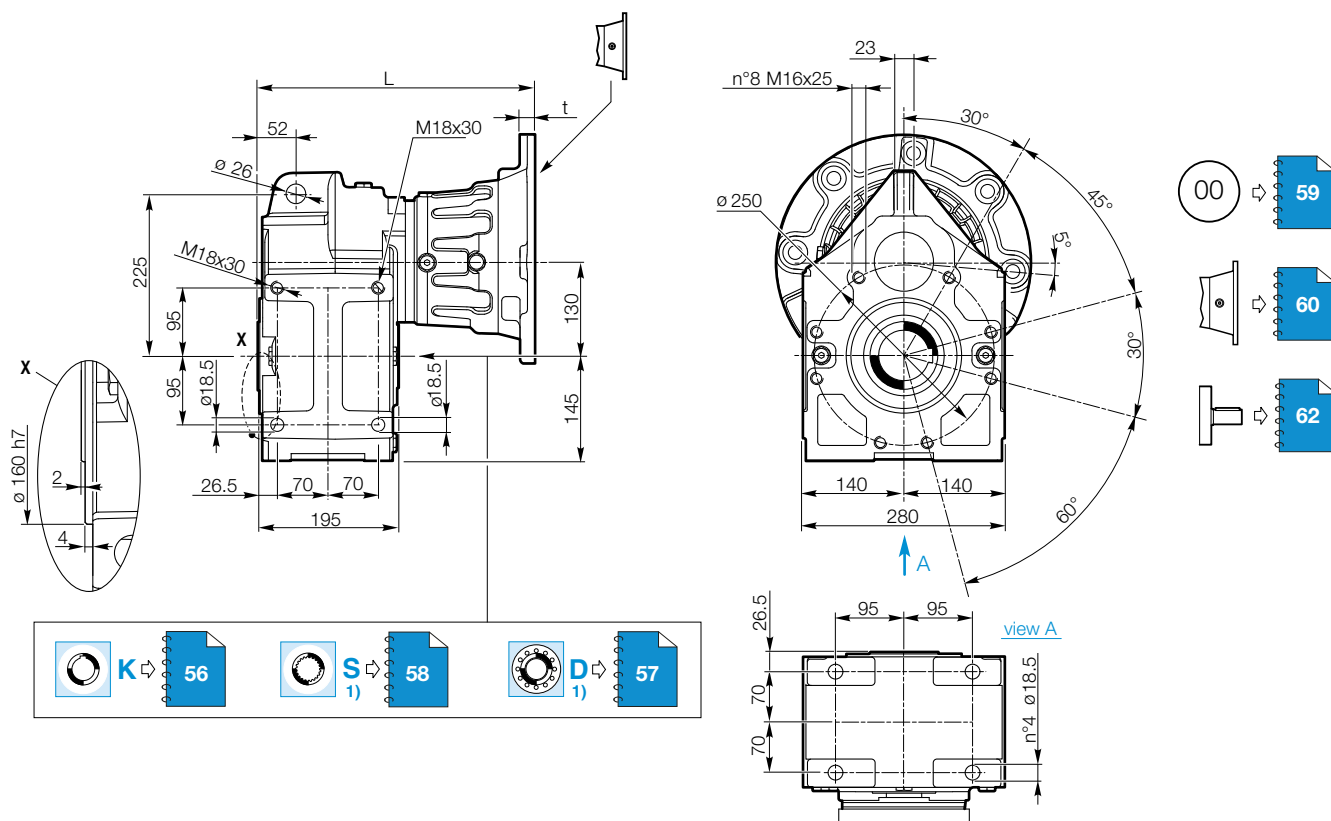
Motion Systems

Type		Size	i_N	T_{N2} [kNm]	Efficiency η	Page
PH		13	13.92 - 1700	2 - 4	0.98 0.97 0.96	24
		16	13.92 - 1694	2 - 6	0.98	26
		18-E	10.75 - 2081	4 - 11		28
		20	11.74 - 1695	4 - 12	0.97	30
		21-E	13.42 - 1996	7 - 16		32
		23	19.92 - 1407	8 - 19	0.96	34
		25	13.34 - 1183	10 - 27		36

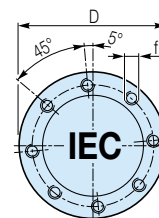
i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]		
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}					
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]					
PH 213														
13.92	108	2500	29.1	72	2800	21.7	54	3050	17.7	3000	7700	29		
15.82	95	2750	28.1	63	3100	21.1	47	3400	17.3		7800			
16.43	91	2950	29	61	3300	21.6	46	3350	16.4		7060			
18.68	80	3250	28	54	3350	19.3	40	3400	14.7		6260			
19.77	76	2850	23.3	51	2950	16	38	3000	12.2		7060			
21.29	70	3300	25	47	3350	16.9	35	3450	13		6260			
22.95	65	3300	23.2	44	3400	15.9	33	3450	12.1		7060			
25.62	59	2900	18.3	39	3000	12.6	29	3050	9.6		6260			
27.63	54	2900	16.9	36	3000	11.7	27	3050	8.9		6020			
30.87	49	2450	12.8	32	2450	8.6	24	2500	6.6		6260			
33.2	45	2950	14.3	30	3050	9.9	23	3100	7.5		5140			
35.24	43	2100	9.7	28	2100	6.5	21	2150	5.0		6260			
37.16	40	2950	12.8	27	2950	8.5	20	3000	6.5		6260			
42.41	35	2500	9.5	24	2500	6.4	18	2550	4.9		6200			
PH 313														
50.79	29.5	3890	12.7	19.7	4030	8.7	14.8	4160	6.8	3000	7800	22		
57.75	26	3920	11.2	17.3	4110	7.8	13	4290	6.1		7060			
59.95	25	3520	9.7	16.7	3650	6.7	12.5	3810	5.3		7800			
65.66	22.8	3960	10	15.2	4190	7	11.4	4380	5.5		7060			
70.97	21.1	3990	9.3	14.1	4170	6.5	10.6	4240	4.9		7800			
74.84	20	4020	8.9	13.4	4270	6.3	10	4460	4.9		7060			
80.69	18.6	4070	8.3	12.4	4320	5.9	9.3	4520	4.6		7800			
83.77	17.9	3610	7.1	11.9	3840	5.1	9.0	4010	4.0		7060			
85.3	17.6	4100	7.9	11.7	4220	5.4	8.8	4290	4.1		7800			
88.33	17	3640	6.8	11.3	3870	4.8	8.5	4040	3.8		7060			
91.97	16.3	4000	7.2	10.9	4110	4.9	8.2	4180	3.7		7800			
95.46	15.7	4140	7.2	10.5	4250	4.9	7.9	4320	3.7		7060			
96.99	15.5	4180	7.1	10.3	4440	5.0	7.7	4640	3.9		7800			
100.7	14.9	3710	6.1	9.9	3950	4.3	7.4	4120	3.4		7060			
108.5	13.8	4250	6.5	9.2	4520	4.6	6.9	4720	3.6		7800			
110.5	13.6	4050	6.0	9.0	4150	4.1	6.8	4230	3.2		7060			
114.5	13.1	3780	5.5	8.7	4020	3.9	6.6	4200	3.0		7800			
117	12.8	3800	5.4	8.5	4040	3.8	6.4	4220	3.0		7060			
123.9	12.1	4340	5.8	8.1	4610	4.1	6.1	4720	3.1		7800			
128.1	11.7	3850	5.0	7.8	4090	3.5	5.9	4270	2.7		7060			
130.5	11.5	3860	4.9	7.7	4100	3.5	5.7	4290	2.7		7800			
141.2	10.6	4110	4.8	7.1	4220	3.3	5.3	4290	2.5		7060			
146.2	10.3	3930	4.4	6.8	4180	3.1	5.1	4360	2.5		7800			
152.2	9.9	3870	4.2	6.6	3970	2.9	4.9	4040	2.2		7060			
157.4	9.5	3970	4.2	6.4	4220	2.9	4.8	4410	2.3					
166.7	9	4010	4.0	6.0	4260	2.8	4.5	4450	2.2					
179.7	8.3	4050	3.7	5.6	4310	2.6	4.2	4490	2.1					
189.5	7.9	3520	3.1	5.3	3740	2.2	4.0	3910	1.7					
200.6	7.5	3550	2.9	5.0	3770	2.1	3.7	3940	1.6					
216.3	6.9	3590	2.8	4.6	3810	1.9	3.5	3980	1.5					
PH 413														
185	Ratios from 185 to 1700, rated torque 3800Nm / 4500Nm at 1500 rpm. For requests consult the DANA area contact person												18	
....														
1700														

PH 13

IEC



	IEC Adaptor						
	71	80 - 90	100 - 112	132	160	180	
	160	200	250	300	350	350	D
	—	—	15	16	20	20	t
	M8	M10	Ø13.5	Ø14.5	Ø19	Ø19	f
PH 213	—	—	334	350	382.5	382.5	L
PH 313	—	393	394	410	442.5	442.5	
PH 413	448	453	454	470	—	—	
PH 213	—	—	76	83	88	88	 *
PH 313	—	80	83	90	95	95	
PH 413	87	87	90	97	—	—	



	 OIL		
	B3/B8/B7	V5/V6	B6
PH 213	3	5	4
PH 313			
PH 413			

1) Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

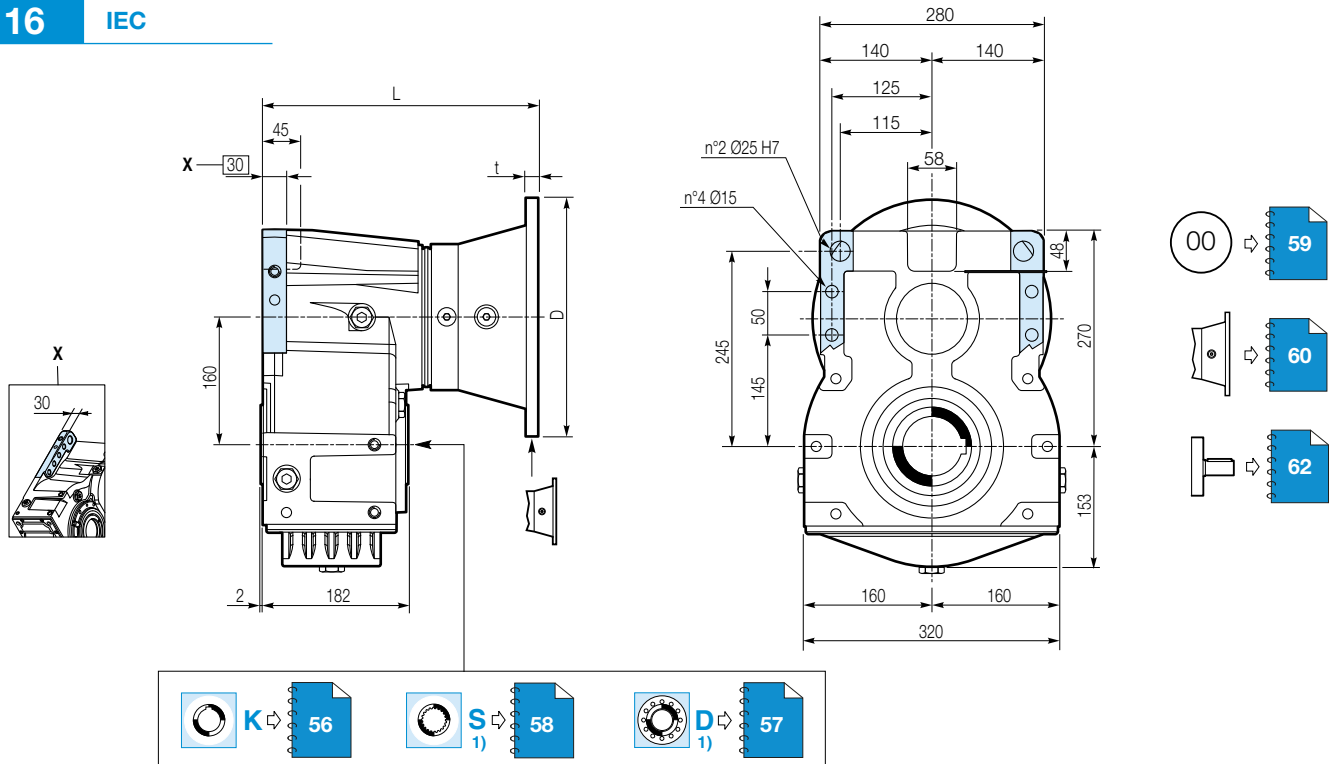
i_{eff}	1500			1000			750			n_{1MAX}	T_{2MAX}	P_T
	n_2	T_{2N}	P_{N1}	n_2	T_{2N}	P_{N1}	n_2	T_{2N}	P_{N1}	[rpm]	[Nm]	[kW]
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]			
PH 216												
13.92	108	2500	29.6	72	2800	22	54	3050	18	3000	7800	29
16.43	91	2950	29.5	61	3300	21.9	46	3600	17.9		9200	
18.68	80	3250	28.5	54	3700	21.5	40	4000	17.4		10200	
19.77	76	3300	27.3	51	3750	20.6	38	4050	16.7			
22.48	67	3450	25.1	44	3900	18.8	33	4250	15.4			
25.62	59	3550	22.6	39	4050	17.1	29	4400	13.9			
27.63	54	3650	21.5	36	4100	16.1	27	4250	12.5			
33.2	45	3350	16.5	30	3400	11.1	23	3450	8.5		8400	
37.16	40	2950	13	27	2950	8.7	20	3000	6.6		7200	
42.41	35	2500	9.7	24	2500	6.5	18	2550	5.0		6200	
PH 316												
50.79	30	3980	12.8	20	4080	8.8	15	4160	6.7	3000	9200	22
57.75	26	4420	12.5	17	4540	8.5	13	4620	6.5		10200	
59.95	25	4700	12.8	17	4820	8.7	13	4900	6.6		11000	
68.16	22	4730	11.3	15	5350	8.5	11	4940	5.9			
77.50	19	5130	10.8	13	5400	7.5	9.7	5500	5.8			
88.33	17	5310	9.8	11	5440	6.7	8.5	5540	5.1			
95.24	16	5330	9.1	10	5470	6.2	7.9	5570	4.7			
114.5	13	5390	7.6	8.7	5530	5.2	6.6	5630	4.0			
128.1	12	5430	6.9	7.8	5570	4.7	5.9	5670	3.6			
146.2	10	5480	6.1	6.8	5620	4.2	5.1	5720	3.2			
157.1	9.6	5480	5.7	6.4	5800	4.0	4.8	5800	3.0	10000		
175.8	8.5	5580	5.2	5.7	5800	3.6	4.3	5800	2.7			
200.6	7.5	5690	4.6	5.0	5800	3.1	3.7	5800	2.3			
216.3	6.9	5490	4.1	4.6	5630	2.8	3.5	5740	2.2			
PH 416												
218.8	6.9	5130	3.8	4.6	5270	2.6	3.4	5360	2	3000	11000	18
248.8	6	5710	3.7	4.0	5850	2.6	3	5960	1.9		11600	
282.9	5.3	5750	3.3	3.5	5900	2.3	2.7	6000	1.7			
299.5	5	6000	3.3	3.3	6000	2.2	2.5	6000	1.6			
340.5	4.4	6000	2.9	2.9	6000	1.9	2.2	6000	1.4			
387.1	3.9	6000	2.5	2.6	6000	1.7	1.9	6000	1.3			
441.3	3.4	6000	2.2	2.3	6000	1.5	1.7	6000	1.1			
502.9	3	6000	1.9	2.0	6000	1.3	1.5	6000	1.0			
542.3	2.8	6000	1.8	1.8	6000	1.2	1.4	6000	0.9			
651.8	2.3	6000	1.5	1.5	6000	1.0	1.2	6000	0.7	10000		
702.8	2.1	6000	1.4	1.4	6000	0.9	1.1	6000	0.7			
844.7	1.8	6000	1.2	1.2	6000	0.8	0.9	6000	0.6			
945.3	1.6	6000	1.0	1.1	6000	0.7	0.8	6000	0.5			
1079	1.4	6000	0.9	0.9	6000	0.6	0.7	6000	0.5			
1230	1.2	6000	0.8	0.8	6000	0.5	0.6	6000	0.4			
1376	1.1	6000	0.7	0.7	6000	0.5	0.5	6000	0.4			
1571	1	6000	0.6	0.6	6000	0.4	0.5	6000	0.3			
1694	0.9	6000	0.6	0.6	6000	0.4	0.4	6000	0.3			

Higher ratios are available. Please consult the DANA area contact person for possible questions

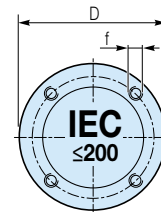


PH 16

IEC



	IEC Adaptor						
	71	80 - 90	100 - 112	132	160	180	
	160	200	250	300	350	350	
	—	—	15	16	20	20	
PH 216 PH 316 PH 416	M8	M10	Ø13.5	Ø14.5	Ø19	Ø19	L
	—	—	—	344.5	377	377	
	—	387.5	388.5	404.5	437	—	
	442.5	447.5	448.5	464.5	—	—	
PH 216 PH 316 PH 416	—	—	—	100	105	105	KQ*
	—	97	100	107	112	—	
	104	104	107	114	—	—	
	—	—	—	—	—	—	



	OIL [l]		
	B3/B8/B7	V5/V6	B6
PH 216	—	—	—
PH 316	4	8	5
PH 416	—	—	—

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

¹⁾ Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

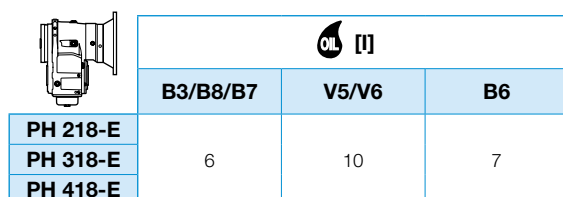
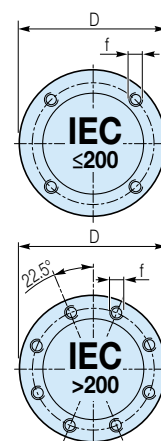
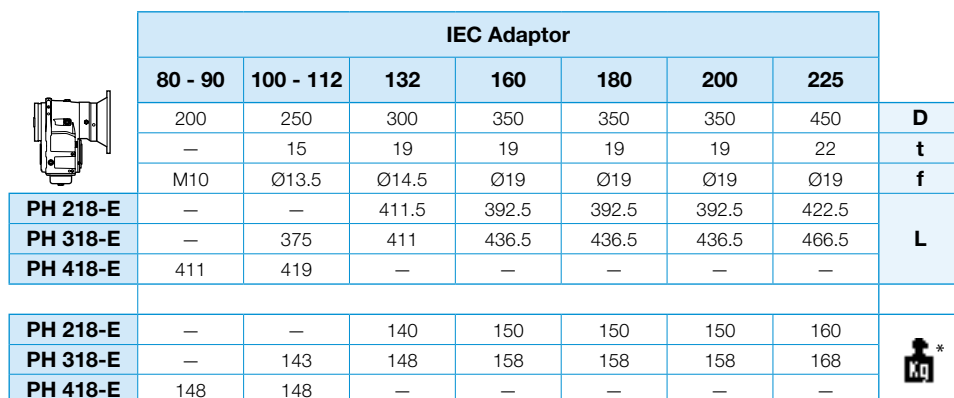
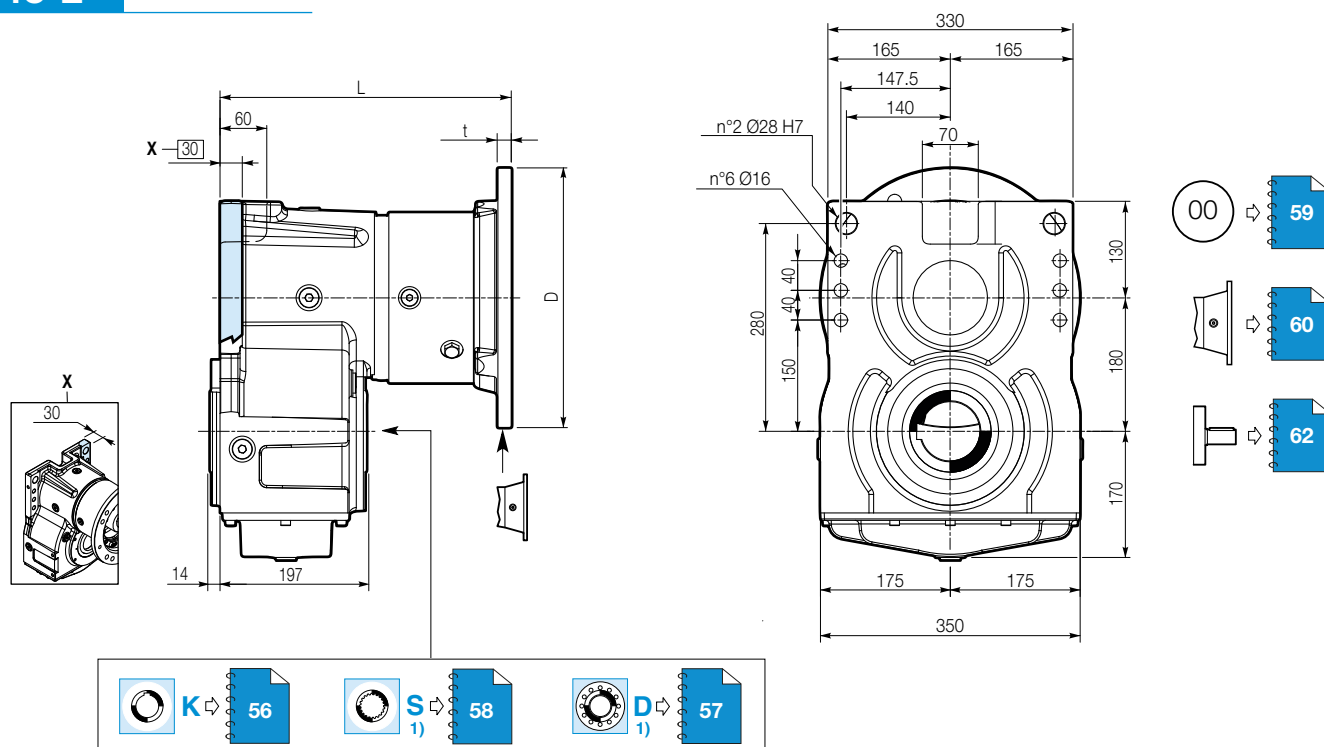
i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}			
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]			
PH 218-E												
10.75	140	3900	58.2	93.1	4465	44.4	69.8	4915	53.0	3000	17740	37
12.42	121	4095	52.8	80.5	6140	52.8	60.4	6760	42.7			
13.42	112	4310	51.5	74.5	4935	39.3	55.9	5430	31.8			
15.52	96.7	4525	46.7	64.4	5180	35.7	48.3	5700	28.8			
18.87	79.5	4830	41	53.0	5530	31.3	39.7	6080	25.3			
22.42	66.9	5115	36.6	44.6	5855	27.9	33.5	6440	22.6			
26.46	56.7	5540	33.6	37.8	6340	25.6	28.3	6980	20.7			
42.41	51.0	5740	31.3	34.0	6305	22.9	25.5	6940	18.5		16380	
											15610	
PH 318-E												
37.82	39.7	5690	24.4	26.4	6430	18.4	19.8	7075	14.7	3000	17740	28
43.73	34.3	5865	21.7	22.9	6620	16.3	17.2	7280	13.1			
50.57	29.7	6535	20.9	19.8	7480	16.0	14.8	8235	12.8			
55.76	26.9	7105	20.6	17.9	8130	15.7	13.5	8950	12.6			
63.15	23.8	7225	18.5	15.8	8270	14.1	11.9	9105	11.3			
66.43	22.6	7345	17.9	15.1	8410	13.7	11.3	9250	10.9			
74.54	20.1	7825	17	13.4	8190	11.9	10.1	9015	9.5			
78.41	19.1	7960	16.4	12.8	8190	11.3	9.6	9015	9.0			
88.85	16.9	7885	14.4	11.3	8385	10.2	8.4	9230	8.2			
93.42	16.1	8230	14.3	10.7	8985	10.4	8.0	9890	8.3			
111.0	13.5	8715	12.7	9.01	8975	8.7	6.76	9880	7.0			
130.8	11.5	8925	11.1	7.65	9010	7.4	5.73	9920	6.0			
155.6	9.64	8740	9.1	6.43	9050	6.3	4.82	9960	5.0			
172.8	8.68	6865	6.4	5.79	7040	4.4	4.34	7750	3.5			
203.6	7.37	6935	5.5	4.91	7115	3.8	3.68	7830	3.0			
PH 418-E												
166.3	9.02	8975	8.8	6.01	9060	5.9	4.51	9975	4.7	3000	17970	22
192.3	7.80	9005	7.7	5.20	9095	5.2	3.90	10010	4.1			
222.3	6.75	9040	6.6	4.50	9265	4.5	3.37	10200	3.6			
257.0	5.84	9070	5.8	3.89	9490	4.0	2.92	10440	3.2			
277.8	5.40	9085	5.3	3.60	9630	3.8	2.70	10600	3.0			
312.6	4.80	9165	4.8	3.20	9765	3.4	2.40	10750	2.7			
350.4	4.28	8485	4	2.85	9005	2.8	2.14	9910	2.2			
390.6	3.84	9510	4	2.56	10000	2.8	1.92	11010	2.2			
451.6	3.32	9720	3.5	2.21	10000	2.4	1.66	11010	1.9			
518.3	2.89	8985	2.8	1.93	9330	2.0	1.45	10270	1.6			
558.2	2.69	10000	2.9	1.79	10000	2.0	1.34	11010	1.6			
632.3	2.37	10000	2.6	1.58	10000	1.7	1.19	11010	1.4			
678.9	2.21	10000	2.4	1.47	10000	1.6	1.10	11010	1.3			
785.0	1.91	10000	2.1	1.27	10000	1.4	0.96	11010	1.1			
906.3	1.66	10000	1.8	1.10	10000	1.2	0.83	11010	1.0			
954.7	1.57	10000	1.7	1.05	10000	1.1	0.79	11010	0.9			
1099	1.36	8480	1.3	0.91	8700	0.9	0.68	9570	0.7			
1271	1.18	10000	1.3	0.79	10000	0.9	0.59	11010	0.7			
1347	1.11	9200	1.1	0.74	9200	0.7	0.56	10120	0.6		16380	
1578	0.95	10000	1	0.63	10000	0.7	0.48	11010	0.6		17972	
1766	0.85	7805	0.7	0.57	7805	0.5	0.42	8590	0.4		16380	
1874	0.80	10000	0.9	0.53	10000	0.6	0.40	11010	0.5		15610	
2081	0.72	7805	0.6	0.48	7805	0.4	0.36	8590	0.3		16380	

Higher ratios are available. Please consult the DANA area contact person for possible questions



