DANA BREVINI® Motion Systems

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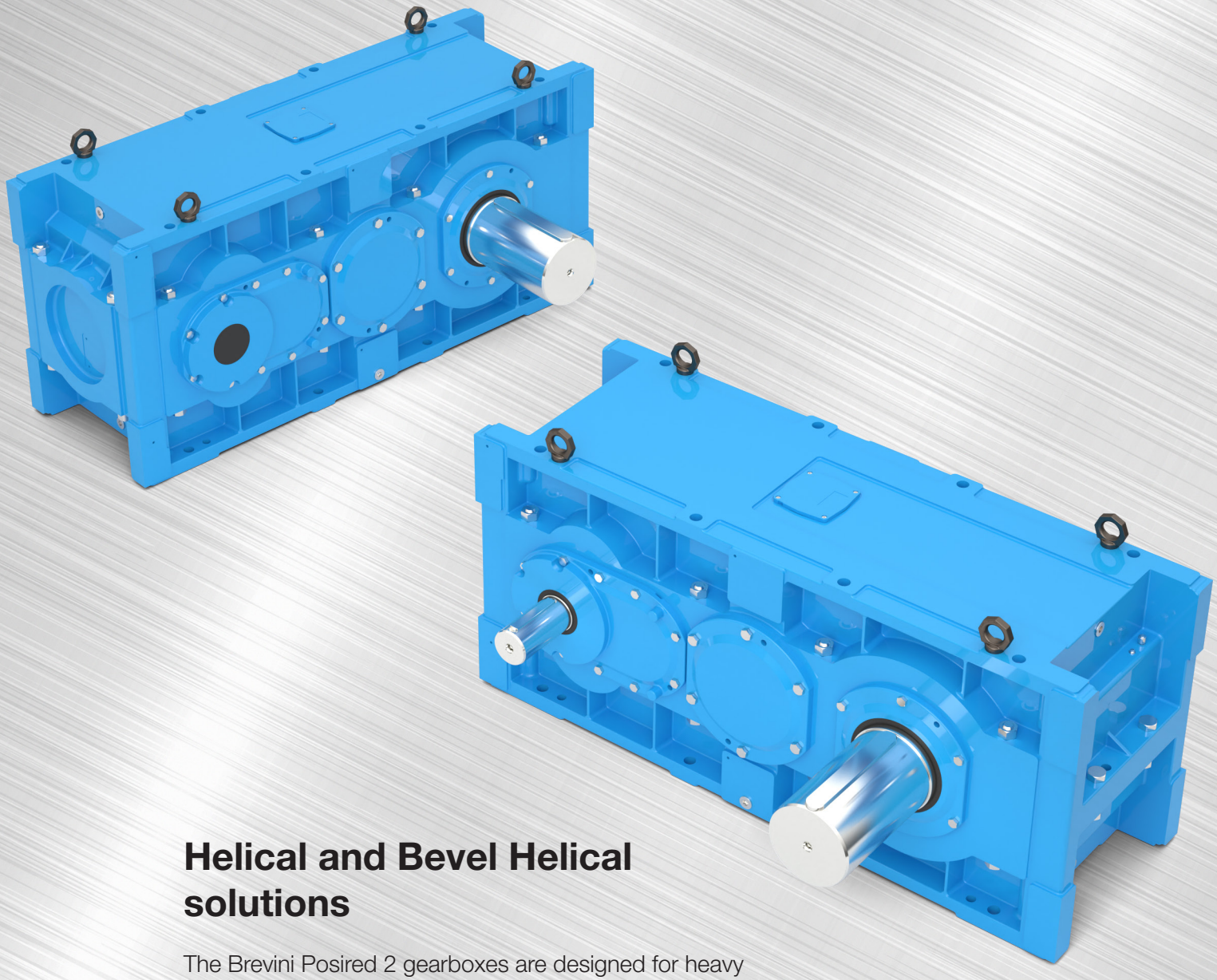
04 2022

Product Catalog

Helical and Bevel Helical Gearboxes

Brevini® Posired 2 Sizes 60 up to Size 85

Output torque from 343 kNm up to 850 kNm



Helical and Bevel Helical solutions

The Brevini Posired 2 gearboxes are designed for heavy duty application in mining, material handling and marine application. They ensure high performances in demanding applications based on their modularity and a wide range of combinations.


DANA
BREVINI®
Motion Systems

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POSIRED 2

is Dana Motion Systems Deutschland GmbH innovative product line. These superior gear units are produced with state of the art design, material, and manufacturing technologies for maximum power and reliability within a cost-effective package.
The Dana Motion Systems Deutschland GmbH ISO 9001:2015 quality assurance system for design, development, production, assembly, and after-sales service guarantees an uniformly high World-class standard.

POSIRED 2

is an “intelligent” gear concept:

- because the design has a high degree of standardization, giving optimum availability and short delivery times
- because a cost effective selection for each application is assured by a torque-dense product range
- because it offers more advantages owing to:
  - high product quality from a robust design
  - high product flexibility allows for more versatile applications
  - tailor-made production from a modular construction system

Construction types:

- 2, 3 an d 4 stage helical gears
- 3, 4 stage bevel helical gears
- 7 frame sizes available

Construction and product configurations:

- horizontal, vertical an upright designs with attachment on all 6 casing-surfaces
- spiral bevel spur gears available for compact, right angle drivess
- right angle drives available with vertical driven shafts
- with output shaft as solid, flanged, or hollow with key or shrink disk
- with motor bell housing
- with base plate for the motor and the drive unit
- with back stop
- with auxiliary drive
- with overriding clutch
- with flange for output side attachments

Output torques

T_2 from 343.000 Nm to 805.000 Nm

Ratios

i_N = 4 to 630

Housing:

- Split casings for frame sizes 60 up to 67; split welded housing for the sizes 71 up to 85
- Greater bore diameters for large roller bearings with high load carrying capacity
- The design simplifies assembly and dismantling of the gear units
- Designed utilizing the latest technologies in acoustics and Finite Element Analysis to produce superior noise reduction and housing rigidity with optimal weight savings
- Material: grey cast iron casting as standard, nodular cast iron or welded steel on request

Gears:

- Helical gears for reduced noise, case hardened and ground
- Heat treatment in Dana Motion Systems Deutschland GmbH dedicated hardening bay for highest quality
- Profile corrections for optimum inertia quality
- Spiral bevel gears (cyclo-palloid tooth form) hardened and lapped, HPGS or ground
- Calculation checks possible in accordance with DIN 3990, ISO 6336, AGMA and classification Company standards
- Gear toothing quality 6 acc. to DIN

Shafts:
Available types of **output shafts**:
- Solid shaft
- Double extended solid shaft
- Hollow shaft with key
- Hollow shaft with shrink disc
- Flanged shaft
- Splined hollow or solid shaft

Available types of **input shafts**:
- Solid shaft
- Double extended solid shaft for helical gear units
- Additional intermediate exterior shaft end for all gear unit types

Keys
acc. to DIN 6885/1 supplied by Dana Motion Systems Deutschland GmbH.

Center holes
on the shaft ends acc. to DIN 332 form DS

D [mm]	20	25..30	35	40..50	60..85	> 85
Thread	M6	M10	M12	M16	M20	M24

Roller bearings
The lifetime calculations of the roller bearings assumes the highest expectations of all engineering parameters

Seals
Standard seal systems available for input and output shafts:
- Radial shaft seals in various materials
- Radial shaft seals with additional dust lip
- Second radial shaft seal with intermediate grease-filled chamber
- Greased labyrinth seals also with radial shaft seals
- No-contact seals
- Maintenance cover with reusable seal

Lubrication:
- Gear wheels and roller bearings are oil-bathed as standard
- Standardized injection lubrication systems with shaft or motor driven pump are available as options
- Oil dipstick as standard for horizontal gear units
- Oil sight glass as standard for vertical gear units

Cooling
Additional cooling devices available as standard are:
- Mechanical or Electrical fan cooling
- Cooling coil
- External oil-air cooler with oil/air or with oil/water heat exchanger

Torque arms
available on request with 1 or 2 ball-and-socket joint.

Motors and driving engines:
- Motors according to DIN, VDE, IEC or other standards
- Speed controlled three phase current drives with the necessary accessories,
- Combinations with mechanical continuously variable units of Dana Motion Systems Deutschland GmbH.

Motor supports
available as standard:
- Motor bell housings
- Motor brackets
- Base plates as support of the motor and the gear unit

Couplings
At the output suitable for standard output shafts and gear torques:
- Elastic couplings
- Gear coupling
- Barrel coupling
- Multiple disc coupling
- other coupling types on request

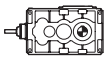
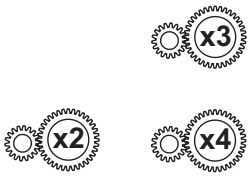
At the input, suitable for standard drive shafts and gear torques:
- Flexible couplings
- Hydrodynamic couplings
- other couplings on request

Backstops
available as standard, accessible in a closed housing.

Accessories:
- Heating element for very cold conditions
- Operational monitoring systems for speed, torque, temperature, oil flow, oil level, and other conditions
- Diagnostic systems also available

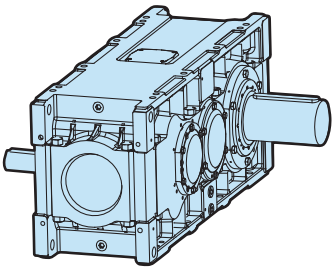
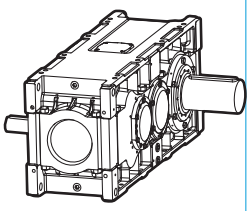
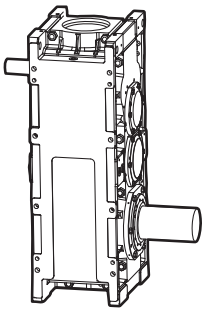
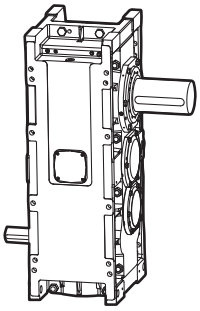
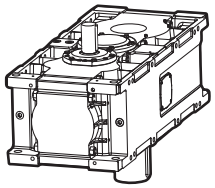
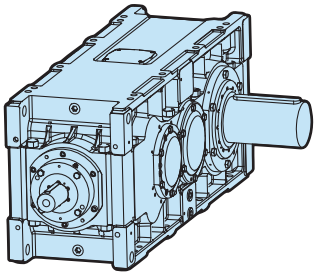
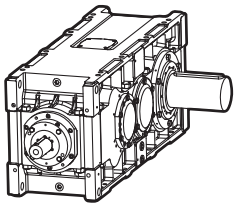
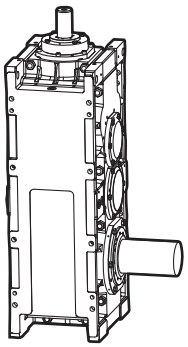
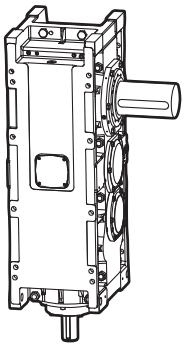
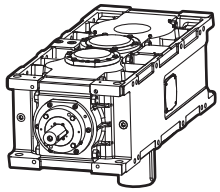
General information:
- Dimension sheets are available as CAD files for various IT systems and interfaces.
- Computer programs for drive selection.
- Gear, shaft and bearing calculation with proof of calculation.
- The degree of protection corresponds to IP 55.
- Information on the weight of the gear unit and the amount of gear oil are guide values. Exact values can be found on the gear unit nameplate or technical description.

Scope of delivery, installation and commissioning:
- The delivery takes place without oil filling.
- Transport aids such as eye bolts are not included.
- Oil type and oil quantity according to the nameplate or technical description
- Recommended quality: CLP according to DIN 51517 or see technical description
- The standard preservation under normal transport and storage conditions is sufficient for a period of 18 months.
- Installation and commissioning according to Brevini Motion Systems operating instructions
- On request, we can supply the legally prescribed contact protection on rotating parts.
- Available, for gearboxes with hollow shaft, protection cover for shrink disk.

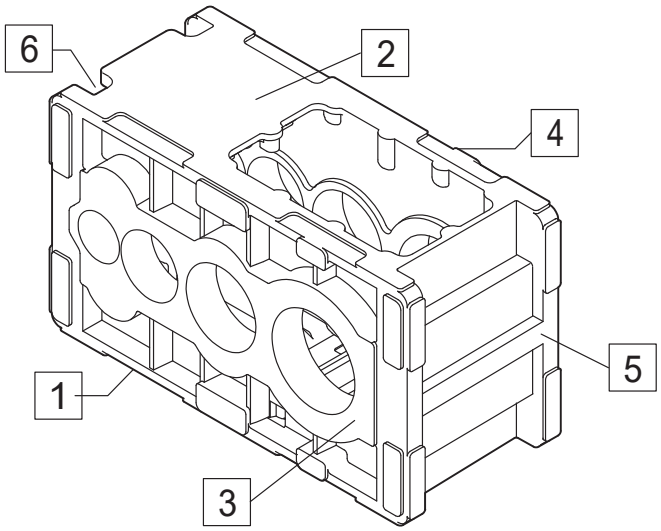
Dimensions	
Symbol referring to gear unit type PC, PD, PE	
Symbol referring to gear unit type PLC, PLD	
Symbols identifying the gear unit stages (2, 3, 4)	
Symbols describing kind of output shaft: **V** = Solid shaft **H** = Hollow shaft with key **G** = Hollow shaft with shrink disc **F** = Flanged shaft	
Gear unit weight [kg]	
	Lubrification
Oil quantity in liters [l]	
Type of oil plug on gear units	
Filling plug	
Oil level	
Oil drain	
Breather	

Reference to page	

SPLIT HOUSING

SPLITHOUSING				
Construction types	**Mounting positions**			
	R (standard)	**S** (on request)	**T** (on request)	**U** (on request)
	Horizontal, output shaft horizontal	Vertical, output shaft below	Vertical, output shaft above	Horizontal, output shaft vertical
PC, PD, PE	**Helical gear units**			
				
PLC, PLD	**Bevel-helical gear units**			
				

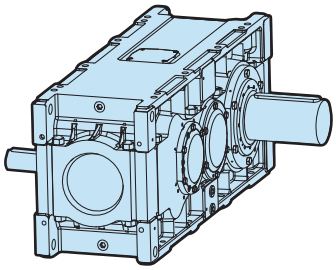
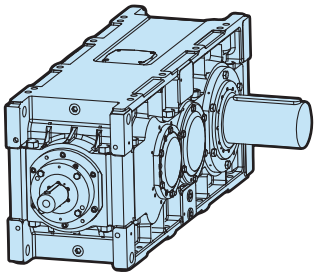
SPLIT HOUSING



Designation of carter surfaces (1 … 6).
Permissible mounting positions: see dimension sheets.

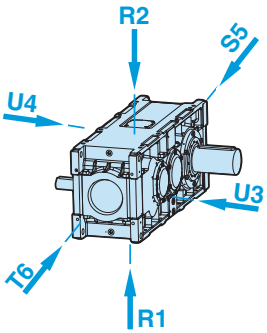
Example:

R1 = R for horizontal mounting position; 1 for surface 1 below

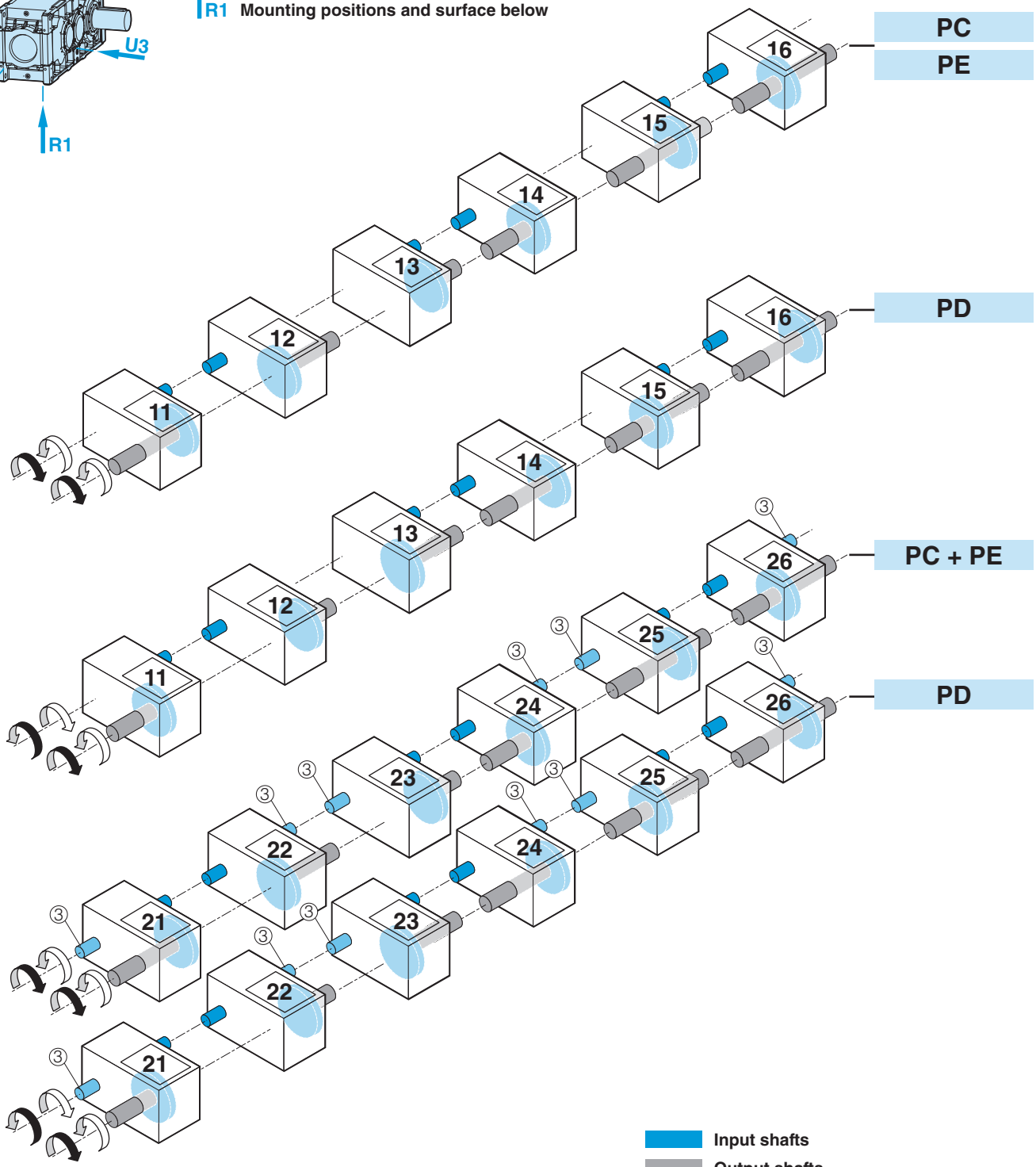
Type	SPLIT HOUSING	Mounting positions and surfaces		Pag.
Helical gear units		**PC**	**R1, R2, S5, T6, U3, U4**	8 - 9
		PD	**R1, R2, S5, T6, U3, U4**	
		PE	**R1, R2, S5, T6, U3, U4**	
Bevel-helical gear units		**PLC**	**R1, R2, S5, T6, U3, U4**	10 -11
		PLD	**R1, R2, S5, T6, U3, U4**	

