

Product Catalogue

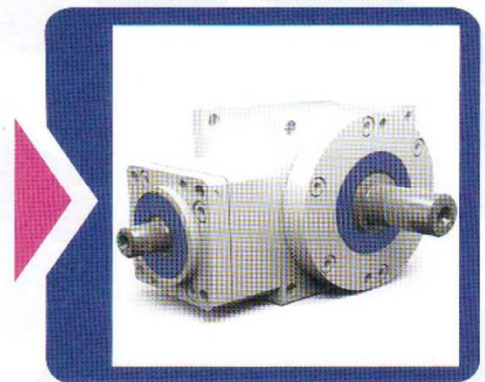
ATEK

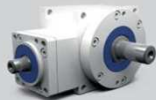
ANTRIEBSTECHNIK

Das Winkelgetriebe



HYPOID GEARBOXES





Hypoid gearboxes

Gear ratios: $i = 8:1$ to $15:1$
Maximum output torque: 1700 Nm
6 gearbox sizes with edge lengths of 090 to 260 mm
Speeds up to $n_1 = 8000$ rpm

Dynamic, powerful, compact
Housing made of aluminium
Hypoid gear sets
Axial offset between drive and output-
Maintenance-free



8.1 Type overview



Type H – Hypoid gearboxes

Gear ratios: $i = 8:1$ to $15:1$ (others upon request)
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

8.2 General construction

The axles intersect in the gearbox at the distance A in an angle of 90°.

Gearbox size	090	115	140	170	215	260
--------------	-----	-----	-----	-----	-----	-----

The edge length of the housing is reflected in the gearbox size (example: H 090: the housing edge length is 90 mm, with the viewing direction towards the output side of the gearbox). The housings are made of aluminium, the shaft suspension units are made of steel or casting.

8.2.1 Toothing

ATEK hypoid gearboxes have gear sets with high-quality hypoid toothing made of hardened carburised steel. A gear set comprises one pinion shaft (small number of teeth / small diameter) and one bevel gear (large number of teeth / large diameter). Gear sets with spiral toothing offer the advantage of very favourable engagement factors (high meshing ratio). Therefore they are predestined for usage with high loads. On hypoid gear sets, the axial offset between pinion shaft and gear results in higher sliding motion rates in the tooth contact. This makes it possible to achieve especially great running smoothness and a high transmission accuracy.

8.2.2 Construction types

Due to the modular system, different gearbox construction types can be configured. The construction types vary in

Construction type	consists of:
-------------------	--------------

The variants differ in the type of the shafts, the rotational direction thereof, and the possibility to use a robot flange interface (BOR and COR).

8.2.3 Threaded mounting holes

The sides 1 and 2 of the gearboxes are machined and may be used as mounting surfaces. The flange on side 3 has also threaded mounting holes. On the sides 5 and 6, fastening can be made via through bores.

You have the following available ordering options:

Order code	Threaded mounting holes are in the housing surfaces on the gearbox side	Threaded mounting holes are in the flanges on the gearbox side
9	1, 2	3

Please enquire other mounting options.

The standard version of the mounting / fastening has the order code 9.

Example of order code: H 090 12:1 D0 9.1

8.2.4 Installation position

The gearboxes can be used in all installation positions. The recommended installation position is the position in which the shafts are horizontal.

These are the installation positions 1 and 2. The installation position is defined by the gearbox side directed downwards during operation and will be indicated by the corresponding gearbox side. Example of order code for the installation position 1: H 090 12:1 D0 9.1

8.2.5 Shaft designation – allocation to the gearbox sides

The fast-rotating shaft has the speed n_1 and is identified by N_1 . The hypoid pinion is located on this shaft. The slowly rotating shaft has the speed n_2 and is identified by N_2 . The hypoid gear is located on this shaft. The gearbox sides are identified by the numerals 1 to 6. (See Figure 4.3.1-1; Gearbox sides)

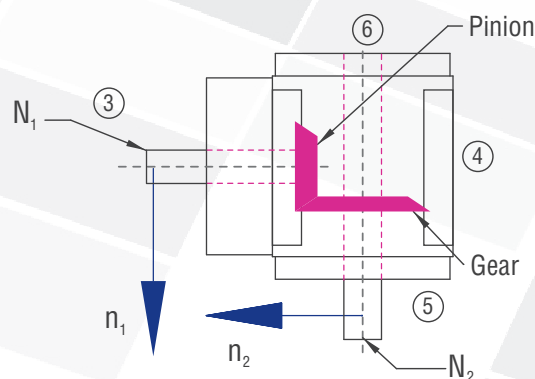


Figure 4.3.1-1; Shaft designations

8.2.6 Preferred direction of rotation

If the clockwise (CW) direction of rotation (viewing direction from shaft end face of the fast-rotating shaft towards the gearbox centre) is selected, a lower noise level is generated.

8.2.7 Efficiency

The achievable efficiency depends on rotational speed, torque, installation position, sealing, and lubricant type. The efficiency is about 95%. The efficiency specified relates to the permissible nominal load and is a guidance value for run-in gearboxes at operating temperature with standard sealing.

8.2.8 Lubrication

The H-series gearboxes have lifetime lubrication.

8.2.9 Vent filter

If venting is required (B1 or C1) the gearboxes will be delivered with a vent filter. The vent bores will be equipped with screw plugs for transport. The vent filter will be enclosed as a separate item and must be mounted in the intended position prior to commissioning. An elbow may be required. Please adhere to the operating instructions!

8.2.10 Low-backlash construction

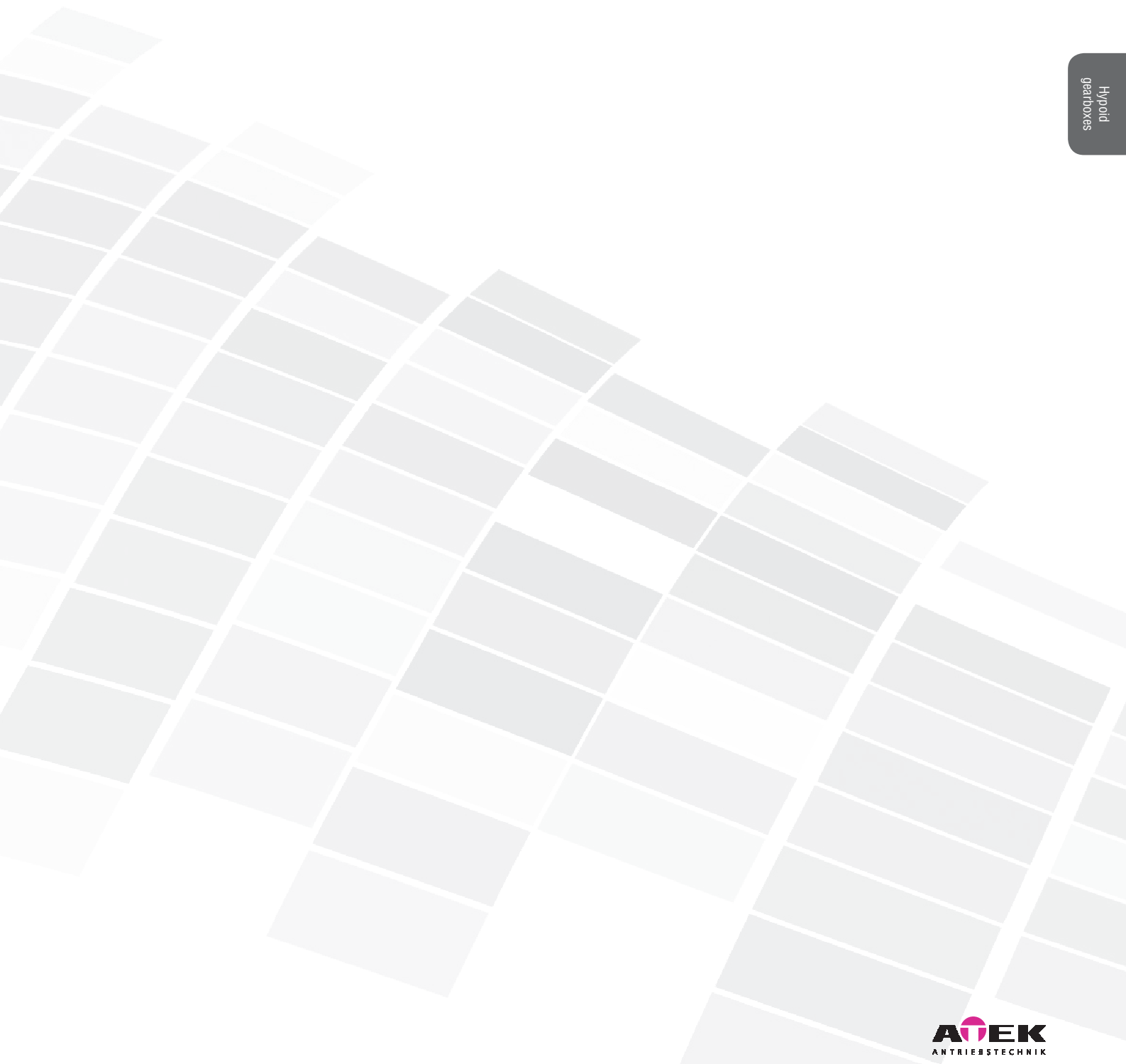
For low-friction running, the tooth space in the gear set is manufactured larger than the tooth. When the direction of rotation is changed, this results in a rotation angle until the counter-rotating tooth flanks contact each other. This rotation angle is called circumferential backlash.

Circumferential backlash, measuring method

The circumferential backlash is measured after the drive shaft (N_1) has been fixed. A force of around 2% of the nominal torque is applied to the output shaft (N_2) in both rotational directions. A tooth backlash will result between the two final positions. This can be measured as rotation angle and is indicated in minutes of arc [arcmin].

