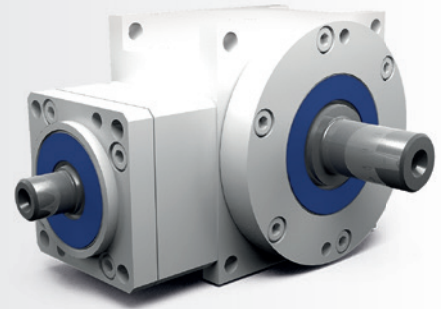


## 8.3 Type H – Standard hypoid gearboxes

### 8.3.1 Features

Gear ratios:  $i = 3:1$  to  $15:1$   
 Maximum output torque: 1450 Nm  
 6 gearbox sizes with edge lengths of 090 to 260 mm  
 Low-backlash construction < 4 angular minutes possible  
 Housing made of aluminium



### 8.3.2 Models

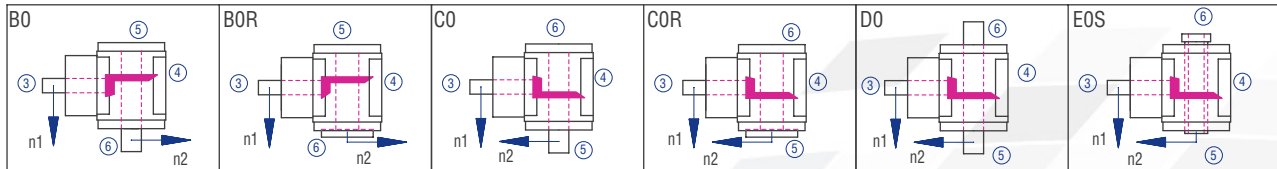


Figure 8.3.2-1; Models

### 8.3.3 Gearbox sides

The example shows the Model C0

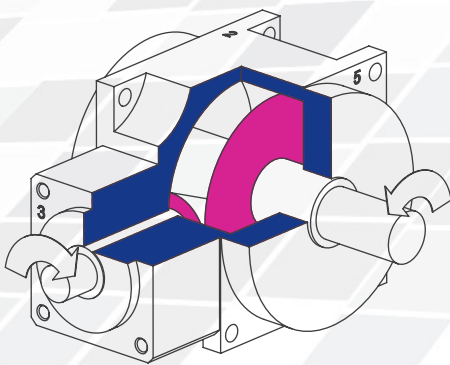


Figure 8.3.3-2; Gearbox sides

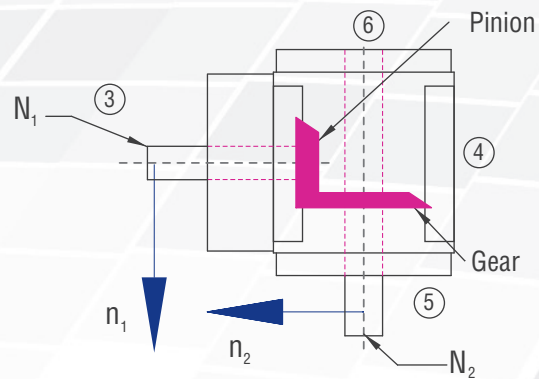


Figure 8.3.3-1; Shaft designations

### 8.3.4 Order code

The order code reflects the customer specifications. Example:

Type	Size	Gear ratio	Model	Fixing side	Installation position	Speed $n_2$	Design
H	090	12:1	C0-	1.	1-	200	/S1
Description	Size; Table 8.3.5-1	Table 8.3.5-1	Figure 8.3.2-1; Models	Side on which fixing is made; Table 8.2.3- 1; Figure 4.3.1-1 Gearbox sides	Side directed downwards; Figure 4.3.1-1 Gearbox sides	Slowly rotating shaft	S1 Standard

### 8.3.5 Overview of performance data

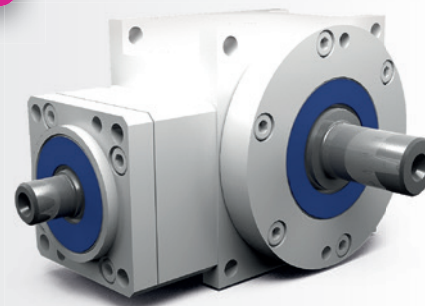
Selection table: gearbox size; gear ratio; rotational speed

size	N <sub>1</sub> MAX [rpm]	N <sub>1</sub> [rpm]	3:1			4:1			5:1			6:1			8:1			10:1			12:1			15:1		
			T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]
090	8000	3900																			25	39	51	25	39	51
		3200											36	54	72	36	54	72	36	54	72					
		2100	36	54	72	36	54	72	36	54	72															
115	8000	3300																			51	77	102	51	77	102
		2700											71	107	143	71	107	143	71	107	143					
		1800	71	107	143	71	107	143	71	107	143															
140	7000	2800																			97	145	193	97	145	193
		2200											142	215	286	142	215	286	142	215	286					
		1500	142	215	286	142	215	286	142	215	286															
170	6000	2300																			182	275	365	182	275	365
		1800											266	398	528	266	398	528	266	398	528					
		1150	266	398	528	266	398	528	266	398	528															
215	5000	1600																			512	767	1022	512	767	1022
		1200											723	1084	1450	723	1084	1450	723	1084	1450					
		700	723	1084	1450	723	1084	1450	723	1084	1450															
260	4500	1300																			1023	1533	2044	1023	1533	2044
		1000											1444	2165	2880	1444	2165	2880	1444	2165	2880					
		550	1444	2165	2880	1444	2165	2880	1444	2165	2880															

Table 8.3.5-1

Hybrid gearboxes

## 8.3.6 Type H 090 – Standard hypoid gearboxes

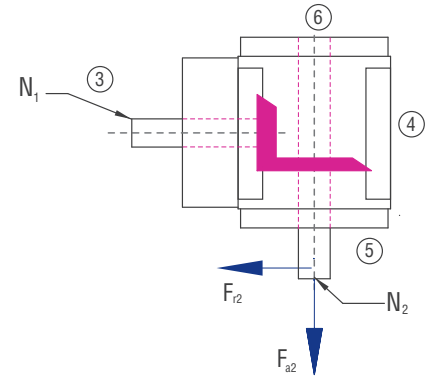


### Characteristics

Characteristic	Standard	Option
<b>Toothing</b>	Spiral-toothed, hardened hypoid bevel gears	See chapter 8.2.1
<b>Gear ratio</b>	3:1 to 15:1	
<b>Housing / Flanges</b>	Aluminium / steel or casting	
<b>Threaded mounting holes</b>	On the sides 1, 2 and 3	See chapter 8.2.3
<b>Shaft</b>	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance	See chapter 4.6.2
<b>Hollow shaft</b>	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
<b>Radial shaft seal ring</b>	NBR, form A	See chapter 4.8
<b>Ambient temperature</b>	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
<b>Circumferential backlash</b>	< 5 arcmin	See chapter 8.2.10
<b>Protection class</b>	IP 64	See chapter 4.5
<b>Corrosion protection</b>	Prime coat; layer thickness >40 µm	See chapter 4.4
<b>Bearing life L10h</b>	more than 30,000h in S5 operation	See chapter 4.9.1
<b>Oil change intervals</b>	Not required if the oil temperature is kept < 90°C. The lifetime of the bearings can be increased by the factor 1.5 if the oil is changed after the first 500 service hours and then every 5000 service hours.	See chapter 8.2.8
<b>Lubricants</b>	Synthetic lubricants	See chapter 8.2.8

## Performance data

N <sub>1</sub> [rpm]	N <sub>1</sub> MAX [rpm]	3:1			4:1			5:1			6:1			8:1			10:1			12:1			15:1		
		T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]
3900	8000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	39	51	25	39	51
3200	8000	0	0	0	0	0	0	0	0	0	36	54	72	36	54	72	36	54	72	0	0	0	0	0	0
2100	8000	36	54	72	36	54	72	36	54	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



## Permissible radial force $F_{r2}$ and axial force $F_{a2}$ on shaft $N_2$

3:1		4:1		5:1		6:1		8:1		10:1		12:1		15:1	
$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]
3300	1650	3300	1650	3300	1650	3300	1650	3300	1650	3300	1650	3300	1650	3300	1650