SHAFT ARRANGEMENT AND SENSE OF ROTATION

PC - PD - PE



R1 Mounting positions and surface below



Input shafts

Output shafts

③ Double extended input shafts

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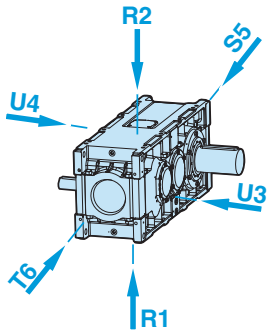
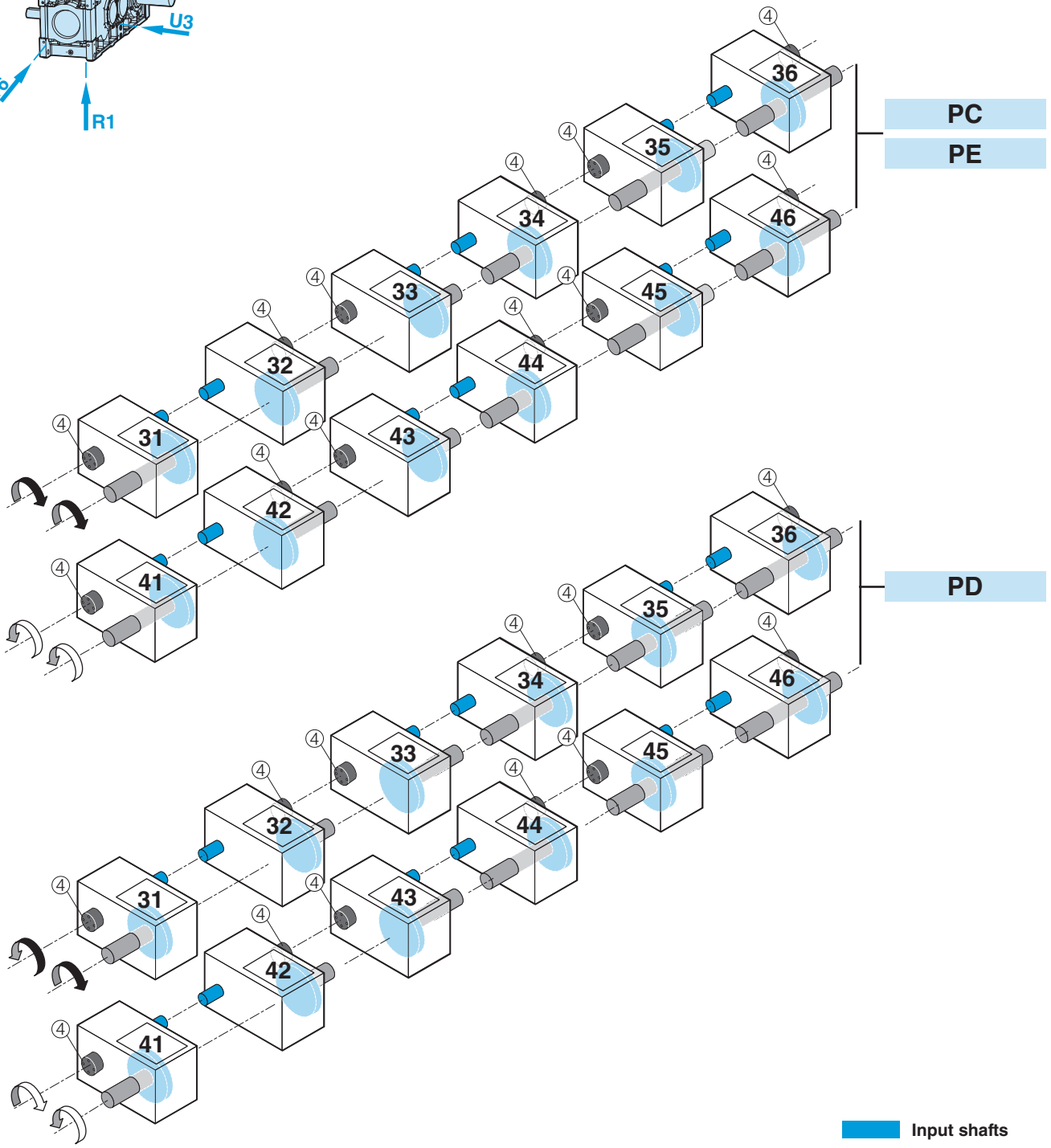
PC - PD - PE



R1 Mounting positions and surface below



Input shafts
Output shafts
④ Backstop

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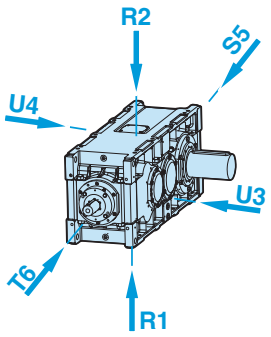
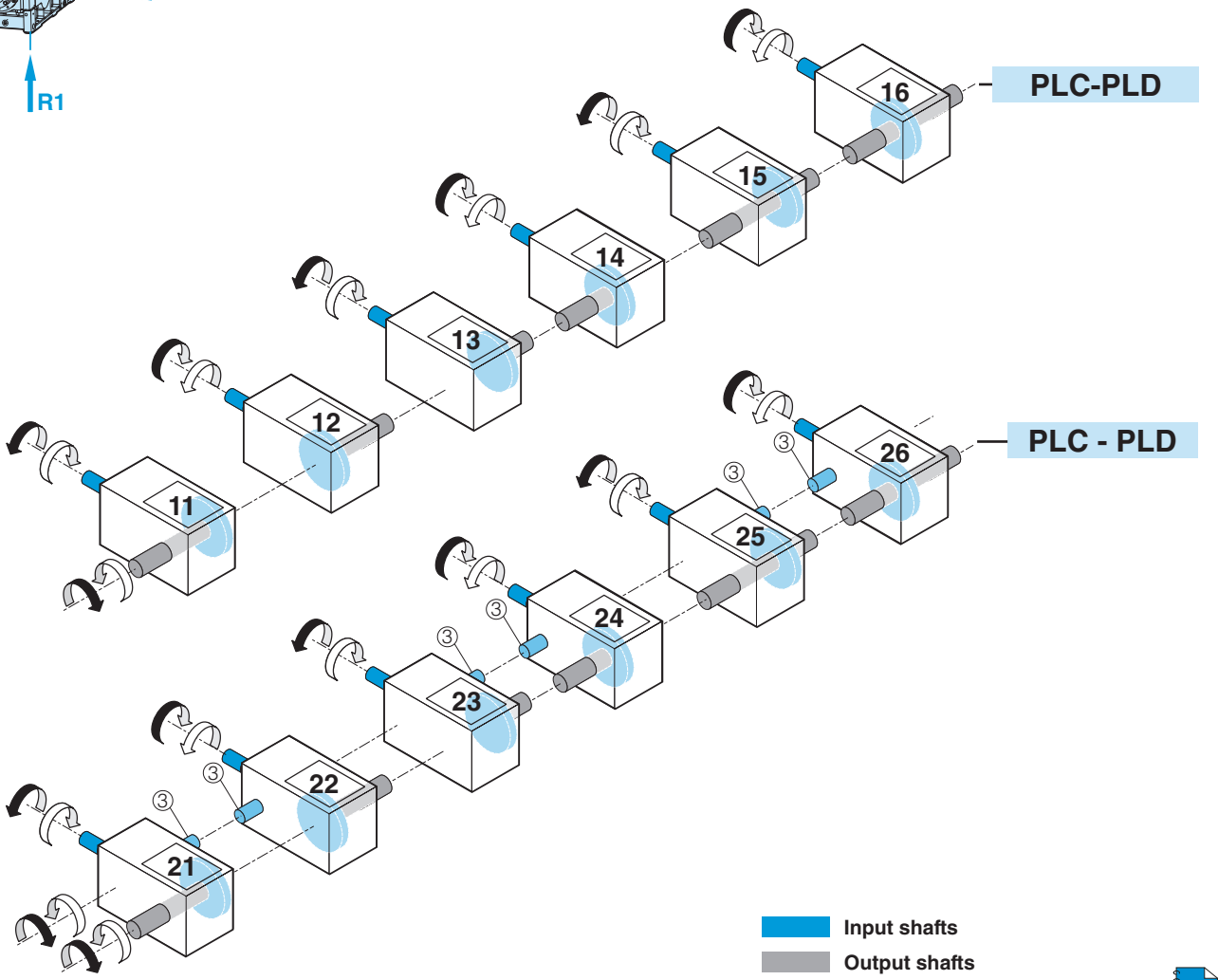
SHAFT ARRANGEMENT AND SENSE OF ROTATION

PLC - PLD



R1 : Mounting positions and surface below



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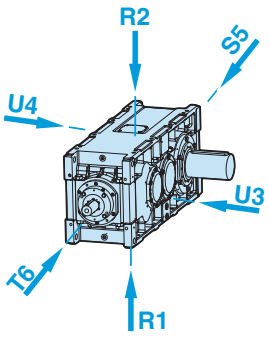
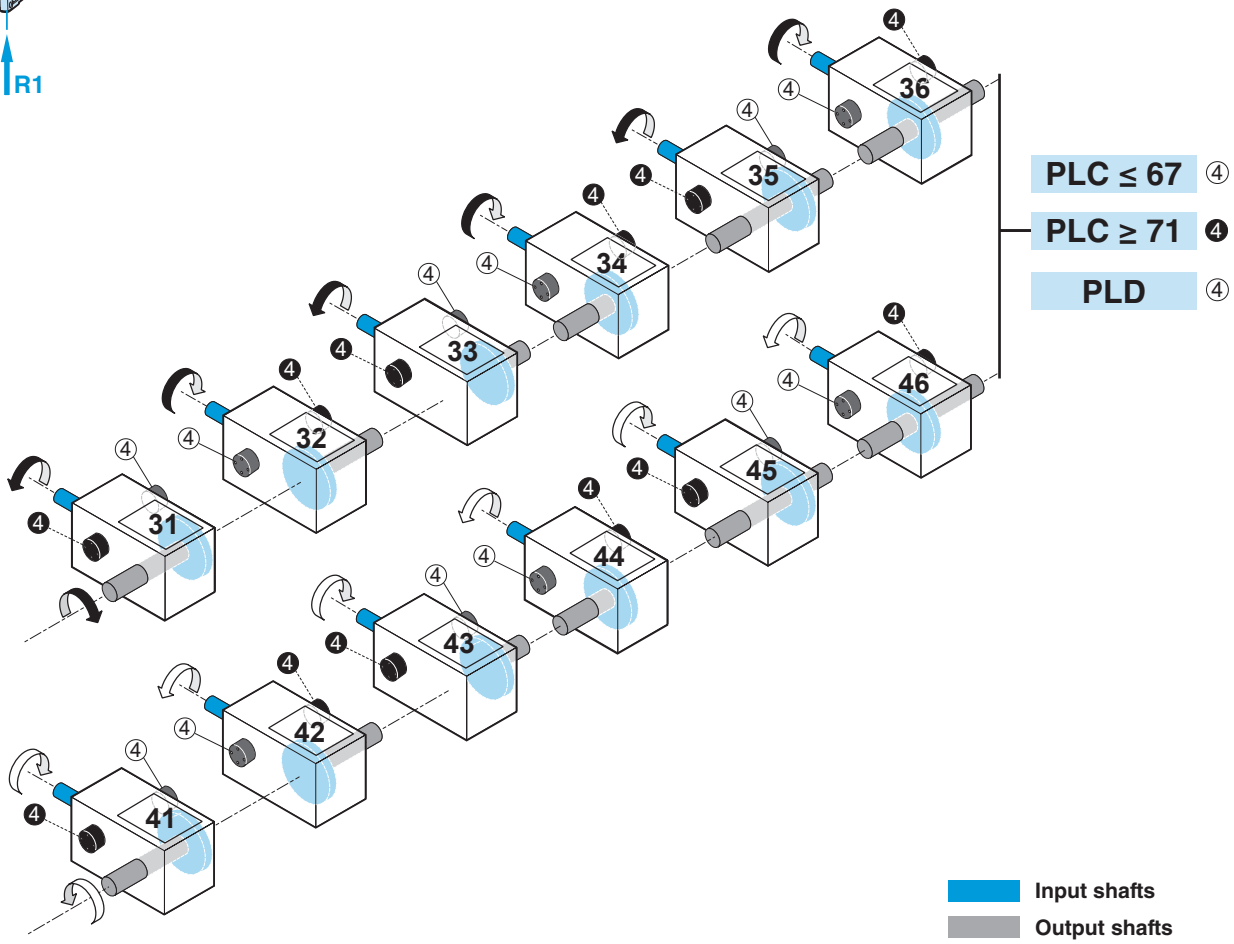
PLC - PLD



R1 : Mounting positions and surface below



Input shafts
Output shafts
④ ❹ Backstop

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DESIGNATION FOR ORDER

K	-	PD	60	-	R	1	1	-	V	11	-	25	-	Z	1

		Motor attachment
K	**K**	Motor bell housing
	M	Motor base plate
	J1	Swing base
	J2	Motor scope
		Type
PD	**PC, PD, PE**	Helical gear units
	PLC, PLD	Bevel-helical gear units
		Size
22	**60...85**	
		Mounting position
R	**R**	Horizontal, output shaft horizontal
	S	Vertical, output shaft below
	T	Vertical, output shaft above
	U	Horizontal, output shaft vertical
		Carter surface below
1	**1...6**	
		Mounting arrangement
1	**0**	Shaft mounted with torque reaction arm
	1	Surface 1
	2	Surface 2
	3	Surface 3
	4	Surface 4
	5	Surface 5
	6	Surface 6
	7	Output flange
		Output shaft
V	**V**	Solid shaft with keyway
	H	Hollow shaft with keyway
	G	Hollow shaft with shrink disc
	F	Flanged shaft
		Shaft positions, directions of rotation, position of back stops
11		
		Nominal ratio
25		
		Addition
Z1	**1**	Fan cooling
	2	2 fans
	3	Cooling coil
	4	Fan cooling + cooling coil
	8	2 cooling coils
	9	2 cooling coils + 1 fan

- Establish the type of gear unit and mounting arrangement
- Ratio $i_{soll} = \frac{n_1}{n_2}$
- Selection of the appropriate nominal ratio i_N
  (or the actual ratio i_w Page 32...34)
- Determine the gear unit size
  Check the gear unit power
  $P_N \geq P_e \cdot f_K$
  f_K = Gear unit application factor, see table 1 (page 16)

  Checking the peak torque
  $T_{max} \leq 9550 \frac{P_N}{n_1} \cdot f_E \cdot f_R$
  f_E = Operating frequency factor, see table 2 (Page 19)
  f_R = Reversal.factor, table 3 (page 19)
- Checking the thermal capacity
  $P_t \geq P_e$
  $P_t = P_{t\_} \cdot f_W \cdot f_A$

n_1	[min^{-1}]	input speed	T_{max}	[Nm]	Start-up or maximum motor or braking torque
n_2	[min^{-1}]	output speed	P_t	[kW]	Thermal capacity
i_{soll}		Desired ratio	P_{t0}	[kW]	Thermal capacity for drive without additional cooling
i_N		Nominal ratio	P_{t1}	[kW]	Thermal capacity with air cooling
i_W		Actual ratio	P_{t3}	[kW]	Thermal capacity with cooling coil
P_M	[kW]	Motor power	P_{t4}	[kW]	Thermal capacity with air cooling and cooling coil
P_N	[kW]	Nominal power output	f_W		Thermal factor
P_e	[kW]	Effective power of machine to be driven	f_A		Load factor
f_K		Gear unit application factor	ϑ_U	[°C]	Ambient temperature
f_E		Operating frequency factor	ED	[%]	Duty cycle per hour
f_R		Reversal factor			

The shaft ends are provided with shearing-loadfree couplings for torque transmission.
Ask for explanations for external forces.

Design Example

Machine to be driven: Agitator for materials with variable density
Required output power: P_e = 700 kW
Speed: n_2 = 35 min^{-1}
Duty cycle: **ED** = 80 %
Starts per hour: 10
Ambient temperature: 24 h/day
Ambient temperature: ϑ_U = 30 °C

Installation in a large hall, constant strong blast given.

Driving Machine:

Three-phase motor
Motor output: P_M = 850 kW
Motor speed: n_1 = 1500 min^{-1}
Max. motor torque: T_{max} = 10800 Nm
(pull-out torque)

Selection

1. A bevel helical gear unit for horizontal installation in a hollow shaft version with shrink disc is required.

2. Ratio:
$i_{soll} = n_1 / n_2 = 1500/35 = 42.8$
Nominal ratio: i_N = 45

The power data page 30 comes up with type **PLC.**

3. Determine the gear unit size
Check the gear unit power
$P_N \geq P_e \cdot f_k$

With application factor f_K from table 1:
f_K = 1.6 (upper value for continuous use)

$P_{N\,erf} \geq 700\ kW \cdot 1.4 = 1120\ kW$

Selected: Gear unit **PLC60** with $P_N = 1200\ kW$

4. Checking the peak torque:

$$T_{max} \leq 9550 \cdot \frac{P_N}{n_1} \cdot f_E \cdot f_R$$

With operating frequency factor f_E from table 2: $f_E = 1.6$

With reversal factor f_R from table 3: $f_R = 1.0$

$$T_{max} \leq 9550 \cdot \frac{1200\ kW}{1500\ min^{-1}} \cdot 1.6 \cdot 1.0 = 12224\ Nm$$

10800 Nm < 12224 Nm O.K.

5. Checking the thermal capacity:

$P_t \geq P_e$ with $P_t = P_{t\_} \cdot f_W \cdot f_A$

$P_{t\_}$:

- P_{t0} Thermal capacity without additional cooling
- P_{t1} Thermal capacity with ventilator
- P_{t3} Thermal capacity with cooling coil
- P_{t4} Thermal capacity with ventilator and cooling coil

With thermal factor f_W from **p. 29**: $f_W = 0.91$ for $\vartheta_U = 30\ °C$ and **ED** = 80%

With a duty cycle factor f_A from **p. 29:** $f_A = 0.93$ for $\frac{P_e}{P_N} = \frac{700}{1200} \cdot 100\% = 58\%$

Gear units with cooling coil: $P_{t3} = 1.109 \cdot 0.91 \cdot 0.93 = 939\ kW$

With $P_{t0} = 83\ kW$ from page 29

$P_e = 700\ kW < P_{t3} = 939\ kW$

A cooling is necessary.

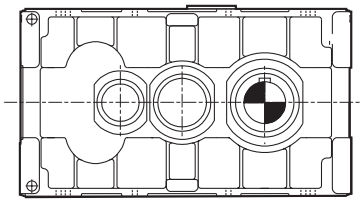
Order code:

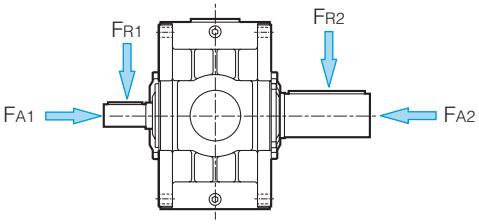
PLC	60	-	R1	1	-	G	12	-	45	-	Z3

RADIAL AND AXIAL LOADS (INQUIRING FORM)

To be sent to the Dana area contact person

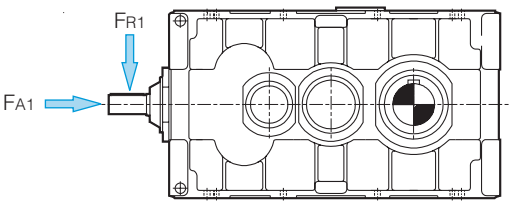
Mr. / Mrs. _____
Company _____
Street _____
Postal code / Locality _____
Country _____
Telephone _____
Telefax _____
E-Mail _____

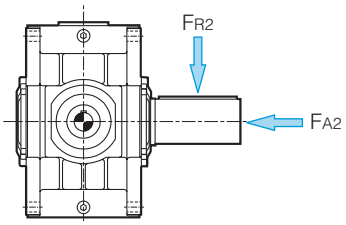




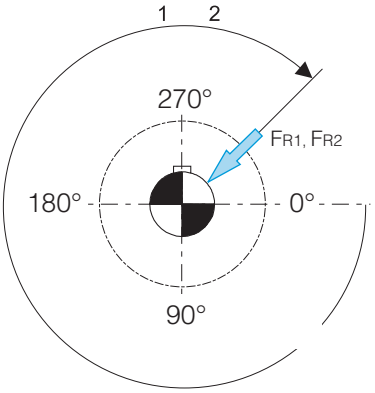
To the verification of the admissible strain of the input shaft and the output shaft due to exterior forces.

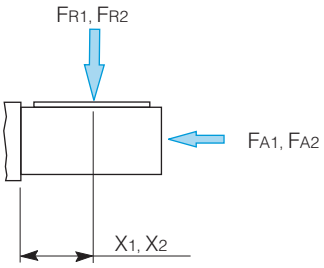
Specify please with negative sign the forces working in a direction opposite to the one represented.





Please note the negative sign of distance of load applications on a hollow shaft.





