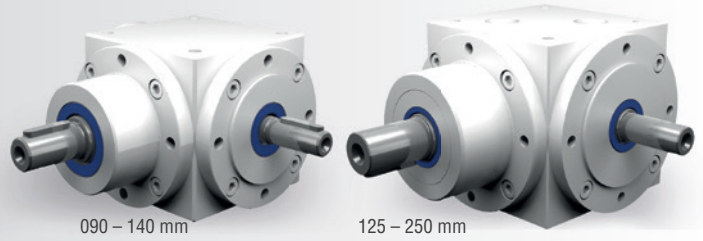


6.4 Type VS – Type V with step-up ratio

6.4.1 Features

Gear ratios: $i = 1:1.5$ to $1:2$
 Maximum output torque: 1200 Nm
 7 gearbox sizes with edge lengths of 090 to 260 mm
 Larger shaft diameter (N_2), slowly rotating
 Low-backlash construction < 10 angular minutes possible
 Housing made of grey cast iron or steel

The through-shaft (N_1) is fast-running



6.4.2 Models

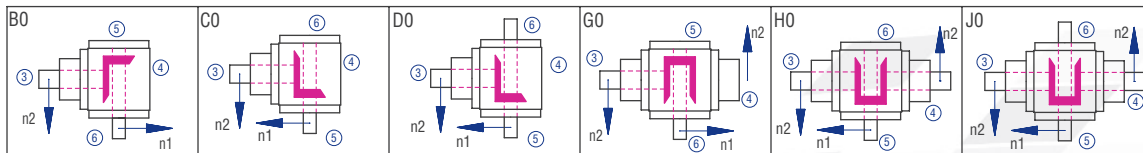


Figure 6.4.2-1; Models

6.4.3 Gearbox sides

The example shows the Model C0

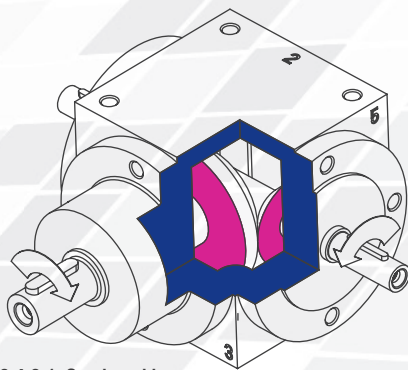


Figure 6.4.3-1; Gearbox sides

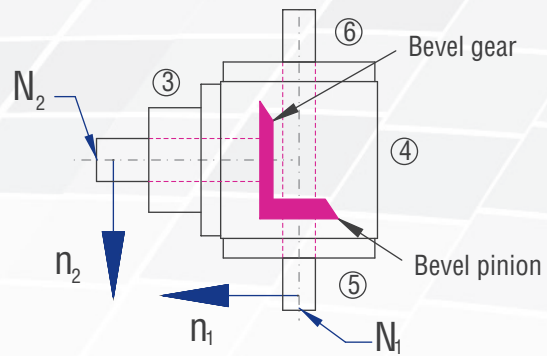


Figure 6.4.3-2; Shaft designations

6.4.4 Order code

The order code reflects the customer specifications. Example:

Type	Size	Gear ratio	Model	Fixing side	Installation position	Speed n_2	Design
VS	090	1.5:1	C0-	1.	1-	1500	/0000
Description	Housing; Table 6.4.5-1	Table 6.4.5-1	Figure 6.4.2-1; Models	Gearbox side on which fixing is made Table 6.2.3-1; Figure 4.3.1-1; Gear- box sides	Gearbox side directed down- wards; Figure 4.3.1-1; Gearbox sides	Slowly rotating shaft; Table 6.4.5-1	Standard

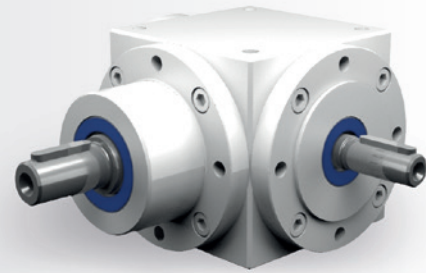
Table 6.4.4-1

6.4.5 Overview of performance data

Size	1.5:1				2:1		
	n ₁ [rpm]	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]
090	3000	2000	5.51	25	1500	3.80	23
	2400	1600	4.59	26	1200	3.17	24
	1500	1000	3.20	29	750	2.23	27
	1000	667	2.35	32	500	1.65	30
	750	500	1.93	35	375	1.24	30
	500	333	1.36	37	250	0.82	30
	250	167	0.74	40	125	0.41	30
	50	33	0.15	40	25	0.08	30
120	3000	2000	13.45	61	1500	9.26	56
	2400	1600	11.46	65	1200	8.07	61
	1500	1000	8.60	78	750	6.03	73
	1000	667	6.32	86	500	4.40	80
	750	500	5.18	94	375	3.30	80
	500	333	3.70	100	250	2.20	80
	250	167	1.84	100	125	1.10	80
	50	33	0.37	100	25	0.22	80
140	3000	2000	24.91	113	1500	16.53	100
	2400	1600	22.22	126	1200	14.68	111
	1500	1000	17.08	155	750	11.41	138
	1000	667	12.87	175	500	8.38	152
	750	500	10.47	190	375	6.86	166
	500	333	7.34	200	250	4.96	180
	250	167	3.76	204	125	2.48	180
	50	33	0.76	210	25	0.50	180
160	3000	2000	40.78	185	1500	28.11	170
	2400	1600	36.15	205	1200	25.53	193
	1500	1000	27.78	252	750	20.25	245
	1000	667	20.59	280	500	14.88	270
	750	500	16.26	295	375	11.57	280
	500	333	11.56	315	250	8.27	300
	250	167	6.07	330	125	4.41	320
	50	33	1.29	355	25	0.88	320
200	3000	2000	72.75	330	1500	51.25	310
	2400	1600	63.49	360	1200	45.24	342
	1500	1000	48.17	437	750	35.13	425
	1000	667	37.13	505	500	27.56	500
	750	500	30.31	550	375	21.90	530
	500	333	22.02	600	250	14.60	530
	250	167	11.04	600	125	7.30	530
	50	33	2.18	600	25	1.46	530
230	3000	2000	99.20	450	1500	87.63	530
	2400	1600	91.35	518	1200	80.02	605
	1500	1000	72.20	655	750	59.11	715
	1000	667	56.21	765	500	45.19	820
	750	500	45.47	825	375	36.79	890
	500	333	33.79	920	250	26.73	970
	250	167	20.57	1120	125	16.88	1225
	50	33	4.89	1330	25	3.66	1330
260	3000	2000	189.58	860	1500	133.92	810
	2400	1600	158.72	900	1200	112.43	850
	1500	1000	104.71	950	750	78.53	950
	1000	667	73.50	1000	500	57.87	1050
	750	500	55.11	1000	375	48.36	1170
	500	333	36.70	1000	250	33.07	1200
	250	167	18.40	1000	125	16.53	1200
	50	33	3.64	1000	25	3.31	1200

