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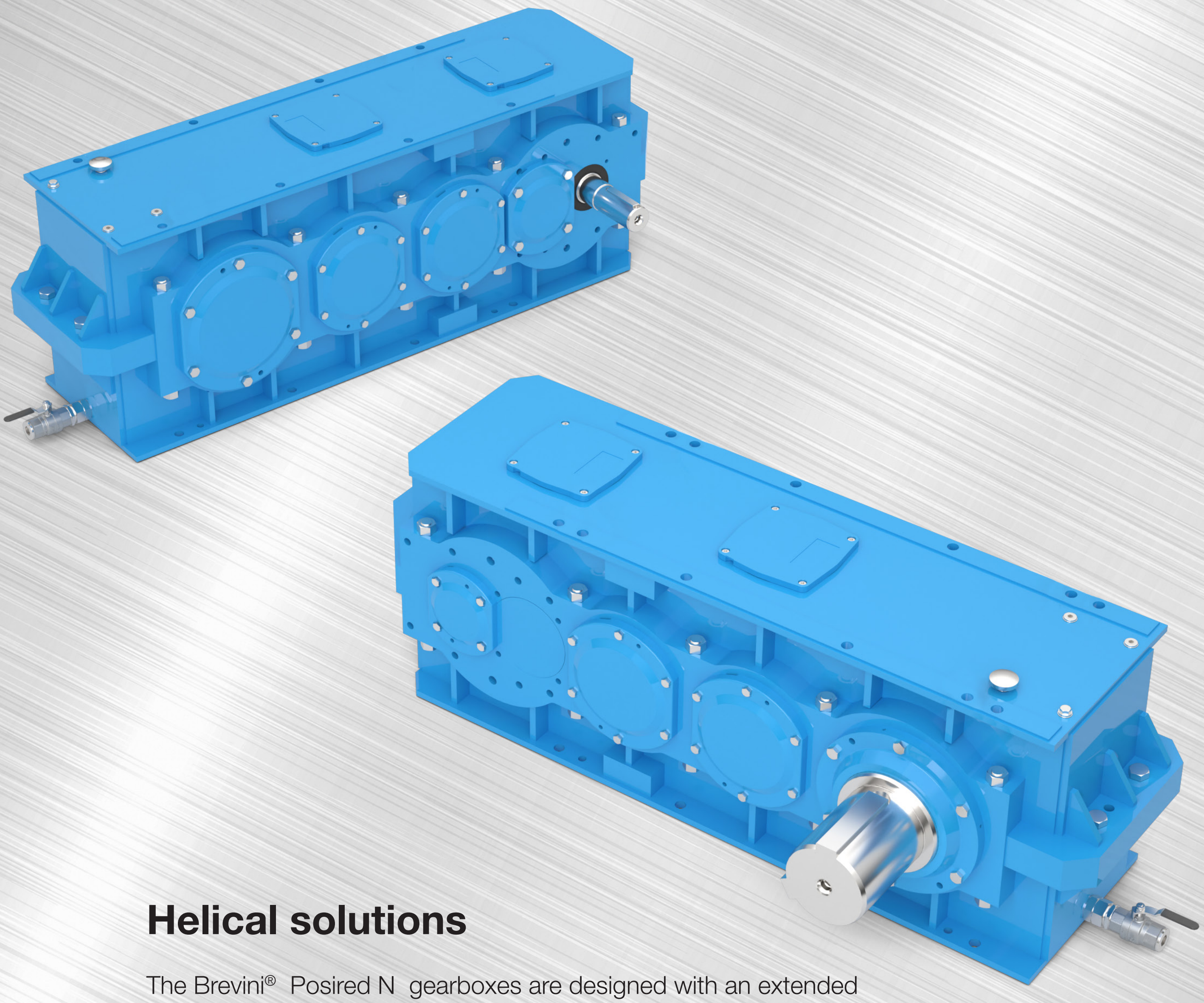
Product Catalog

Helical Gearboxes
Brevini® Posired N Series

Helical gear units with extended center distance



Helical solutions

The Brevini® Posired N gearboxes are designed with an extended center distance for heavy duty application in mining, material handling application. They ensure high performaces in demanding applictions based on their modularity and wide range of combinations.

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POSIRED N

Overview

Posired N is a totally new programme of extended centre gear units designed in accordance with the latest technology
The PIV quality assurance system for design development. product. assembly. customer service as per DIN ISO 9001 (EN 29001). registration Dana DMSD no. 06/100/0141 TÜV CERT ensures a uniformly high standard.

Technical features

Posired N is is an intelligent gear concept:

- Because it manages with fewer but more versatile usable parts (maximum standardisation and the reuse of common parts for optimum availability and prompt delivery terms)
- With increasing size of gear box
- Because sizes are more finely graded and also admissible torques with increasing size are more finely graded
- Because it offers more advantages owing to
- Faster delivery times
- More variable and universal possibilities for adaptation to the machine and greater standardisation of the series (mass production from the module)

Designs

- 19 sizes based on a modular concept
- Greater centre distance between input and output shafts

Versions

- For horizontal. vertical and standing installations

Gears

- Helical gears for reduced noise. case hardened (in our own hardened bay) and ground
- Profile correction for optimum load-bearing capacity
- Proofs of calculation as per DIN 3990. AGMA and classification company standards are possible

Casings

- With centre line split on shaft centres
- Ease of assembly and dismantling
- Design in accordance with the latest trend in acoustics

Material

- Fabricated steel housings as standard. grey cast iron or spheroidal graphite housings on request
- Split housing. Split at centers of shafts

Shafts

available as standard on the output shaft:

- Solid shaft
- Solid double extended shaft
- Hollow shaft with feather key
- Hollow shaft with shrink disc
- Flanged shaft

Input Shaft Design

- Solid shaft with key
- With helical gearboxes, double extended input shaft
- Extended intermediate shaft is available for all gearboxes
- Keys according to DIN 6885/1 are included in the scope of delivery
- Centering bores on the shaft ends are designed according to DIN 332 Form DS

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

Couplings
adapted to the output shaft and standard driven shaft. Rated to suit output torque:
- Elastic couplings
- Gear couplings
- Barrel couplings
- Disk couplings
- Other coupling types on request

Adapted to the input shaft and standard driving shaft to suit input torque:
- Elastic couplings
- Drum- and disk brakes
- Other coupling types on request

Seals
Seal systems available as standard for both input and output shafts:
- Radial shaft seals in various material
- Radial shaft seals with additional dust lip
- Second radial shaft seal with intermediate grease filled chamber maintenance covers for replacement split seals

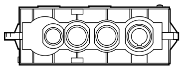
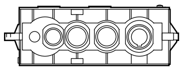
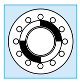
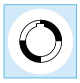
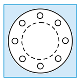
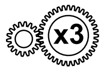
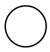
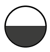
Lubrication
- Gears and rolling element bearings are splash lubricated as standard
- Force fed lubrication systems via shaft or motor driven pump are available as options
- Oil dipstick is standard

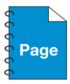
Cooling
Additional cooling devices available as standard:
- Shaft driven fan cooling
- Cooling coil
- External oil coolers (oil/water or oil/air coolers)

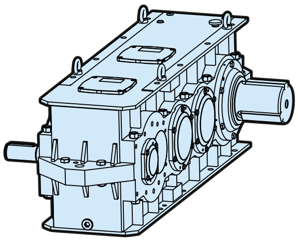
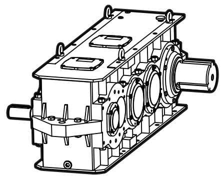
Accessories
- Heating elements
- Operational monitoring systems (among others for speed and torque)
- Diagnostic systems

General Points
- Dimension prints available as CAD files for various DV systems and interfaces
- Computer programmes for drive selection
- Extent of supply – putting into operation
- The units are supplied without oil fill; Oil type and quantity as per units data plate
- Standard conservation for normal transport conditions and storage for a 6 months period
- Installation and setting up in accordance with PIV operating manuals: 999-9999-DOK001 and 430-0000-DOK001
- Protection against accidental contact with moving parts as required by law is not included in the supply (exception: hollow shaft gears are supplied with a protective cover for the shrink disc)
- The standard color is RAL 5012, other colors are available
- Protection covers and air guides painted in RAL 1003 (signal yellow)

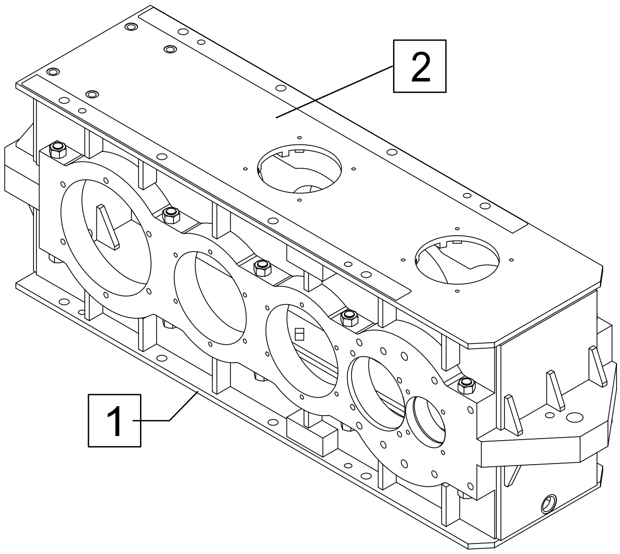
Referenced standards
- Gearing performance calculated according ISO 6336-96
- Bearing life calculated according ISO 281-95
- Motor couplings according IEC 72.2
- Keyhole and keyway as for UNI 6604
- Splined shafts as for DIN 5480 / 5482
- Male input shafts as for DIN 332

Symbology	
Symbol referring to gear unit type ND	
Symbol referring to gear unit type NE	
Symbols describing kind of output shaft: **V** = Solid shaft **G** = Hollow shaft with shrink disc **H** = Hollow shaft with key **F** = Flanged shaft	 V  G  H  F
Symbols identifying the gear unit stages (3, 4)	 
Gear unit weight [kg]	
Oil quantity in liters [l]	
Oil breather and filling plug	
Oil level	
Oil drain	

Reference to page	

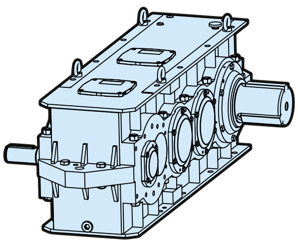
SIZES FROM 18 TO 56	
Construction types	**Mounting positions**
	R
	Horizontal, output shaft horizontal
ND, NE	**Helical gear units**
	

ND - NE

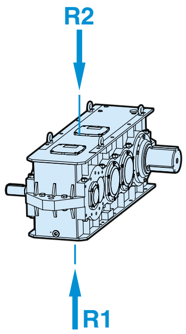


Designation of housing surfaces (1 … 6).
Permissible mounting positions: see dimension sheets.

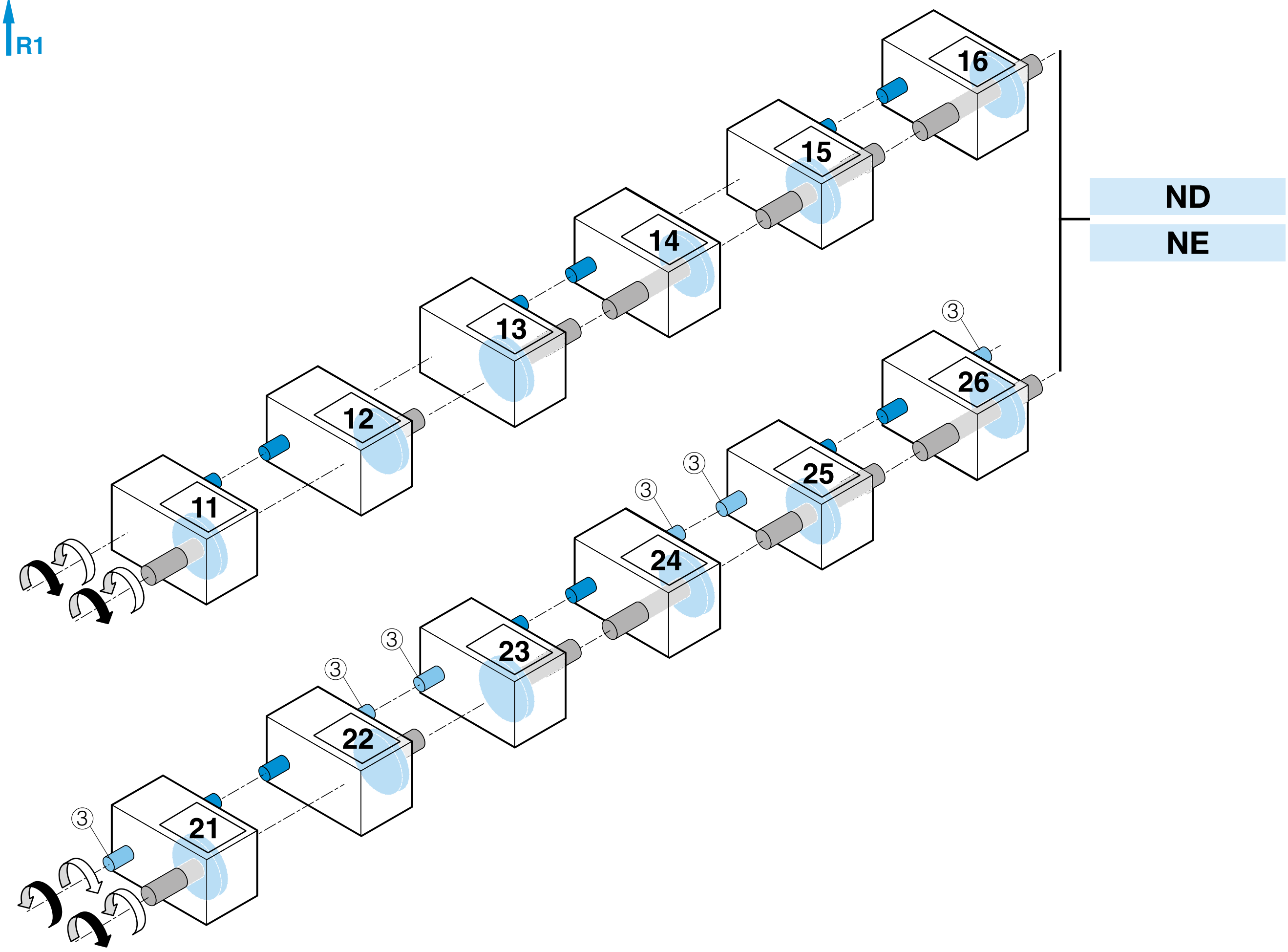
Example:
R1 = R for horizontal mounting position; 1 for surface 1 below

Type	HOUSING	Mounting positions and surfaces		Page
Helical gears		**ND**	**R1, R2,**	**9**
		NE	**R1, R2**	

ND - NE



R1: Mounting positions and surface below



Input shafts

Output shafts

③ Double extended input shafts

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DESIGNATION FOR ORDER

K	- ND	47	R	1	1	- V	- 11	- 25	- Z01
Motor attachment	Type	Size	Mounting position	Carter surface below	Mounting arrang.	Output shaft	Shaft positions, direction of rotation	Nominal ratio	Addition

Motor attachment
- J Motor scope
- K Motor bell housing

Type
- ND 4 stages
- NE 5 stages

Size
- 18
- 20
- 22
- 25
- 28
- 31
- 35
- 40
- 42
- 45
- 47
- 50
- 53
- 56

Mounting position
- R Horizontal, output shaft horizontal

Carter surface below
- 1

Mounting arrang.
- 1

Output shaft
- V Solid shaft with keyway ⇨ 26
- H Hollow shaft with keyway ⇨ 34
- G Hollow Shaft with shrinc disc ⇨ 35
- F Flanged shaft ⇨ 36

Shaft positions, direction of rotation
- 11
- ..
- 26
- 9

Nominal ratio
- 12.5
- ..
- 25
- ..