F_{R1} [N] =	_____	**Radial loads**
F_{A1} [N] =	_____	**Axial loads**
X_1 [mm] =	_____	**Distance of load application**
α_1 =	_____	**Direction of load**

F_{R2} [N] =	_____	**Radial loads**
F_{A2} [N] =	_____	**Axial loads**
X_2 [mm] =	_____	**Distance of load application**
α_2 =	_____	**Direction of load**

APPLICATION FACTOR

Gear unit application factors are in line with DIN standard no. 3990 part 11 (edition 2/89) and are based on our experience for normal operating conditions.
Changes in the necessary drive selection may take place after stating the exact operating conditions.

Table 1: **Gear unit application factor f_a** 1)	**Intermitt. Use** (0,5 h)	**Shifts** 2)
Blowers, Ventilators		
Air cooler		1.4...1.5
Axial blowers	0.8	1.0...1.25
Cooling tower fans	1.2	1.6...1.7
Heat exchangers		1.5
Rotary piston blowers	1	1.25...1.5
Suction draught blower	1	1.25...1.5
Turbo exhauster	0.8	1.0...1.25
Cableways		
Continuous ropeways		1.4...1.6
Freight ways		1.3...1.4
Shuttle cableways		1.4...1.8
T-bar lifts		1.3...1.4
Cement Industry		
Concrete mixers		1.5
Crushers		1.2...1.4
Roller mills		2
Rotary kilns		2
Separators		1.6
Tube mills		1.8
Chemical industry		
Agitators for materials		
with constant density	1	1.3...1.5
with variable density	1.2	1.4...1.6
Agitators with variable gas absorbt.	1.4	1.6...1.8
Centrifuges	1	1.25...1.35
Drying kilns		1.5
Kneading machines		2
Toasters	1	1.3...1.5
Compressors		
Piston compressors		1.8...1.9
Rotary compressors		1.4...1.5
Turbo compressors	1	1.25...1.5
Conveyors		
Apron conveyors		1.2...1.5
Band elevators	1	1.25...1.5
Belt conveyors	1.0...1.1	1.2...1.4
Bucket conveyors		1.2...1.5
Canvas belt elevators	1	1.25...1.5
Cellular bucket belt conveyors	1	1.25...1.5
Chain bucket elevators	1	1.25...1.5
Circular conveyors	1	1.25...1.5
Escalators	1	1.2...1.4
Goods lifts		1.2...1.5
Hoisting engines		1.5...1.8
Passenger lifts		1.5...1.8
Rail travelling devices		1.5
Scraper chain conveyors	1	1.25...1.5
Screw conveyors	1	1.25...1.5
Sinking mine machines	1.5	1.75...2.0
Steel belt conveyors	1	1.25...1.5
Winders	1.4	1.6

Table 1: **Gear unit application factor f_K** 1)	**Intermitt. Use** (0,5 h)	**Shifts** 2)
Cranes Classified acc. to FEM 1001		
Crushers		
Ball crushers		1.75...2.0
Hammer mills		1.75...2.0
Rebound crushers		1.75...2.0
Rod mills		1.75...2.0
Roller mills		2
Swinging crushers		1.75...2.0
Tube mills		1.8
Dredgers		
Bucket chain drives		1.75...1.85
Bucket wheels		1.75...2.2
Cutter heads		2.2
Dumping devices		1.3...1.5
Manoeuvring winches	1	1.25...1.5
Slewing gears		1.4...1.8
Sucking pumps	1	1.25...1.5
Travelling gears (caterpillar)	1.2	1.6...1.8
Travelling gears (rails)	1	1.25...1.5
Food Industry Machinery		
Beet sugar production		
Beet washing machines & cutters		1.5
Slicing machines	1.2	1.2
Juice boilers and refrigerators		1.4
Bottling&container filling machines	0.8	1.25...1.5
Flour bucket elevators	0.8	1.0...1.25
Kneading machines	1	1.25...1.5
Mash tubs	1	1.25...1.5
Packaging machines	0.8	1.0...1.25
Sugar cane crushers		1.25...1.5
Sugar cane knives 3)		1.7
Sugar cane mills 3)		1.7
Generators, Converters (3)		
Frequency converters		1.8...2.0
Generators	0.8	1.0...1.25
Welding generators	1.5	1.75...2.0
Metal Working Machines		
Crank presses		1.75...2.0
Forging presses		1.75...2.0
Hammers		1.75...2.0
Plate bending machines		1.25...1.5
Plate straitening presses		1.75...2.0
Roller levellers		1.6
Stamping presses		1.75...2.0
Metallurgical Industry		
Blast furnace blowers		1.25...1.5
Converters		1.75...2.0
Inclined furnace hoists		1.75...2.0
Mining, Stone an Clay Working Machines		
Conical crushers		2
Endless chain transporters		1.5
Jaw breakers		2
Jolters		1.5
Mine ventilating fans		1.5
Rolling crushers		1.5
Rotary crushers		2
Rotary kilns		2
Separators		1.5
Toothed roll crusher		2
Tub-pushing devices		1.5

APPLICATION FACTOR

Table 1: **Gear unit application factor f_K** 1)	**Intermitt. Use** (0,5 h)	**Shifts** 2)
Oil Industry		
Charging filter pumps		1.25...1.5
Flush boring pumps		1.25...1.5
Pipeline pumps		1.25...1.5
Rotary drilling equipment	1.5	1.75...2.0
Paper Machines for all types		1.8...2.5
Presses 3)		1.0...1.1
Pumps		
Centrifugal pumps	1	1.2...1.3
Charge pumps	1.5	1.75...2.0
Piston pumps	1.2...1.3	1.4...1.8
Plunger pumps		2
Sludgers	1	1.25...1.5
Rolling Mills		
Belt winders	1	1.25...1.5
Billet shears		2
Blooming- and slabbing mills		2
Capstan wheels		1.5
Chain transfer		1.5
Cold band rolling mills 3)		1.75...1.85
Cooling bed transfer frames		1.5
Continuous casting drivers 3)		1.4
Continuous shears 3)		1.5
Crank type shears	1	1
Cropping shears		2
De-scaling breakers		2
Drawing bench drives		2
High speed roller tables		1.5
Ingot conveyors		2
Ingot pushers		1.2
Looper		1.5
Loop lifter		1.5
Low speed roller tables		1.5
Plate rolling trains		2
Plate shears		2
Plate tilters	1	1.0...1.2
Plate trimming shears		1.5
Reversing blooming mills		2.5
Reversing plate mills		1.8
Reversing sheet mills		2
Reversing slabbing mills		2.5
Reversing wire mills		1.8
Rod reel & belt winders		1.5
Roll adjustment devices		1.5
Roll weighting drives	0.9	1
Roller straighteners		1.6
Roller tables continuous		1.5
Roller tables intermittent		2
Sintering belt drives		1.5
Straightening & transp. equipment		1.5
Thin sheet rolling trains		2
Transfer skids		1.5
Tube reverse equipment		1.8
Turntables (Continuous casting)		1.5
Walking beam conveyors		2
Winders		1.6
Working roller tables		2

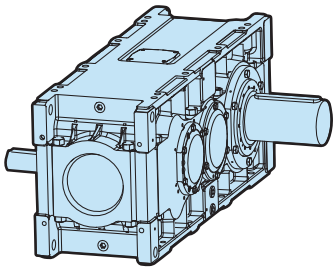
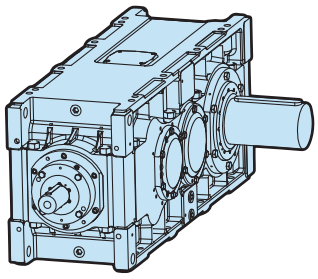
Table 1: Gear unit application factor f_K 1)	**Intermitt. Use** (0,5 h)	**Shifts** 2)
Rubber and Plastic Industry Machinery		
Calenders		1.5
Extruders		1.5
Kneading machines		1.8
Mixers	1.0...1.4	1.3...1.7
Rolling mills		2
Rotary cooler		1.3...1.4
Textile Machines		
Calender	1	1.25...1.5
Looms	1	1.25...1.5
Printing and dyeing machines	1	1.25...1.5
Take-up rollers	1	1.25...1.5
Willows	1	1.25...1.5
Water Treatment		
Circular and longitudinal rakes	1	1.3...1.5
Filter presses	1	1.3...1.5
Flocculation agitators	0.8	1.0...1.3
Pre-thickeners		1.1...1.3
Raking equipment	1	1.2...1.3
Rotary aerators		1.5...1.7
Screw pumps		1.3...1.4
Thickeners		1.2
Water wheels		2
Wood Working Machines		
Barkers	1.5	1.75...2.0
Planing machines	1	1.25...1.5
Saw frames	1.5	1.75...2.0

Table 2: Operating frequency factor f_E					
2	**1.6**	**1.4**	**1.2**	**1.1**	**1**
with ... load peaks per hour					
1	2-10	11-20	21-50	51-100	>100

Table 3: Reversal factor f_R	
1.0	**0.7**
Steady direction of load	Reversing operations

1) Application factors apply to the following driving motors: electric motors, turbines and fluid power motors. When combustion engines are the driving force, enquiries have to be made.
2) The lower table value is for single shift operation and for lighter applications, the upper table value is for continuous use and heavier applications.
3) Design is in accordance with maximum torque.

DANA
BREVINI®
Motion Systems

Type		Size	i_N	T_{N2} [kNm]	η	Pag.
 Helical gear units	PC	60	4 - 18	343	0.93	22
		63	4.5 - 20	416		
		67	5 - 22.4	483		
		71	4 - 18	555		
		75	4.5 - 20	645		
		80	5 - 22.4	720		
		85	5.6 - 25	805		
	PD	60	16 - 100	343	0.91	24
		63	18 - 112	416		
		67	20 - 125	483		
		71	16 - 100	555		
		75	18 - 112	645		
		80	20 - 125	720		
		85	22 - 140	805		
	PE	60	71 - 450	343	0.89	26
		63	80 - 500	416		
		67	100 -630	483		
		71	63 - 400	555		
		75	71 - 450	645		
		80	80 - 500	720		
		85	90 - 560	805		
 Bevel-helical gear units	PLC	60	18 - 71	343	0.93	28
		63	20 - 80	416		
		67	22.4 - 90	483		
		71	18 - 71	555		
		75	20 - 80	645		
		80	22.4 - 90	720		
		85	25 - 100	805		
	PLD	60	80 - 315	343	0.91	30
		63	90 - 355	416		
		67	100 - 400	483		
		71	71 - 280	555		
		75	80 - 315	645		
		80	90 - 355	720		
		85	100 - 400	805		

PC..

Powers and torques

i_N	n_1	n_2	PC 60	63	67	71	75	80	85
	[min^{-1}]		Nominal power P_N [kW]						
4	1500	375	13469			21793			
	1000	250	8979			14529			
	T_{N2} [kNm]		343			555			
4.5	1500	335	12032	14593		19469	22626		
	1000	220	7902	9583		12785	14859		
	T_{N2} [kNm]		343	416		555	645		
5	1500	300	10775	13068	15173	17435	20262	22618	
	1000	200	7183	8712	10115	11623	13508	15079	
	T_{N2} [kNm]		343	416	483	555	645	720	
5.6	1500	270	9697	11761	13655	15691	18236	20356	22759
	1000	180	6465	7841	9104	10461	12157	13571	15173
	T_{N2} [kNm]		343	416	483	555	645	720	805
6.3	1500	240	8620	10454	12138	13948	16209	18094	20230
	1000	160	5747	6970	8092	9298	10806	12063	13487
	T_{N2} [kNm]		343	416	483	555	645	720	805
7.1	1500	211	7578	9191	10672	12262	14251	15908	17786
	1000	141	5064	6142	7131	8194	9523	10630	11885
	T_{N2} [kNm]		343	416	483	555	645	720	805
8	1500	188	6752	8189	9508	10926	12697	14174	15847
	1000	125	4490	5445	6322	7264	8442	9424	10537
	T_{N2} [kNm]		343	416	483	555	645	720	805
9	1500	167	5998	7275	8446	9705	11279	12591	14077
	1000	111	3987	4835	5614	6451	7497	8369	9357
	T_{N2} [kNm]		343	416	483	555	645	720	805
10	1500	150	5387	6534	7586	8717	10131	11309	12644
	1000	100	3592	4356	5058	5812	6754	7539	8429
	T_{N2} [kNm]		343	416	483	555	645	720	805
11.2	1500	134	4813	5837	6777	7787	9050	10103	11295
	1000	89	3197	3877	4501	5172	6011	6710	7502
	T_{N2} [kNm]		343	416	483	555	645	720	805
12.5	1500	120	4200	5227	6069	6974	8105	9047	10115
	1000	80	2800	3485	4046	4649	5403	6031	6743
	T_{N2} [kNm]		343	416	483	555	645	720	805
14	1500	107	3800	4400	5412	6218	7227	8067	9019
	1000	71	2500	2900	3591	4126	4795	5353	5985
	T_{N2} [kNm]		343	416	483	555	645	720	805
16	1500	94	3400	3950	4400	5463	6349	7087	7924
	1000	63	2250	2600	2900	3661	4255	4750	5310
	T_{N2} [kNm]		343	400	483	555	645	720	805
18	1500	83	3000	3400	4000	4824	5606	6258	6996
	1000	56	2000	2250	2650	3254	3782	4222	4720
	T_{N2} [kNm]		343	400	483	555	645	720	805
20	1500	75		3000	3400		5065	5654	6322
	1000	50		2000	2250		3377	3770	4215
	T_{N2} [kNm]			400	460		645	720	805
22.4	1500	67			3000			5051	5648
	1000	44.5			2000			3355	3751
	T_{N2} [kNm]				460			720	805
25	1500	60							5058
	1000	40							3372
	T_{N2} [kNm]								805

Dimensions ⇨ 36

PC..

Thermal capacities

Thermal capacities of types PC: on request

PD..

Powers and torques

i_N	n_1	n_2	PD 60	63	67	71	75	80	85
	[min^{-1}]		Nominal power P_N [kW]						
16	1500	94	3370			5463			
	1000	63	2250			3661			
	T_{N2} [kNm]		343			555			
18	1500	83	3000	3630		4824	5606		
	1000	56	2000	2420		3254	3782		
	T_{N2} [kNm]		343	416		555	645		
20	1500	75	2700	3270	3800	4359	5065	5654	
	1000	50	1800	2180	2530	2906	3377	3770	
	T_{N2} [kNm]		343	416	483	555	645	720	
22.4	1500	67	2410	2805	3390	3894	4525	5051	5648
	1000	44.5	1605	1870	2260	2586	3005	3355	3751
	T_{N2} [kNm]		343	400	483	555	645	720	805
25	1500	60	2160	2614	2890	3487	4052	4524	5058
	1000	40	1440	1743	1930	2325	2702	3016	3372
	T_{N2} [kNm]		343	416	460	555	645	720	805
28	1500	54	1930	2334	2710	3138	3647	4071	4552
	1000	35.5	1285	1556	1807	2063	2398	2676	2992
	T_{N2} [kNm]		343	416	483	555	645	720	805
31.5	1500	47.5	1700	1995	2410	2760	3208	3581	4004
	1000	31.5	1130	1330	1606	1831	2127	2375	2655
	T_{N2} [kNm]		343	400	483	555	645	720	805
35.5	1500	42.5	1520	1780	2035	2470	2870	3204	3582
	1000	28	1013	1172	1360	1627	1891	2111	2360
	T_{N2} [kNm]		343	400	460	555	645	720	805
40	1500	37.5	1350	1634	1800	2179	2533	2827	3161
	1000	25	900	1090	1200	1453	1688	1885	2107
	T_{N2} [kNm]		343	416	460	555	645	720	805
45	1500	33.5	1190	1400	1690	1947	2263	2526	2824
	1000	22.2	791	931	1124	1290	1499	1674	1871
	T_{N2} [kNm]		343	400	483	555	645	720	805
50	1500	30	1080	1256	1445	1743	2026	2262	2529
	1000	20	720	837	963	1162	1351	1508	1686
	T_{N2} [kNm]		343	400	460	555	645	720	805
56	1500	27	963	1170	1300	1569	1824	2036	2276
	1000	17.9	642	778	862	1040	1209	1350	1509
	T_{N2} [kNm]		343	416	460	555	645	720	805
63	1500	23.8	856	1040	1200	1383	1607	1794	2006
	1000	16	571	691	803	930	1081	1206	1349
	T_{N2} [kNm]		343	416	483	555	645	720	805
71	1500	21	752	885	1070	1220	1418	1583	1770
	1000	14	501	590	713	814	946	1055	1180
	T_{N2} [kNm]		343	400	483	555	645	720	805
80	1500	18.8	674	787	903	1093	1270	1417	1585
	1000	12.5	449	523	602	726	844	942	1054
	T_{N2} [kNm]		343	400	460	555	645	720	805
90	1500	16.7	600	726	804	971	1128	1259	1408
	1000	11.1	400	484	534	645	750	837	936
	T_{N2} [kNm]		343	416	460	555	645	720	805
100	1500	15	534	628	759	872	1013	1131	1264
	1000	10	356	419	506	581	675	754	843
	T_{N2} [kNm]		343	400	483	555	645	720	805
112	1500	13.4		561	645		905	1010	1130
	1000	8.9		372	430		601	671	750
	T_{N2} [kNm]			400	460		645	720	805
125	1500	12			578			905	1012
	1000	8			385			603	674
	T_{N2} [kNm]				460			720	805
140	1500	10.7							902
	1000	7.1							598
	T_{N2} [kNm]								805

up to 2000 kNm: on request


Dimensions

PD..

Thermal capacities

PD .. -R1					
v_w [m/s]	n_1 [min^{-1}]	Size 60 5)	63 5)	67 5)	71 ... 85
		P_{t0} [kW]			
0.5 1)	–	312	357	404	4)
1.2 2)	–	434	496	561	
4.0 3)	–	556	635	718	
		P_{t1} [kW]			
–	1500	4)			
–	1000				
		P_{t3} [kW]			
0.5 1)	–	1050	1095	1142	4)
1.2 2)	–	1172	1234	1299	
4.0 3)	–	1294	1373	1456	
		P_{t4} [kW]			
–	1500	4)			
–	1000				
5) P_{t0},P_{t3}	Values for ratios starting with following values i_N (for lower ratios please contact us)				
0.5 1)	i_N	31.5	31.5	31.5	
1.2 2)		22.4	22.4	22.4	

v_w = Average air speed

1) Small closed room, little air movement
2) Large hall with free air movement
3) Constantly strong air movement
4) On request
P_{t0} : Without additional cooling
P_{t1} : With fan
P_{t3} : With cooling coil
P_{t4} : With fan and cooling coil

Thermal capacities of types PD -S5 and PD -T6: on request

Thermal Factor

f_W					
ϑ_U [°C]	ED %				
	100	80	60	40	20
10	1.14	1.21	1.34	1.53	2.03
20	1.00	1.06	1.17	1.34	1.78
30	0.86	0.91	1.00	1.15	1.53
40	0.71	0.76	0.84	0.96	1.27
50	0.57	0.61	0.67	0.77	1.02

Utilization factor

f_A								
Charge P_e / P_N [%]								
20	30	40	50	60	70	80	90	100
0.7	0.8	0.86	0.9	0.93	0.96	0.98	0.99	1

Utilisation < 20%: question required

PD		
60	63	67
Housing surfaces [m^2]		
10.34	11.81	13.35

PE..