Table 6.4.5-1

6.4.6 Type VS 090 – Type V with step-up ratio

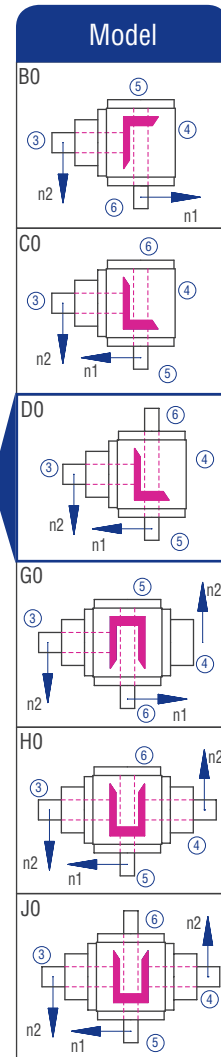
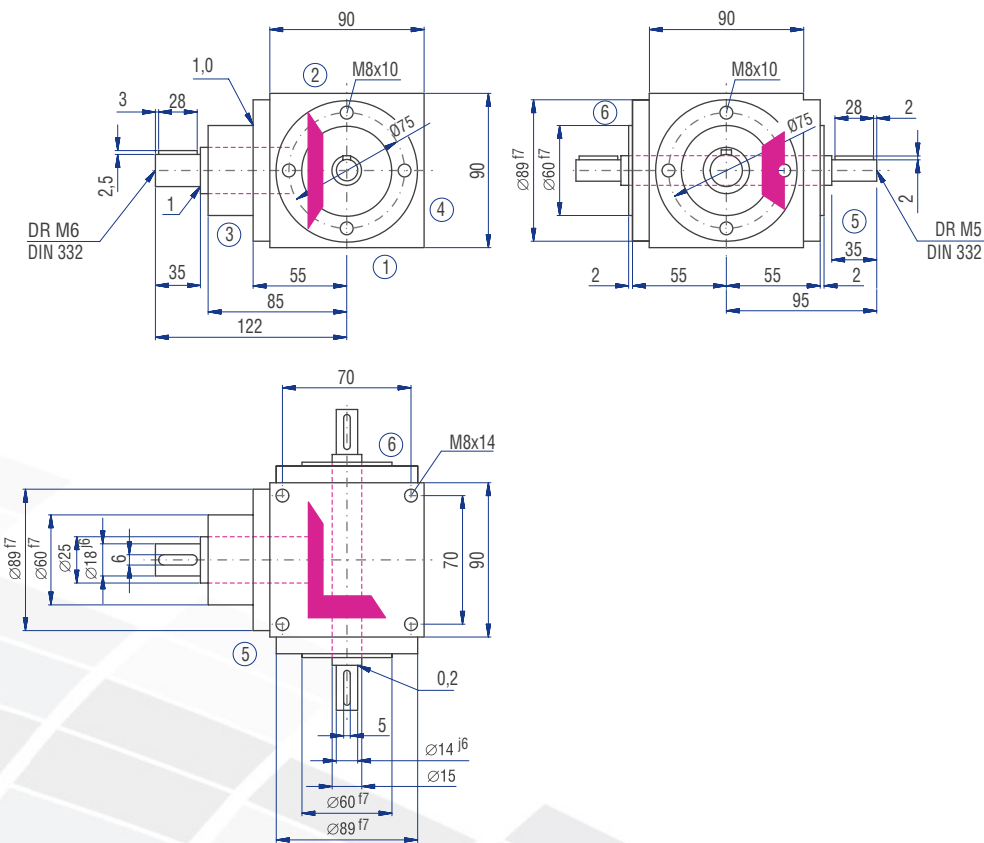


Characteristics

Characteristic	Standard	Option
Toothing	Bevel gear set, spiral-toothed	See chapter 6.2.1
Gear ratio	1.5:1 to 2:1	
Housing / Flanges	Grey cast iron; steel	
Threaded mounting holes	On all housing surfaces without flange and on all flanges.	See chapter 6.2.3
Shaft	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance with parallel keyway: according to DIN 6885 Sheet 1	See chapter 4.6.2
Hollow shaft	Not deliverable	
Radial shaft seal ring	NBR, form A	See chapter 4.8
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Cumferential backlash	< 30 arcmin	See chapter 6.2.10
Protection class	IP 54	See chapter 4.5
Corrosion protection	Prime coat; layer thickness > 40 µm	See chapter 4.4.1
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Oil change intervals	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 6.2.8
Lubricant	Synthetic lubricants	See chapter 6.2.8

Performance data

n ₁ [rpm]	1.5:1			2:1		
	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]
3000	2000	5.51	25	1500	3.80	23
2400	1600	4.59	26	1200	3.17	24
1500	1000	3.20	29	750	2.23	27
1000	667	2.35	32	500	1.65	30
750	500	1.93	35	375	1.24	30
500	333	1.36	37	250	0.82	30
250	167	0.74	40	125	0.41	30
50	33	0.15	40	25	0.08	30
P _{1Nt} [kW]	3.8			3.8		
T _{2max} [Nm]	40			30		



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

n_2 [rpm]	1500		1000		500		250		100		50	
T_{2N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 30	300	150	400	200	470	235	580	290	700	350	800	400
> 30	250	125	330	165	390	195	490	245	590	295	670	335

Permissible radial force F_{r1} and axial force F_{a1} on shaft N_1

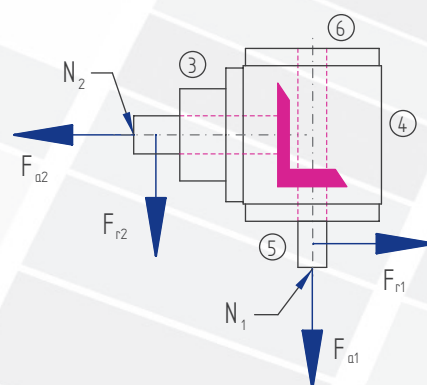
n_1 [rpm]	3000		1000		500		250		100		50	
T_{1N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 20	390	195	510	255	620	310	730	365	960	480	1150	575
> 20	320	160	420	210	510	255	610	305	800	400	960	480

Inertia moments/mass

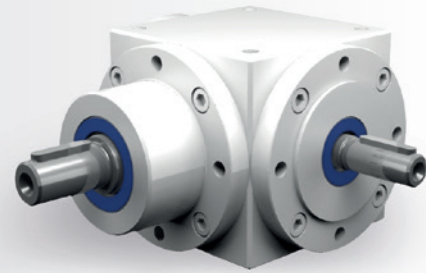
Inertia moment J_2 related to the slowly rotating shaft (N_2)

Model	Inertia moment [kgcm ²]	
	1.5:1	2:1
B0	2.40750	1.82000
C0	2.40750	1.82000
D0	2.45250	1.90000
G0	4.20750	3.12000
H0	4.20750	3.12000
J0	4.25250	3.20000

