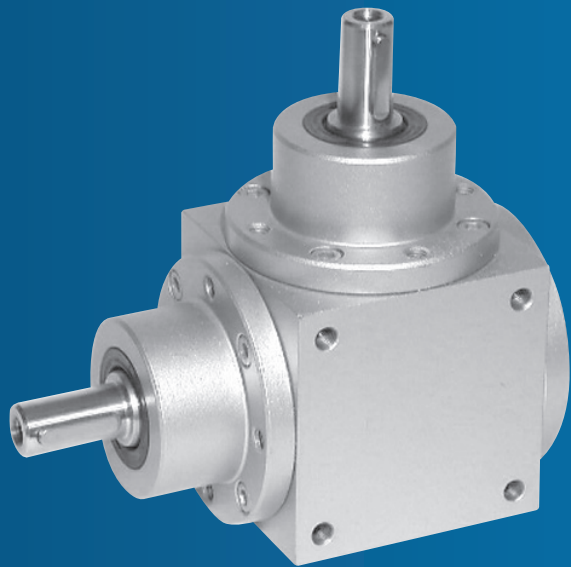


# Spiral Bevel Gearboxes

## Right-Angle Power Transmission



GAM CAN. JUST ASK!

# Company Overview

If you need high precision gear reducers at a reasonable cost and you value innovation and excellent service, take a close look at our product line. You will find a wide range of products all created to minimize your design and installation time, minimize space requirements and maximize your machine's performance.

As you look through the pages that follow, you will find in-line and right-angle gearboxes that offer varying degrees of precision.

GAM also offers one of the widest ranges of servo couplings and safety couplings. Please see the GAM coupling catalog for details on those products.

- 1** *We are flexible! We will modify our products or tailor our services to meet your needs. GAM Can, Just Ask!*
- 2** *Quick delivery on the standard products marked in our literature.*
- 3** *24-Hour a day emergency service and same day delivery available.*
- 4** *Excellent technical assistance from our inside application engineers and trained network of outside sales engineers.*
- 5** *Immediate 2-D drawings or 3-D models configured on-line.*
- 6** *100% inspection and quality control on every gearbox shipped from GAM.*
- 7** *Lean manufacturing procedures used to ensure our products are produced cost effectively.*
- 8** *Largest product range of precision gearboxes for motion control applications.*
- 9** *U.S. owned. Our roots date back to the early 1950s.*
- 10** *We have a great team at GAM. We will listen to you and we promise to do our very best to respond to your needs.*

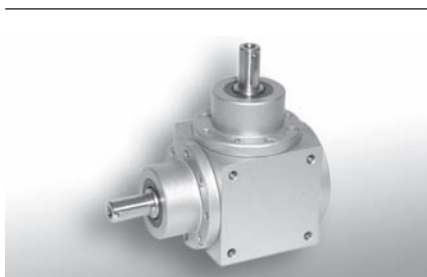
**1. General Information.....4**



**Type L**

**2. Mini Bevel Gearboxes .....8**

- speed reducer
- 35 mm to 45 mm frame sizes
- precision spiral bevel gearing



**Type V**

**3. Spiral Bevel Gearboxes .....18**

- speed reducer
- 65 mm to 350 mm frame sizes
- precision spiral bevel gearing



**Type VS**

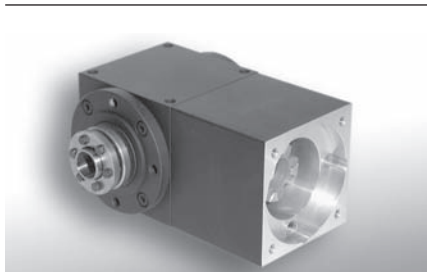
**4. Spiral Bevel Gearboxes .....62**

- speed increaser
- 90 mm to 260 mm frame sizes
- precision spiral bevel gearing



**5. Multi-Shaft Gearboxes .....74**

- gearboxes with shafts in the x, y and z axis



**Type VC**

**6. Spiral Bevel Gearboxes .....NA**

- a higher precision spiral bevel gearbox with integrated motor mount

**See general GAM Gear brochure**

**7. Additional Products .....76**

# General information

This does not apply for Type L

**GAM gearboxes** are universal high-performance gearboxes for general mechanical engineering applications. The characteristics of our gearboxes can only be guaranteed and any guarantee claims may only be accepted if these guidelines have been followed.

## Power Transmission and Torque Ratings

The power transmission and torque ratings given in this catalog apply to the gearbox installation configuration(s) ensuring optimum lubrication but at the same time not causing full submergence of the gears in the oil. In addition standard equipment and normal operating conditions are assumed.

## Condition on Delivery

Before dispatch, our drives are subjected to stringent test and are properly packed. Please inspect the drive on receipt for any transport damage and notify the transport company immediately of any complaints.

On dispatch, GAM drives and drive motors are filled with synthetic oil ready for operation. The gear components will be conserved if an oil filling is expressly not requested. This conservation treatment is sufficient for normal transport conditions and for a period of six months prior to commissioning

## Installation

All gear shaft ends have thread alignments, with the help of which clutches, discs, gear wheels, etc. may be mounted or shrunk on. These parts must not be hammered on!

When assembling motors to Bevel gearboxes type VL always use suitable corrosion protection and lubricants to avoid interfacial corrosion and facilitate subsequent disassembly.

GAM gearboxes must be installed or mounted in the orientation specified at the time of ordering. The lubrication fittings must be freely accessible. If gearbox warming was a factor in selecting the particular design, care must be taken to ensure that the air supply to the gearbox is not restricted.

## Commissioning

The drives are closed for transport purposes, i.e. it has a sealing plug. This closing plug must be removed and replaced with the vent filter supplied if the gearbox requires bleeding.

## Warranty

Opening GAM gearboxes during the warranty period without our permission renders any warranty invalid.

## Gearbox types

GAM Gearboxes are available in many variations.

At the first order of a gearbox the exact specification and a part number is supplied. For repeat orders it is only necessary to point out our part number to get exactly the same gearbox delivered.

## Output Shafts

GAM gearboxes are supplied with C45-grade steel output shafts with keyways and keys as standard equipment.

Output shafts without keyways are available as an option on all GAM gearboxes. The shaft diameters offered are those of the normal or reinforced versions. The shaft is fabricated to the ISO h6 tolerance rating.

### Version VV

Almost all GAM gearboxes are available in an optional version incorporating a reinforced output shaft. This version also incorporates a reinforced bearing to handle the increased radial and/or axial forces.

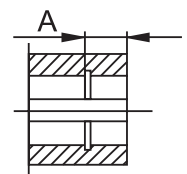
## Hollow Shaft Gearboxes

The hollow shaft with a keyway in accordance with DIN 6885 Sheet 1 – shown in the dimension sheets – is supplied as standard equipment on GAM gearboxes. Many gearbox sizes are also available in **Version SH** which incorporates a larger hollow bore.

When assembling hollow shaft gearboxes, always use suitable corrosion protection and lubricants to avoid interfacial corrosion and facilitate subsequent disassembly.

For assembly, mounting and disassembly of the hollow-shaft gear units are the hollow shafts I.D.  $\geq 35$  mm with recessed ends for retaining rings.

Hollow shafts $\varnothing$	A
35 - 45 mm	18 mm
46 - 60 mm	20 mm
> 61 mm	22 mm



## Hollow Shafts with Shrink-Discs

Our hollow shafts incorporate stepped bores to facilitate assembly and a bronze guide bushing on the guide side. An optional version of the bronze bushing is also available with the same inner diameter as the clamp side I.D..

## Polygonal- / Spline Bore Profile Hollow Shafts

All hollow-shaft gearboxes can also be supplied in an optional version incorporating a polygon-profile inner bore.

The following standard profiles are available:

Type V, VC	Size	Profile
	090	B P4C 17H7
	120	B P4C 21H7
	140	B P4C 30H7
	160	B P4C 35H7
	200	B P4C 43H7
	230	B P4C 53H7
	260	B P4C 53H7
	350	B P4C 60H7

Drawings of spline shafts are part of the relevant dimension sheets.

## Shaft Seals

All GAM gearboxes are supplied with oil-tight shaft seals as standard equipment. Shaft seals with dust lips (Model AS) can be included on the input and output shafts as an option on request to protect against water and dust. If extreme operating environments or high gearbox temperatures are expected, gearboxes can be supplied with optional FKM shaft seals (from VITON). Special seals are available for extremely corrosive operating environments. In such cases, please consult us and provide detailed information on the application in question.

## NOTOX Food Grade Gearboxes

GAM gearboxes can be supplied with NOTOX lubricants when required for applications in the pharmaceutical and food processing industries. These are fully synthetic oils and greases which comply fully with the stringent NSF H-1 specification.

## Corrosion-Resistant Gearboxes

GAM corrosion-resistant bevel gearboxes are outstanding for applications in which drive units are exposed to corrosive substances. Nickel-plated housing components and stainless-steel shafts are provided in these versions as standard equipment. The shaft seals are selected in accordance with the individual application at hand.

GAM bevel gearboxes are also available in full stainless steel versions if required for extreme applications. Please enquire for further information.

## Anti-Corrosion Surface Protection

GAM gearboxes are supplied with a primer coat only as standard equipment. Surface-protected versions are available as options for special operating environments:

- A: normal environmental conditions  
relative humidity less than 60% (standard equipment)
- B: low corrosive emission levels in environment  
relative humidity less than 90%
- C: medium corrosive emission levels in environment  
relative humidity less than 100%
- D: corrosivity category > C3  
as defined in DIN ISO 12944-2

Type	Coating System	Coating thickness [µm]	For Environment
Standard	1 x primer (2-component wash primer or priming by zinc phosphating)	c. 10-40	A
O1	1 x spray primer 1 x 2-component covering lacquer	c. 40-60	B
O2	2 x spray primer 1 x 2-component covering lacquer	c. 60-90	C
O3	suiting for your individual application, please enquire.	> 100	D

\*Fitting dimensions may differ in corrosion-resistant version or when primed / painted!

## Long-Term Storage Version

GAM gearboxes can be supplied in an optional version suitable for long-term storage. In this version, the gearboxes receive a special preservative treatment and are supplied in airtight packaging which must not be opened until the unit is to be used. Exact information on requirements for storage conditions, storage rooms and commissioning are given in our Long-Term Storage information sheet which can be found at our internet site [www.gamweb.com](http://www.gamweb.com).

# Guidelines for the Selection of a Gearbox

This does not apply for Type L

The intended application, the driving motor and the available space determine the type of gearbox to be used, the model and the transmission ratio. All external effects that will act on the gearbox in subsequent operation should be taken into consideration in selecting the optimum gearbox size.

The points listed below are thus key factors for operational reliability and a long service life:

## A. Gearbox Application

- Type of driving motor, drive power, drive speed
- Transmission ratio required
- Type of machine driven, operating power, operating speed, operating torque, maximum output torque, output speed
- Relationship of directions of rotation for drive shaft and power take-off shaft
- Ambient conditions
- Other requirements

## B. Gearbox Loading Conditions

- Operational mode of driving unit
- Operational mode of machine
- Average operating time in hours per day
- Average operating time per hour in percent
- Start-ups per hour
- Ambient temperature
- Additional loads on drive and driven shafts

## Terms, Equations and Factors

$n_1$ (1/min)	RPM speed of the faster-running shaft
$n_2$ (1/min)	RPM speed of the slower-running shaft ( $n_1:i$ )
$iN$	Nominal transmission ratio
$iIst$	Actual transmission ratio
$J$ (kgm <sup>2</sup> )	Mass moment of inertia
$P_1$ (kW)	Effective input power ( $P_1 = T_2 \times n_2 : 9550 \times \eta$ )
$P_{1m}$ (kW)	Input power, corrected by factors, mechanical
$P_{1t}$ (kW)	Input power, corrected by factors, thermal
$P_{1N}$ (kW)	Permissible rated input power for the gearbox, mechanical
$P_{1Nt}$ (kW)	Permissible rated input power for the gearbox, thermal
$T_2$ (Nm)	Effective output torque ( $T_2 = 9550 \times P_1 : n_2 \times \eta$ )
$T_2m$ (kW)	Mechanical output torque, corrected by factors
$T_2t$ (kW)	Thermal output torque, corrected by factors
$T_2N$ (kW)	Permissible rated output torque for the gearbox, mechanical
$T_2Nt$ (kW)	Permissible rated output torque for the gearbox, thermal
$T_{2max}$ (Nm)	Maximum permissible output torque for the gearbox
$\eta$	Efficiency
$f_1$	Operating factor
$f_2$	Start-up factor
$f_3$	Lubrication factor (only for mineral oil lubrication)
$f_4$	Ambient temperature
$f_5$	Operating time per hour
$f_{MB}$	Mass acceleration factor ( $f_{MB} = J \text{ external} : J \text{ driving motor}$ )

## Size Determination

The permissible nominal input power ratings  $P_{1N}$  and the nominal output torques  $T_{2N}$  given in the tables are valid only for shock-free operation, ten hours operation per day and ten start-ups per hour, with an input power of 2.5 times the rated power being permitted during start-up. The thermal nominal power ratings  $P_{1Nt}$  and output torque ratings  $T_{2Nt}$  apply for an ambient temperature of 20°C and 100% operating time. The maximum output torques  $T_{2max}$  may be reached frequently for brief loading peaks, but may not be exceeded.

The required input power or output torque must be calculated on the basis of the operating factors for the determination of the gearbox size.

<b>Mechanical:</b>	<b>Thermal:</b>
$P_{1m} = P_1 \times f_1 \times f_2 \times f_3$	$P_{1t} = P_1 \times f_3 \times f_4 \times f_5$
$T_{2m} = T_2 \times f_1 \times f_2 \times f_3$	$T_{2t} = T_2 \times f_3 \times f_4 \times f_5$

The formulae take account of the mechanical and thermal effects. The following conditions apply for selection of gearbox size:

$$P_{1m} < P_{1N} \quad P_{1t} < P_{1Nt} \quad T_{2m} < T_{2N} \quad T_{2t} < T_{2Nt}$$

The values given in the specification tables apply for lubrication by synthetic oils, based on an oil temperature of 95 °C. Determination of the thermal limit is not necessary if special measures are used (eg. an oil cooler) to ensure that the permissible oil temperature is never exceeded. The permissible torques may be exceeded in special cases, eg. very short running times or static loading only. Please consult us for detailed information.

Exploitation of the maximum output torques  $T_{2max}$  may make a press fit on the output shaft necessary, as the normal feather key connection is not always adequate.

The efficiency data given in the specification tables relate to the permissible rated loading of the transmissions and are guide values for fully run-in gearboxes running at operational temperature with standard seals.

Please refer to the relevant sections for further details such as additional loads, start-up and operating efficiencies, low backlash or increased friction from special seals.

GAM gearboxes are designed for a service life of 12,000 operating hours when using the appropriate factors in selection. The prerequisite for this service life is correct installation and commissioning and proper servicing in accordance with the operating instructions for GAM gearboxes.

### Operational factor $f_1$

Driving motor	Load group	Operating hours / day			
		0.5	3	10	24
Elektromotor	G	0.8	0.9	1.0	1.25
	G	0.8	0.9	1.0	1.25
Hydraulic motor	G	0.8	0.9	1.0	1.25
	G	0.8	0.9	1.0	1.25
Turbine	G	0.8	0.9	1.0	1.25
	G	0.8	0.9	1.0	1.25
IC engine	G	0.8	0.9	1.0	1.25
	G	0.8	0.9	1.0	1.25
4-6 cylinders	G	0.8	0.9	1.0	1.25
	G	0.8	0.9	1.0	1.25
IC engine	G	0.8	0.9	1.0	1.25
	G	0.8	0.9	1.0	1.25
1-2 cylinders	G	0.8	0.9	1.0	1.25
	G	0.8	0.9	1.0	1.25

## Loading Parameters

### Group G: Low loading/shock-free

Mass acceleration factor  $m_{af} < 0.25$ : Filling machines, elevators, light screw conveyors, light conveyor belts, blowers, small agitators, control machines, assembly lines, auxiliary drives for machine tools, centrifuges, packaging machinery

### Group M: Medium loading/light shocks

Mass acceleration factor  $m_{af} < 3.00$ : Reel winders, agitators, plate conveyors, calenders, lifts, mixers, balancing machines, heavy-duty conveyor belts, sheet metal bending machines, road-building machinery, planing machines, shears, extruders, main drives for machine tools, kneading machines, weaving looms, light table rollers.

### Group S: Heavy load/heavy shocks

Mass acceleration factor  $m_{af} < 10.00$ : Excavators, heavy-duty mixers, presses, muller mixers, rolling mills, heavy-duty table rollers, cold reduction mills, stone crushers, eccentric presses, cutter heads, folding machines, rubber belt conveyors (batch loads), bark peeling drums, running gears, punching presses, piston pumps, rotary furnaces, mills, plate filters.

The mass acceleration factor  $m_{af}$  is calculated as follows:

$$m_{af} = \frac{J_{ex.red.}}{J_{mot.}}$$

$m_{af}$  mass acceleration factor  
 $J_{ex.red.}$  all external inertia moments corrected to motor input  
 $J_{mot.}$  moment of inertia of the motor

## Start-up Factor f2

A prerequisite for application of the start-up factor is that the start-up torque (or braking torque) of the driving machine does not exceed 2.5 times the rated torque of the transmission.

$$T1A < 2,5 \times T1N = 9550 \times P1N / n1$$

Start-ups per hour	up to 10	10-60	60-500	500-1500
f2	1.0	1.1	1.2	1.3

## Lubrication Factor f3

The lubrication factor must be taken into consideration when mineral oil is used since the efficiency, service life and permissible oil temperature depend to a great extent on the quality of the oil used, particularly in the case of worm gearboxes.

f3	Synthetic oil	Mineral oil	
	Bevel Gearbox. Worm Gearbox	Bevel Gearbox	Worm Gearbox size 040 - 080    100 - 200
	1.0	1.1	1.2    1.25

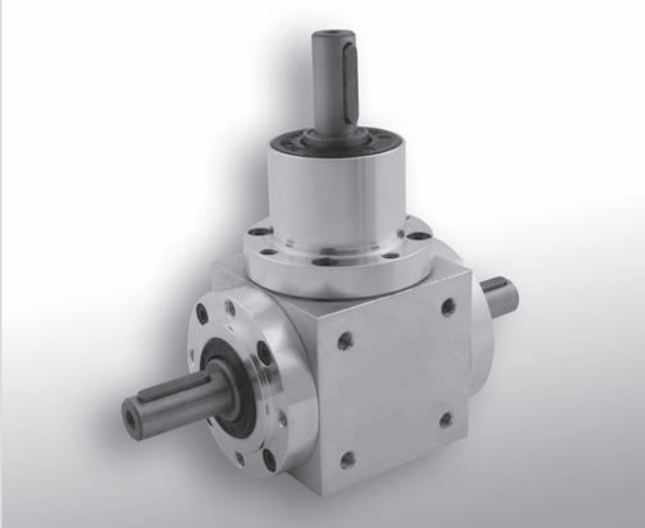
### Temperature factor f4

tu °C	10	20	30	40	50
f4	0.9	1.0	1.15	1.4	1.7

### Factor f5 – operating time per hour

ED in %	100	80	60	40	20
f5	1.0	0.95	0.86	0.75	0.56

# Type L Gearboxes



- Small compact bevel gearboxes
- 35 mm to 45 mm frame sizes
- Precision spiral bevel gearboxes
- Light weight aluminum housing
- Numerous options to choose from



# Selection Criteria

## Bevel Gearbox with Aluminium Housing

The consistent use of the very latest FEM analysis methods allowed the achievement of a harmonious distribution of material and tension curves. The result: L-Series gearboxes operate without the need for maintenance are compactly built and easy to fit.

The smallest gearbox in the series has a cube dimension of 35 mm and a rated torque of 4,5 Nm.

The L-Series gearboxes have housings made of high-strength aluminium. That means not only low weight, but also and above all corrosion resistance, thermal resistance of the surfaces even at the highest temperature ranges, and excellent thermal conductivity of the housing.

By dispensing with paintwork, the L-Series offers many attachment and mating surfaces. In conjunction with tapped holes at all fixing points and with its installation-favouring cube dimension, it can be integrated cost-effectively into existing designs.

## Surface

For a more attractive appearance, it is possible to anodize the gearboxes in black, silver and gold.

## Transmission Ratios

The following standard transmission ratios are available: for L 035 1:1, for L 045 1 - 2 - 3 - and 4:1. All transmission ratios are mathematically precise. The gearboxes can be used for gearing down and gearing up. Special transmission ratios are available.

## Efficiency

The efficiency of the GAM bevel gearbox is 94 - 98%, depending on the speed, installation configuration, sealing rings and lubricant type used. The efficiencies given relate to the power transmission ratings of the gearboxes.

It should be noted that starting efficiency is always lower than operating efficiency. The resultant increased breakaway torque must be taken into consideration when determining the driving power.

## Low-Backlash Version

Standard bevel gearboxes have – depending on their size and transmission ratio – a circumferential backlash of 10 to 30 arc minutes. Nevertheless, all GAM bevel gearboxes can be supplied in a low-backlash version. When the drive shaft is locked, circumferential backlash on the slow-running shaft is measured on a 100 mm lever arm with a measuring force of 3% of the rated torque and then is quoted as a torsion angle.

The following values can be set with standard gear sets:

Version S2:  $i = 1:1$  to  $4:1 < 10$  arc minutes

Tighter values can be obtained from specially selected or ground gear sets – please ask (Version S1).

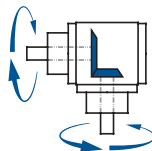
## Mounting Side

All 6 sides of the gearbox are machined and can be used as mounting surfaces. The flange surfaces always have mounting holes as a standard feature. The housing surfaces are provided with holes once the mounting side has been determined depending on the order. The lower tightening torques for female threads made of aluminium must be borne in mind.

The following ordering options are available:

Code	for mounting holes
0	only in the flange surfaces
1,2 ...	on one gearbox side without flange
9	on all gearbox sides without flange
9G	on all gearbox sides with flange

## Preferential Direction of Rotation



GAM bevel gearboxes can normally be run in either rotational direction. The spiral direction of the gear set and the rotational direction used are key factors determining the forces evolved within the unit. In most instances permissible torque transmission can be maximized by using the gear pairing such that the driving gear rotates in the same direction as the spiralling. This arrangement creates a more favourable contact point which reduces gear distortion. This also reduces noise from the gear pairing by 1-2 dBA due to the fact that the axial forces caused by the spiral meshing push the gears apart. In GAM bevel gear transmissions the pinion gear always has a left-handed spiral; accordingly, the large gear has a right-handed spiral.

## Kinematic environment

The rotation direction and the spiral direction result in a different loading of the bearings. Assuming that both operating states (left-hand and right-hand running) are approximately the same, a service life of more than 10,000 hours can be expected. The gearboxes can be operated from both the drive side and the output side. The housings and flanges are made from high-strength aluminium. When further machine elements are attached, no forces may act on the bearings.

## Lubrication

The L-Series gearboxes are provided with a lifetime oil fill. The filling level is designed to ensure an optimum temperature dissipation in any installation configuration. For extreme applications, the lubrication can be adapted accordingly. The gearboxes of the lightweight series are designed as standard without bleed feature. For critical applications inevitably leading to high internal temperatures due to their operating mode, bleeding may however be necessary. This must be clarified for each individual case.

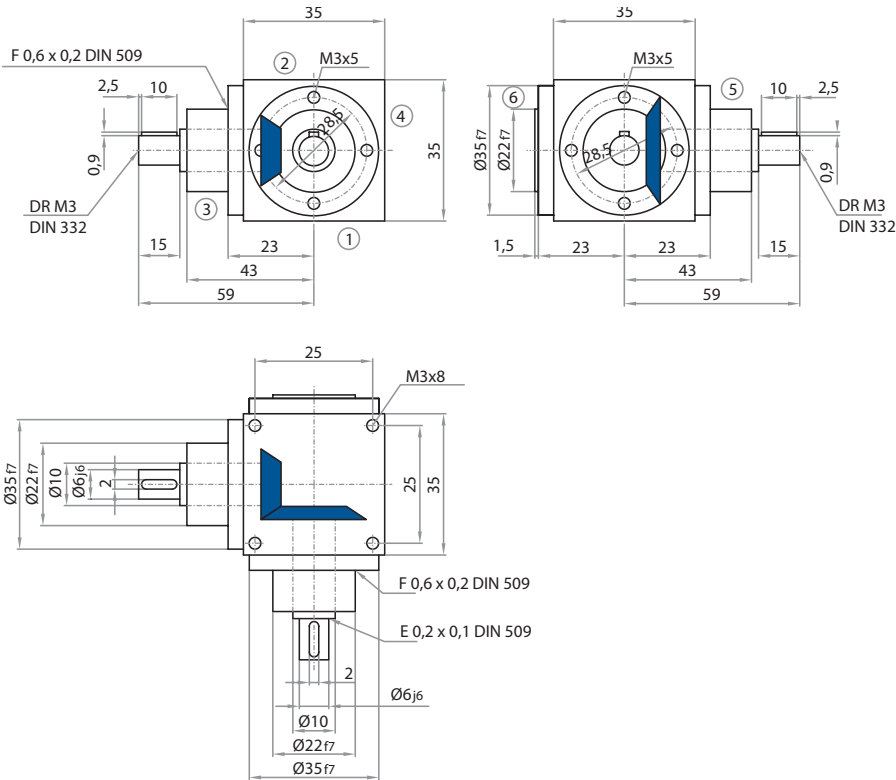
## Limit capacity

The limit capacities of the gearboxes were ascertained on the assumptions of an ambient temperature of 20 °C and a gearbox oil temperature of max. 90 °C. The maximum limit capacity that can be input by the drive unit is independent of the speed and must be taken into account without fail. This assessment applies for S1 continuous operation, where a temperature dissipation exclusively via free radiation is assumed. The limit capacity must be individually adjusted for a poorer or better heat dissipation and for changed temperature conditions. Practical trials in a real-life environment will provide the most reliable findings.

## Shaft Seals

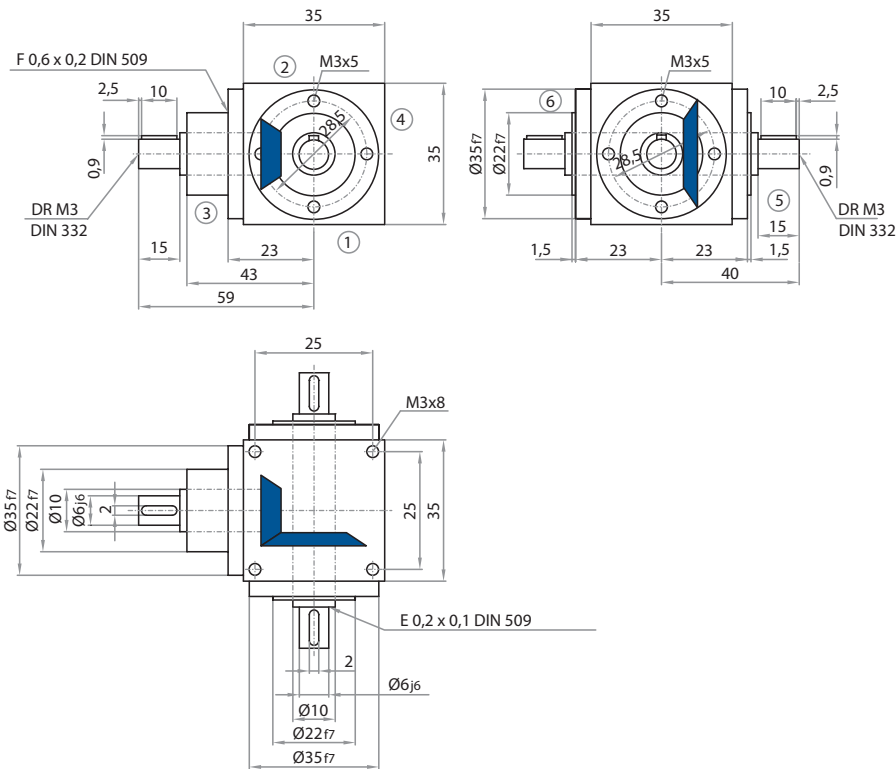
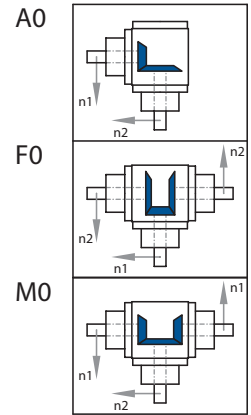
The gearboxes are sealed with single-lip shaft seals made of NBR. If necessary, it is also possible to seal with a dust lip or also with more temperature-stable material (Viton, FPM). This does however involve a greater power loss, which might have to be taken into consideration during design.