Powers and torques

i_N	n_1	n_2	PE 60	PE 63	PE 67	PE 71	PE 75	PE 80	PE 85
	[min^{-1}]		Nominal power P_N [kW]						
63	1500	23.8				1384			
	1000	15.9				922			
	T_{N2} [kNm]					555			
71	1500	21	760			1220	1418		
	1000	14	507			814	946		
	T_{N2} [kNm]		343			555	645		
80	1500	18.8	674	817		1093	1270	1417	
	1000	12.5	450	545		726	844	942	
	T_{N2} [kNm]		343	416		555	645	720	
90	1500	16.7	600	726		971	1128	1259	1408
	1000	11.1	400	484		645	750	837	936
	T_{N2} [kNm]		343	416		555	645	720	805
100	1500	15	540	630	759	872	1013	1131	1264
	1000	10	360	420	506	581	675	754	843
	T_{N2} [kNm]		343	400	483	555	645	720	805
112	1500	13.4	482	583	645	779	905	1010	1130
	1000	8.9	321	389	430	517	601	671	750
	T_{N2} [kNm]		343	416	460	555	645	720	805
125	1500	12	432	523	607	697	810	905	1012
	1000	8	288	349	405	465	540	603	674
	T_{N2} [kNm]		343	416	483	555	645	720	805
140	1500	10.7	384	450	542	622	723	807	902
	1000	7.1	256	300	361	413	480	535	598
	T_{N2} [kNm]		343	400	483	555	645	720	805
160	1500	9.4	337	394	452	546	635	709	792
	1000	6.3	225	264	301	366	425	475	531
	T_{N2} [kNm]		343	400	460	555	645	720	805
180	1500	8.33	300	363	400	484	563	628	702
	1000	5.55	200	242	270	323	375	418	468
	T_{N2} [kNm]		343	416	460	555	645	720	805
200	1500	7.5	269	314	379	436	507	565	632
	1000	5	182	210	253	291	338	377	421
	T_{N2} [kNm]		343	400	483	555	645	720	805
224	1500	6.7	241	280	323	389	453	505	565
	1000	4.46	161	185	215	259	301	336	376
	T_{N2} [kNm]		343	400	460	555	645	720	805
250	1500	6	216	261	290	349	405	452	506
	1000	4	144	174	195	232	270	302	337
	T_{N2} [kNm]		343	416	460	555	645	720	805
280	1500	5.36	193	233	271	311	362	404	452
	1000	3.57	129	155	181	207	241	269	301
	T_{N2} [kNm]		343	416	483	555	645	720	805
315	1500	4.76	171	200	241	277	321	359	401
	1000	3.17	114	133	161	184	214	239	267
	T_{N2} [kNm]		343	400	483	555	645	720	805
355	1500	4.22	152	177	204	245	285	318	356
	1000	2.82	101	121	136	164	190	213	238
	T_{N2} [kNm]		343	400	460	555	645	720	805
400	1500	3.75	135	163	180	218	253	283	316
	1000	2.5	90	109	120	145	169	188	211
	T_{N2} [kNm]		343	416	460	555	645	720	805
450	1500	3.35	120	140	169		226	253	282
	1000	2.22	80	93	113		150	167	187
	T_{N2} [kNm]		343	400	483		645	720	805
500	1500	3		125	145			226	253
	1000	2		84	97			151	169
	T_{N2} [kNm]			400	460			720	805
560	1500	2.68			130				226
	1000	1.79			86				151
	T_{N2} [kNm]				460				805
630	1500	2.38			115				
	1000	1.59			77				
	T_{N2} [kNm]				460				

up to 2000 kNm: on request


Dimensions

PE..

Thermal capacities

PE .. -R1					
v_w [m/s]	n_1 [min^{-1}]	Size 60	63	67	71 ... 85
		P_{t0} [kW]			
0.5 1)	–	235	268	302	4)
1.2 2)	–	326	372	420	
4.0 3)	–	417	476	538	
		P_{t3} [kW]			
0.5 1)	–	789	822	856	4)
1.2 2)	–	880	926	974	
4.0 3)	–	971	1030	1092	

v_w = Average air speed

1) Small closed room, little air movement
2) Large hall with free air movement
3) Constantly strong air movement
4) On request
P_{t0} **:** Without additional cooling
P_{t3} **:** With cooling coil

Thermal capacities of types PE -S5 and PD -T6: on request

Thermal Factor

f_W					
ϑ_U [°C]	ED %				
	100	80	60	40	20
10	1.14	1.21	1.34	1.53	2.03
20	1.00	1.06	1.17	1.34	1.78
30	0.86	0.91	1.00	1.15	1.53
40	0.71	0.76	0.84	0.96	1.27
50	0.57	0.61	0.67	0.77	1.02

Utilization factor

f_A									
Charge P_e / P_N [%]									
20	30	40	50	60	70	80	90	100
0.7	0.8	0.86	0.9	0.93	0.96	0.98	0.99	1

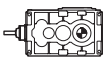
Utilisation < 20%: question required

PE		
60	63	67
Housing surfaces [m^2]		
10.34	11.81	13.35

PLC..

Powers and torques

i_N	n_1	n_2	PLC 60	63	67	71	75	80	85
	[min^{-1}]		Nominal power P_N [kW]						
18	1500	83	3000			4824			
	1000	56	2000			3254			
	T_{N2} [kNm]		343			555			
20	1500	75	2700	3270		4359	5065		
	1000	50	1800	2180		2906	3377		
	T_{N2} [kNm]		343	416		555	645		
22,4	1500	67	2410	2920	3390	3894	4525	5051	
	1000	44.5	1605	1945	2260	2586	3005	3355	
	T_{N2} [kNm]		343	416	483	555	645	720	
25	1500	60	2160	2515	3035	3487	4052	4524	5058
	1000	40	1440	1675	2025	2325	2702	3016	3372
	T_{N2} [kNm]		343	400	483	555	645	720	805
28	1500	54	1930	2335	2580	3138	3647	4071	4552
	1000	35.5	1285	1555	1720	2063	2398	2676	2992
	T_{N2} [kNm]		343	416	460	555	645	720	805
31,5	1500	47.5	1710	2075	2410	2760	3208	3581	4004
	1000	31.5	1140	1385	1605	1831	2127	2375	2655
	T_{N2} [kNm]		343	416	483	555	645	720	805
35,5	1500	42.5	1520	1770	2140	2470	2870	3204	3582
	1000	28	1010	1180	1425	1627	1891	2111	2360
	T_{N2} [kNm]		343	400	483	555	645	720	805
40	1500	37.5	1350	1635	1805	2179	2533	2827	3161
	1000	25	900	1090	1205	1453	1688	1885	2107
	T_{N2} [kNm]		343	416	460	555	645	720	805
45	1500	33.5	1200	1450	1690	1947	2263	2526	2824
	1000	22.2	800	968	1125	1290	1499	1674	1871
	T_{N2} [kNm]		343	416	483	555	645	720	805
50	1500	30	1080	1260	1520	1743	2026	2262	2529
	1000	20	720	838	1010	1162	1351	1508	1686
	T_{N2} [kNm]		343	400	483	555	645	720	805
56	1500	27	963	1170	1290	1569	1824	2036	2276
	1000	17.9	642	778	860	1040	1209	1350	1509
	T_{N2} [kNm]		343	416	460	555	645	720	805
63	1500	23.8	856	1040	1205	1383	1607	1794	2006
	1000	16	571	691	805	930	1081	1206	1349
	T_{N2} [kNm]		343	416	483	555	645	720	805
71	1500	21	754	885	1070	1220	1418	1583	1770
	1000	14	503	590	713	814	946	1055	1180
	T_{N2} [kNm]		343	400	483	555	645	720	805
80	1500	18.8		778	903		1270	1417	1585
	1000	12.5		519	602		844	942	1054
	T_{N2} [kNm]			400	460		645	720	805
90	1500	16.7			804			1259	1408
	1000	11.1			535			837	936
	T_{N2} [kNm]				460			720	805
100	1500	15							1264
	1000	10							843
	T_{N2} [kNm]								805


Dimensions
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PLC..

Thermal capacities

PLC .. -R1					
v_w [m/s]	n_1 [min^{-1}]	Size 60 [5]	63 [5]	67 [5]	71 ... 85
		P_{t0} [kW]			
0.5 [1]	–	268	306	346	4)
1.2 [2]	–	372	425	480	
4.0 [3]	–	476	544	614	
		P_{t1} [kW]			
–	1500	4)			
–	1000				
		P_{t3} [kW]			
0.5 [1]	–	901	939	979	4)
1.2 [2]	–	1005	1058	1113	
4.0 [3]	–	1109	1177	1247	
		P_{t4} [kW]			
–	1500	4)			
–	1000				
[5] P_{t0},P_{t3}	Values for ratios starting with following values i_N (for lower ratios please contact us)				
0.5 [1]	i_N	35.5	35.5	35.5	
1.2 [2]		25	25	28	

v_w = Average air speed

1) Small closed room, little air movement
2) Large hall with free air movement
3) Constantly strong air movement
4) On request
P_{t0} : Without additional cooling
P_{t1} : With fan
P_{t3} : With cooling coil
P_{t4} : With fan and cooling coil

Thermal capacities of types PLC -S5, -T6 and U3: on request

Thermal Factor

f_W					
ϑ_U [°C]	ED %				
	100	80	60	40	20
10	1.14	1.21	1.34	1.53	2.03
20	1.00	1.06	1.17	1.34	1.78
30	0.86	0.91	1.00	1.15	1.53
40	0.71	0.76	0.84	0.96	1.27
50	0.57	0.61	0.67	0.77	1.02

Utilization factor

f_A								
Charge P_e / P_N [%]								
20	30	40	50	60	70	80	90	100
0.7	0.8	0.86	0.9	0.93	0.96	0.98	0.99	1

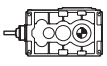
Utilisation < 20%: question required

PLC		
60	63	67
Housing surfaces [m^2]		
10.34	11.81	13.35

PLD..

Powers and torques

i_N	n_1	n_2	PLD 60	63	67	71	75	80	85
	[min^{-1}]					Nominal power P_N [kW]			
71	1500	21				1220			
	1000	14				814			
	T_{N2} [kNm]					555			
80	1500	18.8	674			1093	1270		
	1000	12.5	450			726	844		
	T_{N2} [kNm]		343			555	645		
90	1500	16.7	600	726		971	1128	1259	
	1000	11.1	400	484		645	750	837	
	T_{N2} [kNm]		343	416		555	645	720	
100	1500	15	539	653	760	872	1013	1131	1264
	1000	10	360	435	506	581	675	754	843
	T_{N2} [kNm]		343	416	483	555	645	720	805
112	1500	13.4	482	561	677	779	905	1010	1130
	1000	8.9	321	374	451	517	601	671	750
	T_{N2} [kNm]		343	400	483	555	645	720	805
125	1500	12	432	523	578	697	810	905	1012
	1000	8	288	349	385	465	540	603	674
	T_{N2} [kNm]		343	416	460	555	645	720	805
140	1500	10.7	385	467	542	622	723	807	902
	1000	7.1	257	311	361	413	480	535	598
	T_{N2} [kNm]		343	416	483	555	645	720	805
160	1500	9.4	337	393	474	546	635	709	792
	1000	6.3	225	262	316	366	425	475	531
	T_{N2} [kNm]		343	400	483	555	645	720	805
180	1500	8.33	300	363	401	484	563	628	702
	1000	5.55	200	242	267	323	375	418	468
	T_{N2} [kNm]		343	416	460	555	645	720	805
200	1500	7.5	270	327	380	436	507	565	632
	1000	5	180	218	253	291	338	377	421
	T_{N2} [kNm]		343	416	483	555	645	720	805
224	1500	6.7	241	281	340	389	453	505	565
	1000	4.46	161	187	226	259	301	336	376
	T_{N2} [kNm]		343	400	483	555	645	720	805
250	1500	6	216	261	290	349	405	452	506
	1000	4	144	174	193	232	270	302	337
	T_{N2} [kNm]		343	416	460	555	645	720	805
280	1500	5.36	193	233	271	311	362	404	452
	1000	3.57	129	155	181	207	241	269	301
	T_{N2} [kNm]		343	416	483	555	645	720	805
315	1500	4.76	171	200	241		321	359	401
	1000	3.17	114	133	161		214	239	267
	T_{N2} [kNm]		343	400	483		645	720	805
355	1500	4.22		177	204			318	356
	1000	2.82		118	136			213	238
	T_{N2} [kNm]			400	460			720	805
400	1500	3.75			181				316
	1000	2.5			120				211
	T_{N2} [kNm]				460				805


Dimensions
41

PLD..

Thermal capacities

PLD .. -R1					
v_w [m/s]	n_1 [min^{-1}]	Size 60	63	67	71 ... 85
		P_{t0} [kW]			
0.5 1)	–	209	238	269	4)
1.2 2)	–	290	331	374	
4.0 3)	–	371	424	479	
		P_{t3} [kW]			
0.5 1)	–	701	730	761	4)
1.2 2)	–	782	823	866	
4.0 3)	–	863	916	971	

v_w = Average air speed

1) Small closed room, little air movement
2) Large hall with free air movement
3) Constantly strong air movement
4) On request
P_{t0} **:** Without additional cooling
P_{t3} **:** With cooling coil

Thermal capacities of types PLD -S5, -T6 and -U3: on request

Thermal Factor

f_W					
ϑ_U [°C]	ED %				
	100	80	60	40	20
10	1.14	1.21	1.34	1.53	2.03
20	1.00	1.06	1.17	1.34	1.78
30	0.86	0.91	1.00	1.15	1.53
40	0.71	0.76	0.84	0.96	1.27
50	0.57	0.61	0.67	0.77	1.02

Utilization factor

f_A									
Charge P_e / P_N [%]									
20	30	40	50	60	70	80	90	100
0.7	0.8	0.86	0.9	0.93	0.96	0.98	0.99	1

Utilisation < 20%: question required

PLD		
60	63	67
Housing surfaces [m^2]		
10.34	11.81	13.35

EXACT RATIOS

PC, PD..

	PC						
i_N	60	63	67	71	75	80	85
4	3.92	-	-	On request			
4.5	4.39	4.58	-				
5	4.92	5.13	5.25				
5.6	5.54	5.76	5.88				
6.3	6.27	6.49	6.60				
7.1	7.12	7.33	7.43				
8	7.76	6.33	8.40				
9	8.7	9.08	9.55				
10	10.0	10.2	10.4				
11.2	11.0	11.6	11.7				
12.5	12.8	12.8	13.3				
14	14.2	14.9	14.7				
16	15.9	16.6	17.1				
18	17.8	18.6	19.1				
20	-	20.9	21.3				
22.4	-	-	23.9				
25	-	-	-				
28	-	-	-				

	PD						
i_N	60	63	67	71	75	80	85
16	16.0			On request			
18	17.8	18.7					
20	19.9	20.8	21.4				
22.4	22.6	23.2	23.8				
25	25.2	26.4	26.6				
28	28.1	29.4	30.3				
31.5	31.6	32.9	33.7				
35.5	35.2	36.9	37.7				
40	39.4	41.2	42.3				
45	44.2	46.1	47.2				
50	51.9	51.7	52.7				
56	57.9	60.8	59.2				
63	64.7	67.8	69.6				
71	72.6	75.7	77.6				
80	80.0	85.0	86.7				
90	89.4	93.6	97.3				
100	100	105	107				
112	-	117	120				
125	-	-	135				
140	-	-	-				

i_N : Nominal ratio

PE..

i_N	PE						
	60	63	67	71	75	80	85
71	72.8	-	-	On request			
80	81.2	85.2	-				
90	90.7	95.0	-				
100	104	106	97.6				
112	116	122	109				
125	130	136	122				
140	146	152	140				
160	161	171	156				
180	180	189	174				
200	202	211	195				
224	232	237	216				
250	258	271	242				
280	288	302	271				
315	324	338	310				
355	367	379	346				
400	411	430	387				
450	461	480	434				
500	-	539	492				
560	-	-	550				
630	-	-	618				
710	-	-	-				

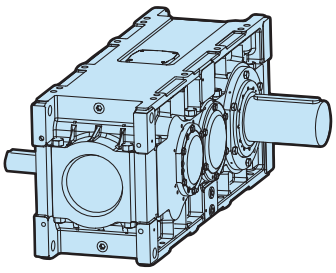
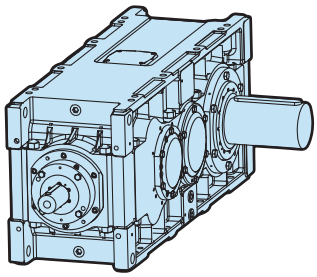
i_N : Nominal ratio

PLC, PLD..

i_N	PLC						
	60	63	67	71	75	80	85
18	17.8	-	-	On request			
20	19.8	20.8	-				
22.4	22.1	23.2	23.8				
25	25.5	25.9	26.6				
28	28.4	29.9	29.7				
31.5	31.8	33.3	34.2				
35.5	35.5	37.2	38.1				
40	39.6	41.6	42.6				
45	44.3	46.4	47.6				
50	51.0	51.8	53.1				
56	56.9	59.7	59.3				
63	63.6	66.6	68.4				
71	71.3	74.4	76.3				
80	-	83.5	85.2				
90	-	-	95.6				
100	-	-	-				
112	-	-	-				

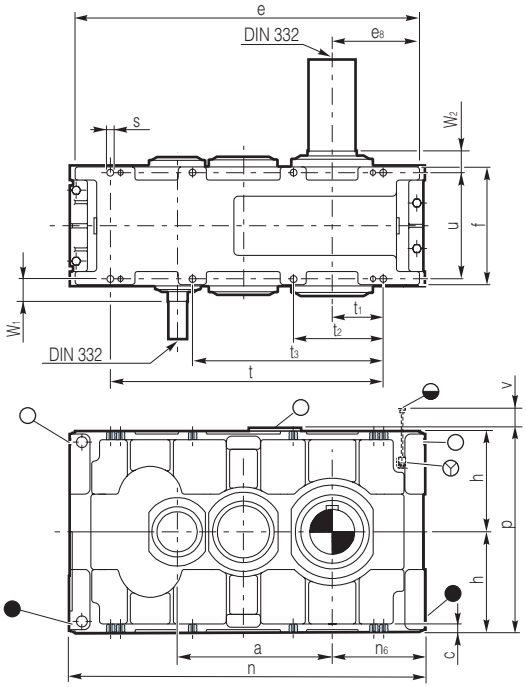
i_N	PLD						
	60	63	67	71	75	80	85
71	-	-	-	On request			
80	80.6	-	-				
90	89.9	94.4	-				
100	100	105	108				
112	116	118	120				
125	129	136	135				
140	144	151	155				
160	161	169	173				
180	180	189	193				
200	201	210	216				
224	232	235	241				
250	258	271	269				
280	288	302	310				
315	324	338	346				
355	-	379	387				
400	-	-	434				
450	-	-	-				
500	-	-	-				

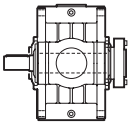
i_N : Nominal ratio

Type		Mounting position	Pag.
 Helical gear units	**PC**	R1	36
	PD	R1	37
	PE	R1	38
 Bevel-helical gear units	**PLC**	R1	39
		U3	40
	PLD	R1	41

R1 : Horizontal, output shaft horizontal
S5 : Vertical, output shaft below
T6 : Vertical, output shaft above
U3 : Horizontal, output shaft vertical

PC ... -R1





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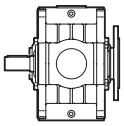

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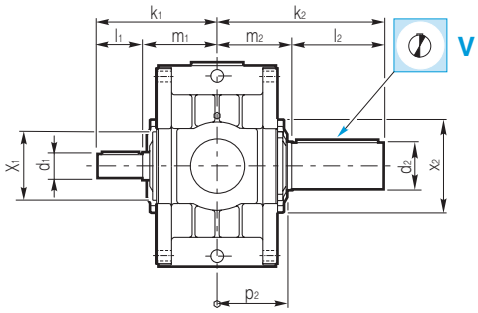


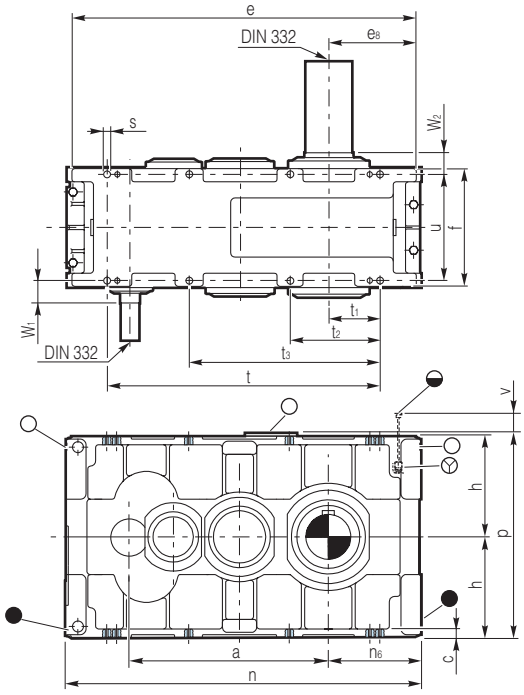
	Input shaft					Output shaft				
	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_2	k_2	l_2	m_2	Ø x_2
PC 60	150 m6	725	250	475	418	290 m6	920	460	460	540
PC 63	150 m6	725	250	475	418	310 m6	970	510	460	580
PC 67	150 m6	725	250	475	418	310 m6	970	510	460	580
PC 71	185 m6	885	330	555	540	350 m6	1110	570	540	620
PC 75	185 m6	885	330	555	540	350 m6	1110	570	540	620
PC 80	185 m6	885	330	555	540	370 m6	1110	570	540	620
PC 85	185 m6	885	330	555	540	370 m6	1110	570	540	620

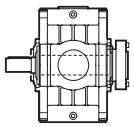
	a	c	e	e_8	f	h -0.2	n	n_6	p	p_2
PC 60	1032	60	2272	565	770	530	2342	600	1070	440
PC 63	1105	60	2420	640	770	600	2490	675	1210	440
PC 67	1176	60	2566	715	770	670	2636	750	1350	440
PC 71	1203	45	2430	560	920	600	2692	690	1200	508
PC 75	1275	45	2649	600	920	670	2814	740	1340	508
PC 80	1335	45	2769	660	920	710	2934	800	1420	508
PC 85	1405	45	2909	730	920	800	3074	870	1600	508

	Fitting											
	Ø s	d_s x l_{max}	t	t_1	t_2	t_3	u	w_1	w_2	v	OIL [l]	Kg
PC 60	42	M36x150	1840	345	630	1200	690	130	115	350	370	6600
PC 63	42	M36x200	1988	420	778	1348	690	130	115	350	460	7600
PC 67	42	M36x250	2134	495	924	1494	690	130	115	350	560	8700
PC 71	48	M42x250	2230	460	850	1490	830	140	125	450	580	9200
PC 75	48	M42x320	2340	495	935	1600	830	140	125	450	620	10200
PC 80	48	M42x360	2460	555	1055	1720	830	140	125	450	700	11500
PC 85	48	M42x450	2600	625	1065	1860	830	140	125	450	800	12800

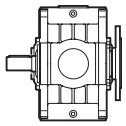
Dimensions l., m. and w. for grease lubricated labyrinth seals, on request.
The other mounting positions S5, T6 are available on request.