Addition
- Z01 1 fan
- Z02 2 fans

0. Required Operating Parameters

- Class of utilisation and state of loading
- Input Speed
- Output Speed
- Motor Power
- Design Information
- Application

1. Establish the type of gear and mounting arrangement

2. Determine ratio required

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

- Selection of the appropriate nominal ratio i_N (for the actual ratio i_w - see exact ratios)

3. Determining the gear unit size

The following method of selection is based on the maxium torque which occurs during the hoisting/lifting operation. and not the nominal motor torque. Owing to the high frequency of stop/start cycles associated with lifting equipment. a high proportion of total running time can be subject to the maximum torque and this must be taken into account. With the following equations it is possible to determine the maximum torque for accelerating. braking and lifting with sufficient accuracy to determine the hoist gears size.
If in doubt consult us.

3.1 Calculating the maximum torque T_{max}

The applicable torque values have to be inserted into the following equations.
$T_R = 0$. can be used as an approximation when the torque loss is unknown.

3.1.1 Acceleration

Hoisting and Luffing Gear:

$$T_{BS} = T_L - T_R + \varphi_a \cdot [\, 2 \cdot T_R + (\, T_M - T_L - T_R\,) \cdot \frac{J_a}{J_a + J_m}\,]$$

Travel and Slewing Gear:

$$T_{BS} = \varphi_a \cdot [\, T_L + T_R + (\, T_M - T_L - T_R\,) \cdot \frac{J_a}{J_a + J_m}\,]$$

3.1.2 Breaking

$$T_{BR} = -\,T_L + T_R + \varphi_b \cdot (\, -\,T_B + T_L - T_R\,) \cdot \frac{J_a}{J_a + J_m}$$

3.1.3 Lifting of Offset Loads

Applicable only to hoist gear. When lifting an out of balance load.

$$T_{AH} = \Psi \cdot T_L$$

3.1.4 Determining the maximum torque

From the following loads is decisive in correct gearbox selection.

$$T_{max} = \max\,(\, T_{BS}.\ T_{BR}.\ T_{AH}\,)$$

3.2 Determining gear selection factor f_k

$$f_k = \frac{f_f}{f_n}$$

f_f : Classification Factor as Table 1
f_n : Output Speed Factor as Table 2

Table 1
Classification Factor f_f (k_m = nominal load spectrum)

Load Spectrum:		L1		L2		L3		L4	
Class of Utilisation		$k_m \leq 0.125$		$k_m \leq 0.250$		$k_m \leq 0.500$		$k_m \leq 1.00$	
T0	(≤ 200 h)	0.55	M 1	0.58	M 1	0.78	M 1	0.81	M 2
T1	(≤ 400 h)	0.55	M 1	0.59	M 1	0.79	M 2	0.82	M 3
T2	(≤ 800 h)	0.59	M 1	0.61	M 2	0.80	M 3	0.83	M 4
T3	(≤ 1600 h)	0.65	M 2	0.68	M 3	0.83	M 4	0.85	M 5
T4	(≤ 3200 h)	0.75	M 3	0.78	M 4	0.95	M 5	0.97	M 6
T5	(≤ 6400 h)	0.77	M 4	0.80	M 5	0.98	M 6	1.00	M 7
T6	(≤ 12800 h)	0.80	M 5	0.83	M 6	1.01	M 7	1.03	M 8
T7	(≤ 25600 h)	0.82	M 6	0.86	M 7	1.06	M 8	1.17	M 8
T8	(≤ 50000 h)	0.85	M 7	0.88	M 8	1.33	M 8	1.45	M 8
T9	(≤ 100000 h)	0.88	M 8	0.91	M 8	1.67	M 8	1.83	M 8

Table 2
Output Speed Factor f_n

Output Speed n_2 [min^{-1}]													
100	**90**	**80**	**70**	**60**	**50**	**40**	**30**	**20**	**10**	**8**	**5**	**3**	**1**
1.00	1.00	1.01	1.02	1.02	1.03	1.04	1.06	1.08	1.00	1.28	1.45	1.50	1.50

3.3 Determinig the gears necessary nominal torque

$$T_{Kat} \geq \frac{f_k}{f_R} \cdot T_{max}$$

Table 3
Reversing Factor f_R

Reversing Factor f_R		
1.0	**0.85**	**0.7**
Uniform Load Direction	Infrequent Reverse Loads	Reverse Operation

3.4 Static Check

$$T_{Kat} \geq \frac{1}{f_{maxS}} \cdot T_{maxS} \cdot \frac{1}{f_R}$$

this is:
f_{maxS} : static overload factor
$f_{maxS} = 2$

T_{maxS} : maximum static torque
Alternative maximum static torque in special cases T_S or maximum running torque T_{max}

$$T_{maxS} = \max(T_S, T_{max})$$

3.5 Checking Thermal Capacity of Gear

Due to the intermittent usage this is generally considered.

Definitions

n_1	[min^{-1}]	gear input speed (= motor speed)
n_2	[min^{-1}]	output speed (= equipment speed)
i_{soll}		desired ratio
i_N		nominal ratio of gearbox
i_W		true ratio of gearbox
f_f		classification factor (FEM). see Table 1
f_k		gear selection factor
f_r		reversing factor. see Table 3
f_{maxS}		static overload factor
f_n		output speed factor. see Table 2
J_a	[kgm^2]	sum of the mass moments of inertia on the equipment side. reduced to the output shaft of gearbox
J_m	[kgm^2]	sum of the mass moments of inertia on motor side. reduced to the input shaft of the gearbox
J	[kgm^2]	mass moment of inertia. not reduced
P_M	[kW]	nominal motor power
T_{Kat}	[Nm]	nominal rated torque of gearbox (catalogue)
T_{max}	[Nm]	maximum running torque
T_{maxs}	[Nm]	maximum static torque
T_B	[Nm]	maximum braking torque referred to the output shaft
T_M	[Nm]	max. motor torque. referred to output shaft
T_L	[Nm]	absorbed torque at the output shaft
T_R	[Nm]	loss of torque at the output shaft
T_S	[Nm]	static torque (special occurrence) on the output shaft
T_{BS}	[Nm]	accelerating torque
T_{BR}	[Nm]	braking torque
T_{AH}	[Nm]	lifting/hoisting torque
T_{BMax}	[Nm]	maximum brake torque (at the brake shaft)
T_{MMax}	[Nm]	maximum motor torque (at motor shaft)
V_H	[m/min]	speed of lift
φ_a		Soscillation coefficient for acceleration as per DIN. see Table 4
φ_b		Soscillation coefficient for braking as per DIN see Table 5
ψ		Soscillation coefficient for lifting as per DIN. see Table 6
$H_{1...4}$		lifting class as per DIN /2/. see Table 6
$S_{0...3}$		load classification as per DIN /1/. /2
$L_{1...4}$		collective load classification as per FEM. see Table 1
$T_{0...9}$		class of utilisation as per FEM. see Table 1
$M_{1...8}$		group classification for transmission units as per FEM. see Table 1
K_m		nominal load spectrum

/1/ DIN technical reports
basis of calculations for lifting equipment 1982

/2/ DIN 15018
cranes. Supporting steel structures part 1 calculations. Nov. 1984

/3/ FEM 1001
basis for calculations for cranes. Book 1grading and loads. 1987

/4/ FEM 9511
basis for calculations for series lifting equipment. Classification of drive equipment. Juni 1986

Table 4
Oscillating coefficients φ_a for acceleration /1/

Type of Drive Motor	Hoisting and Luffing Drives φ_a	Slewing and Travel Gears φ_a
dc or inverter controlled	1.2	1.65
slip-ring or squirrel cage motors with direct on line starting [1]	1.2	2.2

[1] The oscillation coefficients are based on suitable gradations of the rotor resistance

Table 5
Oscillating coefficients φ_b for brakes /1/

Type of Braking	Hoisting and Luffing Drives φ_b	Slewing and Travel Gears φ_b
regenerative braking via the motor	1.2	2.2
mechanical brake with electro-hydraulic thrustor	1.5	1.65
mechanical brake with pneumatic. electromagnetic or mechanical (ball spindle) thrustor	1.2	2.2
mechanical foot operated brake	1.2	1.65
mechanical brake via centrifugally operated thrustor	1.2	1.2

Table 6
Hoisting coefficient ψ for lifting in accordance with lifting speed v_H and hoisting class /2/

Hoist class	Hoisting capacity coefficient ψ for lifting speeds v_H in m/min	
	up to 90	over 90
H1	$1.1 + 0.0022 \times v_H$	1.3
H2	$1.2 + 0.0044 \times v_H$	1.6
H3	$1.3 + 0.0066 \times v_H$	1.9
H4	$1.4 + 0.0088 \times v_H$	2.2

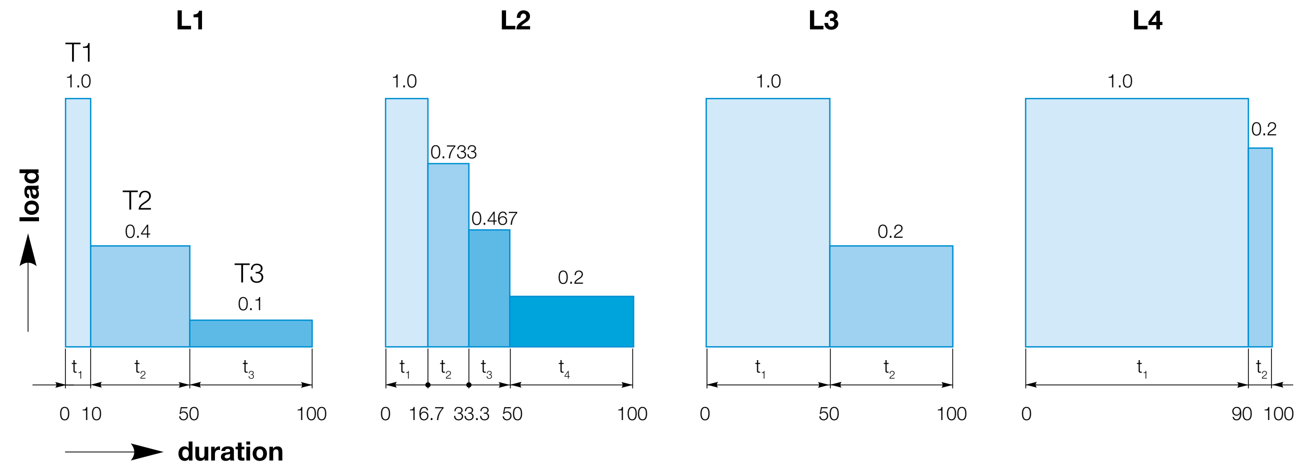
Load Classification /3/. /4/ see Table 1

Determine the load coefficient k_m

$$K_m = \left(\frac{T_1}{T_{max}}\right)^3 \cdot \frac{t_1}{t} + \left(\frac{T_2}{T_{max}}\right)^3 \cdot \frac{t_2}{t} + \ldots + \left(\frac{T_r}{T_{max}}\right)^3 \cdot \frac{t_r}{t} = \sum_{i=1}^{r} \left(\frac{T_i}{T_{max}}\right)^3 \cdot \frac{t_i}{t}$$

Co-ordination of the load classification L1 to L4 is in accordance with km. See Table 1

The FEM /4/ uses the following load classifications with the definitions: $T_{max} = T_1 = 1$ and $t = 100$



Between DIN and FEM standard load classifications the following cross references are applicable by approximation:
S0=L1. S1=L2. S2=L3. S3=L4

Table 7
A few typical cases of use (for correspondence between the class of utilisation /3/ and the collective load classification. see Table 1)

Type of crane		Particulars concerning nature of use	Type of mechanism				
Reference	**Designation**		**Hoisting**	**Slewing**	**Luffing**	**Traverse**	**Travel**
1	Erection cranes		M1	–	–	M1	M1
2	Montagekrane		M2-M3	M2-M3	M1-M2	M1-M2	M2-M3
3	Erection and dismantling cranes for power stations. machine shops. etc.		M2	–	–	M2	M2
4	Bridge cranes	Hook duty	M5-M6	M4	–	M4-M5	M5-M6
5		Grab or magnet	M7-M8	M6	–	M6-M7	M7-M8
6	Workshop cranes		M6	M4	–	M4	M5
7	Overhead travelling cranes. pig-breaking cranes. scrapyard cranes	Grab or magnet	M8	M6	–	M6-M7	M7-M8
8	Ladle cranes		M7-M8	–	–	M4-M5	M6-M7
9	Soaking-pit cranes		M8	M6	–	M7	M8
10	Stripper cranes. open-hearth furnace-charging cranes		M8	M6	–	M7	M8
11	Forge cranes		M8	–	–	M5	M6
12.a	Bridge cranes for unloading. bridge cranes for container	Hook or spreader duty	M6-M7	M5-M6	M3-M4	M6-M7	M4-M5
12.b	Other bridge cranes (with crab and/or slewing Jib crane)	Hook duty	M4-M5	M4-M5	–	M4-M5	M4-M5
13	Bridge cranes for unloading. bridge cranes (with crab and/or slewing jib crane)	Grab or magnet	M8	M5-M6	M3-M4	M7-M8	M4-M5
14	Dry-dock cranes. shipyard jib cranes. jib cranes for dismantling	Hook duty	M5-M6	M4-M5	M4-M5	M4-M5	M5-M6
15	Dockside cranes (slewing. on gantry. etc.). floating cranes and pontoon derricks	Hook duty	M6-M7	M5-M6	M5-M6	–	M3-M4
16		Grab or magnet	M7-M8	M6-M7	M6-M7	–	M4-M5
17	Floating cranes and pontoon derricks f or loads greater than 100 t		M3-M4	M3-M4	M3-M4	–	–
18	Deck cranes	Hook duty	M4	M3-M4	M3-M4	M2	M3
19		Grab or magnet	M5-M6	M3-M4	M3-M4	M4-M5	M3-M4
20	Tower cranes for building		M4	M5	M4	M3	M3
21	Derricks		M2-M3	M1-M2	M1-M2	–	–
22	Railway cranes allowed to run in train		M3-M4	M2-M3	M2-M3	–	–