# Type L 035



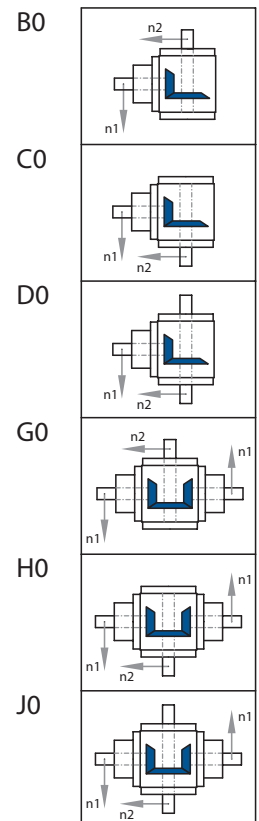
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in grid dimension 28 on sides 3, 5 & 6

## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in grid dimension 28 on sides 3, 5 & 6

## Model



## IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i = n1	1:1 n2	P1N T2N	2:1 n2	P1N T2N	3:1 n2	P1N T2N	4:1 n2	P1N T2N
3000	3000	0,661 2,000						
2400	2400	0,635 2,400						
1500	1500	0,496 3,000						
1000	1000	0,386 3,500						
750	750	0,298 3,600						
500	500	0,220 4,000						
250	250	0,124 4,500						
50	50	0,025 4,500						
<b>P1Nt T2max</b>		<b>0,350 8,000</b>						

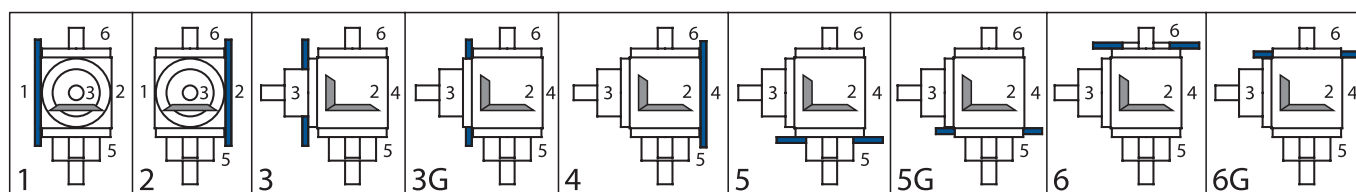
## Moments of Inertia

## Gearbox Weights (kg)

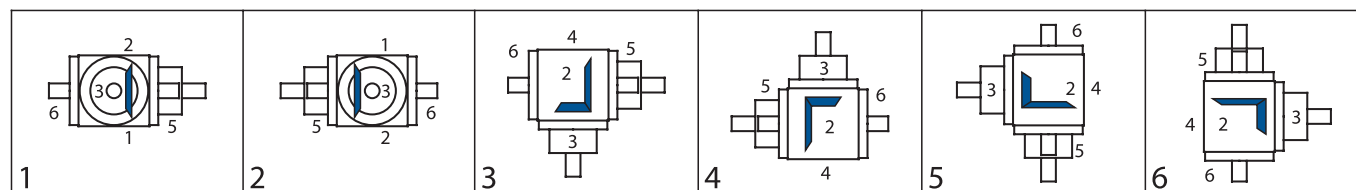
Model	Transmission Ratios	1:1
	upon request	

Model	app. Weight
A0	ca. 230g
F0	ca. 290g
M0	ca. 290g
B0, C0	ca. 225g
D0	ca. 230g
G0, H0	ca. 285g
J0	ca. 290g

## V Mounting Side



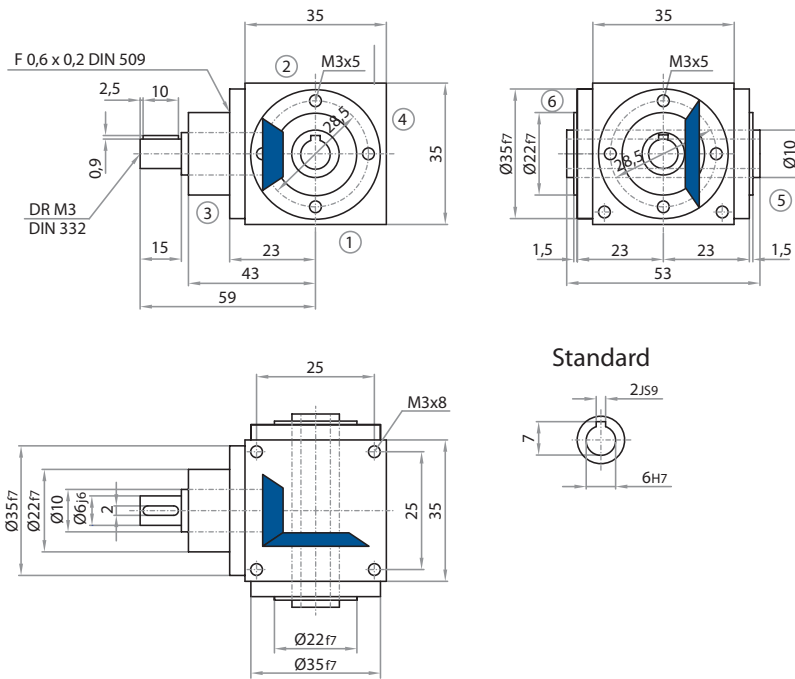
## VI Mounting Configuration (downward-facing side)



## Example of Order

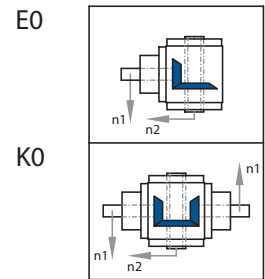
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
	L	035		1:1		A0		-		1		-	500 / 0000=Standard	

# Type L 035



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in grid dimension 28 on sides 3, 5 & 6

## Model



## IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

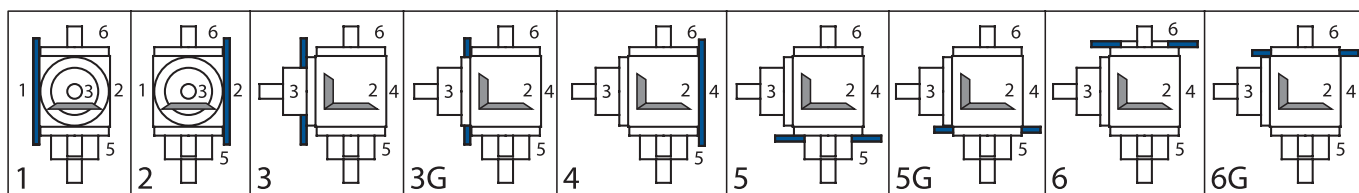
i = n1	1:1 n2	P1N T2N	2:1 n2	P1N T2N	3:1 n2	P1N T2N	4:1 n2	P1N T2N
3000	3000	0,661 2,000						
2400	2400	0,635 2,400						
1500	1500	0,496 3,000						
1000	1000	0,386 3,500						
750	750	0,298 3,600						
500	500	0,220 4,000						
250	250	0,124 4,500						
50	50	0,025 4,500						
<b>P1Nt</b>		<b>0,350</b>						
<b>T2max</b>		<b>8,000</b>						

## Moments of Inertia

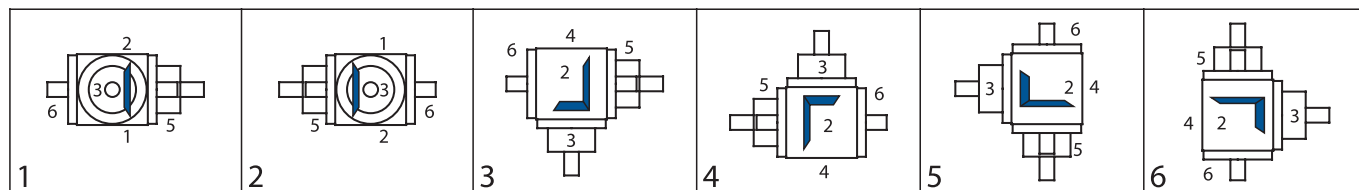
## Gearbox Weights (kg)

Model	Transmission Ratios	1:1	Model	app. Weight
	upon request		E0	ca. 210g
			K0	ca. 270g

## V Mounting Side



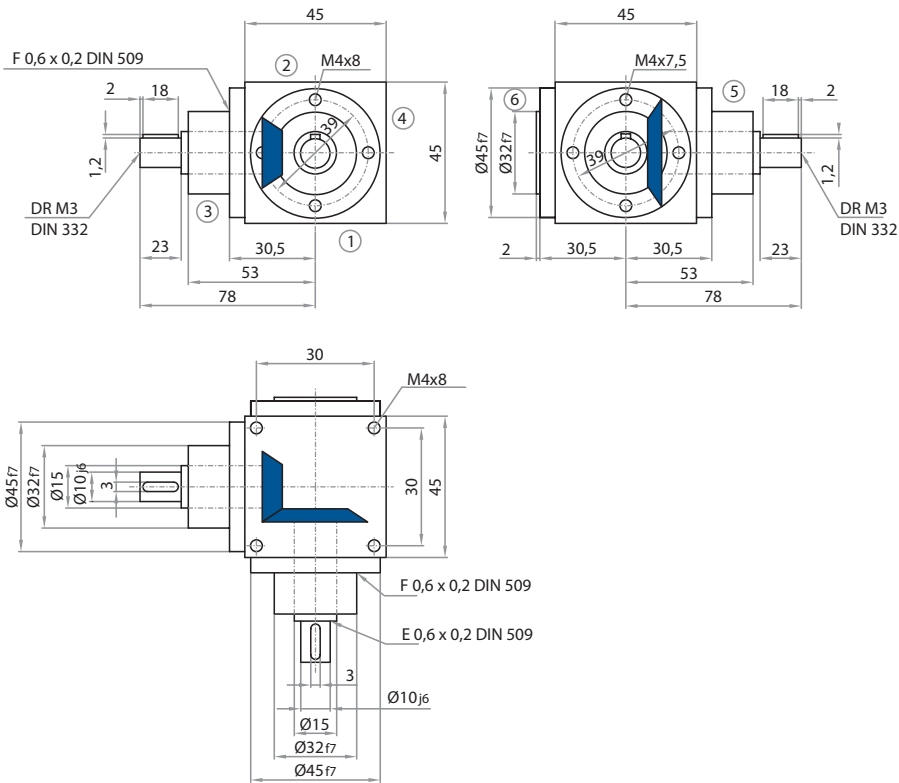
## VI Mounting Configuration (downward-facing side)



## Example of Order

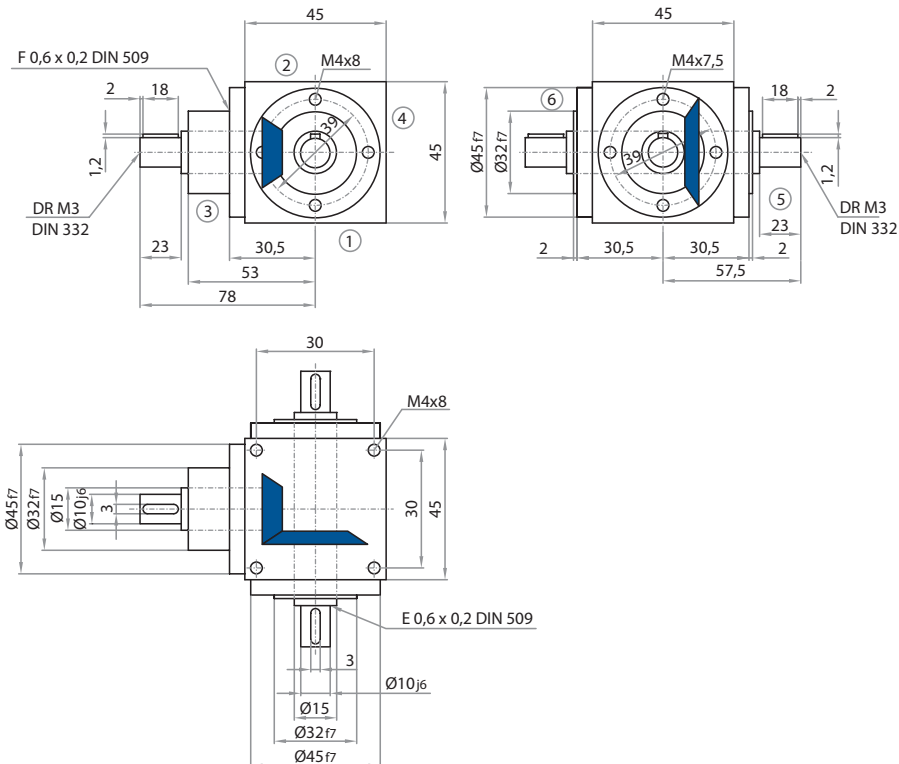
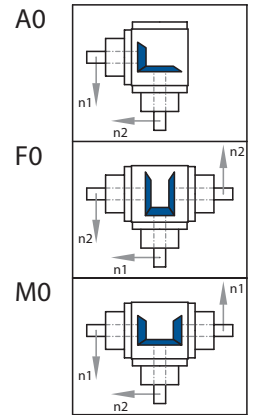
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
L	L	035	1:1	E0	-	1	.	1	-	500 / 0000=Standard				

# Type L 045



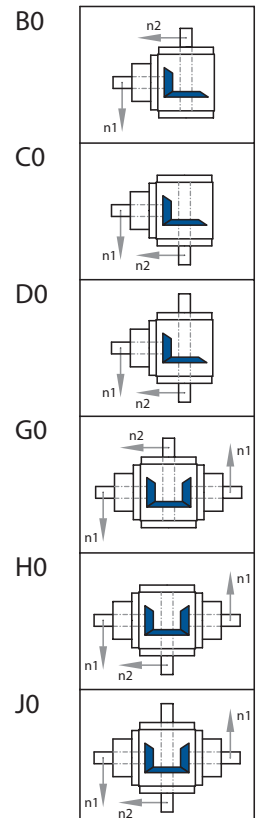
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in grid dimension 38 on sides 3, 5 & 6

## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in grid dimension 38 on sides 3, 5 & 6

## Model



## IV Power Ratings, Torque Ratings

[n=min-1, P=kW, T=Nm]

i = n1	1:1 n2	P1N T2N	2:1 n2	P1N T2N	3:1 n2	P1N T2N	4:1 n2	P1N T2N
3000	3000	1,323 4,000	1500	0,744 4,500	1000	0,331 3,000	750	0,289 3,500
2400	2400	1,190 4,500	1200	0,628 4,750	800	0,300 3,400	600	0,238 3,600
1500	1500	0,992 6,000	750	0,413 5,000	500	0,193 3,500	375	0,155 3,750
1000	1000	0,772 7,000	500	0,303 5,500	333	0,147 4,000	250	0,110 4,000
750	750	0,603 7,300	375	0,236 5,700	250	0,116 4,200	188	0,087 4,200
500	500	0,441 8,000	250	0,165 6,000	167	0,083 4,500	125	0,059 4,250
250	250	0,248 9,000	125	0,090 6,500	83	0,046 5,000	62,5	0,031 4,500
50	50	0,050 9,000	25	0,019 7,000	17	0,010 5,500	12,5	0,006 4,500
<b>P1Nt</b>		<b>0,600</b>		<b>0,600</b>		<b>0,600</b>		<b>0,600</b>
<b>T2max</b>		<b>16,000</b>		<b>12,500</b>		<b>10,000</b>		<b>8,000</b>

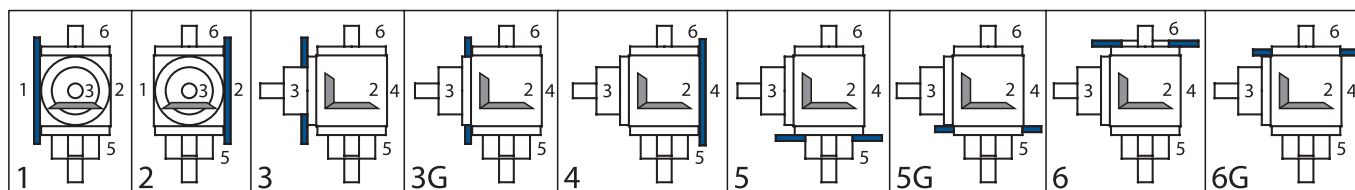
## Moments of Inertia

## Gearbox Weights (kg)

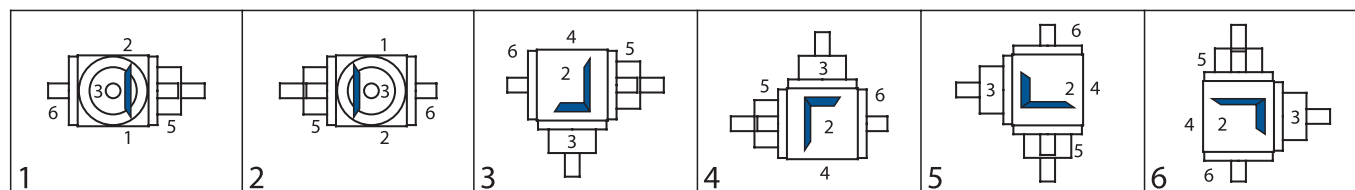
Model	Transmission Ratios			
	1:1	2:1	3:1	4:1
	upon request			

Model	app. Weight
A0	ca. 510g
F0	ca. 700g
M0	ca. 700g
B0, C0	ca. 500g
D0	ca. 530g
G0, H0	ca. 660g
J0	ca. 690g

## V Mounting Side



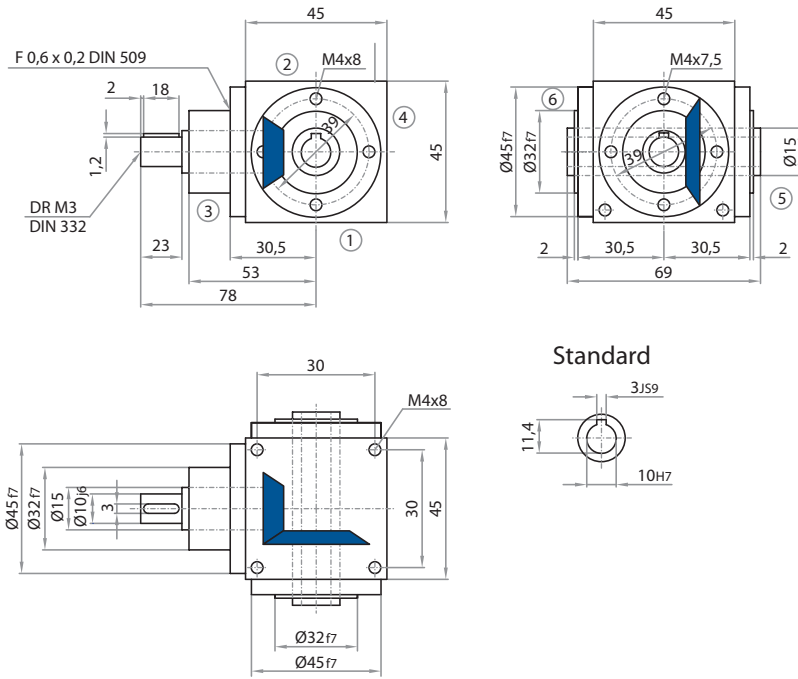
## VI Mounting Configuration (downward-facing side)



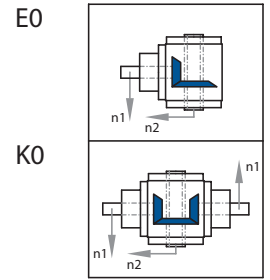
## Example of Order

I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
	L	045		1:1		A0		1		1		-	500 / 0000=Standard	

# Type L 045



## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in grid dimension 38 on sides 3, 5 & 6



## IV Power Ratings, Torque Ratings

[n= min-1, P=kW, T=Nm]

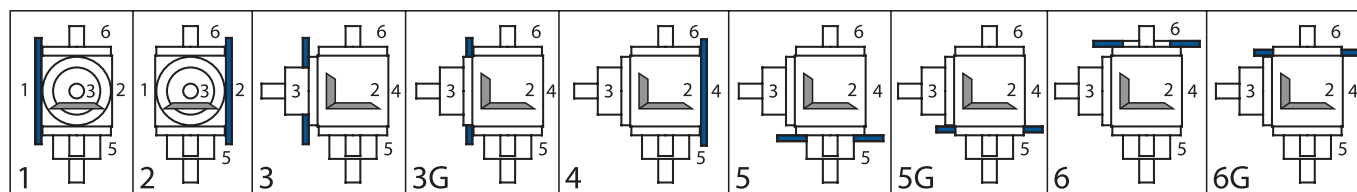
i = n1	1:1 n2	P1N T2N	2:1 n2	P1N T2N	3:1 n2	P1N T2N	4:1 n2	P1N T2N
3000	3000	1,323 4,000	1500	0,744 4,500	1000	0,331 3,000	750	0,289 3,500
2400	2400	1,190 4,500	1200	0,628 4,750	800	0,300 3,400	600	0,238 3,600
1500	1500	0,992 6,000	750	0,413 5,000	500	0,193 3,500	375	0,155 3,750
1000	1000	0,772 7,000	500	0,303 5,500	333	0,147 4,000	250	0,110 4,000
750	750	0,603 7,300	375	0,236 5,700	250	0,116 4,200	188	0,087 4,200
500	500	0,441 8,000	250	0,165 6,000	167	0,083 4,500	125	0,059 4,250
250	250	0,248 9,000	125	0,090 6,500	83	0,046 5,000	62,5	0,031 4,500
50	50	0,050 9,000	25	0,019 7,000	17	0,010 5,500	12,5	0,006 4,500
<b>P1Nt</b>		<b>0,600</b>		<b>0,600</b>		<b>0,600</b>		<b>0,600</b>
<b>T2max</b>		<b>16,000</b>		<b>12,500</b>		<b>10,000</b>		<b>8,000</b>

## Moments of Inertia

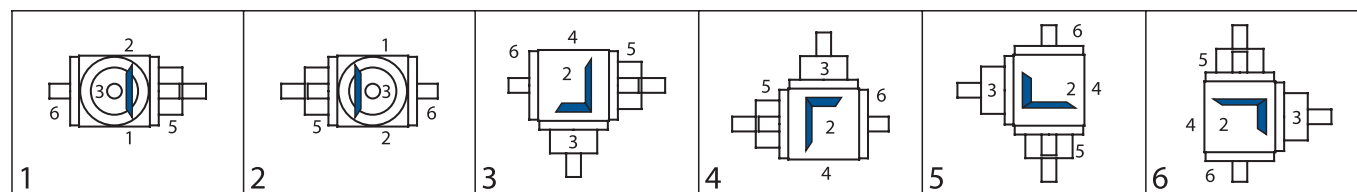
## Gearbox Weights (kg)

Model	Transmission Ratios				Model	app. Weight
	1:1	2:1	3:1	4:1		
	on request				E0	ca. 460g
					K0	ca. 620g

## V Mounting Side



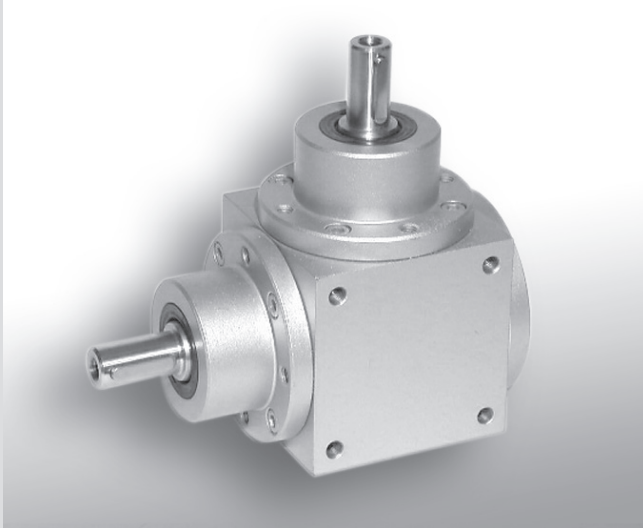
## VI Mounting Configuration (downward-facing side)



## Example of Order

I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
	L	045		1:1		E0		1		1		-	500 / 0000=Standard	

# Type V Gearboxes



- Speed Reducer Gearboxes
- Precision Spiral Bevel gearing
- Robust design
- 65 mm to 350 mm frame sizes
- Ratio 1:1 to 6:1
- Numerous options and configurations to choose from

# Selection Criteria

**GAM bevel gearboxes** are encased in robust cast metal housings and have hardened bevel gears pairs with spiral toothings and amply dimensioned rolling bearings. Spiral bevel gears have the significant benefit of very favourable meshing characteristics (high contact ratio). They are therefore especially well suited for operation under high load factors and when the highest smoothness of running and a high degree of transmission precision are required.

The curved teeth are more resistant to distortion than are straight or helical teeth. A further benefit is their relative insensitivity to elastic distortion of wheels, shafts and bearings. The gearboxes are thus able to transmit extreme shock loads. A total of twelve different standard versions are available, with a further 22 variations as multi-shaft gear-boxes. All gearboxes may be installed in any mounting position and may have mounting holes on all sides.

## Transmission Ratios

Transmission ratios of 1-1.5-2-3-4-5 and 6:1 are available as standard. All transmission ratios are mathematically precise. The gears can be used for gearing down and gearing up. Special transmission ratios are available. Please contact us for details.

## Efficiency

GAM gearboxes are 94-98% efficient, depending on rpm, mounting position, sealing and type of lubrication.

The efficiency level refers to the nominal power output from the transmission. In certain mounting positions, the bevel gears are completely immersed in the lubricant. In this case, churning loss in larger gearboxes and at high circumferential velocities of the wheels can be considerable and GAM should be consulted.

In general, it should be noted that starting efficiency is always lower than operating efficiency. The resulting increased breakaway torque should be taken into consideration when determining the driving power required.

## Low-backlash version

For standard bevel gear units have – depending on gear size and ratio – a backlash of 10 to 30 angular minutes. Nevertheless all GAM bevel gearboxes can be supplied in a low-backlash version.

When the drive shaft is locked, tooth backlash on the slowly-running shaft is measured on a 100mm lever arm with a measuring force of 3% of the rated torque and then is given as a torsion angle.

The following values can be set with standard gear sets.

Design S1:  $i = 1:1$  bis  $2:1 < 6$  angular minutes

Design S2:  $i = 3:1$  bis  $6:1 < 10$  angular minutes

Tighter values can be obtained from specially selected, HPGS-gearred or ground gear sets – please ask (Design S0).

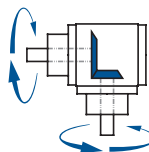
## Mounting Side

To indicate clearly the positions of different gearbox features, the sides of the gearbox are numbered 1 to 6. These numbers can be found in the individual data sheets.

All six sides of the gearbox are machined and can be used as mounting surfaces. The flanges and neck flanges are fitted with threaded holes as standard equipment. The following ordering options are available:

Code	Mounting holes
0	only in the flange surfaces
1, 2 ...	on one gearbox side without flange
3G, 5G ...	on one gearbox side with flange / neck flange
9	on all gearbox sides without flanges
9G	on all gearbox sides with flange / neck flange

## Preferred rotational direction



GAM bevel gearboxes can normally be run in either rotational direction. The spiral direction of the gear set and the rotational direction used are key factors determining the forces evolved within the unit. In most instances permissible torque transmission can be maximized by using the gear pairing such that the driving gear rotates in the same direction as the spiralling. This arrangement creates a more favourable contact point which reduces gear distortion. This also reduces noise from the gear pairing by 1-2dBA due to the fact that the axial forces caused by the spiral meshing push the gears apart. In GAM bevel gear transmissions the pinion gear always has a left-handed spiral; accordingly, the large gear has a right-handed spiral.

## Lubrication

GAM bevel gearboxes are supplied oil-filled and are maintenance-free under normal operating conditions. With extreme requirements or increased demands on durability we recommend to change the oil after approx. 15,000 hours of operation.

GAM is anxious to select the best lubricants for each case of application and in so doing optimizing the lifetime of the transmission. The peripheral speed of the bevel gears, the power that is to be transferred, and the operating conditions are crucial for the choice of the lubricant.

An approximate guideline value for the type of lubrication used can be found in the two selection diagrams and in the lubricant table.

The way to the correct type of lubrication is to be found using the two selection diagrams and the lubricant table. The selection diagrams consider the nominal moment, as taken from catalogue, and the operating mode of the transmission with 100% operating time or 30%/h intermittent operation. After the operating mode being selected and the operating conditions have been considered, the type of lubricant is determined by the number of revolutions of the slow running transmission shaft. From the lubricant table specified underneath this, the type of lubrication, the necessity for aeration of the transmission and the transmission oil can be seen.

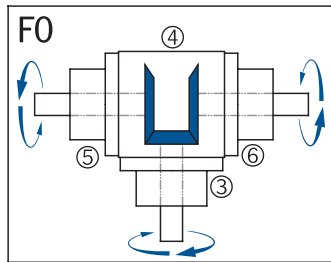
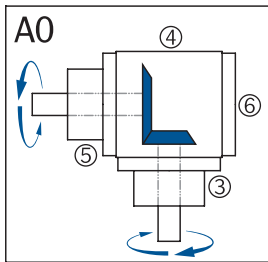
The type of lubrication actually used is determined by us for the specific application and can differ from the values in the table!

Modern synthetic high-tech lubricants are available for choice. For transmission application in the Pharma or Foodstuffs industry, proven NOTOX lubricants with NSF release (USDA-H1) can be selected.

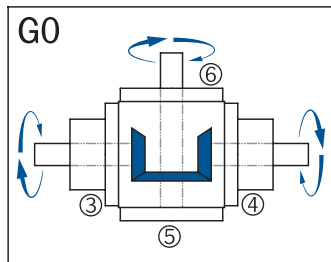
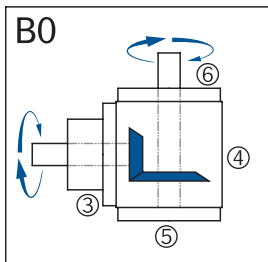
GAM transmissions are lubricated for a lifetime. The amount of lubricant has been internally determined for each assembly position. Naturally, biological-degradable oils or lubricants for extreme operating conditions can be supplied. For this purpose please contact GAM-Technik.

Also under normal operating conditions the transmission temperature can rise to over 50°C because of the small convection surface. If the transmission exceeds this temperature during use the included aeration filter must be fitted in order to avoid overpressure in the transmission and thus a leakage. Sufficient fresh air supply must be ensured. If the unit is intended for use under extreme ambient conditions (dust, moisture, etc.) please consult GAM. With intermittent operation or other operating conditions in which a rise in temperature of the transmission to over 50°C is not expected, the aeration hole is not required.

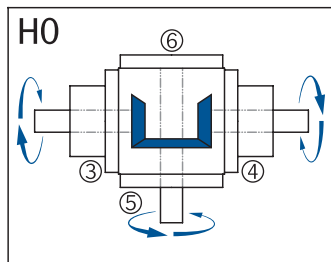
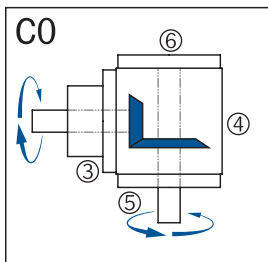
# Models and Rotational Directions



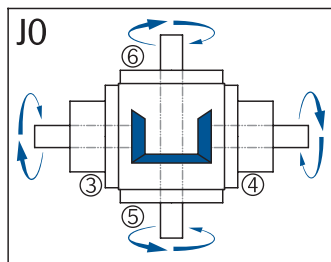
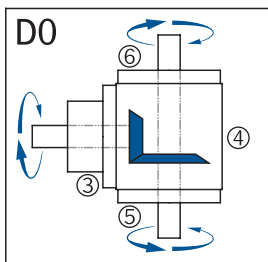
**Models A0 and F0** have shafts with single bearings. The input and output sides are symmetrical at transmission ratios between 1:1 and 2:1. Also available as model M0 with 2 pinion shafts.



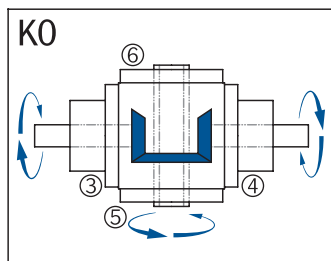
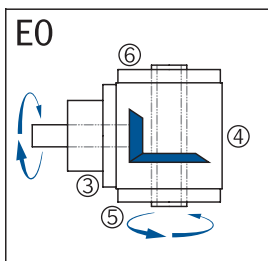
**In models B0 and G0**, the output shaft has bearings on both sides and extends out away from the side where its bevel gear is located. In this design the shafts have the same direction of rotation.



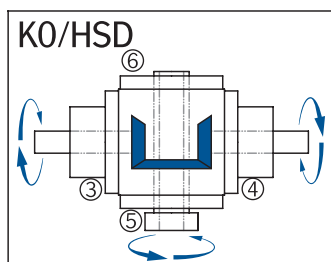
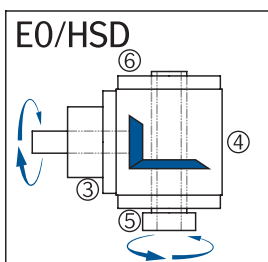
**In models C0 and H0**, the output shaft has bearings on both sides and extends out to the side where its bevel gear is located. In this design the shafts have opposing directions of rotation.



**Models D0 and J0** have a straight-through output shaft. If units are intended for arrangement in series, they can be supplied with reinforced straight-through shafts and bearings.



**Models E0 and K0** have a straight-through hollow shaft. The following options are available:  
- without keyway, - with spline profile, - with polygonal profile.



**Models E0/HSD and K0/HSD** have a stepped hollow shaft without a keyway and a shrunk-on disc for positive torque transmission. The guide side is fitted with a bronze guide bushing.



# Lubrication

Transmission Ratios  $i = 1:1 - 6:1$

Ambient temperature - 10 °C - +30 °C

Operating time 100% / h

n2 [1/min]	Size								
	065	090	120	140	160	200	230	260	350
200	A	A	A	A	A	A	A	A	B 0
300	A	A	A	A	A	A	A	B 0	B 0
400	A	A	A	A	A	A	B 0	B 0	B 0
500	A	A	A	A	A	B 0	B 0	B 0	B 1
600	A	A	A	B 0	B 0	B 0	B 0	B 1	B 1
700	A	A	B 0	B 0	B 0	B 0	B 1	B 1	B 1
800	A	B 0	B 0	B 0	B 0	B 0	B 1	B 1	B 1
900	A	B 0	B 0	B 0	B 1	B 1	B 1	B 1	B 1
1000	A	B 0	B 0	B 1	B 1	B 1	B 1	B 1	B 2
1100	A	B 0	B 0	B 1	B 1	B 1	B 1	B 2	B 2
1200	B 0	B 0	B 1	B 1	B 1	B 1	B 1	B 2	B 2
1500	B 0	B 0	B 1	B 1	B 1	B 1	B 2	B 2	C
1600	B 0	B 1	B 1	B 1	B 1	B 1	B 2	B 2	C
1700	B 0	B 1	B 1	B 1	B 1	B 2	B 2	B 2	C
1800	B 0	B 1	B 1	B 1	B 1	B 2	B 2	B 2	C
2200	B 0	B 1	B 1	B 1	B 2	B 2	C	C	C
3000	B 1	B 1	B 2	B 2	B 2	C	C	C	C
3400	B 1	B 2	B 2	B 2	B 2	C	C	C	C

Operating time 30% / h

n2 [1/min]	Size								
	065	090	120	140	160	200	230	260	350
400	A	A	A	A	A	A	A	A	B 0
500	A	A	A	A	A	A	A	B 0	B 0
700	A	A	A	A	A	A	B 0	B 0	B 1
800	A	A	A	A	A	B 0	B 0	B 1	B 1
900	A	A	A	B 0	B 0	B 0	B 0	B 1	B 1
1000	A	A	B 0	B 0	B 0	B 0	B 1	B 1	B 1
1100	A	A	B 0	B 0	B 0	B 0	B 1	B 1	B 2
1200	A	A	B 0	B 0	B 0	B 0	B 1	B 1	B 2
1300	A	A	B 0	B 0	B 0	B 1	B 1	B 2	B 2
1400	A	B 0	B 0	B 0	B 1	B 1	B 1	B 2	C
1500	A	B 0	B 0	B 0	B 1	B 1	B 2	B 2	C
1700	A	B 0	B 0	B 0	B 1	B 1	B 2	B 2	C
1900	A	B 0	B 1	B 1	B 1	B 1	B 2	B 2	C
2000	B 0	B 0	B 1	B 1	B 1	B 2	B 2	C	C
2200	B 0	B 0	B 1	B 1	B 1	B 2	C	C	C
2300	B 0	B 1	B 1	B 1	B 1	B 2	C	C	C
2800	B 0	B 1	B 1	B 1	B 2	B 2	C	C	C
3000	B 0	B 1	B 2	B 2	B 2	C	C	C	C
3300	B 0	B 1	B 2	B 2	B 2	C	C	C	C

	Code	Lubrication	Venting Filter	Viscosity ISO VG
Standard	A	Dip lubrication	no	460
	B 0	Dip lubrication	no	220
	B 1	Dip lubrication	yes	220
	B 2	Dip lubrication	yes	68
	C	Spray lubrication	yes	68
	F 00	Grease lubrication	no	00
NOTOX	A	Dip lubrication	no	460
	B 0	Dip lubrication	no	220
	B 1	Dip lubrication	yes	220
	B 2	Dip lubrication	yes	68
	F 00	Grease lubrication	no	00

## Position of Vent Filter

In lubrication types B1 and B2, the gearbox is supplied with a vent filter. The possible locations of the filter are given in the table below. When ordering, the customer should specify the side of the gearbox on which the filter should be installed.