Circumferential backlash, type

Ordering option	Gear set	090 - 115	140 - 260
/S2	Standard	-	-
/S0	Special gear set	≤ 3 arcmin	≤ 2 arcmin



8.3 Type H – Standard hypoid gearboxes

8.3.1 Features

Gear ratios: $i = 8:1$ to $15:1$ (others upon request)
 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

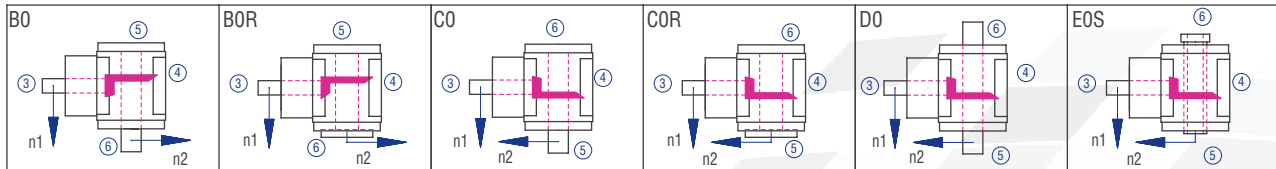


Figure 8.3.2-1; Models

8.3.3 Gearbox sides

The example shows the Model C0

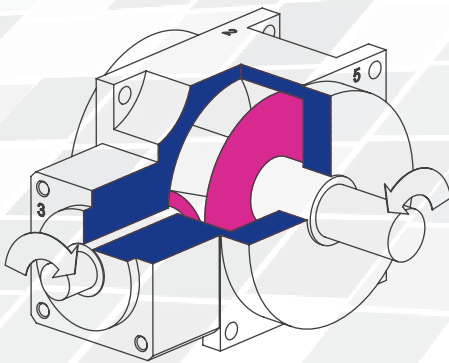


Figure 8.3.3-2; Gearbox sides

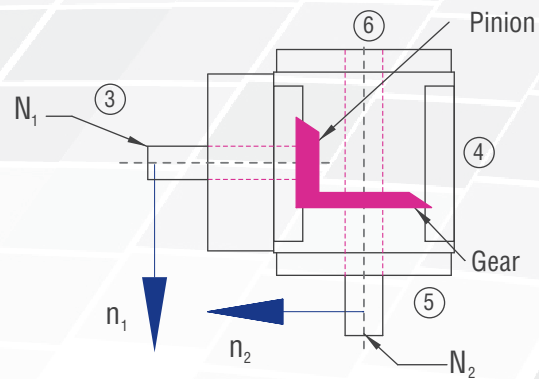


Figure 8.3.3-1; Shaft designations

8.3.4 Order code

The order code reflects the customer specifications. Example:

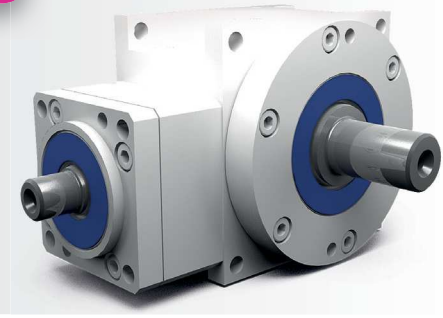
Type	Size	Gear ratio	Model	Fixing side	Installation position	Speed n_2	Design
Description	Size; Table 8.3.5-1	Table 8.3.5-1	Figure 8.3.2-1; Models	Side on which fixing is made; Table 8.2.3- 1; Figure 4.3.1-1 Gearbox sides	Side directed downwards; Figure 4.3.1-1 Gearbox sides	Slowly rotating shaft	S1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

8.3.5 Overview of performance data

Selection table: gearbox size; gear ratio; rotational speed

Size	N _{1MAX} [rpm]	N ₁ [rpm]	8:1			10:1			12:1			15:1		
			T _{2N} [Nm]	T _{2B} [Nm]	T _{2NOT} [Nm]	T _{2N} [Nm]	T _{2B} [Nm]	T _{2NOT} [Nm]	T _{2N} [Nm]	T _{2B} [Nm]	T _{2NOT} [Nm]	T _{2N} [Nm]	T _{2B} [Nm]	T _{2NOT} [Nm]
090	8000	3200	36	54	72	36	54	72						
115	8000	2700	71	107	143	71	107	143						
140	7000	2200	142	215	289	143	215	290						
170	6000	1800	267	398	529	267	398	530						
215	5000	1200	723	1084	1450	723	1084	1450						
260	4500	1000	1444	2165	2887	1444	2165	2887						

8.3.6 Type H 090 – Standard hypoid gearboxes



Characteristics

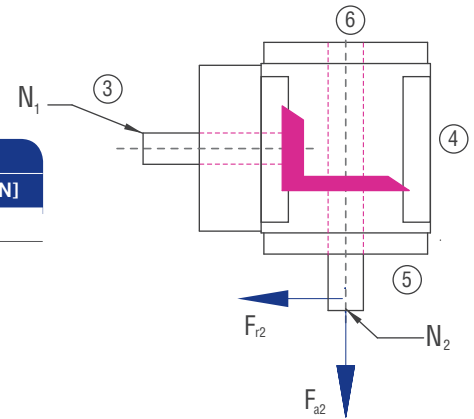
Characteristic	Standard	Option
Gear ratio	8:1 to 15:1	
Threaded mounting holes	On the sides 1, 2 and 3	See chapter 8.2.3
Hollow shaft	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Protection class	IP 54	See chapter 4.5
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Lubricants	Synthetic lubricants	See chapter 8.2.8

Performance data

		8:1			10:1			12:1			15:1		
N_1 [rpm]	N_{1MAX} [rpm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]
3900	8000	0	0	0	0	0	0	26	40	52	25	38	50

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

10:1		12:1		15:1		8:1	
F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]



Hybrid
gearboxes

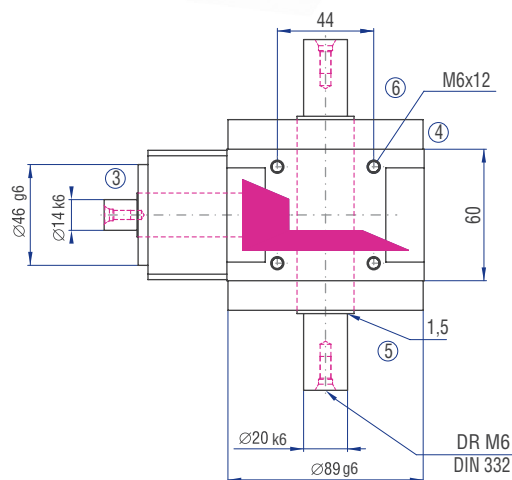
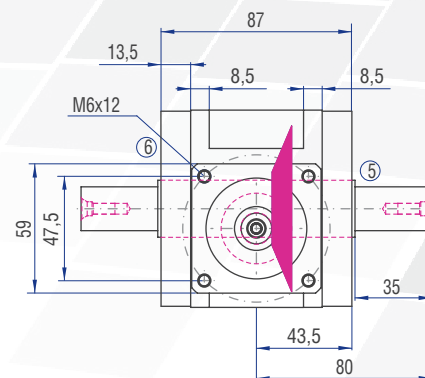
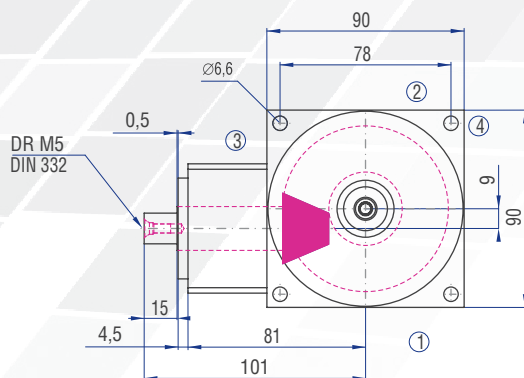
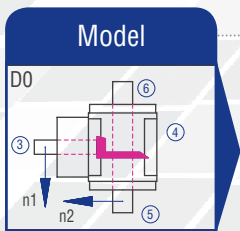
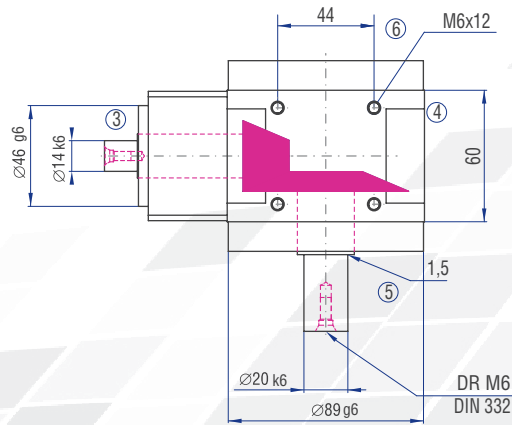
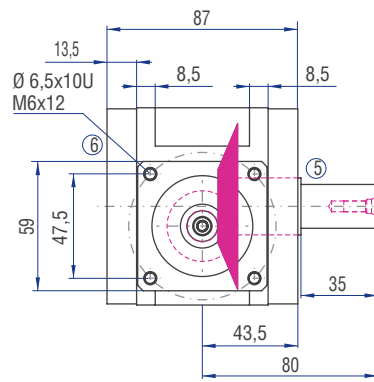
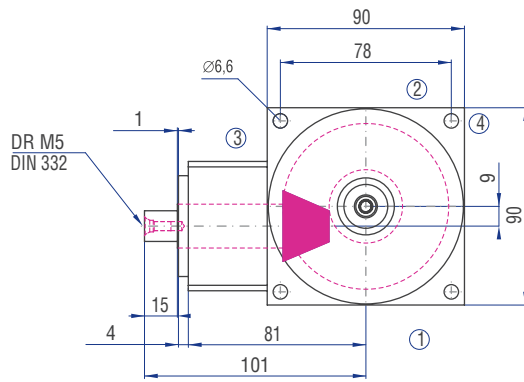
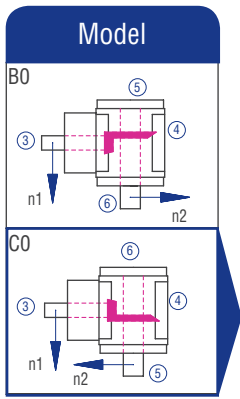
Gearbox inertia moments/mass