PD ... -R1

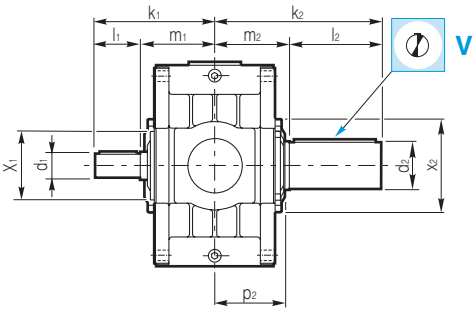




G ⇨ 44



F ⇨ 48



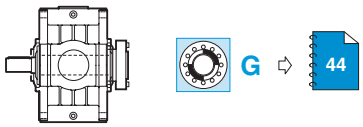
	Input shaft										Output shaft				
	i_N	Ø d_1	k_1	l_1	i_N	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_2	k_2	l_2	m_2	Ø x_2
PD 60	16...100	130 m6	715	250	–	–	–	–	465	390	290 m6	920	460	460	540
PD 63	18...112	130 m6	715	250	–	–	–	–	465	390	310 m6	970	510	460	580
PD 67	20...125	130 m6	715	250	–	–	–	–	465	390	310 m6	970	510	460	580
PD 71	16...100	150 m6	800	250	–	–	–	–	550	480	350 m6	1110	570	540	620
PD 75	18...112	150 m6	800	250	–	–	–	–	550	480	350 m6	1110	570	540	620
PD 80	20...125	150 m6	800	250	–	–	–	–	550	480	370 m6	1110	570	540	620
PD 85	22.4...140	150 m6	800	250	–	–	–	–	550	480	370 m6	1110	570	540	620

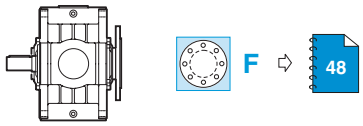
	Casing									
	a	c	e	e_8	f	h -0.2	n	n_6	p	p_2
PD 60	1334	60	2272	565	770	530	2342	600	1070	440
PD 63	1407	60	2420	640	770	600	2490	675	1210	440
PD 67	1478	60	2566	715	770	670	2636	750	1350	440
PD 71	1577	45	2430	560	920	600	2692	690	1200	508
PD 75	1649	45	2649	600	920	670	2814	740	1340	508
PD 80	1709	45	2769	660	920	710	2934	800	1420	508
PD 85	1779	45	2909	730	920	800	3074	870	1600	508

	Fitting											
	Ø s	d_s x l_{max}	t	t_1	t_2	t_3	u	w_1	w_2	v	OIL [l]	Kg
PD 60	42	M36x150	1840	345	630	1200	690	120	115	350	380	6800
PD 63	42	M36x200	1988	420	778	1348	690	120	115	350	480	7800
PD 67	42	M36x250	2134	495	924	1494	690	120	115	350	580	8900
PD 71	48	M42x250	2230	460	850	1490	830	135	125	450	600	9500
PD 75	48	M42x320	2340	495	935	1600	830	135	125	450	640	10500
PD 80	48	M42x360	2460	555	1055	1720	830	135	125	450	720	11800
PD 85	48	M42x450	2600	625	1065	1860	830	135	125	450	820	13100

Dimensions l., m. and w. for grease lubricated labyrinth seals, on request.
The other mounting positions S5, T6 are available on request.

PE ... -R1





	Input shaft						Output shaft				
	i_N	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_2	k_2	l_2	m_2	Ø x_2
PE 60	71...450	80 m6	610	170	440	–	290 m6	920	460	460	540
PE 63	80...500	80 m6	610	170	440	–	310 m6	970	510	460	580
PE 67	100...630	80 m6	610	170	440	–	310 m6	970	510	460	580
PE 71	63...400	95 m6	700	180	–	–	350 m6	1110	570	540	620
PE 75	71...450	95 m6	700	180	–	–	350 m6	1110	570	540	620
PE 80	80...500	95 m6	700	180	–	–	370 m6	1110	570	540	620
PE 85	90...560	95 m6	700	180	–	–	370 m6	1110	570	540	620

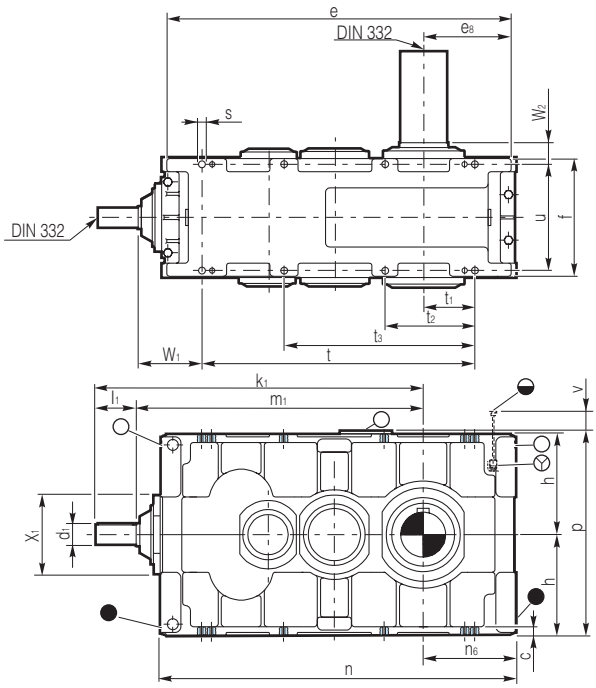
	a	c	e	e_8	f	h -0.2	n	n_6	p	p_2
PE 60	1334	60	2272	565	770	530	2342	600	1070	440
PE 63	1407	60	2420	640	770	600	2490	675	1210	440
PE 67	1478	60	2566	715	770	670	2636	750	1350	440
PE 71	1577	45	2430	560	920	600	2692	690	1200	508
PE 75	1649	45	2649	600	920	670	2814	740	1340	508
PE 80	1709	45	2769	660	920	710	2934	800	1420	508
PE 85	1779	45	2909	730	920	800	3074	870	1600	508

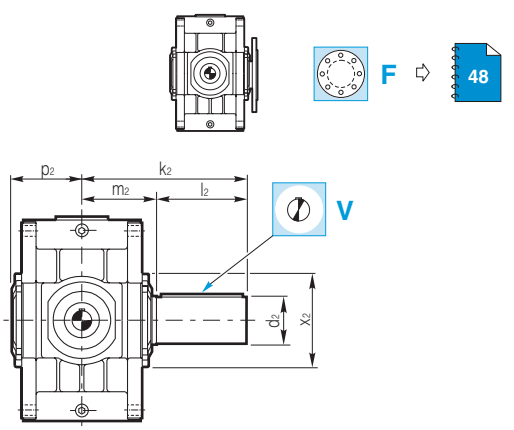
	Fitting											
	Ø s	d_s x l_{max}	t	t_1	t_2	t_3	u	w_1	w_2	v	OIL [l]	Kg
PE 60	42	M36x150	1840	345	630	1200	690	95	115	350	390	6800
PE 63	42	M36x200	1988	420	778	1348	690	95	115	350	480	7800
PE 67	42	M36x250	2134	495	924	1494	690	95	115	350	580	8900
PE 71	48	M42x250	2230	460	850	1490	830	140	125	450	620	9600
PE 75	48	M42x320	2340	495	935	1600	830	140	125	450	660	10600
PE 80	48	M42x360	2460	555	1055	1720	830	140	125	450	740	11900
PE 85	48	M42x450	2600	625	1065	1860	830	140	125	450	840	13200

Dimensions l., m. and w. for grease lubricated labyrinth seals, on request.
The other mounting positions S5, T6 are available on request.

PLC ... -R1

The other mounting positions S5, T6 are available on request.





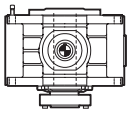
	Input shaft					Output shaft				
	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_2	k_2	l_2	m_2	Ø x_2
PLC 60	130 m6	2113	250	1863	540	290 m6	920	460	460	540
PLC 63	130 m6	2186	250	1936	540	310 m6	970	510	460	580
PLC 67	130 m6	2257	250	2007	540	310 m6	970	510	460	580
PLC 71	140 m6	2427	250	2177	540	350 m6	1110	570	540	620
PLC 75	140 m6	2499	250	2249	540	350 m6	1110	570	540	620
PLC 80	140 m6	2559	250	2309	540	370 m6	1110	570	540	620
PLC 85	140 m6	2629	250	2379	540	370 m6	1110	570	540	620

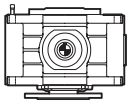
	Casing								
	c	e	e_8	f	h -0.2	n	n_6	p	p_2
PLC 60	60	2272	565	770	530	2342	600	1070	440
PLC 63	60	2420	640	770	600	2490	675	1210	440
PLC 67	60	2566	715	770	670	2636	750	1350	440
PLC 71	45	2430	560	920	600	2692	690	1200	508
PLC 75	45	2649	600	920	670	2814	740	1340	508
PLC 80	45	2769	660	920	710	2934	800	1420	508
PLC 85	45	2909	730	920	800	3074	870	1600	508

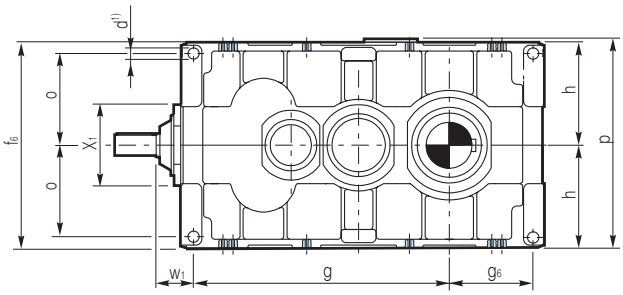
	Fitting											
	Ø s	d_s x l_{max}	t	t_1	t_2	t_3	u	w_1	w_2	v	OIL [l]	Kg
PLC 60	42	M36x150	1840	345	630	1200	690	368	115	350	360	7400
PLC 63	42	M36x200	1988	420	778	1348	690	368	115	350	480	8400
PLC 67	42	M36x250	2134	495	924	1494	690	368	115	350	570	9450
PLC 71	48	M42x250	2230	460	850	1490	830	140	125	450	580	10000
PLC 75	48	M42x320	2340	495	935	1600	830	140	125	450	620	11000
PLC 80	48	M42x360	2460	555	1055	1720	830	140	125	450	700	12300
PLC 85	48	M42x450	2600	625	1065	1860	830	140	125	450	800	13600

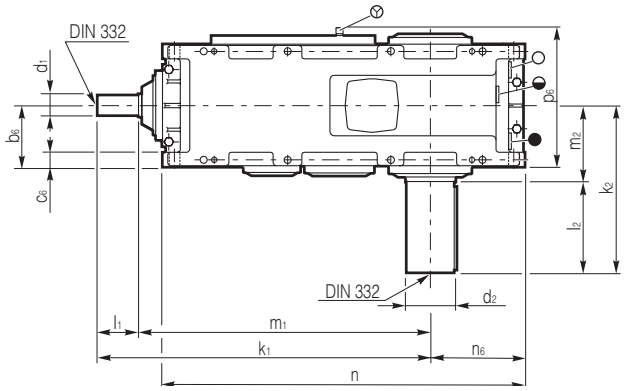
Dimensions l., m. and w. for grease lubricated labyrinth seals, on request.
The other mounting positions S5, T6 are available on request.

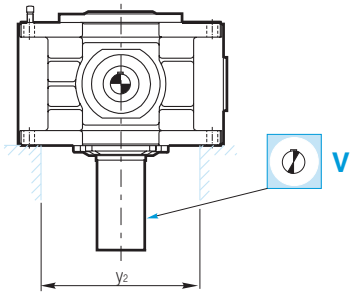
PLC ... - U3











	Input shaft					Output shaft					
	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_2	k_2	l_2	m_2	Ø x_2	y_2
PLC 60	130 m6	2113	250	1863	540	290 m6	920	460	460	540	–
PLC 63	130 m6	2186	250	1936	540	310 m6	970	510	460	580	–
PLC 67	130 m6	2257	250	2007	540	310 m6	970	510	460	580	–
PLC 71	140 m6	2427	250	2177	540	350 m6	1110	570	540	620	–
PLC 75	140 m6	2499	250	2249	540	350 m6	1110	570	540	620	–
PLC 80	140 m6	2559	250	2309	540	370 m6	1110	570	540	620	–
PLC 85	140 m6	2629	250	2379	540	370 m6	1110	570	540	620	–

	Casing						
	f_6	h -0.2	n	n_6	p	p_2	p_6
PLC 60	–	530	2342	600	–	–	–
PLC 63	–	600	2490	675	–	–	–
PLC 67	–	670	2636	750	–	–	–
PLC 71	–	600	2692	690	–	–	–
PLC 75	–	670	2814	740	–	–	–
PLC 80	–	710	2934	800	–	–	–
PLC 85	–	800	3074	870	–	–	–

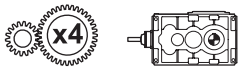
	Fitting								
	Ø s_7	d_s x l_{max}	t_7	u_7	w_1	w_2	v	[l]	Kg
PC 60 ... PC 85	On request								

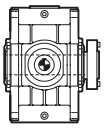
Foundation bolts of min. property class 10.9

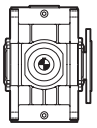
Additional lubrication required, please check back.

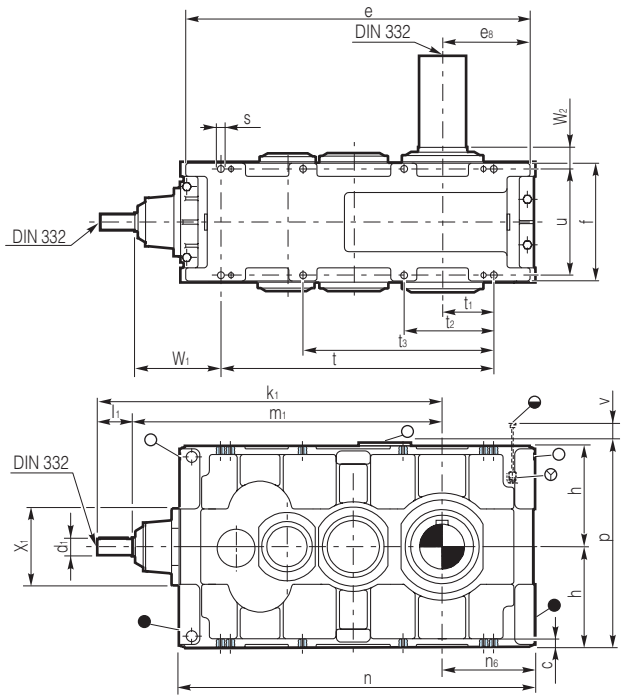
Dimensions l., m. and w. for grease lubricated labyrinth seals, on request.

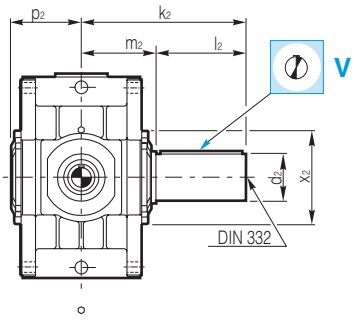
PLD ...-R1











	Input shaft					Output shaft				
	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_2	k_2	l_2	m_2	Ø x_2
PLD 60	85 m6	2096	180	1916	540	290 m6	920	460	460	540
PLD 63	85 m6	2169	180	1989	540	310 m6	970	510	460	580
PLD 67	85 m6	2240	180	2060	540	310 m6	970	510	460	580
PLD 71	100 m6	2512	215	2297	540	350 m6	1110	570	540	620
PLD 75	100 m6	2584	215	2369	540	350 m6	1110	570	540	620
PLD 80	100 m6	2644	215	2429	540	370 m6	1110	570	540	620
PLD 85	100 m6	2714	215	2499	540	370 m6	1110	570	540	620

	Casing								
	c	e	e_8	f	h -0.2	n	n_6	p	p_2
PLD 60	60	2272	565	770	530	2342	600	1070	440
PLD 63	60	2420	640	770	600	2490	675	1210	440
PLD 67	60	2566	715	770	670	2636	750	1350	440
PLD 71	45	2430	560	920	600	2692	690	1200	508
PLD 75	45	2649	600	920	670	2814	740	1340	508
PLD 80	45	2769	660	920	710	2934	800	1420	508
PLD 85	45	2909	730	920	800	3074	870	1600	508

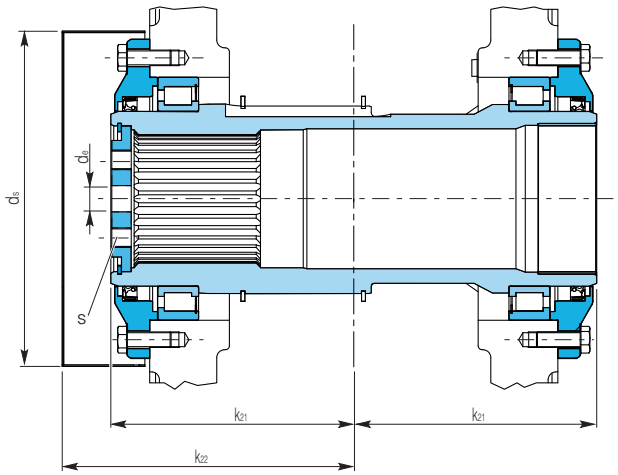
	Fitting											
	Ø s	d_s x l_{max}	t	t_1	t_2	t_3	u	w_1	w_2	v	OIL [l]	Kg
PLD 60	42	M36x150	1840	345	630	1200	690	421	115	350	380	7350
PLD 63	42	M36x200	1988	420	778	1348	690	421	115	350	480	8350
PLD 67	42	M36x250	2134	495	924	1494	690	421	115	350	580	9400
PLD 71	48	M42x250	2230	460	850	1490	830	140	125	450	600	10000
PLD 75	48	M42x320	2340	495	935	1600	830	140	125	450	640	11000
PLD 80	48	M42x360	2460	555	1055	1720	830	140	125	450	720	12300
PLD 85	48	M42x450	2600	625	1065	1860	830	140	125	450	820	13600

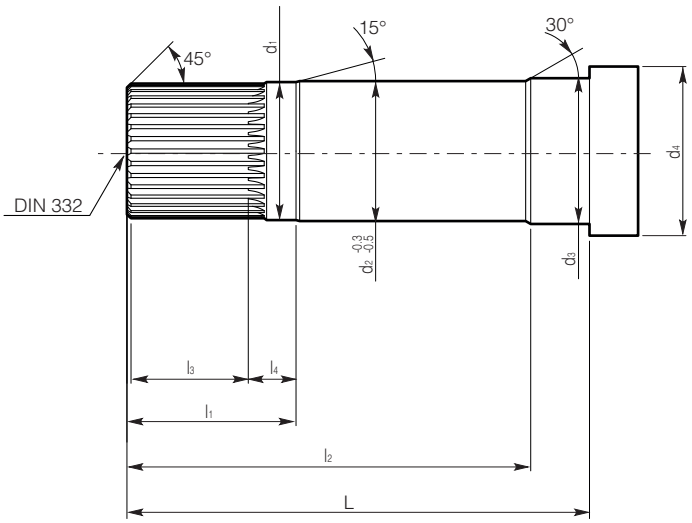
Dimensions l., m. and w. for grease lubricated labyrinth seals, on request.