Mass ca. [kg]
5.1
5.1
5.1
6.6
6.6
6.6



6.4.7 Type VS 120 – Type V with step-up ratio

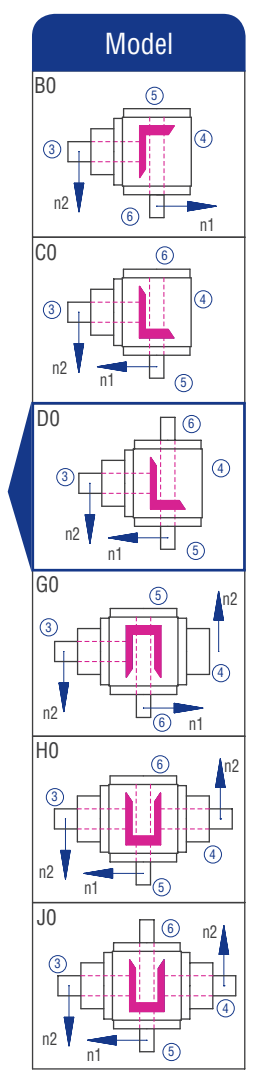
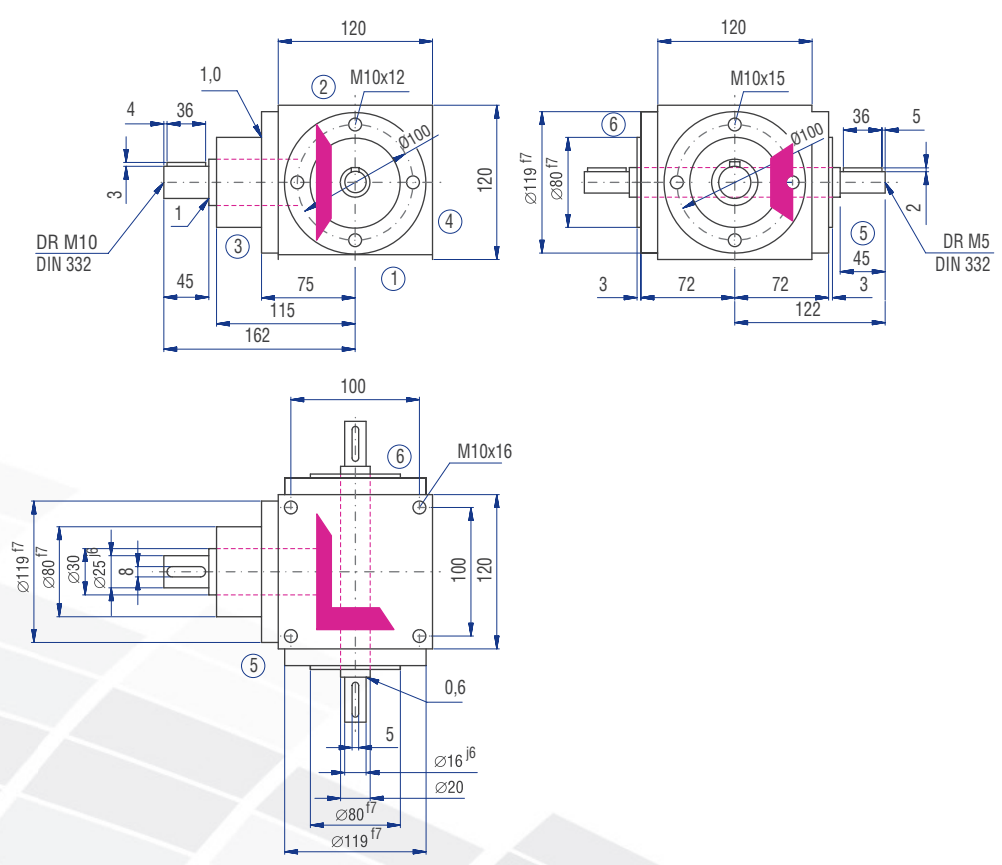


Characteristics

Characteristic	Standard	Option
Toothings	Bevel gear set, spiral-toothed	See chapter 6.2.1
Gear ratio	1.5:1 to 2:1	
Housing / Flanges	Grey cast iron; steel	
Threaded mounting holes	On all housing surfaces without flange and on all flanges.	See chapter 6.2.3
Shaft	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance with parallel keyway: according to DIN 6885 Sheet 1	See chapter 4.6.2
Hollow shaft	Not deliverable	
Radial shaft seal ring	NBR, form A	See chapter 4.8
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Circumferential backlash	< 30 arcmin	See chapter 6.2.10
Protection class	IP 54	See chapter 4.5
Corrosion protection	Prime coat; layer thickness > 40 µm	See chapter 4.4.1
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Oil change intervals	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 6.2.8
Lubricant	Synthetic lubricants	See chapter 6.2.8

Performance data

n ₁ [rpm]	1.5:1			2:1		
	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]
3000	2000	13.45	61	1500	9.26	56
2400	1600	11.46	65	1200	8.07	61
1500	1000	8.60	78	750	6.03	73
1000	667	6.32	86	500	4.40	80
750	500	5.18	94	375	3.30	80
500	333	3.70	100	250	2.20	80
250	167	1.84	100	125	1.10	80
50	33	0.37	100	25	0.22	80
P _{1Nt} [kW]	6.2			6.2		
T _{2max} [Nm]	100			80		



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

n_2 [rpm]	1500		1000		500		250		100		50	
T_{2N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 80	470	235	620	310	720	360	900	450	1150	575	1400	700
> 80	390	195	520	260	600	300	750	375	960	480	1170	585

Permissible radial force F_{r1} and axial force F_{a1} on shaft N_1

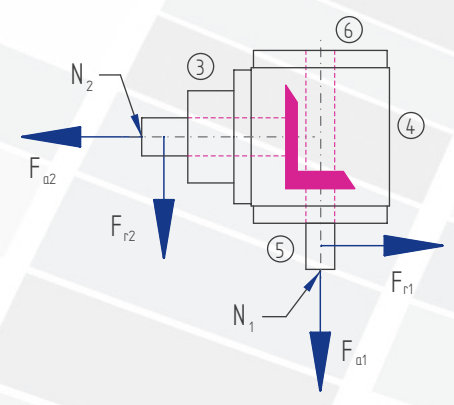
n_1 [rpm]	3000		1000		500		250		100		50	
T_{1N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 60	580	290	770	385	960	480	1150	575	1460	730	1690	845
> 60	480	240	640	320	800	400	960	480	1220	610	1410	705

Inertia moments/mass

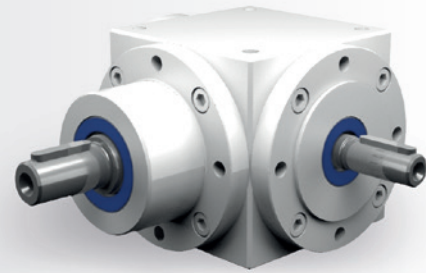
Inertia moment J_2 related to the slowly rotating shaft (N_2)

Model	Inertia moment [kgcm ²]	
	1.5:1	2:1
B0	9.60000	9.80000
C0	9.60000	9.80000
D0	9.70000	9.90000
G0	16.30000	16.40000
H0	16.30000	16.40000
J0	16.40000	16.50000