0. Required Operating Parameters

A gear is required for hoisting application with the following rating:

- Load Classification S1
- Total operating time required 5000 running hours. i. E.
- class of utilisation T5
- Prime mover is D. C. motor
- Motor speed n_1 = 1500 min^{-1}
- Required output speed n_2 = 15 min^{-1}
- Nominal motor power PM = 100 kW
- Maximum motor torque $T_{M\ max}$ = 955 Nm (motor is driving gearbox input shaft)
- Maximum brake torque $T_{B\ max}$ = 1 200 Nm (at gear box input shaft)
- Absorbed torque at output shaft with T_L = 53000 Nm (maximum load on the hook)
- Loss of torque at output shaft losses at T_R = 2650 Nm (the output shaft amount to 5 % of the absorbed torque)
- Maximum static torque T_{maxS} = 115000 Nm (special occurrence)
- Lifting class H2
- Lifting speed v_H = 25 m/min
- Mass moment of inertia (not reduced) motor side:
  - Motor J = 1.2 kgm^2
  - Brake J = 0.85 kgm^2
  - Coupling J = 0.05 kgm^2
  - Equipment side: rope drum with load J = 7 000 kgm^2

1. Establish Gear Construction and Mounting

helical gear – foot mounted

2. Determine ratio required

$$\mathbf{i_{soli}} = \frac{\mathbf{n_1}}{\mathbf{n_2}} = \frac{1500}{15} = 100$$

nominal catalogue rating: $\mathbf{i_N}$ = 100

3. Determine gear size

3.1 Calculating the Maximum Torque

3.1.1 Acceleration

The acceleration torque as per equation will have to be differentiated for

T_L = 53000 Nm
T_R = 2650 Nm
T_M = 95500 Nm (= $T_{M\ max} \cdot i_N$)

φ_a for D.C. motor as table 4: φ_a = 1.2

$$\frac{\mathbf{J_a}}{\mathbf{J_a + J_m}} = 0.25$$

motor side

$$\mathbf{J_m} = \sum \mathbf{J \cdot i_N^2} = (1.2 + 0.85 + 0.05) \cdot 100^2 = 21000\ kgm^2$$

equipment side

$$\mathbf{J_a} = \sum \mathbf{J} = 7000\ kgm^2$$

T_{BS} = 68665 Nm

3.1.2 Braking

The acceleration torque as per equation will have to be differentiated for

T_B = 120000 Nm (= $T_{B\,max} \cdot i_N$)

φ_b for electrical braking as table 5: φ_b = 1.2

for other values see 3.1.1.

T_{BR} = -71245 Nm

3.1.3 Lifting of the deposited Load

The dynamic lifting torque is as per equation

ψ for lifting class H2 and speed v_H = 25 m/min as per Table 6: ψ = 1.31

for other values see 3.1.1.

T_{Ah} = 69430 Nm

3.1.4 Maximum Torque

maximum torque occurs when load braking.

T_{max} = 71245 Nm

3.2 Determining Gear Selection Factor

Gear selection factor is ascertained as per equation

f_r for class of utilisation T5 and load class L2 as per Table 1: f_r = 0.80
f_n for output speed n_2 = 15 min^{-1} as per Table 2: f_n = 1.1
f_k = 0.73

3.3 Ascertaining the Gearbox nominal Torque

The required gear box rated torque is determined by equation
(uniform load direction on the hoist gear) f_R = 1.0
for other values see 3.1.4 and 3.2

$T_{Kat} \geq$ 52009 Nm

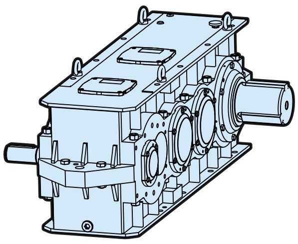
⇒ Gear size 35 with ratio i_N = 100: $T_{Kat} \geq$ 60400 Nm

3.4 Static check

The static check takes place with the maximum occurring torque. This can be either static torque TS or the maximum dynamic moment as per paragraph 3.1

T_S = 11500 Nm
T_{max} = 71245 Nm
T_{maxS} = 115000 Nm
f_{maxS} = 2
$T_{Kat} \geq$ 57500 Nm

⇒ Condition filled



Type		Size	i_N	T_{2N} [kNm]	η	Page
	ND	**18**	12.5 - 56	9	0.93	20
		20	18 - 80	13.7		
		22	12.5 - 56	17.5		
		25	18 - 80	25.5		
		28	12.5 - 56	35		
		31	18 - 80	49.1		
		35	12.5 - 56	64.2		
		40	16 - 71	89.7		
		42	12.5 - 56	109		
		45	16 - 71	138		
		47	20 - 90	176		
		50	12.5 - 56	201		
		53	16 - 71	244		
		56	5.6 - 25	297		
	NE	**18**	50 - 315	9.2	0.89	21
		20	71 - 450	13.7		
		22	63 - 224	17.5		
		25	80 - 280	25.5		
		28	50 - 315	35		
		31	71 - 450	49.1		
		35	50 - 315	64.2		
		40	63 - 400	89.7		
		42	50 - 315	109		
		45	63 - 400	138		
		47	80 - 500	176		
		50	50 - 315	201		
		53	63 - 400	244		
		56	80 - 500	297		

ND..-V Power

			ND..-V														Size
			18	20	22	25	28	31	35	40	42	45	47	50	53	56	Size
			9.2	13.7	17.5	25.5	35.0	49.1	64.2	89.7	109	138	176	201	244	297	T_{2N} [kNm]
i_N	n_1 [min^{-1}]	n_2 [min^{-1}]															
12.5	1500	120	115		222		433		794		1348			2486			
	1000	80	76		148		289		529		899			1657			
14	1500	107	102		196		387		705		1206			2223			
	1000	71	68		131		258		470		804			1482			
16	1500	94	91		175		344		622	839	1077	1381		1986	2521		
	1000	63	61		117		229		415	559	718	920		1324	1681		
18	1500	83	80	119	154	236	304	451	548	745	951	1239		1764	2254	2522	
	1000	56	54	79	103	157	202	301	365	497	634	826		1176	1503	1681	
20	1500	75	72	105	139	211	274	400	502	658	843	1100	1425	1563	2007	2254	
	1000	50	48	70	93	141	182	266	334	439	562	734	950	1042	1338	1502	
22.4	1500	67	63	94	122	186	239	355	440	580	741	976	1268	1373	1783	2011	
	1000	44.6	42	62	81	124	159	237	294	387	494	651	845	915	1188	1340	
25	1500	60	58	83	111	166	219	315	410	532	682	867	1133	1258	1577	1787	
	1000	40.0	39	55	74	110	146	210	273	354	455	578	755	839	1051	1192	
28	1500	54	51	75	98	149	193	284	361	467	605	761	1005	1120	1389	1576	
	1000	35.7	34	50	65	99	129	189	241	311	403	507	670	746	926	1051	
31.5	1500	47.6	46	65	89	130	175	248	315	435	532	699	889	984	1273	1388	
	1000	31.8	31	43	59	87	117	265	210	290	354	466	593	656	849	926	P_N [kW]
35.5	1500	42.3	40	60	77	119	152	226	290	384	482	621	783	892	1131	1275	
	1000	28.2	27	40	51	79	101	151	193	256	322	414	522	595	754	850	
40	1500	37.5	36	53	70	105	137	200	247	334	415	545	718	766	993	1132	
	1000	25.0	24	35	46	70	91	133	164	223	276	363	479	511	662	755	
45	1500	33.3	32	48	62	95	122	181	219	307	371	495	637	688	902	995	
	1000	22.2	22	32	42	64	82	121	146	205	248	330	425	459	601	663	
50	1500	30.0	29	41	56	83	108	157	198	261	341	425	560	624	776	902	
	1000	20.0	19	28	37	55	72	105	132	174	227	283	373	416	517	602	
56	1500	26.8	26	37	51	74	96	142	177	232	300	382	508	567	696	775	
	1000	17.9	17	25	34	50	64	94	118	155	200	254	339	378	464	517	
63	1500	23.8		33		67		127		210		350	437		631	695	
	1000	15.9		22		44		85		140		233	291		421	463	
71	1500	21.1		29		59		112		187		308	392		574	631	
	1000	14.1		20		40		74		125		205	261		382	421	
80	1500	18.8		27		54		100					359			574	
	1000	12.5		18		36		66					240			383	
90	1500	16.7											316				
	1000	11.1											211				

NE..-V Power

			NE..-V														
			18	20	22	25	28	31	35	40	42	45	47	50	53	56	Size
			9.2	13.7	17.5	25.5	35.0	49.1	64.2	89.7	109	138	176	201	244	297	T_{2N} [kNm]
i_N	n_1 [min^{-1}]	n_2 [min^{-1}]															
50	**1500**	30.0	29				109		196		329			605			P_N [kW]
	1000	20.0	19				72		131		219			403			
56	**1500**	26.8	26				97		174		296			542			
	1000	17.9	17				65		116		197			362			
63	**1500**	23.8	23		45		86		158	208	271	338		493	612		
	1000	15.9	15		30		57		105	139	181	225		328	408		
71	**1500**	21.1	20	30	40		76	113	137	185	234	303		418	549		
	1000	14.1	14	20	27		51	75	91	123	156	202		279	366		
80	**1500**	18.8	18	27	36	48	68	101	122	167	207	278	347	375	498	612	
	1000	12.5	12	18	24	32	45	67	81	111	138	185	232	250	332	408	
90	**1500**	16.7	16	24	32	43	60	89	110	145	190	236	311	340	423	549	
	1000	11.1	11	16	22	28	40	59	73	97	126	157	208	227	282	366	
100	**1500**	15.0	15	21	28	38	53	79	98	129	166	213	286	310	379	498	
	1000	10.0	10	14	19	25	36	52	65	86	111	142	191	206	253	332	
112	**1500**	13.4	13	19	25	35	49	71	88	116	149	195	242	279	345	424	
	1000	8.9	9	13	17	23	33	47	58	78	99	130	162	186	230	283	
125	**1500**	12.0	12	17	22	30	43	62	79	104	137	171	218	255	314	379	
	1000	8.0	8	11	15	20	29	41	53	69	91	114	145	170	209	253	
140	**1500**	10.7	10	15	20	27	38	55	71	93	120	153	200	232	284	346	
	1000	7.1	7	10	13	18	26	37	47	62	80	102	134	155	189	230	
160	**1500**	9.4	9	14	18	24	34	51	61	84	104	140	176	188	257	313	
	1000	6.3	6	9	12	16	23	34	41	56	69	93	117	125	171	209	
180	**1500**	8.3	8	12	16	22	31	45	55	75	93	123	157	169	234	284	
	1000	5.6	5	8	11	14	20	30	37	50	62	82	105	113	156	190	
200	**1500**	7.5	7	11	14	19	27	40	50	65	85	106	144	153	190	258	
	1000	5.0	5	7	9	13	18	27	33	43	57	71	96	102	126	172	
224	**1500**	6.7	6	9	13	17	24	35	44	58	75	95	126	139	170	234	
	1000	4.5	4	6	9	11	16	24	29	39	50	64	84	93	114	156	
250	**1500**	6.0	6	8		15	22	32	40	53	65	87	109	121	155	190	
	1000	4.0	4	5		10	15	21	27	35	44	58	73	81	103	127	
280	**1500**	5.4	5	7		14	19	28	36	47	60	77	98	110	141	171	
	1000	3.6	3	5		9	13	19	24	31	40	51	65	73	94	114	
315	**1500**	4.8	5	7			17	25	32	42	53	67	90	100	122	155	
	1000	3.2	3	4			11	17	21	28	35	45	60	66	81	103	
355	**1500**	4.2		6				23		38		62	79		111	141	
	1000	2.8		4				15		25		41	53		74	94	
400	**1500**	3.8		5				20		34		54	69		101	122	
	1000	2.5		4				13		23		36	46		67	81	
450	**1500**	3.3		5				18					63			111	
	1000	2.2		3				12					42			74	
500	**1500**	3.0											56			101	
	1000	2.0											37			67	

ND..-H Power

			ND..-H													
			20	23	25	29	31	36	40	43	45	47	51	53	56	Size
			13.7	19.4	25.5	37.5	49.1	71.0	89.7	119	138	176	220	244	297	T_{2N} [kNm]
i_N	n_1 [min^{-1}]	n_2 [min^{-1}]														
14	**1500**	107		221		430		791		1335			2486			P_N [kW]
	1000	71		147		287		527		890			1657			
16	**1500**	94		195		382		701	839	1191	1381		2215	2521		
	1000	63		130		255		468	559	794	920		1477	1681		
18	**1500**	83	119	174	236	339	451	623	745	1062	1239		1975	2254	2522	
	1000	56	79	116	157	226	301	415	497	708	826		1316	1503	1681	
20	**1500**	75	105	154	211	301	400	549	658	939	1100	1425	1754	2007	2254	
	1000	50	70	103	141	200	266	366	439	626	734	950	1169	1338	1502	
22.4	**1500**	67	94	139	186	270	355	502	580	831	976	1268	1550	1783	2011	
	1000	44.6	62	92	124	180	237	335	387	554	651	845	1033	1188	1340	
25	**1500**	60	83	121	166	237	315	439	532	733	867	1133	1366	1577	1787	
	1000	40.0	55	81	110	158	210	293	354	489	578	755	911	1051	1192	
28	**1500**	54	75	111	149	217	284	410	467	672	761	1005	1252	1389	1576	
	1000	35.7	50	74	99	144	189	273	311	448	507	670	835	926	1051	
31.5	**1500**	47.6	65	98	130	191	248	362	435	597	699	889	1111	1273	1388	
	1000	31.8	43	65	87	127	265	241	290	398	466	593	741	849	926	
35.5	**1500**	42.3	60	89	119	173	226	315	384	524	621	783	976	1131	1275	
	1000	28.2	40	59	79	115	151	210	256	349	414	522	651	754	850	
40	**1500**	37.5	53	77	105	150	200	290	334	476	545	718	886	993	1132	
	1000	25.0	35	51	70	100	133	193	223	317	363	479	591	662	755	
45	**1500**	33.3	48	69	95	135	181	247	307	409	495	637	763	902	995	
	1000	22.2	32	46	64	90	121	164	205	273	330	425	509	601	663	
50	**1500**	30.0	41	62	83	121	157	220	261	366	425	560	684	776	902	
	1000	20.0	28	41	55	81	105	146	174	244	283	373	456	517	602	
56	**1500**	26.8	37	55	74	107	142	198	232	337	382	508	620	696	775	
	1000	17.9	25	37	50	71	94	132	155	225	254	339	414	464	517	
63	**1500**	23.8	33	50	67	95	127	176	210	296	350	437	565	631	695	
	1000	15.9	22	34	44	63	85	118	140	197	233	291	376	421	463	
71	**1500**	21.1	29		59		112		187		308	392		574	631	
	1000	14.1	20		40		74		125		205	261		382	421	
80	**1500**	18.8	27		54		100					359			574	
	1000	12.5	18		36		66					240			383	
90	**1500**	16.7										316				
	1000	11.1										211				