E.G.: E4=vent on side 4. If no vent filter location is specified in the order, the location will be determined by GAM.

		Filter position					
		1	2	3	4	5	6
Type V Model A0 - D0							
	E2	E1	E4	E2	E4	E4	E4
Type V Model E0 - EO/HSD							
	E2	E1	E4	E2	E4	E4	E4
Type V Model E0 - EO/HSD							
	E4	E4	E1	E1	E2	E2	E1
Type VS Model B0 - D0							
	E2	E1	E4	E2	E4	E4	E4
Type VS Model B0 - D0							
	E4	E4	E1	E1	E2	E2	E1

# Type V

## Performance Specifications

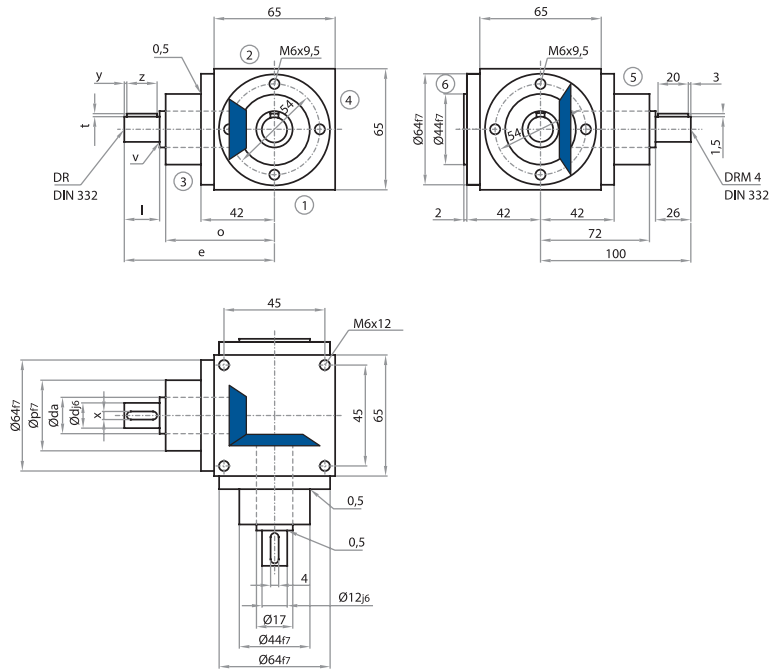
### Bevel Gearboxes

Ratio	n <sub>1</sub> 1/min	n <sub>2</sub> 1/min	kW Nm	size									
				065	090	120	140	160	200	230	260	350	
<b>1:1 - 6:1</b>			<b>P1Nt</b>	<b>1.60</b>	<b>3.80</b>	<b>6.20</b>	<b>10.00</b>	<b>15.00</b>	<b>26.00</b>	<b>34.00</b>	<b>42.00</b>	<b>90.00</b>	
<b>1:1</b>	3000	3000	P1N	3.31	8.93	21.82	39.68						
			T2N	10.00	27.00	66.00	120.00						
	2400	2400	P1N	2.65	7.41	18.52	37.03	57.67					
			T2N	10.00	28.00	70.00	140.00	218.00					
	1500	1500	P1N	1.82	5.29	13.56	26.78	42.99	74.40	87.63	157.07	267.84	
			T2N	11.00	32.00	82.00	162.00	260.00	450.00	530.00	950.00	1620.00	
	1000	1000	P1N	1.32	3.75	10.14	20.28	31.96	56.21	71.65	115.73	210.53	
			T2N	12.00	34.00	92.00	184.00	290.00	510.00	650.00	1050.00	1910.00	
	750	750	P1N	1.07	3.06	8.51	16.20	25.63	45.88	60.76	96.72	195.92	
			T2N	13.00	37.00	103.00	196.00	310.00	555.00	735.00	1170.00	2370.00	
	500	500	P1N	0.83	2.20	6.34	11.46	18.19	34.17	45.19	72.75	155.41	
			T2N	15.00	40.00	115.00	208.00	330.00	620.00	820.00	1320.00	2820.00	
	250	250	P1N	0.47	1.21	3.39	5.92	9.64	19.56	26.73	42.44	94.52	
			T2N	17.00	44.00	123.00	215.00	350.00	710.00	970.00	1540.00	3440.00	
	50	50	P1N	0.10	0.28	0.72	1.21	2.09	4.13	7.00	9.64	24.47	
			T2N	18.00	50.00	130.00	220.00	380.00	750.00	1270.00	1750.00	4440.00	
				<b>T2max</b>	<b>25.00</b>	<b>105.00</b>	<b>220.00</b>	<b>430.00</b>	<b>660.00</b>	<b>1090.00</b>	<b>1500.00</b>	<b>2310.00</b>	<b>5400.00</b>
	<b>1.5:1</b>	3000	2000	P1N	2.20	5.51	13.45	24.91	40.78	72.75	99.20	189.58	
T2N				10.00	25.00	61.00	113.00	185.00	330.00	450.00	860.00		
2400		1600	P1N	1.76	4.59	11.46	22.22	36.15	63.49	91.35	158.72		
			T2N	10.00	26.00	65.00	126.00	205.00	360.00	518.00	900.00		
1500		1000	P1N	1.21	3.20	8.60	17.08	27.78	48.17	72.20	104.71	206.19	
			T2N	11.00	29.00	78.00	155.00	252.00	437.00	655.00	950.00	1870.00	
1000		667	P1N	0.88	2.35	6.32	12.87	20.59	37.13	56.21	77.19	188.55	
			T2N	12.00	32.00	86.00	175.00	280.00	505.00	765.00	1050.00	2560.00	
750		500	P1N	0.72	1.93	5.18	10.47	16.26	30.31	45.47	64.48	141.42	
			T2N	13.00	35.00	94.00	190.00	295.00	550.00	825.00	1170.00	2560.00	
500		333	P1N	0.55	1.36	3.85	7.34	11.56	22.57	33.79	47.72	112.63	
			T2N	15.00	37.00	105.00	200.00	315.00	615.00	920.00	1300.00	3070.00	
250		167	P1N	0.31	0.74	1.99	3.76	6.07	12.70	20.57	27.43	67.11	
			T2N	17.00	40.00	108.00	204.00	330.00	690.00	1120.00	1490.00	3650.00	
50		33	P1N	0.07	0.16	0.41	0.76	1.29	2.73	4.89	6.18	16.34	
			T2N	18.00	45.00	113.00	210.00	355.00	750.00	1330.00	1700.00	4500.00	
				<b>T2max</b>	<b>25.00</b>	<b>80.00</b>	<b>169.00</b>	<b>358.00</b>	<b>650.00</b>	<b>980.00</b>	<b>1400.00</b>	<b>2100.00</b>	<b>5200.00</b>
<b>2:1</b>		3000	1500	P1N	1.65	3.80	9.26	16.53	28.11	51.25	87.63	133.92	
	T2N			10.00	23.00	56.00	100.00	170.00	310.00	530.00	810.00		
	2400	1200	P1N	1.32	3.17	8.07	14.68	25.53	45.24	80.02	112.43		
			T2N	10.00	24.00	61.00	111.00	193.00	342.00	605.00	850.00		
	1500	750	P1N	0.91	2.23	6.03	11.41	20.25	35.13	59.11	78.53	200.06	
			T2N	11.00	27.00	73.00	138.00	245.00	425.00	715.00	950.00	2420.00	
	1000	500	P1N	0.66	1.71	4.46	8.38	14.88	27.56	45.19	57.87	155.41	
			T2N	12.00	31.00	81.00	152.00	270.00	500.00	820.00	1050.00	2820.00	
	750	375	P1N	0.54	1.32	3.55	6.86	11.57	22.32	36.79	48.36	129.37	
			T2N	13.00	32.00	86.00	166.00	280.00	540.00	890.00	1170.00	3130.00	
	500	250	P1N	0.41	0.94	2.54	4.96	8.27	16.81	26.73	35.27	94.52	
			T2N	15.00	34.00	92.00	180.00	300.00	610.00	970.00	1280.00	3430.00	
	250	125	P1N	0.23	0.50	1.35	2.62	4.41	9.37	16.88	20.12	54.15	
			T2N	17.00	36.00	98.00	190.00	320.00	680.00	1225.00	1460.00	3930.00	
	50	25	P1N	0.05	0.10	0.29	0.55	0.98	2.07	3.66	4.55	12.79	
			T2N	18.00	37.00	107.00	200.00	355.00	750.00	1330.00	1650.00	4640.00	
				<b>T2max</b>	<b>25.00</b>	<b>80.00</b>	<b>169.00</b>	<b>320.00</b>	<b>650.00</b>	<b>980.00</b>	<b>1400.00</b>	<b>2100.00</b>	<b>5000.00</b>
	<b>3:1</b>	3000	1000	P1N	1.10	2.54	6.39	12.12	20.94	46.29	44.09	85.97	
T2N				10.00	23.00	58.00	110.00	190.00	420.00	400.00	780.00		
2400		800	P1N	0.88	2.12	5.56	11.46	17.81	39.24	39.68	72.39	160.48	
			T2N	10.00	24.00	63.00	130.00	202.00	445.00	450.00	821.00	1820.00	
1500		500	P1N	0.61	1.49	4.08	8.05	12.68	28.38	29.76	49.60	122.35	
			T2N	11.00	27.00	74.00	146.00	230.00	515.00	540.00	900.00	2220.00	
1000		333	P1N	0.44	1.14	3.01	5.87	8.99	20.37	23.33	36.34	96.26	
			T2N	12.00	31.00	82.00	160.00	245.00	555.00	635.00	990.00	2620.00	



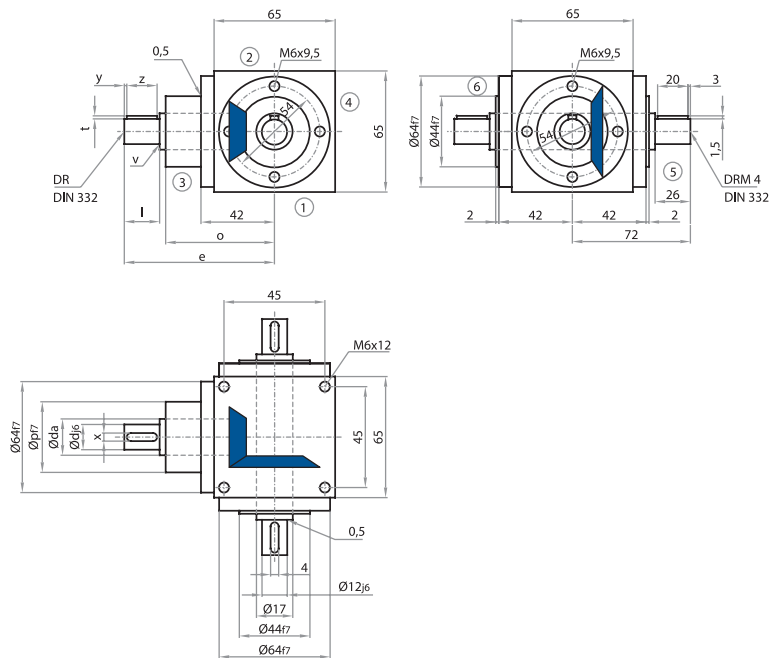
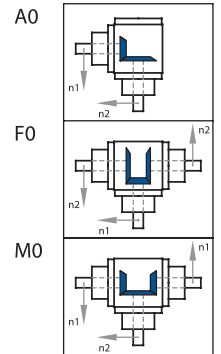
Ratio	n1 1/min	n2 1/min	kW Nm	size									
				065	090	120	140	160	200	230	260	350	
3:1	750	250	P1N	0.33	0.88	2.40	4.60	6.89	15.98	19.29	28.93	81.29	
			T2N	12.00	32.00	87.00	167.00	250.00	580.00	700.00	1050.00	2950.00	
	500	167	P1N	0.24	0.63	1.66	3.20	4.79	11.04	14.07	20.43	59.34	
			T2N	13.00	34.00	90.00	174.00	260.00	600.00	765.00	1110.00	3230.00	
	250	83	P1N	0.12	0.33	0.87	1.62	2.56	5.76	7.58	11.16	34.26	
			T2N	13.00	36.00	95.00	177.00	280.00	630.00	825.00	1220.00	3730.00	
	50	17	P1N	0.03	0.07	0.21	0.34	0.57	1.29	1.63	2.55	7.79	
			T2N	14.00	37.00	110.00	180.00	305.00	690.00	870.00	1360.00	4240.00	
	<b>T2max</b>				<b>23.00</b>	<b>70.00</b>	<b>155.00</b>	<b>280.00</b>	<b>457.00</b>	<b>910.00</b>	<b>1300.00</b>	<b>1940.00</b>	<b>4500.00</b>
	4:1	3000	750	P1N		1.90	4.96	8.51	14.88	28.93	36.37	57.87	
T2N					23.00	60.00	103.00	180.00	350.00	440.00	700.00		
2400		600	P1N		1.65	4.43	7.34	13.23	26.45	32.74	51.58	113.75	
			T2N		25.00	67.00	111.00	200.00	400.00	495.00	780.00	1720.00	
1500		375	P1N		1.12	3.06	4.96	9.09	18.81	24.80	37.20	78.95	
			T2N		27.00	74.00	120.00	220.00	455.00	600.00	900.00	1910.00	
1000		250	P1N		0.85	2.18	3.75	6.61	13.36	18.60	28.93	58.14	
			T2N		31.00	79.00	136.00	240.00	485.00	675.00	1050.00	2110.00	
750		187.5	P1N		0.66	1.69	3.06	5.17	10.54	15.19	22.73	47.95	
			T2N		32.00	82.00	148.00	250.00	510.00	735.00	1100.00	2320.00	
500		125	P1N		0.47	1.16	2.12	3.58	7.23	10.95	16.26	34.72	
			T2N		34.00	84.00	154.00	260.00	525.00	795.00	1180.00	2520.00	
250		62.5	P1N		0.25	0.60	1.12	1.86	3.79	5.99	8.61	19.43	
			T2N		36.00	87.00	162.00	270.00	550.00	870.00	1250.00	2820.00	
50		12.5	P1N		0.05	0.12	0.23	0.39	0.80	1.35	1.82	4.17	
			T2N		37.00	90.00	170.00	280.00	580.00	980.00	1320.00	3030.00	
<b>T2max</b>				<b>70.00</b>	<b>155.00</b>	<b>280.00</b>	<b>422.00</b>	<b>860.00</b>	<b>1300.00</b>	<b>1940.00</b>	<b>3500.00</b>		
5:1		3000	600	P1N		1.52	3.97	6.61	11.90	19.84	33.73	46.29	
	T2N				23.00	60.00	100.00	180.00	300.00	510.00	700.00		
	2400	480	P1N		1.32	3.44	5.56	10.48	17.99	29.10	40.21	78.83	
			T2N		25.00	65.00	105.00	198.00	340.00	550.00	760.00	1490.00	
	1500	300	P1N		0.89	2.38	3.80	7.11	12.57	21.00	29.10	56.54	
			T2N		27.00	72.00	115.00	215.00	380.00	635.00	880.00	1710.00	
	1000	200	P1N		0.68	1.76	2.73	4.96	9.26	15.76	21.82	42.33	
			T2N		31.00	80.00	124.00	225.00	420.00	715.00	990.00	1920.00	
	750	150	P1N		0.53	1.42	2.15	3.97	7.27	12.73	18.19	35.88	
			T2N		32.00	86.00	130.00	240.00	440.00	770.00	1100.00	2170.00	
	500	100	P1N		0.37	0.98	1.50	2.76	5.18	9.15	13.23	26.67	
			T2N		34.00	89.00	136.00	250.00	470.00	830.00	1200.00	2420.00	
	250	50	P1N		0.20	0.51	0.79	1.49	2.78	5.07	7.11	16.09	
			T2N		36.00	92.00	143.00	270.00	505.00	920.00	1290.00	2920.00	
	50	10	P1N		0.04	0.10	0.17	0.32	0.58	1.09	1.47	3.56	
			T2N		37.00	95.00	150.00	290.00	525.00	990.00	1330.00	3230.00	
	<b>T2max</b>				<b>60.00</b>	<b>140.00</b>	<b>250.00</b>	<b>420.00</b>	<b>860.00</b>	<b>1200.00</b>	<b>1910.00</b>	<b>3500.00</b>	
	6:1	3000	600	P1N		1.25	2.95	5.18	7.09	11.45	20.17	27.27	
T2N					23.00	54.00	94.00	129.00	208.00	366.00	495.00		
2400		480	P1N		1.09	2.53	4.58	5.98	9.60	18.08	23.12	56.88	
			T2N		25.00	57.00	104.00	136.00	218.00	410.00	524.00	1290.00	
1500		300	P1N		0.74	1.75	2.95	3.95	6.54	13.50	16.36	41.61	
			T2N		27.00	64.00	107.00	143.00	237.00	490.00	594.00	1510.00	
1000		200	P1N		0.53	1.22	2.06	3.01	4.74	9.92	12.93	31.41	
			T2N		29.00	66.00	112.00	164.00	258.00	540.00	702.00	1710.00	
750		150	P1N		0.40	0.94	1.61	2.43	3.98	7.78	10.91	24.25	
			T2N		29.00	68.00	117.00	176.00	289.00	565.00	792.00	1760.00	
500		100	P1N		0.27	0.63	1.09	1.72	2.79	5.42	8.06	16.72	
			T2N		29.00	69.00	119.00	187.00	304.00	590.00	878.00	1820.00	
250		50	P1N		0.14	0.33	0.56	0.92	1.44	2.82	4.35	9.28	
			T2N		30.00	71.00	121.00	199.00	311.00	610.00	940.00	2020.00	
50		10	P1N		0.03	0.06	0.11	0.18	0.28	0.57	0.87	1.95	
			T2N		33.00	66.00	120.00	197.00	306.00	625.00	951.00	2120.00	
<b>T2max</b>				<b>50.00</b>	<b>120.00</b>	<b>200.00</b>	<b>350.00</b>	<b>625.00</b>	<b>1000.00</b>	<b>1730.00</b>	<b>2300.00</b>		

# Type V 065



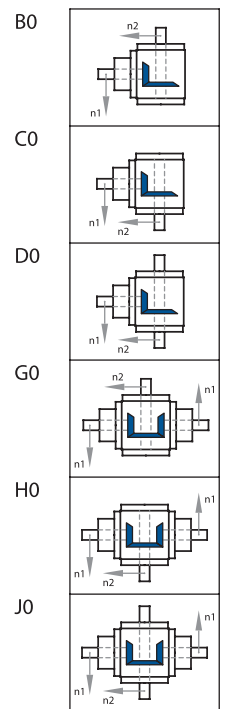
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 54x54 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 54x54 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 1:1 - 2:1	12	17	26	0,5	4	3	20	1,5	M4	100	72	44	i = 3:1	12	17	26	0,5	4	3	20	1,5	M4	100	72	44

### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N
3000	3000	3,31 10,00	2000	2,20 10,00	1500	1,65 10,00	1000	1,10 10,00
2400	2400	2,65 10,00	1600	1,76 10,00	1200	1,32 10,00	800	0,88 10,00
1500	1500	1,82 11,00	1000	1,21 11,00	750	0,91 11,00	500	0,61 11,00
1000	1000	1,32 12,00	667	0,88 12,00	500	0,66 12,00	333	0,44 12,00
750	750	1,07 13,00	500	0,72 13,00	375	0,54 13,00	250	0,33 12,00
500	500	0,83 15,00	333	0,55 15,00	250	0,41 15,00	167	0,24 13,00
250	250	0,47 17,00	167	0,31 17,00	125	0,23 17,00	83	0,12 13,00
50	50	0,10 18,00	33	0,07 18,00	25	0,05 18,00	17	0,03 14,00
<b>P1Nt</b>		<b>1,60</b>		<b>1,60</b>		<b>1,60</b>		<b>1,60</b>
<b>T2max</b>		<b>25,00</b>		<b>25,00</b>		<b>25,00</b>		<b>23,00</b>

### Radial Forces (N)

T2 Nm	n <sub>1</sub> (1/min)						n <sub>2</sub> (1/min)					
	3000	1000	500	250	100	50	3000	1000	500	250	100	50
< 12	180	250	300	350	450	550	300	400	500	650	750	900
> 12	150	210	250	290	380	460	250	330	420	540	630	750

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general information.

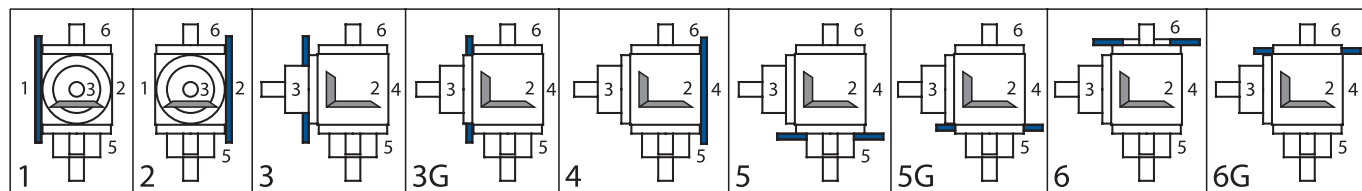
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n<sub>1</sub>)

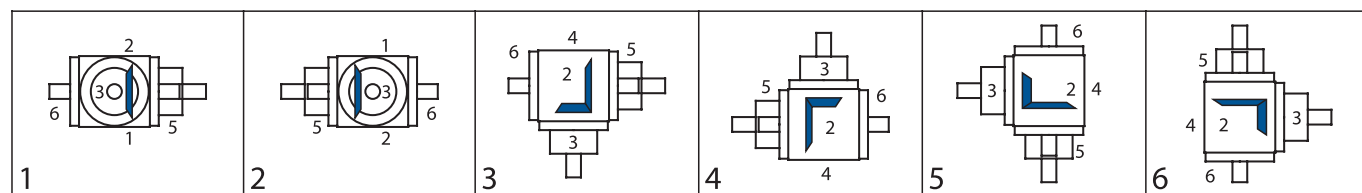
### Gearbox Weights (kg)

Model	Transmission Ratios				Model	app. Weight
	1:1	1.5:1	2:1	3:1		
A0	0,3888	0,2406	0,1839	0,1036	A0	2,3
F0	0,5832	0,3270	0,2325	0,1252	F0	2,7
M0	0,5832	0,3948	0,3192	0,1856	M0	2,7
B0, C0	0,4231	0,3111	0,2330	0,1001	B0, C0	2,2
D0	0,4330	0,3155	0,2355	0,1012	D0	2,3
G0, H0	0,6175	0,4653	0,3683	0,1821	G0, H0	2,6
J0	0,6274	0,4697	0,3708	0,1832	J0	2,7

### V Mounting Side



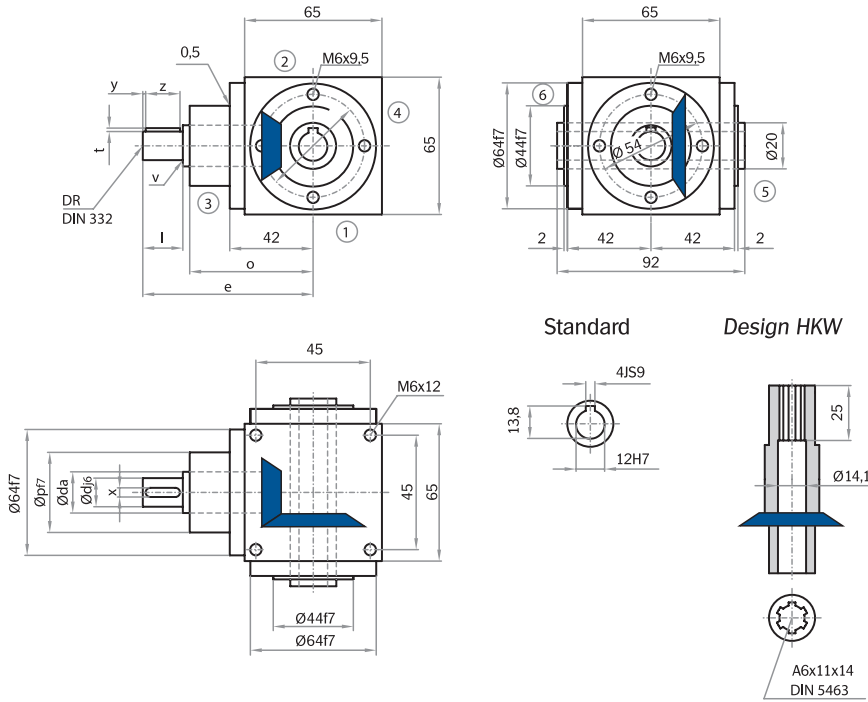
### VI Mounting Configuration (downward-facing side)



### Example of Order

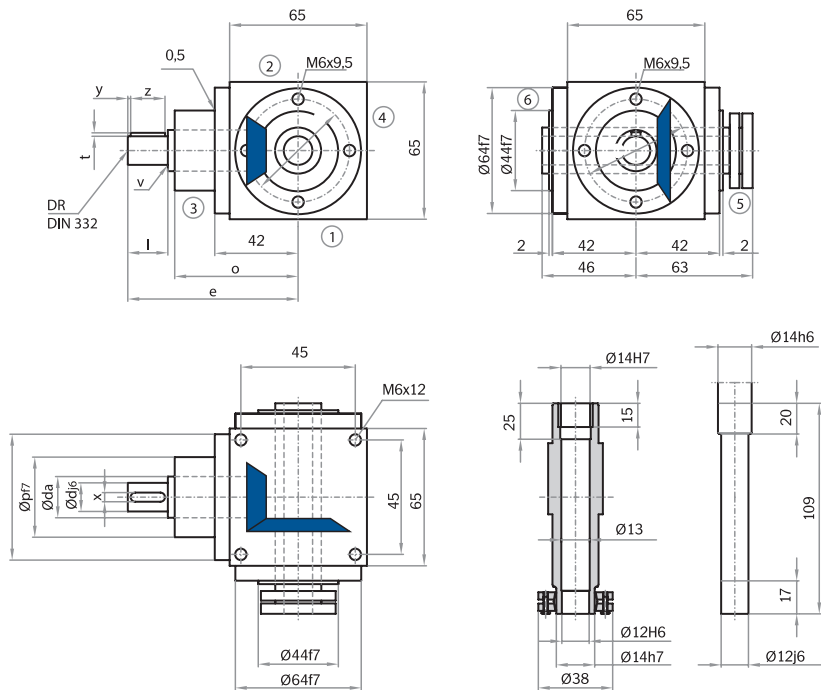
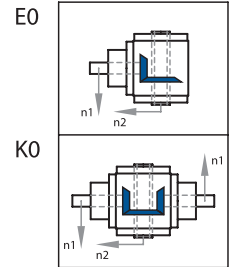
<b>I</b> Type	<b>II</b> Size	<b>IV</b> Ratio	<b>III</b> Model	<b>V</b> Mounting Side	<b>VI</b> Mounting Config.	<b>IV</b> Speed	n <sub>2max</sub>	Design
V	065	1:1	A0	-	1	-	500 /	0000=Standard

# Type V 065



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 54x54 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

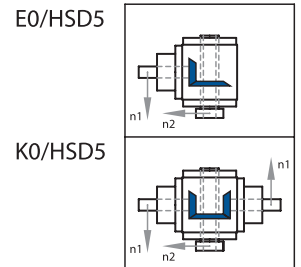
## Model



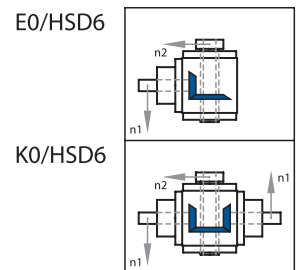
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 54x54 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

### Standard



### Special



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	12	17	26	0,5	4	3	20	1,5	M4	100	72	44	$i = 3:1$	12	17	26	0,5	4	3	20	1,5	M4	100	72	44

### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N
3000	3000	3,31 10,00	2000	2,20 10,00	1500	1,65 10,00	1000	1,10 10,00
2400	2400	2,65 10,00	1600	1,76 10,00	1200	1,32 10,00	800	0,88 10,00
1500	1500	1,82 11,00	1000	1,21 11,00	750	0,91 11,00	500	0,61 11,00
1000	1000	1,32 12,00	667	0,88 12,00	500	0,66 12,00	333	0,44 12,00
750	750	1,07 13,00	500	0,72 13,00	375	0,54 13,00	250	0,33 12,00
500	500	0,83 15,00	333	0,55 15,00	250	0,41 15,00	167	0,24 13,00
250	250	0,47 17,00	167	0,31 17,00	125	0,23 17,00	83	0,12 13,00
50	50	0,10 18,00	33	0,07 18,00	25	0,05 18,00	17	0,03 14,00
<b>P1Nt</b>		<b>1,60</b>		<b>1,60</b>		<b>1,60</b>		<b>1,60</b>
<b>T2max</b>		<b>25,00</b>		<b>25,00</b>		<b>25,00</b>		<b>23,00</b>

### Radial Forces (N)

T2 Nm	n <sub>1</sub> (1/min)						n <sub>2</sub> (1/min)					
	3000	1000	500	250	100	50	3000	1000	500	250	100	50
< 12	180	250	300	350	450	550	300	400	500	650	750	900
> 12	150	210	250	290	380	460	250	330	420	540	630	750

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general information.