PH 18-E

IEC



Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

1) Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

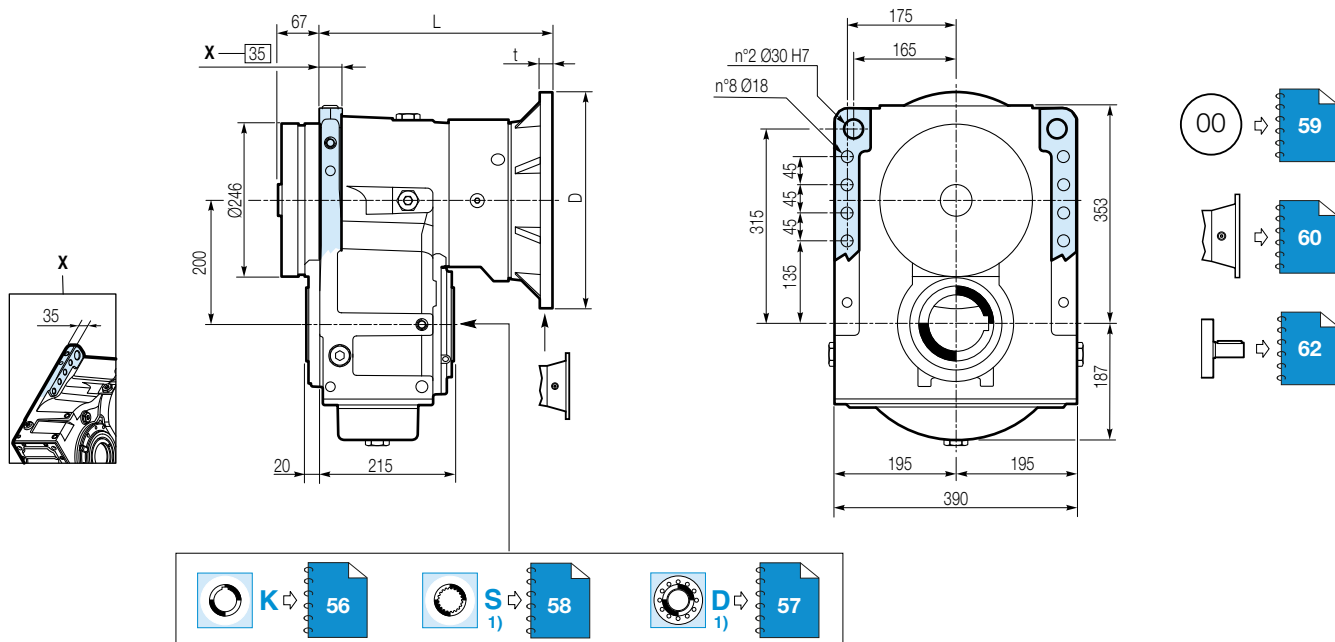
i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}			
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]			
PH 220												
11.74	128	4150	57.3	85	4700	43.2	64	5100	35.1	3000	16200	45
13.86	108	4900	57.2	72	5550	43.1	54	6050	35.2		19000	
15.75	95	5350	54.9	63	6050	41.3	48	6600	33.8		18600	
18.59	81	5550	48.2	54	6250	36.2	40	6800	29.5		17000	
23.27	64	5750	39.9	43	5850	27.1	32	5950	20.6		14400	
27.00	56	5350	32	37	5450	21.7	28	5550	16.6		13400	
32.63	46	4650	23.1	31	4700	15.5	23	4800	11.9		11600	
PH 320												
39.69	38	5900	24.1	25	6650	18.1	19	7250	14.7	3000	10900	34
46.85	32	6950	24	21	7850	18	16	8550	14.7		10100	
53.24	28	7900	23.9	19	8900	18	14	9700	14.7			
62.82	24	8650	22.2	16	9300	15.9	12	9450	12.1		9000	
69.14	22	8300	19.4	14	9400	14.6	10.8	10200	11.9		10100	
78.64	19	7600	15.6	13	7800	10.7	9.5	7900	8.1			
81.59	18	9200	18.2	12	9450	12.4	9.2	9600	9.5	3000	10100	34
94.50	16	8350	14.3	10.6	8450	9.6	7.9	8600	7.3			
111.5	13	9400	13.6	9	9650	9.3	6.7	9800	7.1			
129.0	11.6	8950	11.2	7.8	9050	7.5	5.8	9200	5.7			
139.6	10.7	7850	9.1	7.2	8050	6.2	5.4	8200	4.7	3000	9000	34
161.5	9.3	7950	7.9	6.2	8150	5.4	4.6	8300	4.1			
PH 420												
134.2	11.2	8470	10.4	7.5	9550	7.8	5.6	9570	5.9	3000	20200	27
158.3	9.5	9990	10.4	6.3	11280	7.8	4.7	11300	5.9			
179.9	8.3	11360	10.4	5.6	12000	7.3	4.2	12000	5.5			
205.7	7.3	10810	8.6	4.9	11300	6	3.6	11300	4.5			
233.7	6.4	11960	8.4	4.3	12000	5.6	3.2	12000	4.2			
267.1	5.6	10650	6.6	3.7	10650	4.4	2.8	10650	3.3			
281.1	5.3	11300	6.6	3.6	11300	4.4	2.7	11300	3.3			
303.5	4.9	12000	6.5	3.3	12000	4.3	2.5	12000	3.2			
319.4	4.7	12000	6.2	3.1	12000	4.1	2.3	12000	3.1			
369.5	4.1	12000	5.3	2.7	12000	3.6	2.0	12000	2.7			
414.9	3.6	12000	4.7	2.4	12000	3.2	1.8	12000	2.4			
436.0	3.4	10210	3.9	2.3	10470	2.6	1.7	10660	2			
479.8	3.1	12000	4.1	2.1	12000	2.7	1.6	12000	2.1			
559.0	2.7	12000	3.5	1.8	12000	2.3	1.3	12000	1.8			
638.9	2.3	10650	2.7	1.6	10650	1.8	1.2	10650	1.4			
726.0	2.1	12000	2.7	1.4	12000	1.8	1.0	12000	1.4			
773.9	1.9	10580	2.2	1.3	10990	1.6	1.0	11410	1.2			
856.7	1.8	10650	2	1.2	11160	1.4	0.9	11650	1.1			
895.1	1.7	9950	1.8	1.1	10210	1.3	0.8	10390	1.0			
992	1.5	9500	1.6	1	9750	1.1	0.8	9920	0.8			
1148	1.3	8650	1.2	0.9	8880	0.9	0.7	9040	0.6		18080	
1171	1.3	11000	1.5	0.9	11500	1.1	0.6	11710	0.8		20200	
1354	1.1	10210	1.2	0.7	10470	0.8	0.6	10660	0.6		18000	
1695	0.9	9370	0.9	0.6	9960	0.6	0.4	10400	0.5			

Higher ratios are available. Please consult the DANA area contact person for possible questions

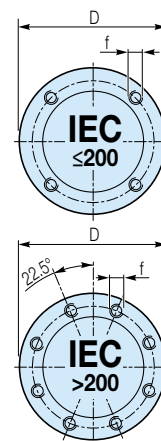


PH 20

IEC



	IEC Adaptor							
	80 - 90	100 - 112	132	160	180	200	225	
	200	250	300	350	350	350	450	D
	—	15	16	20	20	20	22	t
	M10	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	f
PH 220	—	—	350	369.5	369.5	369.5	399.5	L
PH 320	—	305	375	369.5	369.5	369.5	—	
PH 420	344	345	415	—	—	—	—	
PH 220	—	—	164	175	175	180	190	Kg *
PH 320	—	155	169	180	180	185	—	
PH 420	157	160	174	—	—	—	—	



	OIL [l]		
	B3/B8/B7	V5/V6	B6
PH 220			
PH 320	10	19	12
PH 420			

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

¹⁾ Feasibility on request

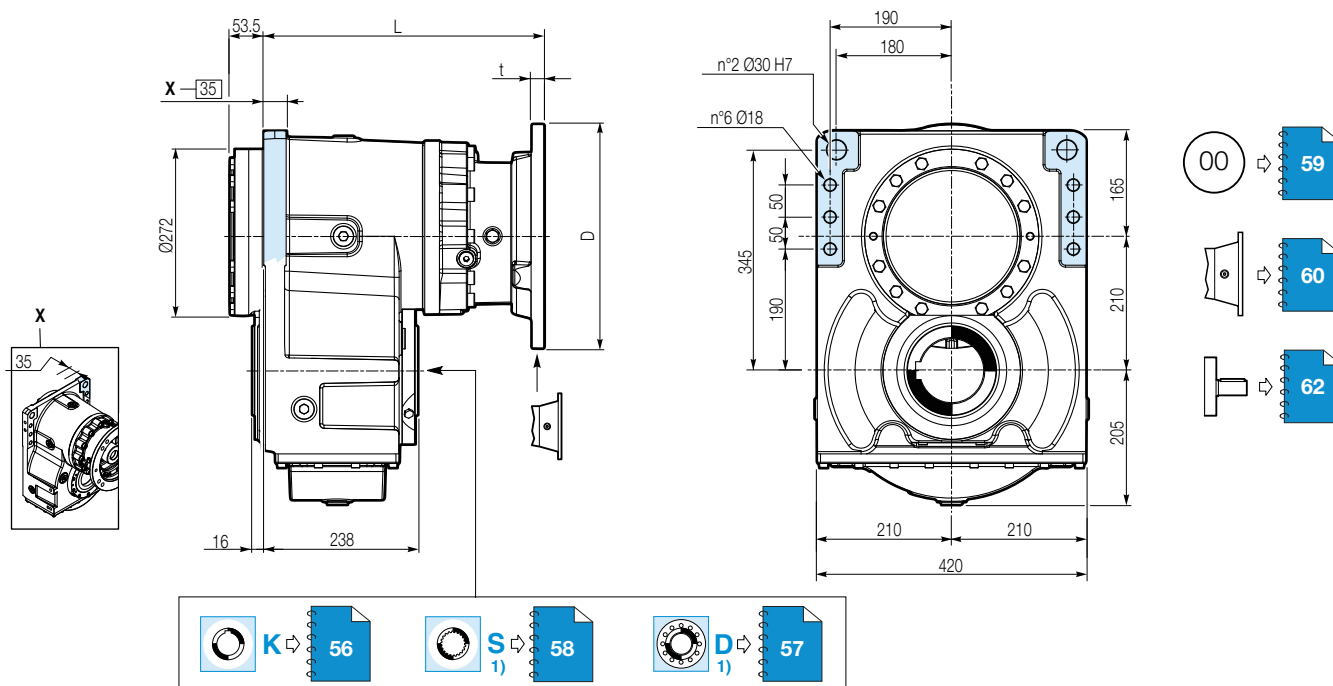
*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}			
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]			
PH 221-E												
13.42	112	7170	85.6	74.5	8100	64.5	55.9	8920	53.0	3000	25280	50 *
15.84	94.7	8460	85.6	63.1	9560	64.5	47.3	10520	52.2		23600	
18.32	81.9	9130	79.9	54.6	10310	60.2	40.9	11350	48.7			
22.28	67.3	9470	68.1	44.9	10700	51.3	33.7	11780	41.5			
26.46	56.7	9785	59.3	37.8	11050	44.6	28.3	12160	36.1		20870	
31.85	47.1	9730	49.0	31.4	9980	33.5	23.5	10980	27.1			
35.37	42.4	9015	40.9	28.3	9650	29.2	21.2	10620	23.6			
PH 321-E												
47.24	31.8	8900	30.5	21.2	10050	23.0	15.9	11060	18.4	3000	25280	37
54.62	27.5	10310	30.6	18.3	11645	23.0	13.7	12820	18.4		23600	
64.47	23.3	12150	30.5	15.5	12590	21.1	11.6	13860	16.9			
74.54	20.1	12230	26.6	13.4	12860	18.6	10.1	14150	14.9		23600	
83.07	18.1	11220	21.9	12.0	12340	16.0	9.0	13580	12.8			
90.66	16.5	12475	22.3	11.0	13240	15.8	8.3	14570	12.6			
98.05	15.3	12620	20.8	10.2	13395	14.8	7.6	14740	11.8			
113.4	13.2	12415	17.7	8.82	13200	12.6	6.61	14530	10.1			
131.0	11.5	12310	15.2	7.63	12625	10.4	5.73	13890	8.3			
137.9	10.9	12790	15.0	7.25	13600	10.7	5.44	14970	8.5			
164.4	9.12	13625	13.4	6.08	14340	9.4	4.56	15780	7.5			
195.3	7.68	12625	10.5	5.12	12945	7.2	3.84	14250	5.7			
PH 421-E												
166.3	9.02	12980	12.8	6.01	14325	9.4	4.51	15770	7.5	3000	25280	30
192.3	7.80	13555	11.5	5.20	14365	8.2	3.90	15810	6.5		23600	
222.3	6.75	14290	10.5	4.50	14580	7.2	3.37	16050	5.7			
262.4	5.72	14095	8.8	3.81	14920	6.2	2.86	16420	4.9			
292.4	5.13	13015	7.3	3.42	13350	5.0	2.56	14690	4.0			
338.1	4.44	13135	6.4	2.96	13475	4.4	2.22	14830	3.4			
369.0	4.07	14790	6.6	2.71	15000	4.4	2.03	16510	3.5			
411.2	3.65	13300	5.3	2.43	13640	3.6	1.82	15010	2.9			
448.8	3.34	15000	5.5	2.23	15000	3.7	1.67	16510	2.9			
488.5	3.07	13445	4.5	2.05	13790	3.1	1.54	15180	2.4			
516.6	2.90	15000	4.8	1.94	15000	3.2	1.45	16510	2.5			
576.5	2.60	15000	4.3	1.73	15000	2.8	1.30	16510	2.3		23600	
628.3	2.39	15000	3.9	1.59	15000	2.6	1.19	16510	2.1			
669.1	2.24	15000	3.7	1.49	15000	2.5	1.12	16510	1.9			
761.8	1.97	15000	3.2	1.31	15000	2.2	0.98	16510	1.7			
813.7	1.84	15000	3.0	1.23	15000	2.0	0.92	16510	1.6			
907.7	1.65	13895	2.5	1.10	14255	1.7	0.83	15690	1.4			
1002	1.50	15000	2.5	1.00	15000	1.6	0.75	16510	1.3			
1148	1.31	14100	2.0	0.87	14570	1.4	0.65	16040	1.1			
1194	1.26	15000	2.1	0.84	15000	1.4	0.63	16510	1.1		25280	
1339	1.12	14235	1.7	0.75	14920	1.2	0.56	15730	0.9			
1680	0.89	15000	1.5	0.60	15000	1.0	0.45	16510	0.8		23600	
1996	0.75	14235	1.2	0.50	14235	0.8	0.38	15670	0.6			

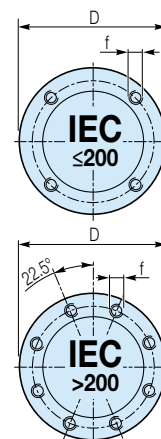
* For mounting position V5/V6 $P_T = 40 \text{ kW}$

PH 21-E

IEC



	IEC Adaptor							
	80 - 90	100 - 112	132	160	180	200	225	
	200	250	300	350	350	350	450	D
	—	15	19	19	19	19	22	t
	M10	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	f
PH 221-E	—	—	—	437.5	437.5	437.5	467.5	L
PH 321-E	433.5	441.5	462.5	498	498	498	—	
PH 421-E	472.5	480.5	516.5	542	542	—	—	
PH 221-E	—	—	—	240	240	240	250	 *
PH 321-E	233	233	238	248	248	248	—	
PH 421-E	238	238	243	253	253	—	—	



	 [1]		
	B3/B8/B7	V5/V6	B6
PH 221-E	16	23	12
PH 321-E			
PH 421-E			

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

1) Feasibility on request

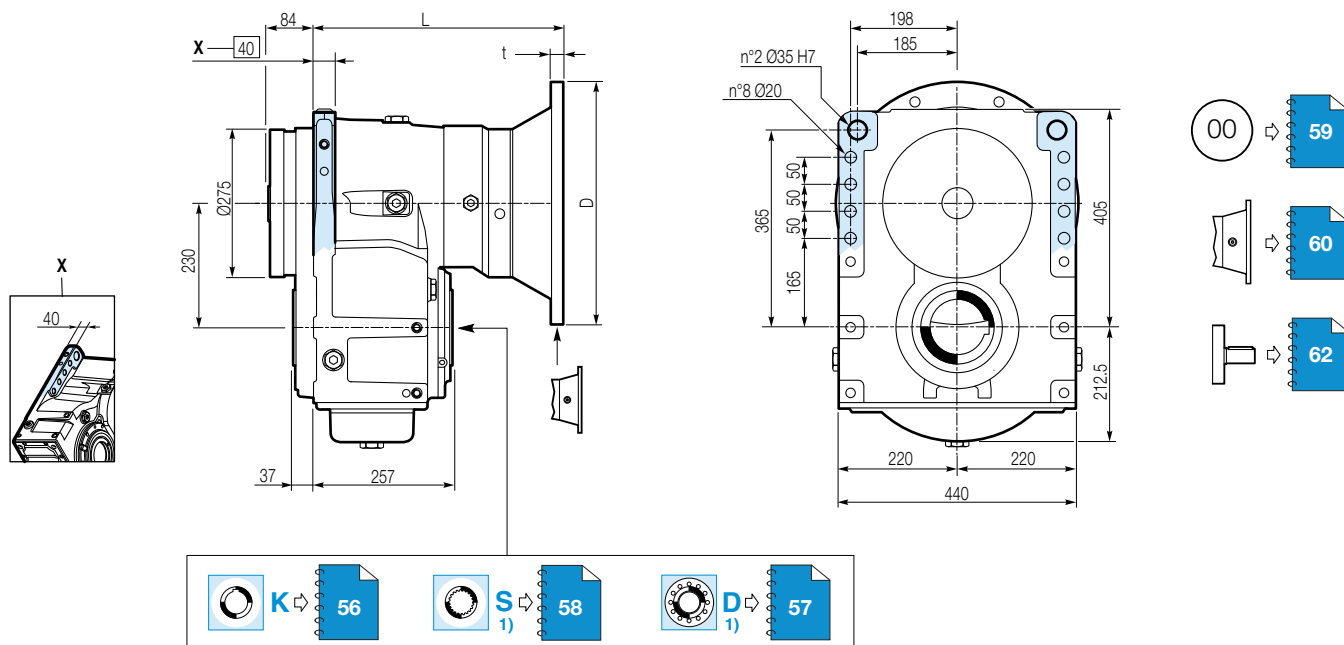
*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}			
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]			
PH 223												
13.92	108	7900	91.9	72	8900	68.9	54	9700	56.3	3000	27200	60
16.43	91	8950	88.0	61	10150	66.5	46	11050	54.2		30200	
18.68	80	9350	80.9	54	10550	60.7	40	11500	49.6			
21.29	70	9700	73.6	47	10950	55.3	35	11950	45.2			
22.95	65	9900	69.6	44	11200	52.4	33	12200	42.8		24800	
27.59	54	9950	58.2	36	10050	39.2	27	10250	30.0		21600	
30.87	49	8700	45.5	32	8750	30.5	24	8950	23.4			
PH 323												
50.79	30	12830	40.7	20	14340	30.3	15	14600	23.1	3000	16400	45
57.75	26	13400	37.4	17	15130	28.1	13	16220	22.6		16700	
65.66	23	13930	34.2	15	15730	25.7	11	16350	20.0			
74.84	20	14480	31.2	13	16190	23.2	10	16490	17.7			
80.69	19	14810	29.6	12	16270	21.6	9.3	16570	16.5			
88.33	17	14970	27.3	11	16480	20.0	8.5	17000	15.5			
100.68	15	15570	24.9	10	16810	17.9	7.4	17000	13.6			
108.55	14	15920	23.6	9.2	17000	16.8	6.9	17000	12.6		13200	
130.5	11	16440	20.3	7.7	17000	14.0	5.7	17000	10.5			
146.0	10.3	16720	18.4	6.8	17000	12.5	5.1	17000	9.4			
157.4	9.5	15940	16.3	6.4	16350	11.1	4.8	16650	8.5			
166.7	8.5	14530	13.3	5.7	15450	9.4	4.3	16140	7.4			
179.7	7.9	14700	12.5	5.3	15630	8.9	4.0	16330	6.9			
PH 423												
185.4	8.1	15160	13.5	5.4	15550	9.2	4.0	15830	7.0	3000	32800	36
218.8	6.9	17770	13.3	4.6	18350	9.2	3.4	18680	7.0		30200	
248.8	6	18120	12	4.0	19000	8.4	3.0	19000	6.3			
282.9	5.3	18480	10.7	3.5	19000	7.3	2.7	19000	5.5			
321.6	4.7	18840	9.6	3.1	19000	6.5	2.3	19000	4.8			
347.6	4.3	19000	9.0	2.9	19000	6.0	2.2	19000	4.5			
366.6	4.1	19000	8.5	2.7	19000	5.7	2.0	19000	4.3			
395.3	3.8	19000	7.9	2.5	19000	5.3	1.9	19000	3.9			
417.8	3.6	19000	7.5	2.4	19000	5.0	1.8	19000	3.7			
450.5	3.3	19000	6.9	2.2	19000	4.6	1.7	19000	3.5			
475.1	3.2	19000	6.6	2.1	19000	4.4	1.6	19000	3.3			
485.7	3.1	19000	6.4	2.1	19000	4.3	1.5	19000	3.2			
541.5	2.8	19000	5.8	1.8	19000	3.8	1.4	19000	2.9			
606.0	2.5	19000	5.1	1.7	19000	3.4	1.2	19000	2.6			
653.4	2.3	19000	4.8	1.5	19000	3.2	1.1	19000	2.4			
691.6	2.2	19000	4.5	1.4	19000	3.0	1.1	19000	2.3			
785.3	1.9	19000	4.0	1.3	19000	2.6	1.0	19000	2.0			
896.4	1.7	19000	3.5	1.1	19000	2.3	0.8	19000	1.7			
1021.6	1.5	19000	3.1	1.0	19000	2.0	0.7	19000	1.5			
1143	1.3	19000	2.7	0.9	19000	1.8	0.7	19000	1.4			
1233	1.2	18130	2.4	0.8	19000	1.7	0.6	19000	1.3			
1407	1.1	17730	2.1	0.7	18180	1.4	0.5	18510	1.1			

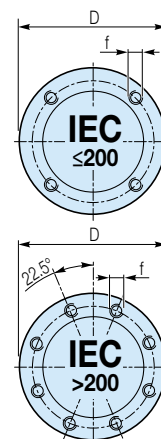
Higher ratios are available. Please consult the DANA area contact person for possible questions

PH 23

IEC



	IEC Adaptor							
	100 - 112	132	160	180	200	225	250 ²⁾	
	250	300	350	350	350	450	550	
	15	16	20	20	20	25	25	
	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	Ø19	D
	PH 223	—	—	427	427	457	457	
	PH 323	—	394.5	427	427	457	—	
	PH 423	439.5	455.5	488	488	—	—	
	PH 223	—	—	265	265	270	275	L
	PH 323	—	253	275	275	280	285	
	PH 423	248	258	280	280	285	290	
	PH 423	248	258	280	280	285	290	



	OIL [l]		
	B3/B8/B7	V5/V6	B6
PH 223	—	—	—
PH 323	12	23	15
PH 423	—	—	—

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

¹⁾ Feasibility on request

²⁾ Ask the technical office to check

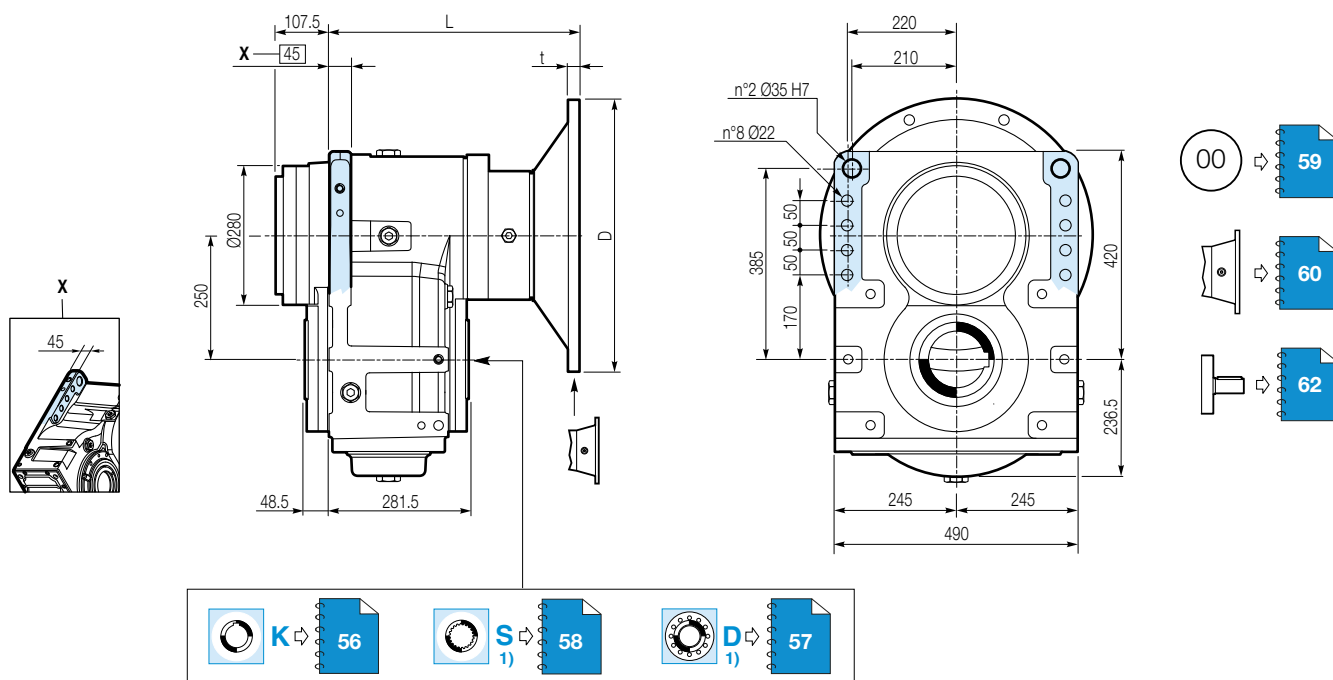
*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}			
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]			
PH 225												
13.34	112	10500	127.8	75	11850	95.9	56	12950	78.5	3000	48400	70
14.72	102	10800	119.2	68	12200	89.5	51	13300	73.1		44800	
15.75	95	12400	127.5	63	14000	95.8	48	15250	78.1		44000	
17.37	86	12750	118.8	58	14400	89.3	43	15700	72.9			
19.49	77	12950	107.5	51	14650	80.9	38	15950	66.0			
22.50	67	13300	95.6	44	15000	71.7	33	16350	58.6			
PH 325												
46.70	32	15350	53.9	21	17350	40.5	16	18900	33.0	3000	48400	53
51.51	29	15800	50.3	19	17850	37.8	15	19450	30.8		44800	
55.13	27	18100	53.7	18	20450	40.3	14	22300	32.9		44000	
65.05	23	19050	47.8	15	21500	35.9	12	23450	29.3			
71.74	21	19600	44.6	14	22150	33.5	10.5	24000	27.2			
81.43	18	20350	40.8	12	23000	30.6	9.2	24000	24.0			
89.80	17	20950	38.0	11	23700	28.6	8.4	24000	21.7			
104.2	14	21900	34.2	9.6	24000	25.0	7.2	24000	18.7			
116.9	13	22300	31.1	8.6	24000	22.3	6.4	24000	16.7			
125.9	11.9	23200	30.0	7.9	24000	20.7	6.0	24000	15.5			
141.3	10.6	23600	27.2	7.1	24000	18.4	5.3	24000	13.8			
163.1	9.2	23000	22.9	6.1	23600	15.7	4.6	24000	12.0			
PH 425												
169.8	8.8	24670	23.9	5.9	26230	17.0	4.4	27000	13.1	3000	44000	42
200.3	7.5	25300	20.8	5.0	26900	14.7	3.7	27000	11.1			
227.7	6.6	25790	18.7	4.4	27000	13.0	3.3	27000	9.8			
250.8	6	26170	17.2	4.0	27000	11.8	3.0	27000	8.9			
268.6	5.6	26450	16.2	3.7	27000	11.0	2.8	27000	8.3			
285.0	5.3	27000	15.6	3.5	27000	10.4	2.6	27000	7.8			
330.8	4.5	27000	13.4	3.0	27000	9.0	2.3	27000	6.7			
336.3	4.5	27000	13.2	3.0	27000	8.8	2.2	27000	6.6			
390.3	3.8	27000	11.4	2.6	27000	7.6	1.9	27000	5.7			
421.0	3.6	27000	10.6	2.4	27000	7.0	1.8	27000	5.3			
471.6	3.2	27000	9.4	2.1	27000	6.3	1.6	27000	4.7			
488.6	3.1	27000	9.1	2.0	27000	6.1	1.5	27000	4.5			
567.0	2.6	27000	7.8	1.8	27000	5.2	1.3	27000	3.9			
590.3	2.5	27000	7.5	1.7	27000	5.0	1.3	27000	3.8			
685.1	2.2	27000	6.5	1.5	27000	4.3	1.1	27000	3.2			
755.6	2.0	27000	5.9	1.3	27000	3.9	1.0	27000	2.9			
827.9	1.8	27000	5.4	1.2	27000	3.6	0.9	27000	2.7			
913.0	1.6	27000	4.9	1.1	27000	3.2	0.8	27000	2.4			
1024	1.5	27000	4.3	1.0	27000	2.9	0.7	27000	2.2			
1183	1.3	27000	3.8	0.8	27000	2.5	0.6	27000	1.9			

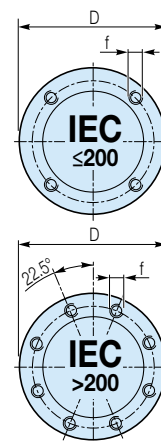
Higher ratios are available. Please consult the DANA area contact person for possible questions

PH 25

IEC



	IEC Adaptor								
	100 - 112	132	160	180	200	225	250	280	
	250	300	350	350	350	450	550	550	
	15	16	20	20	20	25	25	25	
PH 225 PH 325 PH 425	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	Ø19	Ø19	L
	—	—	—	—	465	495	437.5	437.5	
	—	454.5	465	465	465	495	497.5	—	
	455.5	522.5	553.5	553.5	—	—	—	—	
PH 225 PH 325 PH 425	—	—	—	—	358	363	373	373	Kq *
	—	341	379	379	384	389	399	—	
	343	347	385	385	—	—	—	—	
	—	—	—	—	—	—	—	—	



	OIL [l]		
	B3/B8/B7	V5/V6	B6
PH 225	—	—	—
PH 325	14	26	17
PH 425	—	—	—

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

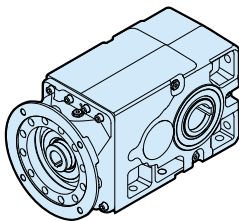
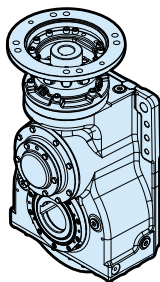
¹⁾ Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.