NE..-H Power

			NE..-H													
			20	23	25	29	31	36	40	43	45	47	51	53	56	Size
			13.7	19.4	25.5	37.5	49.1	71.0	89.7	119	138	176	220	244	297	T_{2N} [kNm]
i_N	n_1 [min^{-1}]	n_2 [min^{-1}]														
56	**1500**	26.8				107		196		325			602			
	1000	17.9				72		131		217			401			
63	**1500**	23.8				96		174	208	292	338		540	612		
	1000	15.9				64		116	139	194	225		360	408		
71	**1500**	21.1	30	44		85	113	158	185	268	303		490	549		
	1000	14.1	20	30		56	75	105	123	179	202		327	366		
80	**1500**	18.8	27	40	48	75	101	137	167	227	278	347	416	498	612	
	1000	12.5	18	27	32	50	67	91	111	151	185	232	277	332	408	
90	**1500**	16.7	24	36	43	67	89	122	145	204	236	311	373	423	549	
	1000	11.1	16	24	28	45	59	81	97	136	157	208	249	282	366	
100	**1500**	15.0	21	32	38	59	79	110	129	187	213	286	339	379	498	
	1000	10.0	14	22	25	39	52	74	86	125	142	191	226	253	332	
112	**1500**	13.4	19	28	35	53	71	98	116	164	195	242	309	345	424	
	1000	8.9	13	18	23	35	47	65	78	109	130	162	206	230	283	
125	**1500**	12.0	17	25	30	48	62	88	104	147	171	218	279	314	379	
	1000	8.0	11	17	20	32	41	59	69	98	114	145	186	209	253	
140	**1500**	10.7	15	22	27	43	55	79	93	134	153	200	254	284	346	
	1000	7.1	10	15	18	28	37	53	62	90	102	134	169	189	230	
160	**1500**	9.4	14	20	24	38	51	71	84	118	140	176	230	257	313	
	1000	6.3	9	13	16	25	34	47	56	79	93	117	154	171	209	P_N [kW]
180	**1500**	8.3	12	18	22	34	45	62	75	102	123	157	187	234	284	
	1000	5.6	8	12	14	23	30	41	50	68	82	105	125	156	190	
200	**1500**	7.5	11	16	19	30	40	55	65	92	106	144	168	190	258	
	1000	5.0	7	11	13	20	27	37	43	81	71	96	112	126	172	
224	**1500**	6.7	9	14	17	27	35	50	58	84	95	126	152	170	234	
	1000	4.5	6	9	11	18	24	33	39	56	64	84	101	114	156	
250	**1500**	6.0	8	13	15	24	32	44	53	74	87	109	138	155	190	
	1000	4.0	5	9	10	16	21	29	35	49	58	73	92	103	127	
280	**1500**	5.4	7		14	22	28	40	47	64	77	98	120	141	171	
	1000	3.6	5		9	14	19	27	31	43	51	65	80	94	114	
315	**1500**	4.8	7			19	25	36	42	59	67	90	109	122	155	
	1000	3.2	4			13	17	24	28	39	45	60	73	81	103	
355	**1500**	4.2	6			17	23	32	38	52	62	79	99	111	141	
	1000	2.8	4			11	15	21	25	35	41	53	66	74	94	
400	**1500**	3.8	5				20		34		54	69		101	122	
	1000	2.5	4				13		23		36	46		67	81	
450	**1500**	3.3	5				18					63			111	
	1000	2.2	3				12					42			74	
500	**1500**	3.0										56			101	
	1000	2.0										37			67	

ND..-V

x3

i_N	ND..-V													
	18	20	22	25	28	31	35	40	42	45	47	50	53	56
12.5	12.6		12.4		12.7		12.7		12.7			12.7		
14	14.1		14.0		14.2		14.3		14.2			14.2		
16	15.9		15.7		16.0		16.2	16.8	15.9	15.7		15.9	15.2	
18	18.0	18.1	17.8	17.0	18.1	17.1	18.4	18.9	18.0	17.5		17.9	17.0	18.5
20	20.0	20.4	19.8	19.0	20.1	19.3	20.1	21.4	20.3	19.7	19.4	20.2	19.1	20.7
22.4	22.8	23.0	22.6	21.5	23.0	21.7	22.9	24.3	23.1	22.2	21.8	23.0	21.5	23.2
25	25.0	26.0	24.7	24.2	25.1	24.5	24.6	26.5	25.1	25.0	24.4	25.1	24.3	26.1
28	28.3	28.8	28.0	26.9	28.5	27.2	27.9	30.2	28.3	28.5	27.5	28.2	27.6	29.6
31.5	31.1	33.0	30.8	30.8	31.4	31.1	32.0	32.4	32.2	31.0	31.1	32.1	30.1	33.6
35.5	35.9	36.1	35.6	33.7	36.2	34.1	34.8	36.7	35.5	34.9	35.3	35.4	33.9	36.6
40	39.9	40.9	39.5	38.2	40.2	38.6	40.9	42.2	41.3	39.8	38.5	41.2	38.6	41.2
45	44.5	45.0	44.1	42.0	44.9	42.5	46.0	45.9	46.1	43.8	43.4	45.9	42.5	46.9
50	50.5	51.9	49.4	48.5	51.0	49.0	50.9	53.9	50.2	51.0	49.4	50.6	49.4	51.7
56	55.9	57.7	54.3	53.9	57.3	54.5	57.1	60.6	57.1	56.8	54.4	55.7	55.1	60.2
63		64.3		60.1		60.8		67.1		61.9	63.3		60.7	67.1
71		73.0		67.4		69.1		75.3		70.4	70.5		66.8	73.9
80		80.8		74.1		77.5					76.9			81.3
90											87.4			

NE..-V

x4

i_N	NE..-V													
	18	20	22	25	28	31	35	40	42	45	47	50	53	56
50	49.9				50.6		51.4		52.0			52.2		
56	55.7				56.4		57.8		57.9			58.2		
63	63.2		61.6		64.2		64.0	67.8	63.1	64.1		64.1	62.6	
71	70.7	72.1	68.7		72.4	68.5	73.6	76.3	73.3	71.5		75.5	69.8	
80	78.8	80.4	77.0	84.0	80.8	76.4	82.7	84.4	82.9	77.9	79.6	84.2	76.9	76.2
90	89.4	91.3	84.8	93.8	91.8	86.9	91.5	97.1	90.3	91.8	88.8	92.8	90.6	84.9
100	98.9	102	98.8	105	103	98.1	103	109	103	102	96.7	102	101	93.6
112	110	114	110	116	112	109	115	121	115	111	114	113	111	110
125	125	129	123	135	128	124	127	136	125	127	127	124	122	123
140	138	143	136	150	143	140	143	152	143	142	138	136	135	135
160	163	159	155	168	161	152	164	168	165	155	157	168	149	149
180	181	181	173	185	179	173	184	188	184	176	176	187	164	164
200	206	200	194	211	204	194	203	216	201	204	192	206	202	181
224	228	235	213	236	229	218	228	243	228	227	219	227	225	199
250	248	262		264	251	243	253	268	262	248	253	261	248	245
280	282	297		291	286	276	280	301	286	282	282	288	272	273
315	311	329			321	310	314	333	325	323	307	317	314	301
355		358				340		369		352	350		346	331
400		407				387		414		401	402		380	382
450		450				434					438			421
500											498			462

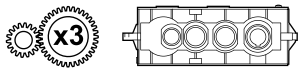
ND..-H

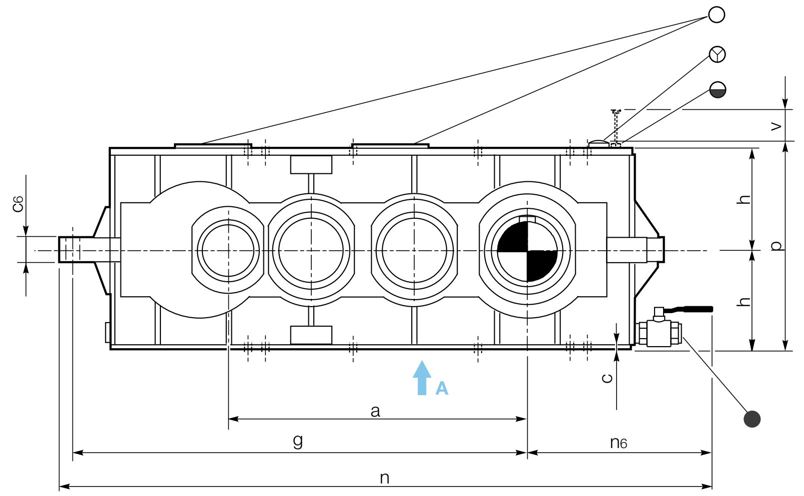
i_N	ND..-H												
	20	23	25	29	31	36	40	43	45	47	51	53	56
14		13.8		13.7		14.1		14.0			13.9		
16		15.6		15.4		15.9	16.8	15.7	15.7		15.6	15.2	
18	18.1	17.5	17.0	17.4	17.1	17.9	18.9	17.6	17.5		17.5	17.0	18.5
20	20.4	19.8	19.0	19.6	19.3	20.3	21.4	19.9	19.7	19.4	19.7	19.1	20.7
22.4	23.0	22.0	21.5	21.8	21.7	22.2	24.3	22.5	22.2	21.8	22.3	21.5	23.2
25	26.0	25.1	24.2	24.9	24.5	25.4	26.5	25.5	25.0	24.4	25.3	24.3	26.1
28	28.8	27.5	26.9	27.2	27.2	27.2	30.2	27.8	28.5	27.5	27.6	27.6	29.6
31.5	33.0	31.2	30.8	30.9	31.1	30.8	32.4	31.3	31.0	31.1	31.1	30.1	33.6
35.5	36.1	34.3	33.7	34.0	34.1	35.4	36.7	35.7	34.9	35.3	35.4	33.9	36.6
40	40.9	39.6	38.2	39.2	38.6	38.5	42.2	39.3	39.8	38.5	39.0	38.6	41.2
45	45.0	44.0	42.0	43.6	42.5	45.2	45.9	45.7	43.8	43.4	45.3	42.5	46.9
50	51.9	49.1	48.5	48.6	49.0	50.8	53.9	51.0	51.0	49.4	50.5	49.4	51.7
56	57.7	55.0	53.9	55.3	54.5	56.3	60.6	55.5	56.8	54.4	55.7	55.1	60.2
63	64.3	60.5	60.1	62.0	60.8	63.2	67.1	63.1	61.9	63.3	61.2	60.7	67.1
71	73.0		67.4		69.1		75.3		70.4	70.5		66.8	73.9
80	80.8		74.1		77.5					76.9			81.3
90										87.4			

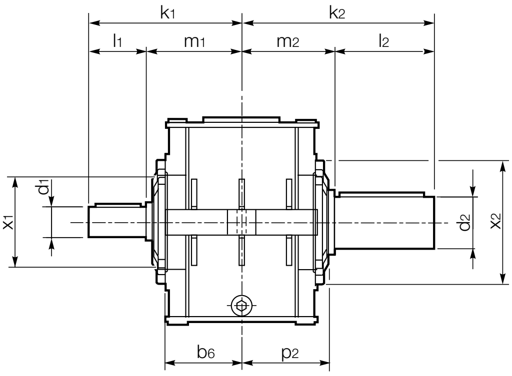
NE..-H

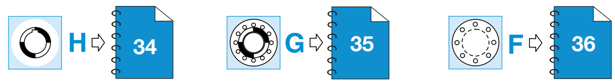
i_N	NE..-H												
	20	23	25	29	31	36	40	43	45	47	51	53	56
56				54.8		56.9		57.5			57.4		
63				61.1		64.0	67.8	64.1	64.1		64.0	62.6	
71	72.1	68.6		69.5	68.5	70.8	76.3	69.8	71.5		70.5	69.8	
80	80.4	76.5	84.0	78.4	76.4	81.4	84.4	82.3	77.9	79.6	83.1	76.9	76.2
90	91.3	85.8	93.8	87.5	86.9	91.5	97.1	91.7	91.8	88.8	92.6	90.6	84.9
100	102	94.4	105	99.5	98.1	101	109	99.9	102	96.7	102	101	93.6
112	114	110	116	112	109	114	121	114	111	114	112	111	110
125	129	123	135	122	124	127	136	127	127	127	124	122	123
140	143	138	150	138	140	141	152	139	142	138	136	135	135
160	159	151	168	155	152	158	168	158	155	157	150	149	149
180	181	173	185	174	173	181	188	183	176	176	185	164	164
200	200	193	211	194	194	203	216	204	204	192	206	202	181
224	235	216	236	221	218	225	243	222	227	219	227	225	199
250	262	237	264	248	243	253	268	253	248	253	250	248	245
280	297		291	272	276	280	301	290	282	282	288	272	273
315	329			309	310	309	333	316	323	307	317	314	301
355	358			347	340	347	369	359	352	350	349	346	331
400	407				387		414		401	402		380	382
450	450				434					438			421
500										498			462