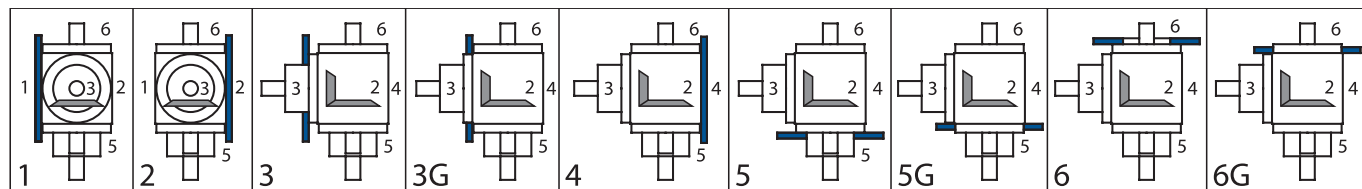
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n<sub>1</sub>)

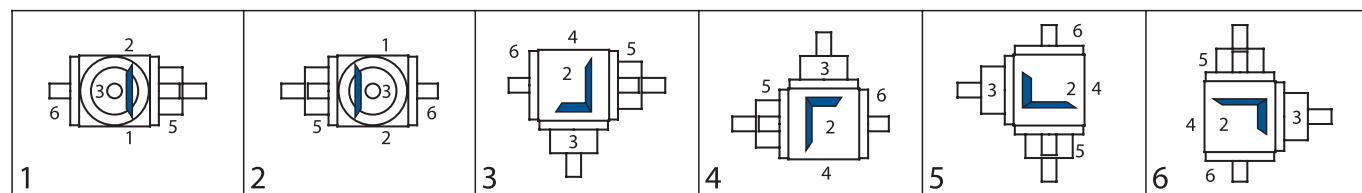
### Gearbox Weights (kg)

Model	Transmission Ratios				Model	app. Weight
	1:1	1.5:1	2:1	3:1		
E0	0,4754	0,3634	0,2853	0,1524	E0	2,1
K0	0,6698	0,5176	0,4206	0,2344	K0	2,5
E0/HSD	0,6012	0,4892	0,4111	0,2782	E0/HSD	2,1
K0/HSD	0,7956	0,6434	0,5464	0,3602	K0/HSD	2,5

### V Mounting Side



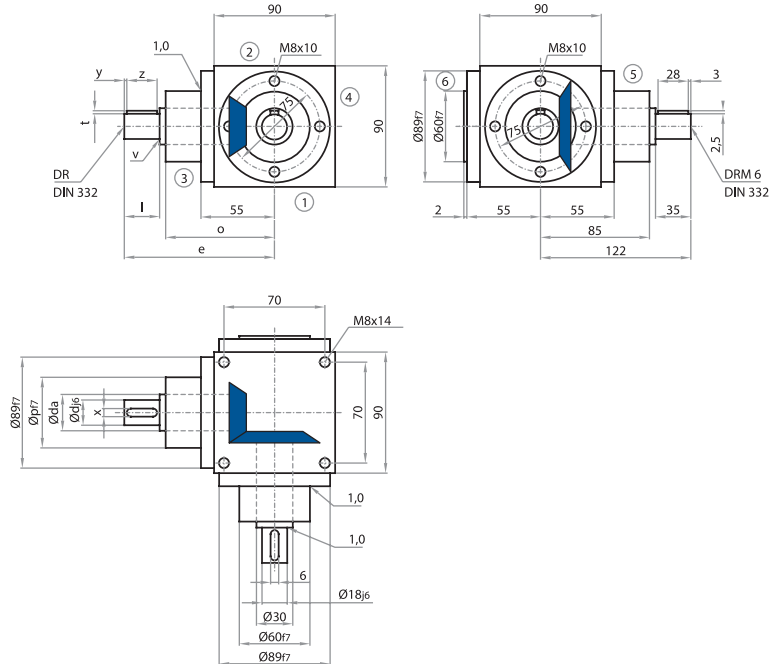
### VI Mounting Configuration (downward-facing side)



### Example of Order

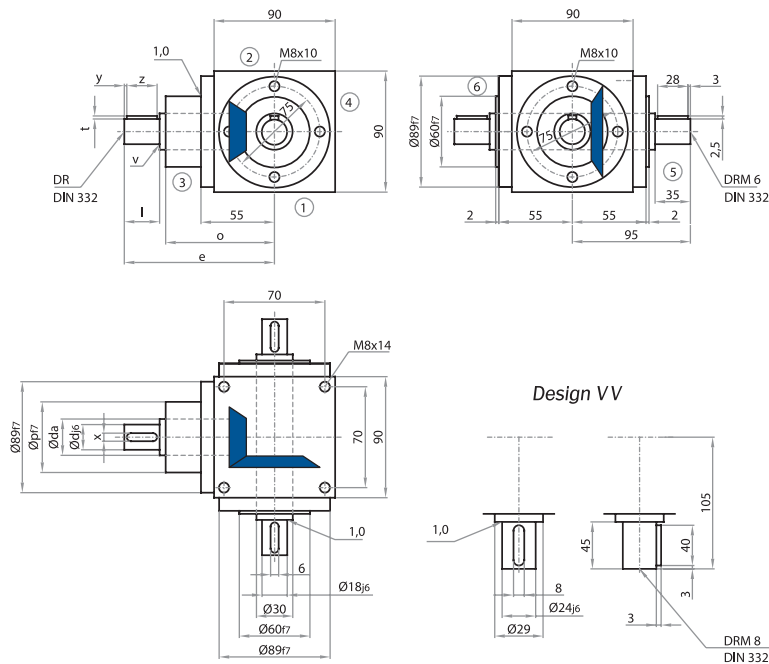
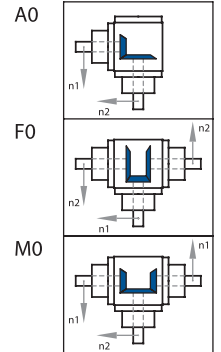
<b>I</b> Type	<b>II</b> Size	<b>IV</b> Ratio	<b>III</b> Model	<b>V</b> Mounting Side	<b>VI</b> Mounting Config.	<b>IV</b> Speed	n <sub>2</sub> max	Design
V	065	1:1	E0	-	1	-	500 /	0000=Standard

# Type V 90



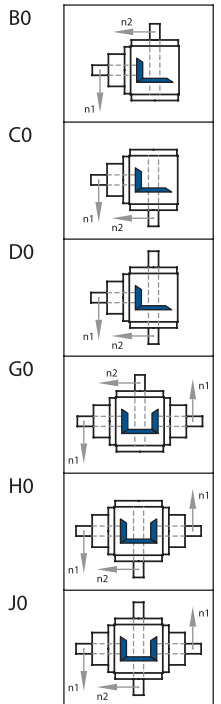
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 75x75 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 75x75 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 1:1 - 2:1	18	25	35	1	6	3	28	2,5	M6	122	85	60

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 3:1	12	20	35	0,5	4	3	28	1,5	M4	122	85	60

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 4:1	12	20	35	0,5	4	3	28	1,5	M4	132	95	60

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 5:1 - 6:1	12	20	35	0,5	4	3	28	1,5	M4	132	95	60

### IV Power Ratings, Torque Ratings

[ $n = \min-1$ ,  $P = kW$ ,  $T = Nm$ ]

$i =$ $n_1$	1:1 $n_2$	P1N T2N	1.5:1 $n_2$	P1N T2N	2:1 $n_2$	P1N T2N	3:1 $n_2$	P1N T2N	4:1 $n_2$	P1N T2N	5:1 $n_2$	P1N T2N	6:1 $n_2$	P1N T2N
3000	3000	8,93 27,00	2000	5,51 25,00	1500	3,80 23,00	1000	2,54 23,00	750	1,90 23,00	600	1,52 23,00	500	1,25 23,00
2400	2400	7,41 28,00	1600	4,59 26,00	1200	3,17 24,00	800	2,12 24,00	600	1,65 25,00	480	1,32 25,00	400	1,09 25,00
1500	1500	5,29 32,00	1000	3,20 29,00	750	2,23 27,00	500	1,49 27,00	375	1,12 27,00	300	0,89 27,00	250	0,74 27,00
1000	1000	3,75 34,00	667	2,35 32,00	500	1,71 31,00	333	1,14 31,00	250	0,85 31,00	200	0,68 31,00	167	0,53 29,00
750	750	3,06 37,00	500	1,93 35,00	375	1,32 32,00	250	0,88 32,00	187,5	0,66 32,00	150	0,53 32,00	125	0,40 29,00
500	500	2,20 40,00	333	1,36 37,00	250	0,94 34,00	167	0,63 34,00	125	0,47 34,00	100	0,37 34,00	83	0,27 29,00
250	250	1,21 44,00	167	0,74 40,00	125	0,50 36,00	83	0,33 36,00	62,5	0,25 36,00	50	0,20 36,00	42	0,14 30,00
50	50	0,28 50,00	33	0,16 45,00	25	0,10 37,00	17	0,07 37,00	12,5	0,05 37,00	10	0,04 37,00	8,3	0,03 33,00
<b>P1Nt</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>
<b>T2max</b>		<b>105,00</b>		<b>40,00</b>		<b>80,00</b>		<b>70,00</b>		<b>70,00</b>		<b>60,00</b>		<b>50,00</b>

### Radial Forces (N)

T2 Nm	n1 (1/min)						n2 (1/min)					
	3000	1000	500	250	100	50	3000	1000	500	250	100	50
< 30	300	400	470	580	700	800	500	660	800	950	1250	1500
> 30	250	330	390	490	590	670	420	550	670	790	1040	1250

For more information and reinforced bearings, refer to general Information.  
Axial forces  $FA = 50\%$  of radial forces - refer to general information.

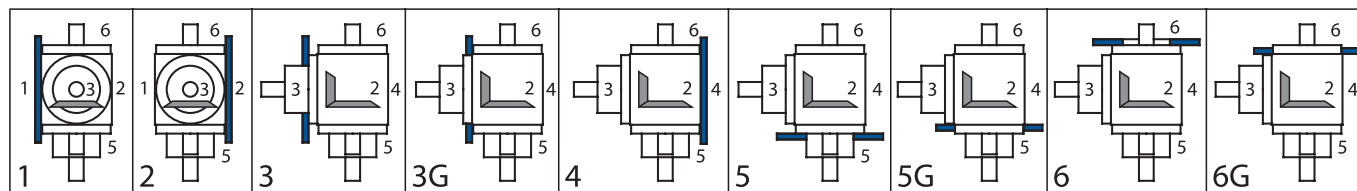
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft ( $n_1$ )

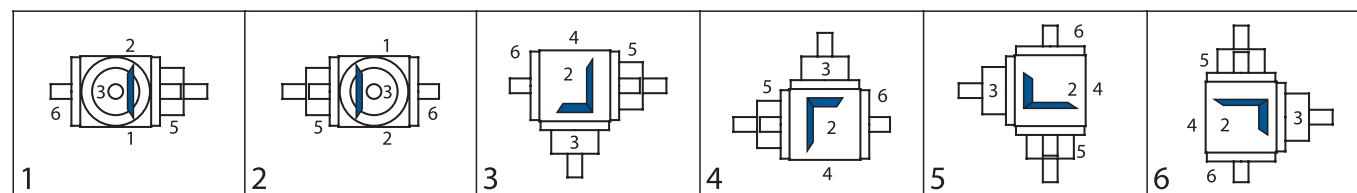
### Gearbox Weights (kg)

Model	Transmission Ratios						Model	app. Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1		
A0	2,5590	1,4822	1,1437	0,8884	0,3631	0,3248	A0	5,1
F0	3,8385	2,0508	1,4636	1,0305	0,4430	0,3760	F0	6,3
M0	3,8385	2,3957	1,9675	1,6346	0,6462	0,5984	M0	6,3
B0, C0	3,3543	2,1833	1,3652	1,0465	0,4607	0,3933	B0, C0	5,4
D0	3,3827	2,1959	1,3723	1,0496	0,4625	0,3945	D0	5,5
G0, H0	4,6338	3,0968	2,1890	1,7927	0,7438	0,6669	G0, H0	6,9
J0	4,6622	3,1094	2,1961	1,7958	0,7456	0,6681	J0	7

### V Mounting Side



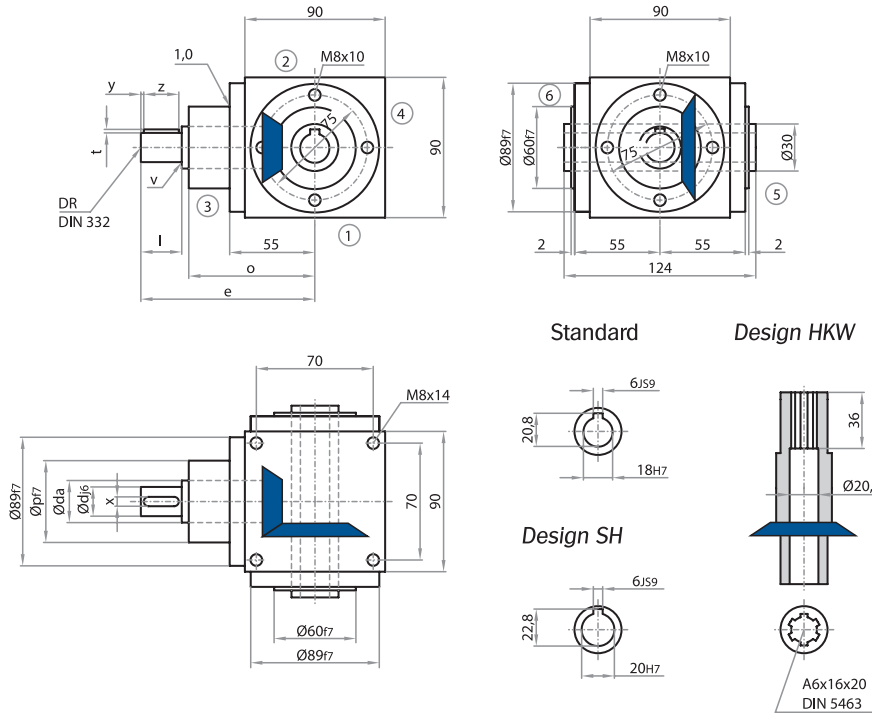
### VI Mounting Configuration (downward-facing side)



### Example of Order

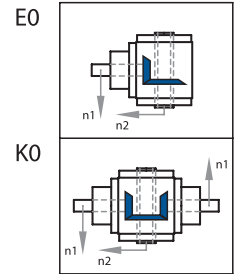
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		090		1:1	A0			1		1			500 / 0000=Standard	

# Type V 90



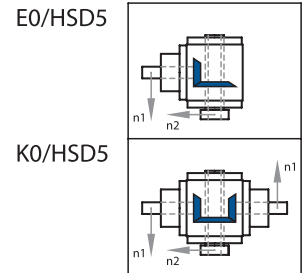
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 75x75 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

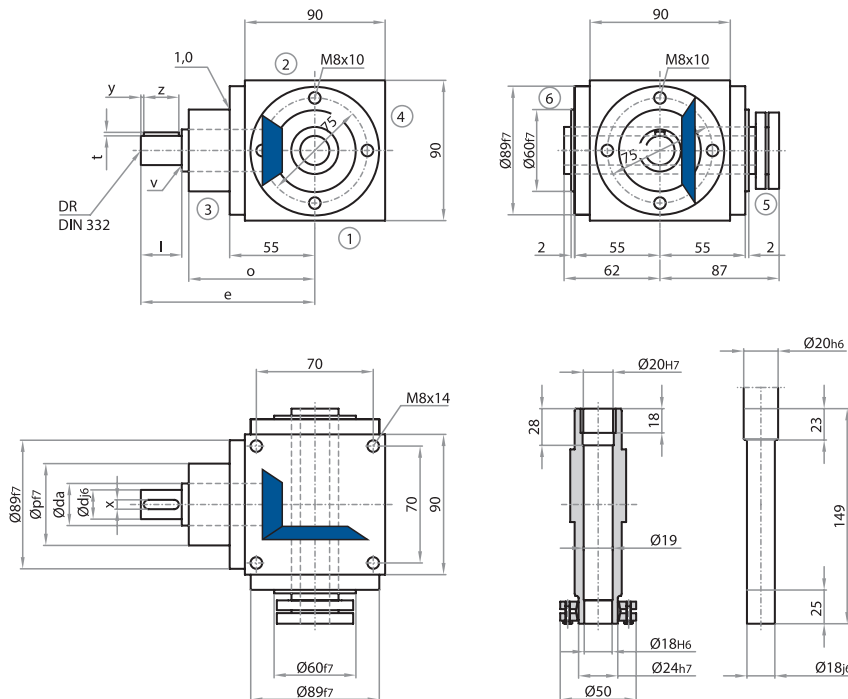
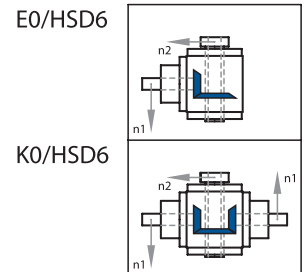


## Model

### Standard



### Special



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 75x75 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	18	25	35	1	6	3	28	2,5	M6	122	85	60
$i = 3:1$	12	20	35	0,5	4	3	28	1,5	M4	122	85	60
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 4:1$	12	20	35	0,5	4	3	28	1,5	M4	132	95	60
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 5:1 - 6:1$	12	20	35	0,5	4	3	28	1,5	M4	132	95	60



### V Power Ratings, Torque Ratings

[ $n$ =min-1,  $P$ =kW,  $T$ =Nm]

$i =$ $n_1$	1:1 $n_2$	P1N T2N	1.5:1 $n_2$	P1N T2N	2:1 $n_2$	P1N T2N	3:1 $n_2$	P1N T2N	4:1 $n_2$	P1N T2N	5:1 $n_2$	P1N T2N	6:1 $n_2$	P1N T2N
3000	3000	8,93 27,00	2000	5,51 25,00	1500	3,80 23,00	1000	2,54 23,00	750	1,90 23,00	600	1,52 23,00	500	1,25 23,00
2400	2400	7,41 28,00	1600	4,59 26,00	1200	3,17 24,00	800	2,12 24,00	600	1,65 25,00	480	1,32 25,00	400	1,09 25,00
1500	1500	5,29 32,00	1000	3,20 29,00	750	2,23 27,00	500	1,49 27,00	375	1,12 27,00	300	0,89 27,00	250	0,74 27,00
1000	1000	3,75 34,00	667	2,35 32,00	500	1,71 31,00	333	1,14 31,00	250	0,85 31,00	200	0,68 31,00	167	0,53 29,00
750	750	3,06 37,00	500	1,93 35,00	375	1,32 32,00	250	0,88 32,00	187,5	0,66 32,00	150	0,53 32,00	125	0,40 29,00
500	500	2,20 40,00	333	1,36 37,00	250	0,94 34,00	167	0,63 34,00	125	0,47 34,00	100	0,37 34,00	83	0,27 29,00
250	250	1,21 44,00	167	0,74 40,00	125	0,50 36,00	83	0,33 36,00	62,5	0,25 36,00	50	0,20 36,00	42	0,14 30,00
50	50	0,28 50,00	33	0,16 45,00	25	0,10 37,00	17	0,07 37,00	12,5	0,05 37,00	10	0,04 37,00	8,3	0,03 33,00
<b>P1Nt</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>		<b>3,80</b>
<b>T2max</b>		<b>105,00</b>		<b>40,00</b>		<b>80,00</b>		<b>70,00</b>		<b>70,00</b>		<b>60,00</b>		<b>50,00</b>

### Radial Forces (N)

FA	T2 Nm	n1 (1/min)						FA	T2 Nm	n2 (1/min)					
		3000	1000	500	250	100	50			3000	1000	500	250	100	50
<	30	300	400	470	580	700	800	<	30	300	400	470	580	700	800
>	30	250	330	390	490	590	670	>	30	250	330	390	490	590	670

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general information.

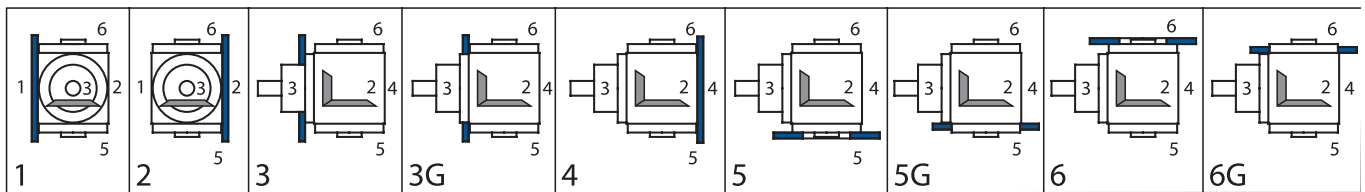
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n1)

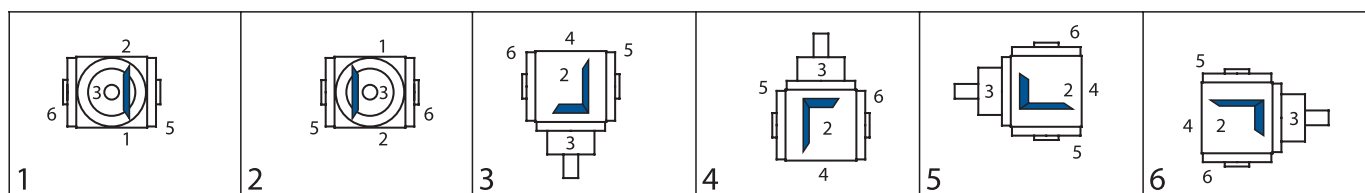
### Gearbox Weights (kg)

Model	Transmission Ratios							Model	app. Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1	6:1		
E0	3,2507	2,1372	1,3393	1,0350	0,4542	0,3892	0,3473	E0	5
K0	4,5302	3,0507	2,1631	1,7812	0,7373	0,6628	0,6180	K0	6.5
E0/HSD	3,9213	2,4353	1,5069	1,1095	0,4961	0,4160	0,3660	E0/HSD	5.2
K0/HSD	5,2008	3,3488	2,3307	1,8557	0,7792	0,6896	0,6367	K0/HSD	6.7

### V Mounting Side



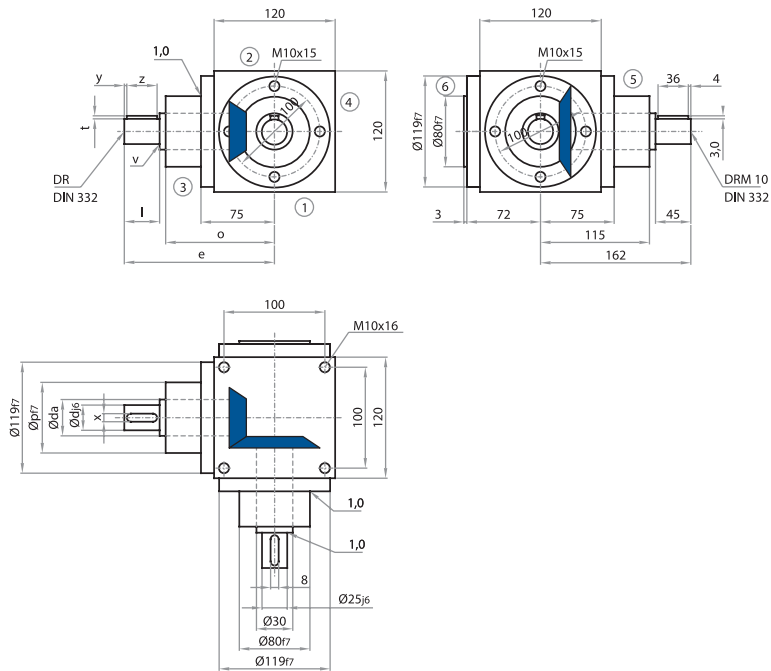
### V Mounting Configuration (downward-facing side)



### Example of Order

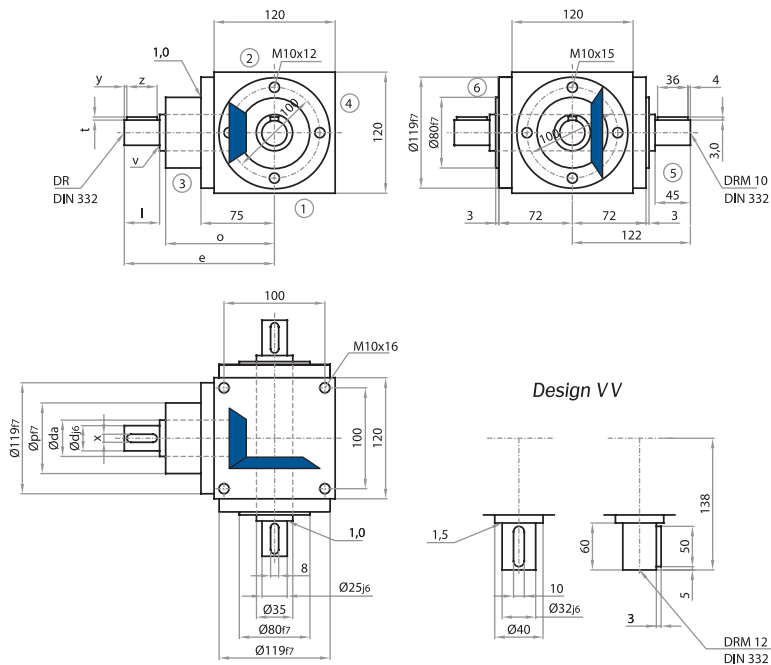
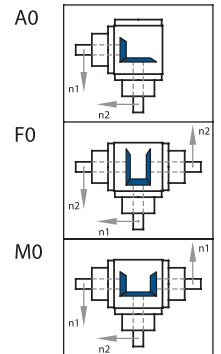
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		090		1:1	E0		-	1	.	1	-	500 /	0000=Standard	

# Type V 120



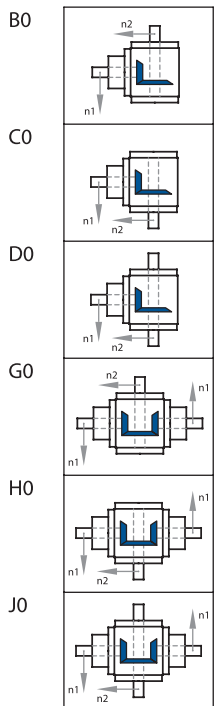
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	25	30	45	1	8	4	36	3	M10	162	115	80
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 3:1$	20	25	45	1	6	4	36	2,5	M6	162	115	80
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 4:1$	20	25	45	1	6	4	36	2,5	M6	172	125	80
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 5:1 - 6:1$	15	20	35	0,5	5	4	28	2	M5	162	125	70

### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i =	1:1	P1N	1.5:1	P1N	2:1	P1N	3:1	P1N	4:1	P1N	5:1	P1N	6:1	P1N
n1	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N
3000	3000	21,82 66,00	2000	13,45 61,00	1500	9,26 56,00	1000	6,39 58,00	750	4,96 60,00	600	3,97 60,00	500	2,95 54,00
2400	2400	18,52 70,00	1600	11,46 65,00	1200	8,07 61,00	800	5,56 63,00	600	4,43 67,00	480	3,44 65,00	400	2,53 57,00
1500	1500	13,56 82,00	1000	8,60 78,00	750	6,03 73,00	500	4,08 74,00	375	3,06 74,00	300	2,38 72,00	250	1,75 64,00
1000	1000	10,14 92,00	667	6,32 86,00	500	4,46 81,00	333	3,01 82,00	250	2,18 79,00	200	1,76 80,00	167	1,22 66,00
750	750	8,51 103,00	500	5,18 94,00	375	3,55 86,00	250	2,40 87,00	187,5	1,69 82,00	150	1,42 86,00	125	0,94 68,00
500	500	6,34 115,00	333	3,85 100,00	250	2,54 92,00	167	1,66 90,00	125	1,16 84,00	100	0,98 89,00	83	0,63 69,00
250	250	3,39 123,00	167	1,99 100,00	125	1,35 98,00	83	0,87 95,00	62,5	0,60 87,00	50	0,51 92,00	42	0,33 71,00
50	50	0,72 130,00	33	0,41 100,00	25	0,29	17	0,21 110,00	12,5	0,12 90,00	10	0,10 95,00	8,3	0,06 66,00
<b>P1Nt</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>
<b>T2max</b>		<b>220,00</b>												

### Radial Forces (N)

FA	FR	T2 Nm	n1 (1/min)						FA	FR	n2 (1/min)					
			3000	1000	500	250	100	50			3000	1000	500	250	100	50
<		80	470	620	720	900	1150	1400			750	1000	1250	1500	1900	2200
>		80	390	520	600	750	960	1170			630	830	1040	1250	1580	1830

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general information.

### Moments of Inertia J (kgcm<sup>2</sup>)

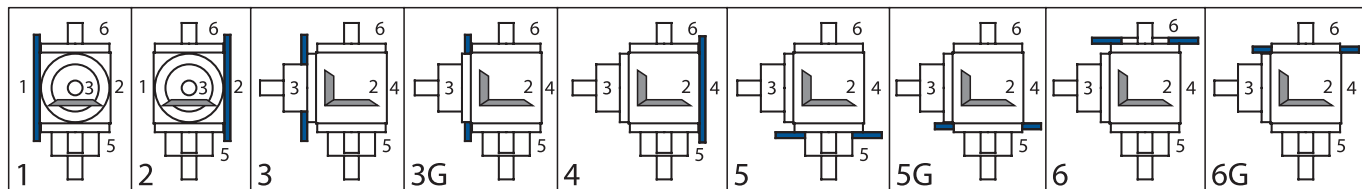
reduced to the input shaft (n1)

Model	Transmission Ratios						
	1:1	1.5:1	2:1	3:1	4:1	5:1	6:1
A0	10,4976	4,8409	3,6465	2,3159	1,2164	0,7516	0,6766
F0	15,7464	7,1737	4,9587	2,8991	1,5444	0,9615	0,8224
M0	15,7464	7,3490	5,9808	4,0486	2,1047	1,2932	1,2074
B0, C0	15,3022	7,4441	4,9747	3,0123	1,6729	1,0593	0,8982
D0	15,5996	7,5762	5,0490	3,0453	1,6915	1,0712	0,9065
G0, H0	20,5510	9,9522	7,3090	4,7450	2,5612	1,6009	1,4290
J0	20,8484	10,0843	7,3833	4,7780	2,5798	1,6128	1,4373

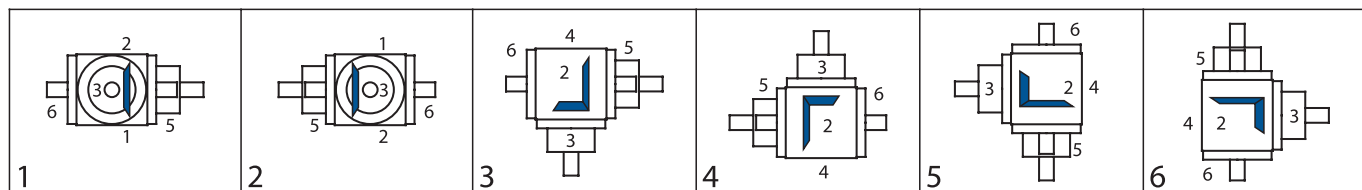
### Gearbox Weights (kg)

Model	app. Weight
A0	12,6
F0	15
M0	15
B0, C0	12,3
D0	12,5
G0, H0	14,7
J0	14,9

### V Mounting Side



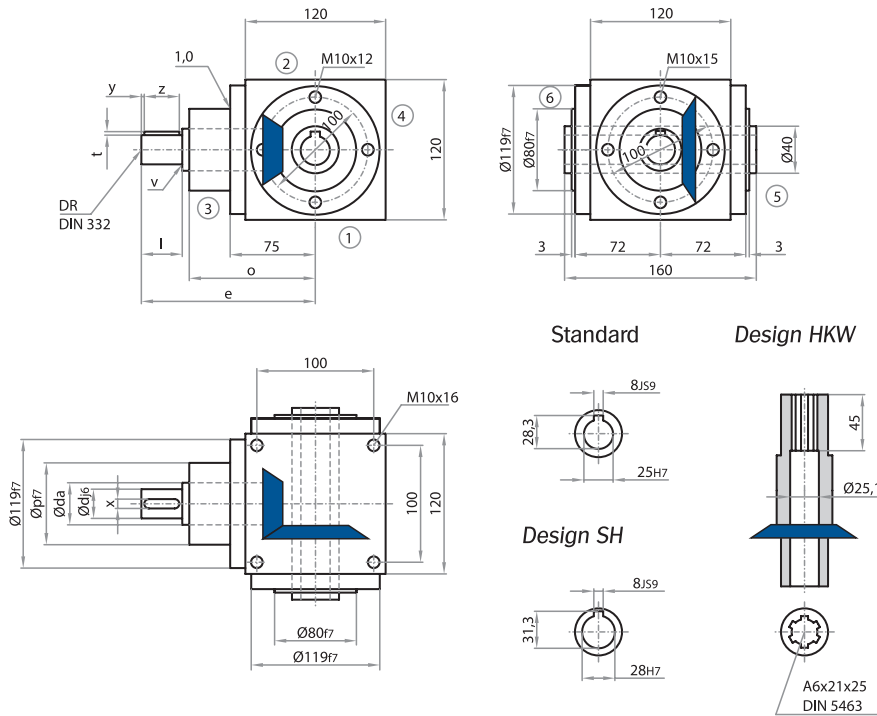
### VI Mounting Configuration (downward-facing side)



### Example of Order

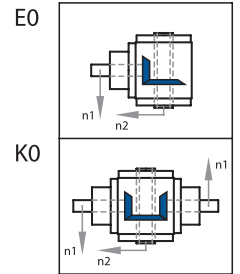
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		120		1:1	A0			1		1			500 /	0000=Standard

# Type V 120



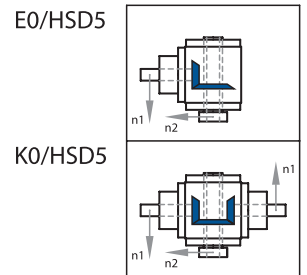
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

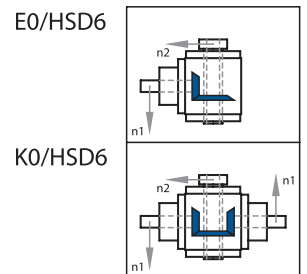


## Model

### Standard



### Special



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	25	30	45	1	8	4	36	3	M10	162	115	80
$i = 3:1$	20	25	45	1	6	4	36	2,5	M6	162	115	80
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 4:1$	20	25	45	1	6	4	36	2,5	M6	172	125	80
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 5:1 - 6:1$	15	20	35	0,5	5	4	28	2	M5	162	125	70

### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N	4:1 n <sub>2</sub>	P1N T2N	5:1 n <sub>2</sub>	P1N T2N	6:1 n <sub>2</sub>	P1N T2N
3000	3000	21,82 66,00	2000	13,45 61,00	1500	9,26 56,00	1000	6,39 58,00	750	4,96 60,00	600	3,97 60,00	500	2,95 54,00
2400	2400	18,52 70,00	1600	11,46 65,00	1200	8,07 61,00	800	5,56 63,00	600	4,43 67,00	480	3,44 65,00	400	2,53 57,00
1500	1500	13,56 82,00	1000	8,60 78,00	750	6,03 73,00	500	4,08 74,00	375	3,06 74,00	300	2,38 72,00	250	1,75 64,00
1000	1000	10,14 92,00	667	6,32 86,00	500	4,46 81,00	333	3,01 82,00	250	2,18 79,00	200	1,76 80,00	167	1,22 66,00
750	750	8,51 103,00	500	5,18 94,00	375	3,55 86,00	250	2,40 87,00	187,5	1,69 82,00	150	1,42 86,00	125	0,94 68,00
500	500	6,34 115,00	333	3,85 100,00	250	2,54 92,00	167	1,66 90,00	125	1,16 84,00	100	0,98 89,00	83	0,63 69,00
250	250	3,39 123,00	167	1,99 100,00	125	1,35 98,00	83	0,87 95,00	62,5	0,60 87,00	50	0,51 92,00	42	0,33 71,00
50	50	0,72 130,00	33	0,41 100,00	25	0,29 107,00	17	0,21 110,00	12,5	0,12 90,00	10	0,10 95,00	8,3	0,06 66,00
<b>P1Nt</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>		<b>6,20</b>
<b>T2max</b>		<b>220,00</b>		<b>100,00</b>		<b>169,00</b>		<b>155,00</b>		<b>155,00</b>		<b>140,00</b>		<b>120,00</b>

### Radial Forces (N)

FA	T2 Nm	n <sub>1</sub> (1/min)					FA	T2 Nm	n <sub>2</sub> (1/min)					
		3000	1000	500	250	100			50	3000	1000	500	250	100
<	80	470	620	720	900	1150	1400	80	470	620	720	900	1150	1400
>	80	390	520	600	750	960	1170	80	390	520	600	750	960	1170

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general information.