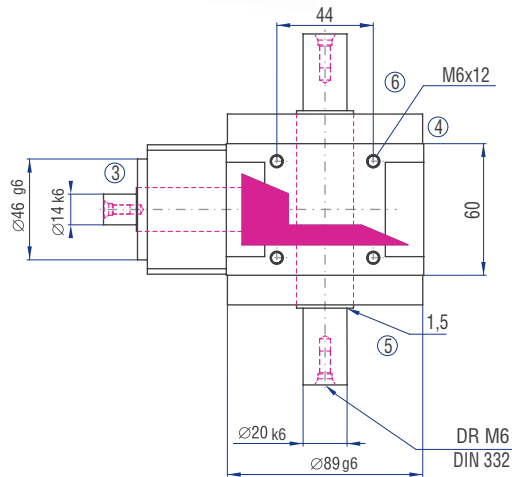
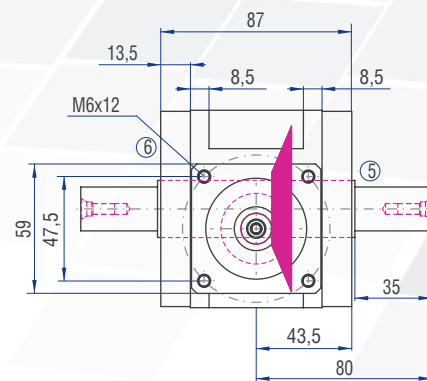
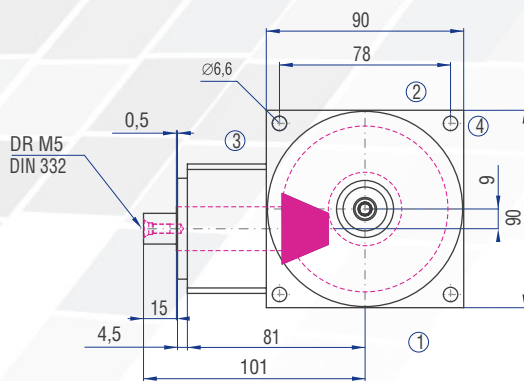
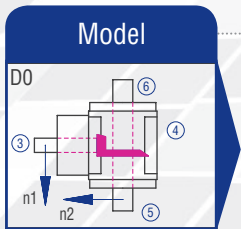
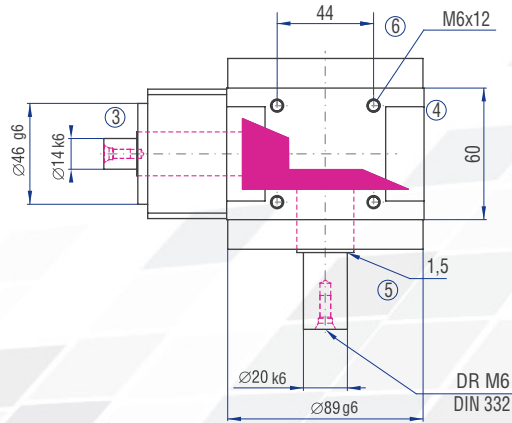
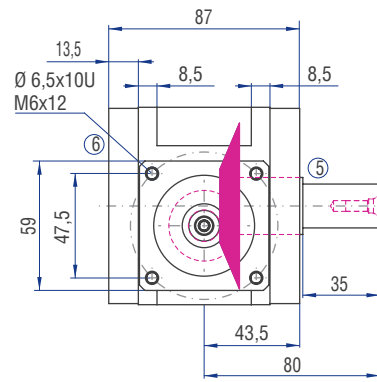
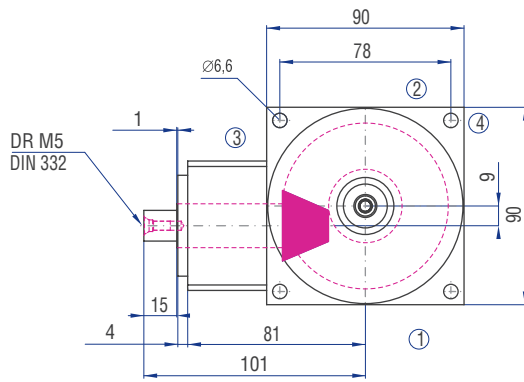
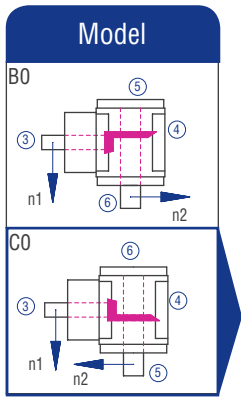
## Gearbox inertia moments/mass

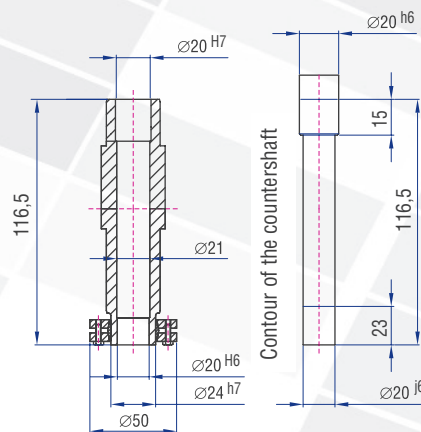
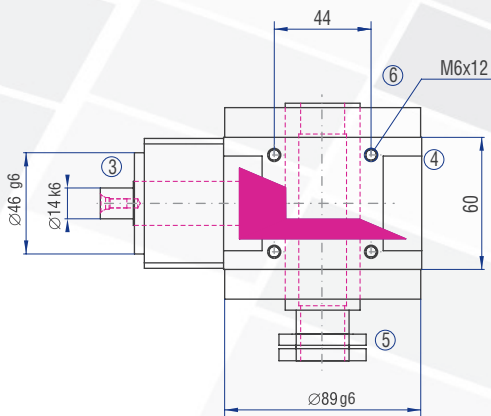
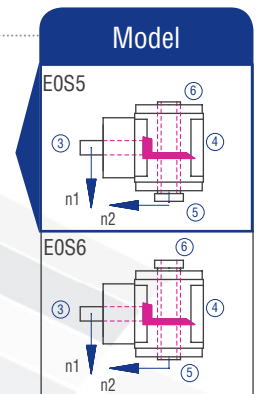
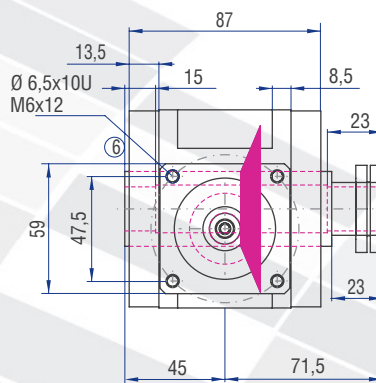
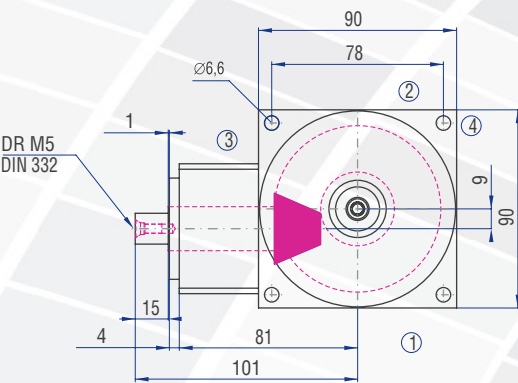
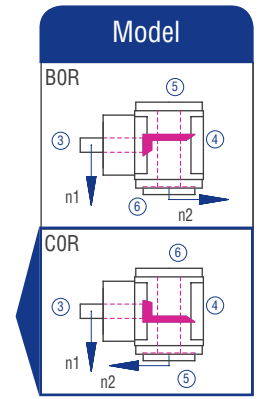
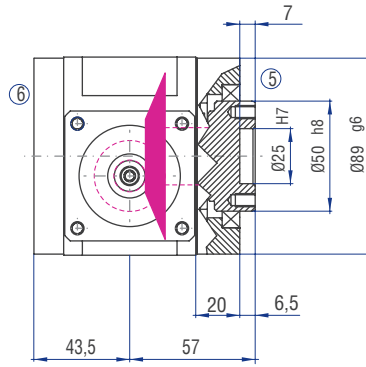
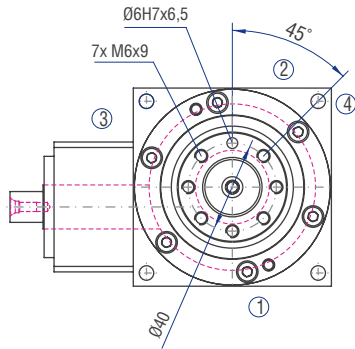
Inertia moment  $J_1$  related to the fast-rotating shaft ( $N_1$ )

Inertia moment [kgcm <sup>2</sup> ]								Mass ca. [kg]
3:1	4:1	5:1	6:1	8:1	10:1	12:1	15:1	
0,3900	0,3000	0,2300	0,2200	0,1700	0,1500	0,1400	0,1300	3.5

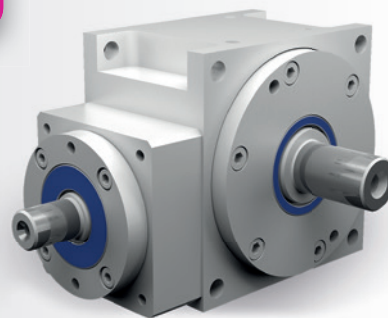
The mass of the gearbox may deviate depending on the type and the gear ratio.