Mass ca.[kg]
11.5
11.5
11.5
15.0
15.0
15.0



6.4.8 Type VS 140 – Type V with step-up ratio

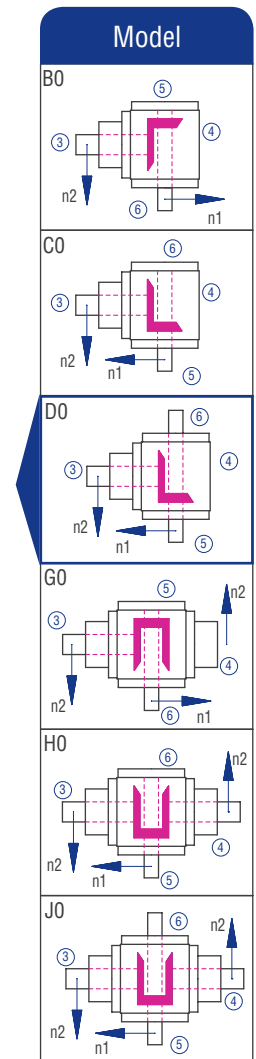
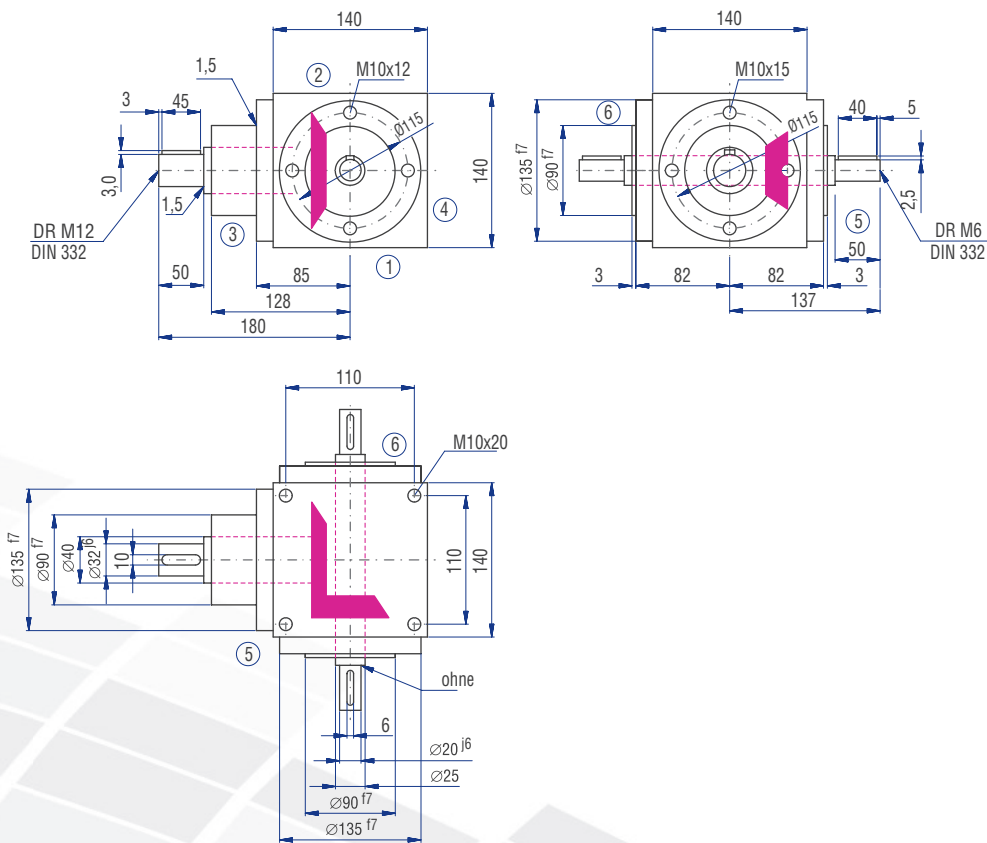


Characteristics

Characteristic	Standard	Option
Toothing	Bevel gear set, spiral-toothed	See chapter 6.2.1
Gear ratio	1.5:1 to 2:1	
Housing / Flanges	Grey cast iron; steel	
Threaded mounting holes	On all housing surfaces without flange and on all flanges.	See chapter 6.2.3
Shaft	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance with parallel keyway: according to DIN 6885 Sheet 1	See chapter 4.6.2
Hollow shaft	Not deliverable	
Radial shaft seal ring	NBR, form A	See chapter 4.8
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Circumferential backlash	< 30 arcmin	See chapter 6.2.10
Protection class	IP 54	See chapter 4.5
Corrosion protection	Prime coat; layer thickness > 40 µm	See chapter 4.4.1
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Oil change intervals	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 6.2.8
Lubricant	Synthetic lubricants	See chapter 6.2.8

Performance data

n ₁ [rpm]	1.5:1			2:1		
	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]
3000	2000	24.91	113	1500	16.53	100
2400	1600	22.22	126	1200	14.68	111
1500	1000	17.08	155	750	11.41	138
1000	667	12.87	175	500	8.38	152
750	500	10.47	190	375	6.86	166
500	333	7.34	200	250	4.96	180
250	167	3.76	204	125	2.48	180
50	33	0.76	210	25	0.50	180
P _{1Nt} [kW]	10.0			10.0		
T _{2max} [Nm]	210			180		



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

n_2 [rpm]	1500		1000		500		250		100		50	
T_{2N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 140	700	350	870	435	1150	575	1370	685	1700	850	2000	1000
> 140	590	295	730	365	960	480	1140	570	1420	710	1670	835

Permissible radial force F_{r1} and axial force F_{a1} on shaft N_1

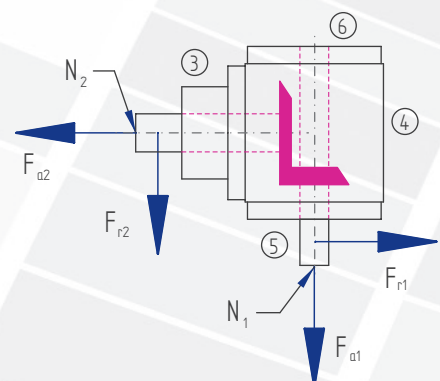
n_1 [rpm]	3000		1000		500		250		100		50	
T_{1N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 90	1210	605	1750	875	2020	1010	2230	1115	3010	1505	3540	1770
> 90	1010	505	1460	730	1680	840	1860	930	2500	1250	2950	1475

Inertia moments/mass

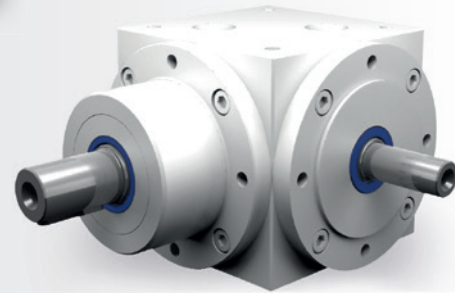
Inertia moment J_2 related to the slowly rotating shaft (N_2)

Model	Inertia moment [kgcm ²]	
	1.5:1	2:1
B0	29.8000	24.2000
C0	29.8000	24.2000
D0	30.0000	24.2000
G0	49.1000	41.4000
H0	49.1000	41.4000
J0	49.4000	41.4000