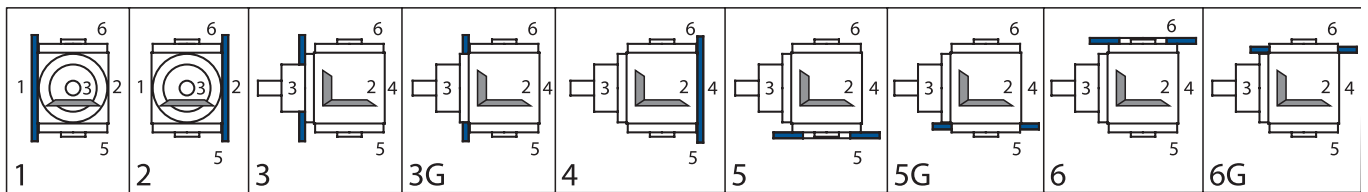
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n<sub>1</sub>)

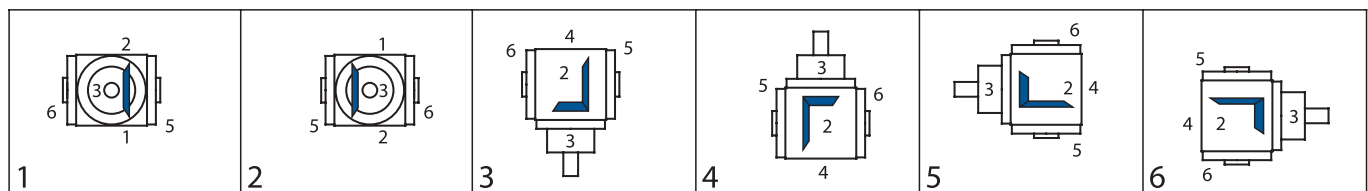
### Gearbox Weights (kg)

Model	Transmission Ratios						Model	app. Weight	
	1:1	1.5:1	2:1	3:1	4:1	5:1			6:1
E0	15,1939	7,3959	4,9476	3,0003	1,6661	1,0550	0,8952	E0	12
K0	20,4427	9,9040	7,2819	4,7330	2,5544	1,5966	1,4260	K0	14,4
E0/HSD	16,9812	8,1903	5,3944	3,1988	1,7778	1,1265	0,9449	E0/HSD	12,3
K0/HSD	22,2300	10,6984	7,7287	4,9315	2,6661	1,6681	1,4757	K0/HSD	14,7

### V Mounting Side



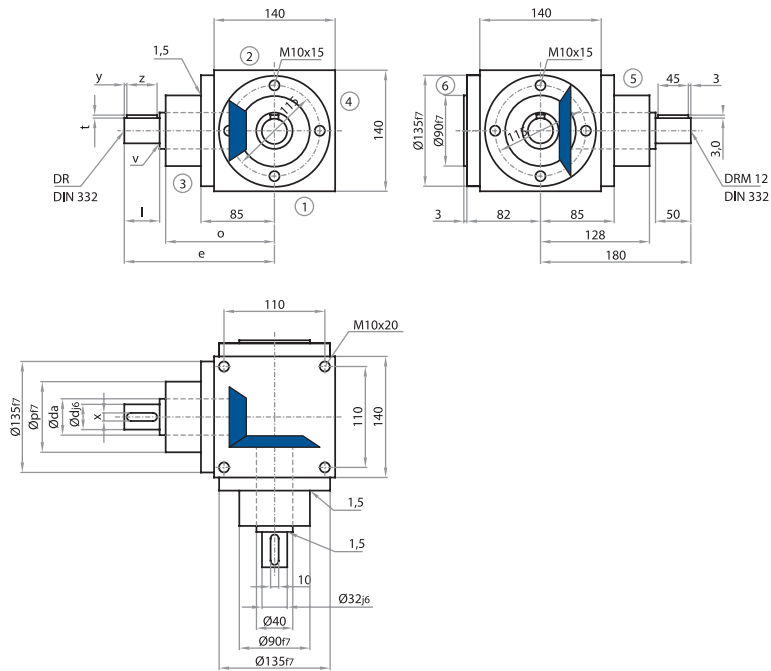
### VI Mounting Configuration (downward-facing side)



### Example of Order

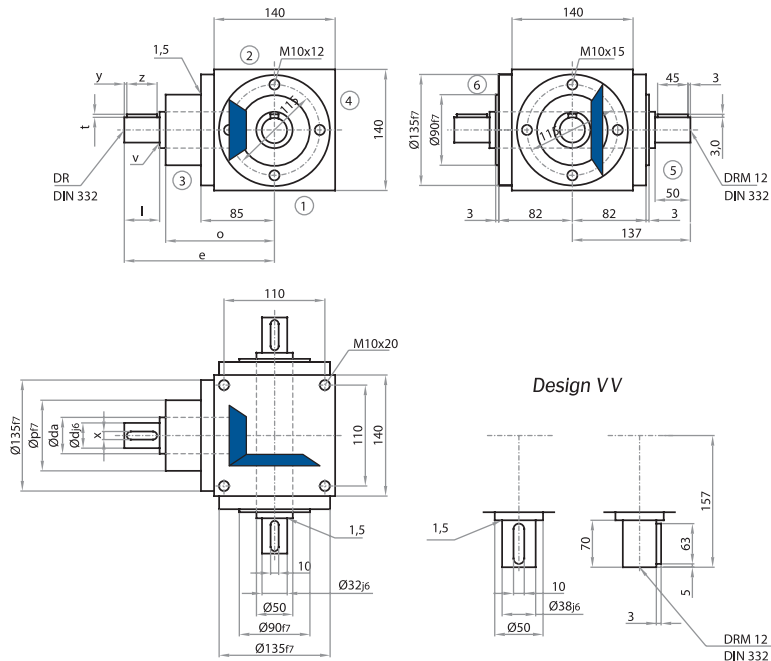
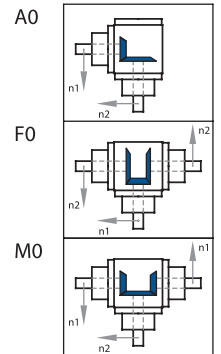
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n <sub>2</sub> max	Design
V		120		1:1	E0			1		1			500 / 0000=Standard	

# Type V 140



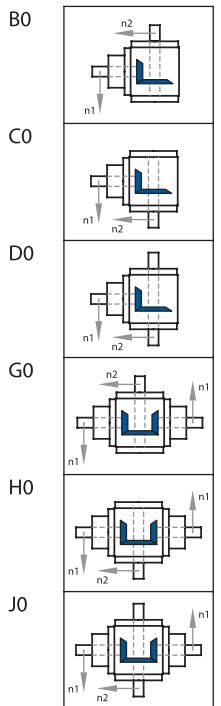
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	32	40	50	1,5	10	3	45	3	M12	180	128	90
$i = 4:1$	24	40	50	1	8	3	45	3	M8	195	143	85

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 3:1$	28	40	50	1	8	3	45	3	M10	180	128	90
$i = 5:1 - 6:1$	24	40	50	1	8	3	45	3	M8	195	143	85

### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i =	1:1	P1N	1.5:1	P1N	2:1	P1N	3:1	P1N	4:1	P1N	5:1	P1N	6:1	P1N
n1	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N
3000	3000	39,68	2000	24,91	1500	16,53	1000	12,12	750	8,51	600	6,61	500	5,18
		120,00		113,00		100,00		110,00		103,00		100,00		94,00
2400	2400	37,04	1600	22,22	1200	14,68	800	11,46	600	7,34	480	5,56	400	4,58
		140,00		126,00		111,00		130,00		111,00		105,00		104,00
1500	1500	26,78	1000	17,08	750	11,41	500	8,05	375	4,96	300	3,80	250	2,95
		162,00		155,00		138,00		146,00		120,00		115,00		107,00
1000	1000	20,28	667	12,87	500	8,38	333	5,87	250	3,75	200	2,73	167	2,06
		184,00		175,00		152,00		160,00		136,00		124,00		112,00
750	750	16,20	500	10,47	375	6,86	250	4,60	187,5	3,06	150	2,15	125	1,61
		196,00		190,00		166,00		167,00		148,00		130,00		117,00
500	500	11,46	333	7,34	250	4,96	167	3,20	125	2,12	100	1,50	83	1,09
		208,00		200,00		180,00		174,00		154,00		136,00		119,00
250	250	5,92	167	3,76	125	2,62	83	1,62	62,5	1,12	50	0,79	42	0,56
		215,00		204,00		190,00		177,00		162,00		143,00		121,00
50	50	1,21	33	0,76	25	0,55	17	0,34	12,5	0,23	10	0,17	8,3	0,11
		220,00		210,00		200,00		180,00		170,00		150,00		120,00
<b>P1Nt</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>
<b>T2max</b>		<b>430,00</b>		<b>210,00</b>		<b>320,00</b>		<b>280,00</b>		<b>280,00</b>		<b>250,00</b>		<b>200,00</b>

### Radial Forces (N)

FA	FR	T2 Nm	n1 (1/min)						FA	FR	n2 (1/min)					
			3000	1000	500	250	100	50			3000	1000	500	250	100	50
<		140	700	870	1150	1370	1700	2000			1300	1700	2000	2500	3000	3800
>		140	590	730	960	1140	1420	1670			1083	1420	1670	2080	2500	3170

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general information.

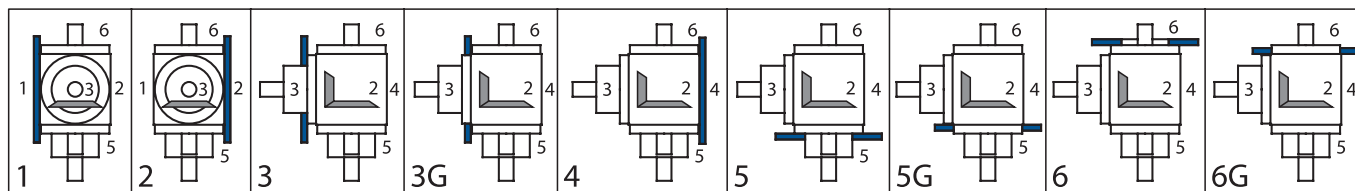
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n1)

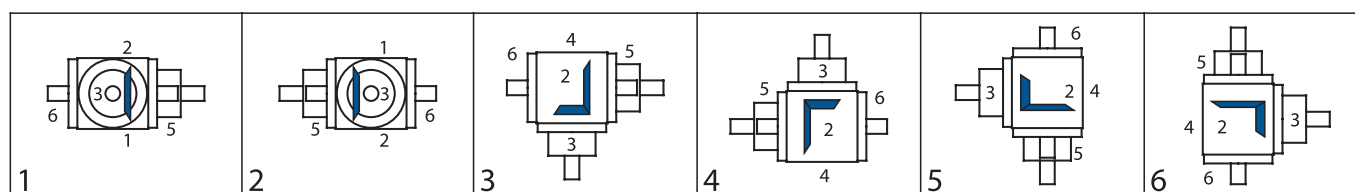
### Gearbox Weights (kg)

Model	Transmission Ratios							Model	app. Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1	6:1		
A0	26,2670	11,8569	8,6762	6,4356	1,8432	1,5320	1,3708	A0	19
F0	39,4005	17,6940	11,9596	7,8949	2,6641	2,0574	1,7356	F0	23
M0	39,4005	17,8767	14,0690	11,4119	2,8656	2,5387	2,3768	M0	23
B0, C0	36,0994	18,7513	12,2785	7,9547	2,6978	2,2113	1,8426	B0, C0	18,5
D0	37,0815	19,1878	12,5241	8,0639	2,7592	2,2506	1,8698	D0	19
G0, H0	49,2329	24,7711	17,6713	12,9310	3,7202	3,2180	2,8486	G0, H0	22,7
I0	50,2150	25,2076	17,9169	13,0402	3,7816	3,2573	2,8758	I0	23,2

### V Mounting Side



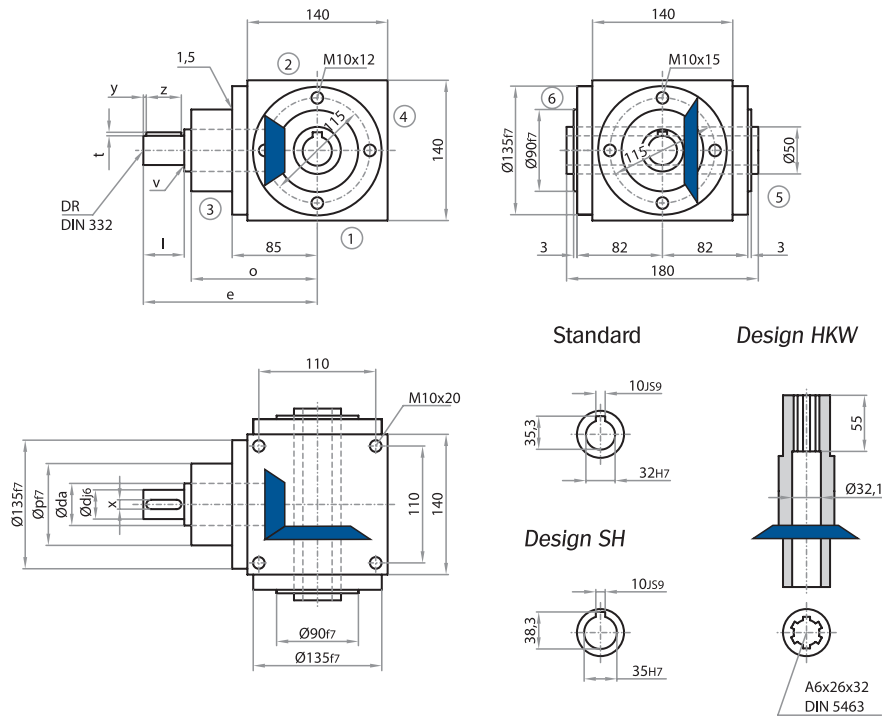
### VI Mounting Configuration (downward-facing side)



### Example of Order

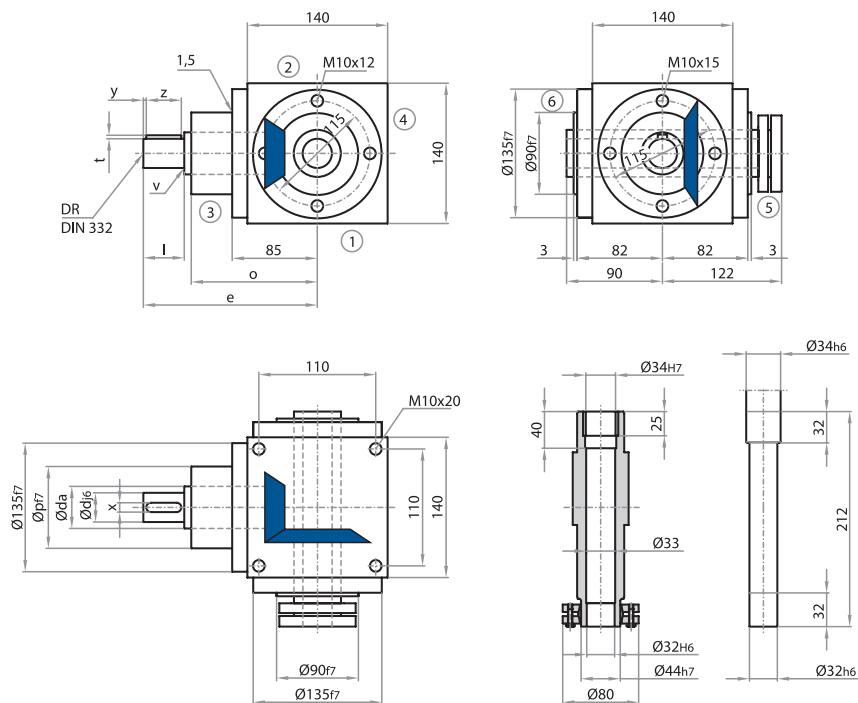
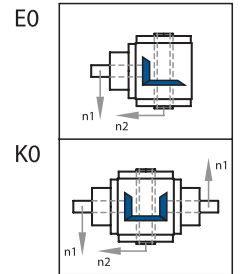
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		140		1:1	A0			1		1			500 / 0000=Standard	

# Type V 140



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

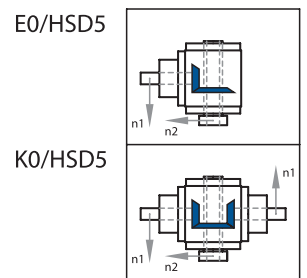
## Model



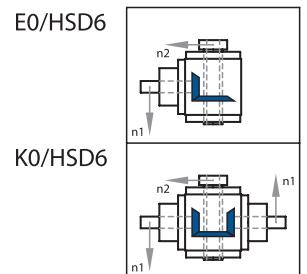
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

### Standard



### Special



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	32	40	50	1,5	10	3	45	3	M12	180	128	90
$i = 3:1$	28	40	50	1	8	3	45	3	M10	180	128	90
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 4:1$	24	40	50	1	8	3	45	3	M8	195	143	85
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 5:1 - 6:1$	24	40	50	1	8	3	45	3	M8	195	143	85



### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i =	1:1	P1N	1.5:1	P1N	2:1	P1N	3:1	P1N	4:1	P1N	5:1	P1N	6:1	P1N
n1	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N
3000	3000	39,68 120,00	2000	24,91 113,00	1500	16,53 100,00	1000	12,12 110,00	750	8,51 103,00	600	6,61 100,00	500	5,18 94,00
2400	2400	37,04 140,00	1600	22,22 126,00	1200	14,68 111,00	800	11,46 130,00	600	7,34 111,00	480	5,56 105,00	400	4,58 104,00
1500	1500	26,78 162,00	1000	17,08 155,00	750	11,41 138,00	500	8,05 146,00	375	4,96 120,00	300	3,80 115,00	250	2,95 107,00
1000	1000	20,28 184,00	667	12,87 175,00	500	8,38 152,00	333	5,87 160,00	250	3,75 136,00	200	2,73 124,00	167	2,06 112,00
750	750	16,20 196,00	500	10,47 190,00	375	6,86 166,00	250	4,60 167,00	187,5	3,06 148,00	150	2,15 130,00	125	1,61 117,00
500	500	11,46 208,00	333	7,34 200,00	250	4,96 180,00	167	3,20 174,00	125	2,12 154,00	100	1,50 136,00	83	1,09 119,00
250	250	5,92 215,00	167	3,76 204,00	125	2,62 190,00	83	1,62 177,00	62,5	1,12 162,00	50	0,79 143,00	42	0,56 121,00
50	50	1,21 220,00	33	0,76 210,00	25	0,55 200,00	17	0,34 180,00	12,5	0,23 170,00	10	0,17 150,00	8,3	0,11 120,00
<b>P1Nt</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>		<b>10,00</b>
<b>T2max</b>		<b>430,00</b>		<b>210,00</b>		<b>320,00</b>		<b>280,00</b>		<b>280,00</b>		<b>250,00</b>		<b>200,00</b>

### Radial Forces (N)

FA	FR	T2 Nm	n1 (1/min)						FA	FR	n2 (1/min)					
			3000	1000	500	250	100	50			3000	1000	500	250	100	50
<	140	700	870	1150	1370	1700	2000			1300	1700	2000	2500	3000	3800	
>	140	590	730	960	1140	1420	1670			1083	1420	1670	2080	2500	3170	

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general Information.

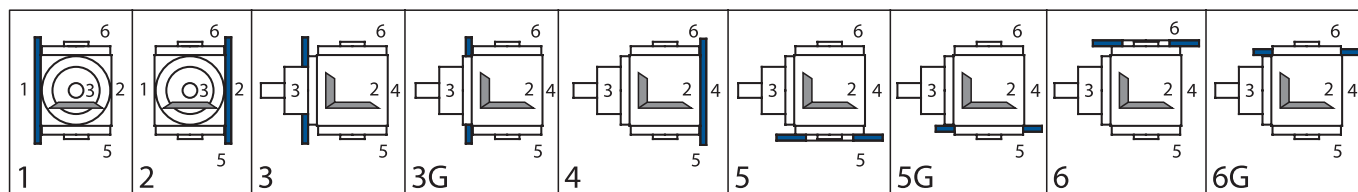
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n1)

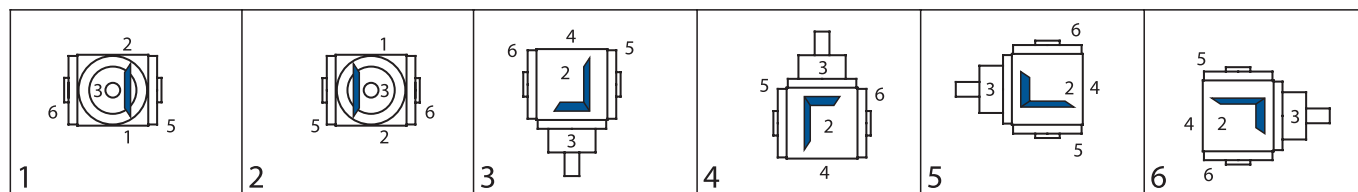
### Gearbox Weights (kg)

Model	Transmission Ratios						Model	app. Weight	
	1:1	1.5:1	2:1	3:1	4:1	5:1			6:1
E0	32,6630	17,2240	11,4194	7,5729	2,4830	2,0739	1,7471	E0	18
K0	45,7965	23,2438	16,8122	12,5492	3,5054	3,0806	2,7531	K0	22,2
E0/HSD	39,0643	20,0691	13,0198	8,2842	2,8831	2,3299	1,9249	E0/HSD	18,7
K0/HSD	52,1978	26,0889	18,4126	13,2605	3,9055	3,3366	2,9309	K0/HSD	22,9

### V Mounting Side



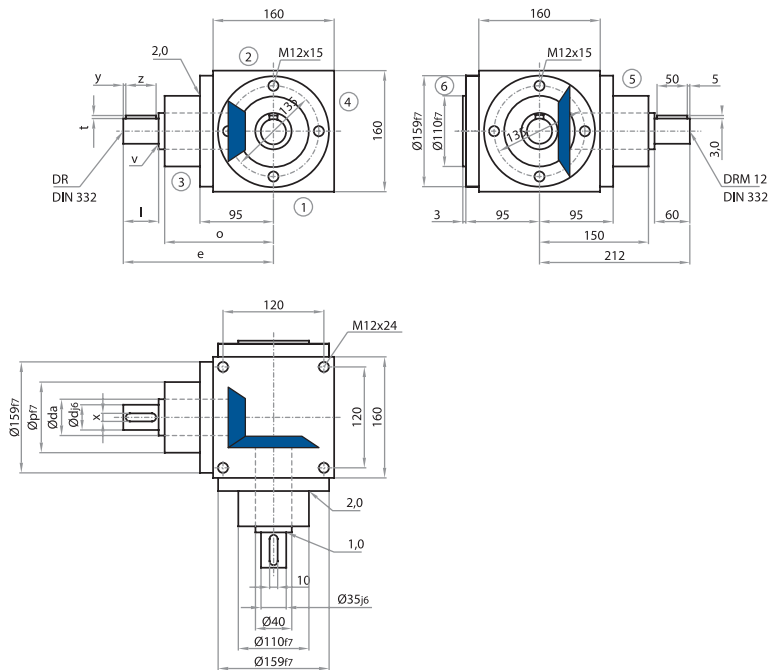
### VI Mounting Configuration (downward-facing side)



### Example of Order

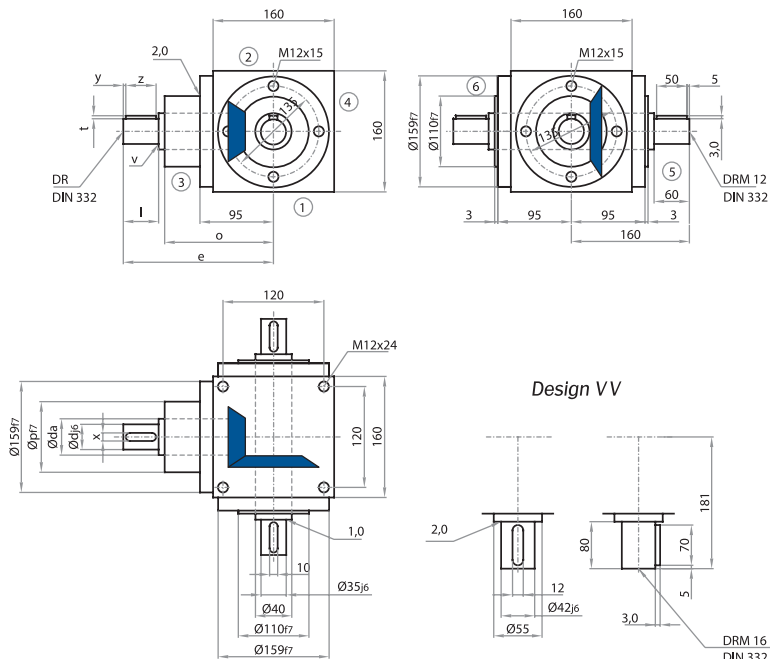
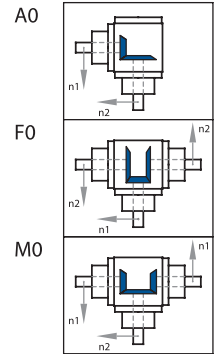
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		140		1:1	E0			1	.	1			500 /	0000=Standard

# Type V 160



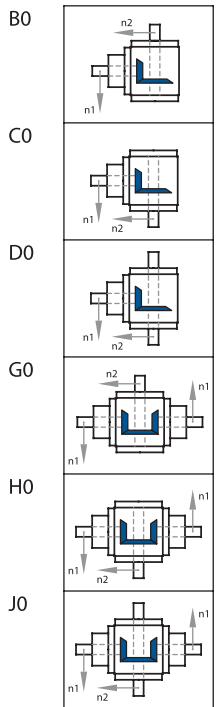
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 130x130 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
Alternatively, also possible in the grid dimension of 130x130 on sides 3, 5 & 6.  
Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 1:1 - 2:1	35	40	60	1,5	10	5	50	3	M12	212	150	110

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 3:1	28	40	60	1	8	5	50	3	M10	212	150	100

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 4:1	24	40	60	1	8	5	50	3	M8	232	170	100

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 5:1 - 6:1	24	25	60	0,5	8	5	50	3	M8	232	170	100

### IV Power Ratings, Torque Ratings

[n=rev/min, P=kW, T=Nm]

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N	4:1 n <sub>2</sub>	P1N T2N	5:1 n <sub>2</sub>	P1N T2N	6:1 n <sub>2</sub>	P1N T2N
3000	3000	0,00 0,00	2000	40,78 185,00	1500	28,11 170,00	1000	20,94 190,00	750	14,88 180,00	600	11,90 180,00	500	7,09 129,00
2400	2400	57,67 218,00	1600	36,15 205,00	1200	25,53 193,00	800	17,81 202,00	600	13,23 200,00	480	10,48 198,00	400	5,98 136,00
1500	1500	42,99 260,00	1000	27,78 252,00	750	20,25 245,00	500	12,68 230,00	375	9,09 220,00	300	7,11 215,00	250	3,95 143,00
1000	1000	31,96 290,00	667	20,59 280,00	500	14,88 270,00	333	8,99 245,00	250	6,61 240,00	200	4,96 225,00	167	3,01 164,00
750	750	25,63 310,00	500	16,26 295,00	375	11,57 280,00	250	6,89 250,00	187,5	5,17 250,00	150	3,97 240,00	125	2,43 176,00
500	500	18,19 330,00	333	11,56 315,00	250	8,27 300,00	167	4,79 260,00	125	3,58 260,00	100	2,76 250,00	83	1,72 187,00
250	250	9,64 350,00	167	6,07 330,00	125	4,41 320,00	83	2,56 280,00	62,5	1,86 270,00	50	1,49 270,00	42	0,92 199,00
50	50	2,09 380,00	33	1,29 355,00	25	0,98 355,00	17	0,57 305,00	12,5	0,39 280,00	10	0,32 290,00	8,3	0,18 197,00
<b>P1Nt</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>
<b>T2max</b>		<b>660,00</b>		<b>650,00</b>		<b>650,00</b>		<b>457,00</b>		<b>422,00</b>		<b>420,00</b>		<b>350,00</b>

### Radial Forces (N)

T2 Nm	n <sub>1</sub> (1/min)						n <sub>2</sub> (1/min)					
	3000	1000	500	250	100	50	3000	1000	500	250	100	50
< 220	1200	1600	1900	2200	2850	3300	2000	2800	3300	4000	5000	6500
> 220	1000	1340	1590	1840	2380	2750	1670	2340	2750	3340	4170	5420

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general Information.