BREVINI[®]

Motion Systems

Type		Size	i_N	T_{N2} [kNm]	Efficiency η	Page
BPH		13	9.7 - 2029.4	2 - 4	0.98 0.97 0.96	40
		16	35.67 - 3126	4 - 6	0.98	42
		18-E	27.54 - 7083	4 - 11		44
		20	30.1 - 6053.7	5 - 12		46
		21-E	30.2 - 7028	9 - 18	0.97	48
		23	30.66 - 6083	9 - 18		50
		25	34.2 - 5378.1	14 - 27	0.96	52
		28	47.1 - 5101.1	20 - 43		54

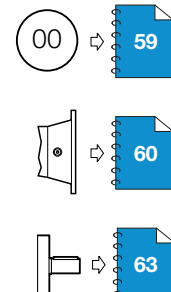
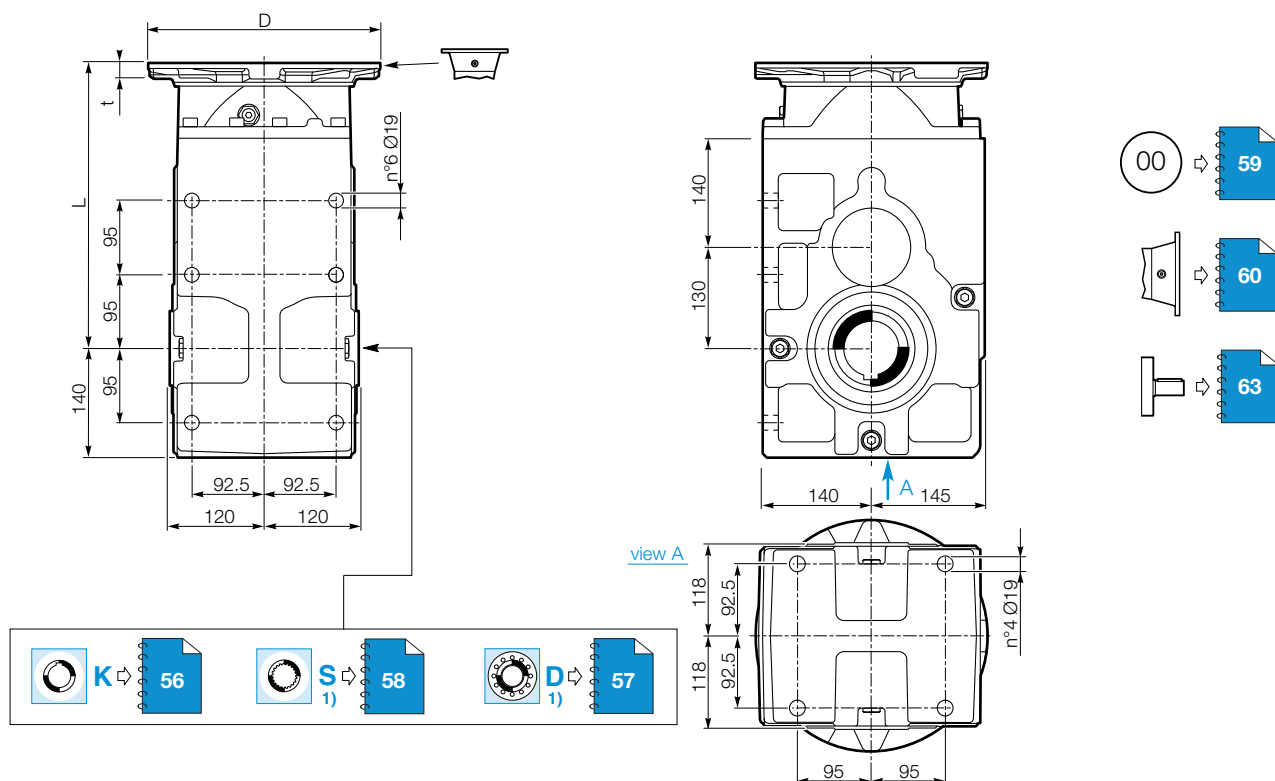
i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]	
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}				
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]				
BPH 213													
9.7	155	2100	35.0	104	2405	26.7	78	2650	22.1	3000	7800	19	
11.4	132	2480	35.0	88	2840	26.8	66	3125	22.1		7060		
13.7	109	2765	32.5	73	2835	22.2	55	2890	17.0		6260		
17.0	88	2280	21.6	59	2575	16.3	44	2770	13.1		7060		
20.0	75	2690	21.6	50	3040	16.3	37	3265	13.1		6260		
24.1	62	2865	19.1	41	2940	13.1	31	2990	10.0		5460		
27.5	55	2280	13.4	36	2340	9.1	27	2380	7.0		6260		
33.1	45	2745	13.4	30	2815	9.1	23	2870	7.0				
BPH 313													
35.3	43	3730	17.3	28	3830	11.8	21	3900	9.0	3000	7800	18	
40.1	37	3760	15.3	25	3860	10.5	19	3900	7.9				7000
45.7	33	3790	13.5	22	3890	9.3	16	3900	7.0				
49.3	31	3810	12.6	20	3900	8.6	15	3900	6.5				7000
53.9	28	3430	10.4	19	3520	7.1	14	3680	5.6		6200		
59.2	25	3850	10.6	17	3900	7.2	13	3900	5.4				
66.3	23	3880	9.6	15	3900	6.4	11	3900	4.8		6200		
75.6	20	3900	8.4	13	3900	5.6	10	3900	4.2				7800
83.2	18	3410	6.7	12	3500	4.6	9.0	3560	3.5				
89.3	17	3570	6.5	11	3800	4.6	8.4	3900	3.6				6200
94.8	16	3440	5.9	11	3530	4.0	7.9	3590	3.1		7800		
102.2	15	3460	5.5	9.8	3540	3.8	7.3	3610	2.9				7000
114.1	13	3190	4.6	8.8	3400	3.2	6.6	3550	2.5		6200		
122.9	12	3500	4.6	8.1	3590	3.2	6.1	3650	2.4				7800
137.5	11	3520	4.2	7.3	3610	2.9	5.5	3680	2.2	7000			
157.0	9.6	3550	3.7	6.4	3640	2.5	4.8	3710	1.9		6200		
165.5	9.1	3380	3.3	6.0	3590	2.4	4.5	3750	1.8	7800			
188.9	7.9	3450	3.0	5.3	3670	2.1	4.0	3830	1.7		7000		
202.9	7.4	3070	2.5	4.9	3150	1.7	3.7	3200	1.3	6200			
227.1	6.6	3090	2.2	4.4	3170	1.5	3.3	3230	1.2		7800		
259.2	5.8	3120	2.0	3.9	3200	1.3	2.9	3250	1.0	7000			
BPH 413													
128.7	12	3900	5.0	7.8	3900	3.4	5.8	3900	2.5	3000	7800	17	
146.3	10	3900	4.4	6.8	3900	3.0	5.1	3900	2.2				7000
166.3	9.0	3900	3.9	6.0	3900	2.6	4.5	3900	2.0				
189.6	7.9	3900	3.4	5.3	3900	2.3	4.0	3900	1.7				7800
204.4	7.3	3900	3.2	4.9	3900	2.1	3.7	3900	1.6		7000		
233.0	6.4	3900	2.8	4.3	3900	1.9	3.2	3900	1.4				
251.2	6.0	3900	2.6	4.0	3900	1.7	3.0	3900	1.3		7800		
280.0	5.4	3900	2.3	3.6	3900	1.5	2.7	3900	1.2				7000
313.4	4.8	3900	2.1	3.2	3900	1.4	2.4	3900	1.0				
362.9	4.1	3900	1.8	2.8	3900	1.2	2.1	3900	0.9				7800
406.2	3.7	3900	1.6	2.5	3900	1.1	1.8	3900	0.8		7000		
454.5	3.3	3900	1.4	2.2	3900	1.0	1.7	3900	0.7				
501.9	3.0	3900	1.3	2.0	3900	0.9	1.5	3900	0.6		7800		
547.2	2.7	3900	1.2	1.8	3900	0.8	1.4	3900	0.6				7000
570.7	2.6	3900	1.1	1.8	3900	0.8	1.3	3900	0.6	6200			
626.7	2.4	3900	1.0	1.6	3900	0.7	1.2	3900	0.5			7800	
701.3	2.1	3900	0.9	1.4	3900	0.6	1.1	3900	0.5	7000			
742.4	2.0	3900	0.9	1.3	3900	0.6	1.0	3900	0.4		6200		
800.5	1.9	3900	0.8	1.2	3900	0.5	0.9	3900	0.4	7800			
943.3	1.6	3900	0.7	1.1	3900	0.5	0.8	3900	0.3		7000		
962.1	1.6	3900	0.7	1.0	3900	0.4	0.8	3900	0.3			6200	
1076.7	1.4	3900	0.6	0.9	3900	0.4	0.7	3900	0.3		7800		
1229.0	1.2	3900	0.5	0.8	3900	0.4	0.6	3900	0.3	7000			
1392.0	1.1	3740	0.4	0.7	3900	0.3	0.5	3900	0.2			6200	
1479.3	1.0	3900	0.4	0.7	3900	0.3	0.5	3900	0.2	7800			
1588.8	0.9	3820	0.4	0.6	3900	0.3	0.5	3900	0.2		7000		
1778.0	0.8	3880	0.4	0.6	3900	0.2	0.4	3900	0.2			6200	
2029.4	0.7	3900	0.3	0.5	3900	0.2	0.4	3900	0.2				

Higher ratios are available. Please consult the DANA area contact person for possible questions

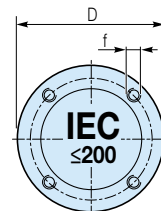


BPH 13

IEC



	IEC Adaptor						
	71	80 - 90	100 - 112	132	160	180	
	160	200	250	300	350	350	D
	—	—	15	16	20	20	t
	M8	M10	Ø13.5	Ø14.5	Ø19	Ø19	f
BPH 213	—	—	—	367	387	387	L
BPH 313	—	448.5	449.5	465.5	498	—	
BPH 413	503.5	508.5	509.5	525.5	—	—	
BPH 213	—	—	—	120	125	125	Kg *
BPH 313	—	117	120	125	130	—	
BPH 413	122	122	125	130	—	—	



	OIL [l]		
	B3/B8	B6/V5/V6	B7
BPH 213	—	—	—
BPH 313	5.3	13	9
BPH 413	—	—	—

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

¹⁾ Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

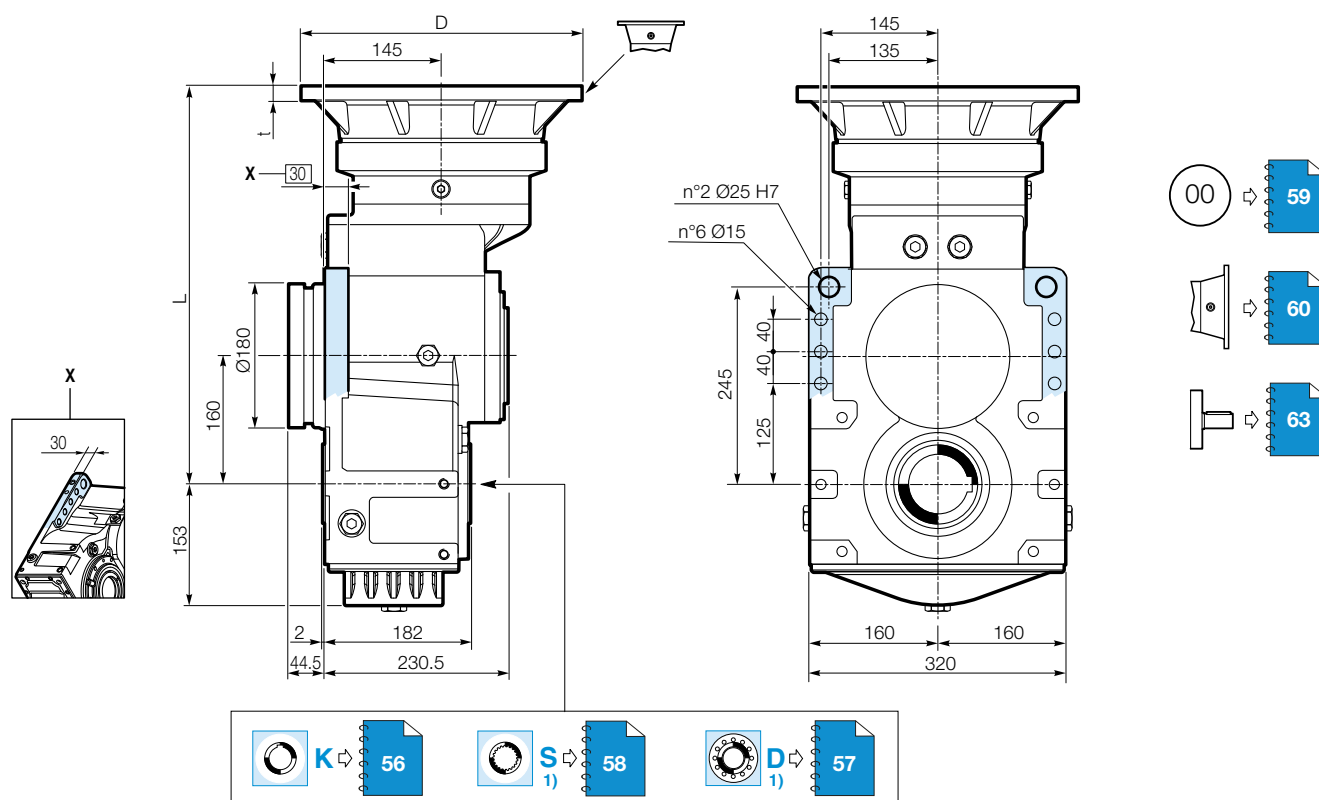
i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]	
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}				
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]				
BPH 316													
35.67	42	3900	17.9	28	4000	12.2	21	4080	9.3	3000	9200	20	
40.55	37	4310	17.3	25	4450	11.9	18	4530	9.1		10200		
42.1	36	4290	16.6	24	4730	12.2	18	4810	9.3		11000		
47.86	31	4450	15.2	21	5030	11.4	16	5350	9.1		11600		
57.61	26	4600	13	17	5080	9.6	13	5250	7.4		10000		
65.67	23	4780	11.9	15	5130	8.5	11	5350	6.6				
70.8	21	4890	11.2	14	5180	7.9	11	5370	6.2				
83.19	18	5260	10.3	12	5440	7.1	9	5500	5.4		11600		
88.07	17	5090	9.4	11	5360	6.6	8.5	5500	5.1		10000		
100.1	15	5140	8.3	10	5460	5.9	7.5	5500	4.5				
114.1	13	5240	7.5	8.8	5500	5.2	6.6	5500	3.9				
123.1	12	5300	7	8.1	5460	4.8	6.1	5500	3.6				
BPH 416													
130.2	12	4250	5.4	7.7	4360	3.7	5.8	4440	2.8	3000	9200	16	
148	10	4730	5.3	6.8	4850	3.6	5.1	4940	2.7		10200		
153.7	9.8	5020	5.4	6.5	5150	3.7	4.9	5240	2.8		11000		
174.7	8.6	5580	5.2	5.7	5720	3.6	4.3	5830	2.7		11600		
198.6	7.6	5630	4.6	5	5770	3.2	3.8	5880	2.4				
226.4	6.6	5670	4.1	4.4	5820	2.8	3.3	5920	2.1				
244.1	6.1	5700	3.8	4.1	5850	2.6	3.1	5950	2		10000		
293.4	5.1	5770	3.2	3.4	5910	2.2	2.6	6000	1.7				
328.3	4.6	5810	2.9	3	5960	2	2.3	6000	1.5				
353.2	4.2	6000	2.8	2.8	6000	1.9	2.1	6000	1.4				
395.2	3.8	6000	2.5	2.5	6000	1.7	1.9	6000	1.2				
451.1	3.3	6000	2.2	2.2	6000	1.5	1.7	6000	1.1				
473.6	3.2	6000	2.1	2.1	6000	1.4	1.6	6000	1				
510.7	2.9	6000	1.9	2	6000	1.3	1.5	6000	1				
613.8	2.4	6000	1.6	1.6	6000	1.1	1.2	6000	0.8				
686.9	2.2	6000	1.4	1.5	6000	1	1.1	6000	0.7				
784.1	1.9	6000	1.3	1.3	6000	0.8	1	6000	0.6				
893.6	1.7	6000	1.1	1.1	6000	0.7	0.8	6000	0.5				
963.5	1.6	6000	1	1	6000	0.7	0.8	6000	0.5				
BPH 516													
560.8	2.7	5310	1.5	1.8	5440	1	1.3	5670	0.8	3000	11000	14	
637.7	2.4	5350	1.3	1.6	5540	0.9	1.2	5720	0.7		11600		
725	2.1	5940	1.3	1.4	6130	0.9	1	6150	0.7				
824.3	1.8	5600	1.1	1.2	6160	0.8	0.9	6150	0.6				
939.5	1.6	6040	1.0	1.1	6160	0.7	0.8	6150	0.5				
1013	1.5	6070	0.9	1.0	6160	0.6	0.7	6160	0.5				
1154.6	1.3	6160	0.8	0.9	6160	0.6	0.6	6160	0.4				
1244.9	1.2	6160	0.8	0.8	6160	0.5	0.6	6160	0.4				
1387.8	1.1	6160	0.7	0.7	6150	0.5	0.5	6150	0.3				
1581.9	0.9	5720	0.6	0.6	5710	0.4	0.5	5710	0.3				
1798.6	0.8	6160	0.5	0.6	6160	0.4	0.4	6150	0.3				
2012.8	0.7	6160	0.5	0.5	6160	0.3	0.4	6160	0.2				
2252.5	0.7	6160	0.4	0.4	6160	0.3	0.3	6160	0.2				
2600.7	0.6	6150	0.4	0.4	6160	0.2	0.3	6170	0.2				
2910.4	0.5	6150	0.3	0.3	6150	0.2	0.3	6170	0.2				
3126	0.5	6150	0.3	0.3	6150	0.2	0.2	6170	0.2				

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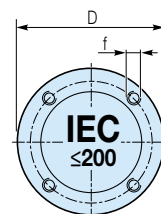


BPH 16

IEC



	IEC Adaptor						
	71	80 - 90	100 - 112	132	160	180	
	160	200	250	300	350	350	D
	—	—	15	16	20	20	t
	M8	M10	Ø13.5	Ø14.5	Ø19	Ø19	f
BPH 316	—	—	430	445	476.5	476.5	L
BPH 416	483	488	489	505	—	—	
BPH 516	543	548	549	—	—	—	
BPH 316	—	—	131	133	151	151	 *
BPH 416	129	129	138	140	112	—	
BPH 516	136	136	145	114	—	—	



	 		
	B3/B8	B6/V5/V6	B7
BPH 316			
BPH 416	6	11	9
BPH 516			

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

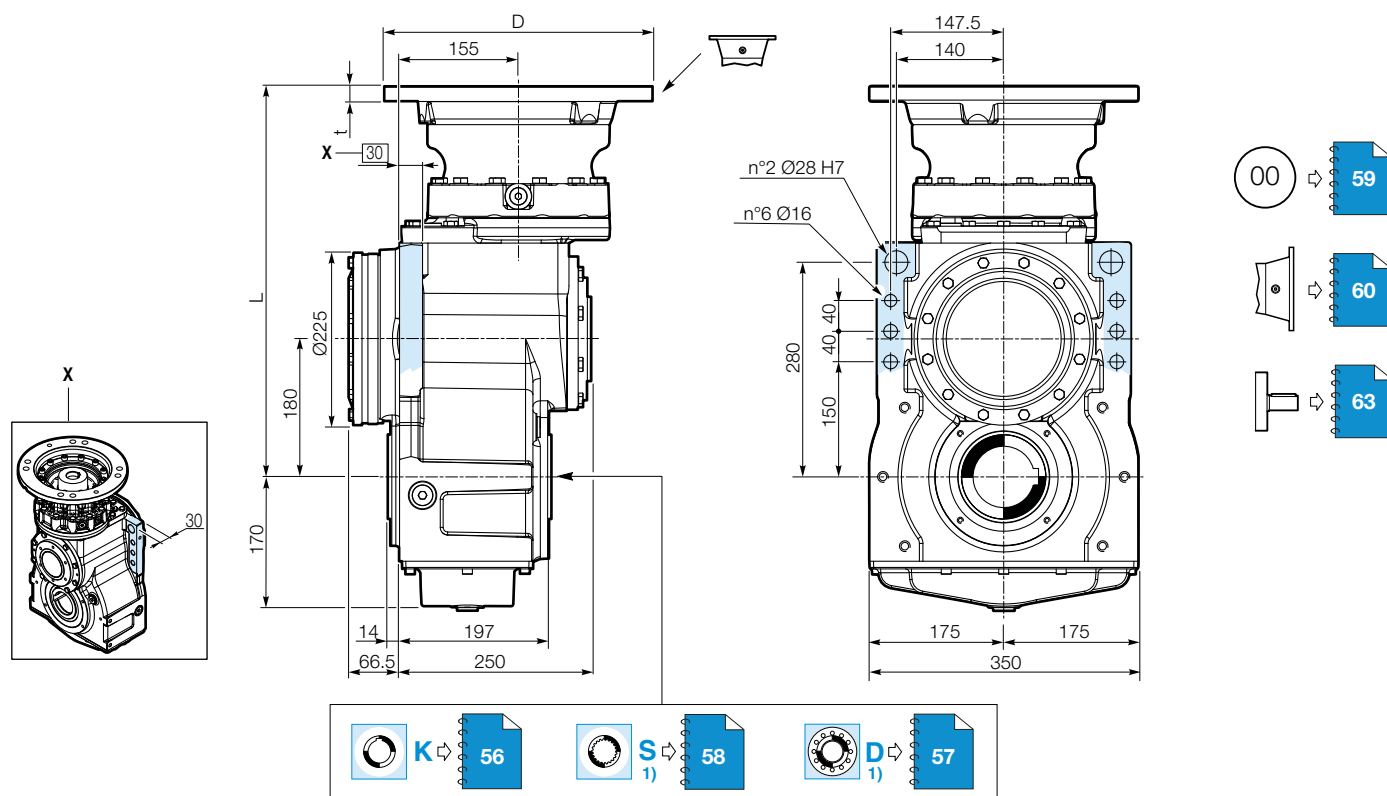
1) Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

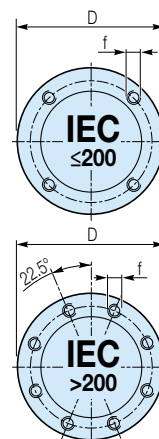
i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]	
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}				
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]				
BPH 318-E													
27.54	54	4260	25.2	36	4815	19.0	27	5300	53.0	3000	17740	25	
31.84	47	4875	24.9	31	5505	18.8	24	6060	14.9		17970		
34.40	44	5325	25.2	29	6010	19.0	22	6610	15.1		16380		
40.60	37	6285	25.2	25	7100	19.0	18	7810	15.1		17970		
48.37	31	6610	22.2	21	7570	17.0	16	8330	13.5		16380		
57.46	26	7000	19.8	17	7770	14.7	13	8550	11.7		16960		
67.82	22	7580	18.2	15	8190	13.1	11	9010	10.4		17970		
78.39	19	7715	16.0	13	8475	11.7	9.6	9330	9.3		16380		
93.12	16	7810	13.6	11	8005	9.3	8.1	8810	7.4				
109.9	14	8190	12.1	9.1	8190	8.1	6.8	9010	6.4				
BPH 418-E													
112.1	13	6495	9.5	8.9	7335	7.2	6.7	8075	5.7	3000	17740	20	
121.1	12	7765	10.5	8.3	8770	7.9	6.2	9650	6.3		17970		
129.6	12	7425	9.4	7.7	8385	7.1	5.8	9230	5.6				
140.0	11	8110	9.5	7.1	8985	7.0	5.4	9890	5.5				
161.9	9.3	8970	9.1	6.2	9055	6.1	4.6	9970	4.8				
170.3	8.8	8600	8.3	5.9	9070	5.8	4.4	9980	4.6				
202.2	7.4	8985	7.3	4.9	9120	4.9	3.7	10040	3.9				
233.8	6.4	9050	6.4	4.3	9340	4.4	3.2	10280	3.5				
275.6	5.4	9085	5.4	3.6	9590	3.8	2.7	10550	3.0				
309.6	4.8	8225	4.4	3.2	8225	2.9	2.4	9055	2.3		16380		
337.8	4.4	8460	4.1	3.0	8675	2.8	2.2	9550	2.2		17970		
398.2	3.8	8550	3.5	2.5	8765	2.4	1.9	9650	1.9		16380		
458.0	3.3	9615	3.5	2.2	10000	2.4	1.6	11010	1.9		17970		
494.3	3.0	9840	3.3	2.0	10130	2.2	1.5	11150	1.8		16380		
547.5	2.7	8720	2.6	1.8	8940	1.8	1.4	9840	1.4		17970		
583.5	2.6	9930	2.8	1.7	10450	2.0	1.3	11500	1.5		16380		
645.3	2.3	8810	2.2	1.5	9035	1.5	1.2	9940	1.2		17970		
693.1	2.2	10165	2.4	1.4	10485	1.7	1.1	11540	1.3		16380		
801.2	1.9	8475	1.7	1.2	8475	1.2	0.9	9330	0.9		16950		
945.6	1.6	10000	1.7	1.1	10000	1.2	0.8	11010	0.9		16380		
BPH 518-E													
842.8	1.8	10160	2.0	1.2	10360	1.4	0.9	11400	1.1	3000	17970	18	
1001	1.5	10190	1.7	1.0	10500	1.2	0.7	11560	0.9		17740		
1122	1.3	10210	1.5	0.9	10500	1.0	0.7	11560	0.8				
1298	1.2	9860	1.3	0.8	10120	0.9	0.6	11140	0.7				
1431	1.0	10500	1.2	0.7	10500	0.8	0.5	11560	0.6				
1621	0.9	10500	1.1	0.6	10500	0.7	0.5	11560	0.6				
1740	0.9	10500	1.0	0.6	10500	0.7	0.4	11560	0.5				
2012	0.7	10500	0.9	0.5	10500	0.6	0.4	11560	0.5				
2228	0.7	9200	0.7	0.4	9200	0.5	0.3	10120	0.4		17970		
2447	0.6	10500	0.7	0.4	10500	0.5	0.3	11560	0.4				
2817	0.5	10500	0.6	0.4	10500	0.4	0.3	11560	0.3				
3174	0.5	10000	0.5	0.3	10000	0.3	0.2	11010	0.3		16380		
3453	0.4	9200	0.4	0.3	9200	0.3	0.2	10120	0.2		17970		
4075	0.4	10500	0.4	0.2	10500	0.3	0.2	11560	0.2		16380		
4472	0.3	9200	0.3	0.2	9200	0.2	0.2	10120	0.2		17970		
5052	0.3	10500	0.3	0.2	10500	0.2	0.1	11560	0.2				
6001	0.2	9200	0.3	0.2	9200	0.2	0.1	10120	0.1				
7083	0.2	10500	0.2	0.1	10500	0.2	0.1	11560	0.1		16380		