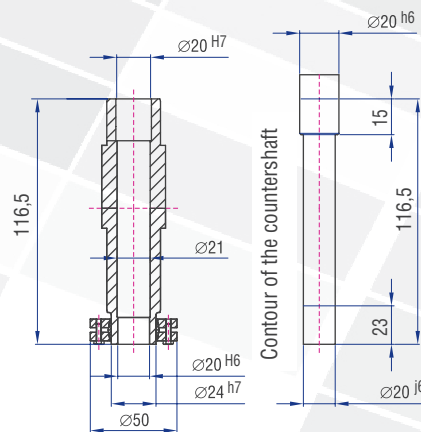
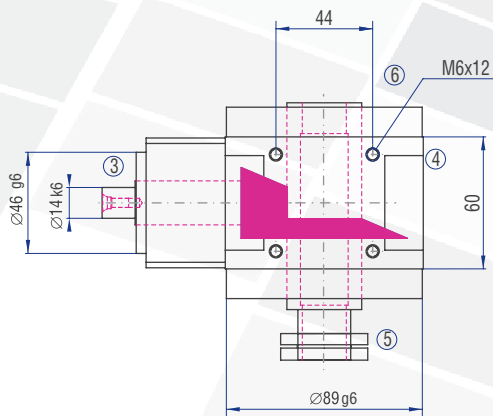
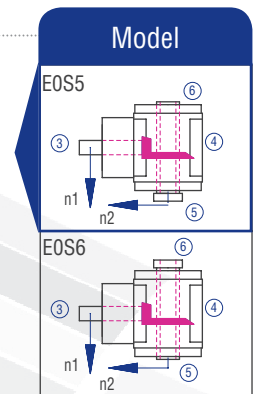
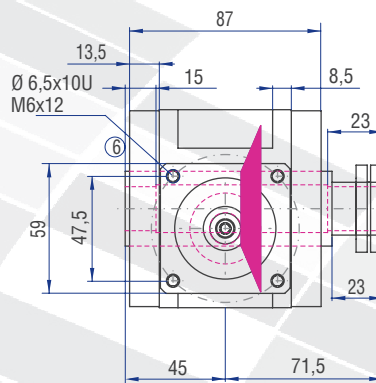
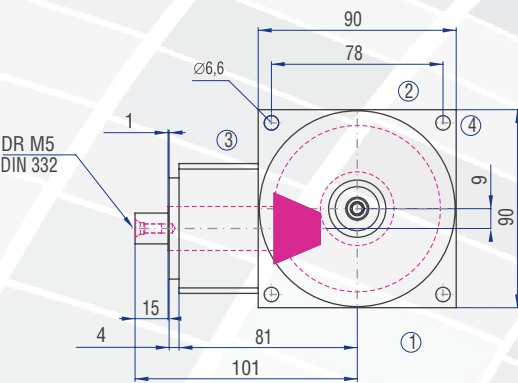
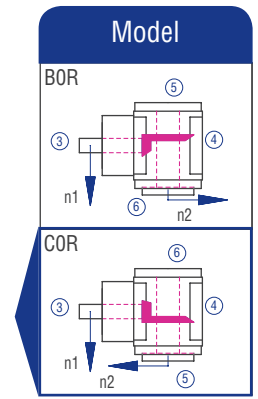
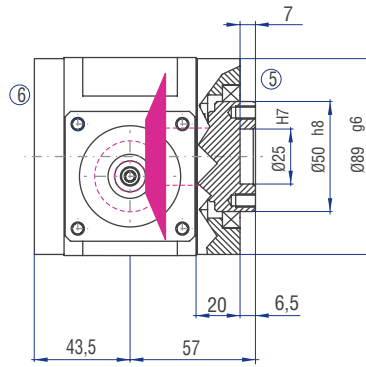
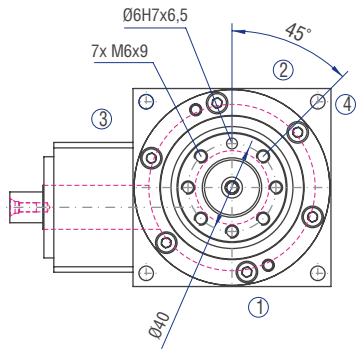
Inertia moment J_1 related to the fast-rotating shaft (N_1)

Inertia moment [kgcm ²]				Mass ca. [kg]
8:1	10:1	12:1	15:1	

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

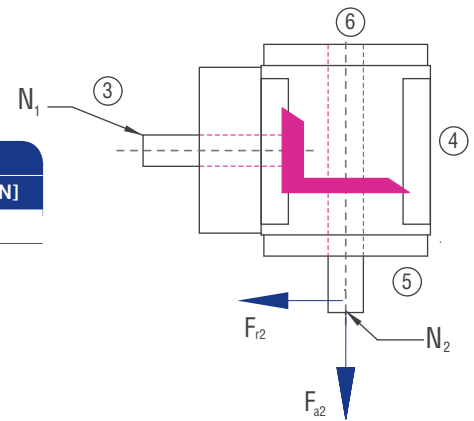
Characteristic	Standard	Option
Gear ratio	8:1 to 15:1	
Threaded mounting holes	On the sides 1, 2 and 3	See chapter 8.2.3
Hollow shaft	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Protection class	IP 54	See chapter 4.5
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Lubricants	Synthetic lubricants	See chapter 8.2.8

Performance data

		8:1			10:1			12:1			15:1		
N_1 [rpm]	N_{1MAX} [rpm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]
3300	8000	0	0	0	0	0	0	52	79	108	50	75	100

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

10:1		12:1		15:1		8:1	
F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]



Hybrid
gearboxes

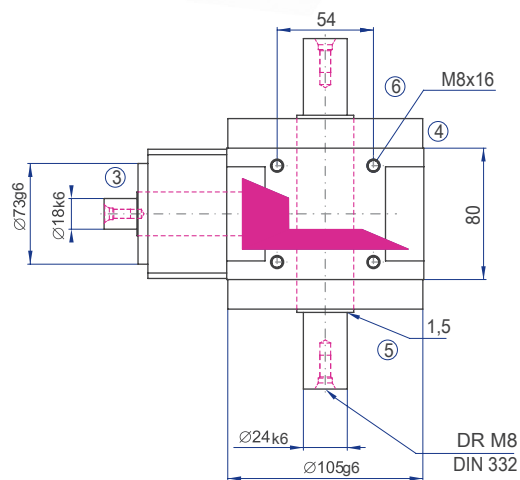
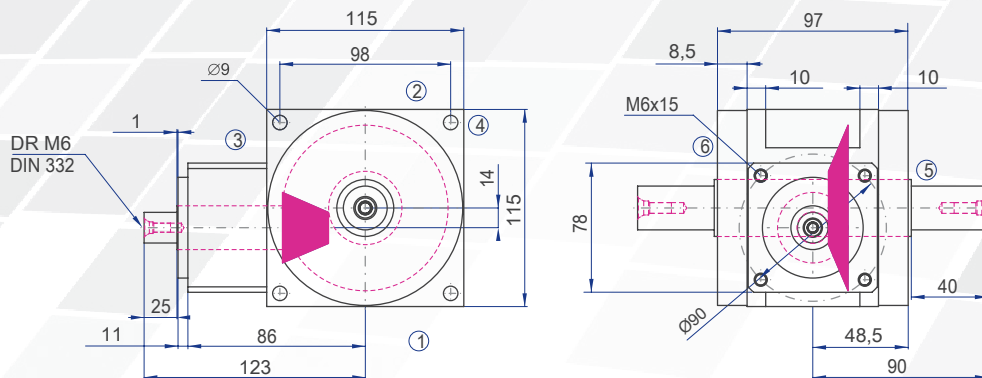
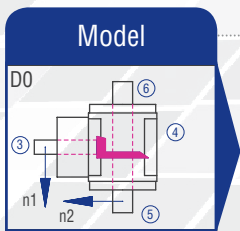
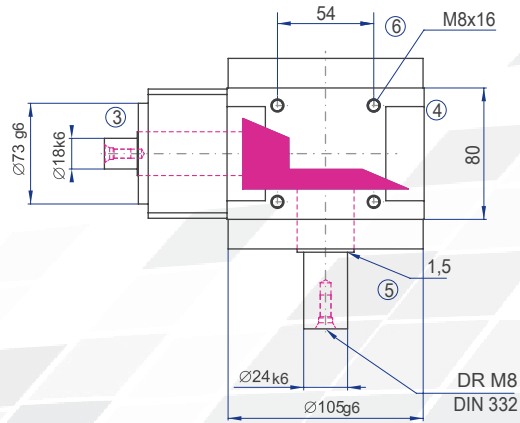
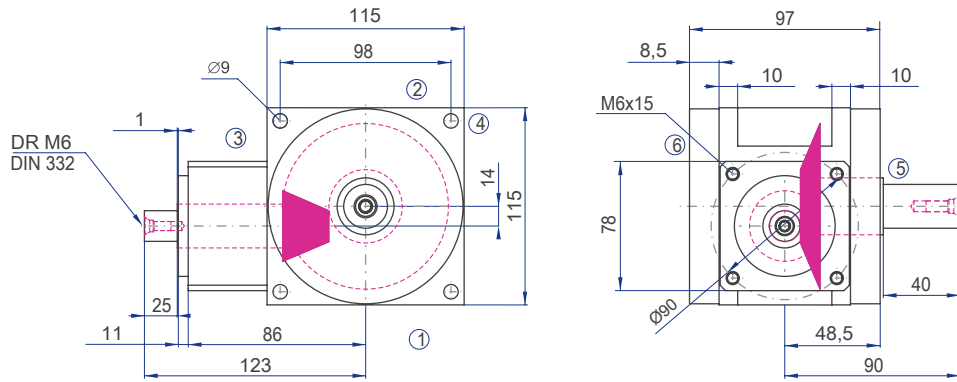
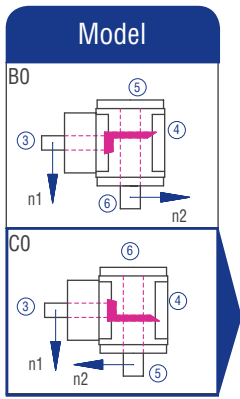
Gearbox inertia moments/mass