The other mounting positions S5, T6 are available on request.

HOLLOW SPLINE SHAFT

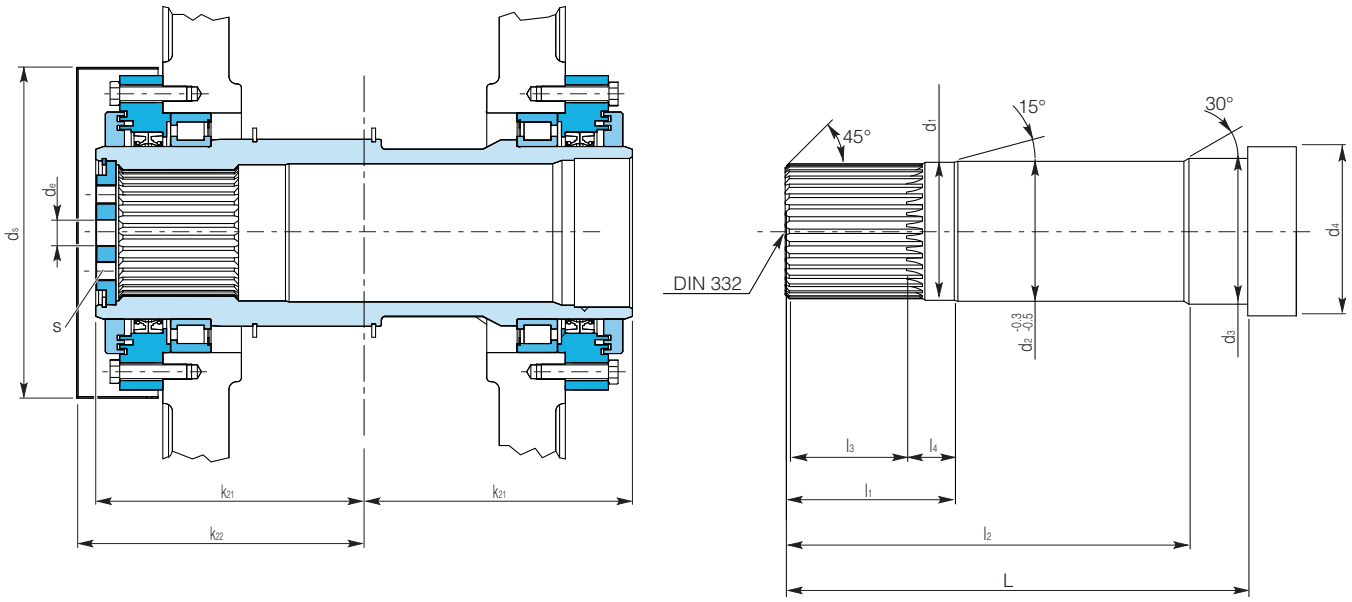
HS





Dimensions on request.
We can supply the hollow spline shaft for all types of configuration.
Please contact local DANA Sales for more information.

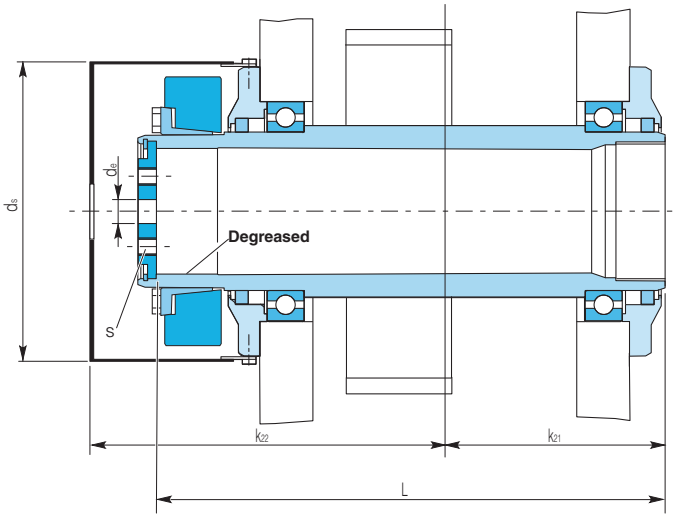
HS- Labyrinth



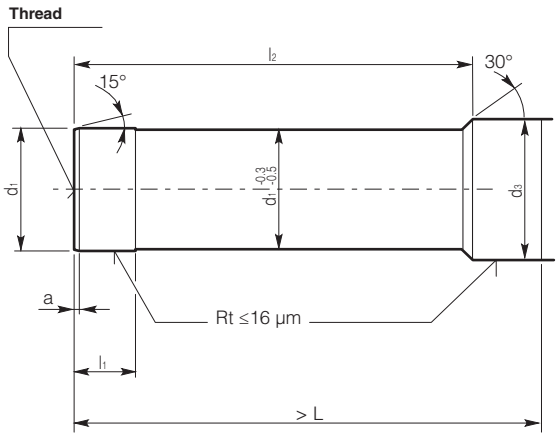
Dimensions on request.
We can supply the hollow spline shaft for all types of configuration.
Please contact local DANA Sales for more information.

HOLLOW SHAFT WITH SHRINK DISC

G



Mounting of shrink disc

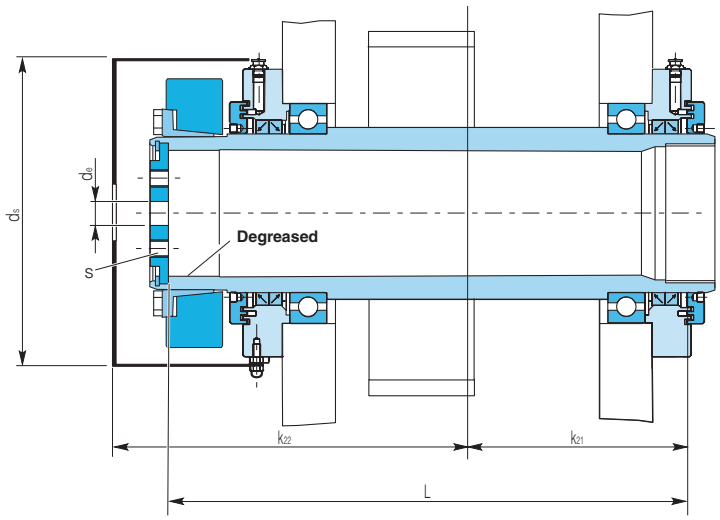


Design of machine shaft

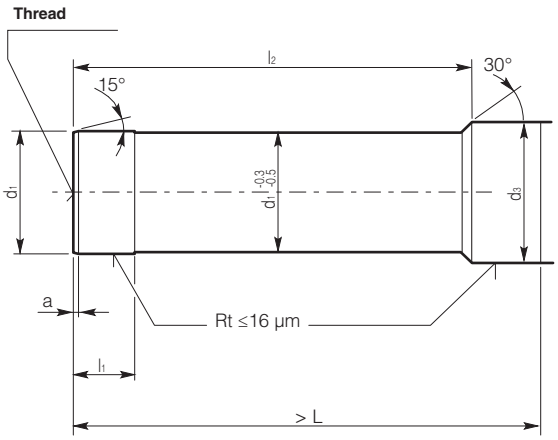
Instructions for assembling and replacing the shrink disc are in scope of delivery.

		Shrink disc				Hollow shaft						Machine shaft				
		Type	Ø d	Screw [1]	Ta [1] [Nm]	Ø d_s	k_{21}	k_{22}	Ø d_e	s	L	a	Ø d_1	Ø d_3	l_1	l_2
PC, PD, PE PLC, PLD, PWC, PWD	60	380 - 71	380	M 24	840	695	465	705	33	M 20	1093	6	310 g6	320 f6	162	939
	63	400 - 71	400	M 24	840	695	465	705	33	M 20	1108	6	330 g6	340 f6	162	939
	67	400 - 81	400	M 27	1450	695	465	705	33	M 20	1108	6	330 g6	340 f6	177	939
	71 ... 85	On request														

G - Labyrinth



Mounting of shrink disc

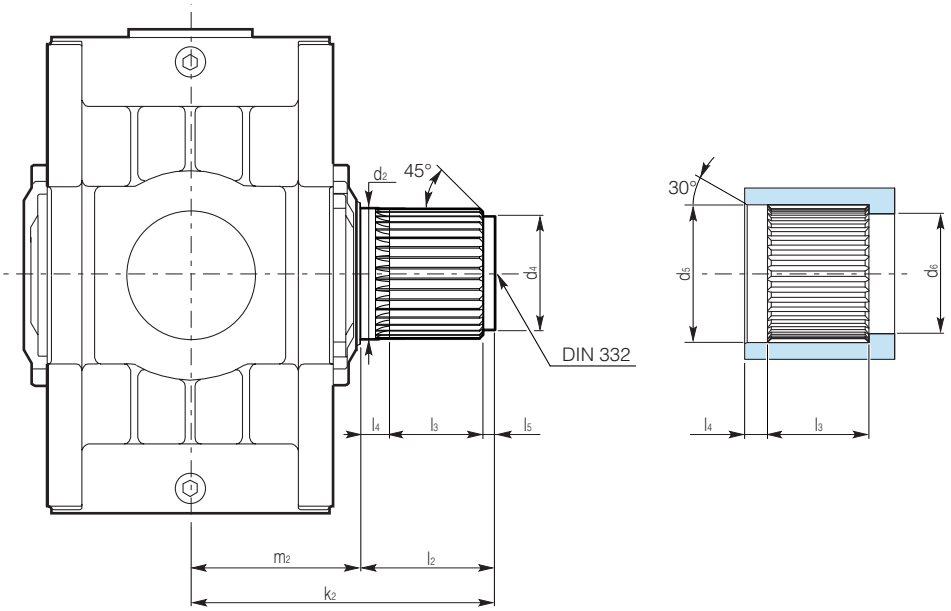


Design of machine shaft

Instructions for assembling and replacing the shrink disc are in scope of delivery.

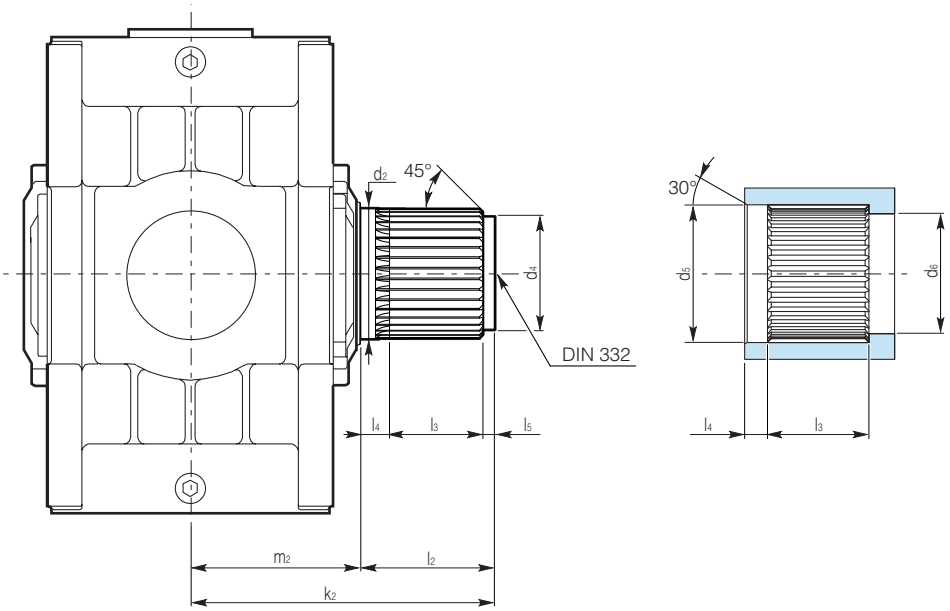
		Shrink disc				Hollow shaft						Machine shaft				
		Type	Ø d	Screw [1]	Ta [1] [Nm]	Ø d_s	k_{21}	k_{22}	Ø d_e	s	L	a	Ø d_1	Ø d_3	l_1	l_2
PC, PD, PE PLC, PLD, PWC, PWD	60	380 - 71	380	M 24	840	695	465	705	33	M 20	1093	6	310 g6	320 f6	165	939
	63	400 - 71	400	M 24	840	695	465	705	33	M 20	1108	6	330 g6	340 f6	165	943
	67	400 - 81	400	M 27	1450	695	465	705	33	M 20	1108	6	330 g6	340 f6	180	943
	71 ... 85	On request														

VS



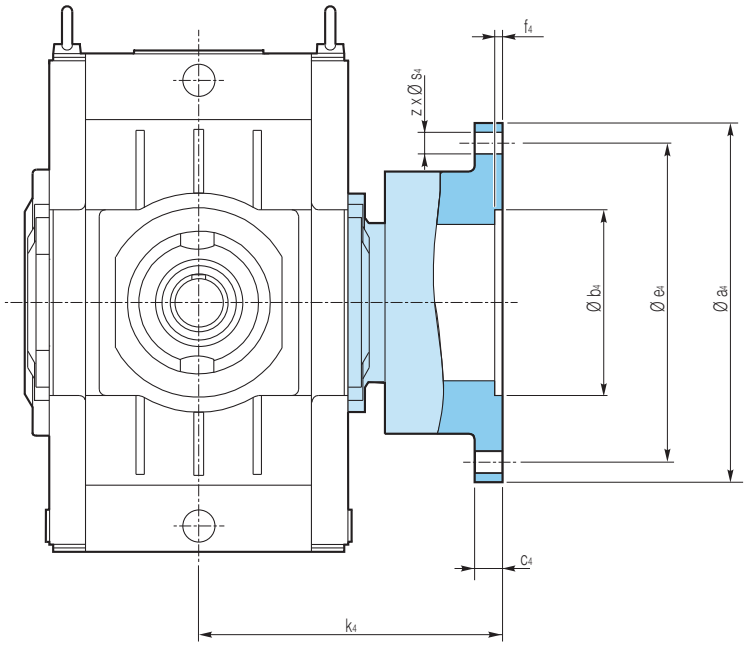
Dimensions on request.
We can supply the hollow spline shaft for all types of configuration.
Please contact local DANA Sales for more information.

vs - Labyrinth



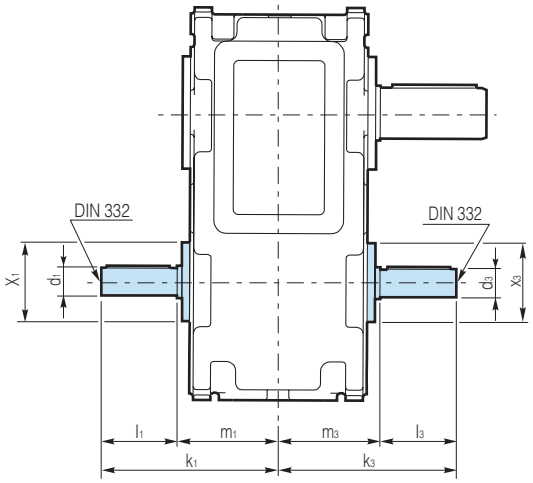
Dimensions on request.
We can supply the hollow spline shaft for all types of configuration.
Please contact local DANA Sales for more information.

F



		k_4	a_4	e_4	b_4	f_4	c_4	z	s_4	Screw Ø x_3
PC, PD, PE PLC, PLD, PWC, PWD	**60**	748	930	830	460 H7	18	65	30	39	M36x170
	63	790	1000	895	570 H7	20	75	26	45	M42x200
	67	790	1000	895	570 H7	20	75	26	45	M42x200
	71	915	1120	1015	640 H7	20	85	30	45	M42x220
	75	915	1120	1015	640 H7	20	85	30	45	M42x220
	80	967	1250	1145	700 H7	22	95	34	45	M42x230
	85	967	1250	1145	700 H7	22	95	34	45	M42x230

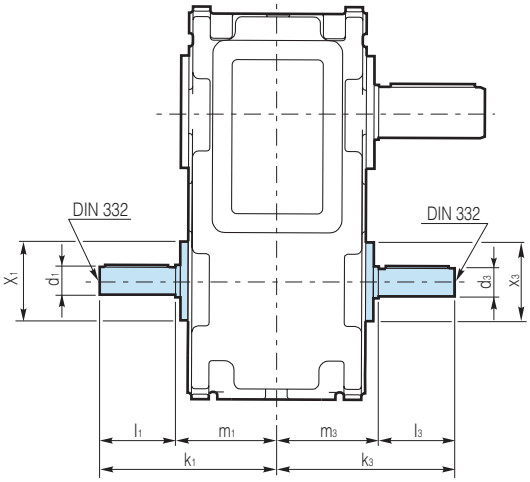
PC



	Input shaft										
	i_N	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_3	k_3	l_3	m_3	Ø x_3
PC 60	4...14	150 m6	725	250	475	418	150 m6	725	250	475	418
	16...18						110 m6	690	215		
PC 63	4.5...16	150 m6	725	250	475	418	150 m6	725	250	475	418
	18...20						110 m6	690	215		
PC 67	5...18	150 m6	725	250	475	418	150 m6	725	250	475	418
	20...22.4						110 m6	690	215		
PC 71 ... PC 85	**On request**										

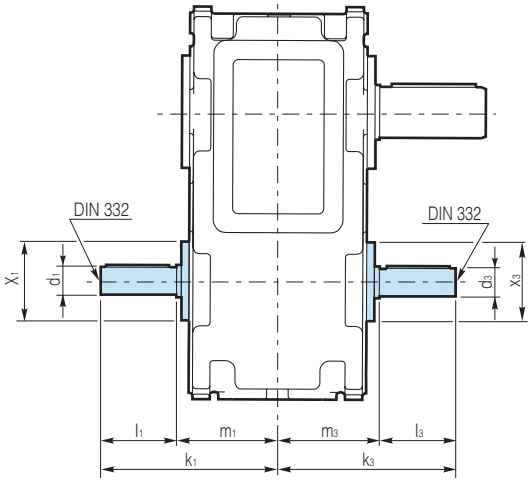
DOUBLE EXTENDED INPUT SHAFT

PD



	Input shaft										
	i_N	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_3	k_3	l_3	m_3	Ø x_3
PD 60	16...45	130 m6	715	250	465	390	130 m6	715	250	465	390
	50...100	130 m6	715	250			100 m6	680	215		
PD 63	18...50	130 m6	715	250	465		130 m6	715	250	465	390
	56...112	130 m6	715	250			100 m6	680	215		
PD 67	20...56	130 m6	715	250	465		130 m6	715	250	465	390
	63...125	130 m6	715	250			100 m6	680	215		
PD 71 ... PD 85	**On request**										

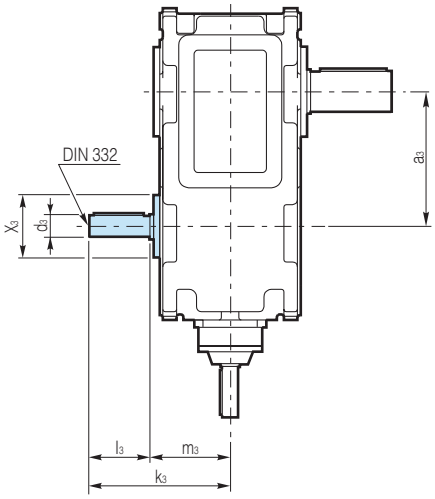
PE



	Input shaft										
	i_N	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_3	k_3	l_3	m_3	Ø x_3
PE 60	71...450	80 m6	610	170	440		80 m6	610	170	440	
PE 63	80...500										
PE 67	100...630										
PE 71 ... PE 85	**On request**										