Higher ratios are available. Please consult the DANA area contact person for possible questions

BPH 18-E IEC



	IEC Adaptor									
	71	80	90	100 - 112	132	160	180	200	225	
	160	200	200	250	300	350	350	400	450	
	—	—	—	15	16	20	20	20	22	
	M8	M10	M10	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	D
BPH 318-E	—	—	—	—	—	509.5	509.5	509.5	539.5	t
BPH 418-E	—	—	484.3	492.3	528.3	554	554	—	—	f
BPH 518-E	538.8	528.3	528.3	536.3	572.3	—	—	—	—	L
BPH 318-E	—	—	—	—	—	180	180	180	190	Kg*
BPH 418-E	—	—	165	165	170	185	185	—	—	
BPH 518-E	170	170	170	170	175	—	—	—	—	



	OIL [I]		
	B3/B8	B6/V5/V6	B7
BPH 318-E	—	—	—
BPH 418-E	7	13	10
BPH 518-E	—	—	—

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1) Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

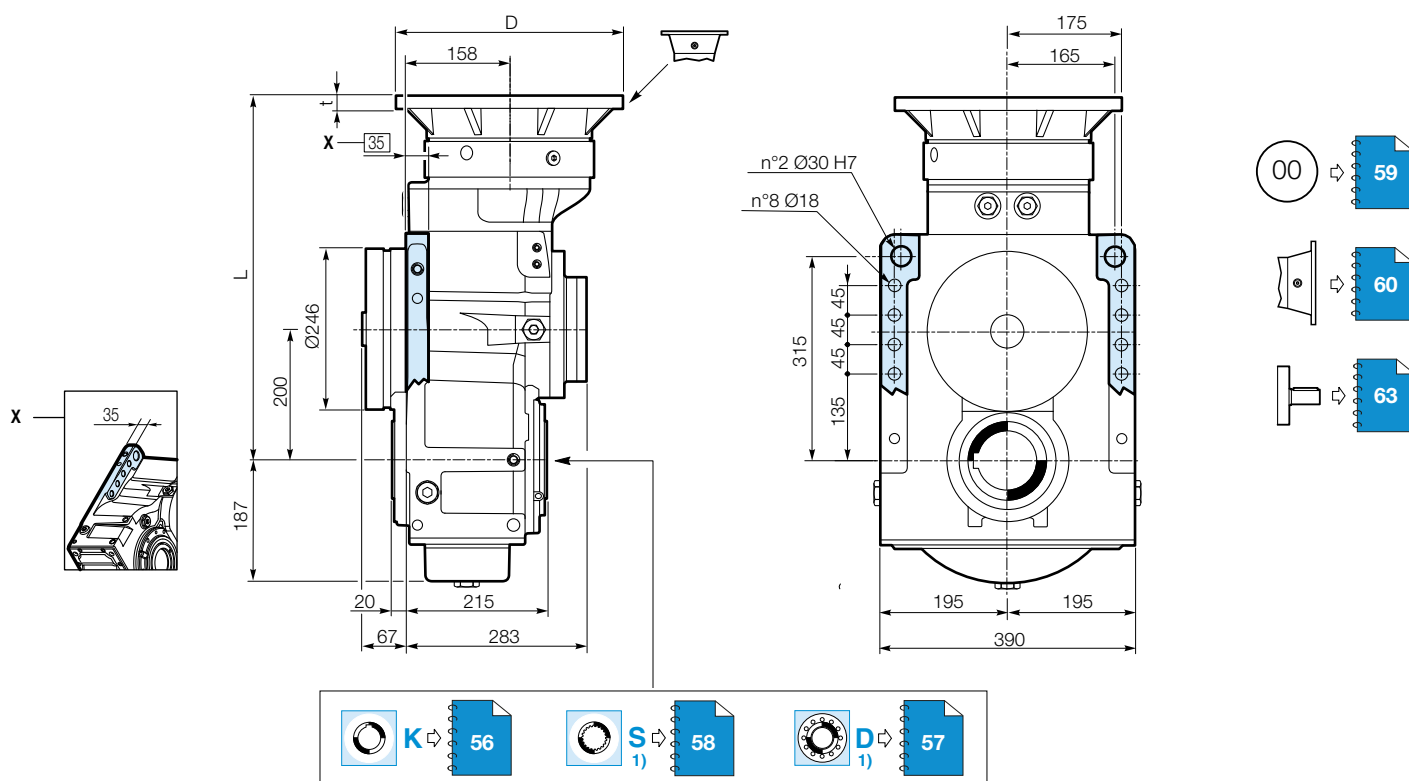
i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]	
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}				
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]				
BPH 320													
30.1	50	5560	30.0	33	6280	22.6	25	6840	18.4	3000	20200	30	
34.2	44	6320	30.0	29	7130	22.5	22	7780	18.4		22000		
35.52	42	6560	30.0	28	7410	22.6	21	8080	18.4		20200		
40.37	37	7460	30.0	25	8420	22.5	19	9180	18.4				
47.63	31	7930	27.0	21	8960	20.3	15.7	9280	15.8				
61.91	24	7260	19.0	16	8200	14.3	12.1	8940	11.7				
70.36	21	8250	19.0	14	9320	14.3	10.7	10100	11.6				
83.02	18	9200	17.9	12	9430	12.3	9	9600	9.4				
103.9	14	7700	12.0	9.6	7900	8.2	7.2	8050	6.3		18000		
BPH 420													
101.7	15	8050	13.1	9.8	9090	9.8	7.4	9910	8.0	3000	21800	25	
115.6	13	9150	13.1	8.7	10090	9.6	6.5	10270	7.3		22000		
120.1	13	9500	13.1	8.3	10730	9.8	6.2	11500	7.9		20200		
136.4	11	10800	13.0	7.3	11500	9.2	5.5	11500	6.9				
155.9	9.6	10280	10.9	6.4	11500	8.1	4.8	11500	6.1				
177.2	8.5	11500	10.7	5.6	11500	7.1	4.2	11500	5.3				
205.2	7.3	11200	9.0	4.9	11500	6.1	3.7	11500	4.6				
213.1	7	11500	8.9	4.7	11500	5.9	3.5	11500	4.4				
242.2	6.2	11500	7.8	4.1	11500	5.2	3.1	11500	3.9		20200		
280.1	5.4	11500	6.8	3.6	11500	4.5	2.7	11500	3.4				
308.9	4.9	11500	6.1	3.2	11500	4.1	2.4	11500	3.1				
371.5	4	11500	5.1	2.7	11500	3.4	2	11500	2.5				
422.1	3.6	11500	4.5	2.4	11500	3	1.8	11500	2.2				
488.3	3.1	11500	3.9	2	11500	2.6	1.5	11500	1.9				
576.2	2.6	11500	3.3	1.7	11500	2.2	1.3	11020	1.6				
650.1	2.3	11500	2.9	1.5	11500	1.9	1.2	11500	1.5				
738.7	2	11500	2.6	1.4	11500	1.7	1	11500	1.3				
871.7	1.7	10700	2.0	1.1	11500	1.4	0.9	11500	1.1				
1091.2	1.4	8970	1.4	0.9	9360	0.9	0.7	9770	0.7		18000		
BPH 520													
461.2	3.3	12340	4.2	2.2	12650	2.9	1.6	12650	2.2	3000	20200	23	
544.2	2.8	10240	3.0	1.8	10500	2.00	1.4	10750	1.6				
599	2.5	12550	3.3	1.7	12640	2.2	1.3	12650	1.7				
706.8	2.1	10410	2.3	1.4	10710	1.6	1.1	11190	1.2				
818.6	1.8	12650	2.4	1.2	12650	1.6	0.9	12650	1.2				
918	1.6	10570	1.8	1.1	11140	1.3	0.8	11640	1.0				
966	1.6	10610	1.7	1	11230	1.2	0.8	11740	1.0				
1063.3	1.4	12650	1.9	0.9	12650	1.2	0.7	12650	0.9				
1229.9	1.2	12650	1.6	0.8	12640	1.1	0.6	12650	0.8				
1453.2	1	12650	1.4	0.7	12640	0.9	0.5	12650	0.7				
1680.9	0.9	12640	1.2	0.6	12650	0.8	0.4	12650	0.6				
1860.7	0.8	12650	1.1	0.5	12640	0.7	0.4	12640	0.5				
1983.5	0.8	11780	0.9	0.5	12420	0.7	0.4	12420	0.5				
2195.7	0.7	11970	0.9	0.5	12420	0.6	0.3	12430	0.4				
2543.1	0.6	12650	0.8	0.4	12660	0.5	0.3	12650	0.4				
3000.9	0.5	12410	0.6	0.3	12410	0.4	0.2	12430	0.3				
3245.2	0.5	12650	0.6	0.3	12650	0.4	0.2	12650	0.3				
3459.2	0.4	12430	0.6	0.3	12430	0.4	0.2	12410	0.3				
4001.2	0.4	12420	0.5	0.2	12420	0.3	0.2	12420	0.2				
5130.2	0.3	12660	0.4	0.2	12640	0.3	0.1	12660	0.2				
6053.7	0.2	12420	0.3	0.2	12400	0.2	0.1	12460	0.2				

Higher ratios are available. Please consult the DANA area contact person for possible questions

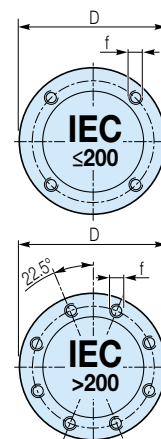


BPH 20

IEC



	IEC Adaptor								
	71	80 - 90	100 - 112	132	160	180	200	225	
	160	200	250	300	350	350	400	450	
	—	—	15	16	20	20	20	22	
	M8	M10	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	D
									t
									f
BPH 320	—	—	—	573.5	593	593	593	623	L
BPH 420	—	527.5	528.5	598.5	593	593	—	—	
BPH 520	562.5	567.5	568.5	638.5	—	—	—	—	
									Kg *
BPH 320	—	—	—	207	227	227	232	240	
BPH 420	—	196	199	212	232	232	—	—	
BPH 520	202	202	205	217	—	—	—	—	



	OIL [l]		
	B3/B8	B6/V5/V6	B7
BPH 320			
BPH 420	9	21	15
BPH 520			

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¹⁾ Feasibility on request

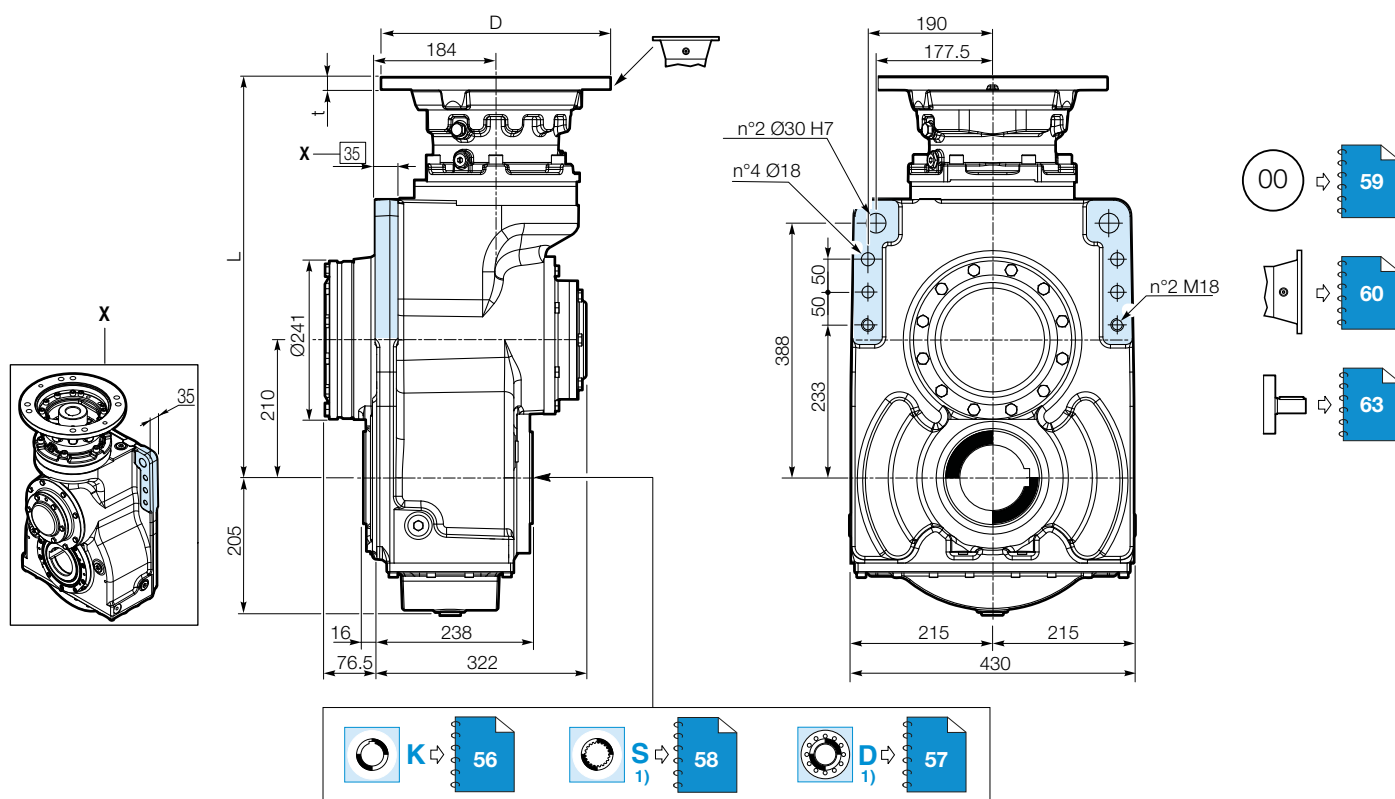
*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}			
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]			
BPH 321-E												
30.20	50	8955	48.3	33	10115	36.3	25	11130	28.9	3000	25280	33
34.39	44	9310	44.1	29	10515	33.2	22	11570	26.4		24460	
39.76	38	10280	42.1	25	11610	31.7	19	12780	25.2		25280	
48.36	31	10640	35.8	21	12020	27.0	16	13230	21.5		23600	
57.08	26	11545	32.9	18	11800	22.4	13	12990	17.9		25280	
69.12	22	12130	28.6	14	12640	19.8	11	13910	15.8		23600	
81.59	18	11800	23.5	12	11800	15.7	9.2	12990	12.5			
99.23	15	11800	19.4	10	11800	12.9	7.6	12990	10.3			
BPH 421-E												
106.2	14	13000	20.1	9.4	13000	13.4	7.1	14310	10.6	3000	25280	28
121.0	12	13000	17.7	8.3	13000	11.8	6.2	14310	9.3		24460	
140.0	11	13700	16.1	7.1	13700	10.7	5.4	15080	8.5		25280	
161.8	9.3	13700	13.9	6.2	13700	9.3	4.6	15080	7.3			
170.2	8.8	13600	13.1	5.9	13920	9.0	4.4	15320	7.1			
200.9	7.5	14040	11.5	5.0	14400	7.9	3.7	15850	6.2			
232.3	6.5	14320	10.1	4.3	14680	6.9	3.2	16160	5.5			
248.1	6.0	14340	9.5	4.0	14800	6.5	3.0	16290	5.2			
282.5	5.3	14375	8.4	3.5	15065	5.8	2.7	16580	4.6			
325.2	4.6	14550	7.4	3.1	15350	5.2	2.3	16900	4.1			
395.6	3.8	14930	6.2	2.5	15750	4.4	1.9	17340	3.4			
479.7	3.1	15310	5.2	2.1	16160	3.7	1.6	17790	2.9			
491.2	3.1	15365	5.1	2.0	16200	3.6	1.5	17830	2.9			
565.4	2.7	15650	4.6	1.8	16200	3.1	1.3	17830	2.5			
583.4	2.6	15750	4.4	1.7	16500	3.1	1.3	18160	2.4			
687.6	2.2	16060	3.8	1.5	16500	2.6	1.1	18160	2.1			
706.4	2.1	13700	3.2	1.4	13700	2.1	1.1	15080	1.7		25280	
1014	1.5	16500	2.7	1.0	16500	1.8	0.7	18160	1.4		23600	
BPH 521-E												
823.0	1.8	13600	2.7	1.2	13600	1.8	0.9	14970	1.4	3000	25280	26
1001	1.5	14500	2.4	1.0	14500	1.6	0.7	15960	1.3			
1150	1.3	16500	2.4	0.9	16500	1.6	0.7	18160	1.2			
1422	1.1	16500	1.9	0.7	16500	1.3	0.5	18160	1.0			
1610	0.9	16500	1.7	0.6	16500	1.1	0.5	18160	0.9			
1729	0.9	16500	1.6	0.6	16500	1.1	0.4	18160	0.8			
1999	0.8	16500	1.4	0.5	16500	0.9	0.4	18160	0.7			
2254	0.7	16500	1.2	0.4	16500	0.8	0.3	18160	0.6			
2447	0.6	14500	1.0	0.4	14500	0.7	0.3	15960	0.5			
2935	0.5	16300	0.9	0.3	16300	0.6	0.3	17940	0.5			
3570	0.4	16500	0.8	0.3	16500	0.5	0.2	18160	0.4			
4043	0.4	16500	0.7	0.2	16500	0.5	0.2	18160	0.4			
5020	0.3	16500	0.5	0.2	16500	0.4	0.1	18160	0.3			
5963	0.3	16500	0.5	0.2	16500	0.3	0.1	18160	0.2			
7028	0.2	16500	0.4	0.1	16500	0.3	0.1	18160	0.2			

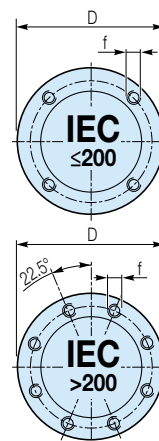
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BPH 21-E IEC



	IEC Adaptor									
	71	80	90	100 - 112	132	160	180	200	225	
	160	200	200	250	300	350	350	400	450	D
	—	—	—	15	16	20	20	20	22	t
	M8	M10	M10	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	f
BPH 321-E	—	—	—	—	—	610.5	610.5	610.5	640.5	L
BPH 421-E	595.5	585	585	593	629	655	655	—	—	
BPH 521-E	639.5	629	629	637	673	—	—	—	—	
BPH 321-E	—	—	—	—	—	280	280	280	290	 *
BPH 421-E	265	265	265	265	270	285	285	—	—	
BPH 521-E	270	270	270	270	275	--	—	—	—	



	 [1]		
	B3/B8	B6/V5/V6	B7
	11	23	17
	BPH 321		
BPH 421			
BPH 521			

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1) Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

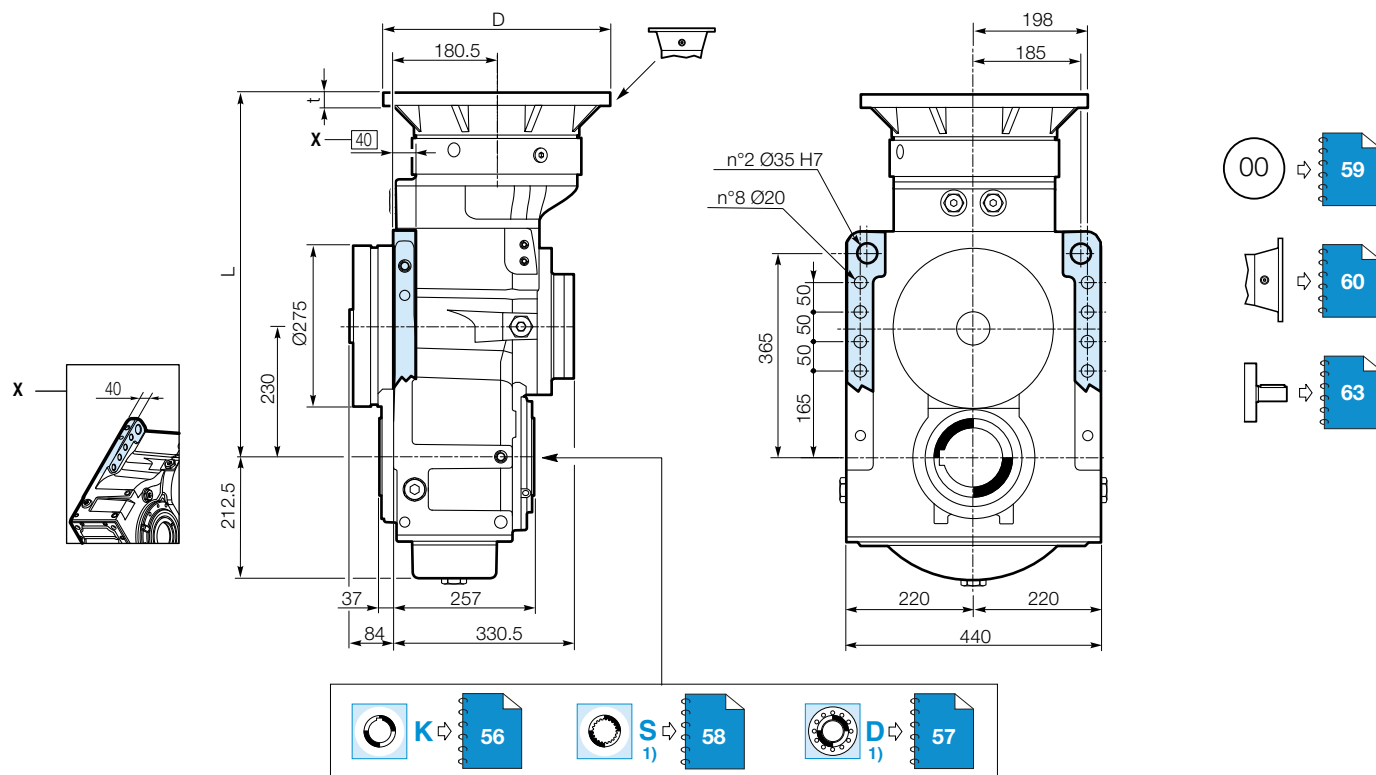
i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]	
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}				
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]				
BPH 323													
30.66	49	8240	43.7	33	9300	32.9	24	10140	26.9	3000	28200	40	
35.67	42	9580	43.7	28	10820	32.8	21	11790	26.8		32800		
40.55	37	10890	43.6	25	12300	32.8	18	13410	26.8		33400		
42.1	36	11310	43.6	24	12770	32.8	18	13920	26.8		30200		
47.86	31	12450	42.2	21	14060	31.7	16	15100	25.6				
54.55	27	12950	38.5	18	14620	29	13.7	15100	22.4				
58.82	26	13240	36.5	17	15100	27.7	12.8	15100	20.8				
73.37	20	12350	27.3	14	14140.0	20.8	10.2	15100	16.7				
83.42	18	14040	27.3	12	15100.0	19.6	9.0	15100	14.7				
95.08	16	15100	25.7	10.5	15100.0	17.2	7.9	15100	12.9				
102.5	15	15100	23.9	9.8	15100.0	15.9	7.3	15100	11.9				
123.2	12	10740	14.2	8.1	11010.0	9.7	6.1	11210	7.4		24800		
BPH 423													
120.6	12.4	13950	19	8.3	15290.0	13.8	6.2	15570	10.6	3000	32800	33	
137.1	10.9	15860	18.9	7.3	16990.0	13.5	5.5	17270	10.3		33400		
142.3	10.5	16470	18.9	7.0	17890	13.7	5.3	18000	10.3		30200		
161.8	9.3	17150	17.3	6.2	18000.0	12.1	4.6	18000	9.1				
184.4	8.1	17310	15.3	5.4	18000.0	10.6	4.1	18000	8.0				
210.1	7.1	17840	13.9	4.8	18000.0	9.3	3.6	18000	7.0				
239.5	6.3	17600	12	4.2	18000.0	8.2	3.1	18000	6.1				
252.6	5.9	18000	11.6	4.0	18000.0	7.8	3.0	18000	5.8				
287.2	5.2	18000	10.2	3.5	18000.0	6.8	2.6	18000	5.1				
332.2	4.5	18000	8.9	3.0	18000.0	5.9	2.3	18000	4.4				
366.2	4.1	18000	8	2.7	18000.0	5.4	2.0	18000	4.0				
417.4	3.6	18000	7	2.4	18000.0	4.7	1.8	18000	3.5				
500.5	3.0	18000	5.9	2.0	18000.0	3.9	1.5	18000	2.9				
578.9	2.6	18000	5.1	1.7	18000.0	3.4	1.3	18000	2.5				
659.9	2.3	18000	4.5	1.5	18000.0	3	1.1	18000	2.2				
770.4	1.9	18000	3.8	1.3	18000.0	2.5	1.0	18000	1.9				
875.9	1.7	18000	3.4	1.1	18000.0	2.2	0.9	18000	1.7				
998.3	1.5	18000	2.9	1.0	18000.0	2	0.8	18000	1.5				
1076.4	1.4	18000	2.7	0.9	18000.0	1.8	0.7	18000	1.4				
BPH 523													
624.6	2.4	18730	4.7	1.6	18920.0	3.2	1.2	18920	2.4	3000	30200	31	
710.2	2.1	18920	4.2	1.4	18920	2.8	1.1	18920	2.1				
811.3	1.8	18920	3.7	1.2	18920.0	2.4	0.9	18920	1.8				
922.4	1.6	18920	3.2	1.1	18920.0	2.1	0.8	18920	1.6				
987.5	1.5	18920	3.0	1.0	18920.0	2	0.8	18920	1.5				
1108.8	1.4	18930	2.7	0.9	18920	1.8	0.7	18930	1.3				
1260.7	1.2	18920	2.4	0.8	18930	1.6	0.6	18920	1.2				
1415	1.1	18920	2.1	0.7	18920	1.4	0.5	18920	1.1				
1608.8	0.9	18920	1.8	0.6	18920	1.2	0.5	18920	0.9				
1722.2	0.9	18930	1.7	0.6	18920	1.2	0.4	18930	0.9				
1993.1	0.8	18930	1.5	0.5	18920	1.0	0.4	18920	0.7				
2236.9	0.7	18930	1.3	0.4	18920	0.9	0.3	18930	0.7				
2543.3	0.6	18920	1.2	0.4	18920	0.8	0.3	18920	0.6				
2643.1	0.6	18930	1.1	0.4	18920	0.7	0.3	18930	0.6				
3057.2	0.5	18920	1.0	0.3	18930	0.6	0.2	18920	0.5				
3476	0.4	18930	0.9	0.3	18920	0.6	0.2	18910	0.4				
3961.8	0.4	18930	0.8	0.3	18920	0.5	0.2	18930	0.4				
4625.4	0.3	18930	0.6	0.2	18920	0.4	0.2	18930	0.3				
6083	0.2	18930	0.5	0.2	18950	0.3	0.1	18930	0.2				

Higher ratios are available. Please consult the DANA area contact person for possible questions

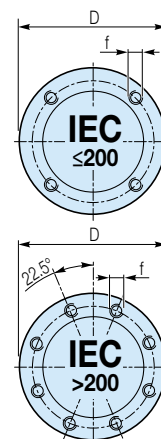


BPH 23

IEC



	IEC Adaptor								
	71	80 - 90	100 - 112	132	160	180	200	225	
	160	200	250	300	350	350	400	450	D
	—	—	15	16	20	20	20	22	t
	M8	M10	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	f
BPH 323	—	—	—	—	645	645	645	675	L
BPH 423	—	579.5	580.5	650.5	645	645	—	—	
BPH 523	614.5	619.5	620.5	690.5	—	—	—	—	
BPH 323	—	—	—	—	319	319	324	329	M
BPH 423	—	288	291	303	333	333	—	—	
BPH 523	294	294	297	309	—	—	—	—	