## 8.3.6 Type H 090 – Standard hypoid gearboxes





## 8.3.7 Type H 115 – Standard hypoid gearboxes

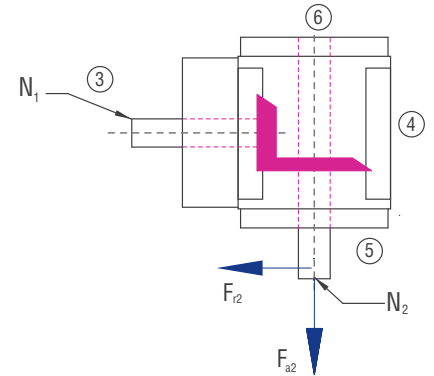


### Characteristics

Characteristic	Standard	Option
<b>Toothing</b>	Spiral-toothed, hardened hypoid bevel gears	See chapter 8.2.1
<b>Gear ratio</b>	3:1 to 15:1	
<b>Housing / Flanges</b>	Aluminium / steel or casting	
<b>Threaded mounting holes</b>	On the sides 1, 2 and 3	See chapter 8.2.3
<b>Shaft</b>	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance	See chapter 4.6.2
<b>Hollow shaft</b>	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
<b>Radial shaft seal ring</b>	NBR, form A	See chapter 4.8
<b>Ambient temperature</b>	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
<b>Circumferential backlash</b>	< 5 arcmin	See chapter 8.2.10
<b>Protection class</b>	IP 64	See chapter 4.5
<b>Corrosion protection</b>	Prime coat; layer thickness >40 µm	See chapter 4.4
<b>Bearing life L10h</b>	more than 30,000h in S5 operation	See chapter 4.9.1
<b>Oil change intervals</b>	Not required if the oil temperature is kept < 90°C. The lifetime of the bearings can be increased by the factor 1.5 if the oil is changed after the first 500 service hours and then every 5000 service hours.	See chapter 8.2.8
<b>Lubricants</b>	Synthetic lubricants	See chapter 8.2.8

## Performance data

N <sub>1</sub> [rpm]	N <sub>1MAX</sub> [rpm]	3:1			4:1			5:1			6:1			8:1			10:1			12:1			15:1		
		T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]
3300	8000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51	77	102	51	77	102
2700	8000	0	0	0	0	0	0	0	0	0	71	107	143	71	107	143	71	107	143	0	0	0	0	0	0
1800	8000	71	107	143	71	107	143	71	107	143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



## Permissible radial force $F_{r2}$ and axial force $F_{a2}$ on shaft $N_2$

3:1		4:1		5:1		6:1		8:1		10:1		12:1		15:1	
$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]
4900	2450	4900	2450	4900	2450	4900	2450	4900	2450	4900	2450	4900	2450	4900	2450

## Gearbox inertia moments/mass

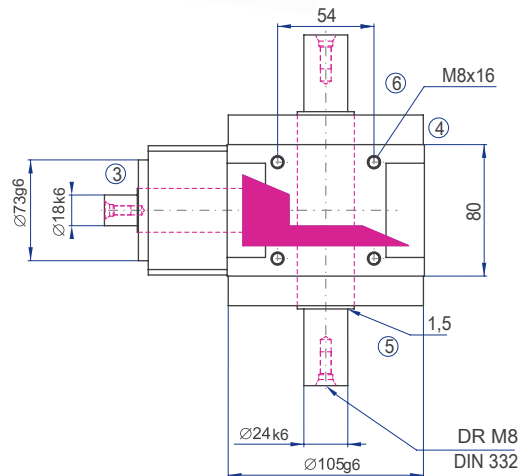
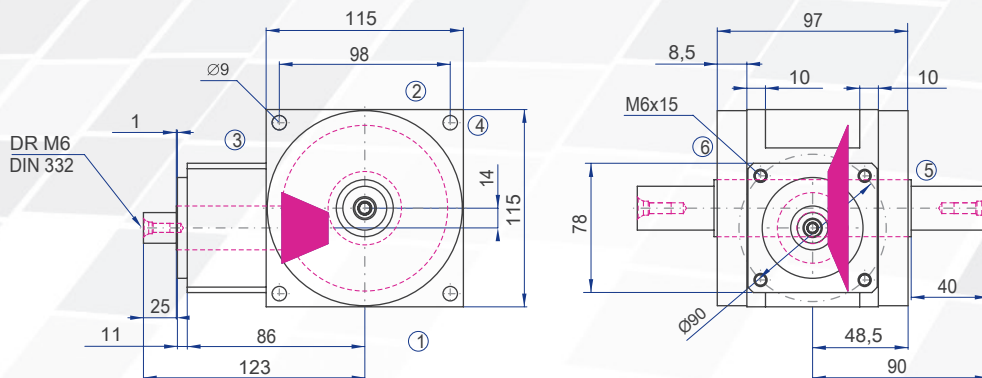
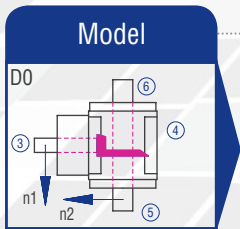
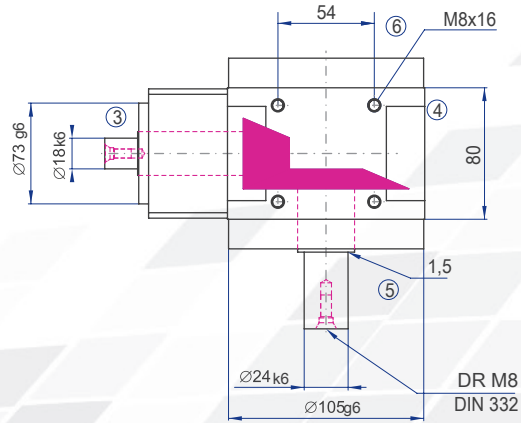
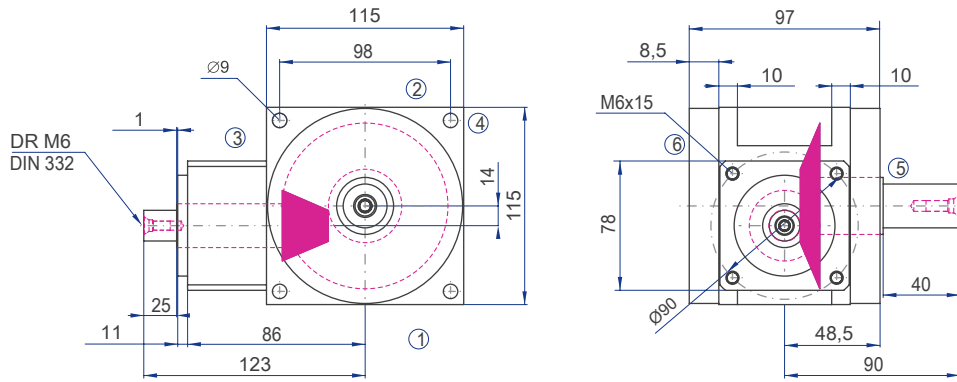
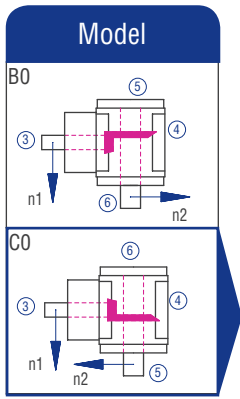
Inertia moment  $J_1$  related to the fast-rotating shaft ( $N_1$ )