Mass ca. [kg]
18.5
18.5
18.8
22.7
22.7
23.0



6.4.9 Type VS 160 – Type V with step-up ratio

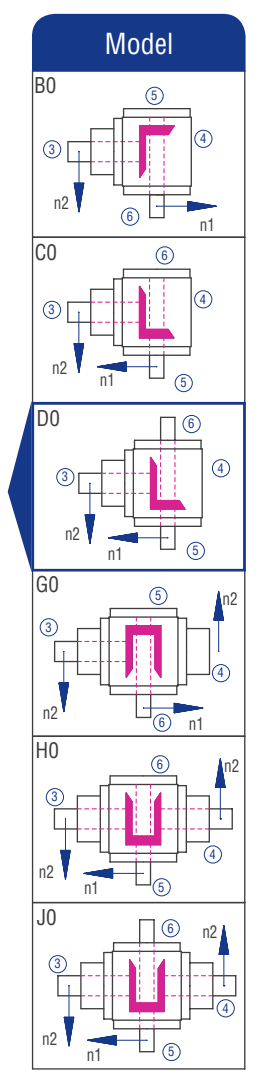
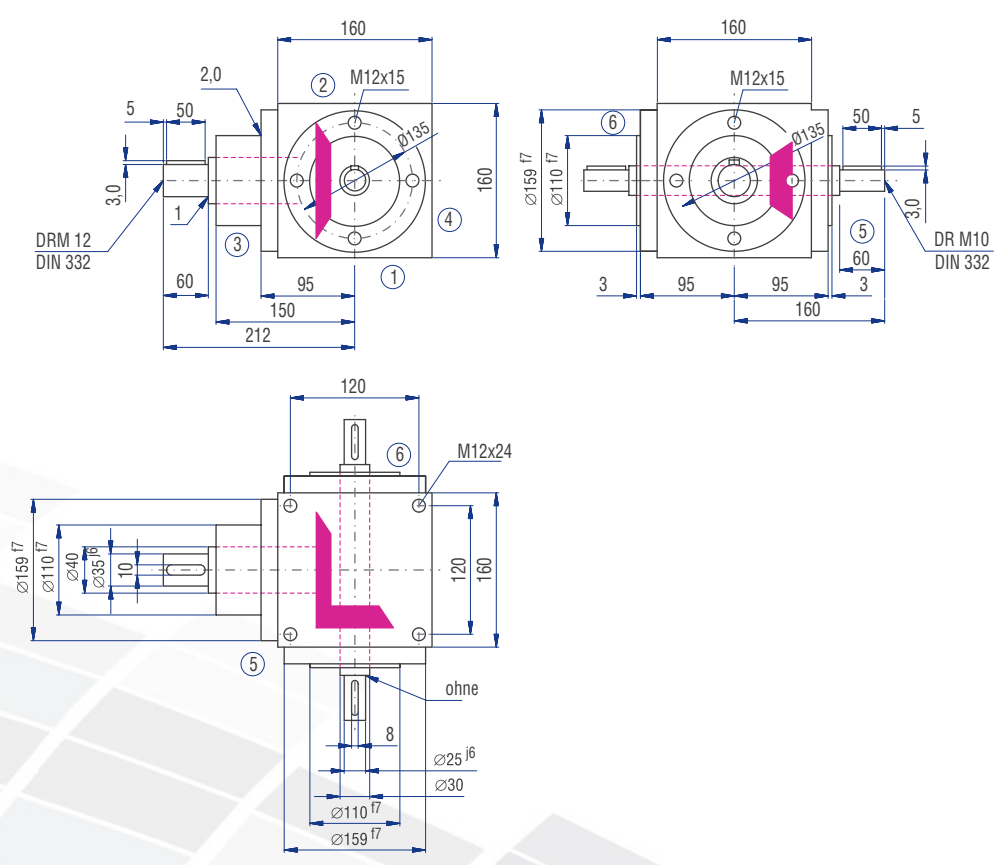


Characteristics

Characteristic	Standard	Option
Toothing	Bevel gear set, spiral-toothed	See chapter 6.2.1
Gear ratio	1.5:1 to 2:1	
Housing / Flanges	Grey cast iron; steel	
Threaded mounting holes	On all housing surfaces without flange and on all flanges.	See chapter 6.2.3
Shaft	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance with parallel keyway: according to DIN 6885 Sheet 1	See chapter 4.6.2
Hollow shaft	Not deliverable	
Radial shaft seal ring	NBR, form A	See chapter 4.8
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Circumferential backlash	< 30 arcmin	See chapter 6.2.10
Protection class	IP 54	See chapter 4.5
Corrosion protection	Prime coat; layer thickness > 40 µm	See chapter 4.4.1
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Oil change intervals	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 6.2.8
Lubricant	Synthetic lubricants	See chapter 6.2.8

Performance data

n ₁ [rpm]	1.5:1			2:1		
	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]
3000	2000	40.78	185	1500	28.11	170
2400	1600	36.15	205	1200	25.53	193
1500	1000	27.78	252	750	20.25	245
1000	667	20.59	280	500	14.88	270
750	500	16.26	295	375	11.57	280
500	333	11.56	315	250	8.27	300
250	167	6.07	330	125	4.41	320
50	33	1.29	355	25	0.88	320
P _{1Nt} [kW]	15.0			15.0		
T _{2max} [Nm]	360			320		



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

n_2 [rpm]	1500		1000		500		250		100		50	
T_{2N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 220	1200	600	1600	800	1900	950	2200	1100	2850	1425	3300	1650
> 220	1000	500	1340	670	1590	795	1840	920	2380	1190	2750	1375

Permissible radial force F_{r1} and axial force F_{a1} on shaft N_1

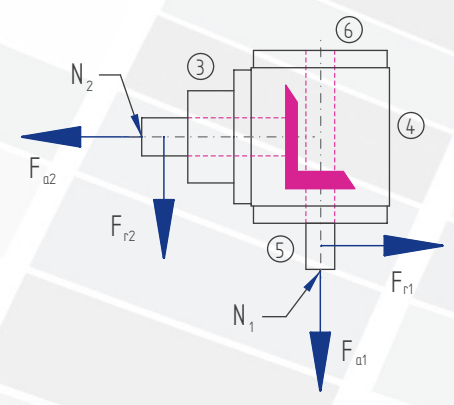
n_1 [rpm]	3000		1000		500		250		100		50	
T_{1N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 150	1670	835	2330	1165	2750	1375	3330	1665	4170	2085	5420	2710
> 150	1390	695	1940	970	2290	1145	2780	1390	3470	1735	4510	2255

Inertia moments/mass

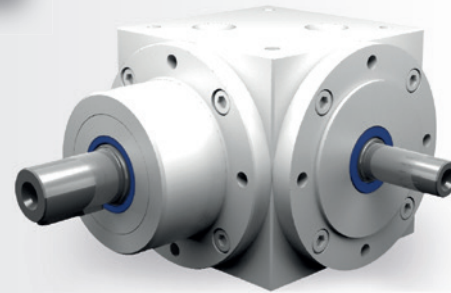
Inertia moment J_2 related to the slowly rotating shaft (N_2)