	OIL [l]		
	B3/B8	B6/V5/V6	B7
BPH 323	—	—	—
BPH 423	13	25	18
BPH 523	—	—	—

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

¹⁾ Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

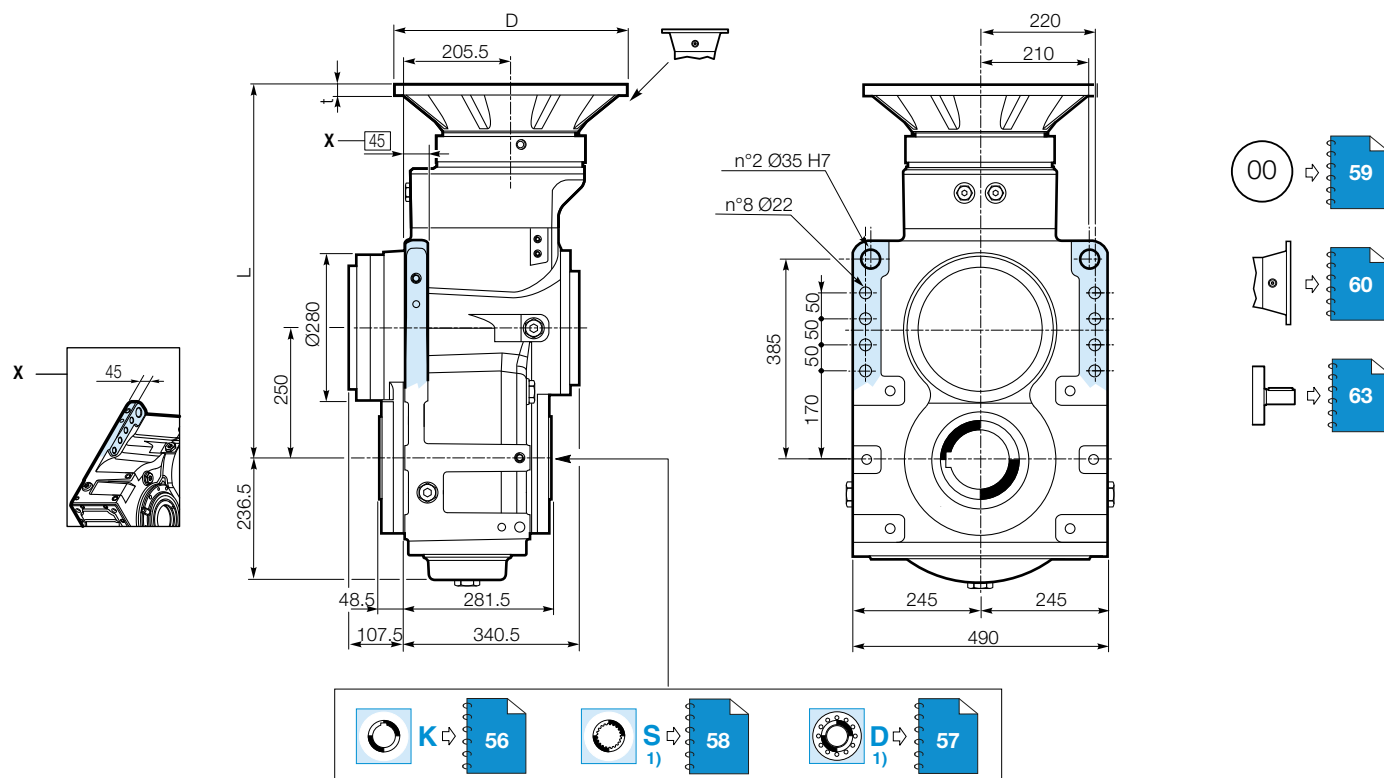
i _{eff}	1500			1000			750			n _{1MAX} [rpm]	T _{2MAX} [Nm]	P _T [kW]		
	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}	n ₂	T _{2N}	P _{N1}					
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]					
BPH 325														
34.2	44	14100	67.1	29	15900	50.4	22	17350	41.1	3000	48400	47		
40.37	37	16650	67.0	25	18800	50.3	19	20500	41.1		44000			
44.52	34	17100	62.3	22	19350	46.9	17	21100	38.3					
49.94	30	17400	56.5	20	19650	42.5	15	21450	34.7				44000	
57.67	26	17800	50.0	17	20150	37.7	13	21950	30.8					
59.44	25	16650	45.5	17	18800	34.2	12.6	20500	27.9					
70.16	21	19650	45.2	14	22000	33.7	10.7	22000	25.3					
77.38	19	20250	42.2	12.9	22000	30.6	9.7	22000	22.9					
86.8	17	20550	38.2	11.5	22000	27.2	8.6	22000	20.4					
100.23	15	21050	33.9	9.9	22000	23.6	7.5	22000	17.7					
BPH 425														
124.8	12.0	20480	27.1	8.0	22990	20.3	6	23410	15.5	3000	48400	39		
147.3	10.2	24180	27.1	6.8	25780	19.2	5.1	26930	15.1		44000			
167.5	9.0	24720	24.4	6.0	26290	17.3	4.5	27000	13.3					
190.9	7.9	25220	21.8	5.2	26810	15.4	3.9	27000	11.7					
205.9	7.3	25510	20.4	4.9	27000	14.4	3.6	27000	10.8					
247.5	6.1	27000	18.0	4.0	27000	12	3.0	27000	9.0					
276.9	5.4	27000	16.1	3.6	27000	10.7	2.7	27000	8.0					
291.2	5.2	27000	15.3	3.4	27000	10.2	2.6	27000	7.6					
331.9	4.5	27000	13.4	3.0	27000	8.9	2.3	27000	6.7					
357.8	4.2	27000	12.4	2.8	27000	8.3	2.1	27000	6.2					
394.6	3.8	27000	11.3	2.5	27000	7.5	1.9	27000	5.6					
430.1	3.5	27000	10.4	2.3	27000	6.9	1.7	27000	5.2					
481.3	3.1	27000	9.3	2.1	27000	6.2	1.6	27000	4.6					
530.8	2.8	26100	8.1	1.9	27000	5.6	1.4	27000	4.2					
595.4	2.5	26120	7.2	1.7	27000	5.0	1.3	27000	3.7					
687.6	2.2	25030	6.0	1.5	25800	4.1	1.1	26950	3.2					
784.8	1.9	25230	5.3	1.3	26320	3.7	1.0	27000	2.8					
BPH 525														
611.5	2.5	27530	7.1	1.6	27530	4.7	1.2	27530	3.5	3000	44000	35		
696.9	2.2	27530	6.2	1.4	27530	4.1	1.1	27530	3.1					
792.4	1.9	27530	5.5	1.3	27530	3.6	0.9	27530	2.7					
903.2	1.7	27530	4.8	1.1	27530	3.2	0.8	27530	2.4					
1010.8	1.5	27530	4.3	1.0	27530	2.9	0.7	27530	2.1					
1149.2	1.3	27530	3.8	0.9	27530	2.5	0.7	27530	1.9					
1262.0	1.2	27530	3.4	0.8	27530	2.3	0.6	27530	1.7					
1412.3	1.1	27530	3.1	0.7	27530	2	0.5	27530	1.5					
1557.6	1.0	27530	2.8	0.6	27530	1.9	0.5	27530	1.4					
1783.0	0.8	27530	2.4	0.6	27530	1.6	0.4	27530	1.2					
2010.5	0.7	27530	2.2	0.5	27530	1.4	0.4	27530	1.1					
2241.2	0.7	27530	1.9	0.4	27530	1.3	0.3	27530	1.0					
2508.1	0.6	27530	1.7	0.4	27530	1.1	0.3	27530	0.9					
2813.5	0.5	27530	1.5	0.4	27530	1.0	0.3	27530	0.8					
3130.2	0.5	27530	1.4	0.3	27530	0.9	0.2	27530	0.7					
3503.0	0.4	27530	1.2	0.3	27530	0.8	0.2	27530	0.6					
4210.4	0.4	27530	1.0	0.2	27530	0.7	0.2	27530	0.5					
4805.8	0.3	27530	0.9	0.2	27530	0.6	0.2	27530	0.4					
5378.1	0.3	27530	0.8	0.2	27530	0.5	0.1	27530	0.4					

Higher ratios are available. Please consult the DANA area contact person for possible questions

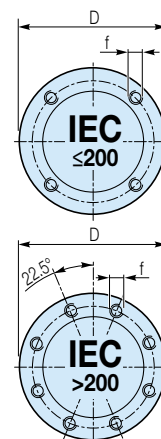


BPH 25

IEC



	IEC Adaptor									
	80 - 90	100 - 112	132	160	180	200	225	250 ²⁾	280 ²⁾	
	200	250	300	350	350	400	450	550	550	D
	—	15	16	20	20	20	22	25	25	t
	M10	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	Ø19	Ø19	f
BPH 325	—	—	—	754	754	754	784	784	784	L
BPH 425	—	706.5	721.5	754	754	754	—	—	—	
BPH 525	766.5	766.5	782.5	815	815	—	—	—	—	
BPH 325	—	—	—	475	475	480	485	495	495	Kg *
BPH 425	—	450	462	502	502	507	—	—	—	
BPH 525	454	457	469	469	469	—	—	—	—	



	OIL [l]		
	B3/B8	B6/V5/V6	B7
BPH 325			
BPH 425	16	30	23
BPH 525			

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

¹⁾ Feasibility on request

²⁾ Ask the technical office to check

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

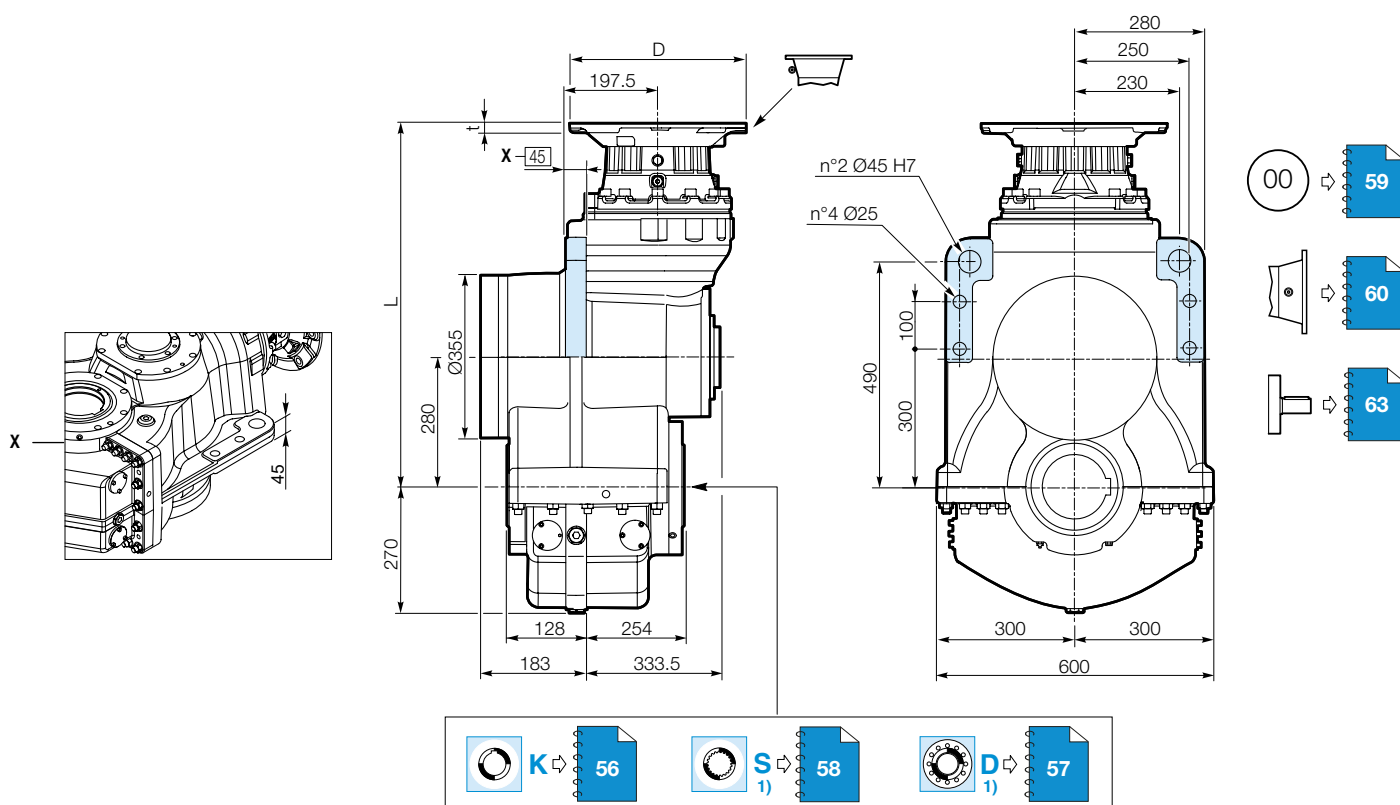
i_{eff}	1500			1000			750			$n_{1\text{MAX}}$	$T_{2\text{MAX}}$	P_T
	n_2	T_{2N}	P_{N1}	n_2	T_{2N}	P_{N1}	n_2	T_{2N}	P_{N1}	[rpm]	[Nm]	[kW]
	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]	[rpm]	[Nm]	[kW]			
BPH 328												
47.1	32	21360	73.8	21	24150	55.7	16	26300	45.5	3000	71400	75
58.2	26	22220	62.1	17	25100	46.7	13	27350	38.2		71200	
67	22	22720	55.2	15	25650	41.5	11	27950	33.9		64000	
BPH 428												
144.9	10.3	29910	33.9	6.9	33800	25.6	5.2	35650	20.2	3000	71400	60
164.7	9.1	31080	31.0	6.1	35100	23.4	4.6	35650	17.8		71200	
179.4	8.4	31110	28.5	5.6	32800	20.0	4.2	33350	15.3		64000	
194.3	7.7	32660	27.6	5.1	35650	20.1	3.9	35650	15.1		71200	
203.9	7.4	32210	26.0	4.9	33050	17.8	3.7	33650	13.6		71400	
206.4	7.3	28680	22.9	4.8	29400	15.6	3.6	29950	11.9		64000	
234.5	6.4	28910	20.3	4.3	29650	13.9	3.2	30200	10.6		71400	
240.5	6.2	32550	22.3	4.2	33400	15.2	3.1	34000	11.6		71400	
243.3	6.2	34940	23.6	4.1	35650	16.1	3.1	35650	12.1		64000	
276.7	5.4	29210	17.4	3.6	29950	11.9	2.7	30500	9.1		71400	
282.3	5.3	35670	20.8	3.5	35650	13.8	2.7	35650	10.4		64000	
301.1	5	33010	18.0	3.3	33850	12.3	2.5	34450	9.4		71200	
341.2	4.4	35670	17.2	2.9	35650	11.5	2.2	35650	8.6		71400	
346.4	4.3	29620	14.1	2.9	30400	9.6	2.2	30950	7.3		64000	
349.5	4.3	33320	15.7	2.9	34150	10.7	2.1	34800	8.2		71200	
402.1	3.7	29900	12.2	2.5	30650	8.4	1.9	31200	6.4		64000	
422.3	3.6	33710	13.1	2.4	34600	9.0	1.8	35200	6.9		71200	
485.8	3.1	30250	10.2	2.1	31050	7.0	1.5	31600	5.3		64000	
BPH 528												
446.4 *	3.4	39800	14.8	2.2	40800	10.1	1.7	42200	7.9	3000	71400	55
507.3 *	3	40120	13.1	2	41200	9.0	1.5	43050	7.0			
576.4 *	2.6	40440	11.7	1.7	42000	8.1	1.3	43650	6.3			
598.6 *	2.5	40530	11.2	1.7	42250	7.8	1.3	43650	6.1			
627.9 *	2.4	34570	9.1	1.6	35450	6.3	1.2	36900	4.9			
680.2 *	2.2	40860	10.0	1.5	43100	7.0	1.1	43650	5.3			
713.5 *	2.1	34840	8.1	1.4	36000	5.6	1.1	37600	4.4			
740.9 *	2	34930	7.8	1.3	36200	5.4	1	37800	4.2			
802.6 *	1.9	41540	8.6	1.2	43650	6.0	0.9	43650	4.5			
851.5 *	1.8	41910	8.2	1.2	43650	5.7	0.9	43650	4.3			
869.6 *	1.7	42050	8.0	1.1	43650	5.6	0.9	43650	4.2			
954.3	1.6	42640	7.4	1	43650	5.1	0.8	43650	3.8			
1005.8	1.5	42980	7.1	1	43650	4.8	0.7	43650	3.6			
1068	1.4	43380	6.7	0.9	43650	4.5	0.7	43650	3.4			
1143	1.3	43640	6.3	0.9	43650	4.2	0.7	43650	3.2			
1181.2	1.3	36540	5.1	0.8	38850	3.6	0.6	40600	2.9			
1239.5	1.2	43640	5.8	0.8	43650	3.9	0.6	43650	2.9			
1348.7	1.1	43640	5.4	0.7	43650	3.6	0.6	43650	2.7			
1459.7	1	43640	5.0	0.7	43650	3.3	0.5	43650	2.5			
1521.8	1	37940	4.1	0.7	38200	2.8	0.5	38900	2.1			
1688.4	0.9	43640	4.3	0.6	43650	2.9	0.4	43650	2.1			
1806.7	0.8	38970	3.6	0.6	41450	2.5	0.4	41500	1.9			
1959.4	0.8	43640	3.7	0.5	43650	2.5	0.4	43650	1.8			
2040.6	0.7	43640	3.6	0.5	43650	2.4	0.4	43650	1.8			
2140.5	0.7	39980	3.1	0.5	41500	2.1	0.4	41500	1.6			
2367.7	0.6	43640	3.1	0.4	43650	2.0	0.3	43650	1.5			
2425.3	0.6	40750	2.8	0.4	41500	1.9	0.3	41500	1.4			
2554.5	0.6	43640	2.8	0.4	43650	1.9	0.3	43650	1.4			
2790.3	0.5	36460	2.2	0.4	38750	1.5	0.3	38900	1.2		64600	
2964.6	0.5	43640	2.4	0.3	43650	1.6	0.3	43650	1.2			
3161.8	0.5	41500	2.2	0.3	41500	1.5	0.2	41500	1.1			
3582.2	0.4	43640	2.0	0.3	43650	1.3	0.2	43650	1.0		71400	
3669.4	0.4	41500	1.9	0.3	41500	1.3	0.2	41500	0.9			
4221.6	0.4	38820	1.5	0.2	38900	1.0	0.2	38900	0.8		64600	
4433.8	0.3	41500	1.6	0.2	41500	1.0	0.2	41500	0.8		71400	
5101.1	0.3	38880	1.3	0.2	38900	0.8	0.1	38900	0.6		64600	

* First stage EM1020

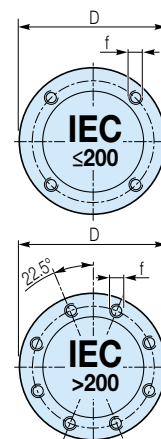


BPH 28

IEC



	IEC Adaptor									
	80 - 90	100 - 112	132	160	180	200	225	250	280	
	200	250	300	350	350	400	450	550	550	D
	—	15	16	20	20	20	22	25	25	t
	M10	Ø13.5	Ø14.5	Ø19	Ø19	Ø19	Ø19	Ø19	Ø19	f
BPH 328	—	—	—	—	—	785	815	815	815	L
BPH 428	—	—	774.5	785	785	785	815	—	—	
BPH 528	759	760	827	858	—	—	—	—	—	
BPH 328	—	—	—	—	—	590	595	605	605	Kg *
BPH 428	—	—	585	600	600	605	610	—	—	
BPH 528	595	598	605	620	—	—	—	—	—	



	OIL [l]		
	B3/B8	B6/V5/V6	B7
BPH 328	—	—	—
BPH 428	30	60	45
BPH 528	—	—	—

Note: unquoted holes are for internal Dana use only and can be modified at any time without prior notice

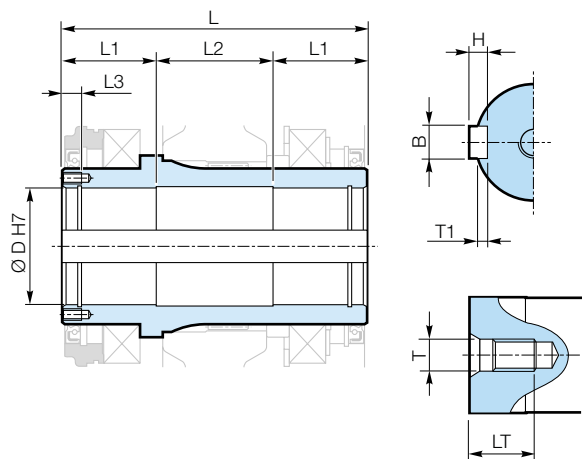
¹⁾ Feasibility on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

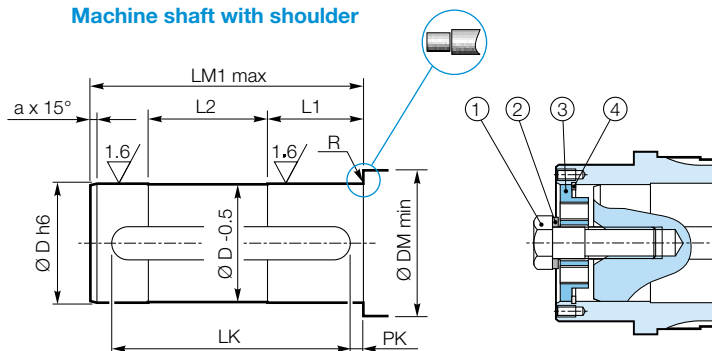
PH, BPH



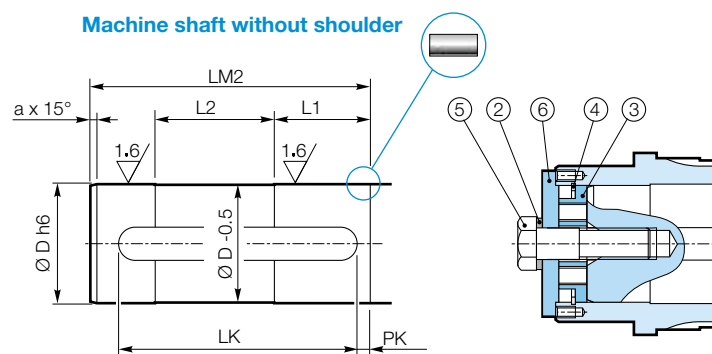
K



Machine shaft with shoulder



Machine shaft without shoulder



3 6 ⇌ 74

Size	Scheme	Gear unit					Machine shaft												Screw	Washer	End plate	Circlip	Screw	Plate
		D	L	L1	L2	L3	LM1 max	LM2	R	DM min	a	T	LT	B	T1	H	PK	LK	1 UNI5737	2 UNI1751	3 Code	4 UNI7437	5 UNI 5737	6 Code
STANDARD																								
13 PH	S 13K	70	195	60	75	13.5	170	173	1	84	4	M20	42	20	7.5	12	15	140	M20x65	M20		70 I	M20x75	
13 BPH	S 13K	70	240	80	80	13.5	215	218	1	84	4	M20	42	20	7.5	12	10	190	M20x65	M20		70 I	M20x75	
16	S 16K	70	184	60	64	13.5	159	162	1.5	84	4	M20	42	20	7.5	12	10	140	M20x65	M20		70 I	M20x75	
18-E	S 18K	80	211	70	71	15	183	187	1.5	94	5	M20	42	22	9	14	10	160	M20x65	M20		80 I	M20x75	
20	S 20K	90	235	72.5	90	15	206	210	1.5	104	5	M24	50	25	9	14	10	180	M24x75	M24		90 I	M24x90	
21-E	S 21K	100	254	92	70	20	220	222	1.5	114	5	M24	55	28	20	16	12	200	M24x80	M24		100 I	M24x100	
23	S 23K	100	294	92	110	20	258	262	2	114	5	M24	50	28	10	16	15	220	M24x80	M24		100 I	M24x100	
25	S 25K	120	330	100	130	20	294	298	2	134	5	M24	50	32	11	18	20	250	M24x80	M24		120 I	M24x100	
28 BPH	S 28K	140	382	125	132	22	341	346	2	160	5	M30	60	36	12	20	10	320	M30x100	M30		140 I	M30x110	

Only for size 13 hollow shaft is different between PH and BPH

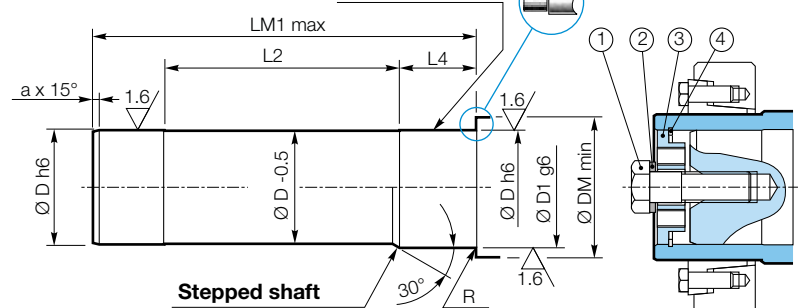
PH, BPH



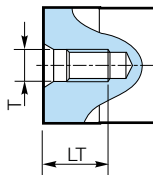
D
Feasibility on request

Machine shaft with shoulder

Through shaft

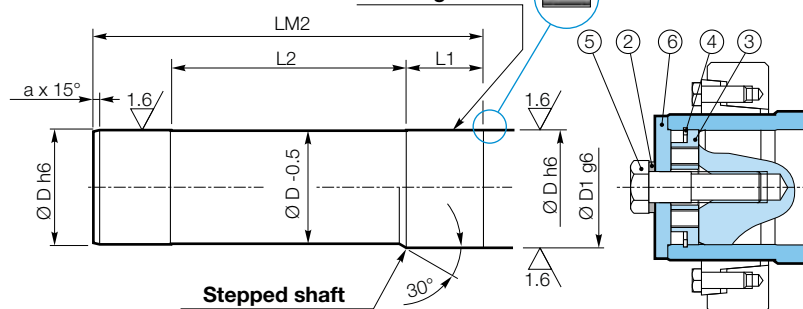


Stepped shaft

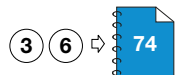


Machine shaft without shoulder

Through shaft



Stepped shaft



Size	Scheme	Gear unit							Machine shaft										Screw	Washer	End plate	Circlip	Screw	Plate	
		D ¹⁾	D1 ¹⁾	L	L1	L2	L3	L4	LM1 max	LM2	R	DM min	a	T	LT	DC	DS	HS	LS	1 UNI5737	2 UNI1751	3 Code	4 UNI7437	5 UNI 5737	6 Code
STANDARD																									
13 PH	S 13D	70	—	250	75	115	13.5	60	225	228	1	84	4	M20	42	90	155	38	11	M20x65	M20		70 I	M20x75	
13 BPH	S 13D	70	—	310	75	175	13.5	60	285	288	1	84	4	M20	42	90	155	38	27	M20x65	M20		70 I	M20x75	
16	S 16D	70	75	287	75	152	13.5	60	262	265	1.5	90	4	M20	42	90	155	38	27	M20x65	M20		70 I	M20x75	
18-E	S 18D	80	85	316	80	176	15	60	288	292	1.5	100	5	M20	42	100	170	43	27	M20x65	M20		80 I	M20x75	
20	S 20D	90	95	330	90	180	15	60	301	305	1.5	110	5	M24	50	115	197	53	27	M24x75	M24		90 I	M24x90	
21-E	S 21D	100	105	421	95	258	27	68	390	392	3.5	120	3	M24	55	130	215	53	32	M24x80	M24		100 I	M24x100	
23	S 23D	100	105	387	95	232	20	60	351	355	2	120	5	M24	50	130	215	53	35	M24x80	M24		100 I	M24x100	
25	S 25D	120	125	470	105	305	20	60	434	438	2	140	5	M24	50	155	263	62	35	M24x80	M24		120 I	M24x100	
28 BPH	S 28D	140	—	495	120	295	22	80	454	459	2	160	5	M30	60	175	300	68	35	M30x100	M30		140 I	M30x110	