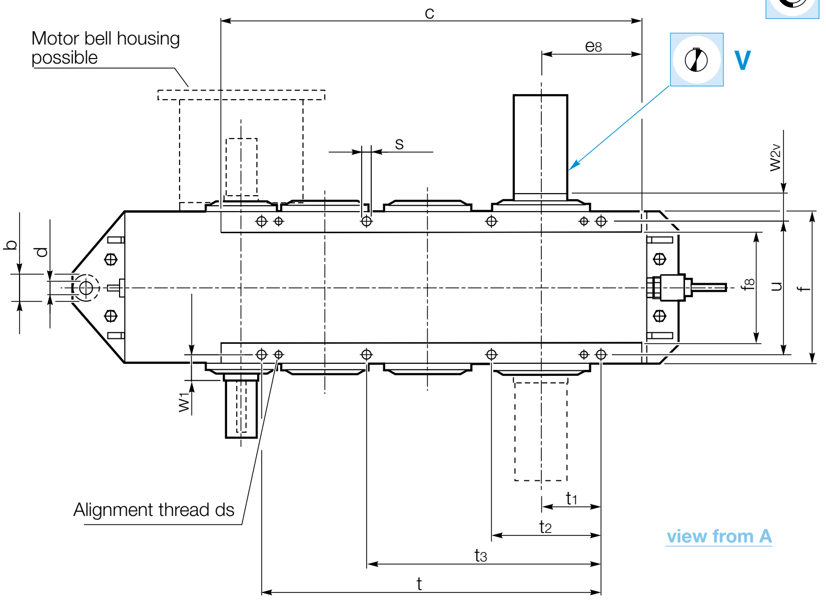
ND.. -R1..-V



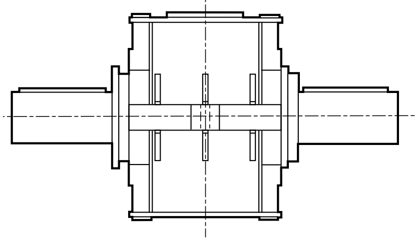








Hub mounting possible



Keys to DIN 6885/1

ND.. -R1..-V

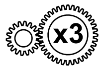
	Input shaft					Output shaft				
	Ø d_1	k_1	l_1	m_1	Ø x_1	Ø d_2 m6	k_2	l_2	m_2	Ø x_2
ND 18..-V	45 k6	275	120	155	–	95	350	170	180	–
ND 20..-V	45 k6	275	120	155	–	120	370	190	180	–
ND 22..-V	60	337	140	197	195	130	405	190	215	–
ND 25..-V	60	337	140	197	195	145	450	230	220	296
ND 28..-V	70	369	140	229	205	160	480	230	250	328
ND 31..-V	70	369	140	229	205	175	540	290	250	348
ND 35..-V	90	446	180	266	255	155	570	290	280	328
ND 40..-V	90	446	180	266	255	175	570	290	280	348
ND 42..-V	100	537	215	322	328	195	650	330	320	400
ND 45..-V	100	537	215	322	328	210	730	410	320	440
ND 47..-V	100	537	215	322	328	230	730	410	320	440
ND 50..-V	120	600	215	385	348	250	795	410	385	480
ND 53..-V	120	600	215	385	348	250	795	410	385	480
ND 56..-V	120	600	215	385	348	270	845	460	385	540

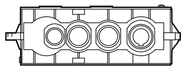
	Casing															
	a	b_{max}	b_6	c	c_6	Ø d_{H9}	e	e_8	f	f_8	g	h -0.2	n	n_6	p	p_2
ND 18..-V	449	50	147	16	42	26	620	155	280	210	684	190	1059	350	402	–
ND 20..-V	503	50	147	16	42	26	680	185	280	210	738	225	1144	381	472	–
ND 22..-V	577	70	179	16	52	33	775	190	346	266	940	235	1423	448	492	–
ND 25..-V	635	70	179	16	52	33	840	220	346	266	998	265	1511	478	552	204
ND 28..-V	712	70	210	18	62	33	910	210	406	316	1115	280	1643	493	582	246
ND 31..-V	780	70	210	18	62	33	1050	280	406	316	1183	315	1746	528	652	239
ND 35..-V	875	80	225	19	74	39	1245	310	438	338	1335	300	1932	557	622	262
ND 40..-V	952	80	225	19	74	39	1365	370	438	338	1412	375	2062	610	772	262
ND 42..-V	1064	80	265	19	90	39	1470	345	514	404	1595	355	2251	616	732	303
ND 45..-V	1130	80	265	19	90	39	1570	380	514	404	1661	425	2331	630	872	303
ND 47..-V	1216	80	265	19	90	39	1720	465	514	404	1747	500	2504	717	1022	303
ND 50..-V	1315	90	320	28	110	45	1765	400	620	500	1945	450	2702	712	922	358
ND 53..-V	1386	90	320	28	110	45	1910	475	620	500	2016	500	2780	719	1022	358
ND 56..-V	1479	90	320	28	110	45	2100	570	620	500	2109	600	2972	818	1222	365

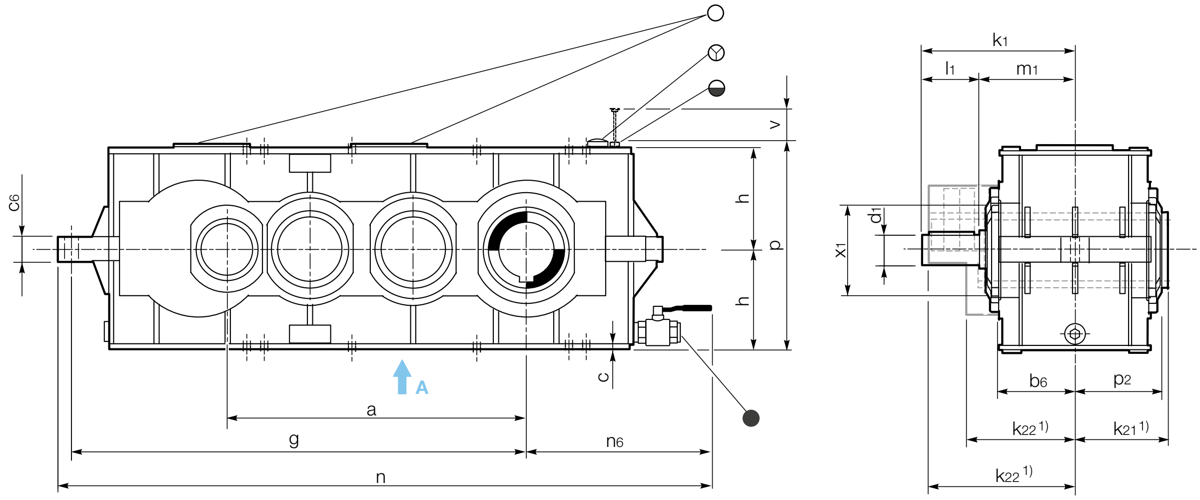
	Fitting									OIL	*
	Ø s	d_s x l_{max} 1)	t	t_1	t_2	t_3	u	v	w_1	w_{2v}	[l]	
ND 18..-V	14.5	M12x55	486	87	175	–	248	260	31	56	345	20
ND 20..-V	14.5	M12x90	596	143	285	–	248	300	31	56	375	25
ND 22..-V	18.5	M16x70	622	113	226	–	306	300	44	62	510	35
ND 25..-V	18.5	M16x100	736	169	340	–	306	330	44	67	610	45
ND 28..-V	24	M20x90	752	132	265	–	360	350	49	70	780	60
ND 31..-V	24	M20x120	889	201	402	–	360	390	49	70	1050	80
ND 35..-V	24	M20x100	1005	190	325	695	396	400	68	82	1470	70
ND 40..-V	24	M20x130	1157	265	477	847	396	470	68	82	1680	90
ND 42..-V	28	M24x120	1230	225	390	820	460	470	92	90	2150	110
ND 45..-V	28	M24x140	1356	285	516	946	460	540	92	90	2400	150
ND 47..-V	28	M24x250	1527	370	687	1117	460	620	92	90	3000	210
ND 50..-V	35	M30x140	1524	280	504	1014	560	590	105	105	4250	230
ND 53..-V	35	M30x200	1670	355	650	1160	560	640	105	105	4600	290
ND 56..-V	35	M30x250	1858	450	838	1348	560	740	105	105	5500	400

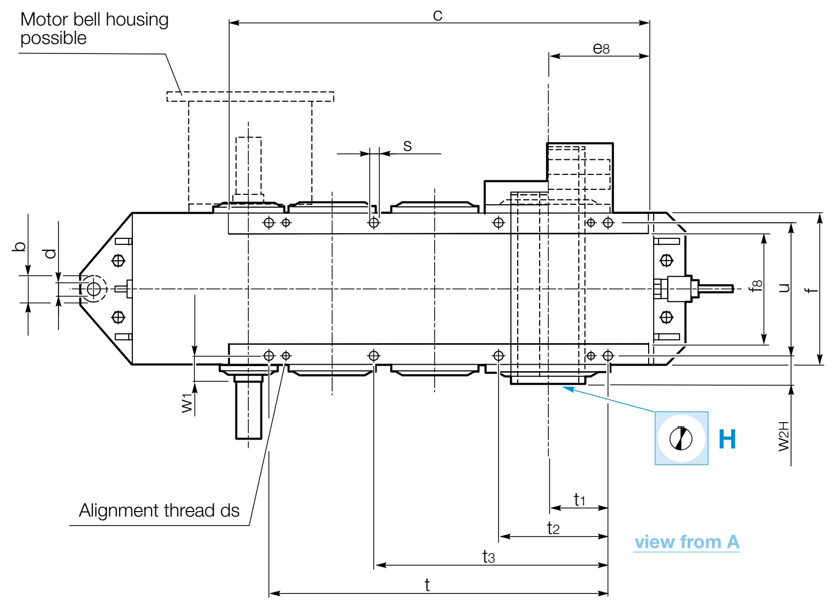
1) Maximum screw length.
***Provided weight values are without oil filling and may differ slightly according to specific product configuration.**

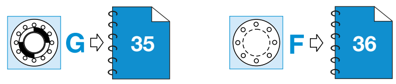
ND.. -R1..-H



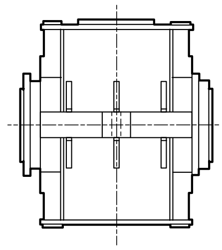








Hub mounting possible



Keys to DIN 6885/1

1) Hollow shaft and machine shaft see dimensions in page 34 (Hollow Shaft with keyway) or 35 (Hollow Shaft with Shrink Disc)

ND.. -R1..-H

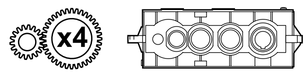
	Input shaft				
	Ø d_1	k_1	l_1	m_1	Ø x_1
ND 20..-H	45 k6	275	120	155	–
ND 23..-H	60	337	140	197	195
ND 25..-H	60	337	140	197	195
ND 29..-H	70	369	140	229	205
ND 31..-H	70	369	140	229	205
ND 36..-H	90	446	180	266	255
ND 40..-H	90	446	180	266	255
ND 43..-H	100	537	215	322	328
ND 45..-H	100	537	215	322	328
ND 47..-H	100	537	215	322	328
ND 51..-H	120	600	215	385	348
ND 53..-H	120	600	215	385	348
ND 56..-H	120	600	215	385	348

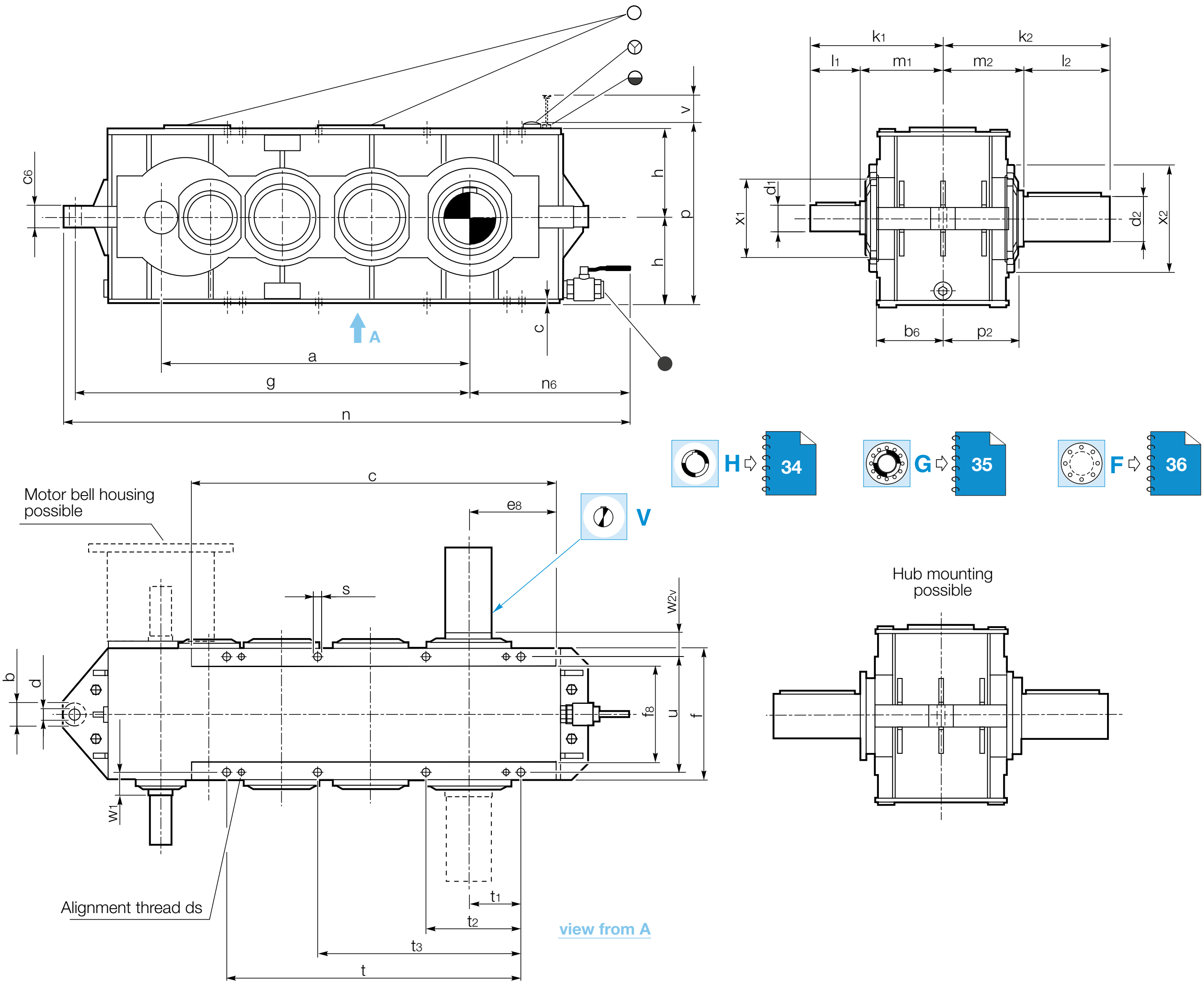
	Casing															
	a	b_{max}	b_6	c	c_6	Ø d_{H9}	e	e_8	f	f_8	g	h -0.2	n	n_6	p	p_2
ND 20..-H	503	50	147	16	42	26	680	185	280	210	738	225	1144	381	472	–
ND 23..-H	591	70	179	16	52	33	775	176	346	266	954	235	1423	434	492	–
ND 25..-H	635	70	179	16	52	33	840	220	346	266	998	265	1511	478	552	204
ND 29..-H	727	70	210	18	62	33	910	195	406	316	1130	280	1643	478	582	246
ND 31..-H	780	70	210	18	62	33	1050	280	406	316	1183	315	1746	528	652	239
ND 36..-H	899	80	225	19	74	39	1245	286	438	338	1359	300	1932	533	622	262
ND 40..-H	952	80	225	19	74	39	1365	370	438	338	1412	375	2062	610	772	262
ND 43..-H	1091	80	265	19	90	39	1470	318	514	404	1622	355	2251	589	732	303
ND 45..-H	1130	80	265	19	90	39	1570	380	514	404	1661	425	2331	630	872	303
ND 47..-H	1216	80	265	19	90	39	1720	465	514	404	1747	500	2504	717	1022	303
ND 51..-H	1349	90	320	28	110	45	1765	366	620	500	1979	450	2702	678	922	358
ND 53..-H	1386	90	320	28	110	45	1910	475	620	500	2016	500	2780	719	1022	358
ND 56..-H	1479	90	320	28	110	45	2100	570	620	500	2109	600	2972	818	1222	365