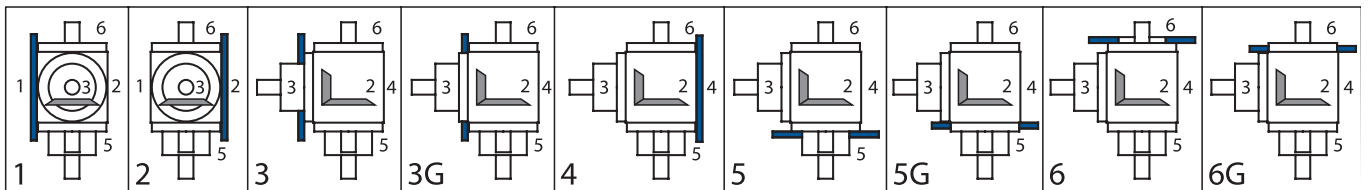
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n<sub>1</sub>)

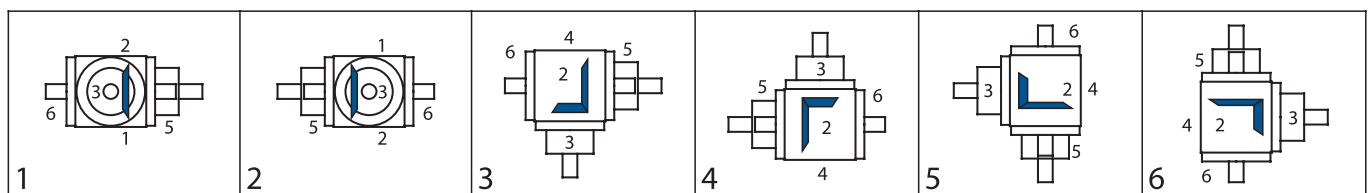
### Gearbox Weights (kg)

Model	Transmission Ratios							Model	app. Weight
	1:1	1.5	2:1	3:1	4:1	5:1	6:1		
A0	29,6710	19,6374	12,3589	8,9516	6,4348	2,2733	2,0901	A0	28,5
F0	44,5065	26,2309	16,0678	10,6000	7,3620	2,8667	2,5022	F0	35
M0	44,5065	32,6812	21,0089	16,2548	11,9424	3,9532	3,7681	M0	35
B0, C0	31,5527	32,0243	20,1006	12,0803	8,4198	3,6887	2,9407	B0, C0	28
D0	32,5820	32,4818	20,3579	12,1947	8,4841	3,7299	2,9693	D0	28,5
G0, H0	46,3882	45,0681	28,7506	19,3835	13,9274	5,3686	4,6187	G0, H0	34,5
J0	47,4175	45,5256	29,0079	19,4979	13,9917	5,4098	4,6473	J0	35

### V Mounting Side



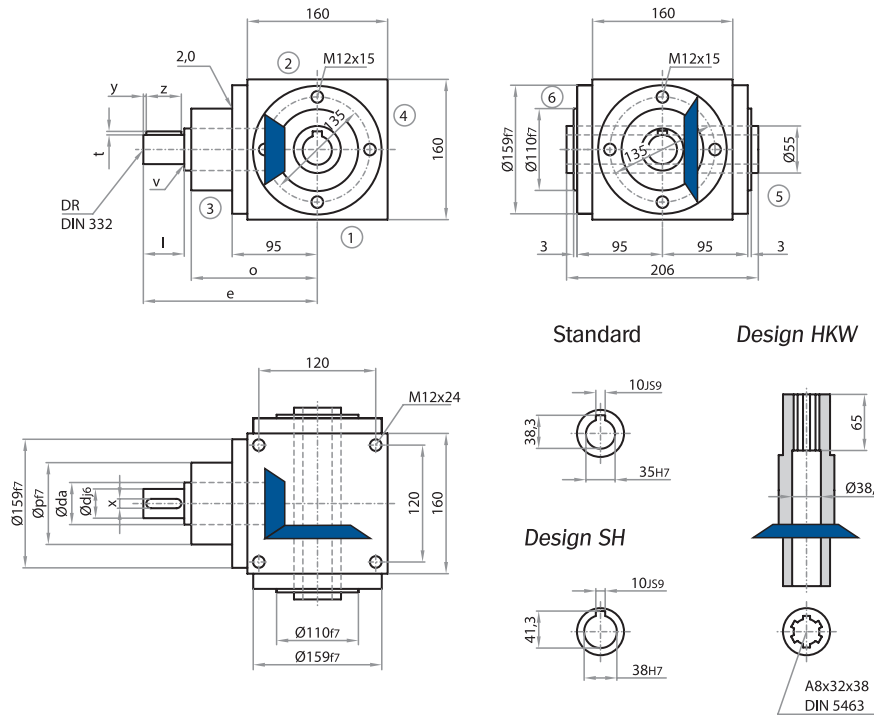
### VI Mounting Configuration (downward-facing side)



### Example of Order

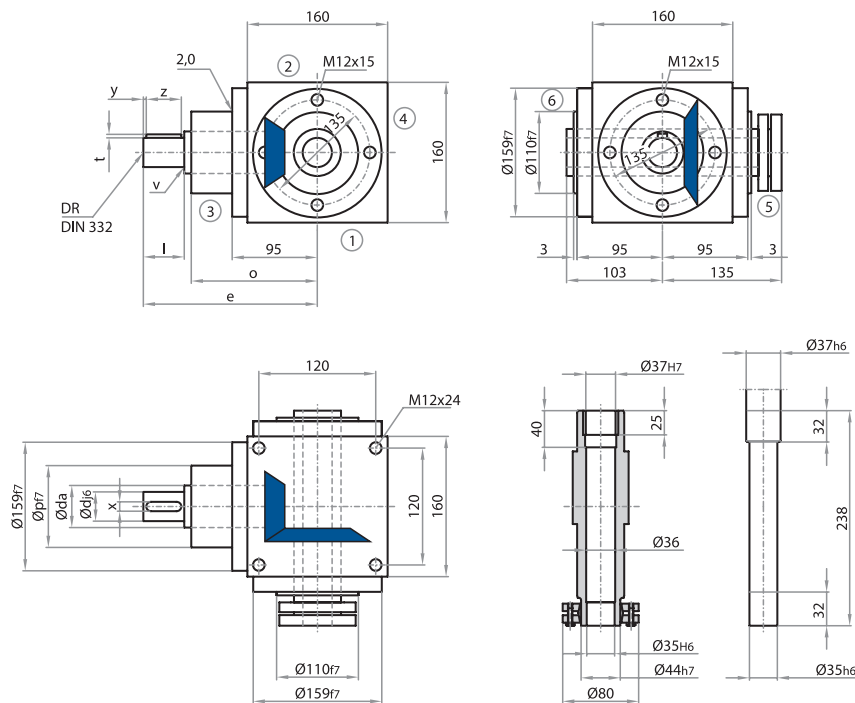
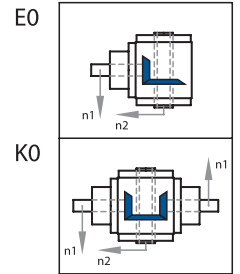
<b>I</b> Type	<b>II</b> Size	<b>III</b> Ratio	<b>IV</b> Model	<b>V</b> Mounting Side	<b>VI</b> Mounting Config.	<b>VII</b> Speed	<b>VIII</b> n <sub>2</sub> max	<b>IX</b> Design
V	160	1:1	A0	1	1	-	400 / 0000=Standard	

# Type V 160



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
 Alternatively, also possible in the grid dimension of 130x130 on sides 3, 5 & 6.  
 Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

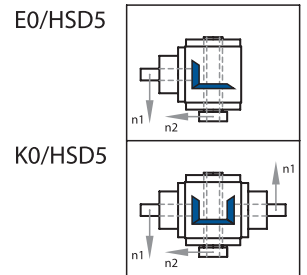
## Model



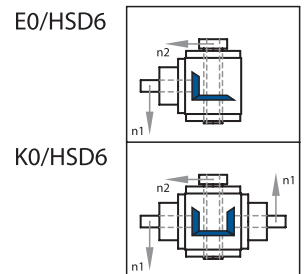
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
 Alternatively, also possible in the grid dimension of 130x130 on sides 3, 5 & 6.  
 Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

### Standard



### Special



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	35	40	60	1,5	10	5	50	3	M12	212	150	110
$i = 3:1$	28	40	60	1	8	5	50	3	M10	212	150	100
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 4:1$	24	40	60	1	8	5	50	3	M8	232	170	100
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 5:1 - 6:1$	24	25	60	0,5	8	5	50	3	M8	232	170	100

### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N	4:1 n <sub>2</sub>	P1N T2N	5:1 n <sub>2</sub>	P1N T2N	6:1 n <sub>2</sub>	P1N T2N
3000	3000	0,00 0,00	2000	40,78 185,00	1500	28,11 170,00	1000	20,94 190,00	750	14,88 180,00	600	11,90 180,00	500	7,09 129,00
2400	2400	57,67 218,00	1600	36,15 205,00	1200	25,53 193,00	800	17,81 202,00	600	13,23 200,00	480	10,48 198,00	400	5,98 136,00
1500	1500	42,99 260,00	1000	27,78 252,00	750	20,25 245,00	500	12,68 230,00	375	9,09 220,00	300	7,11 215,00	250	3,95 143,00
1000	1000	31,96 290,00	667	20,59 280,00	500	14,88 270,00	333	8,99 245,00	250	6,61 240,00	200	4,96 225,00	167	3,01 164,00
750	750	25,63 310,00	500	16,26 295,00	375	11,57 280,00	250	6,89 250,00	187,5	5,17 250,00	150	3,97 240,00	125	2,43 176,00
500	500	18,19 330,00	333	11,56 315,00	250	8,27 300,00	167	4,79 260,00	125	3,58 260,00	100	2,76 250,00	83	1,72 187,00
250	250	9,64 350,00	167	6,07 330,00	125	4,41 320,00	83	2,56 280,00	62,5	1,86 270,00	50	1,49 270,00	42	0,92 199,00
50	50	2,09 380,00	33	1,29 355,00	25	0,98 355,00	17	0,57 305,00	12,5	0,39 280,00	10	0,32 290,00	8,3	0,18 197,00
<b>P1Nt</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>		<b>15,00</b>
<b>T2max</b>		<b>660,00</b>		<b>650,00</b>		<b>650,00</b>		<b>457,00</b>		<b>422,00</b>		<b>420,00</b>		<b>350,00</b>

### Radial Forces (N)

FA	FR	T2 Nm	n <sub>1</sub> (1/min)						FA	FR	n <sub>2</sub> (1/min)					
			3000	1000	500	250	100	50			3000	1000	500	250	100	50
↖	↑	↖	1200	1600	1900	2200	2850	3300	↖	↖	2300	3100	3600	4300	5300	7000
↘	↑	↘	1000	1340	1590	1840	2380	2750	↘	↘	1920	2580	3000	3580	4420	5830

For more information and reinforced bearings, refer to general information.  
Axial forces FA = 50% of radial forces - refer to general information.

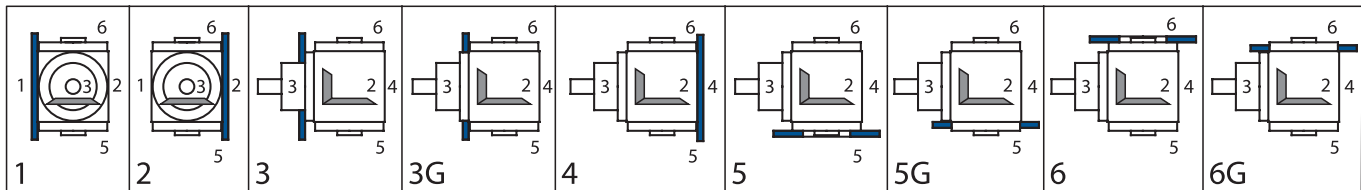
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n<sub>1</sub>)

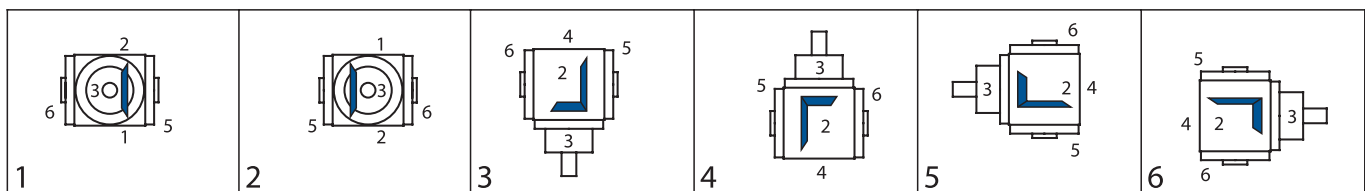
### Gearbox Weights (kg)

Model	Transmission Ratios						Model	Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1		
E0	34,3851	33,1416	20,6658	12,3315	8,5611	3,7791	E0	27
K0	49,2206	46,1854	29,3158	19,6347	14,0687	5,4590	K0	34
E0/HSD	40,6750	35,9371	22,2382	13,0304	8,9542	4,0307	E0/HSD	27,5
K0/HSD	55,5105	48,9809	30,8882	20,3336	14,4618	5,7106	K0/HSD	34,5

### V Mounting Side



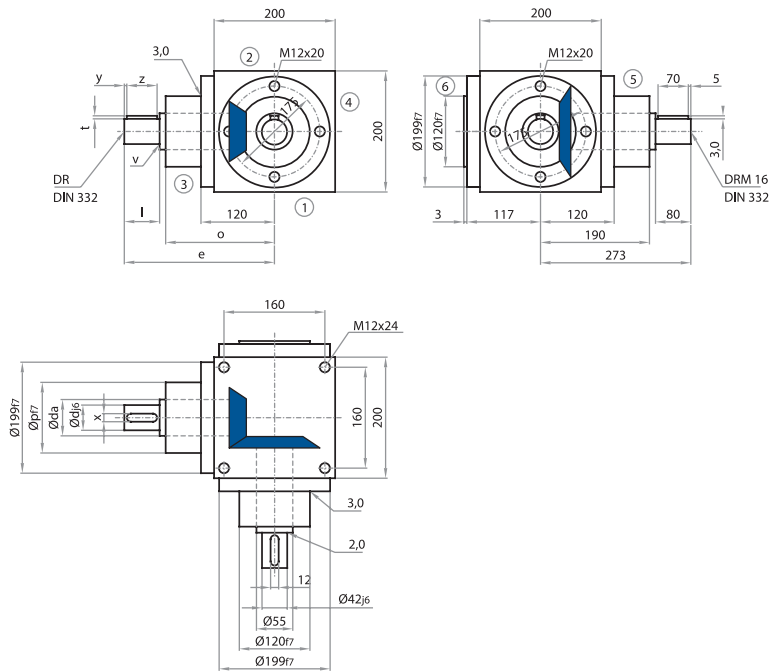
### VI Mounting Configuration (downward-facing side)



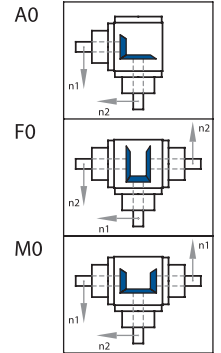
### Example of Order

I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n <sub>2max</sub>	Design
V		160		1:1	E0			1	.	1	-		400 /	0000=Standard

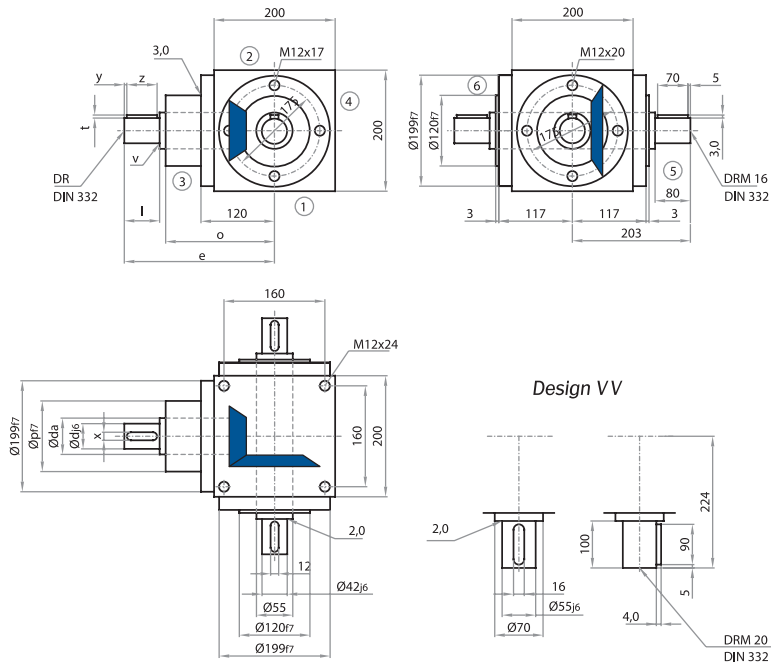
# Type V 200



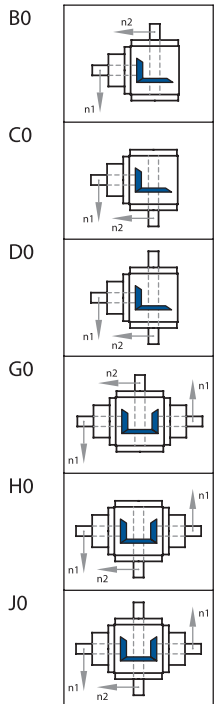
## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.



## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 1:1 - 2:1	42	55	80	2	12	5	70	3	M16	273	190	120

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 3:1	35	40	68	1	10	3	63	3	M12	261	190	120

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 4:1	35	40	68	1	10	3	63	3	M12	261	190	120

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 5:1 - 6:1	28	30	68	-	8	3	63	3	M10	261	190	110

### IV Power Ratings, Torque Ratings

[ $n = \min-1, P = kW, T = Nm$ ]

$i = \frac{n_1}{n_2}$	1:1 $n_1$ $n_2$	P1N T2N	1.5:1 $n_2$ $T2N$	P1N T2N	2:1 $n_2$ $T2N$	P1N T2N	3:1 $n_2$ $T2N$	P1N T2N	4:1 $n_2$ $T2N$	P1N T2N	5:1 $n_2$ $T2N$	P1N T2N	6:1 $n_2$ $T2N$	P1N T2N
3000	3000	0,00 0,00	2000 72,75 330,00	1500 51,25 310,00	1000 46,29 420,00	750 28,93 350,00	600 19,84 300,00	500 14,45 208,00	400 9,60 128,00	300 6,40 96,00	250 4,80 72,00	200 3,20 48,00	150 2,40 36,00	100 1,60 24,00
2400	2400	0,00 0,00	1600 63,49 360,00	1200 45,24 342,00	800 39,24 445,00	600 26,45 400,00	480 17,99 340,00	400 12,80 288,00	300 8,00 240,00	240 5,76 192,00	200 4,80 144,00	150 3,60 108,00	100 2,40 72,00	75 1,80 54,00
1500	1500	74,40 450,00	1000 48,17 437,00	750 35,13 425,00	500 28,38 515,00	375 18,81 455,00	300 12,57 380,00	250 6,28 316,00	200 4,80 256,00	150 3,60 192,00	120 2,88 144,00	100 2,40 120,00	75 1,80 90,00	50 1,60 60,00
1000	1000	56,21 510,00	667 37,13 505,00	500 27,56 500,00	333 20,37 555,00	250 13,36 485,00	200 9,26 420,00	150 6,17 360,00	120 4,80 312,00	100 3,20 240,00	75 2,40 180,00	50 1,60 120,00	37 1,11 84,00	25 0,78 58,00
750	750	45,88 555,00	500 30,31 550,00	375 22,32 540,00	250 15,98 580,00	187,5 10,54 615,00	150 7,27 640,00	125 4,54 670,00	100 3,60 700,00	75 2,70 735,00	50 1,80 770,00	37 1,11 800,00	25 0,78 830,00	17 0,54 860,00
500	500	34,17 620,00	333 22,57 615,00	250 16,81 610,00	167 11,04 600,00	125 7,23 525,00	100 5,18 470,00	75 3,41 420,00	50 2,70 370,00	37 1,66 320,00	25 1,19 280,00	17 0,80 240,00	10 0,58 200,00	6 0,28 160,00
250	250	19,56 710,00	167 12,70 690,00	125 9,37 680,00	83 5,76 630,00	62,5 3,79 550,00	50 2,78 505,00	37 1,85 455,00	25 1,44 410,00	17 1,11 365,00	10 0,80 320,00	6 0,58 280,00	3 0,39 240,00	2 0,28 200,00
50	50	4,13 750,00	33 2,73 750,00	25 2,07 750,00	17 1,29 690,00	12,5 0,80 580,00	10 0,58 525,00	6 0,39 470,00	3 0,28 420,00	2 0,19 370,00	1 0,13 320,00	0,5 0,09 280,00	0,3 0,05 240,00	0,2 0,03 200,00
<b>P1Nt</b>		<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>	<b>26,00</b>
<b>T2max</b>		<b>1090,00</b>	<b>980,00</b>	<b>980,00</b>	<b>980,00</b>	<b>910,00</b>	<b>860,00</b>	<b>860,00</b>	<b>860,00</b>	<b>860,00</b>	<b>860,00</b>	<b>860,00</b>	<b>860,00</b>	<b>625,00</b>

### Radial Forces (N)

FA	FR	T2 Nm	n1 (1/min)						FA	FR	T2 Nm	n2 (1/min)					
			3000	1000	500	250	100	50				3000	1000	500	250	100	50
< 500			2200	1700	3200	3900	5000	6200				3200	4300	5000	6500	8000	10000
> 500			1840	1420	2670	3250	4170	5170				2670	3580	4170	5420	6670	8330

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general Information.

### Moments of Inertia J (kgcm<sup>2</sup>)

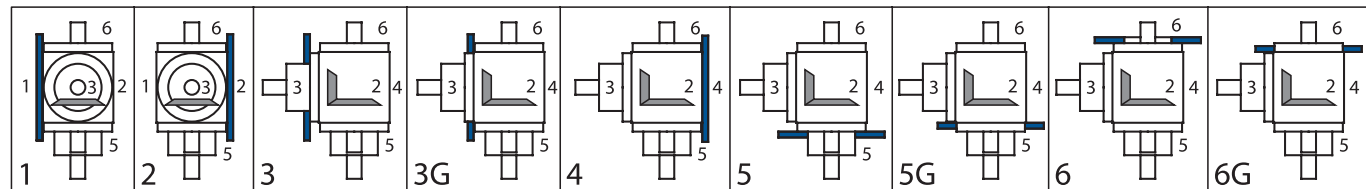
reduced to the input shaft (n1)

Model	Transmission Ratios						
	1:1	1.5:1	2:1	3:1	4:1	5:1	6:1
A0	121,2522	57,6950	36,3095	18,8322	14,2651	6,1470	5,3881
F0	181,8783	84,6400	51,4661	25,5685	18,0543	8,5721	7,0721
M0	181,8783	88,4451	57,4625	30,9282	24,7411	9,8690	9,0921
B0, C0	174,7000	103,5829	71,6215	34,1931	22,7181	12,8770	10,0616
D0	177,8173	104,9684	72,4008	34,5395	22,9130	13,0016	10,1482
G0, H0	235,3261	134,3330	92,7745	46,2891	33,1941	16,5990	13,7656
J0	238,4434	135,7185	93,5538	46,6355	33,3890	16,7236	13,8522

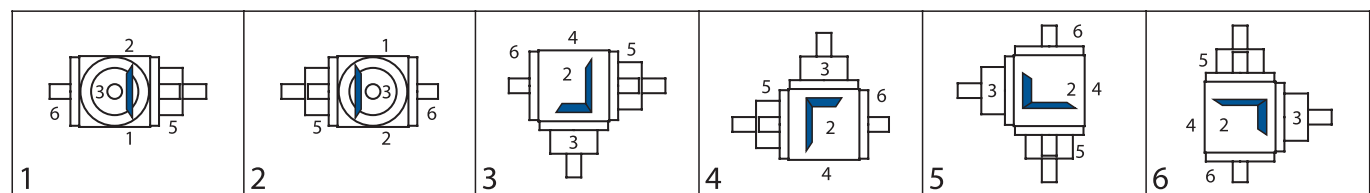
### Gearbox Weights (kg)

Model	app. Weight
A0	52
F0	60
M0	60
B0, C0	48
D0	50
G0, H0	58
J0	60

### V Mounting Side



### VI Mounting Configuration (downward-facing side)

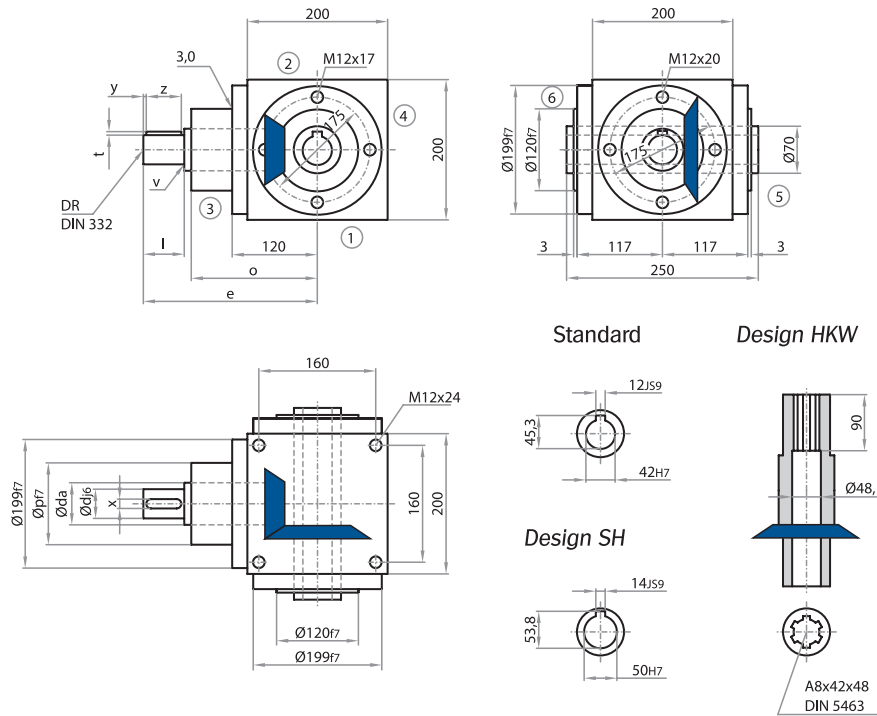


### Example of Order

I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		200		1:1	A0			1		1			300 / 0000=Standard	

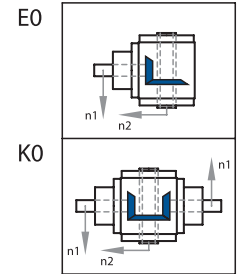
Bevel Gearboxes Type V

# Type V 200

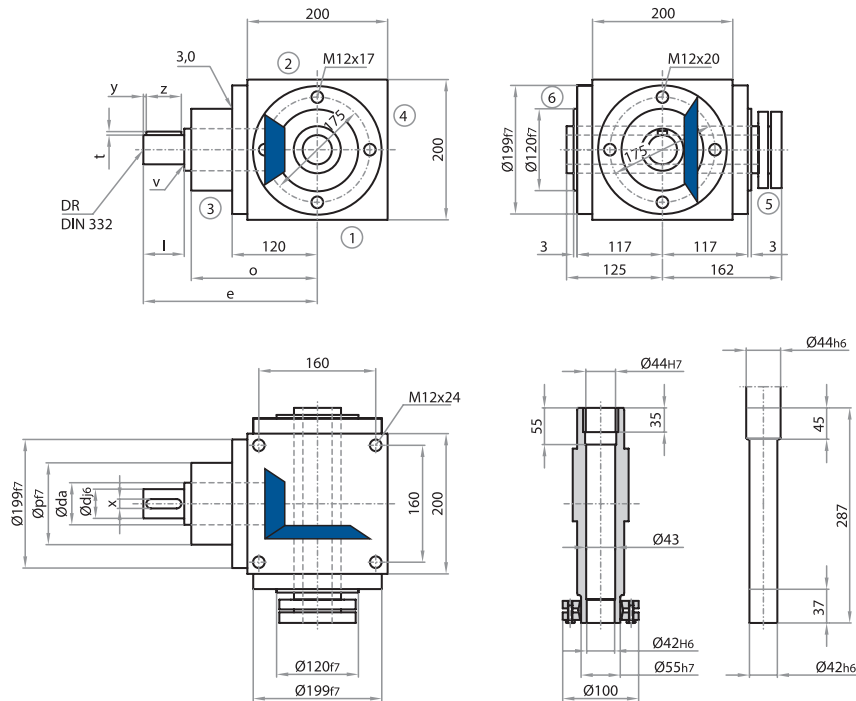
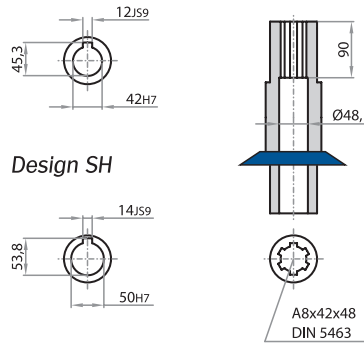


**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



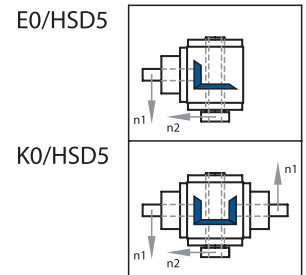
Standard      Design HKW



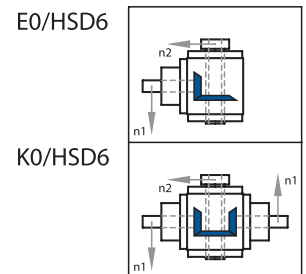
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

Standard



Special



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	42	55	80	2	12	5	70	3	M16	273	190	120
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 3:1$	35	40	68	1	10	3	63	3	M12	261	190	120
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 4:1$	35	40	68	1	10	3	63	3	M12	261	190	120
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 5:1 - 6:1$	28	30	68	-	8	3	63	3	M10	261	190	110



### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i =	1:1	P1N	1.5:1	P1N	2:1	P1N	3:1	P1N	4:1	P1N	5:1	P1N	6:1	P1N
n1	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N	n2	T2N
3000	3000	0,00	2000	72,75	1500	51,25	1000	46,29	750	28,93	600	19,84	500	11,45
		0,00		330,00		310,00		420,00		350,00		300,00		208,00
2400	2400	0,00	1600	63,49	1200	45,24	800	39,24	600	26,45	480	17,99	400	9,60
		0,00		360,00		342,00		445,00		400,00		340,00		218,00
1500	1500	74,40	1000	48,17	750	35,13	500	28,38	375	18,81	300	12,57	250	6,54
		450,00		437,00		425,00		515,00		455,00		380,00		237,00
1000	1000	56,21	667	37,13	500	27,56	333	20,37	250	13,36	200	9,26	167	4,74
		510,00		505,00		500,00		555,00		485,00		420,00		258,00
750	750	45,88	500	30,31	375	22,32	250	15,98	187,5	10,54	150	7,27	125	3,98
		555,00		550,00		540,00		580,00		510,00		440,00		289,00
500	500	34,17	333	22,57	250	16,81	167	11,04	125	7,23	100	5,18	83	2,79
		620,00		615,00		610,00		600,00		525,00		470,00		304,00
250	250	19,56	167	12,70	125	9,37	83	5,76	62,5	3,79	50	2,78	42	1,44
		710,00		690,00		680,00		630,00		550,00		505,00		311,00
50	50	4,13	33	2,73	25	2,07	17	1,29	12,5	0,80	10	0,58	8,3	0,28
		750,00		750,00		750,00		690,00		580,00		525,00		306,00
<b>P1Nt</b>		<b>26,00</b>		<b>26,00</b>		<b>26,00</b>		<b>26,00</b>		<b>26,00</b>		<b>26,00</b>		<b>26,00</b>
<b>T2max</b>		<b>1090,00</b>		<b>980,00</b>		<b>980,00</b>		<b>910,00</b>		<b>860,00</b>		<b>860,00</b>		<b>625,00</b>

### Radial Forces (N)

FA	FR	T2 Nm	n1 (1/min)						FA	FR	n2 (1/min)					
			3000	1000	500	250	100	50			3000	1000	500	250	100	50
<	500	2200	1700	3200	3900	5000	6200			3600	4700	5400	7200	9000	11000	
>	500	1840	1420	2670	3250	4170	5170			3000	3900	4500	6000	7500	9200	

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general information.