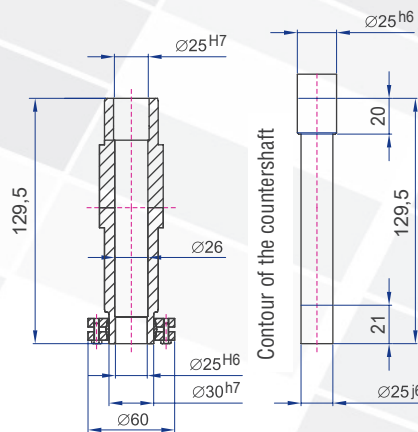
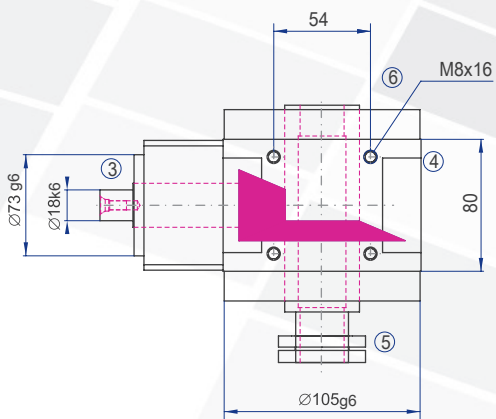
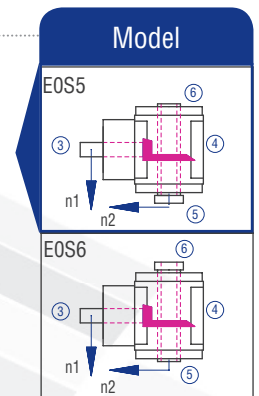
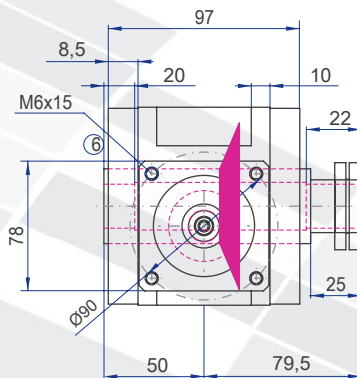
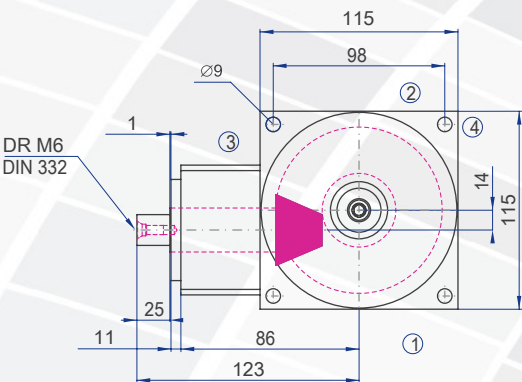
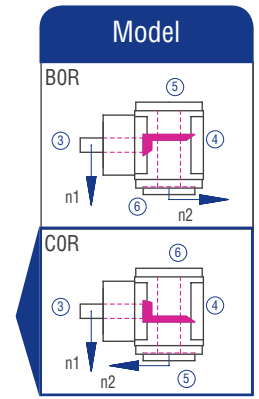
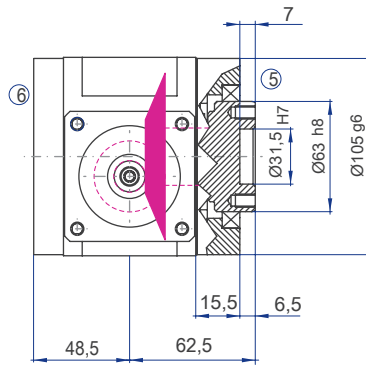
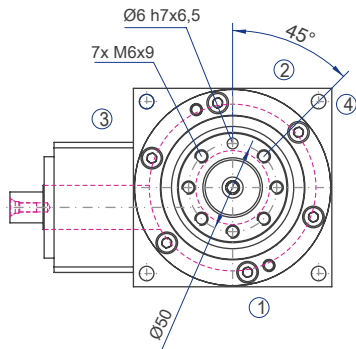
Inertia moment [kgcm <sup>2</sup> ]								Mass ca. [kg]
3:1	4:1	5:1	6:1	8:1	10:1	12:1	15:1	
0,9800	0,7300	0,5800	0,5200	0,4300	0,3800	0,3600	0,3400	5.5

The mass of the gearbox may deviate depending on the type and the gear ratio.

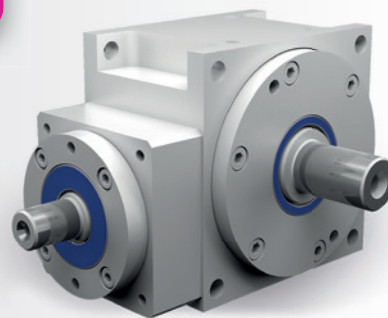


## 8.3.7 Type H 115 – Standard hypoid gearboxes





## 8.3.8 Type H 140 – Standard hypoid gearboxes

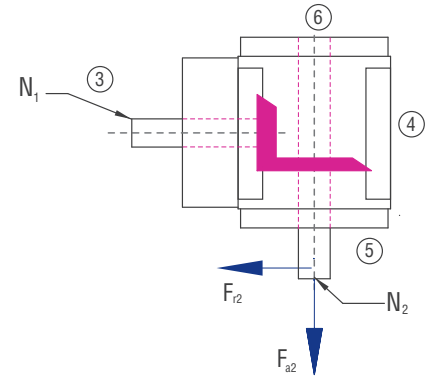


### Characteristics

Characteristic	Standard	Option
<b>Toothing</b>	Spiral-toothed, hardened hypoid bevel gears	See chapter 8.2.1
<b>Gear ratio</b>	3:1 to 15:1	
<b>Housing / Flanges</b>	Aluminium / steel or casting	
<b>Threaded mounting holes</b>	On the sides 1, 2 and 3	See chapter 8.2.3
<b>Shaft</b>	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance	See chapter 4.6.2
<b>Hollow shaft</b>	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
<b>Radial shaft seal ring</b>	NBR, form A	See chapter 4.8
<b>Ambient temperature</b>	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
<b>Circumferential backlash</b>	< 4 arcmin	See chapter 8.2.10
<b>Protection class</b>	IP 64	See chapter 4.5
<b>Corrosion protection</b>	Prime coat; layer thickness >40 µm	See chapter 4.4
<b>Bearing life L10h</b>	more than 30,000h in S5 operation	See chapter 4.9.1
<b>Oil change intervals</b>	Not required if the oil temperature is kept < 90°C. The lifetime of the bearings can be increased by the factor 1.5 if the oil is changed after the first 500 service hours and then every 5000 service hours.	See chapter 8.2.8
<b>Lubricants</b>	Synthetic lubricants	See chapter 8.2.8

## Performance data

N <sub>1</sub> [rpm]	N <sub>1</sub> MAX [rpm]	3:1			4:1			5:1			6:1			8:1			10:1			12:1			15:1		
		T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]
2800	7000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97	145	193	97	145	193
2200	7000	0	0	0	0	0	0	0	0	0	142	215	286	142	215	286	142	215	286	0	0	0	0	0	0
1500	7000	142	215	286	142	215	286	142	215	286	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



## Permissible radial force $F_{r2}$ and axial force $F_{a2}$ on shaft $N_2$

3:1		4:1		5:1		6:1		8:1		10:1		12:1		15:1	
$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]
7200	3600	7200	3600	7200	3600	7200	3600	7200	3600	7200	3600	7200	3600	7200	3600

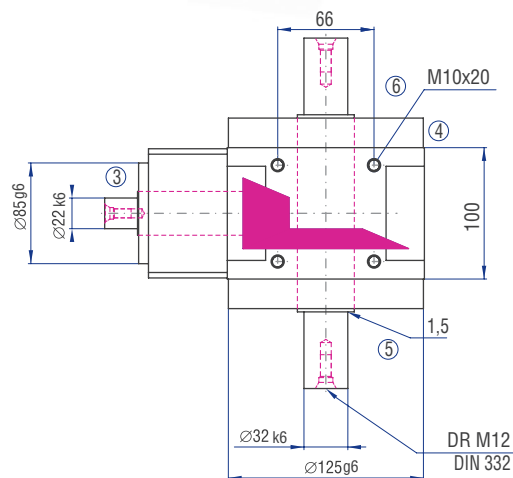
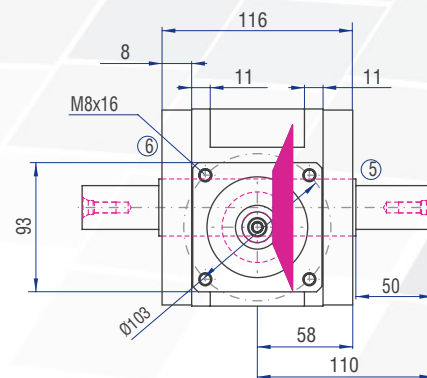
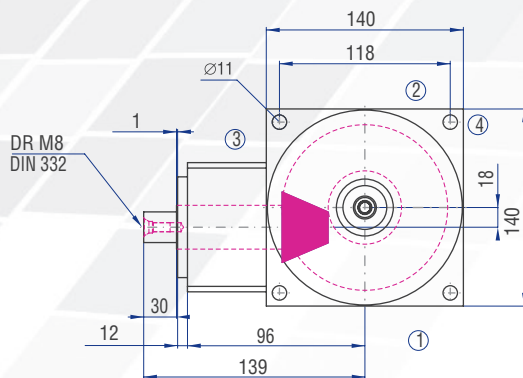
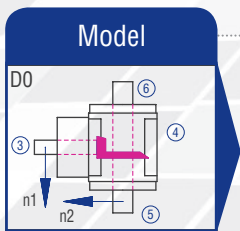
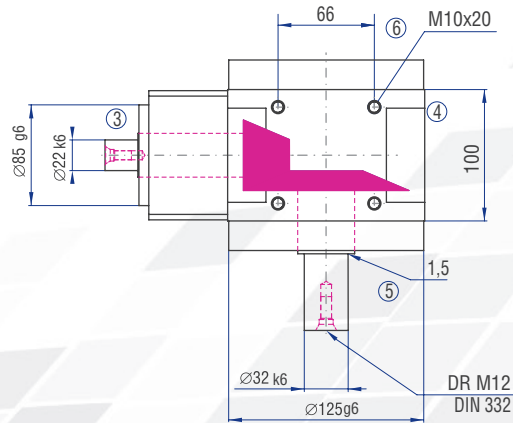
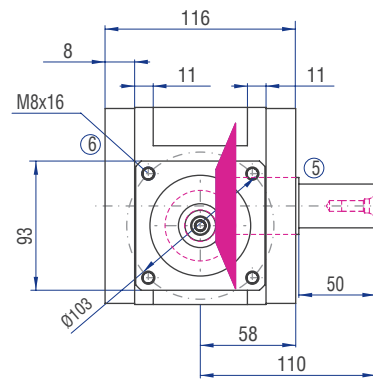
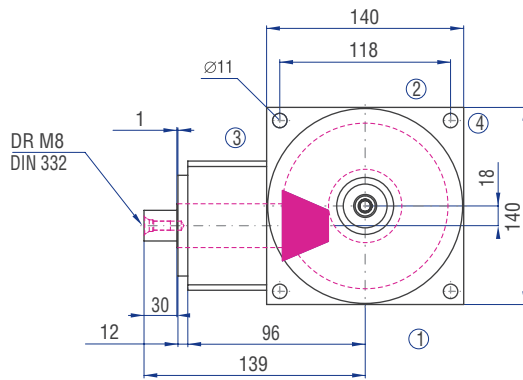
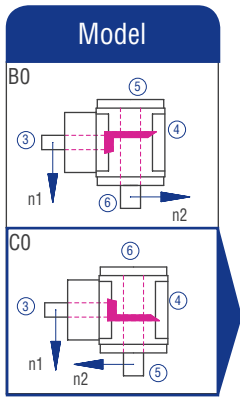
## Gearbox inertia moments/mass