	Fitting										OIL	*
	Ø s	d_s x l_{max}[1)]	t	t_1	t_2	t_3	u	v	w_1	w_{2H}	[l]	
ND 20..-H	14,5	M12x90	596	143	285	–	248	300	31	33	375	25
ND 23..-H	18,5	M16x70	622	99	226	–	306	300	44	36	510	35
ND 25..-H	18,5	M16x100	736	169	340	–	306	330	44	62	610	45
ND 29..-H	24	M20x90	752	117	265	–	360	350	49	70	780	60
ND 31..-H	24	M20x120	889	201	402	–	360	390	49	70	1050	80
ND 36..-H	24	M20x100	1005	166	325	695	396	400	68	87	1470	70
ND 40..-H	24	M20x130	1157	265	477	847	396	470	68	87	1680	90
ND 43..-H	28	M24x120	1230	198	390	820	460	470	92	85	2150	110
ND 45..-H	28	M24x140	1356	285	516	946	460	540	92	90	2400	150
ND 47..-H	28	M24x250	1527	370	687	1117	460	620	92	100	3000	210
ND 51..-H	35	M30x140	1524	246	504	1014	560	590	105	110	4250	230
ND 53..-H	35	M30x200	1670	355	650	1160	560	640	105	110	4600	290
ND 56..-H	35	M30x250	1858	450	838	1348	560	740	105	110	5500	400

[1)] Maximum screw length.
***Provided weight values are without oil filling and may differ slightly according to specific product configuration.**

NE.. -R1..-V





Keys to DIN 6885/1

NE.. -R1..-V

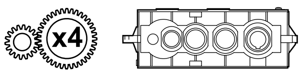
	Input shaft										Output shaft				
	i_N	Ø d_1 m6	k_1	l_1	i_N	Ø d_1 m6	k_1	l_1	m_1	Ø x_1	Ø d_2 m6	k_2	l_2	m_2	Ø x_2
NE 18..-V	50...140	35 k6	283	100	160...315	30 k6	283	100	183	–	95	350	170	180	–
NE 20..-V	71...200	35 k6	283	100	224...450	30 k6	283	100	183	–	120	370	190	180	–
NE 22..-V	63...140	50 k6	347	120	160...224	40 k6	347	120	227	130	130	405	190	215	–
NE 25..-V	80...180	50 k6	347	120	200...280	40 k6	347	120	227	130	145	450	230	220	296
NE 28..-V	50...140	50 k6	362	120	160...315	40 k6	362	120	242	–	160	480	230	250	328
NE 31..-V	71...200	50 k6	362	120	224...450	40 k6	362	120	242	–	175	540	290	250	348
NE 35..-V	50...140	70	435	145	160...315	50 k6	415	125	290	205	155	570	290	280	328
NE 40..-V	63...180	70	435	145	200...400	50 k6	415	125	290	205	175	570	290	280	348
NE 42..-V	50...140	80	508	170	160...315	65	483	145	338	245	195	650	330	320	400
NE 45..-V	63...180	80	508	170	200...400	65	483	145	338	245	210	730	410	320	440
NE 47..-V	80...224	80	508	170	250...500	65	483	145	338	245	230	730	410	320	440
NE 50..-V	50...315	100	595	215	–	–	–	–	380	290	250	795	410	385	480
NE 53..-V	63...400	100	595	215	–	–	–	–	380	290	250	795	410	385	480
NE 56..-V	80...500	100	595	215	–	–	–	–	380	290	270	845	460	385	540

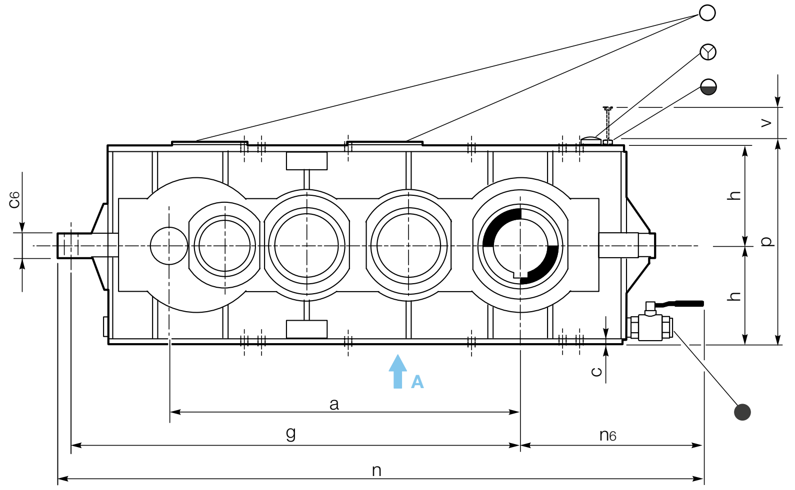
	Casing														
	a	b_{max}	b_6	c	c_6	Ø d_{H9}	e	e_8	f	f_8	g	h -0.2	n	n_6	p	p_2
NE 18..-V	543	50	147	16	42	26	620	155	280	210	684	190	1059	350	402	–
NE 20..-V	597	50	147	16	42	26	680	185	280	210	738	225	1144	381	472	–
NE 22..-V	693	70	179	16	52	33	775	190	346	266	940	235	1423	448	492	–
NE 25..-V	751	70	179	16	52	33	840	220	346	266	998	265	1511	478	552	204
NE 28..-V	839	70	210	18	62	33	910	210	406	316	1115	280	1643	493	582	246
NE 31..-V	907	70	210	18	62	33	1050	280	406	316	1183	315	1746	528	652	239
NE 35..-V	1039	80	225	19	74	39	1245	310	438	338	1335	300	1932	557	622	262
NE 40..-V	1116	80	225	19	74	39	1365	370	438	338	1412	375	2062	610	772	262
NE 42..-V	1265	80	265	19	90	39	1470	345	514	404	1595	355	2251	616	732	303
NE 45..-V	1331	80	265	19	90	39	1570	380	514	404	1661	425	2331	630	872	303
NE 47..-V	1417	80	265	19	90	39	1720	465	514	404	1747	500	2504	717	1022	303
NE 50..-V	1562	90	320	28	110	45	1765	400	620	500	1945	450	2702	712	922	358
NE 53..-V	1633	90	320	28	110	45	1910	475	620	500	2016	500	2780	719	1022	358
NE 56..-V	1726	90	320	28	110	45	2100	570	620	500	2109	600	2972	818	1222	365

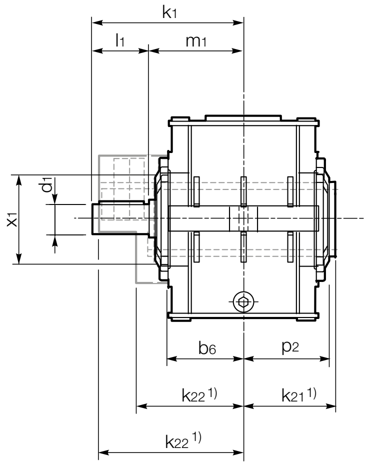
	Fitting										OIL	*
	Ø s	d_s x l_{max} 1)	t	t_1	t_2	t_3	u	v	w_1	w_{2v}	[l]	
NE 18..-V	14.5	M12x55	486	87	175	–	248	260	31	56	345	20
NE 20..-V	14.5	M12x90	596	143	285	–	248	300	31	56	375	25
NE 22..-V	18.5	M16x70	622	113	226	–	306	300	44	62	510	35
NE 25..-V	18.5	M16x100	736	169	340	–	306	330	44	67	610	45
NE 28..-V	24	M20x90	752	132	265	–	360	350	49	70	780	60
NE 31..-V	24	M20x120	889	201	402	–	360	390	49	70	1050	80
NE 35..-V	24	M20x100	1005	190	325	695	396	400	68	82	1470	70
NE 40..-V	24	M20x130	1157	265	477	847	396	470	68	82	1680	90
NE 42..-V	28	M24x120	1230	225	390	820	460	470	92	90	2150	110
NE 45..-V	28	M24x140	1356	285	516	946	460	540	92	90	2400	150
NE 47..-V	28	M24x250	1527	370	687	1117	460	620	92	90	3000	210
NE 50..-V	35	M30x140	1524	280	504	1014	560	590	105	105	4250	230
NE 53..-V	35	M30x200	1670	355	650	1160	560	640	105	105	4600	290
NE 56..-V	35	M30x250	1858	450	838	1348	560	740	105	105	5500	400

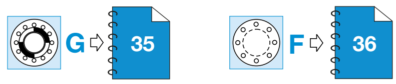
1) Maximum screw length.
***Provided weight values are without oil filling and may differ slightly according to specific product configuration.**

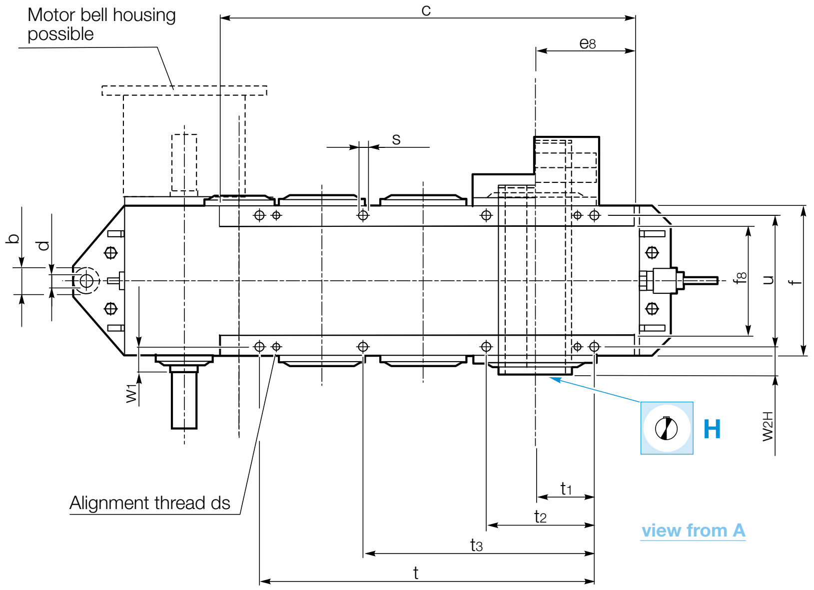
NE.. -R1..-H



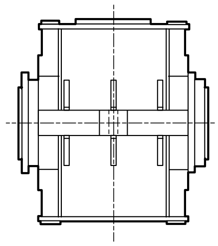








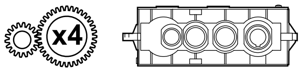
Hub mounting possible



Keys to DIN 6885/1

1) Hollow shaft and machine shaft see dimensions in page 34 (Hollow Shaft with keyway) or 35 (Hollow Shaft with Shrink Disc)

NE.. -R1..-H



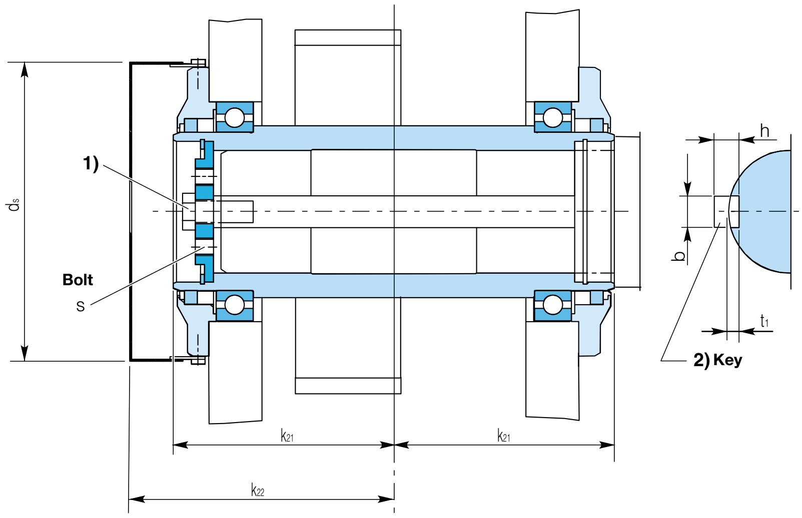
	Input shaft				Output shaft					
	i_N	Ø d_1 m6	k_1	l_1	i_N	Ø d_2 m6	k_2	l_2	m_2	Ø x_2
NE 20..-H	71...200	35 k6	283	100	224...450	30 k6	283	100	183	–
NE 23..-H	71...160	50 k6	347	120	180...250	40 k6	347	120	227	130
NE 25..-H	80...180	50 k6	347	120	200...280	40 k6	347	120	227	130
NE 29..-H	56...160	50 k6	362	120	180...355	40 k6	362	120	242	–
NE 31..-H	71...200	50 k6	362	120	224...450	40 k6	362	120	242	–
NE 36..-H	56...160	70	435	145	180...355	50 k6	415	125	290	205
NE 40..-H	63...180	70	435	145	200...400	50 k6	415	125	290	205
NE 43..-H	56...160	80	508	170	180...355	65	483	145	338	245
NE 45..-H	63...180	80	508	170	200...400	65	483	145	338	245
NE 47..-H	80...224	80	508	170	250...500	65	483	145	338	245
NE 51..-H	56...355	100	595	215	–	–	–	–	380	290
NE 53..-H	63...400	100	595	215	–	–	–	–	380	290
NE 56..-H	80...500	100	595	215	–	–	–	–	380	290

	Casing														
	a	b_{max}	b_6	c	c_6	Ø d_{H9}	e	e_8	f	f_8	g	h -0.2	n	n_6	p	p_2
NE 20..-H	597	50	147	16	42	26	680	185	280	210	738	225	1144	381	472	–
NE 23..-H	707	70	179	16	52	33	775	176	346	266	954	235	1423	434	492	–
NE 25..-H	751	70	179	16	52	33	840	220	346	266	998	265	1511	478	552	204
NE 29..-H	854	70	210	18	62	33	910	195	406	316	1130	280	1643	478	582	246
NE 31..-H	907	70	210	18	62	33	1050	280	406	316	1183	315	1746	528	652	239
NE 36..-H	1063	80	225	19	74	39	1245	286	438	338	1359	300	1932	533	622	262
NE 40..-H	1116	80	225	19	74	39	1365	370	438	338	1412	375	2062	610	772	262
NE 43..-H	1292	80	265	19	90	39	1470	318	514	404	1622	355	2251	589	732	303
NE 45..-H	1331	80	265	19	90	39	1570	380	514	404	1661	425	2331	630	872	303
NE 47..-H	1417	80	265	19	90	39	1720	465	514	404	1747	500	2504	717	1022	303
NE 51..-H	1596	90	320	28	110	45	1765	366	620	500	1979	450	2702	678	922	358
NE 53..-H	1633	90	320	28	110	45	1910	475	620	500	2016	500	2780	719	1022	358
NE 56..-H	1726	90	320	28	110	45	2100	570	620	500	2109	600	2972	818	1222	365