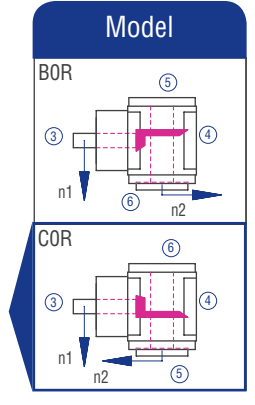
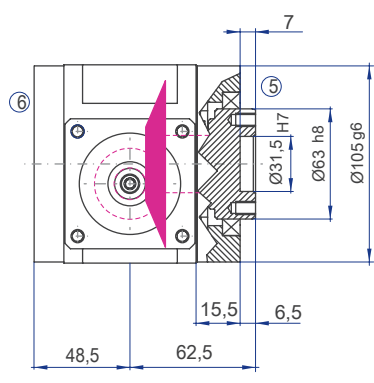
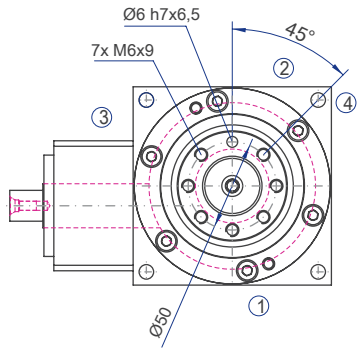
Inertia moment J_1 related to the fast-rotating shaft (N_1)

Inertia moment [kgcm ²]				Mass ca. [kg]
8:1	10:1	12:1	15:1	

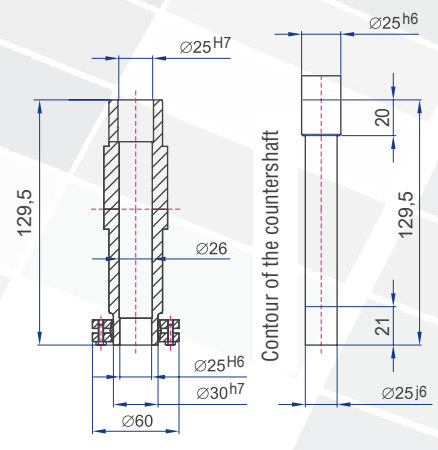
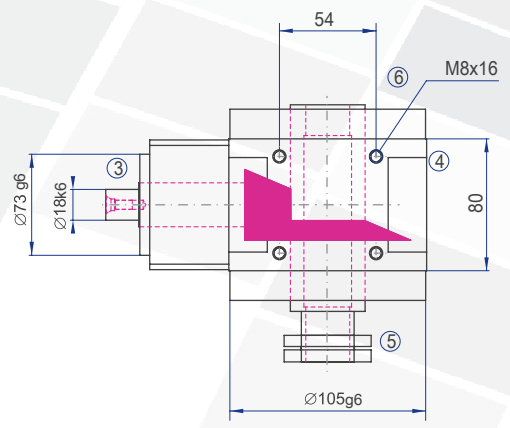
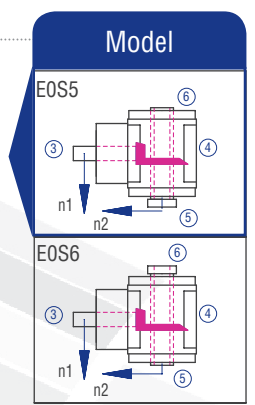
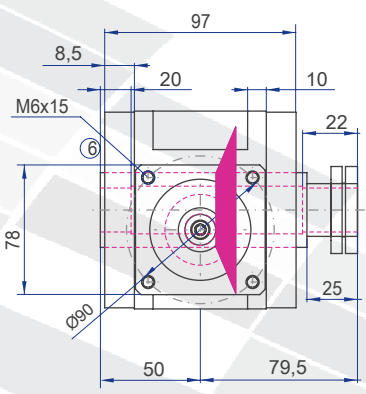
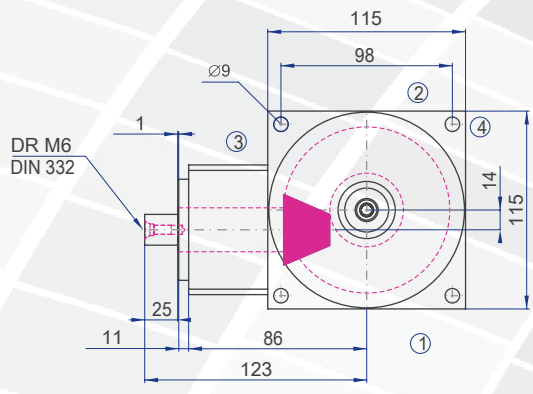
The mass of the gearbox may deviate depending on the type and the gear ratio.

8.3.7 Type H 115 – Standard hypoid gearboxes

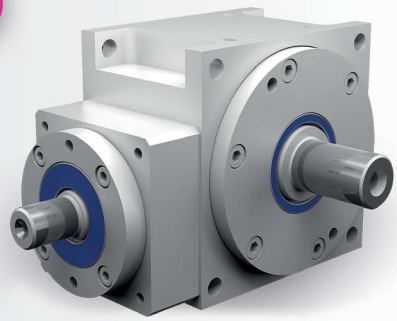




Hybrid gearboxes



8.3.8 Type H 140 – Standard hypoid gearboxes



Characteristics

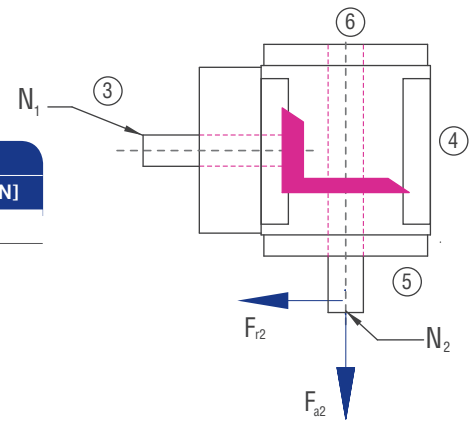
Characteristic	Standard	Option
Gear ratio	8:1 to 15:1	
Threaded mounting holes	On the sides 1, 2 and 3	See chapter 8.2.3
Hollow shaft	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Protection class	IP 54	See chapter 4.5
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Lubricants	Synthetic lubricants	See chapter 8.2.8

Performance data

		8:1			10:1			12:1			15:1		
N_1 [rpm]	N_{1MAX} [rpm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]
2800	7000	0	0	0	0	0	0	98	146	195	97	145	194

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

10:1		12:1		15:1		8:1	
F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]



Hybrid
gearboxes

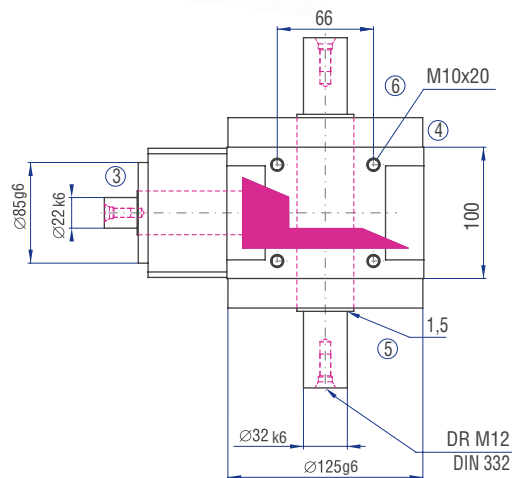
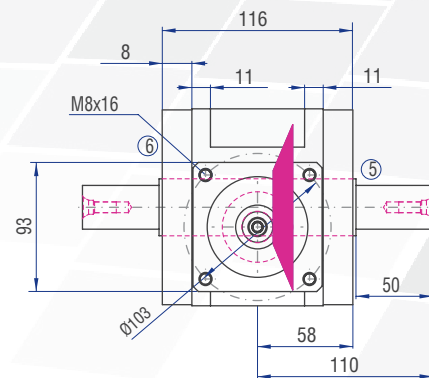
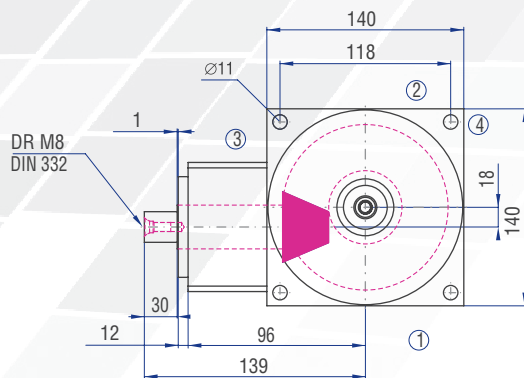
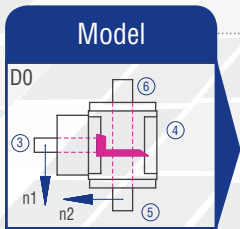
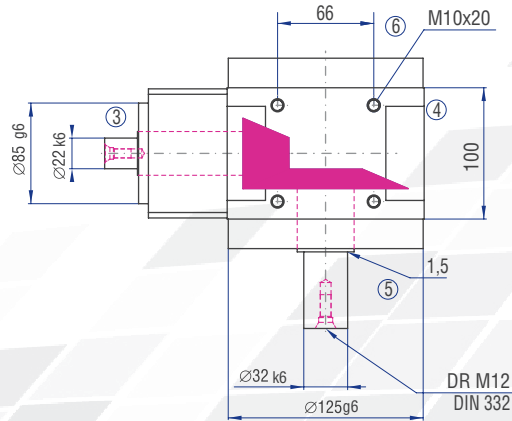
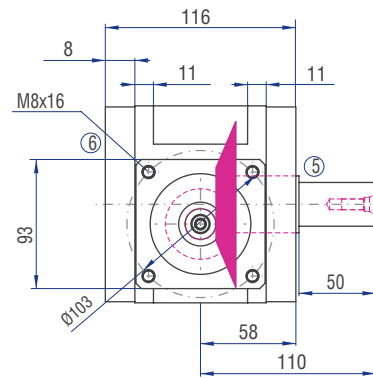
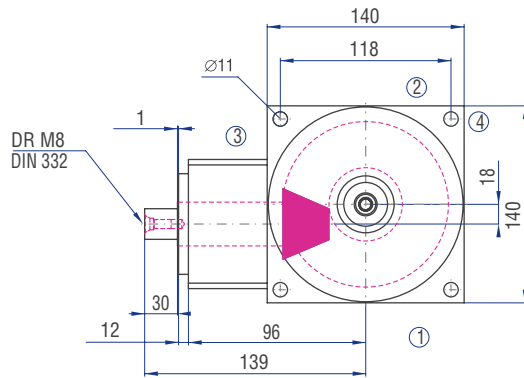
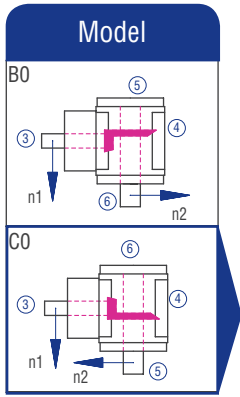
Gearbox inertia moments/mass