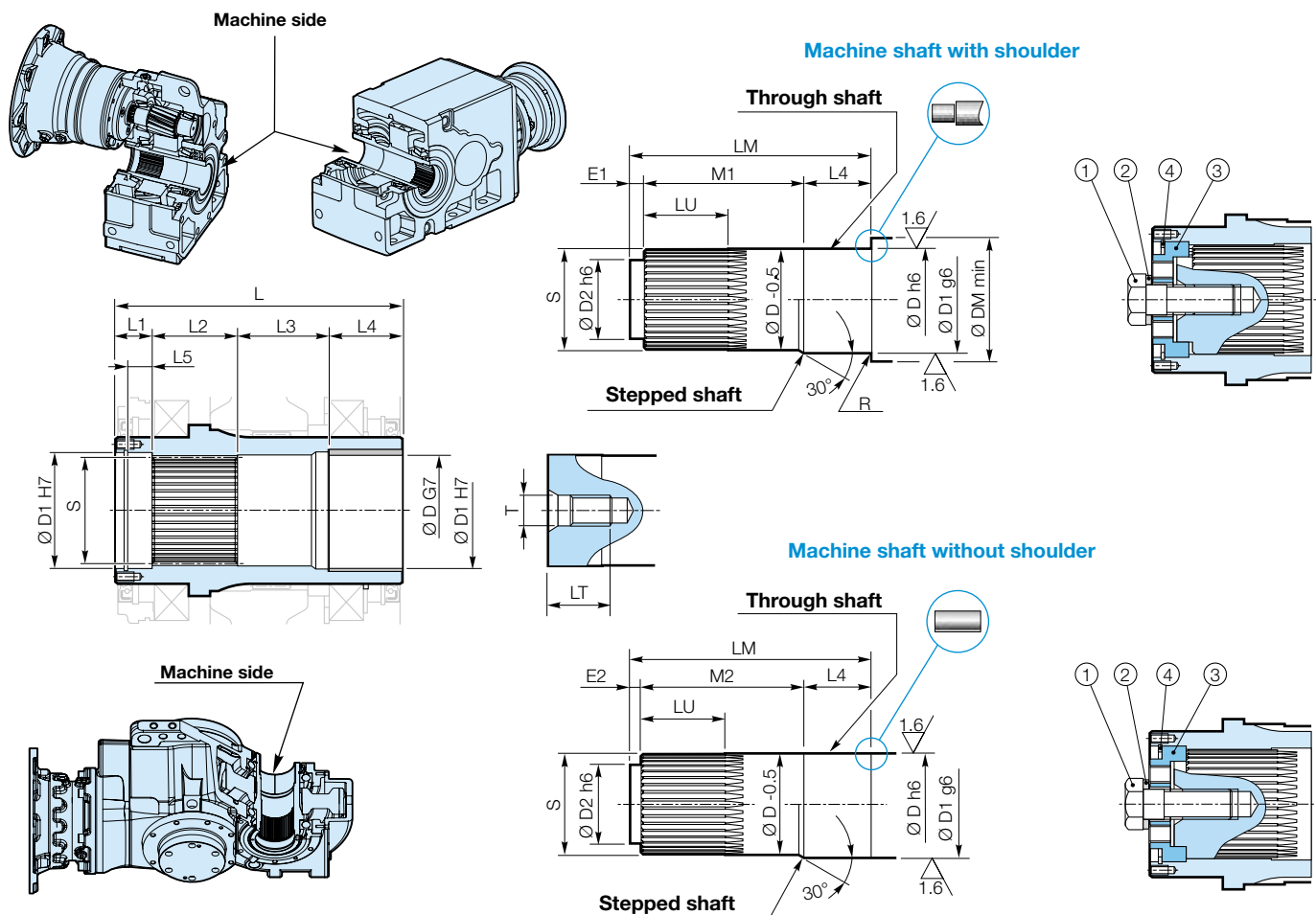
Only for size 13 hollow shaft is different between PH and BPH

¹⁾ Specify D and D1 dimensions in the product designation for code request

PH, BPH



S
Feasibility on request



3

74

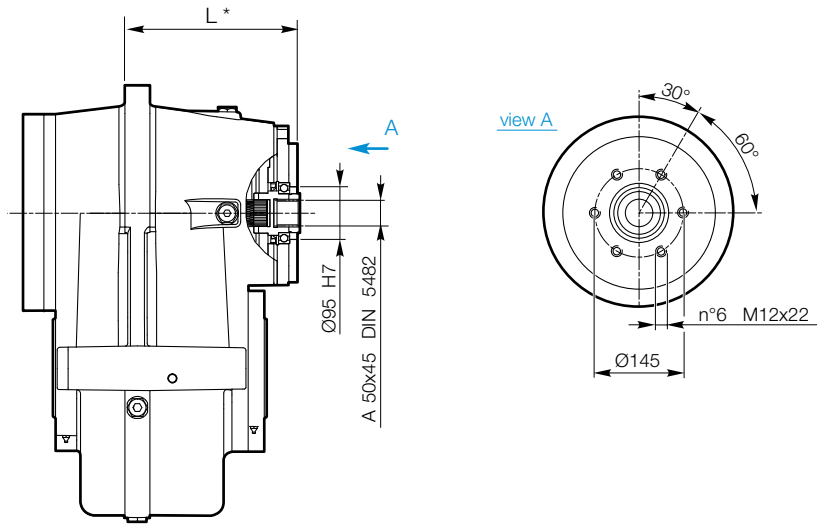
Size	Scheme	Gear unit										Machine shaft										Screw	Washer	End plate	Circlip
		S	D ¹⁾	D1 ¹⁾	L	L1	L2	L3	L4	L5	LM	R	DM min	D2	E1	E2	LU	M1	M2	T	LT	1 UNI5737	2 UNI6592	3 Cod./Code	4 UNI7437
STANDARD																									
13 PH	S 13S	70x64 DIN 5482	70	70	195	23	55	57	60	16	180	1	90	55	10	8	60	110	112	M20	42	M20x60	M20	74	75 I
13 BPH	S 13S	70x64 DIN 5482	70	70	240	23	55	102	60	16	225	1	84	55	10	8	60	155	157	M20	42	M20x60	M20		75 I
16	S 16S	70x64 DIN 5482	70	75	184	23	55	46	60	16	169	1.5	90	55	10	8	60	99	101	M20	42	M20x60	M20		75 I
18-E	S 18S	80x74 DIN 5482	80	85	211	25	60	66	60	16	194	1.5	100	55	10	8	65	124	126	M20	42	M20x60	M20		85 I
20	S 20S	90x84 DIN 5482	90	95	235	30	70	75	60	20	215	1.5	110	70	13	10	75	142	145	M24	50	M24x70	M24		95 I
21-E	S 21S	100x94 DIN 5482	100	105	254	30	80	84	60	20	235	1.5	120	75	13	11	85	162	164	M24	50	M24x70	M24		105 I
23	S 23S	100x94 DIN 5482	100	105	294	30	80	124	60	20	274	2	120	75	13	10	85	201	204	M24	50	M24x70	M24		105 I
25	S 25S	120x3 DIN 5480	120	125	330	35	80	155	60	25	307	2	140	85	15	12	85	232	235	M24	50	M24x75	M24		125 I
28 BPH	S28S	140x5 DIN 5480	140	145	382	20	80	202	80	—	382	1.5	160	120	20	—	85	272	—	M30	60	M30x90	M30		—

Only for size 13 hollow spline shaft is different between PH and BPH

¹⁾ Specify D and D1 dimensions in the product designation for code request

PH

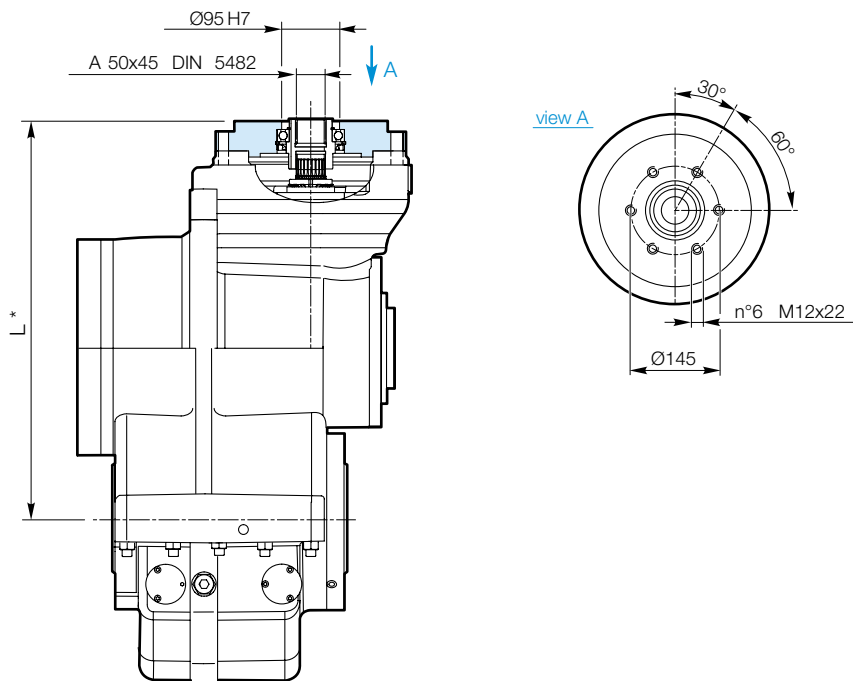
00



Size	L	Kg *
PH 213	306	71
PH 313	366	78
PH 413	4226	85
PH 216	300.5	92
PH 316	360.5	99
PH 416	420.5	106
PH 218-E	316.5	137
PH 318-E	355.5	144
PH 418-E	399.5	151
PH 220	255	160
PH 320	277	154
PH 420	317	159
PH 221-E	361	220
PH 321-E	421.5	228
PH 421-E	458	233
PH 223	293.5	238
PH 323	351.5	241
PH 423	411.5	246
PH 225	318.5	346
PH 325	359.5	336
PH 425	427.5	342

BPH

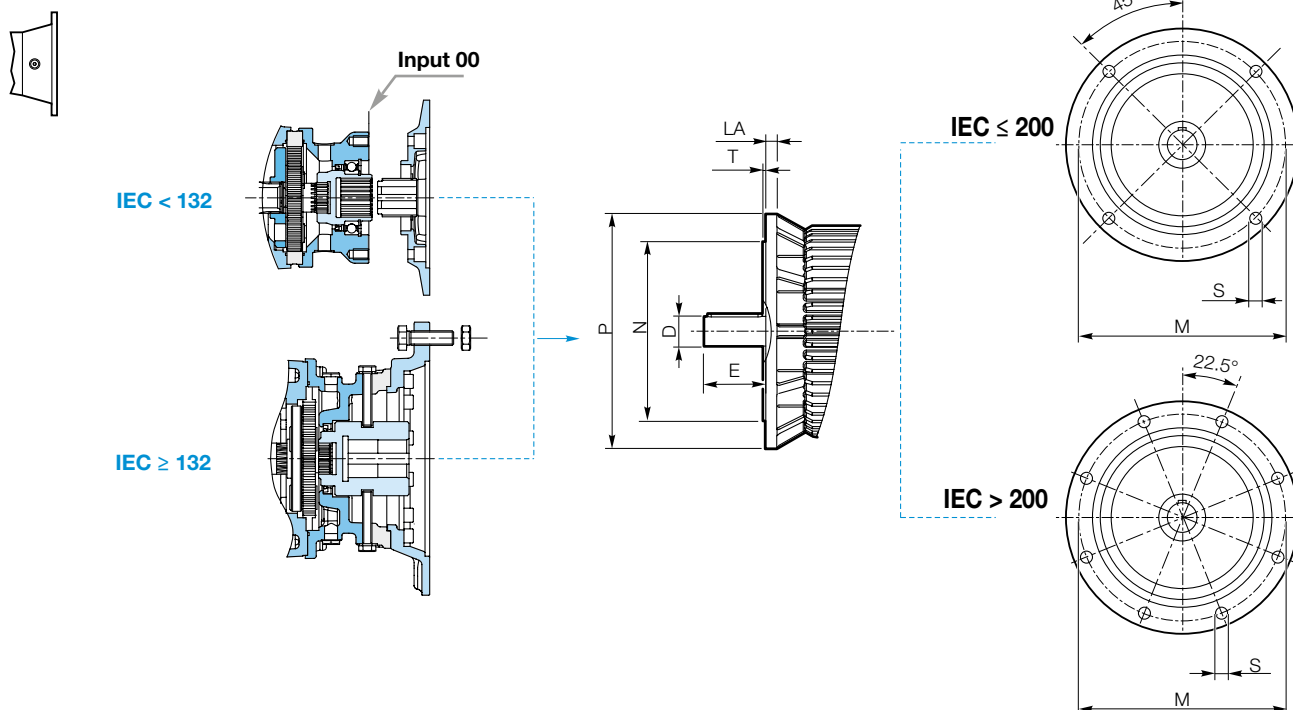
00



Size	L	Kg *
BPH 213	356	123
BPH 313	421.5	118
BPH 413	481.5	123
BPH 316	402	129
BPH 416	461	136
BPH 516	521	143
BPH 318-E	434.5	155
BPH 418-E	472.8	160
BPH 518-E	516.8	165
BPH 320	478.5	172
BPH 420	500.5	198
BPH 520	540.5	204
BPH 321-E	534	255
BPH 421-E	573.5	260
BPH 521-E	617.5	265
BPH 323	530	278
BPH 423	552.5	290
BPH 523	592.5	296
BPH 325	620.5	460
BPH 425	678.5	449
BPH 525	738.5	456
BPH 328	651	640
BPH 428	679.5	679.5
BPH 528	732	732

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.

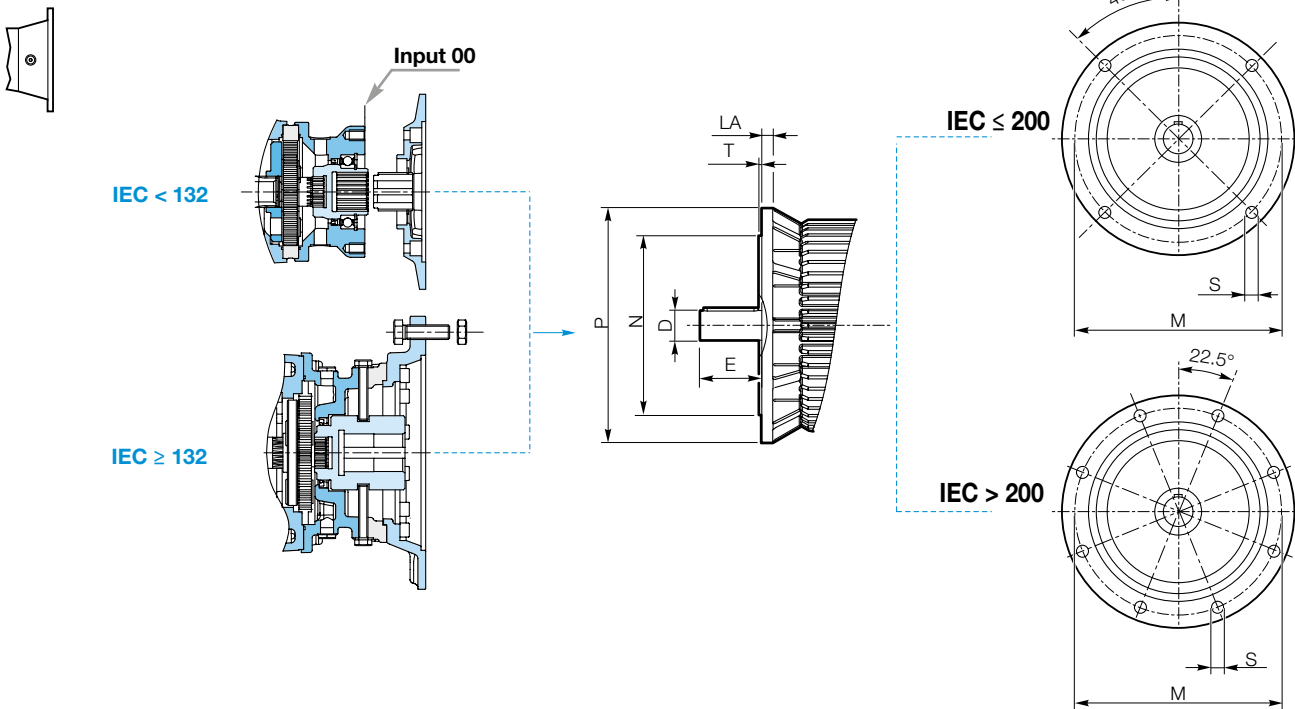
PH



		IEC											
		63	71	80	90	100/112	132	160	180	200	225	250	280
	D	11	14	19	24	28	38	42	48	55	60	65	75
	E	23	30	40	50	60	80	110	110	110	140	140	140
	P	140	160	200	200	250	300	350	350	400	450	550	550
	N	95	110	130	130	180	230	250	250	300	350	450	450
	M	115	130	165	165	215	265	300	300	350	400	500	500
	T	3	3.5	3.5	3.5	4	4	5	5	5	5	5	5
	LA	10	10	12	12	15	15	15	18	20	20	22	22
	S	10	10	12	12	15	15	19	19	19	19	19	19
13	PH 213												
	PH 313												
	PH 413												
16	PH 216												
	PH 316												
	PH 416												
18	PH 218-E												
	PH 318-E												
	PH 418-E												
20	PH 220												
	PH 320												
	PH 420												
21	PH 221-E												
	PH 321-E												
	PH 421-E												
23	PH 223												
	PH 323												
	PH 423												
25	PH 225												
	PH 325												
	PH 425												

Connections to the NEMA standard are available for hydraulic motors, special flanges not standardised

BPH



		IEC											
		63	71	80	90	100/112	132	160	180	200	225	250	280
	D	11	14	19	24	28	38	42	48	55	60	65	75
	E	23	30	40	50	60	80	110	110	110	140	140	140
	P	140	160	200	200	250	300	350	350	400	450	550	550
	N	95	110	130	130	180	230	250	250	300	350	450	450
	M	115	130	165	165	215	265	300	300	350	400	500	500
	T	3	3.5	3.5	3.5	4	4	5	5	5	5	5	5
	LA	10	10	12	12	15	15	15	18	20	20	22	22
	S	10	10	12	12	15	15	19	19	19	19	19	19
13	BPH213												
	BPH313												
	BPH413												
16	BPH 316												
	BPH 416												
	BPH 516												
18	BPH 318-E												
	BPH 418-E												
	BPH 518-E												
20	BPH 320												
	BPH 420												
	BPH 520												
21	BPH 321-E												
	BPH 421-E												
	BPH 521-E												
23	BPH 323												
	BPH 423												
	BPH 523												
25	BPH 325												
	BPH 425												
	BPH 525												
28	BPH 328												
	BPH 428												
	BPH 528												

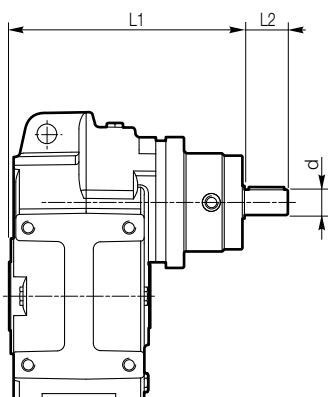
Connections to the NEMA standard are available for hydraulic motors, special flanges not standardised

PH...M

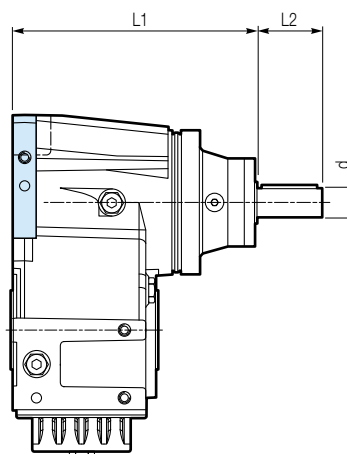
Feasibility on request



PH...13..M

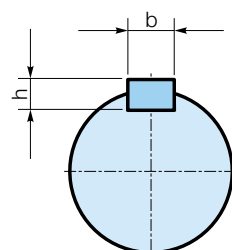
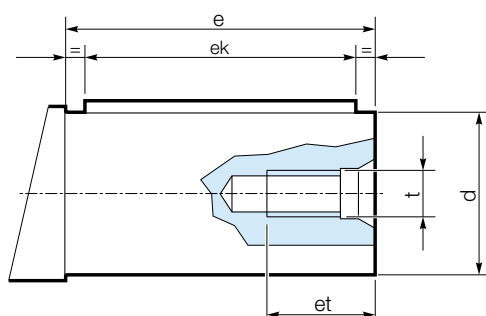


PH...M



Size	L1	L2	d	 *
PH 213	326	60	35 j6	80
PH 313	386	60	35 j6	87
PH 413	446	60	35 j6	94
PH 216	320.5	60	35 j6	93
PH 316	380.5	60	35 j6	98
PH 416	440.5	60	35 j6	105
PH 220	342	105	65 m6	172
PH 320	313	60	35 j6	179
PH 420	353	60	35 j6	185
PH 223	422	110	60 k6	260
PH 323	393.5	110	48 k6	250
PH 423	431.5	60	35 j6	255
PH 225	463.5	105	65 m6	375
PH 325	463.5	105	65 m6	367
PH 425	490	105	65 m6	351

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.



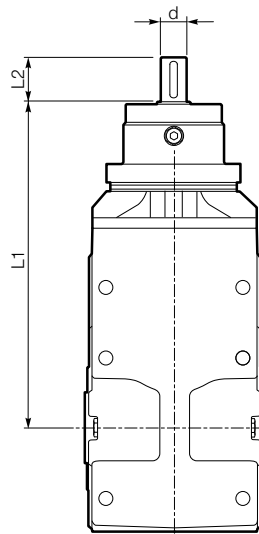
d	e	b	h	ek	t	et
35 j6	60	10	8	50	M10	22
38 j6	80	10	8	70	M10	22
42 j6	80	12	8	70	M12	28
48 k6	110	14	9	90	M16	36
60 k6	110	18	11	100	M20	42
65 m6	105	18	11	90	M20	42

BPH...M

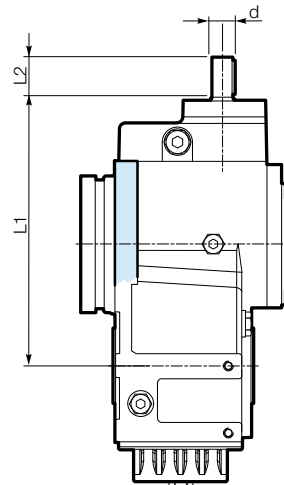
Feasibility on request



BPH...13..M



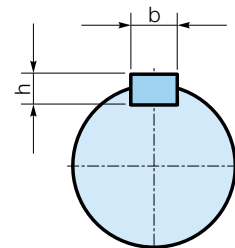
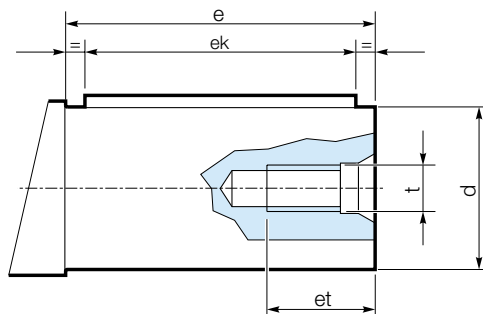
BPH...M



Size	L1	L2	d	 *
BPH 213	358	80	42 j6	130
BPH 313	441.5	60	35 j6	140
BPH 413	501.5	60	35 j6	145
BPH 416	481	60	35 j6	130
BPH 516	541	60	35 j6	137
BPH 420	536	60	35 j6	223
BPH 520	576	60	35 j6	210
BPH 323	484	80	42 j6	272
BPH 423	588.5	60	35 j6	315
BPH 523	628.5	60	35 j6	302
BPH 325	562	110	48 k6	415
BPH 425	720.5	110	48 k6	456
BPH 525	758.5	60	35 j6	457
BPH 328	783.5	105	65 m6	634 ¹⁾
BPH 428	783.5	105	65 m6	695
BPH 528	768	60	35 j6	710

¹⁾ Refer to MN input. MR input on request

*Provided weight values are without oil filling and may differ slightly according to specific product configuration.



d	e	b	h	ek	t	et
35 j6	60	10	8	50	M10	22
38 j6	80	10	8	70	M10	22
42 j6	80	12	8	70	M12	28
48 k6	110	14	9	90	M16	36
65 m6	105	18	11	90	M20	42



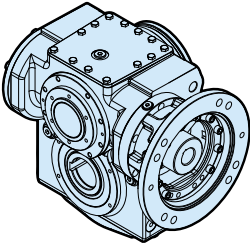
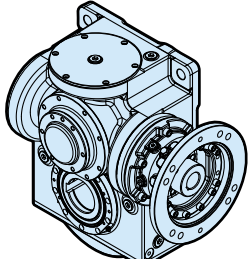
BREVINI[®]

Motion Systems

Following configuration have been designed for dedicated customer/application, please contact Product Manager or STS to have further information about feasibility and drawings availability

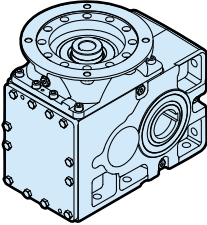
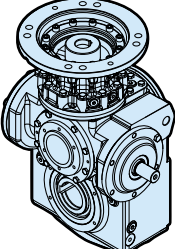
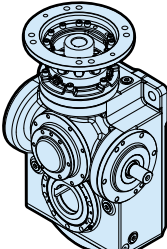
BPC

Feasibility on request

BPC	Size	i_N	T_{N2} [kNm]
	18	27.54 - 7083	3 - 10
	21	30.2 - 7028	7 - 16

BPW

Feasibility on request

BPW	Size	i_N	T_{N2} [kNm]
	13	9.7 - 2029.4	2 - 4
	18	27.54 - 67.82	3 - 8
	21	30.2 - 50.12	7 - 12

BPW

INPUT SIDE POSITION

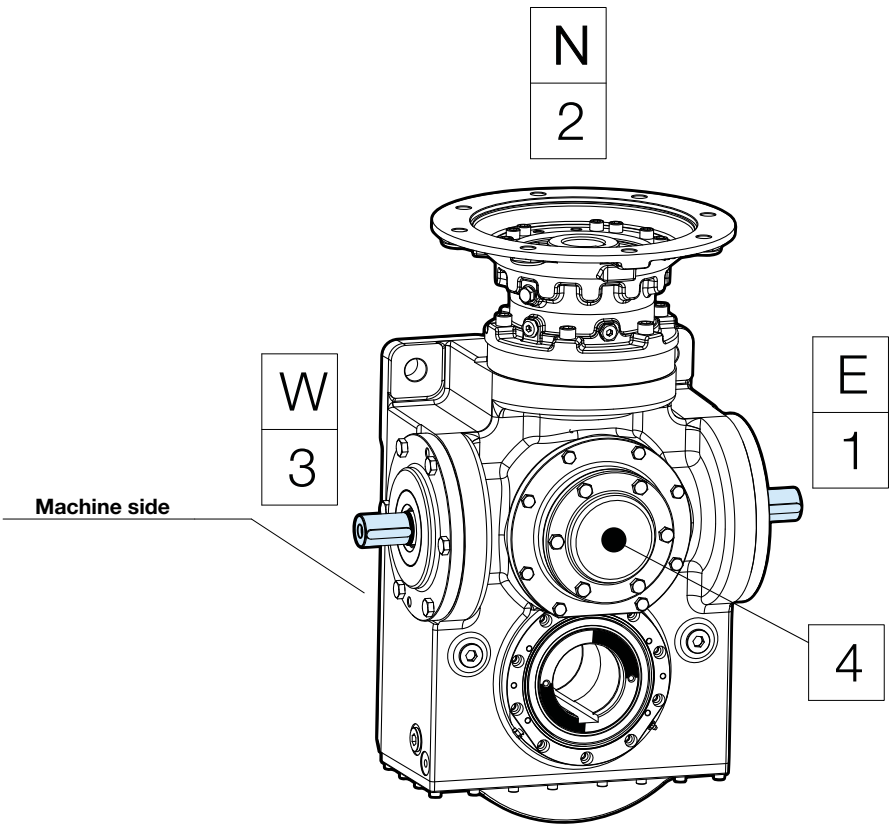
For motor **input side position** use the letters:

E	N	W
---	---	---

For the **auxiliary input shaft/s** positions use the numbers:

1	2	3
---	---	---

The gearbox is in front of the customer machine.