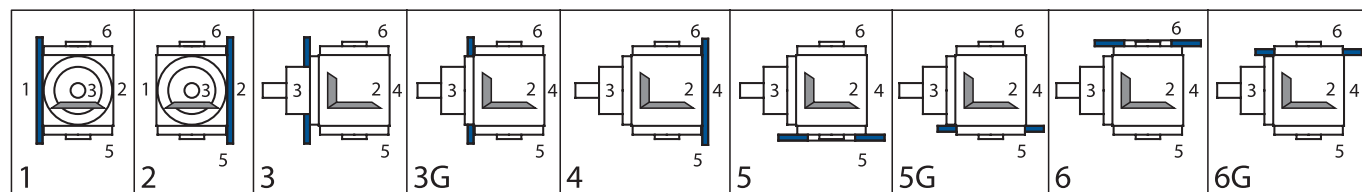
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n1)

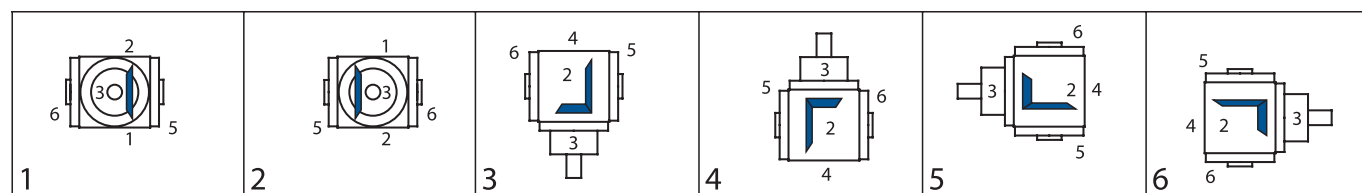
### Gearbox Weights (kg)

Model	Transmission Ratios						Model	app. Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1		
E0	201,3904	109,0276	76,4341	35,2209	23,3588	13,8070	E0	48
K0	262,0165	139,7777	97,5871	47,3169	33,8348	17,5290	K0	58
E0/HSD	222,4124	118,3707	81,6896	37,5567	24,6726	14,6479	E0/HSD	49,3
K0/HSD	283,0385	149,1208	102,8426	49,6527	35,1486	18,3699	K0/HSD	59,3

### V Mounting Side



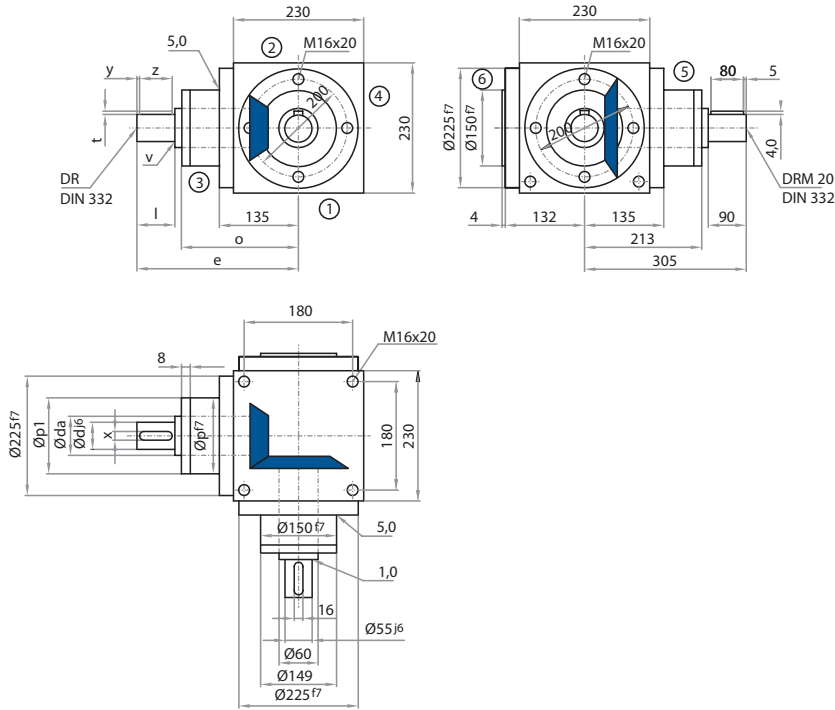
### VI Mounting Configuration (downward-facing side)



### Example of Order

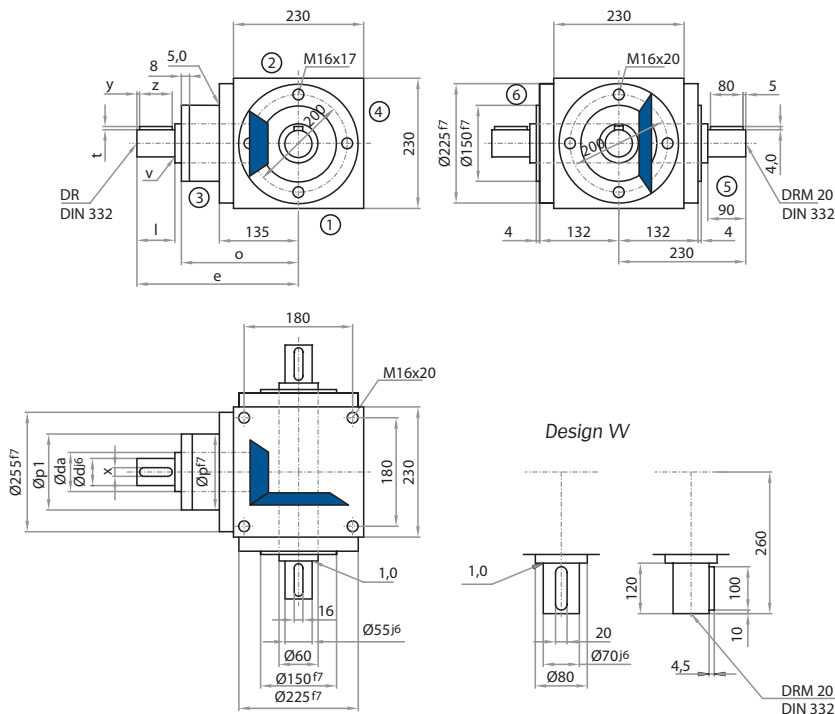
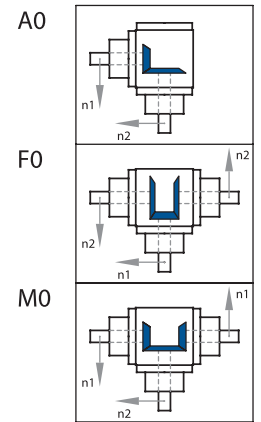
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		200		1:1	E0			1		1			300 / 0000=Standard	

# Type V 230

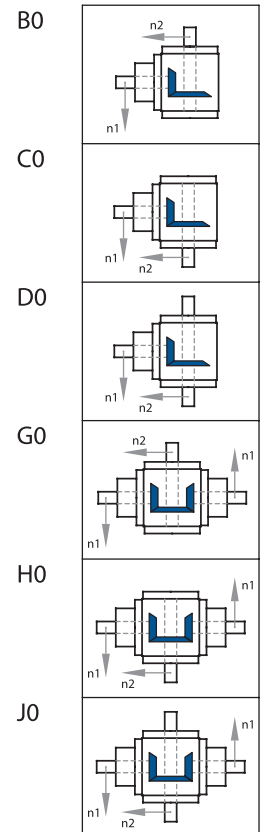


**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	p1
$i = 1:1 - 2:1$	55	60	90	1	16	5	80	2,5	M20	305	213	150	149

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	p1
$i = 3:1$	40	50	80	1	12	5	70	3	M16	310	228	140	139

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	p1
$i = 4:1$	40	50	80	1	12	0	70	3	M16	310	228	140	139

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	p1
$i = 5:1 - 6:1$	35	45	70	1	10	3	63	3	M16	300	228	140	139

### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N	4:1 n <sub>2</sub>	P1N T2N	5:1 n <sub>2</sub>	P1N T2N	6:1 n <sub>2</sub>	P1N T2N
3000	3000		2000	99.2 450	1500	87.63 530	1000	44.09 400	750	36.37 440	600	33.73 510	500	20.17 366
2400	2400		1600	91.35 518	1200	80.02 605	800	39.68 450	600	32.74 495	480	29.1 550	400	18.08 410
1500	1500	87.63 530	1000	72.2 655	750	59.11 715	500	29.76 540	375	24.8 600	300	21 635	250	13.5 490
1000	1000	71.65 650	667	56.21 765	500	45.19 820	333	23.33 635	250	18.6 675	200	15.76 715	167	9.92 540
750	750	60.76 735	500	45.47 825	375	36.79 890	250	19.29 700	187.5	15.19 735	150	12.73 770	125	7.78 565
500	500	45.19 820	333	33.79 920	250	26.73 970	167	14.07 765	125	10.95 795	100	9.15 830	83	5.42 590
250	250	26.73 970	167	20.57 1120	125	16.88 1225	83	7.58 825	62.5	5.99 870	50	5.07 920	42	2.82 610
50	50	7 1270	33	4.89 1330	25	3.66 1330	17	1.633 870	12.5	1.35 980	10	1.09 990	8.3	0.57 625
<b>P1Nt</b>		<b>34</b>		<b>34</b>		<b>34</b>		<b>34</b>		<b>34</b>		<b>34</b>		<b>34</b>
<b>T2max</b>		<b>1500</b>		<b>1400</b>		<b>1400</b>		<b>1300</b>		<b>1300</b>		<b>1200</b>		<b>1000</b>

### Radial Forces (N)

FA	FR	T2 Nm	n1 (1/min)					n2 (1/min)					
			3000	1000	500	250	100	50	3000	1000	500	250	100
<	750	4600	5150	7200	9450	11250	13100	5850	8650	10500	12250	15000	19000
>	750	3830	4290	6000	7870	9370	10920	4870	7210	8750	10210	12500	15830

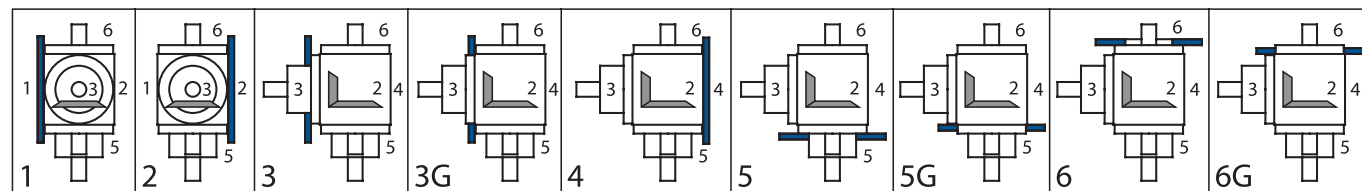
For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general Information.

### Moments of Inertia

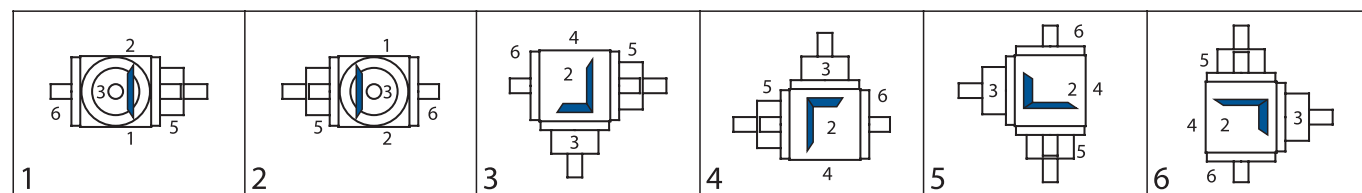
### Gearbox Weights (kg)

Model	Transmission Ratios						Model	app. Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1		
	upon request						A0	79
							F0	97
							M0	97
							B0, C0	76
							D0	78
							G0, H0	100
							I0	102

### V Mounting Side



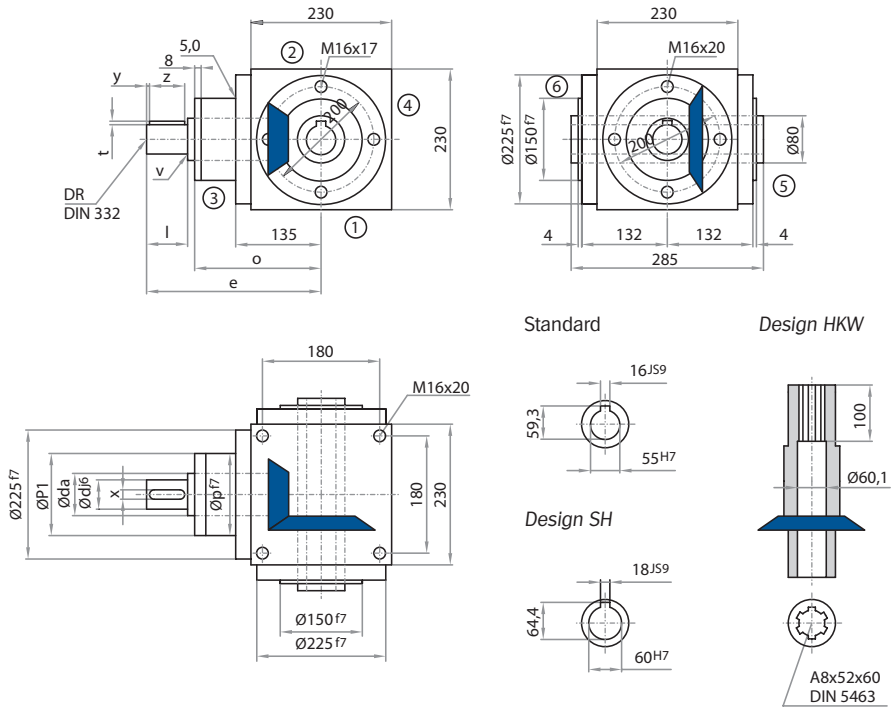
### VI Mounting Configuration (downward-facing side)



### Example of Order

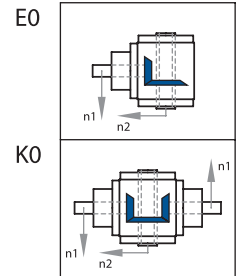
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		230		1:1	A0			1	.	1	-		200 / 0000=Standard	

# Type V 230



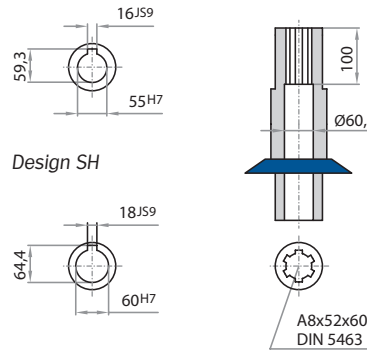
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

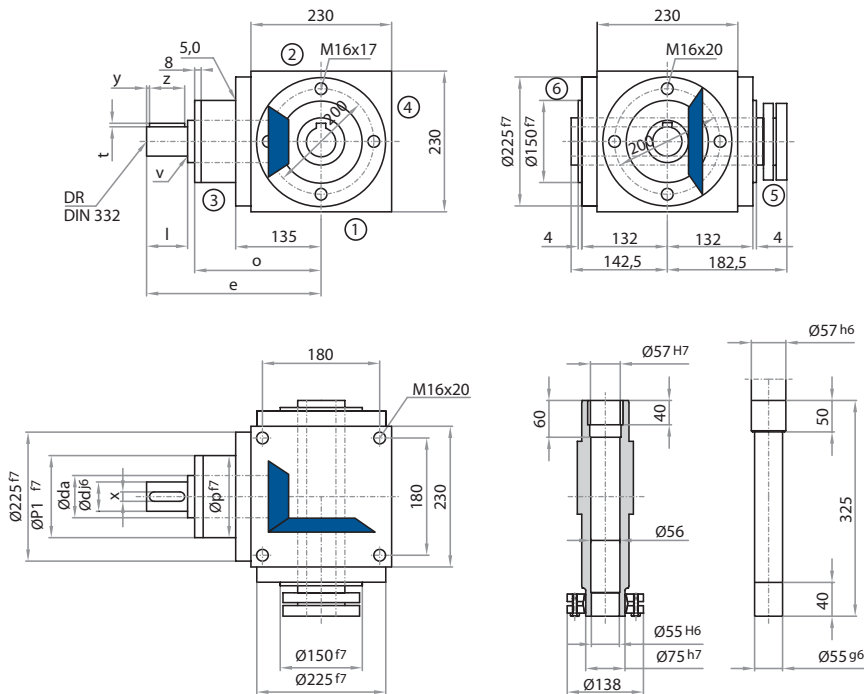


Standard

Design HKW



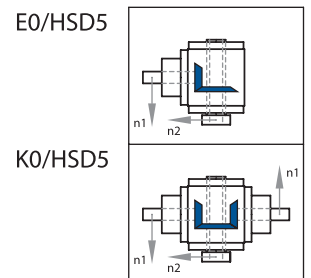
A8x52x60  
DIN 5463



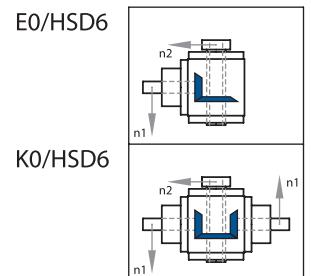
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

Standard



Special



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	p1
i = 1:1 - 2:1	55	60	90	1	16	5	80	2,5	M20	305	213	150	149

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	p1
i = 3:1	40	50	80	1	12	5	70	3	M16	310	228	140	139

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	p1
i = 4:1	40	50	80	1	12	0	70	3	M16	310	228	140	139

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	p1
i = 5:1 - 6:1	35	45	70	1	10	3	63	3	M16	300	228	140	139

### IV Power Ratings, Torque Ratings

[ $n$ =min-1,  $P$ =kW,  $T$ =Nm]

$i =$ $n_1$	1:1 $n_2$	P1N T2N	1.5:1 $n_2$	P1N T2N	2:1 $n_2$	P1N T2N	3:1 $n_2$	P1N T2N	4:1 $n_2$	P1N T2N	5:1 $n_2$	P1N T2N	6:1 $n_2$	P1N T2N
3000	3000	0	2000	99.2	1500	87.63	1000	44.09	750	36.37	600	33.73	500	20.17
		0		450		530		400		440		510		366
2400	2400	0	1600	91.35	1200	80.02	800	39.68	600	32.74	480	29.1	400	18.08
		0		518		605		450		495		550		410
1500	1500	87.63	1000	72.2	750	59.11	500	29.76	375	24.8	300	21	250	13.5
		530		655		715		540		600		635		490
1000	1000	71.65	667	56.21	500	45.19	333	23.33	250	18.6	200	15.76	167	9.92
		650		765		820		635		675		715		540
750	750	60.76	500	45.47	375	36.79	250	19.29	187.5	15.19	150	12.73	125	7.78
		735		825		890		700		735		770		565
500	500	45.19	333	33.79	250	26.73	167	14.07	125	10.95	100	9.15	83	5.42
		820		920		970		765		795		830		590
250	250	26.73	167	20.57	125	16.88	83	7.58	62.5	5.99	50	5.07	42	2.82
		970		1120		1225		825		870		920		610
50	50	7	33	4.89	25	3.66	17	1.633	12.5	1.35	10	1.09	8.3	0.57
		1270		1330		1330		870		980		990		625
<b>P1Nt</b>		<b>34</b>		<b>34</b>		<b>34</b>		<b>34</b>		<b>34</b>		<b>34</b>		<b>34</b>
<b>T2max</b>		<b>1500</b>		<b>1400</b>		<b>1400</b>		<b>1300</b>		<b>1300</b>		<b>1200</b>		<b>1000</b>

### Radial Forces (N)

FA	FR	T2 Nm	n1 (1/min)						FA	FR	n2 (1/min)					
			3000	1000	500	250	100	50			3000	1000	500	250	100	50
<	750	4600	5150	7200	9450	11250	13100			5850	8650	10500	12250	15000	19000	
>	750	3830	4290	6000	7870	9370	10920			4870	7210	8750	10210	12500	15830	

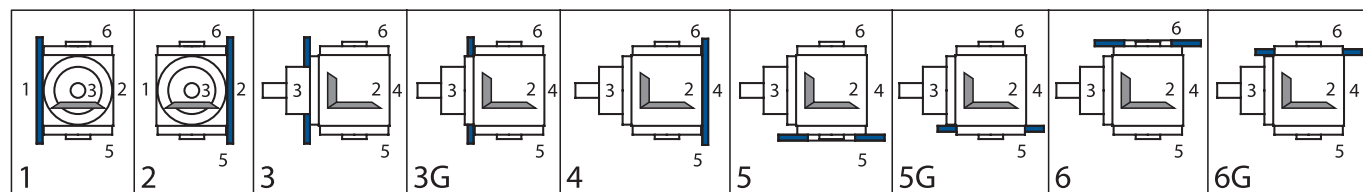
For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general information.

### Moments of Inertia

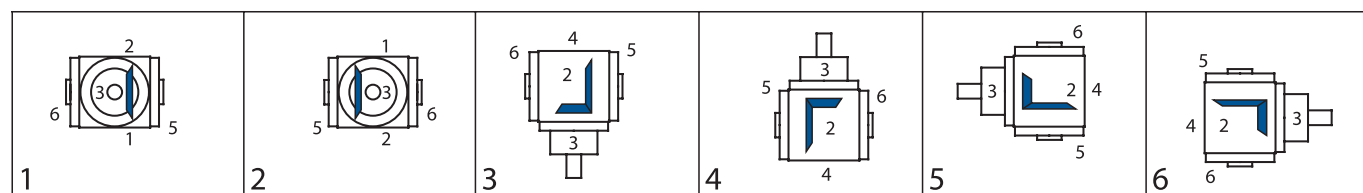
### Gearbox Weights (kg)

Model	Transmission Ratios						Model	app. Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1		
	upon request						E0	71
							K0	95
							E0/HSD	72
							K0/HSD	96

### V Mounting Side



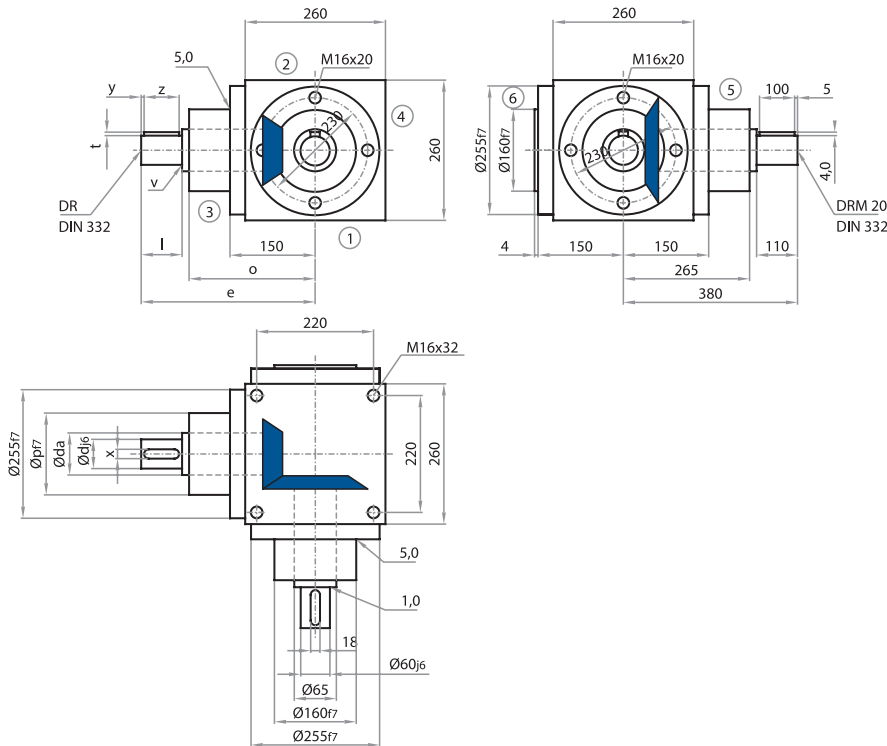
### VI Mounting Configuration (downward-facing side)



### Example of Order

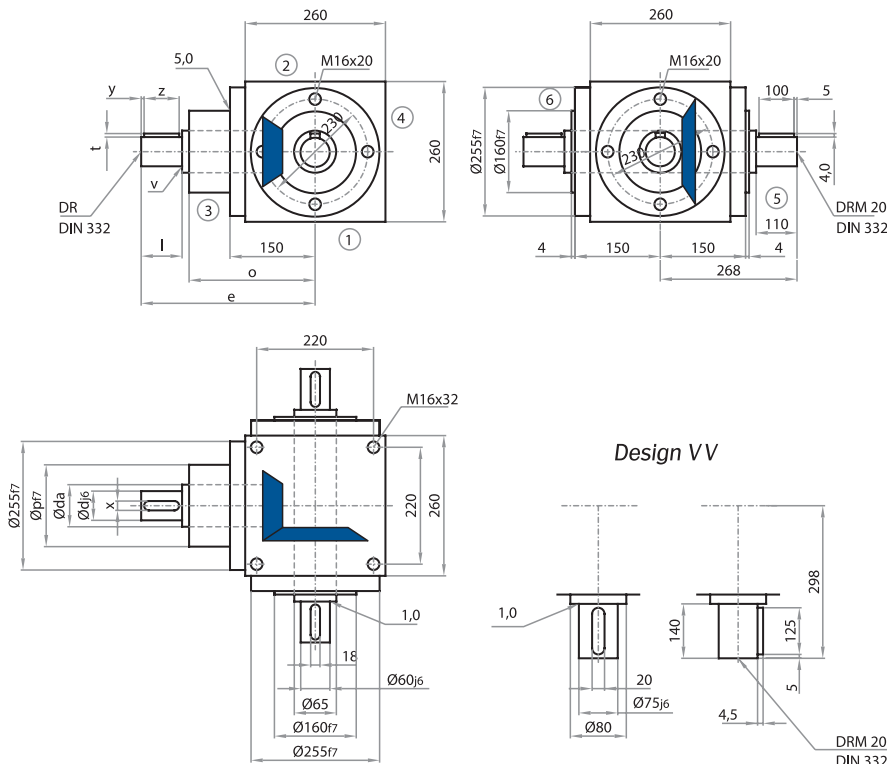
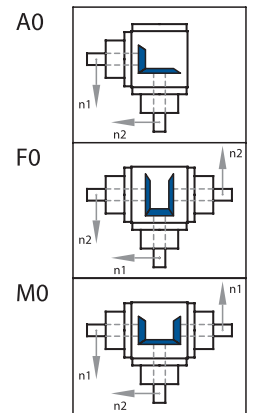
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		230		1:1	E0		-	1	.	1	-		200 / 0000=Standard	

# Type V 260



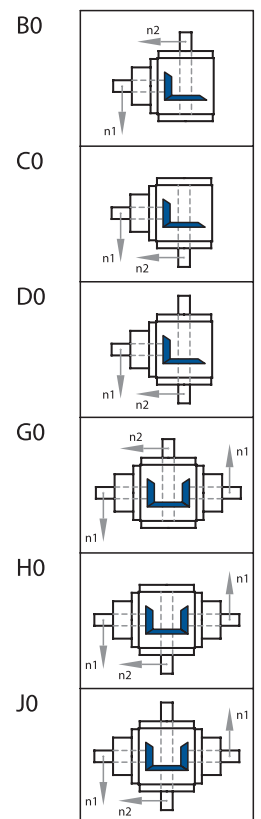
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	60	65	110	1	18	5	100	4	M20	380	265	160
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 3:1$	45	65	90	1,5	14	5	80	3,5	M16	360	265	160
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 4:1$	45	65	90	1,5	14	5	80	3,5	M16	360	265	160
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 5:1 - 6:1$	45	65	90	1,5	14	5	80	3,5	M16	360	265	160

### IV Power Ratings, Torque Ratings

[n=min-1, P=kW, T=Nm]

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N	4:1 n <sub>2</sub>	P1N T2N	5:1 n <sub>2</sub>	P1N T2N	6:1 n <sub>2</sub>	P1N T2N
3000	3000	0,00 0,00	2000	189,58 860,00	1500	133,92 810,00	1000	85,97 780,00	750	57,87 700,00	600	46,29 700,00	500	27,27 495,00
2400	2400	0,00 0,00	1600	158,72 900,00	1200	112,43 850,00	800	72,39 821,00	600	51,58 780,00	480	40,21 760,00	400	23,12 524,00
1500	1500	157,07 950,00	1000	104,71 950,00	750	78,53 950,00	500	49,60 900,00	375	37,20 900,00	300	29,10 880,00	250	16,36 594,00
1000	1000	115,73 1050,00	667	77,19 1050,00	500	57,87 1050,00	333	36,34 990,00	250	28,93 1050,00	200	21,82 990,00	167	12,93 702,00
750	750	96,72 1170,00	500	64,48 1170,00	375	48,36 1170,00	250	28,93 1050,00	187,5	22,73 1100,00	150	18,19 1100,00	125	10,91 792,00
500	500	72,75 1320,00	333	47,72 1300,00	250	35,27 1280,00	167	20,43 1110,00	125	16,26 1180,00	100	13,23 1200,00	83	8,06 878,00
250	250	42,44 1540,00	167	27,43 1490,00	125	20,12 1460,00	83	11,16 1220,00	62,5	8,61 1250,00	50	7,11 1290,00	42	4,35 940,00
50	50	9,64 1750,00	33	6,18 1700,00	25	4,55 1650,00	17	2,55 1360,00	12,5	1,82 1320,00	10	1,47 1330,00	8,3	0,87 951,00
<b>P1Nt</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>
<b>T2max</b>		<b>2310,00</b>		<b>2100,00</b>		<b>2100,00</b>		<b>1940,00</b>		<b>1940,00</b>		<b>1910,00</b>		<b>1730,00</b>

### Radial Forces (N)

T2 Nm	n <sub>1</sub> (1/min)						T2 Nm	n <sub>2</sub> (1/min)					
	3000	1000	500	250	100	50		3000	1000	500	250	100	50
< 950	7000	8600	11200	15000	17500	20000	< 950	8500	13000	16000	18000	22000	28000
> 950	5830	7170	9330	12500	14580	16670	> 950	7080	10830	13330	15000	18330	23330

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general information.

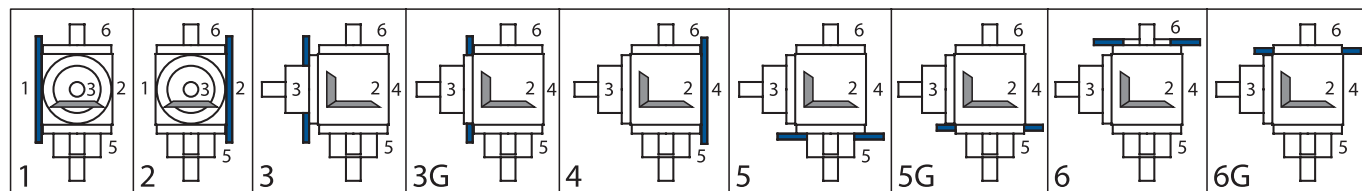
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n<sub>1</sub>)

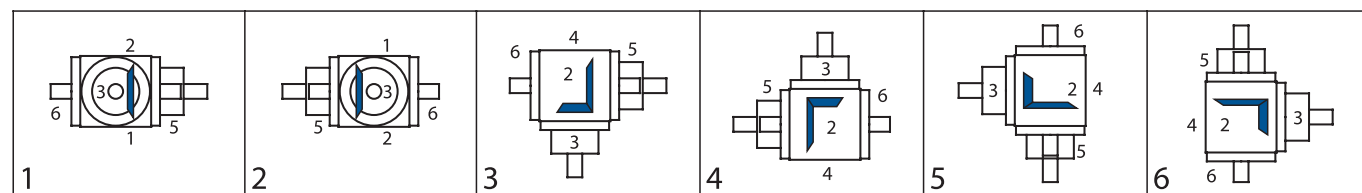
### Gearbox Weights (kg)

Model	Transmission Ratios							Model	app. Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1	6:1		
A0	814,2000	305,9333	194,2750	85,0833	46,7738	37,2840	31,8083	A0	85
F0	1221,3000	486,8667	296,0500	130,3167	72,2175	53,5680	43,1167	F0	105
M0	1221,3000	430,9333	286,7750	124,9333	68,1038	58,2840	52,3083	M0	105
B0, C0	827,4400	168,2622	281,3350	117,2211	66,6638	50,0136	40,7039	B0, C0	85
D0	841,8500	383,5556	284,9375	52,2667	67,5644	50,5900	41,1042	D0	88
G0, H0	1234,5400	293,2622	373,8350	157,0711	87,9938	71,0136	61,2039	G0, H0	109
I0	1248,9500	508,5556	377,4375	92,1167	88,8944	71,5900	61,6042	I0	112

### V Mounting Side



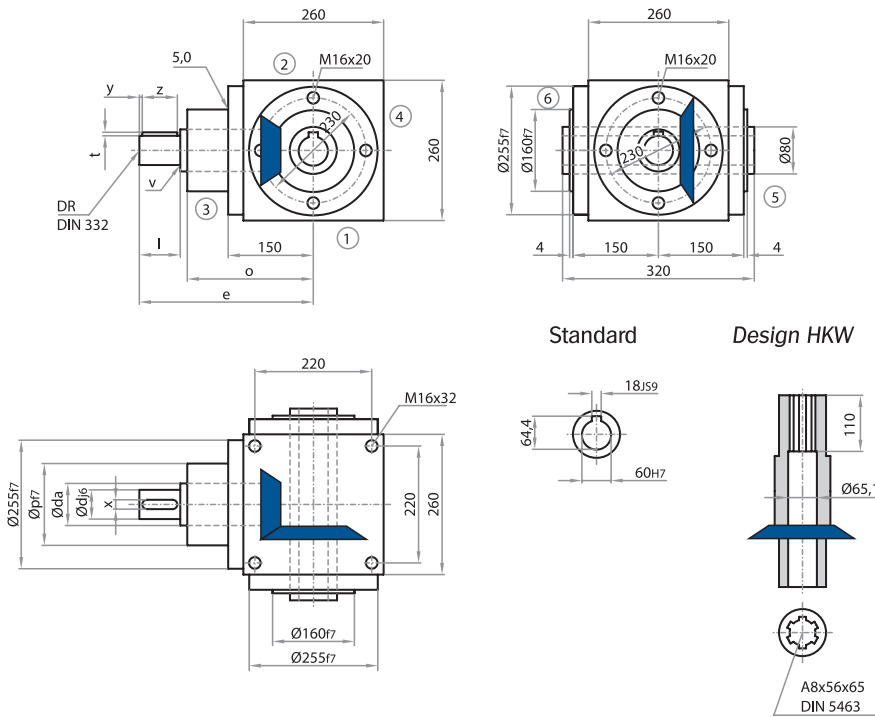
### VI Mounting Configuration (downward-facing side)



### Example of Order

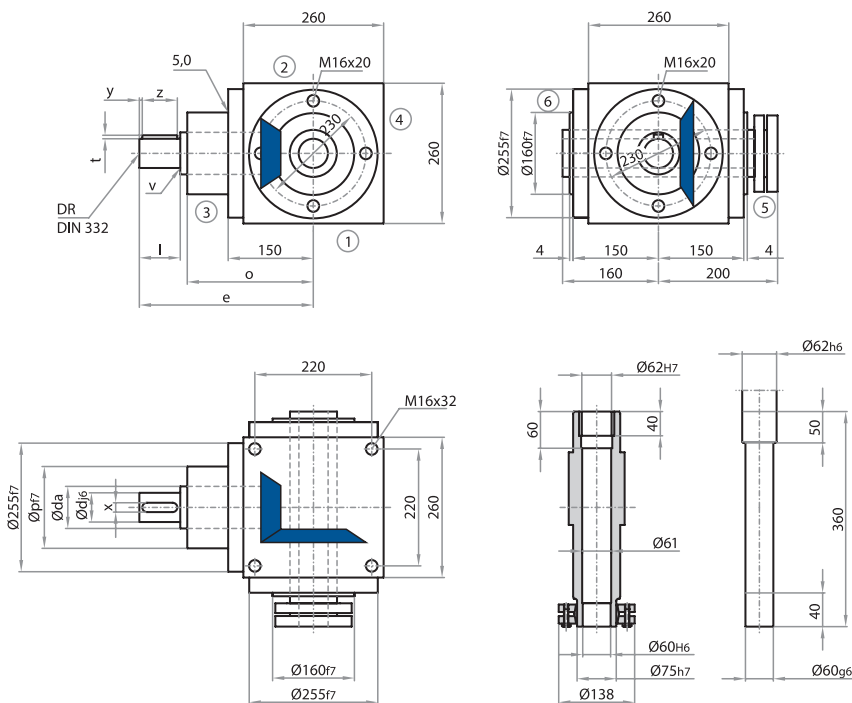
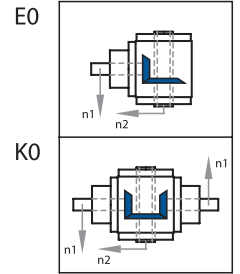
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n <sub>2</sub> max	Design
V		260		1:1	A0			1		1			200 / 0000=Standard	

# Type V 260



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

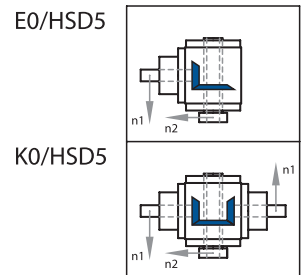
## Model



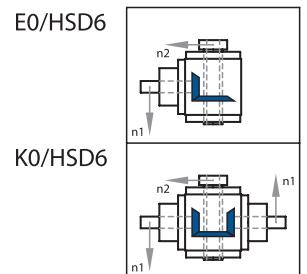
**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 3, 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

### Standard



### Special



## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 1:1 - 2:1	60	65	110	1	18	5	100	4	M20	380	265	160	i = 3:1	45	65	90	1,5	14	5	80	3,5	M16	360	265	160
i = 4:1	45	65	90	1,5	14	5	80	3,5	M16	360	265	160	i = 5:1 - 6:1	45	65	90	1,5	14	5	80	3,5	M16	360	265	160



### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N	4:1 n <sub>2</sub>	P1N T2N	5:1 n <sub>2</sub>	P1N T2N	6:1 n <sub>2</sub>	P1N T2N
3000	3000	0,00 0,00	2000	189,58 860,00	1500	133,92 810,00	1000	85,97 780,00	750	57,87 700,00	600	46,29 700,00	500	27,27 495,00
2400	2400	0,00 0,00	1600	158,72 900,00	1200	112,43 850,00	800	72,39 821,00	600	51,58 780,00	480	40,21 760,00	400	23,12 524,00
1500	1500	157,07 950,00	1000	104,71 950,00	750	78,53 950,00	500	49,60 900,00	375	37,20 900,00	300	29,10 880,00	250	16,36 594,00
1000	1000	115,73 1050,00	667	77,19 1050,00	500	57,87 1050,00	333	36,34 990,00	250	28,93 1050,00	200	21,82 990,00	167	12,93 702,00
750	750	96,72 1170,00	500	64,48 1170,00	375	48,36 1170,00	250	28,93 1050,00	187,5	22,73 1100,00	150	18,19 1100,00	125	10,91 792,00
500	500	72,75 1320,00	333	47,72 1300,00	250	35,27 1280,00	167	20,43 1110,00	125	16,26 1180,00	100	13,23 1200,00	83	8,06 878,00
250	250	42,44 1540,00	167	27,43 1490,00	125	20,12 1460,00	83	11,16 1220,00	62,5	8,61 1250,00	50	7,11 1290,00	42	4,35 940,00
50	50	9,64 1750,00	33	6,18 1700,00	25	4,55 1650,00	17	2,55 1360,00	12,5	1,82 1320,00	10	1,47 1330,00	8,3	0,87 951,00
<b>P1Nt</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>		<b>42,00</b>
<b>T2max</b>		<b>2310,00</b>		<b>2100,00</b>		<b>2100,00</b>		<b>1940,00</b>		<b>1940,00</b>		<b>1910,00</b>		<b>1730,00</b>

### Radial Forces (N)

T2 Nm	n1 (1/min)						n2 (1/min)					
	3000	1000	500	250	100	50	3000	1000	500	250	100	50
< 950	7000	8600	11200	15000	17500	20000	8500	13000	16000	18000	22000	28000
> 950	5830	7170	9330	12500	14580	16670	7080	10830	13330	15000	18330	23330

For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general Information.