Model	Inertia moment [kgcm ²]	
	1.5:1	2:1
B0	67.0000	56.0000
C0	67.0000	56.0000
D0	68.0000	57.0000
G0	110.0000	99.0000
H0	110.0000	99.0000
J0	111.0000	100.0000

Mass ca. [kg]
27.0
27.0
27.4
33.5
33.5
33.9



6.4.10 Type VS 200 – Type V with step-up ratio

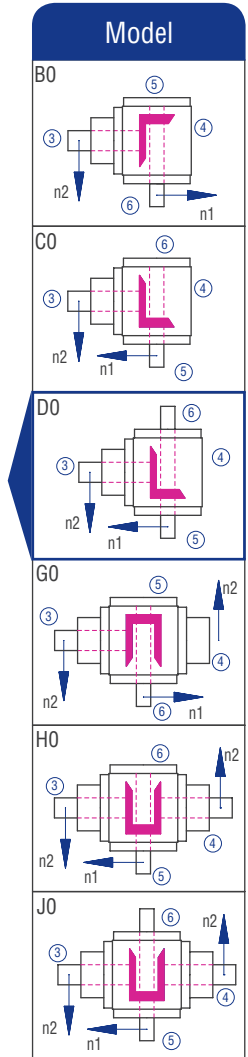
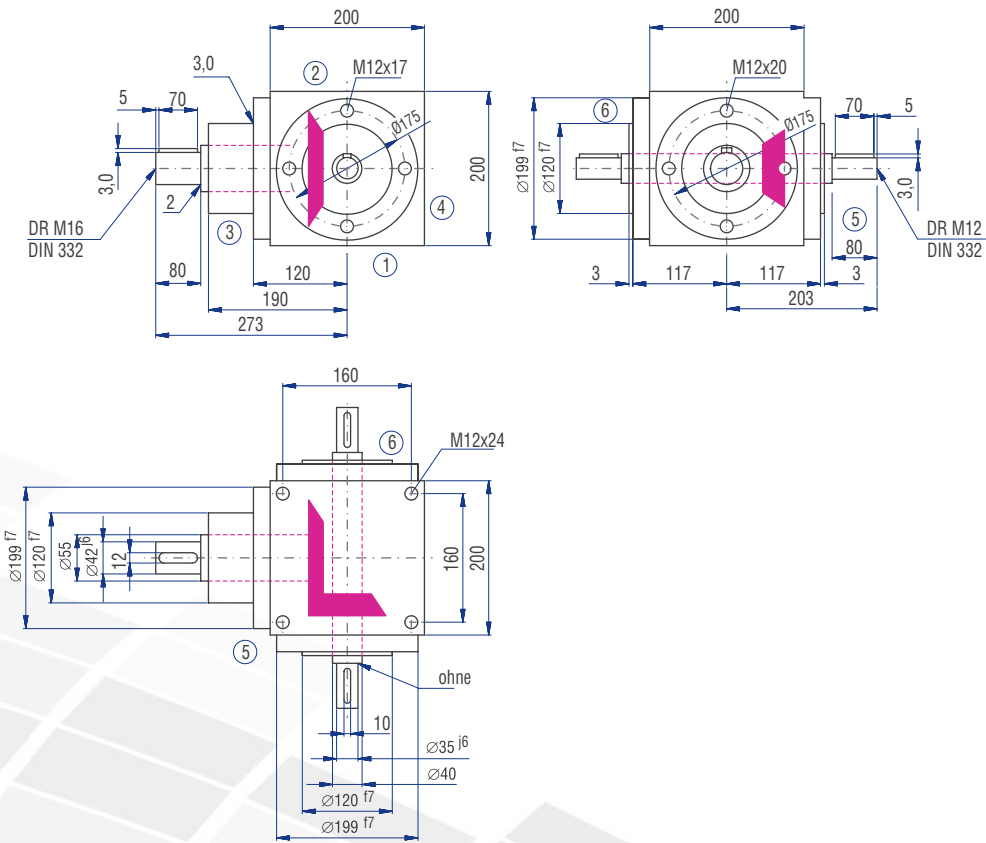


Characteristics

Characteristic	Standard	Option
Toothing	Bevel gear set, spiral-toothed	See chapter 6.2.1
Gear ratio	1.5:1 to 2:1	
Housing / Flanges	Grey cast iron; steel	
Threaded mounting holes	On all housing surfaces without flange and on all flanges.	See chapter 6.2.3
Shaft	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance with parallel keyway: according to DIN 6885 Sheet 1	See chapter 4.6.2
Hollow shaft	Not deliverable	
Radial shaft seal ring	NBR, form A	See chapter 4.8
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Circumferential backlash	< 30 arcmin	See chapter 6.2.10
Protection class	IP 54	See chapter 4.5
Corrosion protection	Prime coat; layer thickness > 40 µm	See chapter 4.4.1
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Oil change intervals	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 6.2.8
Lubricant	Synthetic lubricants	See chapter 6.2.8

Performance data

n ₁ [rpm]	1.5:1			2:1		
	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]
3000	2000	72.75	330	1500	51.25	310
2400	1600	63.49	360	1200	45.24	342
1500	1000	48.17	437	750	35.13	425
1000	667	37.13	505	500	27.56	500
750	500	30.31	550	375	21.90	530
500	333	22.02	600	250	14.60	530
250	167	11.04	600	125	7.30	530
50	33	2.18	600	25	1.46	530
P _{1Nt} [kW]	26.0			26.0		
T _{2max} [Nm]	600			530		



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

n_2 [rpm]	1500		1000		500		250		100		50	
T_{2N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 500	2200	1100	1700	850	3200	1600	3900	1950	5000	2500	6200	3100
> 500	1840	920	1420	710	2670	1335	3250	1625	4170	2085	5170	2585

Permissible radial force F_{r1} and axial force F_{a1} on shaft N_1

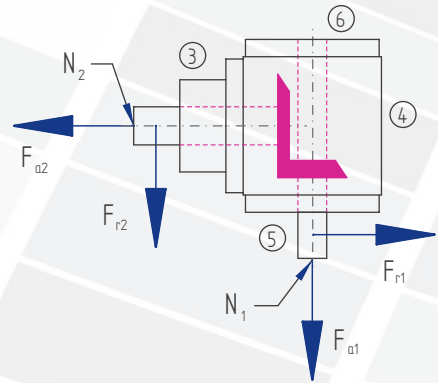
n_1 [rpm]	3000		1000		500		250		100		50	
T_{1N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 350	2670	1335	3580	1790	4170	2085	5420	2710	6670	3335	8330	4165
> 350	2220	1110	2990	1495	3470	1735	4510	2255	5560	2780	6940	3470

Inertia moments/mass

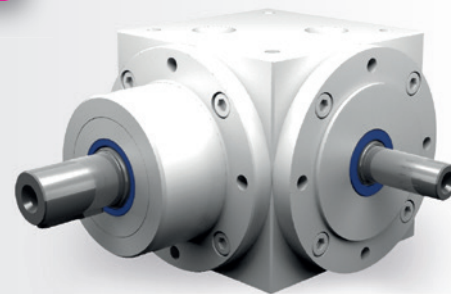
Inertia moment J_2 related to the slowly rotating shaft (N_2)