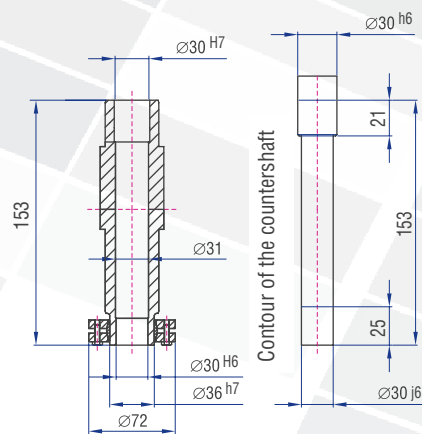
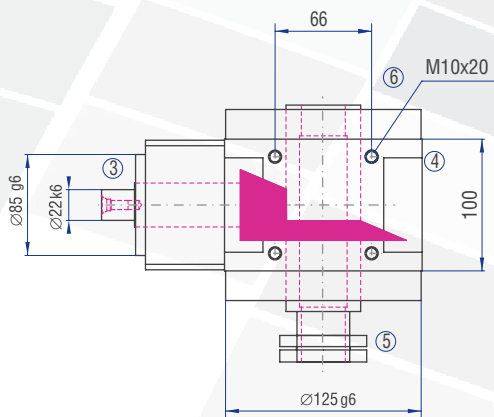
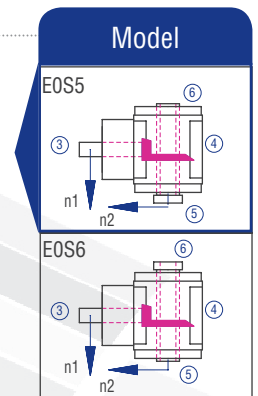
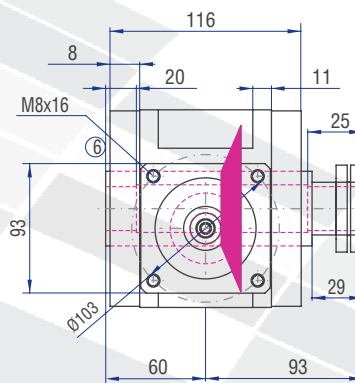
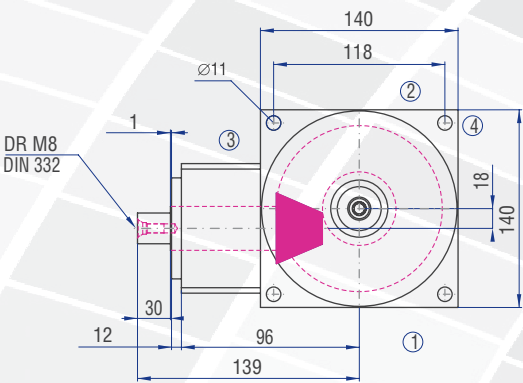
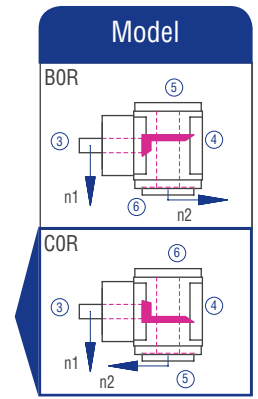
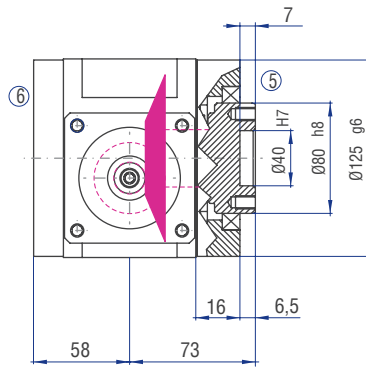
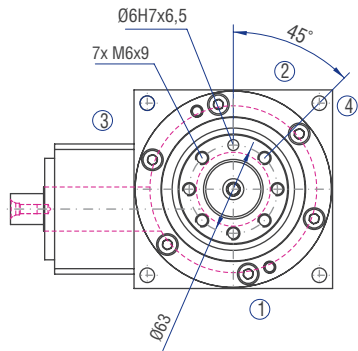
Inertia moment J_1 related to the fast-rotating shaft (N_1)

Inertia moment [kgcm ²]				Mass ca. [kg]
8:1	10:1	12:1	15:1	

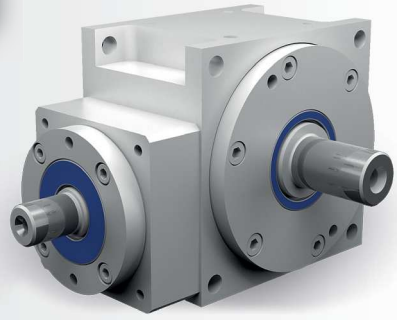
The mass of the gearbox may deviate depending on the type and the gear ratio.

8.3.8 Type H 140 – Standard hypoid gearboxes





8.3.9 Type H 170 – Standard hypoid gearboxes



Characteristics

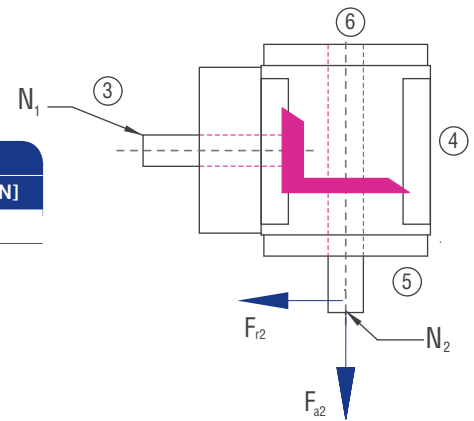
Characteristic	Standard	Option
Gear ratio	8:1 to 15:1	
Threaded mounting holes	On the sides 1, 2 and 3	See chapter 8.2.3
Hollow shaft	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Protection class	IP 54	See chapter 4.5
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Lubricants	Synthetic lubricants	See chapter 8.2.8

Performance data

		8:1			10:1			12:1			15:1		
N_1 [rpm]	N_{1MAX} [rpm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]
2300	6000	0	0	0	0	0	0	188	280	370	182	278	369

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

10:1		12:1		15:1		8:1	
F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]