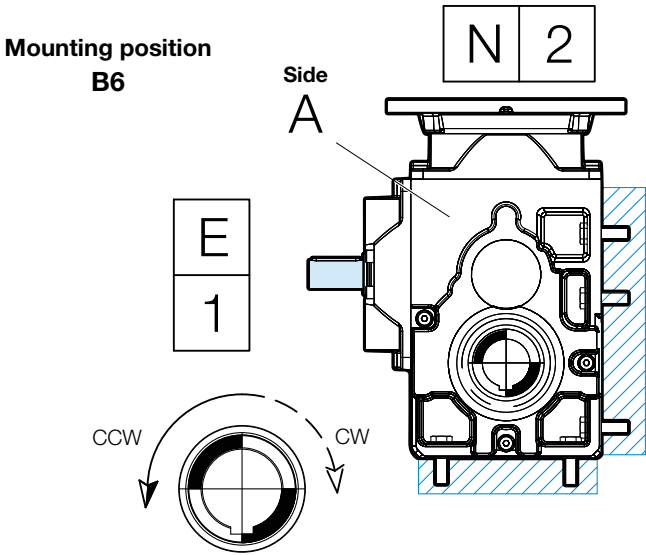
Example of designation for order:

BPW	3	21	K	84.07	IEC200	N	M	1	M	3
Type	Reduction stages	Size	Hollow shaft	Exact Ratio	Motor Input	Motor position	Auxiliary male	Male shaft position	Auxiliary male	Male shaft position

BPW 13 INPUT SIDE POSITION

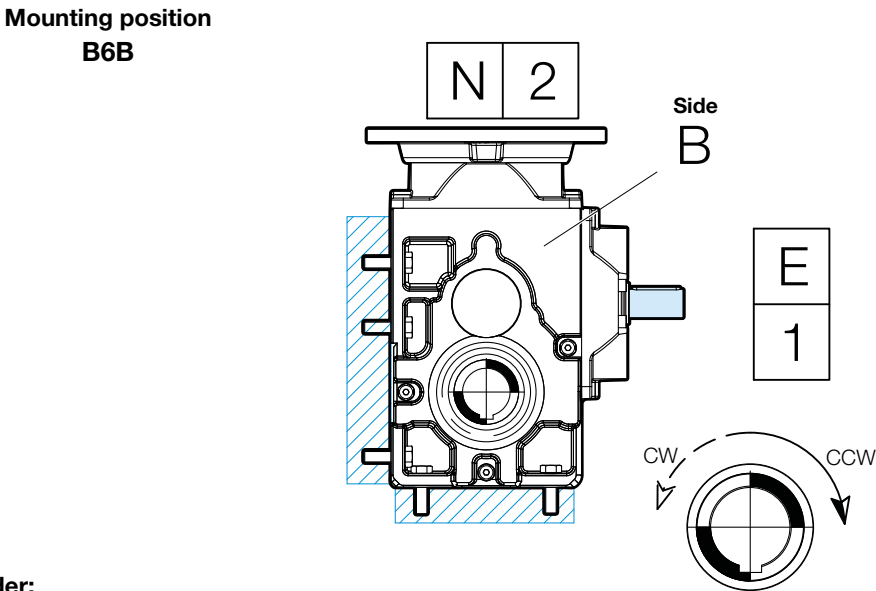
The gearbox is in front of the customer machine.

Output shaft direction of rotation and input motor position



Example of designation for order:

BPW	2	13	K	24.1	IEC160	N	M	1	B6	CCW
Type	Reduction stages	Size	Hollow shaft	Exact Ratio	Motor Input	Motor position	Male output shaft	Male output shaft position	Mounting position	Rotation of output shaft



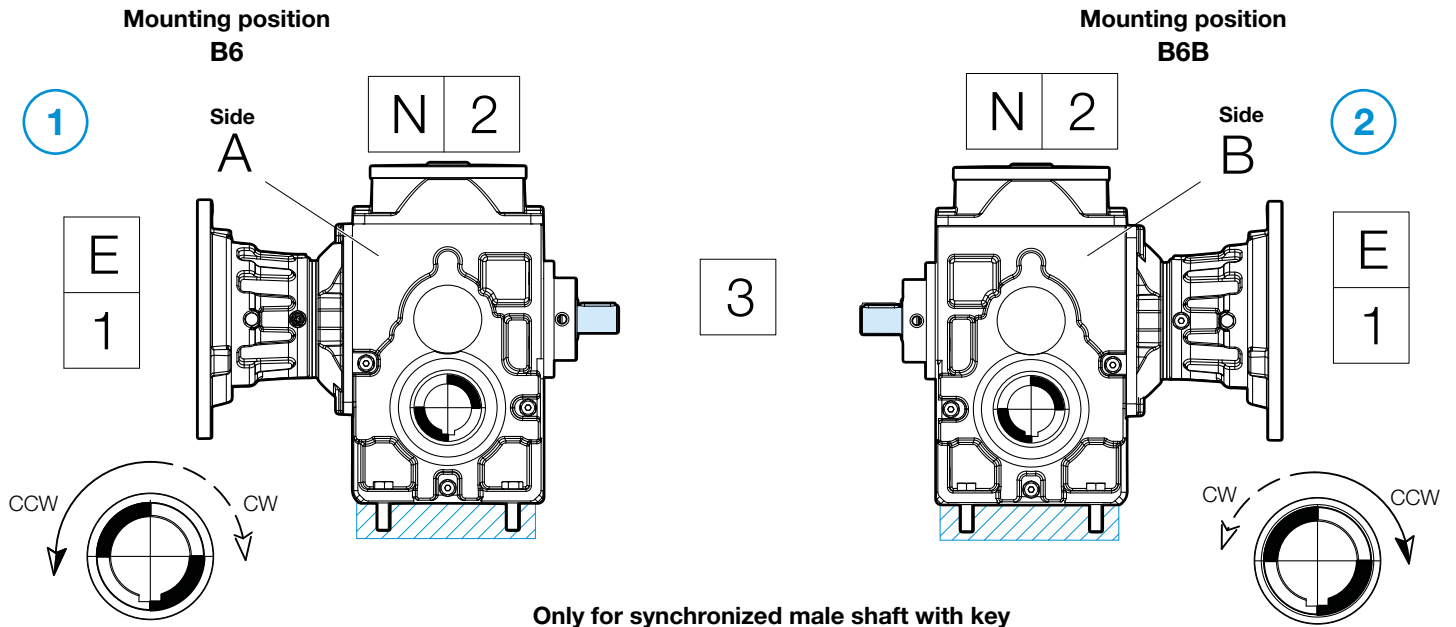
Example of designation for order:

BPW	2	13	K	24.1	IEC160	N	M	1	B6B	CCW
Type	Reduction stages	Size	Hollow shaft	Exact Ratio	Motor Input	Motor position	Male output shaft	Male output shaft position	Mounting position	Rotation of output shaft

BPW 13 INPUT SIDE POSITION

The gearbox is in front of the customer machine.

Output shaft direction of rotation and input motor position



1

Example of designation for order:

BPW	2	13	K	24.1	IEC160	E	00	N	M	3	B6	CCW
Type	Reduction stages	Size	Hollow shaft	Exact Ratio	Motor Input	Motor position	Input 00	Input position	Male output shaft	Male output shaft position	Mounting position	Rotation of output shaft

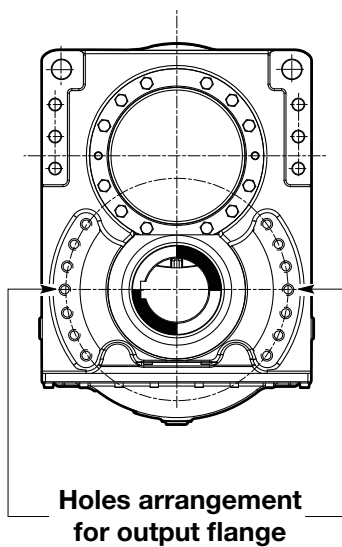
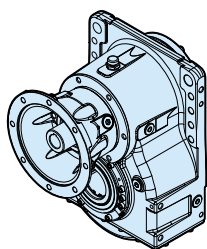
2

Example of designation for order:

BPW	2	13	K	24.1	IEC160	E	00	N	M	3	B6B	CCW
Type	Reduction stages	Size	Hollow shaft	Exact Ratio	Motor Input	Motor position	Input 00	Input position	Male output shaft	Male output shaft position	Mounting position	Rotation of output shaft

PH

Feasibility on request

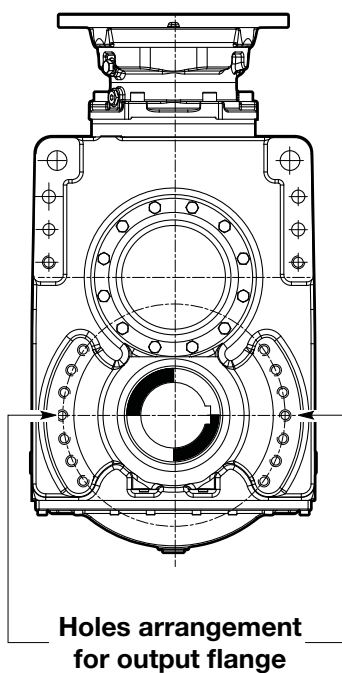
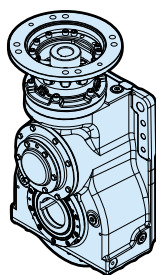


Size	Rigid mounting output flange arrangement
13	●
16	●
18-E	●
20	–
21-E	●
23	●
25	●

● Available
– Not available

BPH

Feasibility on request



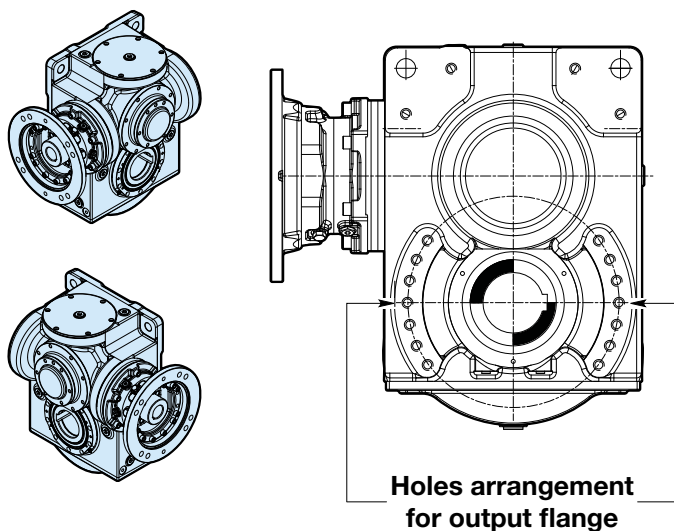
Size	Rigid mounting output flange arrangement
13	●
16	●
18-E *	●
20	–
21-E	●
23	●
25 *	●
28	–

● Available
– Not available

* The housing configuration for rigid arrangement version is different from shaft mounting

BPC

Feasibility on request



Size	Rigid mounting output flange arrangement
13	●
16	–
18-E	●
20	–
21-E	●
23	–
25*	–
28	–

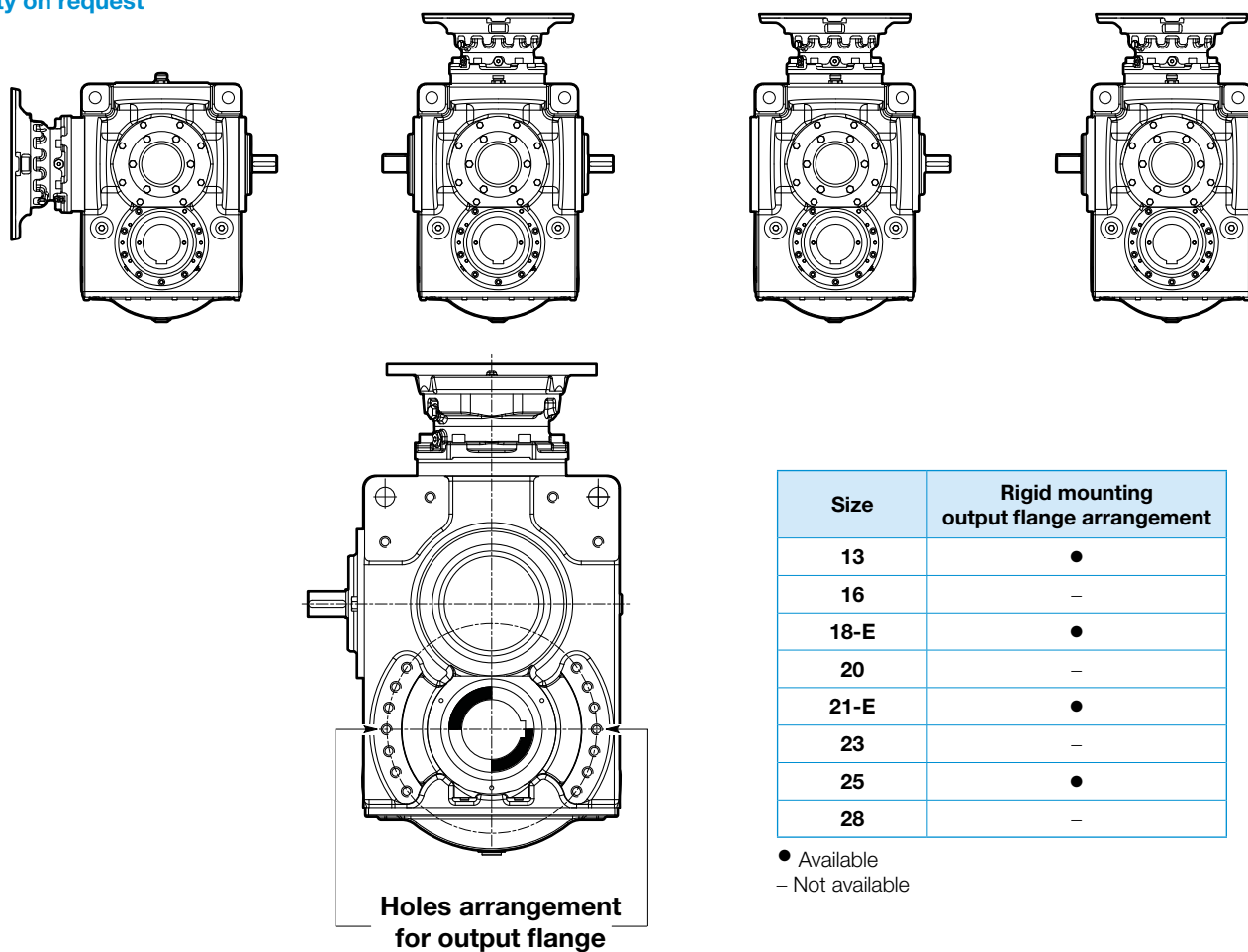
● Available

– Not available

* The housing configuration for rigid arrangement version is different from shaft mounting

BPW

Feasibility on request



Size	Rigid mounting output flange arrangement
13	●
16	–
18-E	●
20	–
21-E	●
23	–
25	●
28	–

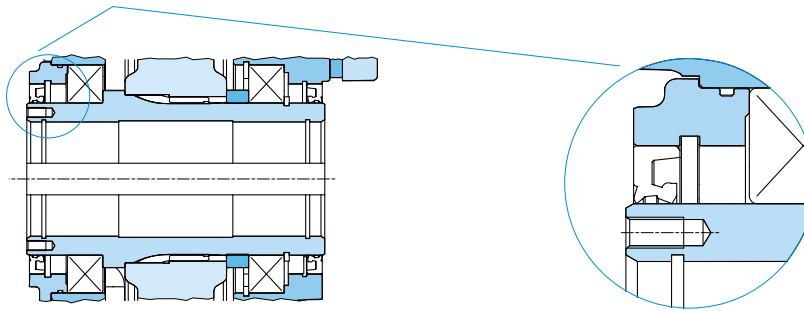
● Available

– Not available

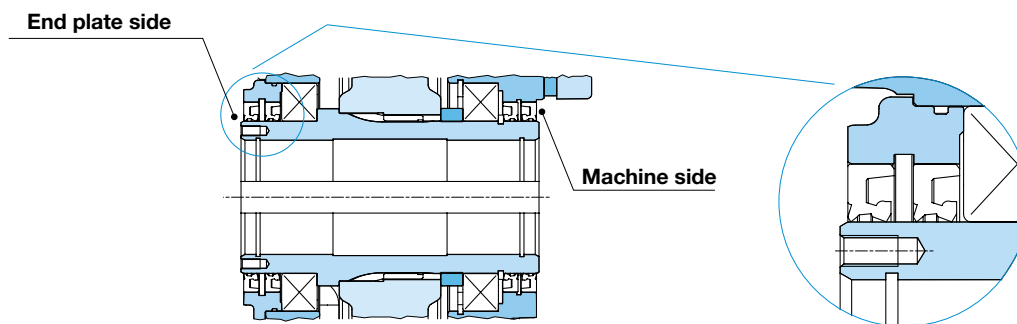
PH, BPH

Single seal: NBR or FKM

Single NBR / FKM seal on both end plate side and machine side is the Posiplan standard configuration available on all sizes and variant.



Double seals: 2 NBR or 2 FKM

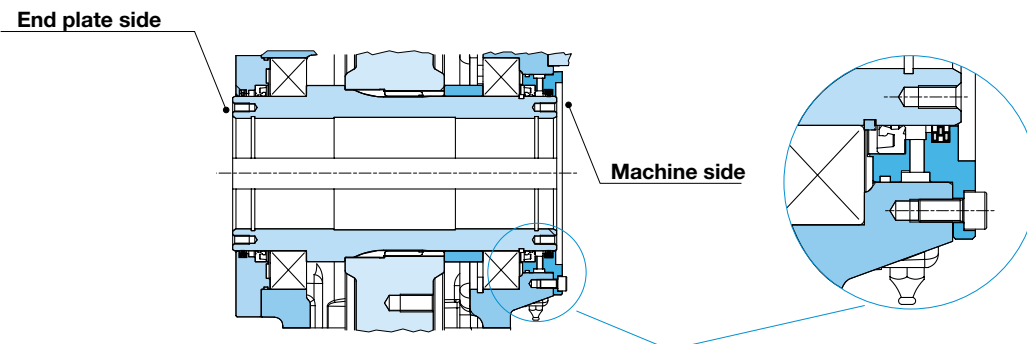


Size	End plate side	Machine side
PH13	●	●
BPH13	-	-
PH16	-	-
PH18-E - BPH18-E	-	-
PH20 - BPH20	●	●
PH21-E - BPH21-E	●	●
PH23 - BPH23	●	●
PH25 - BPH25	●	●
BPH28	●	●

● Available
- Not available

PH, BPH

Labyrinth seals regreasable: FEY

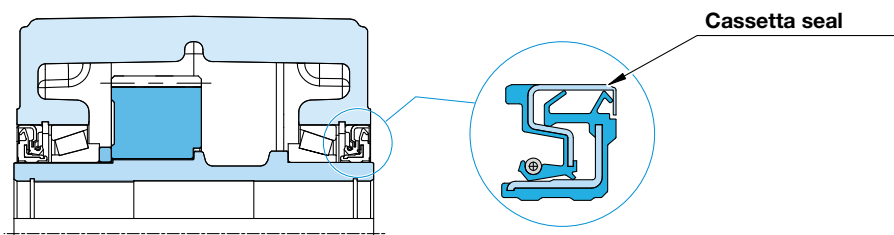


Size	End plate side	Machine side
PH13	-	1)
BPH13	1)	1)
PH16	1)	1)
PH18-E - BPH18-E	1)	●
PH20 - BPH20	1)	●
PH21-E - BPH21-E	●	1)
PH23 - BPH23	1)	●
PH25 - BPH25	●	●
BPH28	1)	●

1) Feasibility on request.
Ask the technical office to check

● Available
– Not available

Combined seal ring, pre-greased: CS



Size	End plate side	Machine side
PH13	-	●
BPH13	●	●
PH16	●	●
PH18-E - BPH18-E	●	●
PH20 - BPH20	●	●
PH21-E - BPH21-E	●	●
PH23 - BPH23	●	●
PH25 - BPH25	●	●
BPH28	●	1)

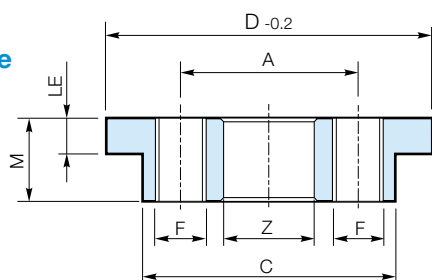
1) Feasibility on request.
Ask the technical office to check

● Available
– Not available

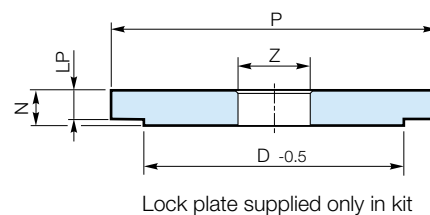
Type	Page
Cover and end plate	74
Backstop device	76
Reaction arrangements	77
Other options and accessories	80

PH, BPH END PLATE FOR K/D SHAFT

End plate



Plate



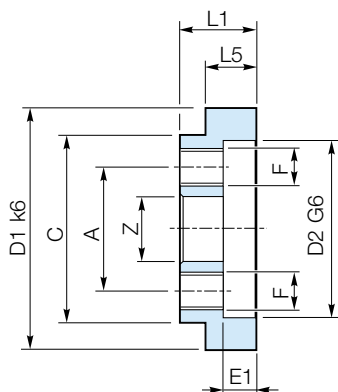
Lock plate supplied only in kit

Size	D	Z	End plate					Plate			Code End plate	Code Kit * (Plate +End plate)
			A	C	F	LE	M	P	LP	N		
13 - 16	70	21	36	50	M10	8.5	19.5	89	9	11	EPKD13	EPF13
18-E	80	21	42	60	M12	9.0	20.5	99	9	12	EPKD18	EPF18
20	90	25	49	70	M16	10.0	23.0	113	15	17	EPKD20	EPF20
21-E - 23	100	25	52	78	M16	12.0	27.0	123	17	19	EPKD21	EPF21
25	120	25	65	92	M16	12.0	28.0	153	17	20	EPKD25	EPF25
28	140	31	75	110	M20	14.0	32.0	170	17	23	EPKD28	EPF28

* End plate kit includes washer, screw and circlip

PH, BPH END PLATE FOR S SHAFT

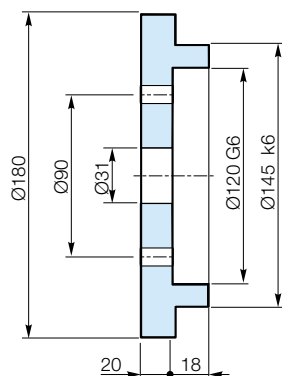
Feasibility on request

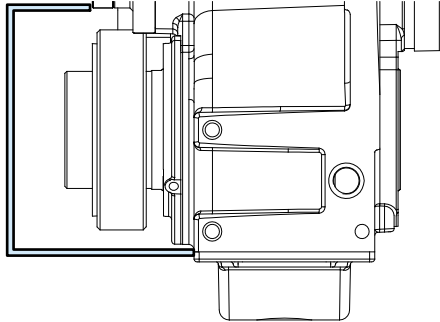


Size	D1	L1	L5	A	C	F	E1	D2	Z	Code Kit * (Plate +End plate)
13 - 16	75	23	16	40	55	M10	10	55	21	EPS13
18-E	85	25	16	40	64	M12	10	55	21	EPS18
20	95	30	20	19	75	M16	13	70	25	EPS20
21-E - 23	105	30	20	50	82	M16	13	75	25	EPS21
25	125	35	25	60	96	M16	15	85	25	EPS25
28	See dimensions in drawing below									EPS28

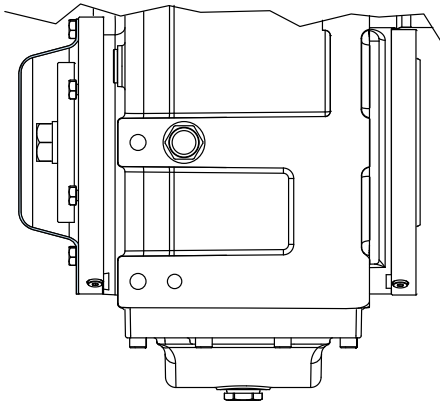
* End plate kit includes washer, screw and circlip

BPH 28



PH, BPH COVER**Cover for shrink disc**

Size	Code PH	Code BPH
13	CTDP13	CTDB13
16	CTDP16	CTDB16
18-E	CTDP18	CTDB18
20	CTDP20	CTDB20
21-E	CTDP21	CTDB20
23	CTDP23	CTDB23
25	CTDP25	CTDB25
28	CTDP28	CTDB28

Cover for K/S shaft

Size	Code PH	Code BPH
13	CSKP13	CSKB13
16	CSK16	
18-E	CSK16	
20	CSK21	
21-E	CSK21	
23	CSK21	
25	CSK25	
28	CSK28	

BPH

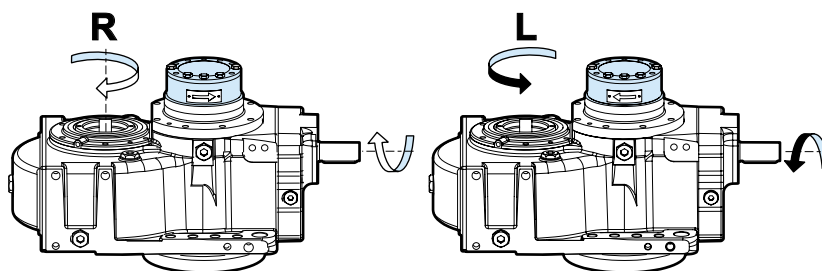
Backstop device blocks the rotation in one direction.

This device can be located on the input shaft or in an intermediate shaft due to gearbox configuration.

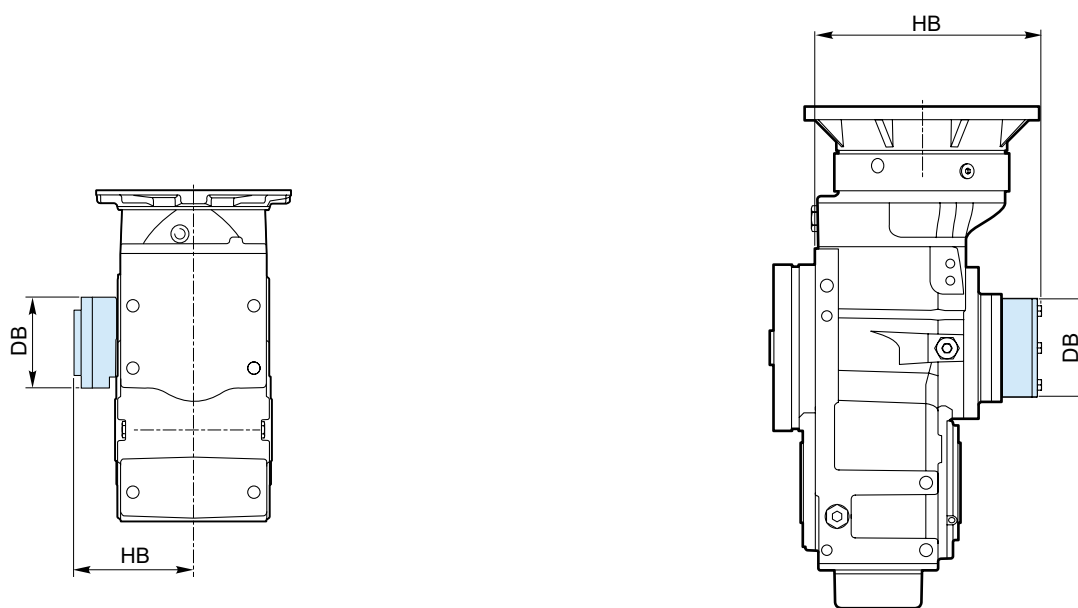
The maximum blocking torque is typically twice the T2ISO torque, more details are available through our technical office.

The free rotation direction is indicated on the gearbox with an arrow fixed on the gearbox, for designation see the following scheme.