Model	Inertia moment [kgcm ²]	
	1.5:1	2:1
B0	225.000	235.000
C0	225.000	235.000
D0	227.000	239.000
G0	367.000	419.000
H0	367.000	419.000
J0	369.000	423.000

Mass ca.[kg]
48.0
48.0
50.0
58.0
58.0
60.0



6.4.11 Type VS 230 – Type V with step-up ratio

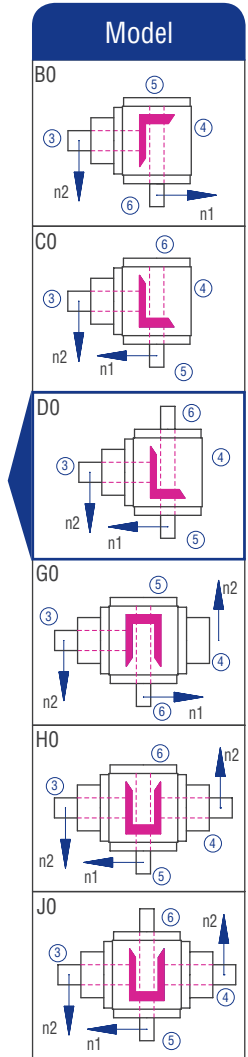
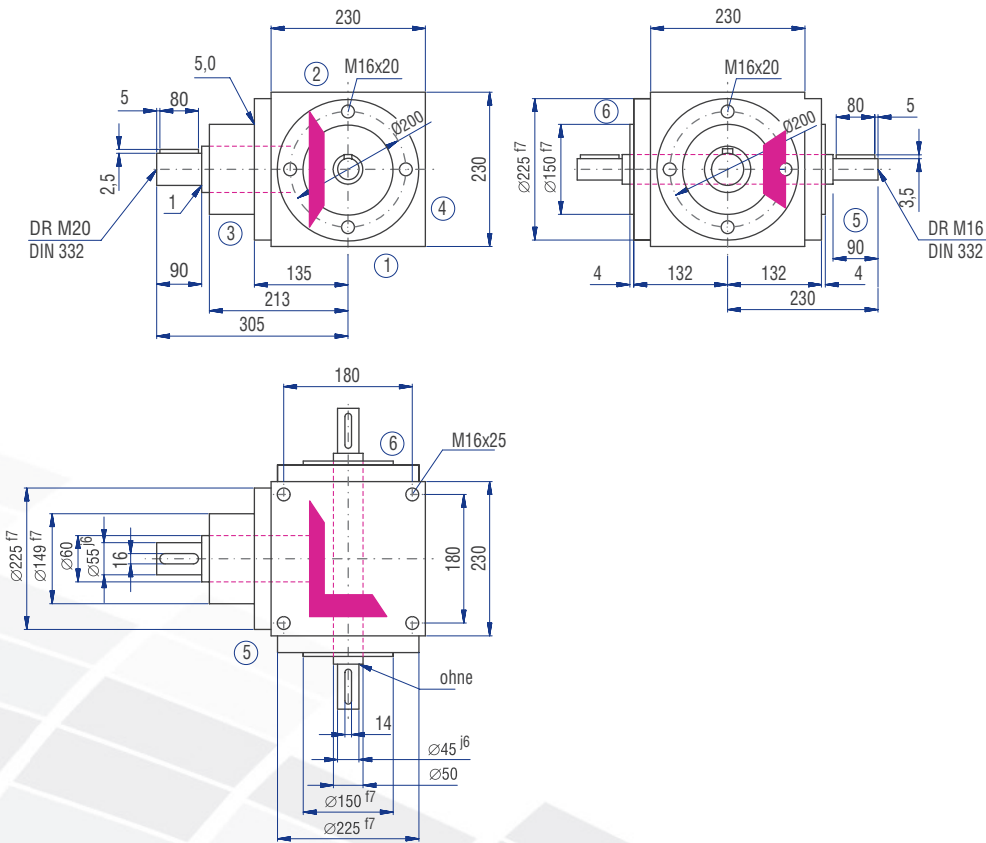


Characteristics

Characteristic	Standard	Option
Toothing	Bevel gear set, spiral-toothed	See chapter 6.2.1
Gear ratio	1.5:1 to 2:1	
Housing / Flanges	Grey cast iron; steel	
Threaded mounting holes	On all housing surfaces without flange and on all flanges.	See chapter 6.2.3
Shaft	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance with parallel keyway: according to DIN 6885 Sheet 1	See chapter 4.6.2
Hollow shaft	Not deliverable	
Radial shaft seal ring	NBR, form A	See chapter 4.8
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Circumferential backlash	< 30 arcmin	See chapter 6.2.10
Protection class	IP 54	See chapter 4.5
Corrosion protection	Prime coat; layer thickness > 40 µm	See chapter 4.4.1
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Oil change intervals	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 6.2.8
Lubricant	Synthetic lubricants	See chapter 6.2.8

Performance data

n ₁ [rpm]	1.5:1			2:1		
	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]
3000	2000	99.20	450	1500	87.63	530
2400	1600	91.35	518	1200	80.02	605
1500	1000	72.20	655	750	59.11	715
1000	667	56.21	765	500	45.19	820
750	500	45.47	825	375	36.79	890
500	333	33.79	920	250	26.73	970
250	167	20.57	1,120	125	16.88	1,225
50	33	4.89	1,330	25	3.66	1,330
P _{1Nt} [kW]	34.0			34.0		
T _{2max} [Nm]	1400			1400		



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

n_2 [rpm]	1500		1000		500		250		100		50	
T_{2N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 750	4600	2300	5150	2575	7200	3600	9450	4725	11250	5625	13100	6550
> 750	3832	1916	4290	2145	6000	3000	7876	3938	9376	4688	10918	5459

Permissible radial force F_{r1} and axial force F_{a1} on shaft N_1

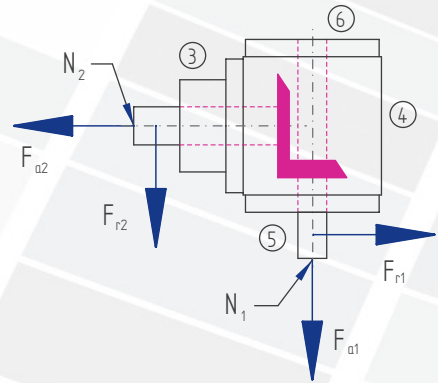
n_1 [rpm]	3000		1000		500		250		100		50	
T_{1N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
Not specified												

Inertia moments/mass

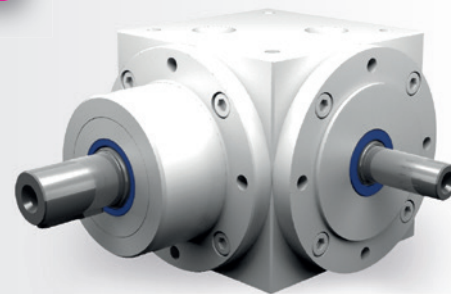
Inertia moment J_2 related to the slowly rotating shaft (N_2)