Hybrid
gearboxes

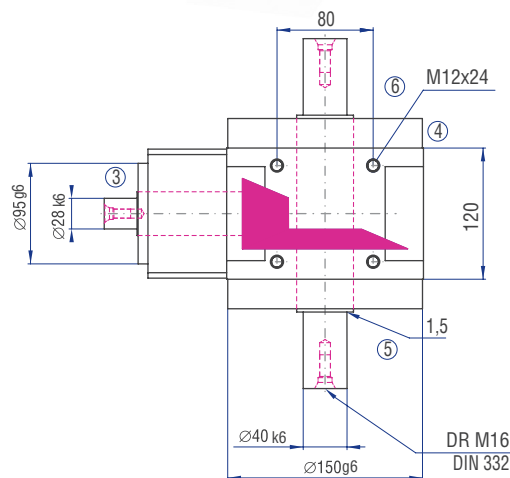
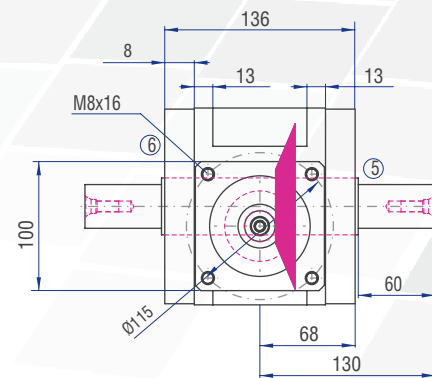
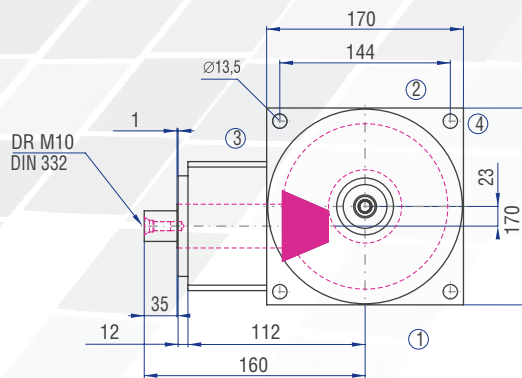
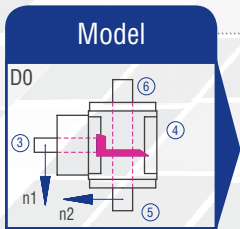
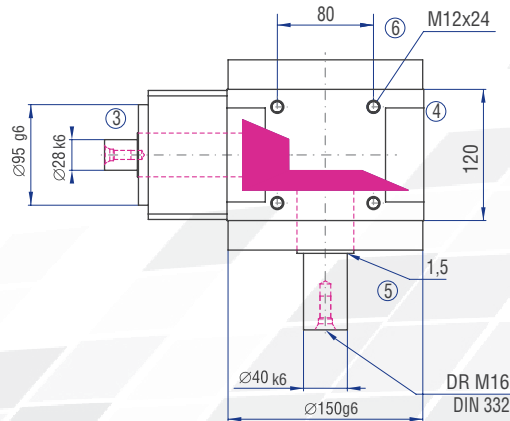
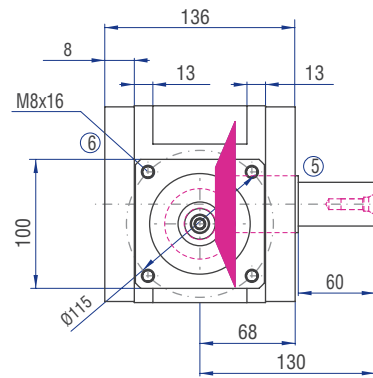
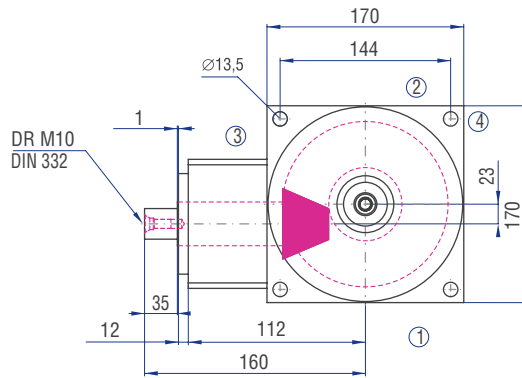
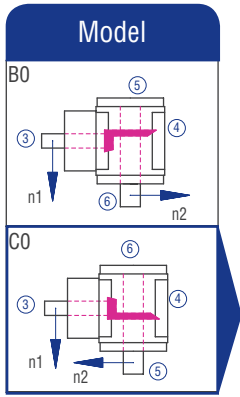
Gearbox inertia moments/mass

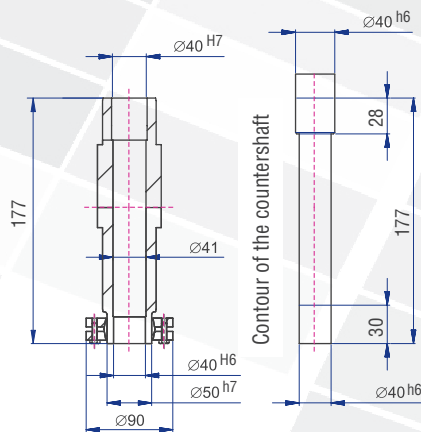
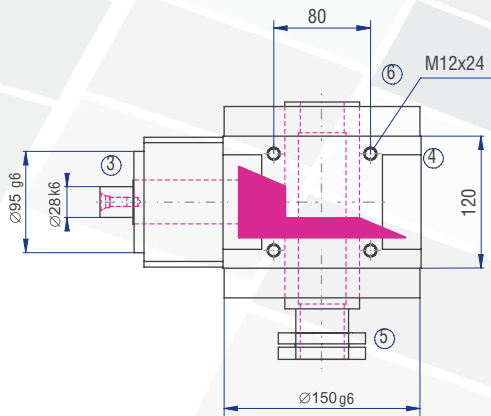
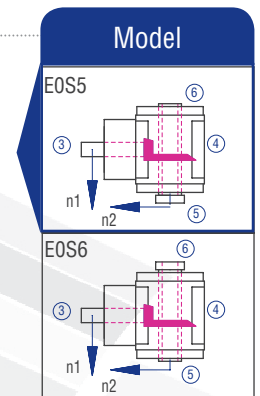
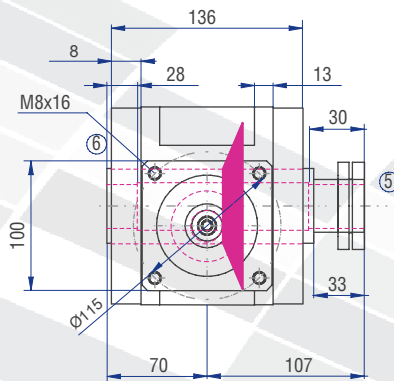
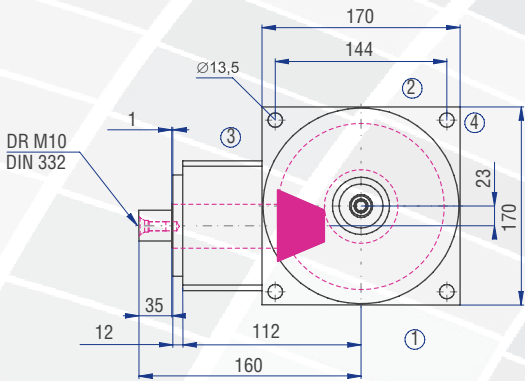
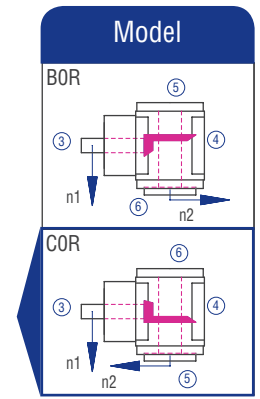
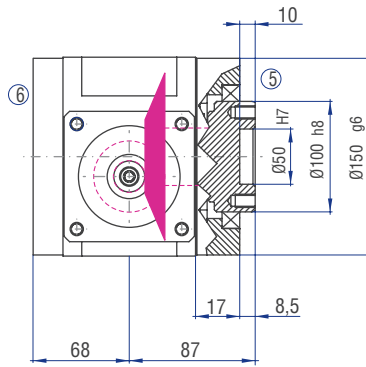
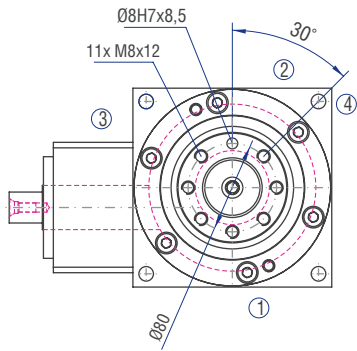
Inertia moment J_1 related to the fast-rotating shaft (N_1)

Inertia moment [kgcm ²]				Mass ca. [kg]
8:1	10:1	12:1	15:1	

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

8.3.9 Type H 170 – Standard hypoid gearboxes





Contour of the countershaft

8.3.10 Type H 215 – Standard hypoid gearboxes



Characteristics

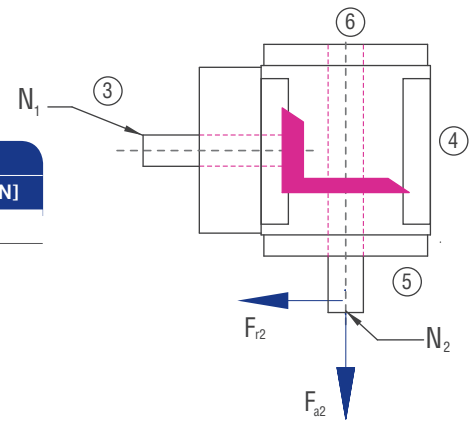
Characteristic	Standard	Option
Gear ratio	8:1 to 15:1	
Threaded mounting holes	On the sides 1, 2 and 3	See chapter 8.2.3
Hollow shaft	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Protection class	IP 54	See chapter 4.5
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Lubricants	Synthetic lubricants	See chapter 8.2.8

Performance data

		8:1			10:1			12:1			15:1		
N_1 [rpm]	N_{1MAX} [rpm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]
1600	5000	0	0	0	0	0	0	512	767	1022	512	767	1022

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

10:1		12:1		15:1		8:1	
F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]