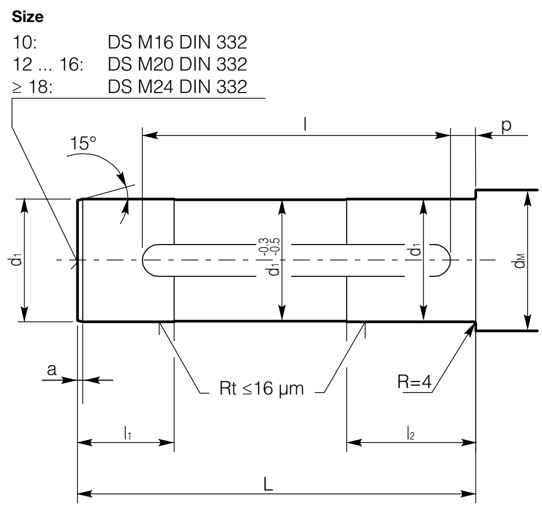
	Fitting										OIL	*
	Ø s	d_s x l_{max} 1)	t	t_1	t_2	t_3	u	v	w_1	w_{2H}	[l]	
NE 20..-H	14.5	M12x90	596	143	285	–	248	300	31	33	350	20
NE 23..-H	18.5	M16x70	622	99	226	–	306	300	74	36	380	25
NE 25..-H	18.5	M16x100	736	169	340	–	306	330	74	62	510	35
NE 29..-H	24	M20x90	752	117	265	–	360	350	62	70	610	45
NE 31..-H	24	M20x120	889	201	402	–	360	390	62	70	680	60
NE 36..-H	24	M20x100	1005	166	325	695	396	400	92	87	1050	80
NE 40..-H	24	M20x130	1157	265	477	847	396	470	92	87	1470	70
NE 43..-H	28	M24x120	1230	198	390	820	460	470	108	85	1680	90
NE 45..-H	28	M24x140	1356	285	516	946	460	540	108	90	2150	110
NE 47..-H	28	M24x250	1527	370	687	1117	460	620	108	100	2400	150
NE 51..-H	35	M30x140	1524	246	504	1014	560	590	100	110	300	210
NE 53..-H	35	M30x200	1670	355	650	1160	560	640	100	110	4250	230
NE 56..-H	35	M30x250	1858	450	838	1348	560	740	100	110	5500	400

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

H



Design of hollow shaft



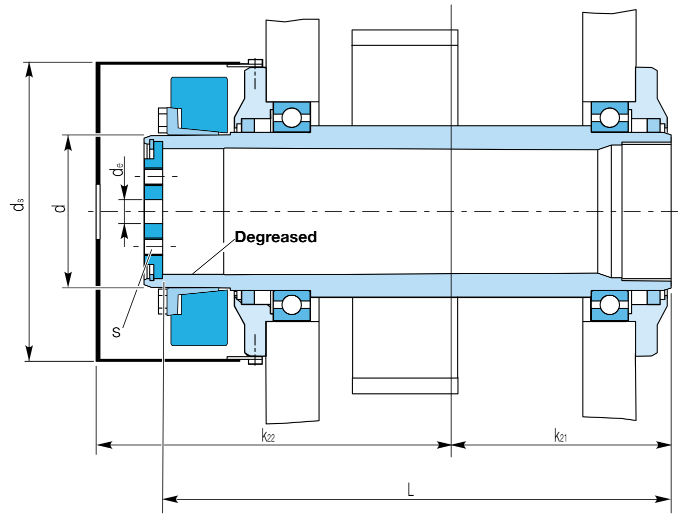
Design of machine shaft

		a	Ø d_1	Ø d_M min	Ø d_s	k_{21}	k_{22}	l_1	l_2	L	l min	p	t_1	s	Bolt [1] ISO4014	Key [2] b x h
ND NE	**20**	5	100 h6	120	285	157	173	80	109	276	220	24	10	M 16	M 24 x 65	28 x 16
	23	5	110 h6	128	285	189	205	90	119	340	280	24	10	M 16	M 24 x 65	28 x 16
	25	6	130 h6	150	310	215	250	100	132	388	280	26	11	M 20	M 24 x 70	32 x 18
	29	6	140 h6	160	340	250	300	110	147	453	320	29	12	M 20	M 24 x 70	36 x 20
	31	6	160 h6	180	365	250	300	125	162	453	320	27	13	M 20	M 24 x 70	40 x 22
	36	6	170 h6	190	380	285	320	135	180	515	400	35	13	M 20	M 24 x 70	40 x 22
	40	6	190 h6	210	410	285	320	150	195	515	400	32	15	M 20	M 24 x 70	45 x 25
	43	6	200 h6	220	470	315	360	160	215	565	400	40	15	M 20	M 24 x 70	45 x 25
	45	6	220 h6	240	495	320	360	175	225	578	400	34	17	M 20	M 24 x 70	50 x 28
	47	6	235 h6	255	540	330	355	190	235	603	400	26	20	M 20	M 24 x 70	56 x 32
	51	6	250 h6	270	570	390	425	205	250	723	400	26	20	M 20	M 24 x 70	56 x 32
	53	6	270 h6	290	615	390	600	220	275	715	400	25	20	M 20	M 24 x 70	63 x 32
	56	6	290 h6	310	615	390	600	235	290	715	400	25	20	M 20	M 24 x 70	63 x 32

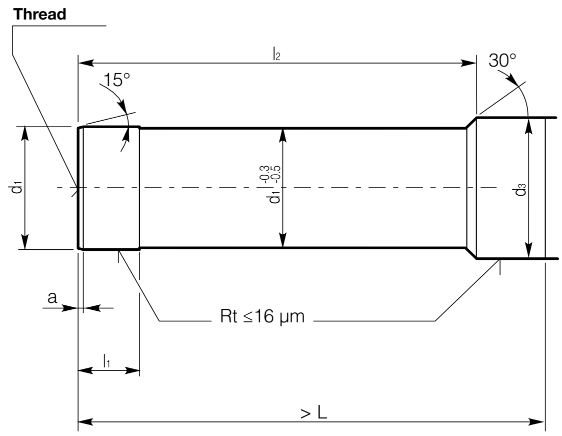
[1] Key of machine shaft and secured bolt are not in scope of delivery.
[2] Type of tolerance of the keyway width in the hollow shaft: P9.

Dimensions of hollow and machine shafts for grease lubricated labyrinth seals: on request.

G



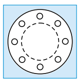
Mounting of shrink disc



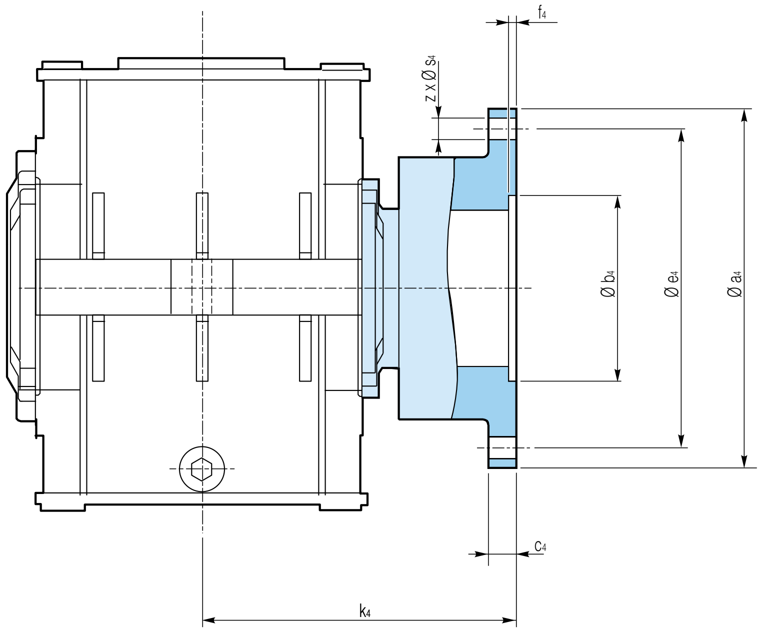
Design of machine shaft

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

		Hollow shaft							Machine shaft				
		Ø d_s	**k_{21}**	**k_{22}**	**Ø d**	**Ø d_e**	**s**	**L**	**a**	**Ø d_1**	**Ø d_3**	**l_1**	**l_2**
	20	250	157	247	130	27	M 16	371	5	100 h6	105 f6	54	324
	23	250	189	279	140	27	M 16	443	5	110 h6	115 f6	58	392
	25	315	215	340	170	27	M 20	504	6	130 h6	135 f6	70	442
	29	345	250	360	180	33	M 20	576	6	140 h6	150 f6	70	514
	31	365	250	375	200	33	M 20	594	6	160 h6	170 f6	85	517
ND	**36**	385	285	430	220	33	M 20	677	6	170 g6	180 f6	104	581
	40	420	285	435	240	33	M 20	682	6	190 g6	200 f6	108	582
NE	**43**	470	315	475	260	33	M 20	750	6	210 g6	220 f6	119	639
	45	500	320	485	280	33	M 20	763	6	230 g6	240 f6	130	641
	47	540	330	515	300	33	M 20	800	6	245 g6	250 f6	138	670
	51	555	390	574	320	33	M 20	918	6	260 g6	270 f6	138	788
	53	615	390	600	340	33	M 20	933	6	270 g6	280 f6	152	789
	56	615	390	600	360	33	M 20	939	6	290 g6	300 f6	158	789



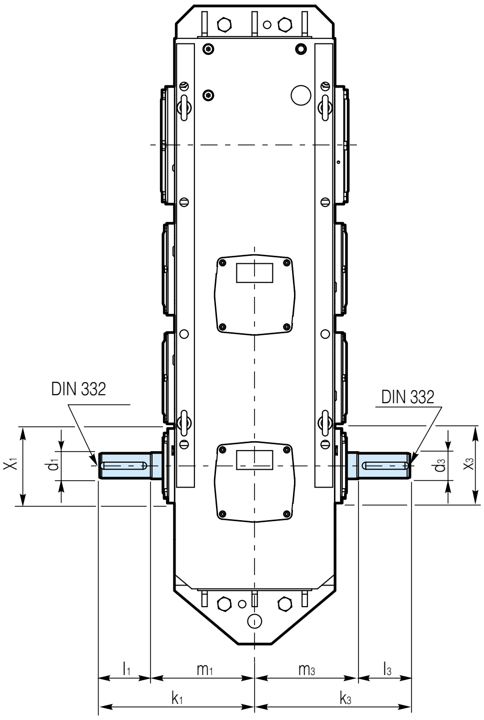
F



		k_4	a_4	e_4	b_4	f_4	c_4	z	s_4	Bolt [1]
ND NE	18	265	360	320	150 H7	10	25	16	22	M20x70
	20	275	360	320	160 H7	10	25	18	22	M20x70
	22	320	370	320	180 H7	10	30	16	26	M24x90
	25	345	390	340	190 H7	10	30	18	26	M24x90
	28	387	470	420	220 H7	12	38	20	26	M24x100
	31	397	500	450	240 H7	12	38	22	26	M24x100
	35	On request.								
	40									
	42									
	45									
	47									
	50									
	53									
	56									