PLC, PLD

PLC, PLD

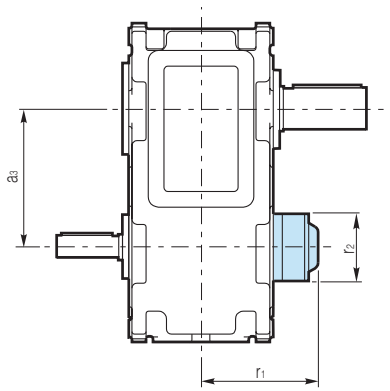


		a_3	Ø d_3	k_3	l_3	m_1	Ø x_3
PLC, PLD	60	1032	150 m6	725	250	475	440
	63	1105	150 m6	725	250	475	440
	67	1176	150 m6	725	250	475	440
	71... 85	On request					

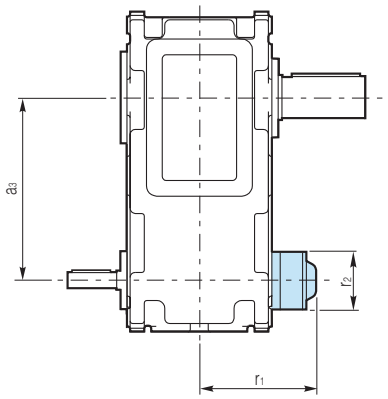
Type	Pag.
Back stops	54
Torque reaction arms	56
Motor attachments	58
Fan cooling	60
Coolling coils	61
Sealing systems	62
Lubrication	63
Auxiliary drive	64
Breather with filter	65
Breather with wet filter	65
Temperature switch	65
Pressure switch	65
P100	66
Manometer	66
Oil level switch	66
Oil drain with ball valve	66
Oil filter, single, double	67
Regulator for quantity of cooling water	67

PC, PD, PE

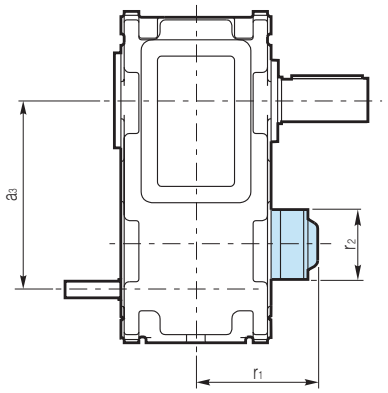
PC



PD



PE



	i_N	r_1	Ø r_2	a_3
PC 60 ... PC 85	On request			

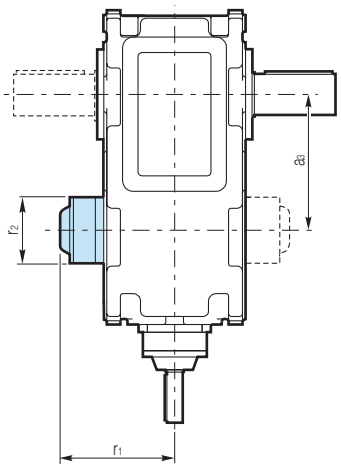
	i_N	r_1	Ø r_2	a_3
PC 60 ... PC 85	On request			

	r_1	Ø r_2	a_3
PC 60 ... PC 85	On request		

Directions of rotation and locations of shafts see p. 8-9.
Backstopps have adequate capacities to deal with full rated torque.

PLC, PLD

PLC, PLD

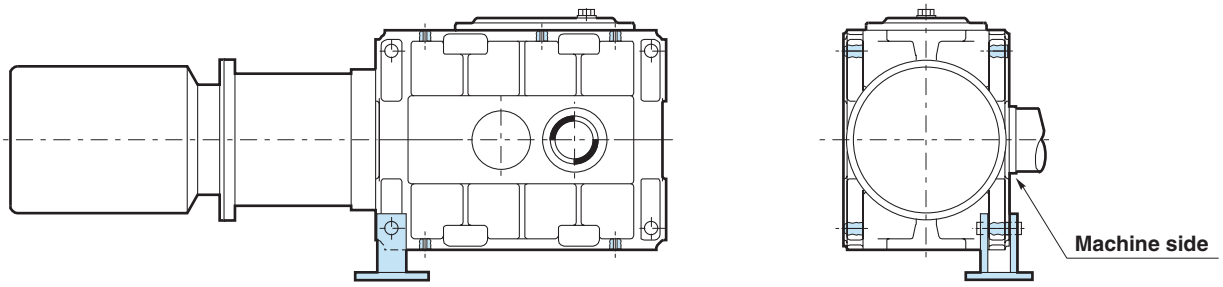


		r_1	Ø r_2	a_3
PLC, PLD	60	626	440	1032
	63	626	440	1105
	67	626	440	1176
	71... 85	On request		

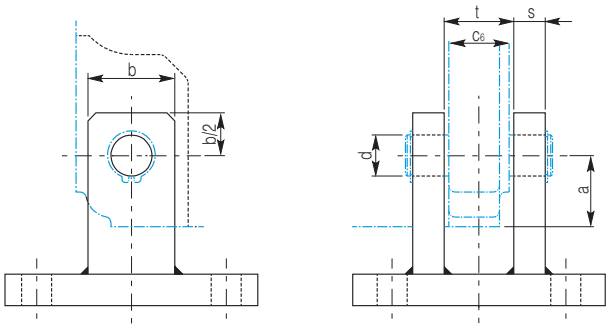
Directions of rotation and locations of shafts see p. 10-11.
Backstops have adequate capacities to deal with full rated torque.

PC, PD, PE, PLC, PLD

Torque reaction arm with 1 ball-and-socket joint



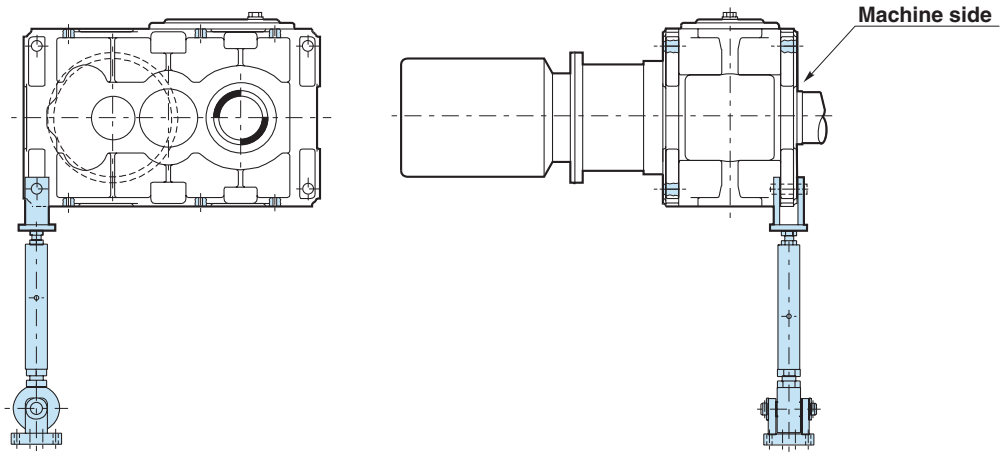
Torque arm on driven machine side



		a	t	c_6	d	b	s
PC, PD, PE PLC, PLD,	60 - 63	70	98	90	65 H9/h6	140	50
	67	80	98	90	70 H9/h6	140	50
	71 ... 85	On request					

PC, PD, PE, PLC, PLD

Torque reaction arm with 2 ball-and-socket joints



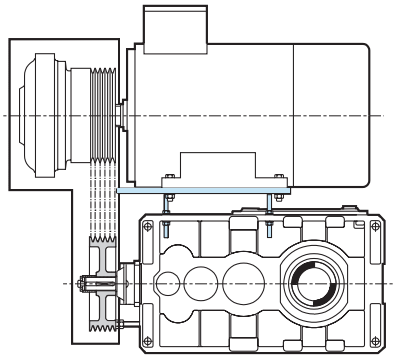
Dimensions on request

Torque reaction arm not supplied by DMSD

M-P..., J1-P..., J2-P...

M...

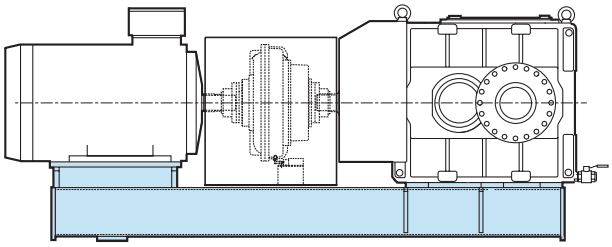
Motor base plate

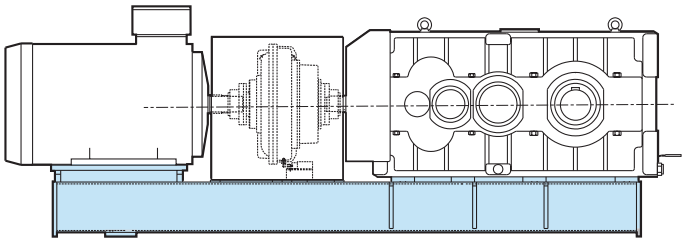


Only on request.

J1...

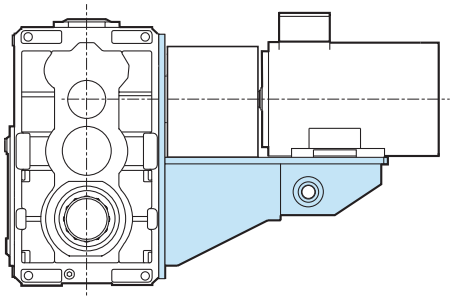
Swing base

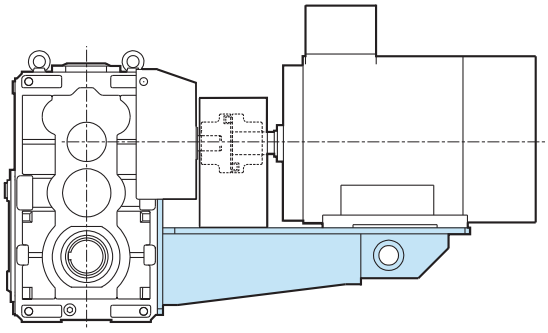




J2...

Motor scope



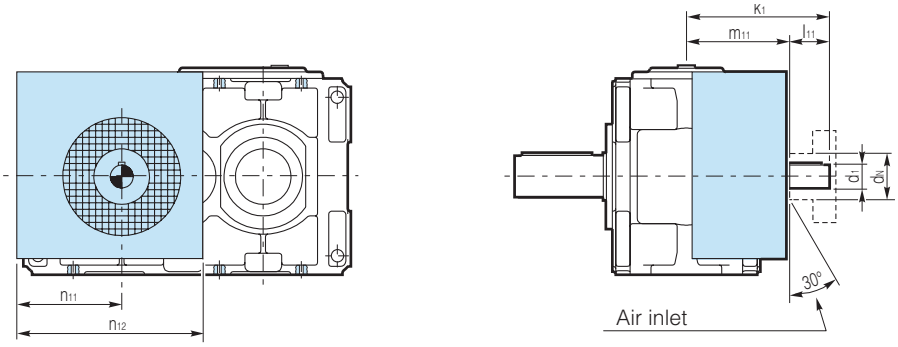


Dimensions on request

PC, PD.. -R11

Permissible location of shafts .1 and .2 see p. 8-9.

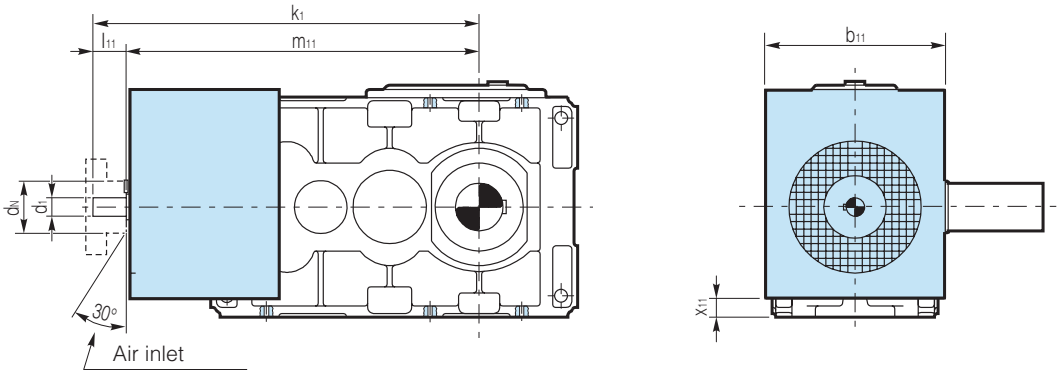
Type PC..-R11
PD..-R11



Attention: To mount the feet- fitting screws, demount the fan cover. Mounting of the input hub only after mounting of the feet-fitting screws.

	d_1	$d_{N\ max}$	k_1	l_{11}	m_{11}	n_{11}	n_{12}
PC, PD 60...85	**On request**						

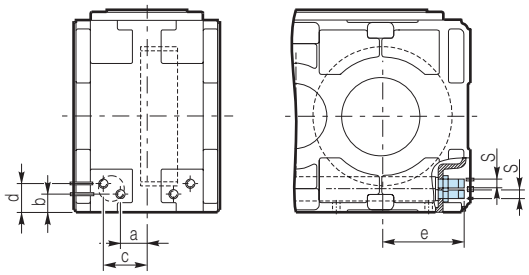
PLC .. -R11



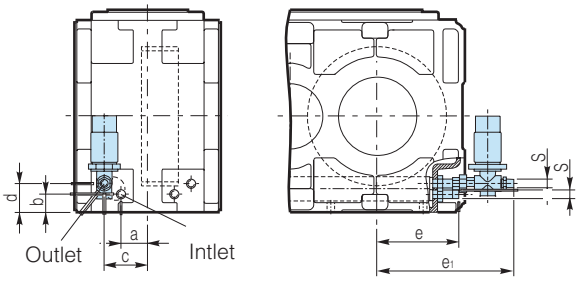
	b11	d1	dN max	k1	l11	m11	x11
PLC 60...85	On request						

PC, PD, PE, PLC, PLD.. -R1

Water connection for cooling coil without cooling water controller



Water connection for cooling coil with cooling water controller



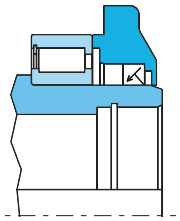
Cooling coil placed adjacent to the final gear wheel. For the gear wheel position see the dimension sheets

		a	b	c	d	e	e_1	s	V Water l/min	Δ p W bar
PC, PD, PE, PLC, PLD, PWC, PWD	60	80	125	190	125	495	634	R 3/4 A		0.6
	63	80	125	190	125	570	709	R 3/4 A		0.6
	67	80	125	190	125	645	784	R 3/4 A		0.6
	71...85	On request								

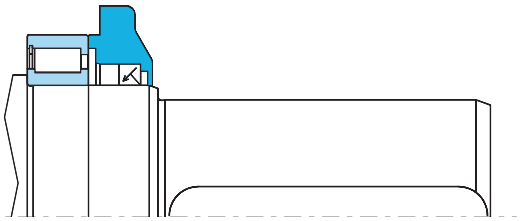
PC, PD, PE, PLC, PLD

Standard sealing

Single shaft seal with dust lip



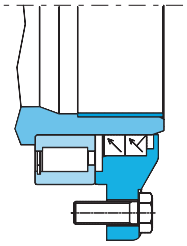
Hollow shaft



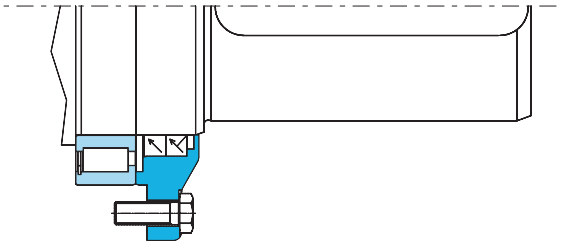
Solid shaft

Special seals according to the operating conditions

Two shaft seals, outside with dust lip

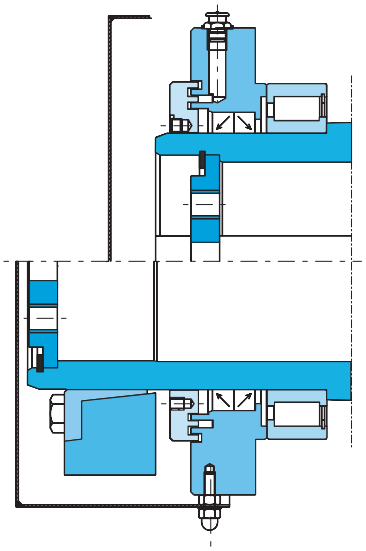


Hollow shaft

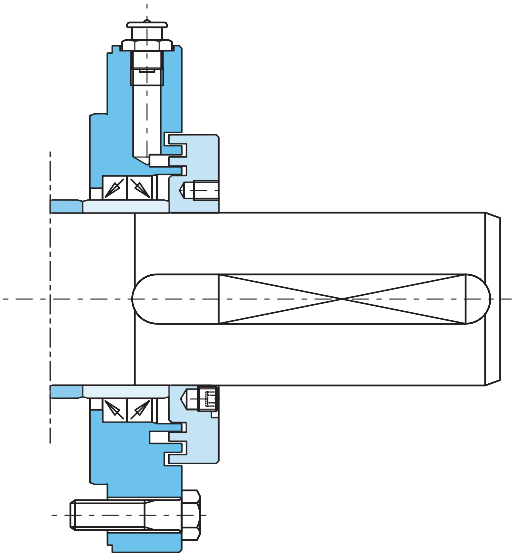


Solid shaft

Two shaft seals with additional refillable grased labyrinth seals (Taconite sealing)