Hybrid
gearboxes

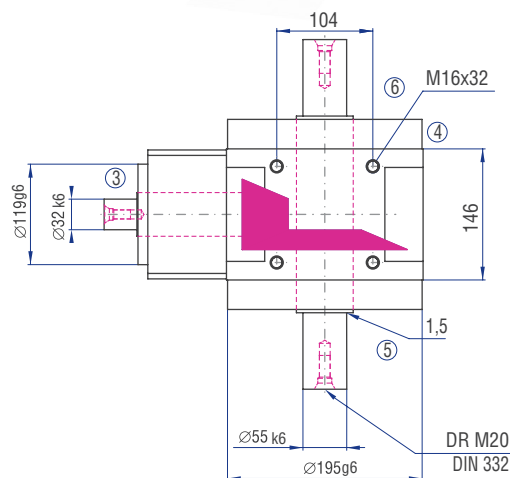
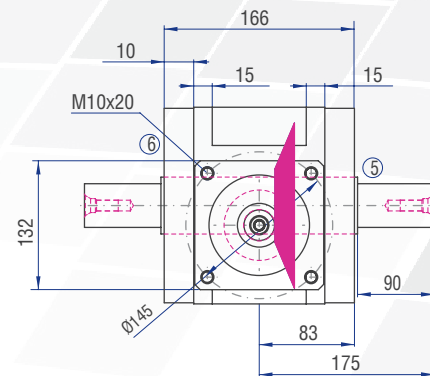
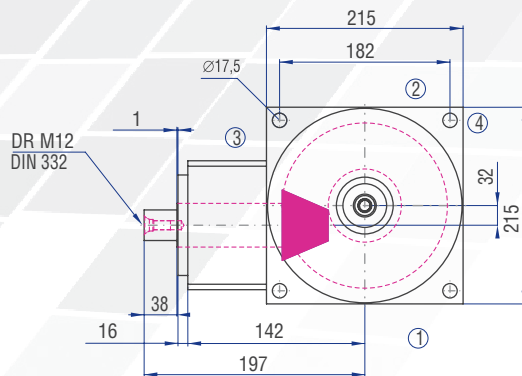
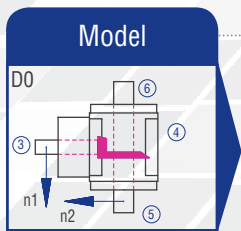
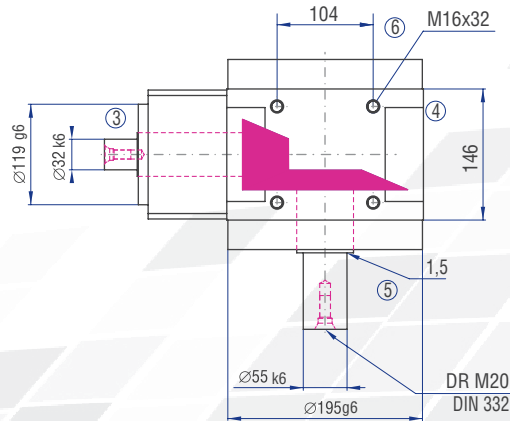
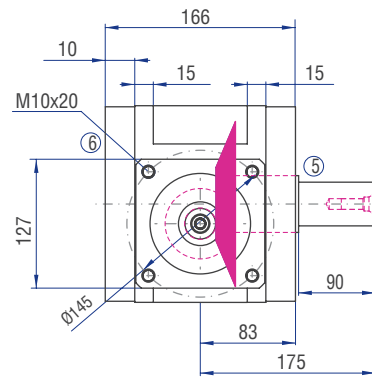
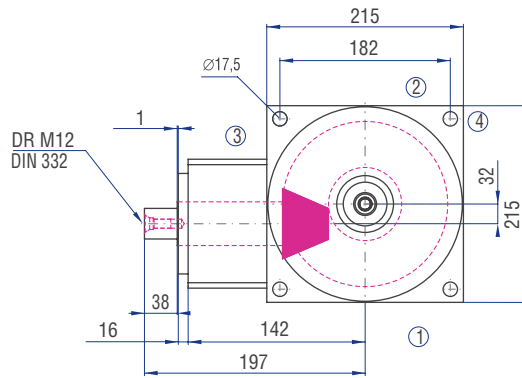
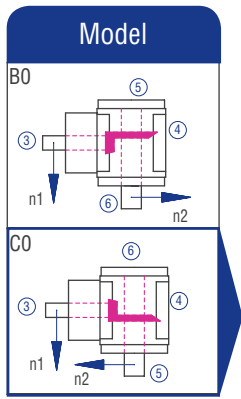
Gearbox inertia moments/mass

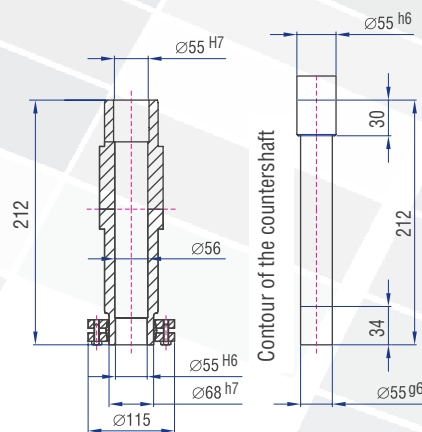
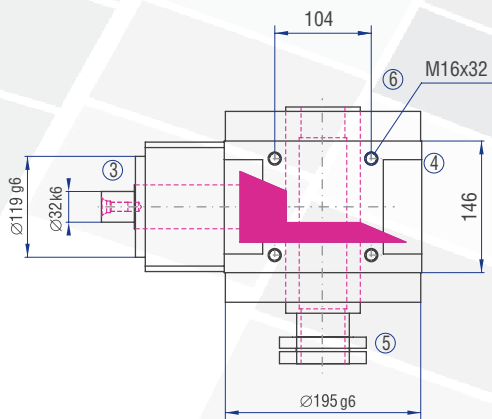
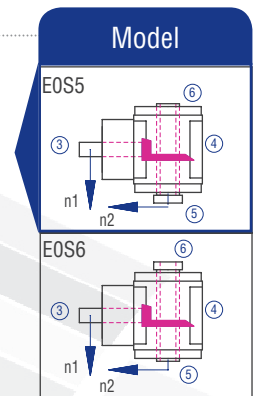
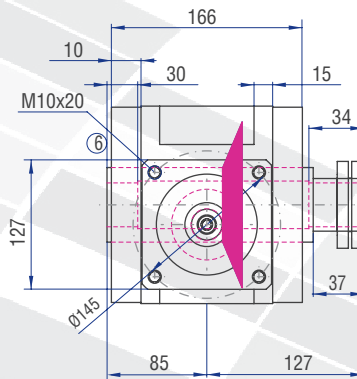
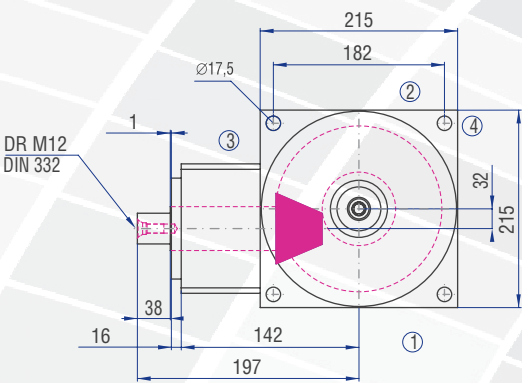
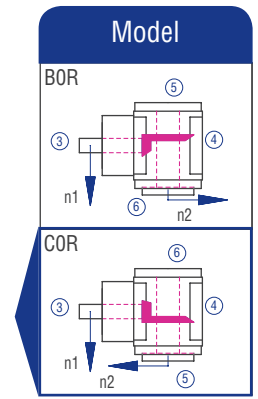
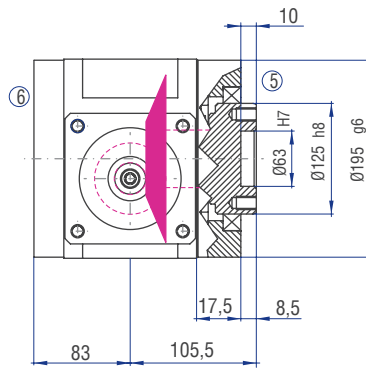
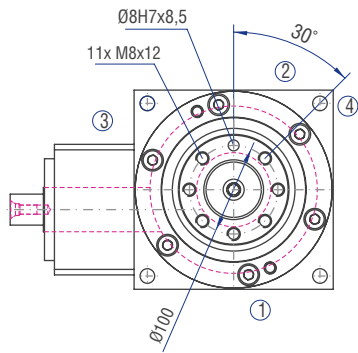
Inertia moment J_1 related to the fast-rotating shaft (N_1)

Inertia moment [kgcm ²]				Mass ca. [kg]
8:1	10:1	12:1	15:1	

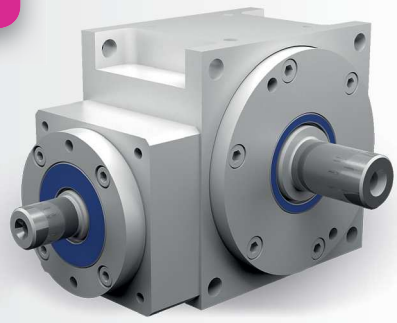
The mass of the gearbox may deviate depending on the type and the gear ratio.

8.3.10 Type H 215 – Standard hypoid gearboxes





8.3.11 Type H 260 – Standard hypoid gearboxes



Characteristics

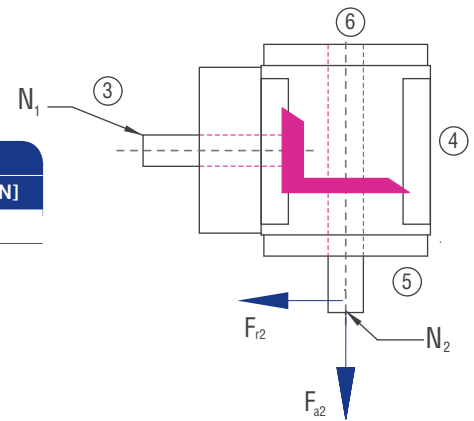
Characteristic	Standard	Option
Gear ratio	8:1 to 15:1	
Threaded mounting holes	On the sides 1, 2 and 3	See chapter 8.2.3
Hollow shaft	Material 1 C45, shafts greased Fit with ISO 6 tolerance	See chapter 4.6.3
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Protection class	IP 54	See chapter 4.5
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Lubricants	Synthetic lubricants	See chapter 8.2.8

Performance data

		8:1			10:1			12:1			15:1		
N_1 [rpm]	N_{1MAX} [rpm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]	T_{2N} [Nm]	T_{2B} [Nm]	T_{2NOT} [Nm]
1300	4500	0	0	0	0	0	0	1023	1533	2044	1023	1533	2044

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

10:1		12:1		15:1		8:1	
F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]	F_{r2} [N]	F_{a2} [N]