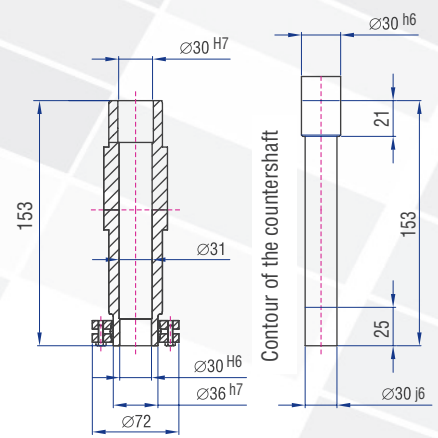
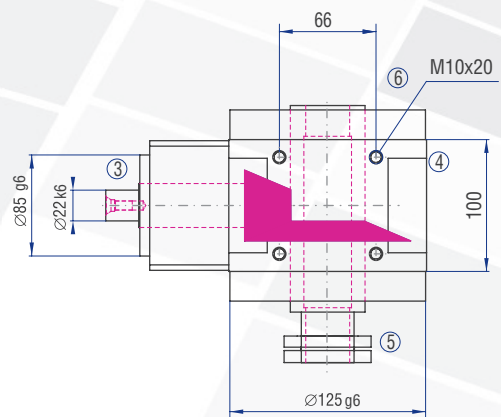
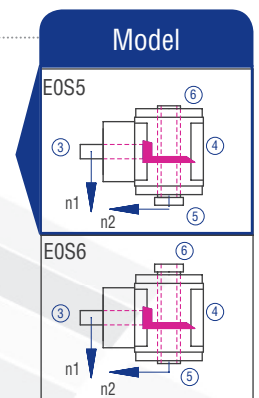
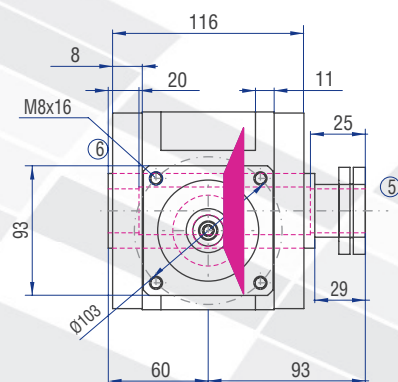
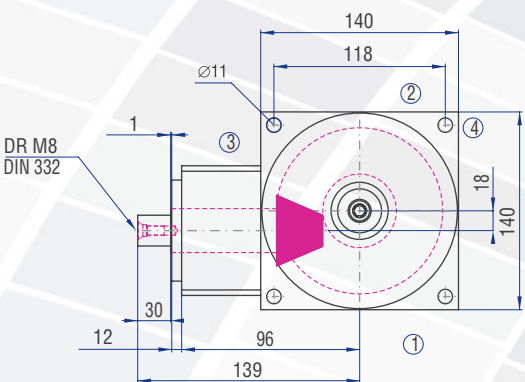
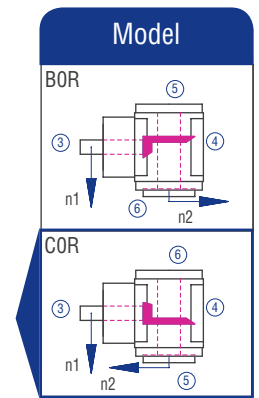
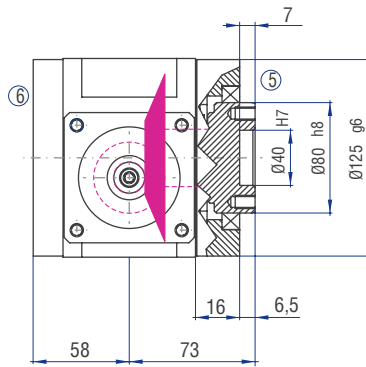
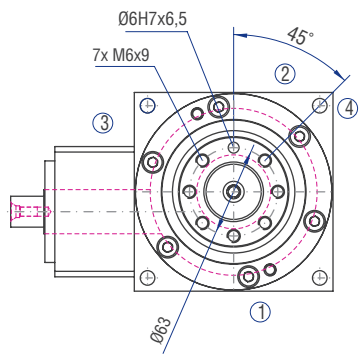
Inertia moment  $J_1$  related to the fast-rotating shaft ( $N_1$ )

Inertia moment [kgcm <sup>2</sup> ]								Mass ca. [kg]
3:1	4:1	5:1	6:1	8:1	10:1	12:1	15:1	
2,4200	1,7700	1,4100	1,4100	1,1200	1,0000	0,8800	0,8100	9.5

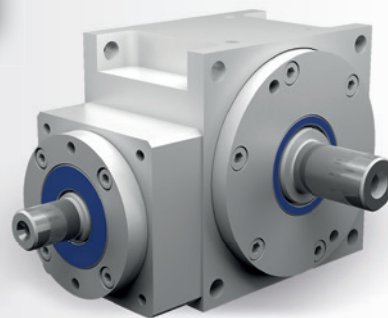
The mass of the gearbox may deviate depending on the type and the gear ratio.

## 8.3.8 Type H 140 – Standard hypoid gearboxes





## 8.3.9 Type H 170 – Standard hypoid gearboxes



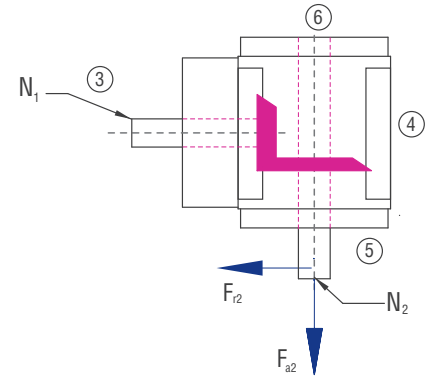
### Characteristics

Characteristic	Standard	Option
<b>Toothing</b>	Spiral-toothed, hardened hypoid bevel gears	See chapter 8.2.1
<b>Gear ratio</b>	3:1 to 15:1	
<b>Housing / Flanges</b>	Aluminium / steel or casting	
<b>Threaded mounting holes</b>	On the sides 1, 2 and 3	See chapter 8.2.3
<b>Shaft</b>	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance	See chapter 4.6.2
<b>Hollow shaft</b>	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
<b>Radial shaft seal ring</b>	NBR, form A	See chapter 4.8
<b>Ambient temperature</b>	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
<b>Circumferential backlash</b>	< 4 arcmin	See chapter 8.2.10
<b>Protection class</b>	IP 64	See chapter 4.5
<b>Corrosion protection</b>	Prime coat; layer thickness >40 µm	See chapter 4.4
<b>Bearing life L10h</b>	more than 30,000h in S5 operation	See chapter 4.9.1
<b>Oil change intervals</b>	Not required if the oil temperature is kept < 90°C. The lifetime of the bearings can be increased by the factor 1.5 if the oil is changed after the first 500 service hours and then every 5000 service hours.	See chapter 8.2.8
<b>Lubricants</b>	Synthetic lubricants	See chapter 8.2.8