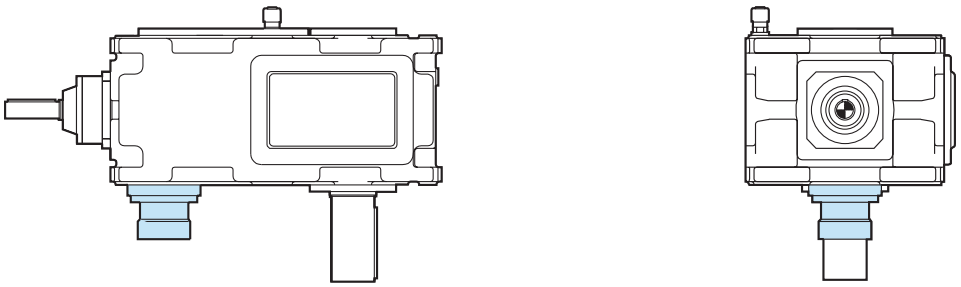
Hollow shaft



Solid shaft

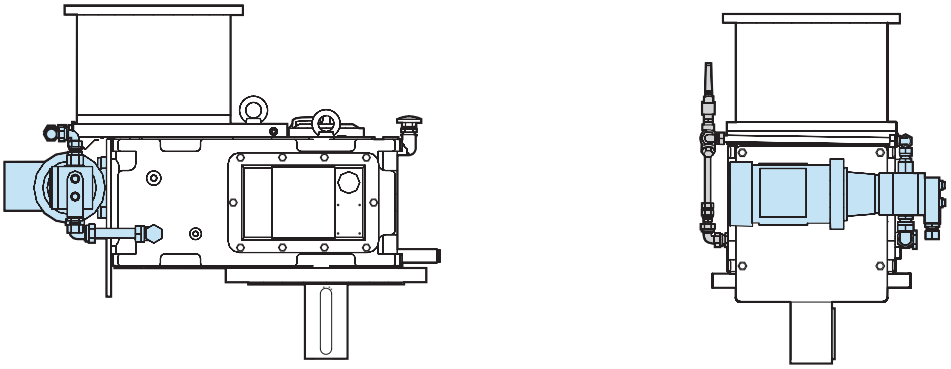
PC, PD, PE, PLC, PLD .. -R1

Flange pump

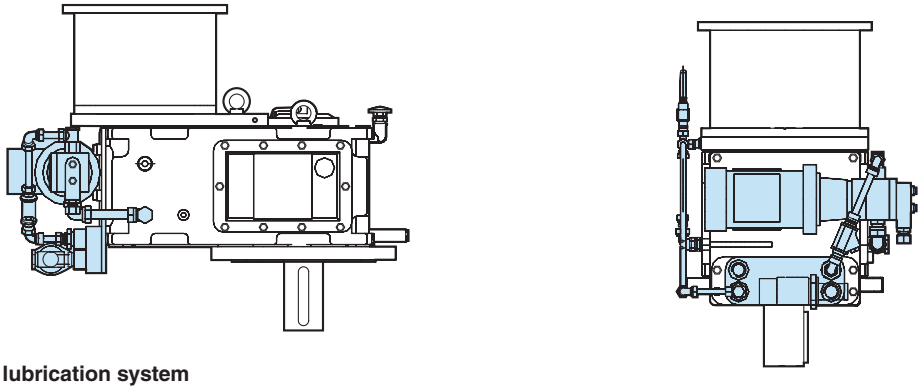


Motor pump

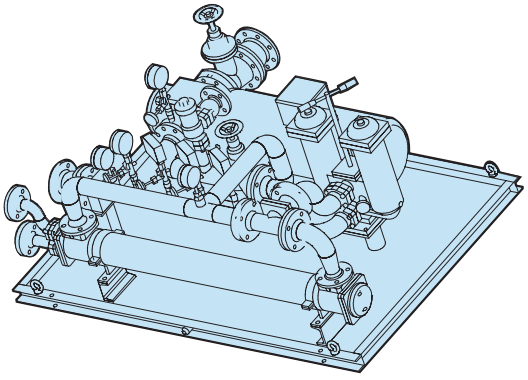
a) With pressure lubrication (motor pump)



b) With pressure lubrication (motor pump) and plate cooler



Separate cooling and lubrication system



Dimensions on request

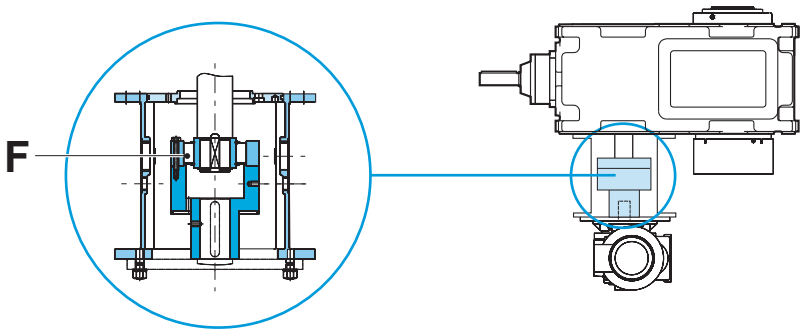
PC, PD, PE, PLC, PLD

F = Free-wheel
R = Backstop

The elements R and F are located in closed casings and are lubricated by the gearing oil

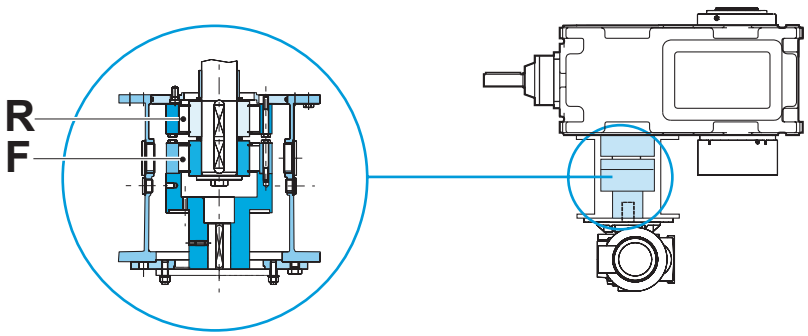
Version A

To avoid a turn back of the installation, the auxiliary drive must possess a motor-brake

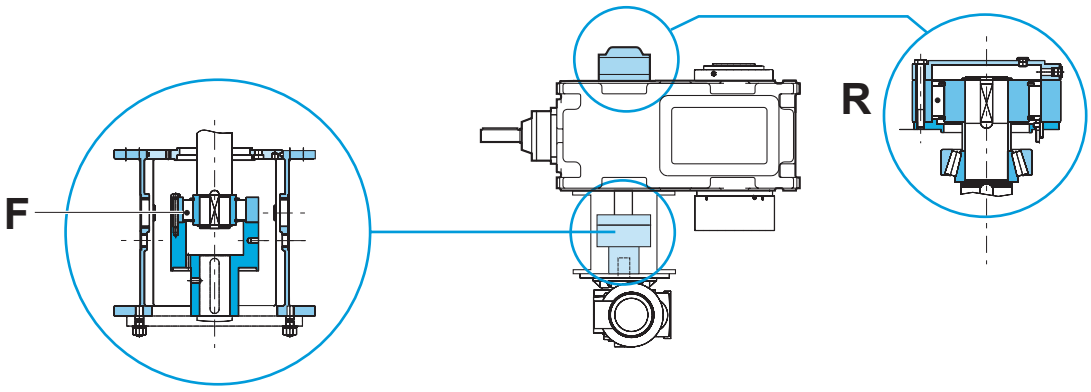


Version B

Standard execution



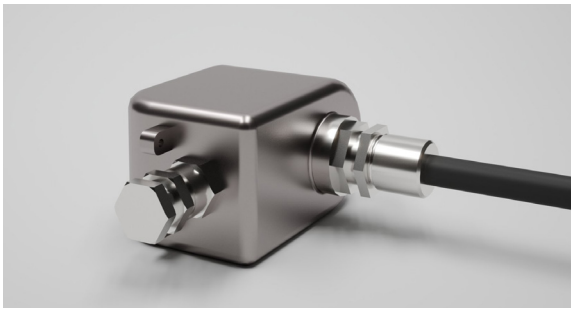
Version C



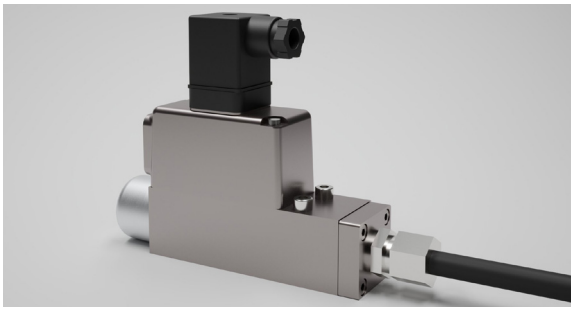
PC, PD, PE, PLC, PLD

Breather with filter
A breather with a filter can be used to prevent dust from entering the gearbox while the gear unit is cooling down.

Breather with wet filter
If the humidity is high, we recommend a breather with wet filter to prevent water vapor from penetrating the gear oil.



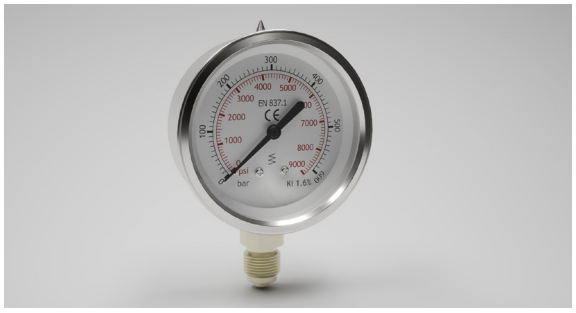
Temperature switch
To control the max. oil temperature there is the possibility to install a Temperature switch into the oil sump and get output signal when the temperature is above certain level.



Pressure switch
In case of a force lubrication or cooling unit there is the possibility to control the oil pressure with a pressure switch. If the oil pressure is below certain pressure a signal will stop the main motor of the gearbox.

PC, PD, PE, PLC, PLD

P100
To monitor the oil temperatures on the gearbox, and set up different level of attention at certain temperature, for instance start, alert and stop of the gearbox.



Manometer
In case of a force lubrication or cooling unit there is the possibility to have visual control the oil pressure with a manometer.

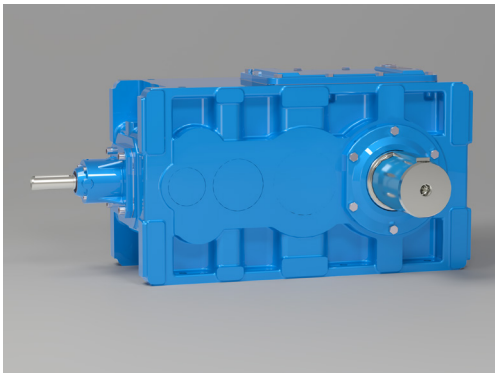
Oil level switch
With the oil level switch is it possible to control the min. oil level of the gearbox in case you use a heater.

Oil drain with ball valve
For an easy, safe and clean oil drain from the gearbox, we can deliver an oil drain with a ball valve

PC, PD, PE, PLC, PLD

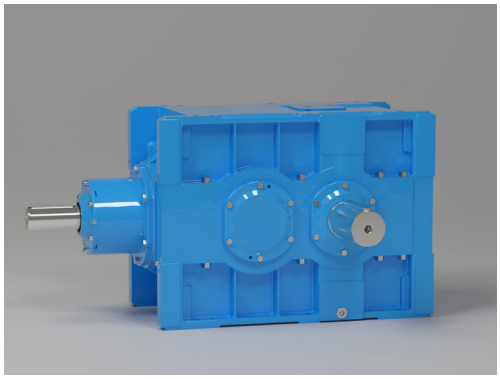
Oil filter, single, double
To increase the bearing lifetime is it possible in case of force lubrication / cooling to use an oil filter. We recommend a double switching filter for 24 hours operation.

Regulator for quantity of cooling water
In order to have a constant gear oil temperature with water cooling, we recommend the installation of a water regulator.



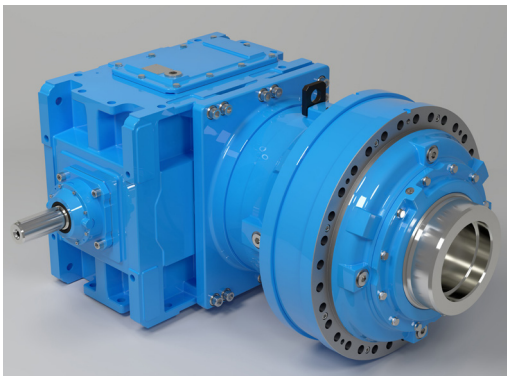
Brevini EvoMax™

The Brevini EvoMax™ gearbox series is a further development of the POSIRED 2 series from Dana Motion Systems Deutschland GmbH Drives GmbH. The development has incorporated over 90 years of application knowledge and customer feedback and the outcome is a series of highly reliable, efficient and economical products.
The development of the Brevini EvoMax™ gearbox series enabled the improvement in torque density, smaller physical envelope, higher efficiency, lower weight, noise and power consumption. Overall, the modular design of the Brevini EvoMax™ series gives sustainable and efficient transmission that minimize operating costs and maximize availability.
Torque range 10 kNm up to 290kNm
Ratios from 4 up to 500

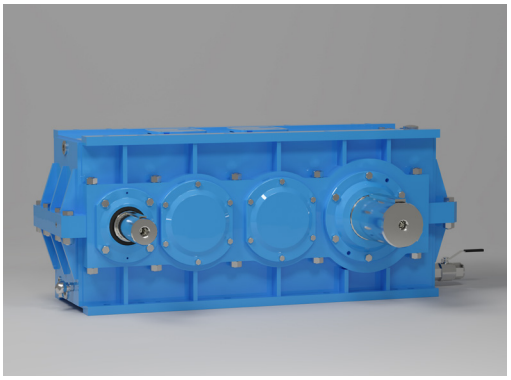


POSIRED 2

The Posired 2 PB / PLB is a 1 stage helical and 2 stage bevel-helical gearbox series with 6 frame sizes. The gearbox based on the modular system. The torque range is from 5.7 kNm up to 120 kNm.
Ratios from 1,25 up to 5,6 for the helical gearboxes and from 5.6 up to 22.4 available



High Power
The High Power is a compact bevel-helical gearbox with a planetary gearbox on the output.
Torque range from 90 kNm up to 2.100 kNm
Ratios up to 8.000



POSIRED N
The POSIRED N is a helical gearbox with a extended center distance
Torquerange 8 kNm up to 290 kNm
Ratios from 12,5 up to 500

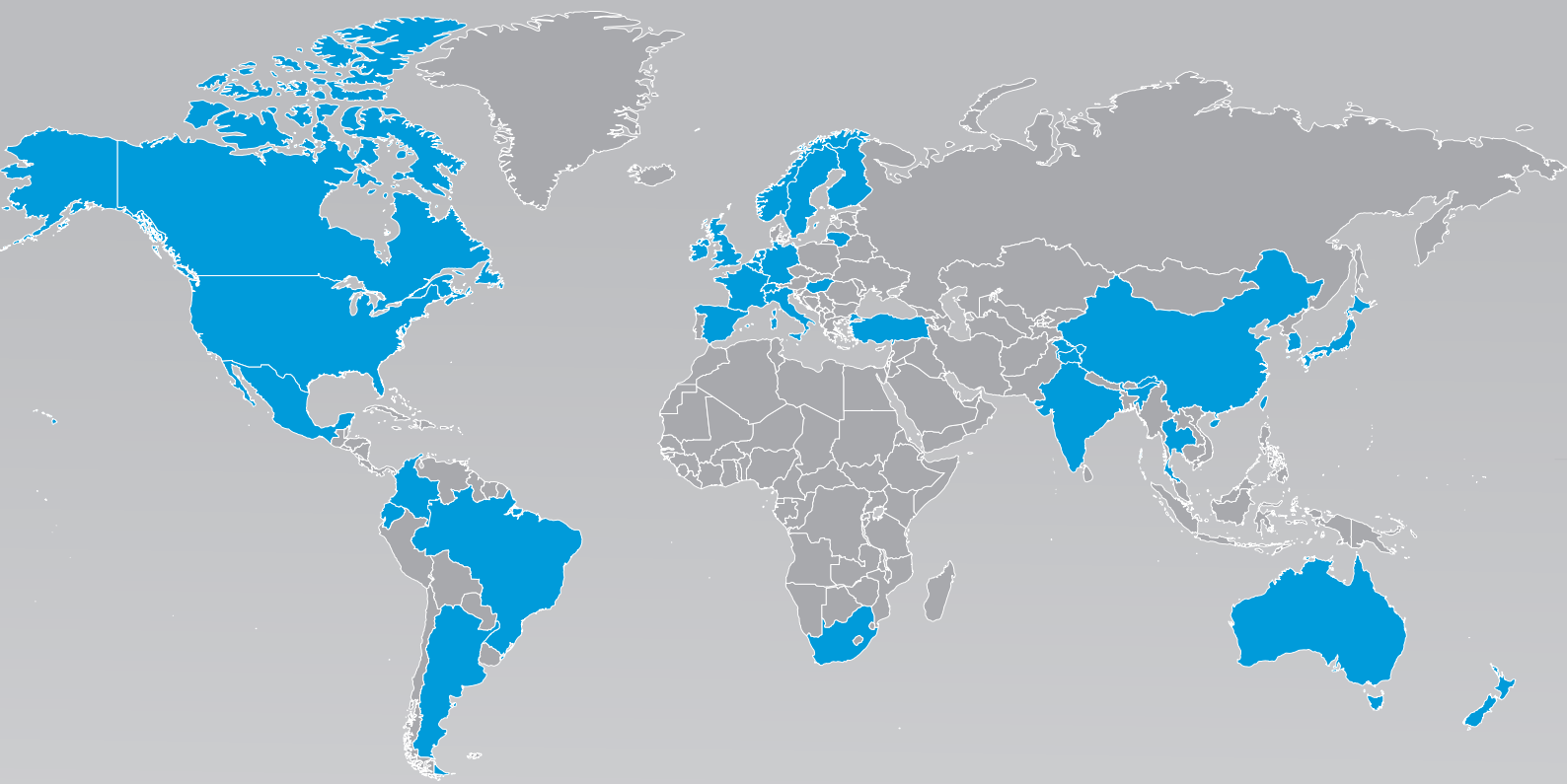
POSIRED TS
The POSIRED TS is helical gearbox with two counter rotating output shafts.
Torquerange 1 kNm up to 110 kNm
Ratios from 5 up to 100

CONVERSION FACTORS

	SI system into Imperial System	Imperial System into SI System
Power rating	kW x 1.341 = HP	HP x 0.7457 = kW
Torque	Nm x 8.851 = in-lbs Nm x 0.7375 = ft-lbs	in-lbs x 0.113 = Nm ft-lbs x 1.356 = Nm
Force	N x 0.2248 = lbs	lbs x 4.4482 = N
Stress	N/mm^2 x 0.00689 = lbs/in^2 (psi)	lbs/in^2 x 145.04 = N/mm^2
Mass moment of inertia	kgm^2 x 23.73 = $lb\text{-}ft^2$	$lb\text{-}ft^2$ (psi) x 0.0421 = kgm^2
Lenght	mm x 0.03937 = inches m x 39.3701 = inches m x 3.2808 = foot µm x 0.03937 = mil (0.001 in)	inches x 25.4 = mm inches x 0.0254 = m foot x 0.3048 = m mil (0.001 in) x 25.4 = µm
Weight (mass)	kg x 2.205 = lbs	lbs x 0.4536 = kg
Volume	l x 0.264 = US gal	US gal x 3.785 = l
Volume flow rate	l/min x 0.264 = gal/min (GPM) m^3/h x 0.2271 = gal/min (GPM)	gal/min (GPM) x 3.785 = l/min gal/min (GPM) x 4.403 = m^3/h
Velocity	m/s x 196.85 = ft/min	ft/min x 0.0051 = m/s

Symbol	Name	Symbol	Name	Approximate temperature	
				°C	deg F
Nm N/mm^2 kgm^2	Newton-Meter Newton/Millimeter^2 Kilogramm-Meter^2	in-lbs ft-lbs lbs/in^2 (psi)	inch pounds foot pounds pounds/inch^2	20 27 38	68 80 100
m mm µm	Meter Millimeter (0.001 Meter) Mikrometer (0.001 Millimeter)	in ft mil	inches foot 0.001 inch	-18 -12 -7	0 10 20
kg kW N	Kilogramm Kilowatt Newton	lbs HP	pounds horsepower	0 4 15	32 40 60
l l/min m^3/h m/s	Liter Liter/Minute Meter^3/Stunde Meter/Sekunde	$lb\text{-}ft^2$ US gal gal/min (GPM) ft/min	pound foot^2 US gallons gallons/minute foot/minute	49 60 77 93	120 140 170 200

Torque calculation			
SI system		**Imperial System**	
$T = 9550 \times \frac{P}{n}$ [Nm]	P in kW n in min^{-1}	$T = 5252 \times \frac{P}{n}$ [ft-lbs] $T = 63025 \times \frac{P}{n}$ [in-lbs]	P in HP n in rpm
$T = 159.2 \times \frac{P}{n}$ [Nm]	P in kW n in 1/s	$T = 87.53 \times \frac{P}{n}$ [ft-lbs] $T = 1050.42 \times \frac{P}{n}$ [in-lbs]	P in HP n in rps



Technologies Customized to **Every Part of the Globe**

With a presence in 31 countries, Dana Incorporated boasts more than 150 engineering, manufacturing, and distribution facilities. Our worldwide network of local service centers provides assurance that each customer will benefit from the local proximity and responsiveness.

About Dana Incorporated

Dana is an integral partner for virtually every major vehicle and engine manufacturer worldwide. We are a leading supplier of drivetrain, sealing, and thermal technologies to the global automotive, commercial-vehicle, and off-highway markets. Founded in 1904, we employ thousands of people across six continents.

About Dana Off-Highway Drive and Motion Technologies

Dana delivers fully optimized Spicer® drivetrain and Brevini® motion systems to customers in construction, agriculture, material-handling, mining, and industrial markets. We bring our global expertise to the local level with technologies customized to individual requirements through a network of strategically located technology centers, manufacturing locations, and distribution facilities.

Learn more about Dana's drivetrain and motion systems at **dana.com/offhighway**.

Dana-Industrial.com

Application Policy
Capacity ratings, features, and specifications vary depending upon the model and type of service. Application approvals must be obtained from Dana; contact your representative for application approval. We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.

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BREVINI®
Motion Systems