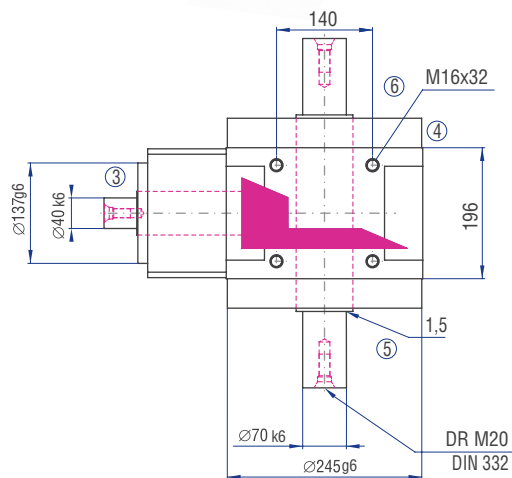
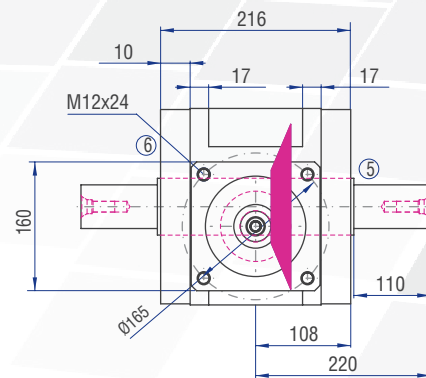
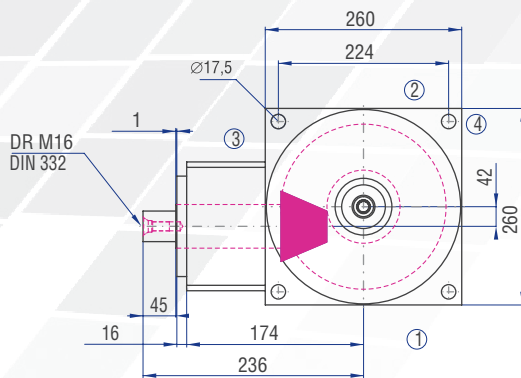
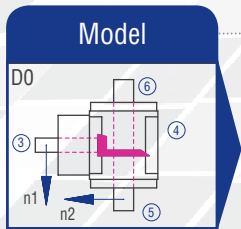
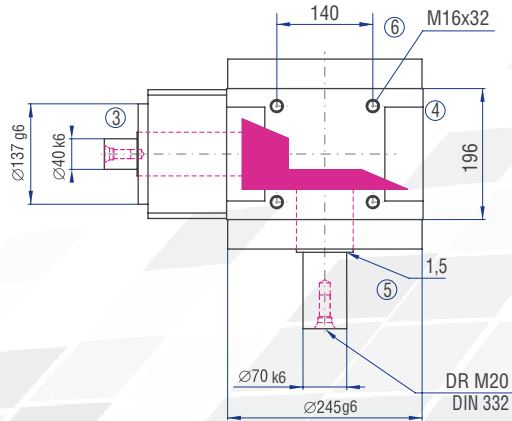
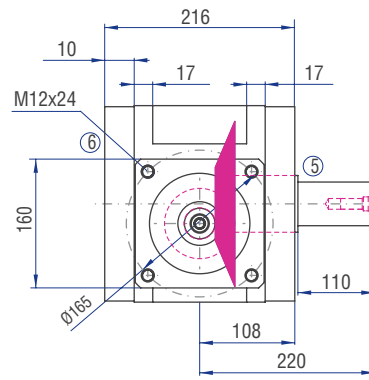
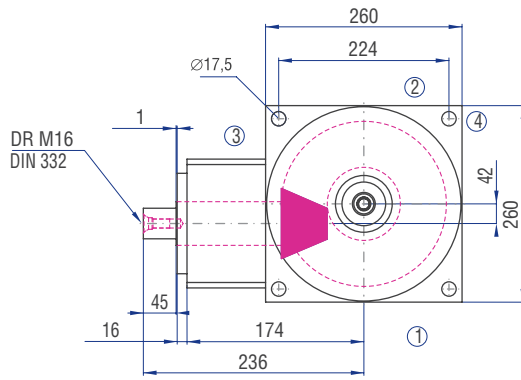
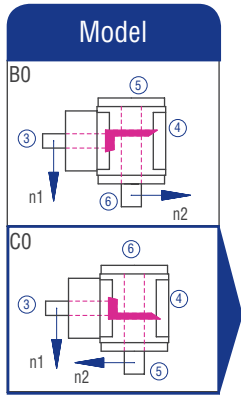
Gearbox inertia moments/mass

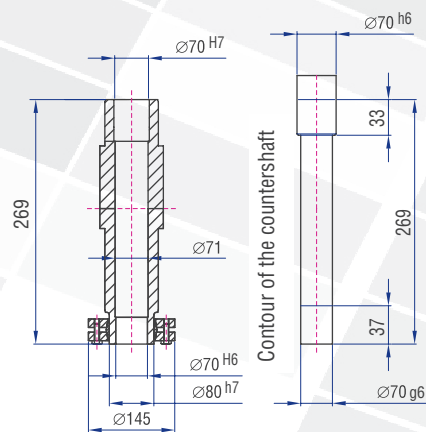
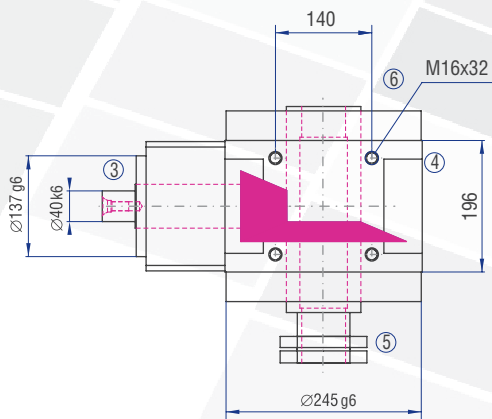
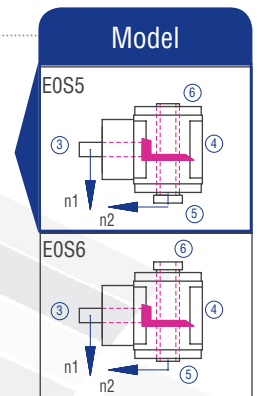
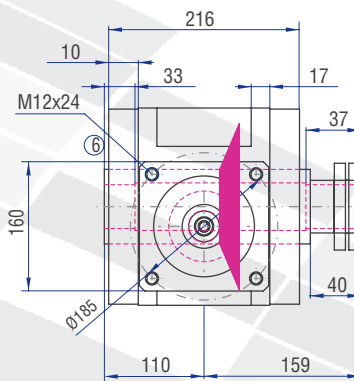
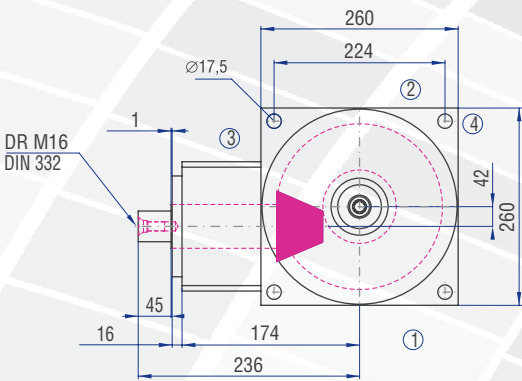
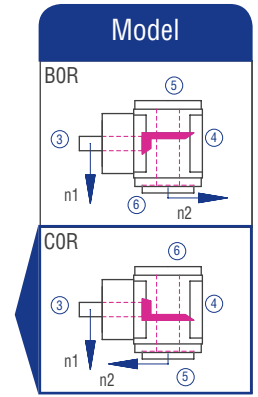
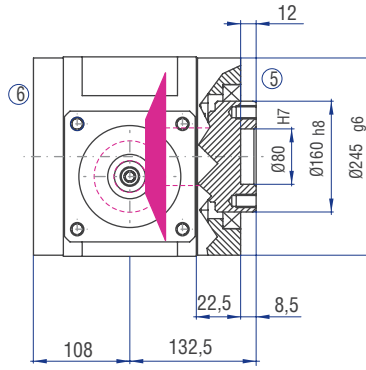
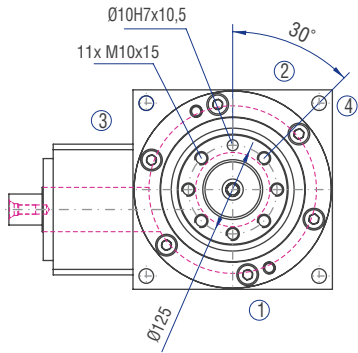
Inertia moment J_1 related to the fast-rotating shaft (N_1)

Inertia moment [kgcm ²]				Mass ca. [kg]
8:1	10:1	12:1	15:1	

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

8.3.11 Type H 260 – Standard hypoid gearboxes





www.setec-group.com



TORINO

Direzione Generale e Stabilimento di Produzione
Headquarter and Production Plant

Via Mappano, 17 - 10071 Borgaro T.se (TO) - T +39 011 451 8611 (centr. r.a.) - F +39 011 470 4891
setec.to@setec-group.it



MILANO

Via Meccanica, 5
20026 Novate (MI) - Z. I. Vialba
T +39 02 356 0990 - 382 01 590 (r.a.)
F +39 02 356 0943
setec.mi@setec-group.it



BOLOGNA

Via Del Lavoro, 6/A
40051 Altedo (BO)
T +39 051 871 949 (3 linee r.a.)
F +39 051 870 329
setec.bo@setec-group.it



PADOVA

Via Secchi, 81
35136 Padova
T +39 049 872 5983
F +39 049 856 0965
setec.pd@setec-group.it

FIRENZE

Via Galileo Galilei, 3
50015 Bagno a Ripoli - Grassina (FI)
T +39 055 643 261
F +39 055 646 6614
setec.fi@setec-group.it