Model	Inertia moment [kgcm ²]	
	1.5:1	2:1
B0	440.000	528.000
C0	440.000	528.000
D0	442.000	532.000
G0	661.000	749.000
H0	661.000	749.000
J0	663.000	753.000

Mass ca. [kg]
75.0
75.0
77.0
98.0
98.0
100.0



6.4.12 Type VS 260 – Type V with step-up ratio

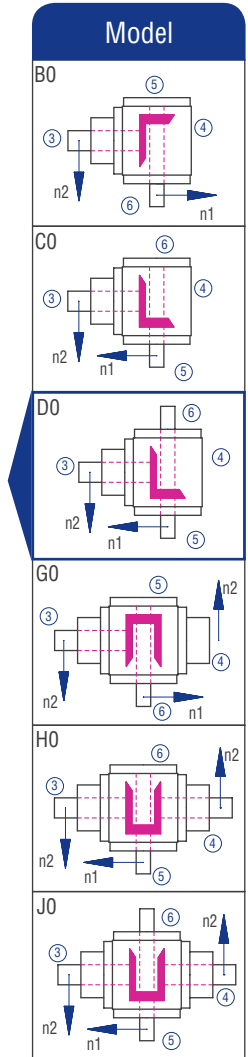
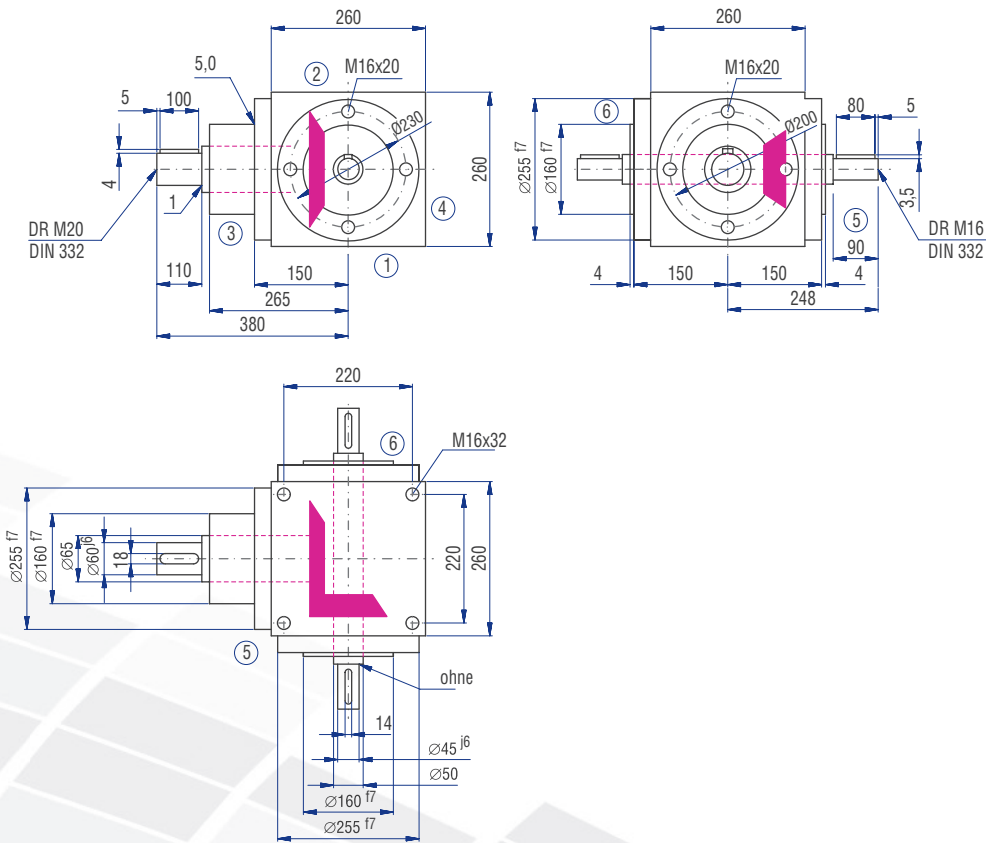


Characteristics

Characteristic	Standard	Option
Toothing	Bevel gear set, spiral-toothed	See chapter 6.2.1
Gear ratio	1.5:1 to 2:1	
Housing / Flanges	Grey cast iron; steel	
Threaded mounting holes	On all housing surfaces without flange and on all flanges.	See chapter 6.2.3
Shaft	Material 1 C45, shaft ends greased Fit with ISO 6 tolerance with parallel keyway: according to DIN 6885 Sheet 1	See chapter 4.6.2
Hollow shaft	Not deliverable	
Radial shaft seal ring	NBR, form A	See chapter 4.8
Ambient temperature	-10°C to +90°C. The values of the performance tables are valid for +20°C	See chapter 4.9.3
Cumferential backlash	< 30 arcmin	See chapter 6.2.10
Protection class	IP 54	See chapter 4.5
Corrosion protection	Prime coat; layer thickness > 40 µm	See chapter 4.4.1
Bearing life L10h	more than 15,000h	See chapter 4.9.1
Oil change intervals	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 6.2.8
Lubricant	Synthetic lubricants	See chapter 6.2.8

Performance data

n ₁ [rpm]	1.5:1			2:1		
	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]	n ₂ [rpm]	P _{1N} [kW]	T _{2N} [Nm]
3000	2000	189.58	860	1500	133.92	810
2400	1600	158.72	900	1200	112.43	850
1500	1000	104.71	950	750	78.53	950
1000	667	73.50	1,000	500	57.87	1,050
750	500	55.11	1,000	375	48.36	1,170
500	333	36.70	1,000	250	33.07	1,200
250	167	18.40	1,000	125	16.53	1,200
50	33	3.64	1,000	25	3.31	1,200
P _{1Nt} [kW]	42.0			42.0		
T _{2max} [Nm]	1000			1200		



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

n_2 [rpm]	1500		1000		500		250		100		50	
T_{2N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 750	4600	2300	5150	2575	7200	3600	9450	4725	11250	5625	13100	6550
> 750	3832	1916	4290	2145	6000	3000	7876	3938	9376	4688	10918	5459

Permissible radial force F_{r1} and axial force F_{a1} on shaft N_1

n_1 [rpm]	3000		1000		500		250		100		50	
T_{1N} [Nm]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]	F_r [N]	F_a [N]
< 650	7010	3505	10900	5450	13000	6500	15000	7500	18000	9000	22000	11000
> 650	5840	2920	9080	4540	10800	5400	12500	6250	15000	7500	18000	9000

Inertia moments/mass

Inertia moment J_2 related to the slowly rotating shaft (N_2)

Model	Inertia moment [kgcm ²]	
	1.5:1	2:1
B0	810.000	751.000
C0	810.000	751.000
D0	818.000	763.000
G0	1344.000	1366.000
H0	1344.000	1366.000
J0	1354.000	1378.000

Mass ca. [kg]
83.0
83.0
84.5
107.0
107.0
108.5