Non-return devices for PH, ask the technical office



Backstop device mounted on intermediate shaft



Only BPH13

Size	BPH.13	BPH.16	BPH.18-E	BPH.20	BPH.21	BPH.23	BPH.25	BPH.28
DB	138	150	150	150	150	180	180	180
HB	180	307	323	345	401	395	440	432
Code	BK13	BK16	BK18	BK20	BK21	BK23	BK25	BK25

PH, BPH

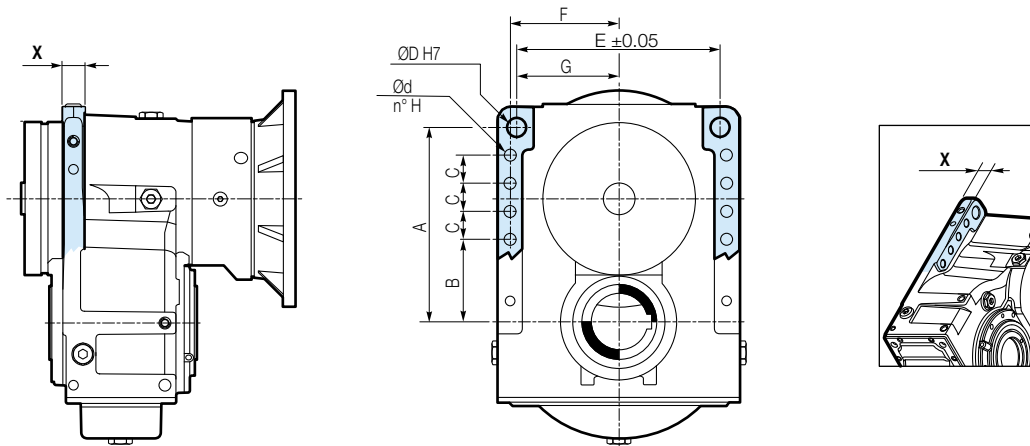
When shaft mounted the gearmotor must be supported both axially and radially by the shaft end of the driven machine.

Anchor the gear unit against rotation only, by means of a reaction constraint having freedom of axial movement and adequate axial clearance.

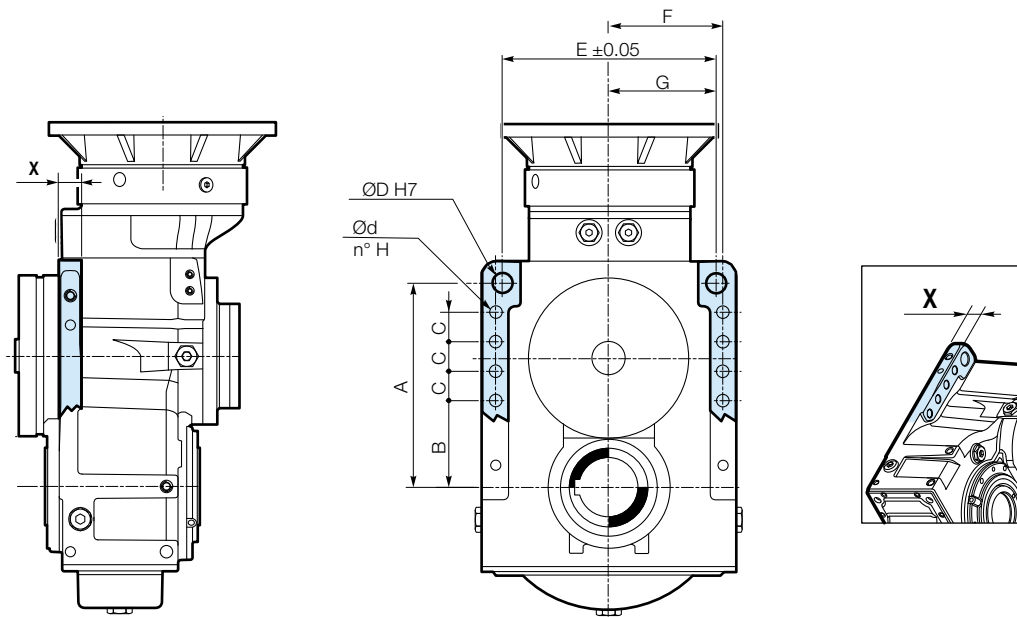
The reaction arm shall permit the minor radial oscillations, always present in shaft mounted applications, for this reason elastic elements like disc springs, rubber buffers, vibration dampers, articulated joints, brackets or similar. Elastic elements will prevent dangerous overloads on the gearmotor.

Always consider the danger of exceptional situations like rotation or falling of the gearmotor due to the breakage of the reaction arm movement of the gearmotor due to the breakage of the driven shaft or its bearings.

PH

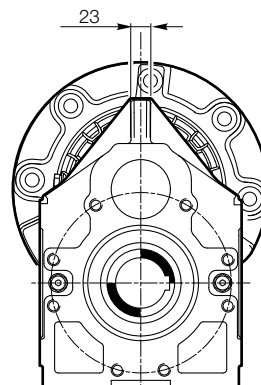
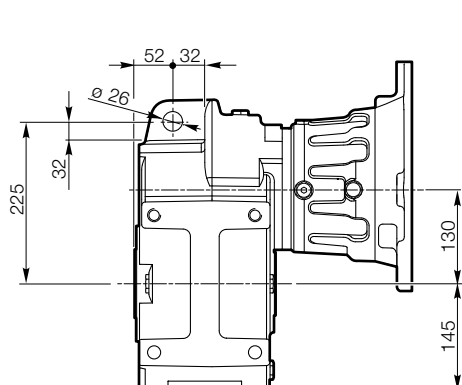


BPH

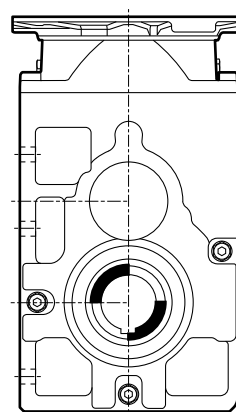
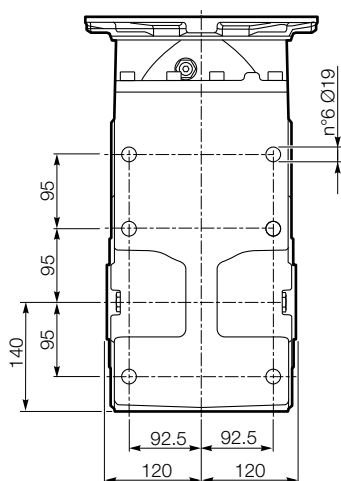


Size	D (H7)	d	H	X	A	B	C	E (±0.05)	F	G
PH16	25	15	4	30	245	145	50	230	125	115
BPH16	25	15	6	30	245	125	40	270	145	135
PH18-E - BPH18-E	28	16	6	30	280	150	40	280	147.5	140
PH20 - BPH20	30	18	8	35	315	135	45	330	175	165
PH21-E - BPH21-E	30	18	6	35	345	190	50	360	190	180
PH23 - BPH23	35	20	8	40	365	165	50	370	198	185
PH25 - BPH25	35	22	8	45	385	170	50	420	220	210
BPH28	45	25	2	45	490	300	100	490	250	230

PH 13



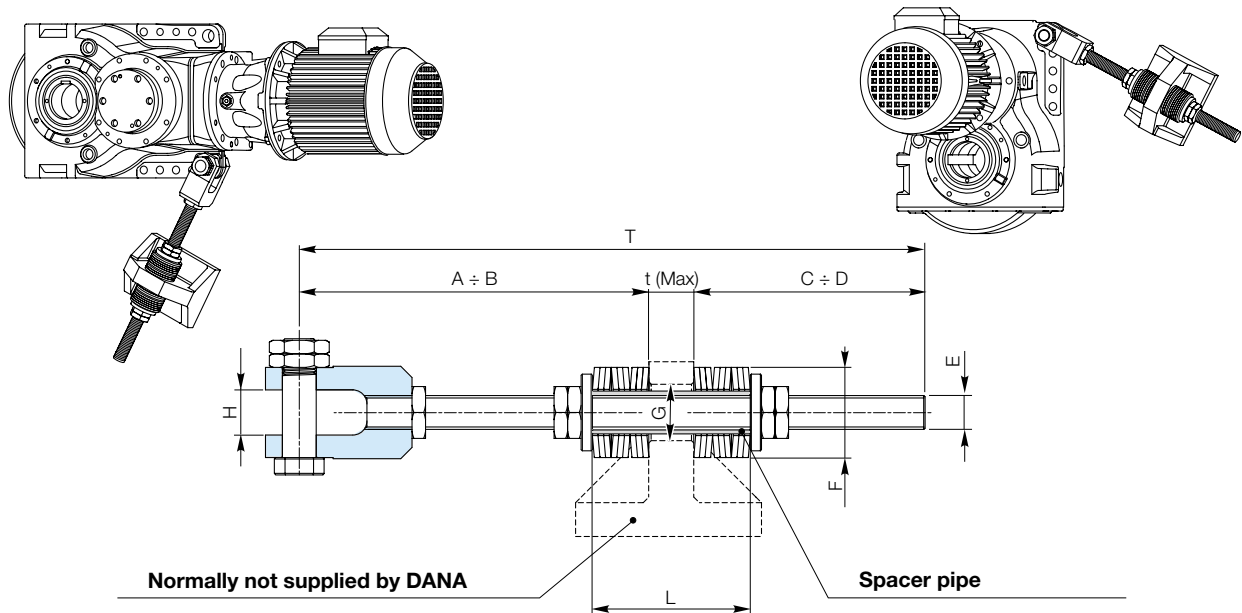
BPH 13



PH, BPH

Reaction arrangement with fork, tie rod and disc springs.

Coupling shall be made with a gauged pin inserted in one of the H7 tolerance holes. The fork allows axial backlash. Disc springs acts like elastic elements and smooth radial vibrations. Consult the DANA area contact person for further details.



Reaction arm												
Size	Code	A	B	t (Max)*	C	D	T	E	F	G	H	L *
PH13	BRP13	See dimensions in drawing below										
BPH13	BRB13	See dimensions in drawing below										
PH16 - BPH16	BR16	250	225	40	120	95	385	M30	80	50	35	110
PH18-E - BPH18-E	BR18											
PH20 - BPH20	BR20	310	230	40	205	285	555	M30	80	50	40	140
PH21-E - BPH21-E												
PH23 - BPH23	BR23	350	310	40	170	210	560	M30	80	50	45	140
PH25 - BPH25	BR25	380	330	50	140	190	570	M36	100	56	55	170
BPH28	BR28	490	355	50	205	340	580	M42	125	70	55	205

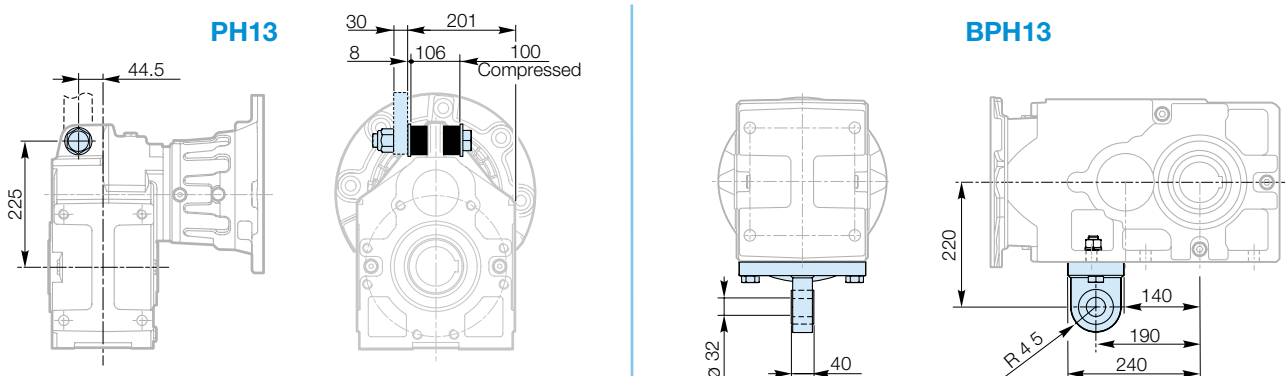
NOTE:

The "L" dimension is to be changed in relation to the figure (t) to keep the correct pre-loading of the Belleville washers

* Example:

Size 20 with (t) = 35mm instead of 40 mm as seen in the table, we will have $L = (140 - 5) = 135$ mm, so we will shorten the spacer pipe 5 mm.

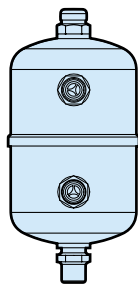
Antivibration kit



PH, BPH OIL EXPANSION TANK

Available only:

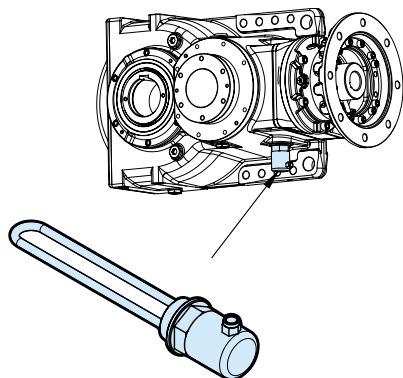
- 1200 cc
- 2500 cc



Capacity	Code
1200 cc	TK12
2500 cc	TK25

PH, BPH HEATING SYSTEMS

On request and to be checked with eng department.



Size	End plate side	Code
13	●	HT13
16	●	HT16
18-E	●	HT18
20	1)	
21-E	●	HT21
23	●	HT23
25	1)	
28	–	

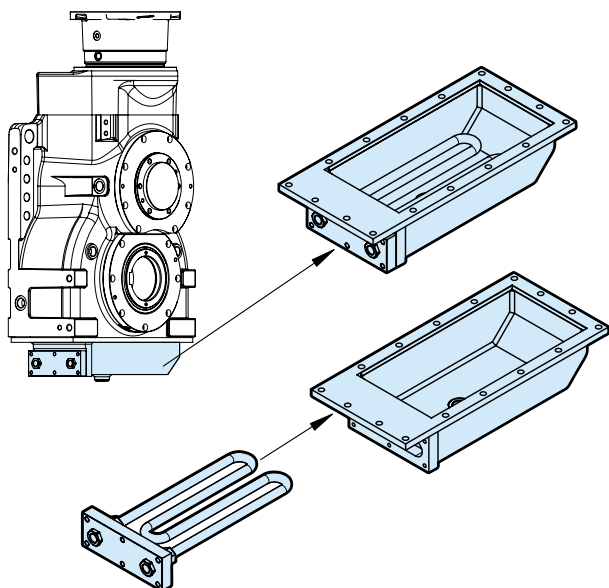
1) Feasibility on request. Ask the technical office to check

- Available
- Not available

PH, BPH COOLING COIL SYSTEMS

Water cooling system

On request and to be checked with eng department.



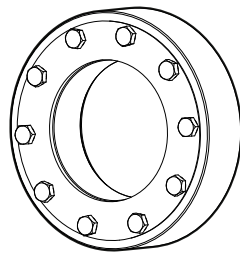
Size	Cooling systems	Code
13	–	
16	1)	
18-E	●	RF18
20	●	RF20
21-E	1)	
23	●	RF23
25	●	RF25
28	●	RF28

1) Feasibility on request. Ask the technical office to check

- Available
- Not available

PH, BPH

SHRINK DISK



Size	Code
13	SD13
16	SD16
18-E	SD18
20	SD20
21-E	SD21
23	SD21
25	SD25
28	SD28

Supply status

Unless otherwise specified in the contract, the gearboxes are painted externally with an anticorrosive 2-component water-soluble epoxy resin based primer, blue RAL 5012.

The protection is suitable for withstanding normal industrial environments (also outdoors) and can be finished with synthetic, nitro-synthetic or 2-component enamel paints.

In case of particularly aggressive ambient conditions, it is necessary to use special painting cycles, which can be carried out on request. The machined external parts of the gearbox, such as the shaft ends, support surfaces, spigots, etc., must be protected with antioxidant oil (Tectyl).

The inside walls of the gearbox casings are painted with oil-proof paint and the kinematic mechanisms are protected with antioxidant oil. Unless otherwise specified in the contract, all gearboxes are supplied without lubricant, as shown by a special sticker applied to the gearbox to indicate its condition.

The gearboxes are packed and shipped in crates or on pallets able to withstand normal industrial environments.

Each gearbox comes with an "Installation and Maintenance Manual", "Manufacturer's Declaration" and "Certificate of Conformity" 2.1 according to EN10204.

Storage conditions

If the product is to be stored for more than 2 months:

- protect shafts and spigots with a film of grease or corrosion protection products
- fill the gearbox completely with the lubricant required for the application
- store in a dry place with a temperature from -5 °C to +30 °C
- protect the gearbox from dirt, dust and damp
- always place a wooden support or other material between the gearbox and the ground to prevent direct contact with the ground.

When storing for more than 1 year, the rotary seals will lose efficiency. In this case, it is advisable to carry out a periodic check by turning the input shaft by hand to rotate the gears.

If there is a negative multi-disc brake, release the brake with a hydraulic pump or similar (see the "Oil bath multi-disc brakes" section for the brake release pressure).

At start-up, it is advisable to replace the seals.

DANA gearboxes are supplied without lubricant; therefore the user must fill them correctly before starting the machine.

Essential oil specifications

The important parameters to consider when choosing the oil type are:

- viscosity under nominal operating conditions
- additives

The same oil must lubricate the bearings and the gears and all these components work inside the same box, in different operating conditions.

Viscosity

Nominal viscosity refers to a temperature of 40 °C, but decreases rapidly as the temperature increases. If the gearbox operating temperature is from 50 °C to 70 °C, a nominal viscosity can be chosen from the following guide table; choose the highest viscosity if a higher operating temperature is expected.

Output speed n_2 [rpm]	Working temperature	
	50° C	70° C
$n_2 \geq 20$	VG 150	VG 220
$5 < n_2 < 20$	VG 220	VG 320
$n_2 \leq 5$	VG 320	VG 460

Special attention must be paid to highly loaded output stages and those with very low speeds (<1 rpm). In such cases, always use high viscosity oils and with a good amount of Extreme Pressure (EP) additive.

Additives

In addition to the normal anti-foam and antioxidant additives, it is important to use oils with additives offering EP (extreme-pressure) and anti-wear properties, according to ISO 67436 L-CKC or DIN 515173 CLP. The lower the gearbox output speed, the more marked the EP characteristics of the products have to be. It should be remembered that the chemical compounds replacing hydrodynamic lubrication are formed to the detriment of the original EP load.

Therefore in case of very low speeds and high loads, it is important to observe the maintenance intervals so as not to lower the lubricating properties of the oil excessively.

Oil types

Oil types

The oils available generally belong to three large families.

- Mineral oils
- Polyalphaolefin (PAO) synthetic oils
- Polyalkylene glycol (PAG) synthetic oils

The most suitable choice is generally tied to the conditions of use.

Gearboxes that are not particularly loaded and with an intermittent operating cycle but without considerable temperature ranges can be lubricated with mineral oil.

In cases of heavy use, when the gearboxes are highly and continuously loaded resulting in a temperature increase, it is best to use polyalphaolefin synthetic lubricants.

The use of polyalkylene glycol oils is not allowed as they are not compatible with other oils and are often completely mixable with water; this phenomenon is particularly dangerous because it can go unnoticed, but rapidly diminishes the lubricating properties of the oil. Moreover, these lubricants may chemically attack the oil seals and paint inside the gearbox.

In addition to the above, there are also hydraulic oils and oils for the food industry.

The former are used for negative brakes.

The latter are used specifically in the food industry as they are special products that are not harmful to health.

The tables below contain lubricants offered by the best-known manufacturers, with specifications suitable for lubricating DANA gearboxes.

Contamination

During normal operation, due to run-in of the surfaces, metallic microparticles will inevitably form in the oil.

This contamination can shorten the life of the bearings, resulting in premature gearbox failure.

To limit and control this phenomenon, without resorting to frequent and costly oil changes, a suitable auxiliary oil circulation system with filtering and cooling of the oil must be provided.

This system offers the dual advantage of controlling the level of contamination through the use of special filters and stabilising the operating temperature at a level more suitable for ensuring the required viscosity.

For lubrication problems with gearboxes intended for special uses, it is advisable to contact your local DANA representative regarding the construction type and operating parameters.

Lubricant oils for general use

Manufacturer	Mineral Oil			Polyalphaolefin Synthetic Oils (PAO)		
	ISO VG	ISO VG	ISO VG	ISO VG	ISO VG	ISO VG
	150	220	320	150	220	320
ADDINOL	Eco Gear 150 M	Eco Gear 220 M	Eco Gear 320 M	Eco Gear 150 S	Eco Gear 220 S	Eco Gear 320 S
ARAL	Degol BG 50 Plus	Degol BG 220 Plus	Degol BG 320 Plus	Degol PAS 150	Degol PAS 220	Degol PAS 320
BP	Energol GR-XP 150	Energol GR-XP 220	Energol GR-XP 320	Energol EPX 150	Energol EPX 220	Energol EPX 320
CASTROL	Alpha SP 150	Alpha SP 220	Alpha SP 320	Alphasyn EP 150	Alphasyn EP 220	Alphasyn EP 320
CEPSA	Engranajes XMP 150	Engranajes XMP 220	Engranajes XMP 320	-	Aerogear Synt 220	Aerogear Synt 320
CHEVRON	-	-	-	Tegra Synthetic Gear 150	Tegra Synthetic Gear 220	Tegra Synthetic Gear 320
ENI	Blasia 150	Blasia 220	Blasia 320	Blasia SX 150	Blasia SX 220	Blasia SX 320
FUCHS	Renolin CLP Gear Oil 150	Renolin CLP Gear Oil 220	Renolin CLP Gear Oil 320	Renolin Unisyn CLP 150	Renolin Unisyn CLP 220	Renolin Unisyn CLP 320
KLÜBER	Klüberoil GEM 1-150 N	Klüberoil GEM 1-220 N	Klüberoil GEM 1-320 N	Klübersynth GEM 4-150 N	Klübersynth GEM 4-220 N	Klübersynth GEM 4-320 N
LUBRITECH	Gearmaster CLP 150	Gearmaster CLP 220	Gearmaster CLP 320	Gearmaster SYN 150	Gearmaster SYN 220	Gearmaster SYN 320
MOBIL	Mobilgear XMP 150	Mobilgear XMP 220	Mobilgear XMP 320	Mobil SHC Gear 150	Mobil SHC Gear 220	Mobil SHC Gear 320
MOLIKOTE	L-0115	L-0122	L-0132	L-2115	L-2122	L-2132
NILS	Ripress EP 150	Ripress EP 220	Ripress EP 320	Atoil Synth PAO 150	-	Atoil Synth PAO 320
Q8	Goya NT 150	Goya NT 220	Goya NT 320	El Greco 150	El Greco 220	El Greco 320
REPSOL	Super Tauro 150	Super Tauro 220	Super Tauro 320	Super Tauro Sintetico 150	Super Tauro Sintetico 220	Super Tauro Sintetico 320
SHELL	Omala S2 G 150	Omala S2 G 220	Omala S2 G 320	Omala S4 GX 150	Omala S4 GX 220	Omala S4 GX 320
SUNOCO	Sun EP 150	Sun EP 220	Sun EP 320	-	-	-
TEXACO	Meropa 150	Meropa 220	Meropa 320	Pinnacle EP 150	Pinnacle EP 220	Pinnacle EP 320
TOTAL	Carter EP 150	Carter EP 220	Carter EP 320	Carter SH 150	Carter SH 220	Carter SH 320
TRIBOL	1100/150	1100/220	1100/320	-	-	1510/320

Lubricant oils for use in the food industry

(USDA-H1 and NSF-H1 approved)

Manufacturer	Hydraulic Oil			Gear Oil		
	ISO VG 32	ISO VG 46	ISO VG 68	ISO VG 150	ISO VG 220	ISO VG 320
ARAL	Eural Hyd 32	Eural Hyd 46	Eural Hyd 68	Eural Gear 150	Eural Gear 220	-
CASTROL	Optileb HY 32	Optileb HY 46	Optileb HY 68	Optileb GT 150	Optileb GT 220	Optileb GT 320
CHEVRON	Lubricating Oil FM 32	Lubricating Oil FM 46	Lubricating Oil FM 68	-	Lubricating Oil FM 220	-
ENI	Rocol Foodlube Hi-Power 32	Rocol Foodlube Hi-Power 46	Rocol Foodlube Hi-Power 68	Rocol Foodlube Hi-Torque 150	Rocol Foodlube Hi-Torque 220	Rocol Foodlube Hi-Torque 320
FUCHS	Cassida Fluid HF 32	Cassida Fluid HF 46	Cassida Fluid HF 68	Cassida Fluid GL 150	Cassida Fluid GL 220	Cassida Fluid GL 320
KLÜBER	Klüberfood 4 NH1-32	Klüberfood 4 NH1-46	Klüberfood 4 NH1-68	Klüberoil 4 UH1-150N	Klüberoil 4 UH1-220N	Klüberoil 4 UH1-320N
MOBIL	Mobil SHC Cibus 32	Mobil SHC Cibus 46	Mobil SHC Cibus 68	Mobil SHC Cibus 150	Mobil SHC Cibus 220	Mobil SHC Cibus 320
NILS	Mizar 32	Mizar 46	Mizar 68	Ripress Synt Food 150	Ripress Synt Food 220	Ripress Synt Food 320
TEXACO	Cygnus Hydraulic Oil 32	Cygnus Hydraulic Oil 32	Cygnus Hydraulic Oil 32	Cygnus Gear PAO 150	Cygnus Gear PAO 220	-
TRIBOL	Foodproof 1840/32	Foodproof 1840/46	Foodproof 1840/68	-	Foodproof 1810/220	Foodproof 1810/320



BREVINI[®]

Motion Systems


brevini

Posiplan Gearbox technical datasheet

Date	Salesman
Subsidiary	Requested lead time for quotation

Customer	Customer type [OEM; End User;...]
Contact person	Market Sector
Product to be replaced ☐ or new application ☐	Machine Type
Q.ty / batch	Q.ty / year
Requested Lead Time Prototype	Requested Lead Time Series
Target Price Prototype	Target Price Series

Description of the application:

Working conditions

Max. Output Torque [Nm]		Max. Input speed (as peak, not continuous) [rpm]	
Output speed [rpm]			
Input speed [rpm]			

FEM Class Selection process	FEM Class (if known)
	ym

Lifetime Selection process*	Lifetime requested
-----------------------------	--------------------

	Operating time [%]	Output Torque [Nm]	Output speed [rpm]
Phase 1			
Phase 2			
Phase 3			
Phase 4			

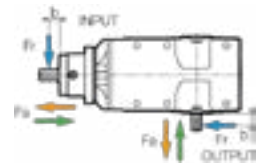
Motor type	Hydraulic ☐	Electric ☐	Other ☐	
------------	---------------------------------	--------------------------------	-----------------------------	--

Nominal Power [kW]	
Nominal speed [rpm]	

* Follow FEM Class selection process if FEM Class is known. Follow Lifetime selection process if FEM Class is unknown or duty cycle is available.

Loads

	Output shaft	Input shaft
Radial force, Fr [N]		
b [mm]		
Axial force, Fa [N]		



Environmental conditions

Ambient temperature [°C]		Small space ☐	Large space ☐	Outdoors ☐
Number of starts per hours/day				
Operating temperature [°C]				

Gearbox characteristics

Transmission type


☐

☐

Helical (PH)

Bevel Helical (BPH)


☐

☐

Bevel helical with lateral input (BPC)

Bevel helical with more inputs (BPW)

Orienting



PH

B3

B6

B7

B8

V5

V6



BPH

B3

B6

B7

B8

V5

V6

Mounting solution

Shaft mounted ☐	Flange mounted ☐	Foot mounted ☐
-------------------------------------	--------------------------------------	------------------------------------

Output shaft

☐ Male Cylindrical	☐ Hollow splined
☐ Hollow with keyway	☐ Hollow for shrink disc

Interchangeability requested

Yes, fill notes ☐	No ☐
---------------------------------------	--------------------------

Notes:



GEARBOX TECHNICAL DATASHEET

Input

Multidisk negative Brake Yes ☐ No ☐ Shaft Yes ☐ No ☐ Flange/Motor Adaptor Yes ☐ No ☐

Notes:

Motor power supply

Motor not included into supply ☐ Electric ☐ Hydraulic ☐

Model*

Flange type*

Manufacturer*

Shaft type*

Electric

Supply Frequency [Hz]

Supply Voltage [V]

N. of Poles*

Hydraulic

Max pressure at the motor [bar]

Working Pressure [bar]

Displacement [cc/rev]*

Max oil flow at the motor [l/min]

min:

max:

* Fill up only if the motor is not included into supply

Accessories

Painting (Cycle/RAL/gloss) Gearbox filled with oil Yes ☐ No ☐

Reaction Kit ☐ Reaction Flange ☐ Shaft Cover ☐ Plate & and Plate Kit ☐ Back stop device ☐
Shrink Disc ☐ Encoder ☐ Heater with Thermostat ☐ Cooling System ☐ Other (specify in the box "Notes") ☐

Certification required Yes ☐ No ☐ Certification type if requested

Notes:

Addition Notes

Attachments

Yes ☐

No ☐