## Performance data

N <sub>1</sub> [rpm]	N <sub>1</sub> MAX [rpm]	3:1			4:1			5:1			6:1			8:1			10:1			12:1			15:1		
		T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]
2300	6000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	182	275	365	182	275	365
1800	6000	0	0	0	0	0	0	0	0	0	266	398	528	266	398	528	266	398	528	0	0	0	0	0	0
1150	6000	266	398	528	266	398	528	266	398	528	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



## Permissible radial force $F_{r2}$ and axial force $F_{a2}$ on shaft $N_2$

3:1		4:1		5:1		6:1		8:1		10:1		12:1		15:1	
$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]
10000	5000	10000	5000	10000	5000	10000	5000	10000	5000	10000	5000	10000	5000	10000	5000

## Gearbox inertia moments/mass

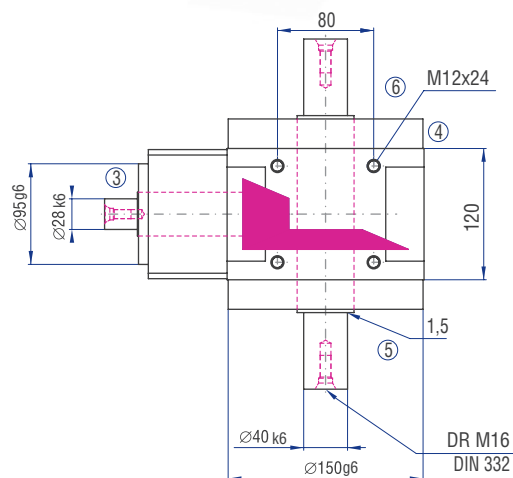
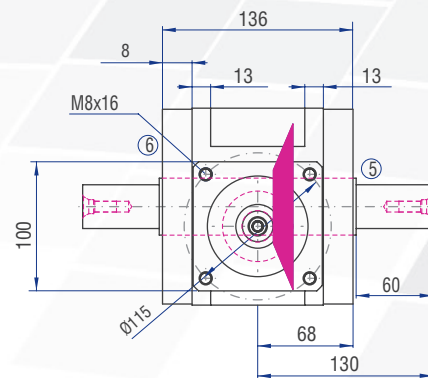
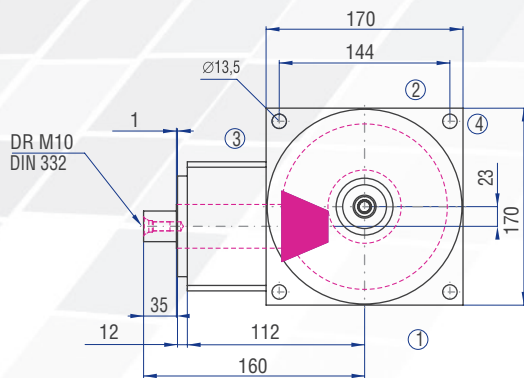
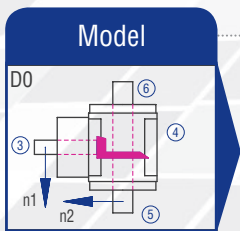
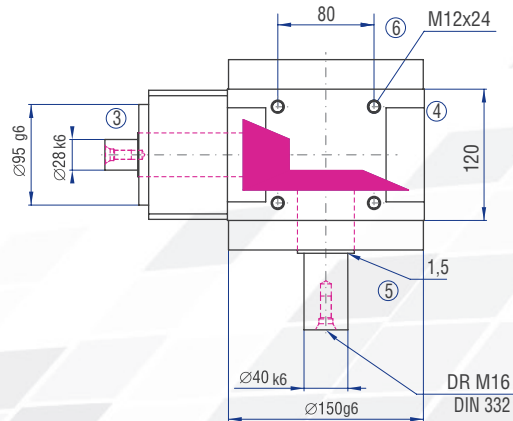
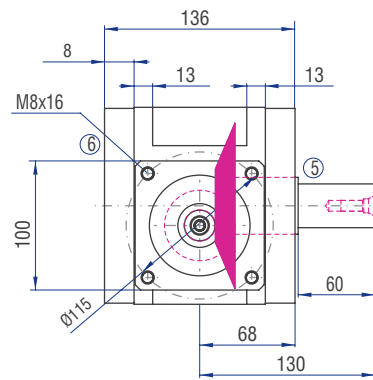
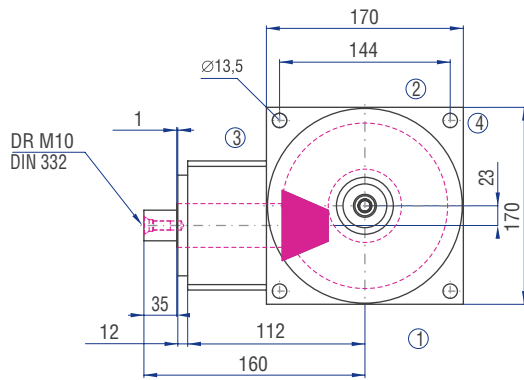
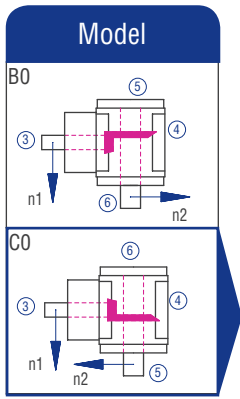
Inertia moment  $J_1$  related to the fast-rotating shaft ( $N_1$ )

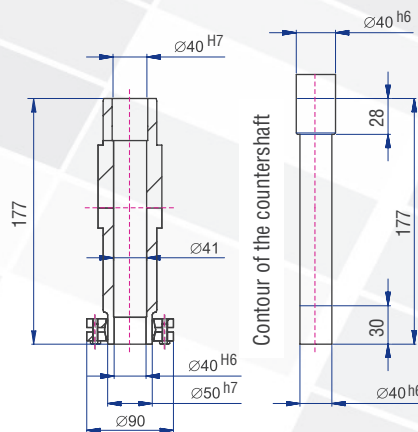
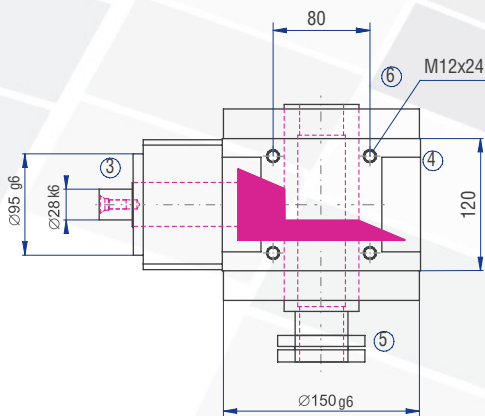
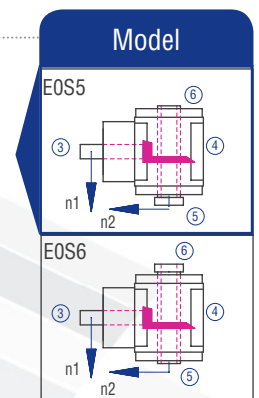
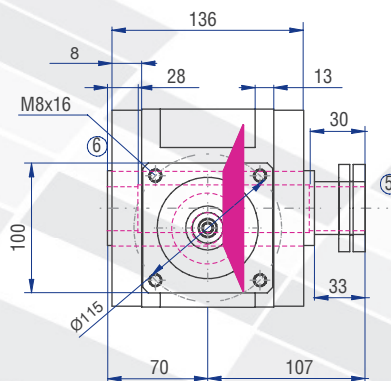
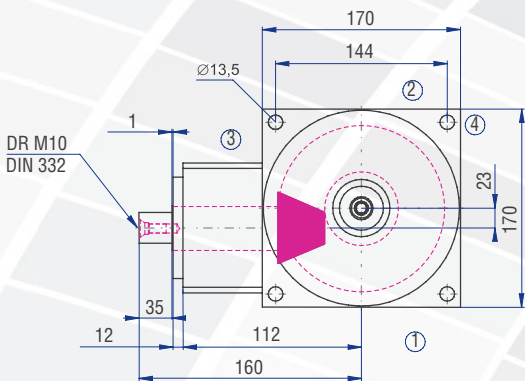
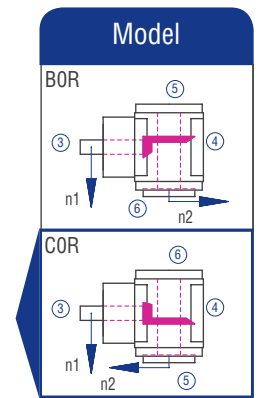
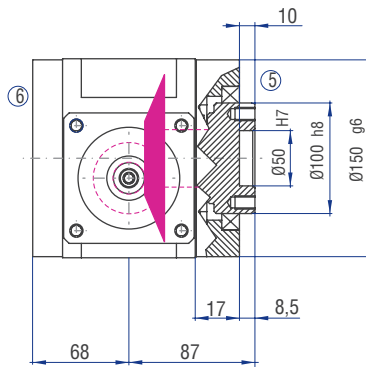
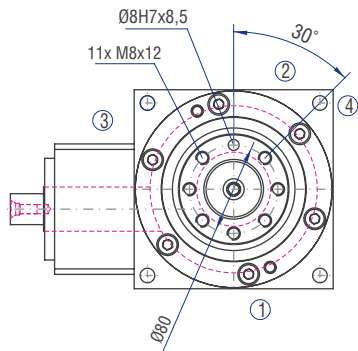
Inertia moment [kgcm <sup>2</sup> ]								Mass ca. [kg]
3:1	4:1	5:1	6:1	8:1	10:1	12:1	15:1	
7,1200	5,0900	4,0000	3,6500	2,8500	2,4600	2,2500	2,0700	15.5