[1] **Minimum bolt property class 8.8 according to ISO 898.**

ND

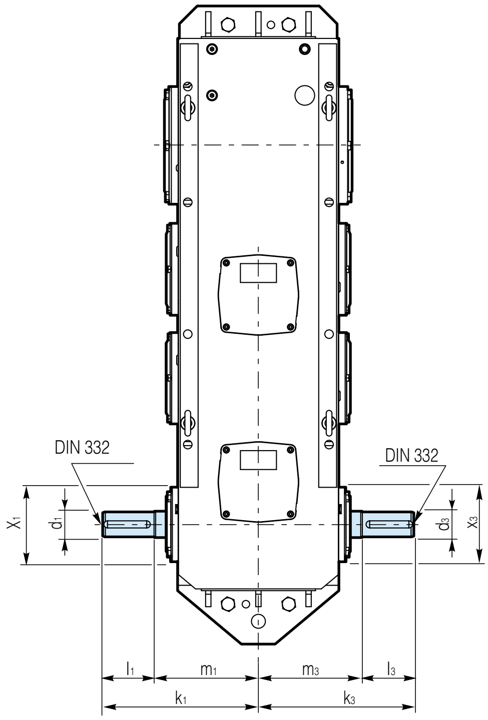


Keys to DIN 6885/1

<table>
<tr><th rowspan="2"></th><th colspan="11">Input shaft</th></tr>
<tr><th>i_N</th><th>Ø d_1</th><th>k_1</th><th>l_1</th><th>m_1</th><th>Øx_1</th><th>Ø d_3</th><th>k_3</th><th>l_3</th><th>m_3</th><th>Øx_3</th></tr>
<tr><td rowspan="2">ND 18</td><td>12.5...45</td><td rowspan="4">45 k6</td><td rowspan="4">275</td><td rowspan="4">120</td><td rowspan="4">155</td><td rowspan="4">–</td><td>45 k6</td><td>275</td><td>120</td><td rowspan="4">155</td><td rowspan="4">–</td></tr>
<tr><td>50...56</td><td>30 k6</td><td>255</td><td>100</td></tr>
<tr><td rowspan="2">ND 20</td><td>18...63</td><td>45 k6</td><td>275</td><td>120</td></tr>
<tr><td>71...80</td><td>30 k6</td><td>255</td><td>100</td></tr>
<tr><td rowspan="2">ND 22</td><td>12.5...45</td><td rowspan="6">60 m6</td><td rowspan="6">337</td><td rowspan="12">140</td><td rowspan="6">197</td><td rowspan="6">195</td><td>60 m6</td><td>337</td><td>140</td><td rowspan="6">197</td><td rowspan="6">195</td></tr>
<tr><td>50...56</td><td>40 k6</td><td>317</td><td>120</td></tr>
<tr><td rowspan="2">ND 23</td><td>14...50</td><td>60 m6</td><td>337</td><td>140</td></tr>
<tr><td>56...63</td><td>40 k6</td><td>317</td><td>120</td></tr>
<tr><td rowspan="2">ND 25</td><td>18...63</td><td>60 m6</td><td>337</td><td>140</td></tr>
<tr><td>71...80</td><td>40 k6</td><td>317</td><td>120</td></tr>
<tr><td rowspan="2">ND 28</td><td>12.5...45</td><td rowspan="6">70 m6</td><td rowspan="6">369</td><td rowspan="6">229</td><td rowspan="6">205</td><td>70 m6</td><td>369</td><td>140</td><td rowspan="6">229</td><td rowspan="6">205</td></tr>
<tr><td>50...56</td><td>50 k6</td><td>349</td><td>120</td></tr>
<tr><td rowspan="2">ND 29</td><td>14...50</td><td>70 m6</td><td>369</td><td>140</td></tr>
<tr><td>56...63</td><td>50 k6</td><td>349</td><td>120</td></tr>
<tr><td rowspan="2">ND 31</td><td>18...63</td><td>70 m6</td><td>369</td><td>140</td></tr>
<tr><td>71...80</td><td>50 k6</td><td>349</td><td>120</td></tr>
<tr><td rowspan="2">ND 35</td><td>12.5...45</td><td rowspan="6">90 m6</td><td rowspan="6">446</td><td rowspan="6">180</td><td rowspan="6">266</td><td rowspan="6">255</td><td>85 m6</td><td>446</td><td>180</td><td rowspan="6">266</td><td rowspan="6">255</td></tr>
<tr><td>50...56</td><td>60 m6</td><td>406</td><td>140</td></tr>
<tr><td rowspan="2">ND 36</td><td>14...50</td><td>85 m6</td><td>446</td><td>180</td></tr>
<tr><td>56...63</td><td>60 m6</td><td>406</td><td>140</td></tr>
<tr><td rowspan="2">ND 40</td><td>16...56</td><td>85 m6</td><td>446</td><td>180</td></tr>
<tr><td>63...71</td><td>60 m6</td><td>406</td><td>140</td></tr>
<tr><td rowspan="2">ND 42</td><td>12.5...45</td><td rowspan="8">100 m6</td><td rowspan="8">537</td><td rowspan="18">215</td><td rowspan="8">322</td><td rowspan="8">328</td><td>100 m6</td><td>537</td><td>215</td><td rowspan="8">322</td><td rowspan="8">328</td></tr>
<tr><td>50...56</td><td>80 m6</td><td>492</td><td>170</td></tr>
<tr><td rowspan="2">ND 43</td><td>14...50</td><td>100 m6</td><td>537</td><td>215</td></tr>
<tr><td>56...63</td><td>80 m6</td><td>492</td><td>170</td></tr>
<tr><td rowspan="2">ND 45</td><td>16...56</td><td>100 m6</td><td>537</td><td>215</td></tr>
<tr><td>63...71</td><td>80 m6</td><td>492</td><td>170</td></tr>
<tr><td rowspan="2">ND 47</td><td>20...71</td><td>100 m6</td><td>537</td><td>215</td></tr>
<tr><td>80...90</td><td>80 m6</td><td>492</td><td>170</td></tr>
<tr><td rowspan="2">ND 50</td><td>12.5...45</td><td rowspan="10">120 m6</td><td rowspan="10">600</td><td rowspan="10">385</td><td rowspan="10">348</td><td>120 m6</td><td>600</td><td>215</td><td rowspan="10">385</td><td rowspan="10">348</td></tr>
<tr><td>50...56</td><td>95 m6</td><td>565</td><td>180</td></tr>
<tr><td rowspan="2">ND 51</td><td>14...50</td><td>120 m6</td><td>600</td><td>215</td></tr>
<tr><td>56...63</td><td>95 m6</td><td>565</td><td>180</td></tr>
<tr><td rowspan="2">ND 53</td><td>16...56</td><td>120 m6</td><td>600</td><td>215</td></tr>
<tr><td>63...71</td><td>95 m6</td><td>565</td><td>180</td></tr>
<tr><td rowspan="2">ND 56</td><td>18...63</td><td>120 m6</td><td>600</td><td>215</td></tr>
<tr><td>71...80</td><td>95 m6</td><td>565</td><td>180</td></tr>
</table>

DOUBLE EXTENDED INPUT SHAFT

NE



Keys to DIN 6885/1

	Input shaft									
	i_N	Ø d_1	k_1	l_1	m_1	Øx_1	Ø d_3	k_3	l_3	m_3	Øx_3
NE 18	50...140	35 k6	283	100	183	–	35 k6	283	100	183	–
	160...315	30 k6					30 k6				
NE 20	71...200	35 k6					35 k6				
	224...450	30 k6					30 k6				
NE 22	63...140	50 k6	347	120	227	130	50 k6	320	120	200	130
	160...224	40 k6					40 k6				
NE 23	71...160	50 k6					50 k6				
	180...250	40 k6					40 k6				
NE 25	80...180	50 k6					50 k6				
	200...280	40 k6					40 k6				
NE 28	50...140	50 k6	362		242	–	50 k6	362		242	–
	160...315	40 k6					40 k6				
NE 29	56...160	50 k6					50 k6				
	180...355	40 k6					40 k6				
NE 31	71...200	50 k6					50 k6				
	224...450	40 k6					40 k6				
NE 35	50...140	70 m6	435	145	290		70 m6	435	145	290	205
	160...315	50 k6	415	125			50 k6	415	125		
NE 36	56...160	70 m6	435	145			70 m6	435	145		
	180...355	50 k6	415	125			50 k6	415	125		
NE 40	63...180	70 m6	435	145			70 m6	435	145		
	200...400	50 k6	415	125			50 k6	415	125		
NE 42	50...140	80 m6	508	170	338		80 m6	508	170	338	245
	160...315	65 m6	483	145			65 m6	483	145		
NE 43	56...160	80 m6	508	170			80 m6	508	170		
	180...355	65 m6	483	145			65 m6	483	145		
NE 45	63...180	80 m6	508	170			80 m6	508	170		
	280...400	65 m6	483	145			65 m6	483	145		
NE 47	80...224	80 m6	508	170			80 m6	508	170		
	250...500	65 m6	483	145			65 m6	483	145		
NE 50	50...140	100 m6	595	215	380	290	100 m6	595	215	380	290
	160...315						75 m6	540	160		
NE 51	56...160						100 m6	595	215		
	180...355						75 m6	540	160		
NE 53	63...180						100 m6	595	215		
	200...400						75 m6	540	160		
NE 56	80...224						100 m6	595	215		
	250...500						75 m6	540	160		

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.

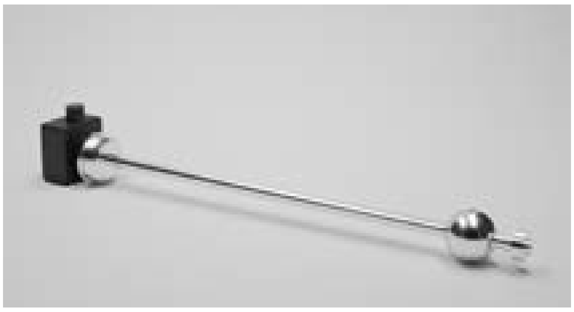
Breather with wet filter
If the humidity is high, we recommend a breather with wet filter to prevent water vapor from penetrating the gear oil.

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.

PT100
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.



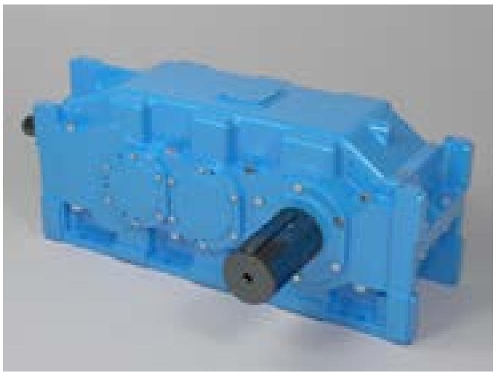
Oil level switch
With the oil level switch is it possible to control the min. oil level of the gearbox in case you use a heater.

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

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.

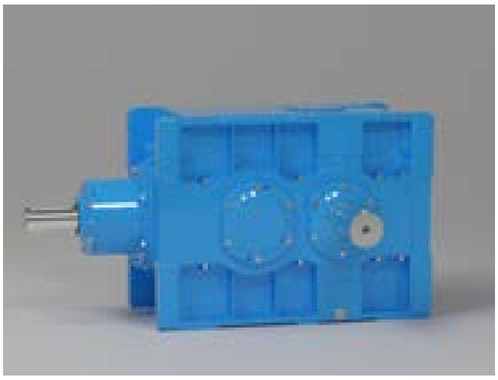
Regulator for quantity of cooling water
In order to have a constant gear oil temperature with water cooling, we recommend the installation of a water regulator.

OTHER PRODUCTS



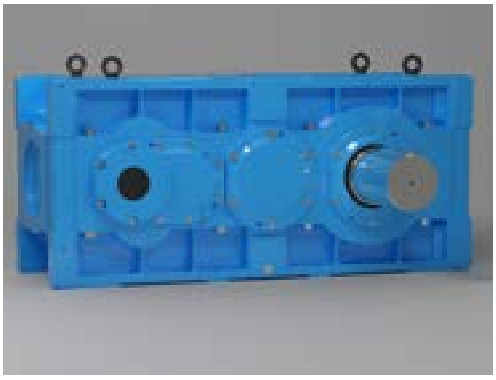
Brevini EvoMax™

The Brevini EvoMax™ gearbox series is a further development of the POSIRED 2 series from PIV 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



Brevini Posired 2 PB - PLB

The Posired 2 is a bevel-helical gearbox series with 2, 3 and 4 helical bevel helical gear stages. The gearbox based on the modular system of Brevini EvoMax™ .
Torque range from 340 kNm up to 805 kNm.
Ratios up to 560.



Brevini Posired 2 Big sizes

The Posired 2 is a bevel-helical gearbox series with 2, 3 and 4 helical bevel helical gear stages. The gearbox based on the modular system of Brevini EvoMax™ .
Torque range from 340 kNm up to 805 kNm.
Ratios up to 560.

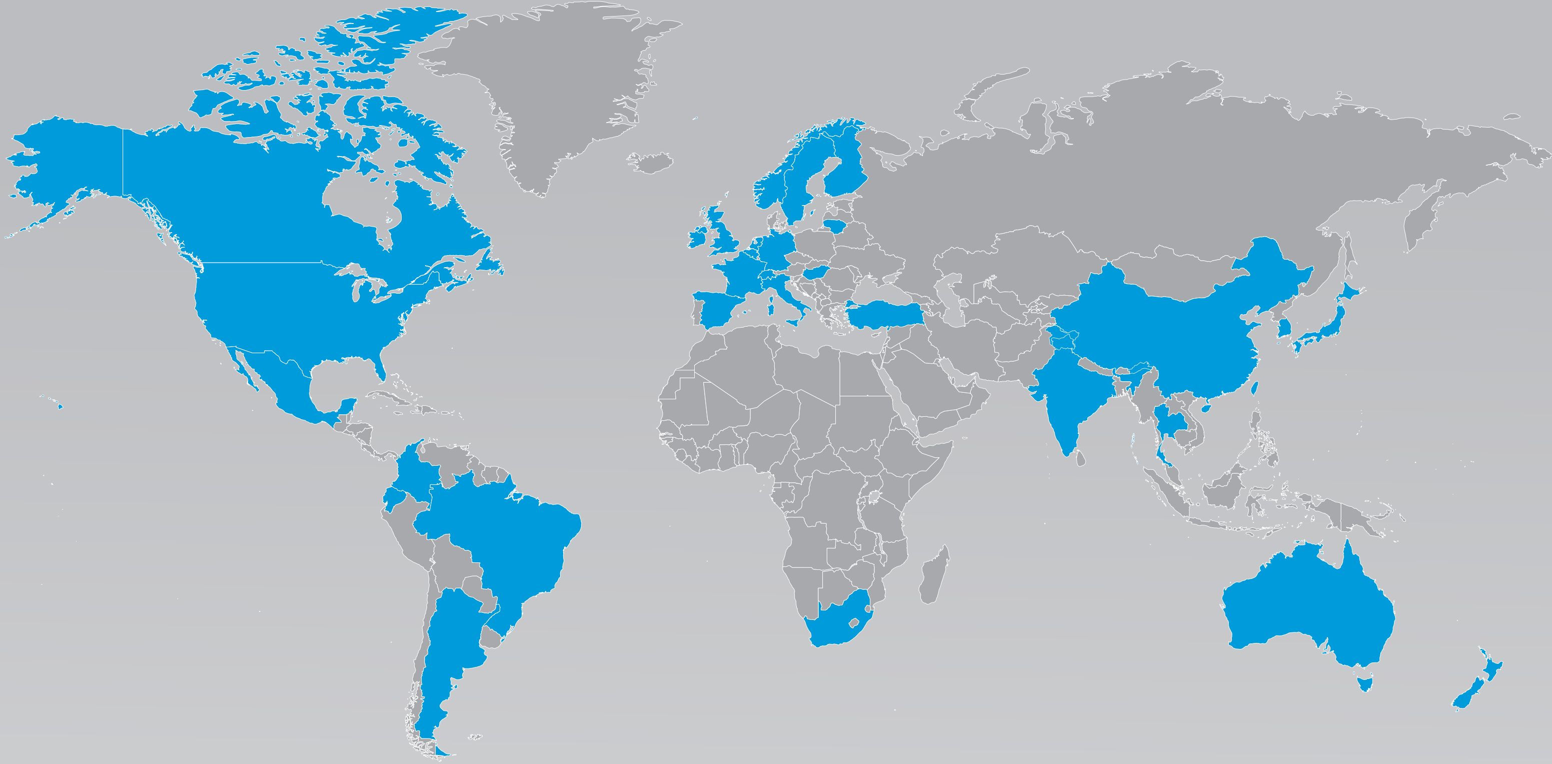
Brevini® S Series planetary gearboxes

S Series planetary gearboxes are designed to ensure effective performances and quite operation in multiple possible configurations.
Torques from 16.000 Nm to 1.100.000 Nm

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

Winch Drive
Brevini® Planetary Winch Drives for industrial hoisting applications. This range featuring a state-of-art design to deliver optimal performance for onshore and offshore equipment, material handling, mining, all lifting and hoisting applications.
Their strength design ensure the best performance and efficiency in severe environments helping to increase productivity and reduce total cost of ownership.
Output torque from 10 kNm up to 850 kNm

BWE
Nine sizes of winches with line pull from 1,5 tons to 16 tons at first layer, designed for cranes used in Mobileand Industrial market.
The winches are equipped with High Speed Brevini® Hydraulic Motor and a wide range of controls ensure safety, avoid damage to the winch, the crane, and most importantly, people on job site.



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 a leader in the design and manufacture of highly efficient propulsion and energy-management solutions that power vehicles and machines in all mobility markets across the globe. The company is shaping sustainable progress through its conventional and clean-energy solutions that support nearly every vehicle manufacturer with drive and motion systems; electrodynamic technologies, including software and controls; and thermal, sealing, and digital solutions. Founded in 1904, we employ thousands of people across six continents.

About Dana Off-Highway Drive and Motion Systems

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.

DANA BREVINI® Motion Systems

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