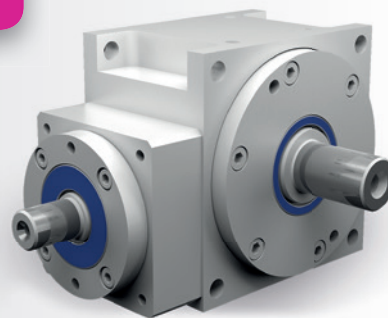
The mass of the gearbox may deviate depending on the type and the gear ratio.



## 8.3.9 Type H 170 – Standard hypoid gearboxes





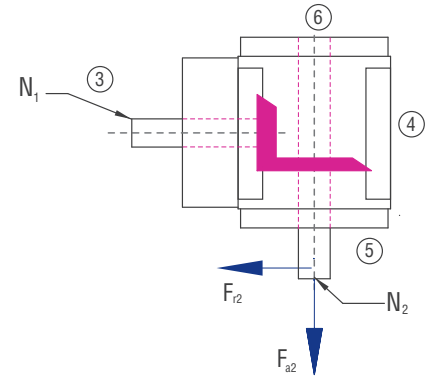


### Characteristics

Characteristic	Standard	Option
<b>Toothing</b>	Spiral-toothed, hardened hypoid bevel gears	See chapter 8.2.1
<b>Gear ratio</b>	3:1 to 15:1	
<b>Housing / Flanges</b>	Aluminium / steel or casting	
<b>Threaded mounting holes</b>	On the sides 1, 2 and 3	See chapter 8.2.3
<b>Shaft</b>	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance	See chapter 4.6.2
<b>Hollow shaft</b>	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
<b>Radial shaft seal ring</b>	NBR, form A	See chapter 4.8
<b>Ambient temperature</b>	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
<b>Circumferential backlash</b>	< 4 arcmin	See chapter 8.2.10
<b>Protection class</b>	IP 64	See chapter 4.5
<b>Corrosion protection</b>	Prime coat; layer thickness >40 µm	See chapter 4.4
<b>Bearing life L10h</b>	more than 30,000h in S5 operation	See chapter 4.9.1
<b>Oil change intervals</b>	Not required if the oil temperature is kept < 90°C. The lifetime of the bearings can be increased by the factor 1.5 if the oil is changed after the first 500 service hours and then every 5000 service hours.	See chapter 8.2.8
<b>Lubricants</b>	Synthetic lubricants	See chapter 8.2.8

## Performance data

N <sub>1</sub> [rpm]	N <sub>1</sub> MAX [rpm]	3:1			4:1			5:1			6:1			8:1			10:1			12:1			15:1		
		T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]
1600	5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	512	767	1022	512	767	1022
1200	5000	0	0	0	0	0	0	0	0	0	723	1084	1450	723	1084	1450	723	1084	1450	0	0	0	0	0	0
700	5000	723	1084	1450	723	1084	1450	723	1084	1450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



## Permissible radial force $F_{r2}$ and axial force $F_{a2}$ on shaft $N_2$

3:1		4:1		5:1		6:1		8:1		10:1		12:1		15:1	
$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]
15000	7500	15000	7500	15000	7500	15000	7500	15000	7500	15000	7500	15000	7500	15000	7500

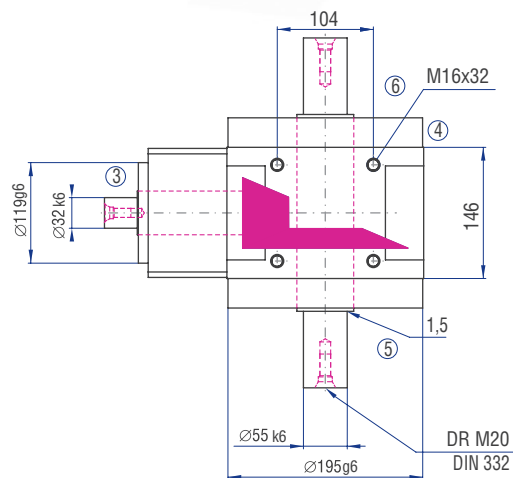
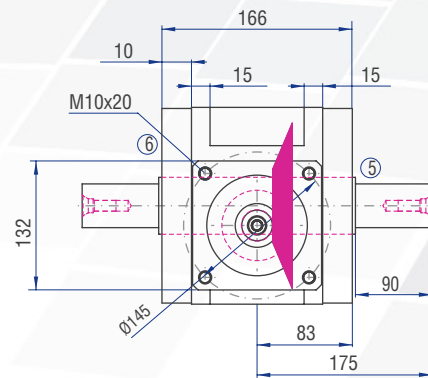
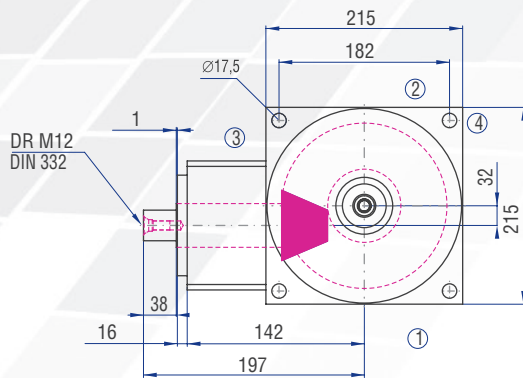
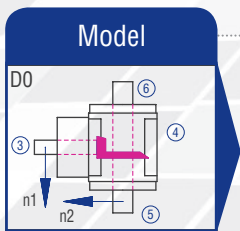
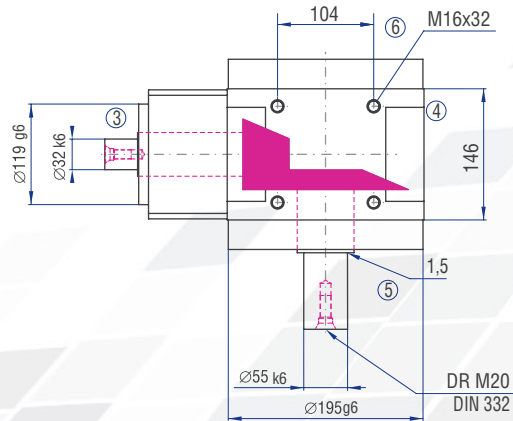
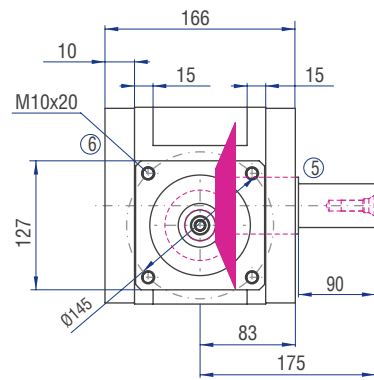
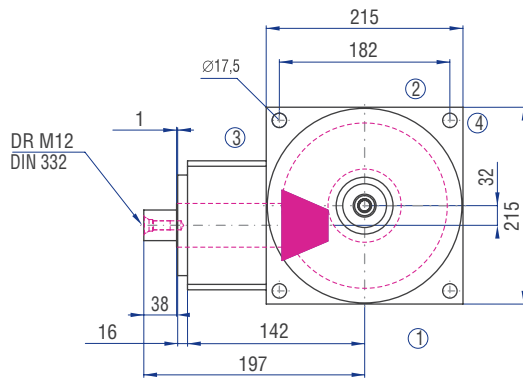
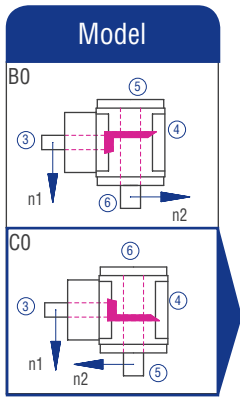
## Gearbox inertia moments/mass

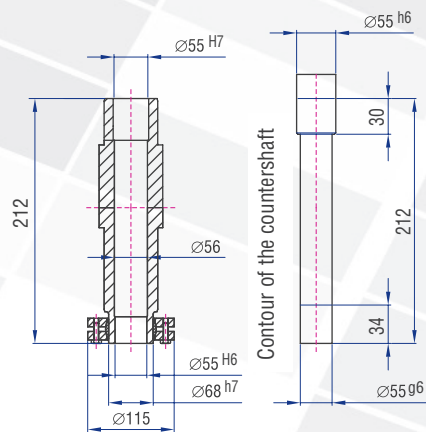
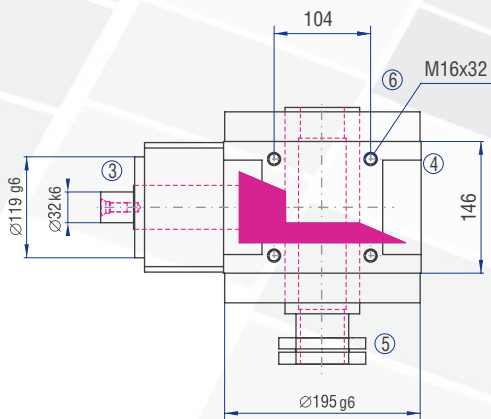
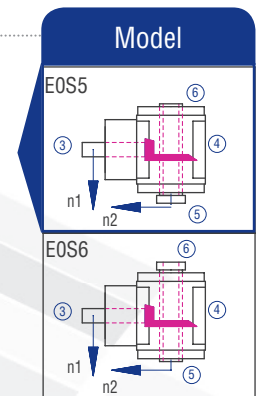
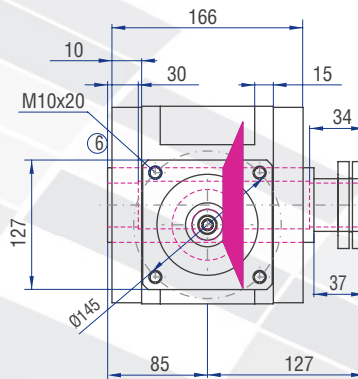
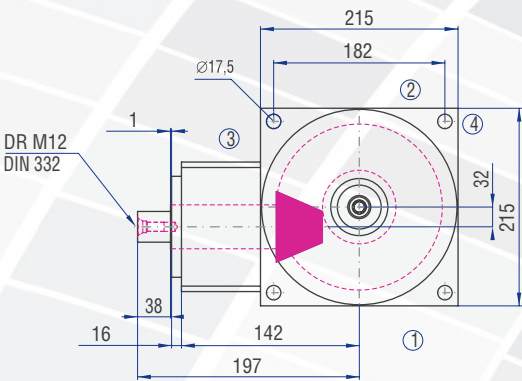
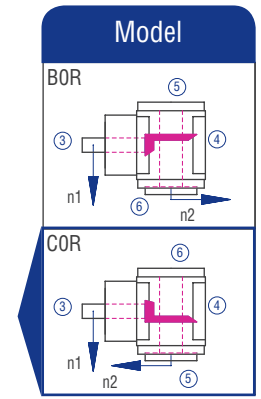
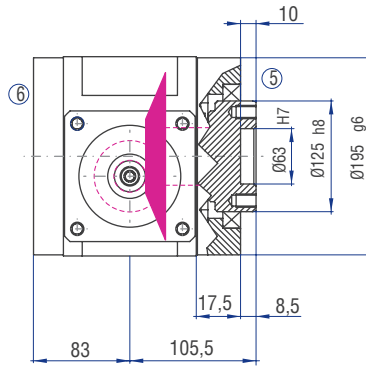
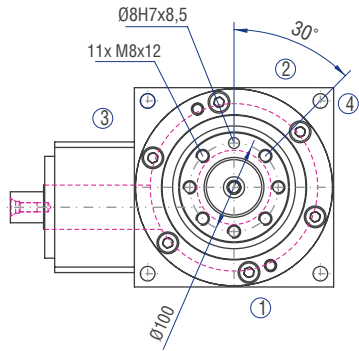
Inertia moment  $J_1$  related to the fast-rotating shaft ( $N_1$ )

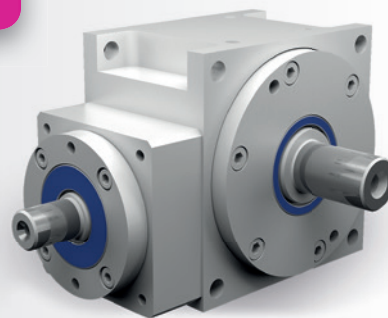
Inertia moment [kgcm <sup>2</sup> ]								Mass ca. [kg]
3:1	4:1	5:1	6:1	8:1	10:1	12:1	15:1	
26,9600	17,4400	13,5300	12,2500	8,9500	7,3800	6,4700	5,7600	32.5

The mass of the gearbox may deviate depending on the type and the gear ratio.

## 8.3.10 Type H 215 – Standard hypoid gearboxes







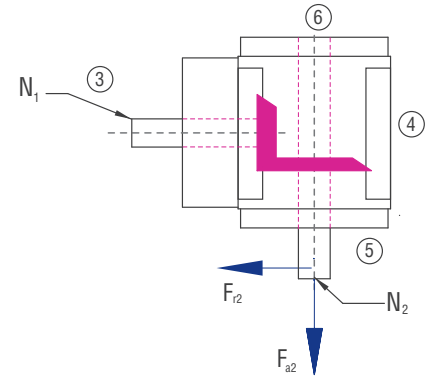
### Characteristics

Characteristic	Standard	Option
<b>Toothing</b>	Spiral-toothed, hardened hypoid bevel gears	See chapter 8.2.1
<b>Gear ratio</b>	3:1 to 15:1	
<b>Housing / Flanges</b>	Aluminium / steel or casting	
<b>Threaded mounting holes</b>	On the sides 1, 2 and 3	See chapter 8.2.3
<b>Shaft</b>	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance	See chapter 4.6.2
<b>Hollow shaft</b>	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
<b>Radial shaft seal ring</b>	NBR, form A	See chapter 4.8
<b>Ambient temperature</b>	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
<b>Circumferential backlash</b>	< 4 arcmin	See chapter 8.2.10
<b>Protection class</b>	IP 64	See chapter 4.5
<b>Corrosion protection</b>	Prime coat; layer thickness >40 µm	See chapter 4.4
<b>Bearing life L10h</b>	more than 30,000h in S5 operation	See chapter 4.9.1
<b>Oil change intervals</b>	Not required if the oil temperature is kept < 90°C. The lifetime of the bearings can be increased by the factor 1.5 if the oil is changed after the first 500 service hours and then every 5000 service hours.	See chapter 8.2.8
<b>Lubricants</b>	Synthetic lubricants	See chapter 8.2.8



## Performance data

N <sub>1</sub> [rpm]	N <sub>1</sub> MAX [rpm]	3:1			4:1			5:1			6:1			8:1			10:1			12:1			15:1		
		T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]	T <sub>2N</sub> [Nm]	T <sub>2B</sub> [Nm]	T <sub>2NOT</sub> [Nm]
1300	4500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1023	1533	2044	1023	1533	2044
1000	4500	0	0	0	0	0	0	0	0	0	0	1444	2165	2880	1444	2165	2880	1444	2165	2880	0	0	0	0	0
550	4500	1444	2165	2880	1444	2165	2880	1444	2165	2880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



## Permissible radial force $F_{r2}$ and axial force $F_{a2}$ on shaft $N_2$

3:1		4:1		5:1		6:1		8:1		10:1		12:1		15:1	
$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]	$F_{r2}$ [N]	$F_{a2}$ [N]
22500	11250	22500	11250	22500	11250	22500	11250	22500	11250	22500	11250	22500	11250	22500	11250

## Gearbox inertia moments/mass

Inertia moment  $J_1$  related to the fast-rotating shaft ( $N_1$ )

Inertia moment [kgcm <sup>2</sup> ]								Mass ca. [kg]
3:1	4:1	5:1	6:1	8:1	10:1	12:1	15:1	
91,4700	62,4300	44,2900	39,5500	27,0700	21,4300	18,1400	15,5300	60

The mass of the gearbox may deviate depending on the type and the gear ratio.



## 8.3.11 Type H 260 – Standard hypoid gearboxes