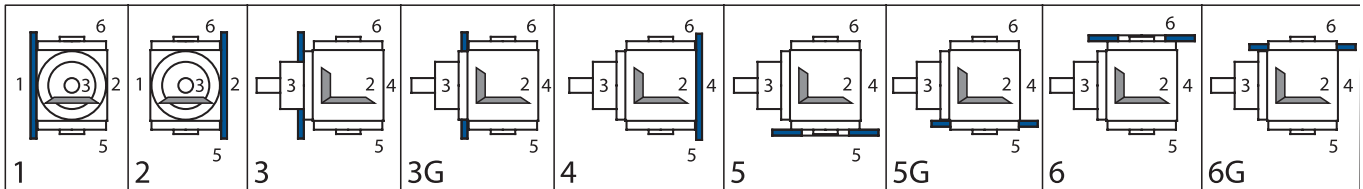
### Moments of Inertia J (kgcm<sup>2</sup>)

reduced to the input shaft (n1)

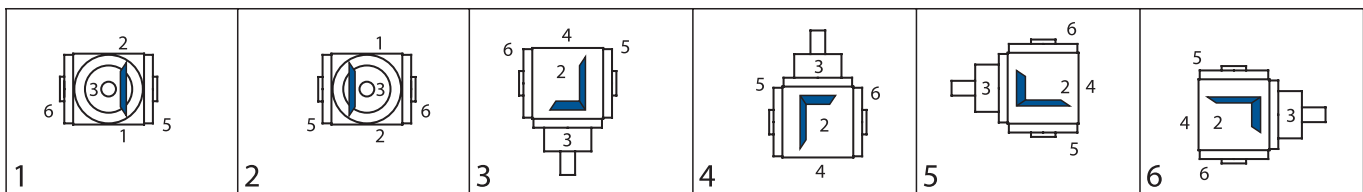
### Gearbox Weights (kg)

Model	Transmission Ratios							Model	app. Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1	6:1		
E0	828,6900	413,2622	287,8975	120,1100	68,2888	51,0536	41,4261	E0	82
K0	1235,7900	538,2622	380,3975	159,9600	89,6188	72,0536	61,9261	K0	106
E0/HSD	892,3400	441,5511	303,8100	127,1800	72,2656	53,5988	43,1936	E0/HSD	84,9
K0/HSD	1299,4400	566,5511	396,3100	167,0300	93,5956	74,5988	63,6936	K0/HSD	108,9

### V Mounting Side



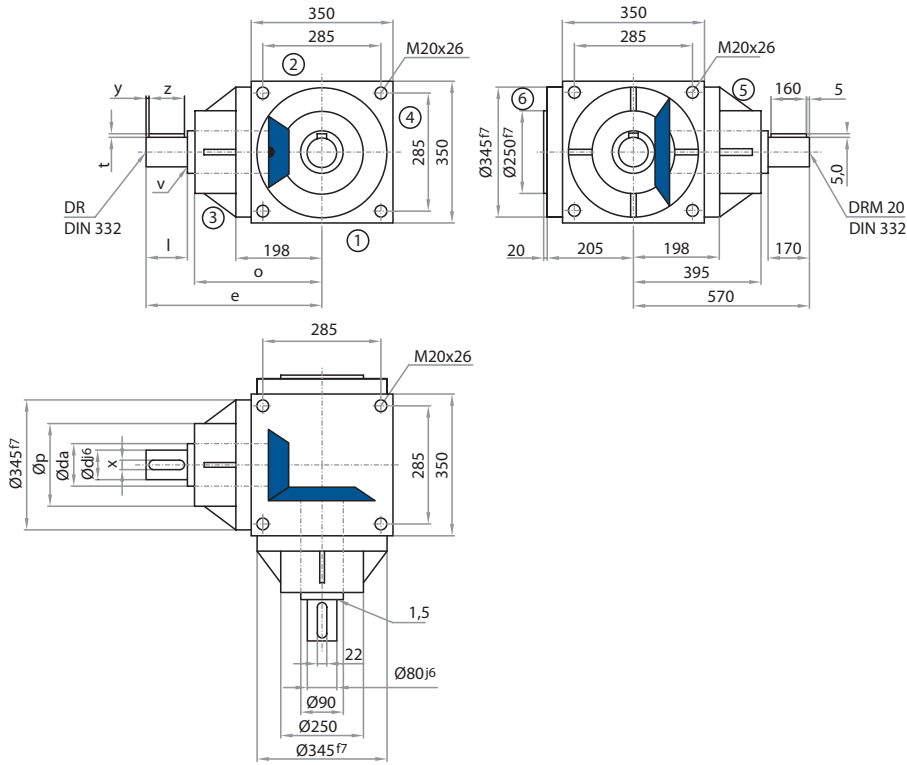
### VI Mounting Configuration (downward-facing side)



### Example of Order

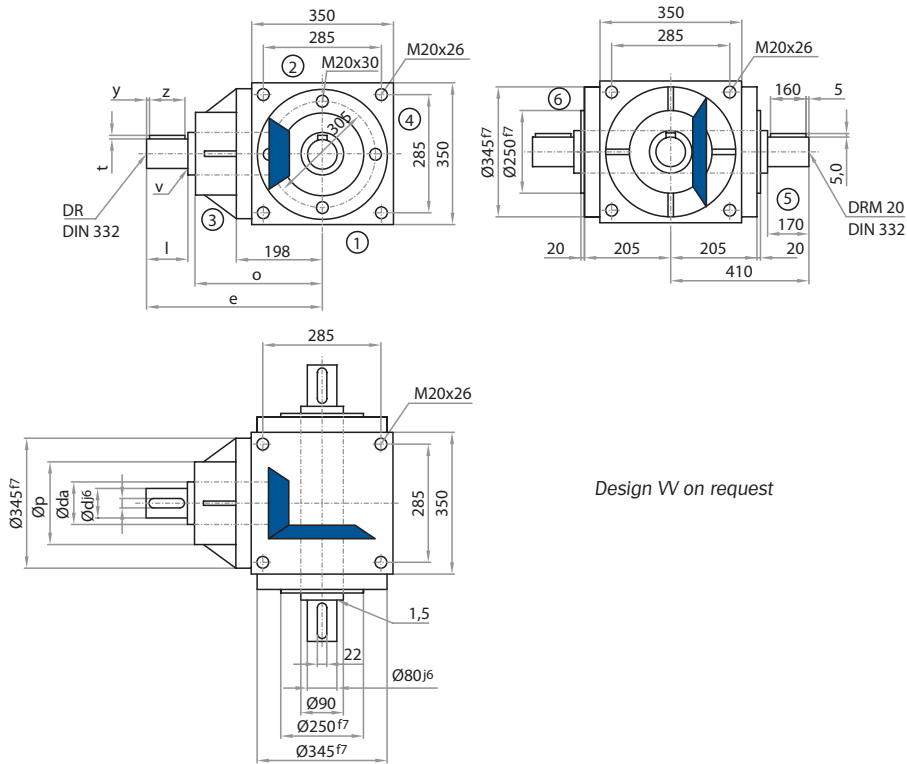
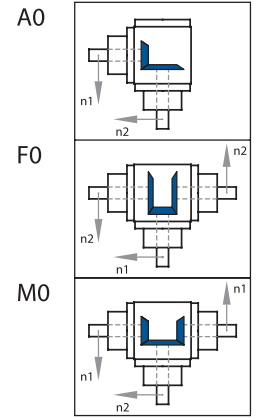
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		260		1:1	E0		-	1	.	1	-		200 / 0000=Standard	

# Type V 350

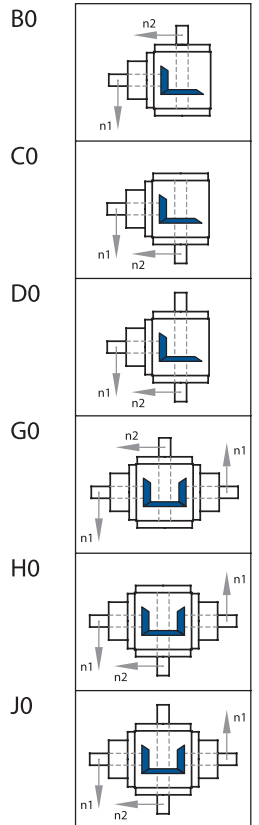


**Note:** Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



Design W on request



**Note:** Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 1:1 - 2:1$	80	90	170	1,5	22	5	160	5	M20	570	395	250
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 3:1$	65	90	140	1,5	18	7,5	125	4	M20	540	395	250
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 4:1$	65	90	140	1,5	18	7,5	125	4	M20	540	395	250
Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
$i = 5:1 - 6:1$	55	72	110	1,5	16	10	90	4	M20	510	395	250

### IV Power Ratings, Torque Ratings

[n = min-1, P = kW, T = Nm]

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N	4:1 n <sub>2</sub>	P1N T2N	5:1 n <sub>2</sub>	P1N T2N	6:1 n <sub>2</sub>	P1N T2N
3000	3000		2000		1500		1000		750		600		500	
2400	2400		1600		1200		800	160.48 1820	600	113.75 1720	480	78.83 1490	400	56.88 1290
1500	1500	267.84 1620	1000	206.19 1870	750	200.06 2420	500	122.35 2220	375	78.95 1910	300	56.54 1710	250	41.61 1510
1000	1000	210.53 1910	667	188.55 2560	500	155.41 2820	333	96.26 2620	250	58.14 2110	200	42.33 1920	167	31.41 1710
750	750	195.92 2370	500	141.42 2560	375	129.37 3130	250	81.29 2950	187.5	47.95 2320	150	35.88 2170	125	24.25 1760
500	500	155.41 2820	333	112.63 3070	250	94.52 3430	167	59.34 3230	125	34.72 2520	100	26.67 2420	83	16.72 1820
250	250	94.52 3440	167	67.11 3650	125	54.15 3930	83	34.26 3730	62.5	19.43 2820	50	16.09 2920	42	9.28 2020
50	50	24.47 4440	33	16.34 4500	25	12.79 4640	17	7.79 4240	12.5	4.17 3030	10	3.56 3230	8.3	1.95 2120
<b>P1Nt</b>		<b>90</b>		<b>90</b>		<b>90</b>		<b>90</b>		<b>90</b>		<b>90</b>		<b>90</b>
<b>T2max</b>		<b>5400</b>		<b>5200</b>		<b>5000</b>		<b>4500</b>		<b>3500</b>		<b>3500</b>		<b>2300</b>

### Radial Forces (N)

FA	FR	T2 Nm	n <sub>1</sub> (1/min)						FA	FR	n <sub>2</sub> (1/min)					
			1500	1000	500	250	100	50			1500	1000	500	250	100	50
<	2400	14500	15000	17500	22500	27500	33000			17500	18100	21100	26150	34200	40200	
>	2400	12000	12500	14500	18700	23000	27500			14500	15080	17580	21790	28500	33500	

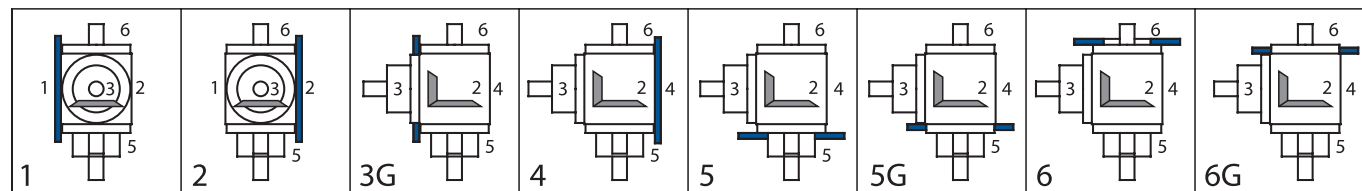
For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general Information.

### Moments of Inertia

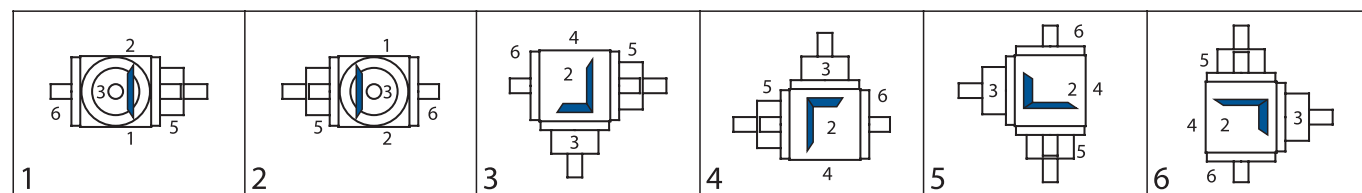
### Gearbox Weights (kg)

Model	Transmission Ratios						Model	app. Weight
	1:1	1.5:1	2:1	3:1	4:1	5:1		
	upon request						A0	269
							F0	340
							M0	340
							B0, C0	280
							D0	287
							G0, H0	372
							I0	379

### V Mounting Side



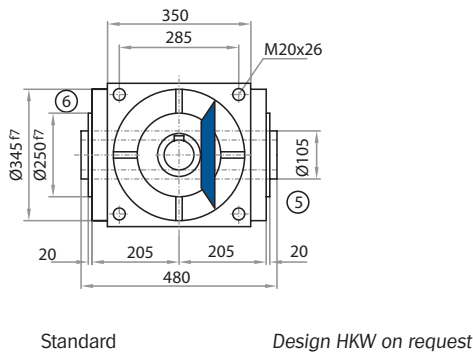
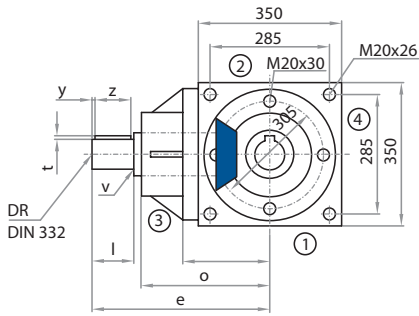
### VI Mounting Configuration (downward-facing side)



### Example of Order

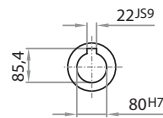
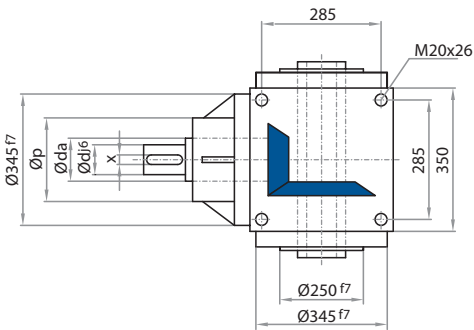
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n <sub>2</sub> max	Design
V		350		1:1	A0			1	.	1	-		200 / 0000=Standard	

# Type V 350



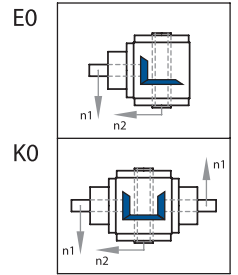
Standard

Design HKW on request

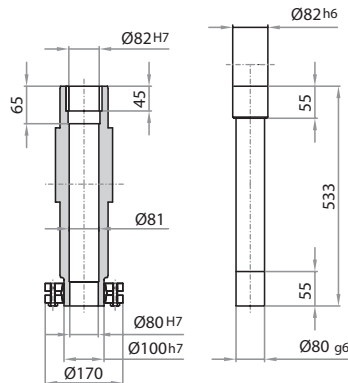
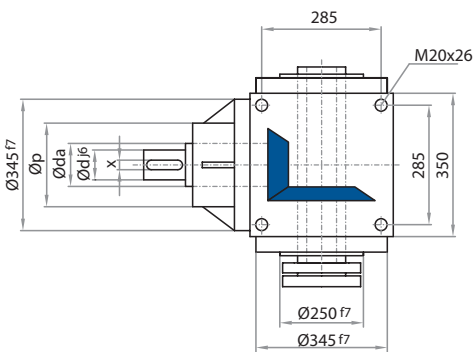
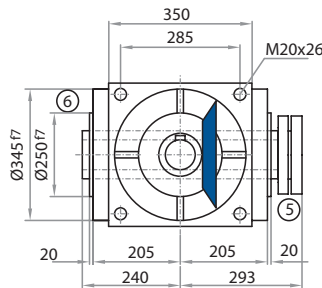
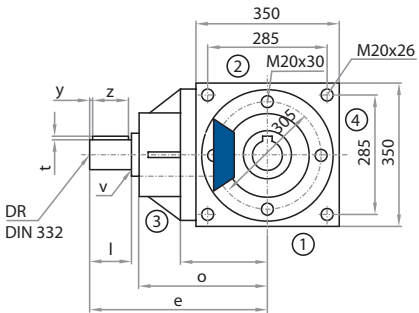


Design SH on request

## Model

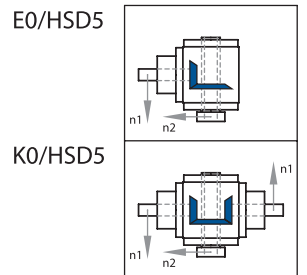


Note: Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

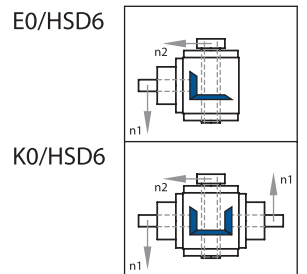


## Model

### Standard



### Special



Note: Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Transmission Ratios

Ratio	d	da	l	v	x	y	z	t	DR	e	o	p	Ratio	d	da	l	v	x	y	z	t	DR	e	o	p
i = 1:1 - 2:1	80	90	170	1,5	22	5	160	5	M20	570	395	250	i = 3:1	65	90	140	1,5	18	7,5	125	4	M20	540	395	250
i = 4:1	65	90	140	1,5	18	7,5	125	4	M20	540	395	250	i = 5:1 - 6:1	55	72	110	1,5	16	10	90	4	M20	510	395	250

### IV Power Ratings, Torque Ratings

i = n <sub>1</sub>	1:1 n <sub>2</sub>	P1N T2N	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N	3:1 n <sub>2</sub>	P1N T2N	4:1 n <sub>2</sub>	P1N T2N	5:1 n <sub>2</sub>	P1N T2N	6:1 n <sub>2</sub>	P1N T2N
3000	3000		2000		1500		1000		750		600		500	
2400	2400		1600		1200		800	160.48 1820	600	113.75 1720	480	78.83 1490	400	56.88 1290
1500	1500	267.84 1620	1000	206.19 1870	750	200.06 2420	500	122.35 2220	375	78.95 1910	300	56.54 1710	250	41.61 1510
1000	1000	210.53 1910	667	188.55 2560	500	155.41 2820	333	96.26 2620	250	58.14 2110	200	42.33 1920	167	31.41 1710
750	750	195.92 2370	500	141.42 2560	375	129.37 3130	250	81.29 2950	187.5	47.95 2320	150	35.88 2170	125	24.25 1760
500	500	155.41 2820	333	112.63 3070	250	94.52 3430	167	59.34 3230	125	34.72 2520	100	26.67 2420	83	16.72 1820
250	250	94.52 3440	167	67.11 3650	125	54.15 3930	83	34.26 3730	62.5	19.43 2820	50	16.09 2920	42	9.28 2020
50	50	24.47 4440	33	16.34 4500	25	12.79 4640	17	7.79 4240	12.5	4.17 3030	10	3.56 3230	8.3	1.95 2120
<b>P1Nt</b>		<b>90</b>		<b>90</b>		<b>90</b>		<b>90</b>		<b>90</b>		<b>90</b>		<b>90</b>
<b>T2max</b>		<b>5400</b>		<b>5200</b>		<b>5000</b>		<b>4500</b>		<b>3500</b>		<b>3500</b>		<b>2300</b>

### Radial Forces (N)

FA	FR	T2 Nm	n <sub>1</sub> (1/min)						FA	FR	n <sub>2</sub> (1/min)					
			1500	1000	500	250	100	50			1500	1000	500	250	100	50
<	2400	14500	15000	17500	22500	27500	33000			17500	18100	21100	26150	34200	40200	
>	2400	12000	12500	14500	18700	23000	27500			14500	15080	17580	21790	28500	33500	

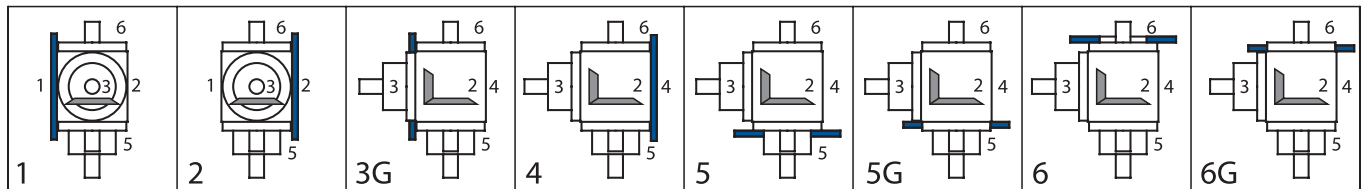
For more information and reinforced bearings, refer to general Information.  
Axial forces FA = 50% of radial forces - refer to general Information.

### Moments of Inertia

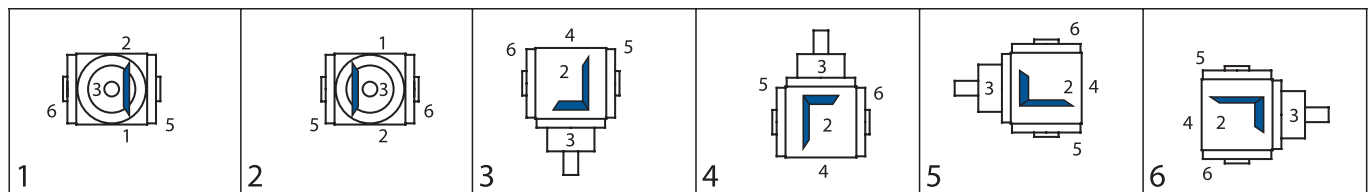
### Gearbox Weights (kg)

Model	Transmission Ratios						Model	app. Weight	
	1:1	1.5:1	2:1	3:1	4:1	5:1			6:1
upon request								E0	259
								K0	351
								E0/HSD	264
								K0/HSD	356

### V Mounting Side



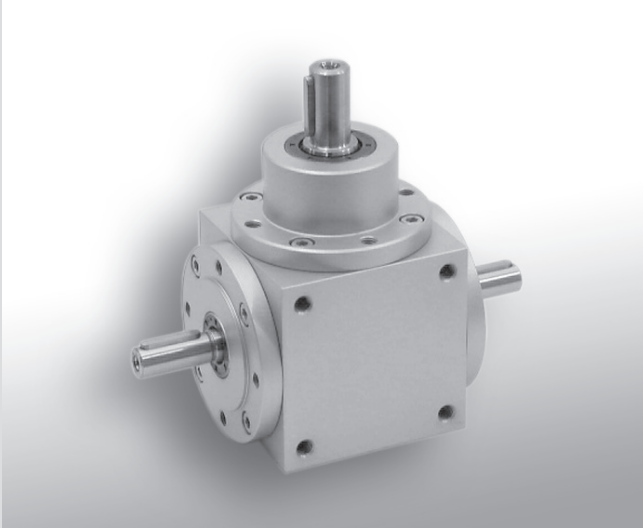
### VI Mounting Configuration (downward-facing side)



### Example of Order

I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n <sub>2</sub> max	Design
V		350		1:1		E0	-	1	.	1	-	200 / 0000=Standard		

# Type VS Gearboxes



- Speed Increaser Gearboxes
- Precision Spiral Bevel gearing
- Robust design
- 90 mm to 260 mm frame sizes
- Ratio 1.5:1 and 2:1
- Numerous options and configurations to choose from

# Selection Criteria

**GAM bevel gearboxes** are encased in robust cast metal housings and have hardened bevel gears pairs with spiral toothings and amply dimensioned rolling bearings. Spiral bevel gears have the significant benefit of very favourable meshing characteristics (high contact ratio). They are therefore especially well suited for operation under high load factors and when the highest smoothness of running and a high degree of transmission precision are required.

The curved teeth are more resistant to distortion than are straight or helical teeth. A further benefit is their relative insensitivity to elastic distortion of wheels, shafts and bearings. The gearboxes are thus able to transmit extreme shock loads. A total of twelve different standard versions are available, with a further 22 variations as multi-shaft gear-boxes. All gearboxes may be installed in any mounting position and may have mounting holes on all sides.

## Transmission Ratios

Transmission ratios of 1-1.5-2-3-4-5 and 6:1 are available as standard. All transmission ratios are mathematically precise. The gears can be used for gearing down and gearing up. Special transmission ratios are available. Please contact us for details.

## Efficiency

GAM gearboxes are 94-98% efficient, depending on rpm, mounting position, sealing and type of lubrication.

The efficiency level refers to the nominal power output from the transmission. In certain mounting positions, the bevel gears are completely immersed in the lubricant. In this case, churning loss in larger gearboxes and at high circumferential velocities of the wheels can be considerable and GAM should be consulted.

In general, it should be noted that starting efficiency is always lower than operating efficiency. The resulting increased breakaway torque should be taken into consideration when determining the driving power required.

## Low-backlash version

For standard bevel gear units have – depending on gear size and ratio – a backlash of 10 to 30 angular minutes. Nevertheless all GAM bevel gearboxes can be supplied in a low-backlash version.

When the drive shaft is locked, tooth backlash on the slowly-running shaft is measured on a 100mm lever arm with a measuring force of 3% of the rated torque and then is given as a torsion angle.

The following values can be set with standard gear sets.

Design S1:  $i = 1:1$  bis  $2:1 < 6$  angular minutes

Design S2:  $i = 3:1$  bis  $6:1 < 10$  angular minutes

Tighter values can be obtained from specially selected, HPGS-gearred or ground gear sets – please ask (Design S0).

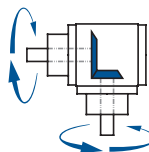
## Mounting Side

To indicate clearly the positions of different gearbox features, the sides of the gearbox are numbered 1 to 6. These numbers can be found in the individual data sheets.

All six sides of the gearbox are machined and can be used as mounting surfaces. The flanges and neck flanges are fitted with threaded holes as standard equipment. The following ordering options are available:

Code	Mounting holes
0	only in the flange surfaces
1, 2 ...	on one gearbox side without flange
3G, 5G ...	on one gearbox side with flange / neck flange
9	on all gearbox sides without flanges
9G	on all gearbox sides with flange / neck flange

## Preferred rotational direction



GAM bevel gearboxes can normally be run in either rotational direction. The spiral direction of the gear set and the rotational direction used are key factors determining the forces evolved within the unit. In most instances permissible torque transmission can be maximized by using the gear pairing such that the driving gear rotates in the same direction as the spiralling. This arrangement creates a more favourable contact point which reduces gear distortion. This also reduces noise from the gear pairing by 1-2dBA due to the fact that the axial forces caused by the spiral meshing push the gears apart. In GAM bevel gear transmissions the pinion gear always has a left-handed spiral; accordingly, the large gear has a right-handed spiral.

## Lubrication

GAM bevel gearboxes are supplied oil-filled and are maintenance-free under normal operating conditions. With extreme requirements or increased demands on durability we recommend to change the oil after approx. 15,000 hours of operation.

GAM is anxious to select the best lubricants for each case of application and in so doing optimizing the lifetime of the transmission. The peripheral speed of the bevel gears, the power that is to be transferred, and the operating conditions are crucial for the choice of the lubricant.

An approximate guideline value for the type of lubrication used can be found in the two selection diagrams and in the lubricant table.

The way to the correct type of lubrication is to be found using the two selection diagrams and the lubricant table. The selection diagrams consider the nominal moment, as taken from catalogue, and the operating mode of the transmission with 100% operating time or 30%/h intermittent operation. After the operating mode being selected and the operating conditions have been considered, the type of lubricant is determined by the number of revolutions of the slow running transmission shaft. From the lubricant table specified underneath this, the type of lubrication, the necessity for aeration of the transmission and the transmission oil can be seen.

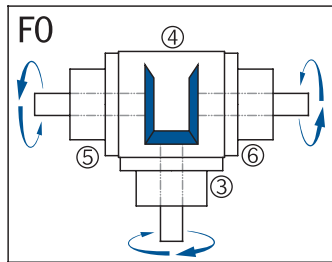
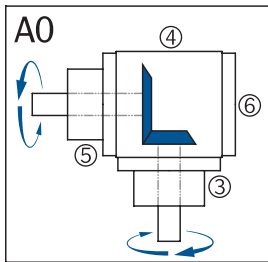
The type of lubrication actually used is determined by us for the specific application and can differ from the values in the table!

Modern synthetic high-tech lubricants are available for choice. For transmission application in the Pharma or Foodstuffs industry, proven NOTOX lubricants with NSF release (USDA-H1) can be selected.

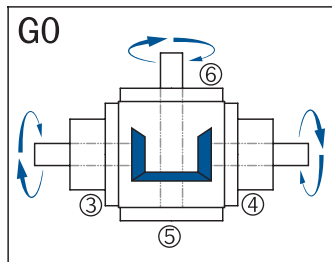
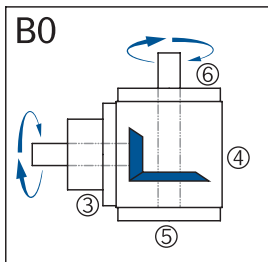
GAM transmissions are lubricated for a lifetime. The amount of lubricant has been internally determined for each assembly position. Naturally, biological-degradable oils or lubricants for extreme operating conditions can be supplied. For this purpose please contact GAM-Technik.

Also under normal operating conditions the transmission temperature can rise to over 50°C because of the small convection surface. If the transmission exceeds this temperature during use the included aeration filter must be fitted in order to avoid overpressure in the transmission and thus a leakage. Sufficient fresh air supply must be ensured. If the unit is intended for use under extreme ambient conditions (dust, moisture, etc.) please consult GAM. With intermittent operation or other operating conditions in which a rise in temperature of the transmission to over 50°C is not expected, the aeration hole is not required.

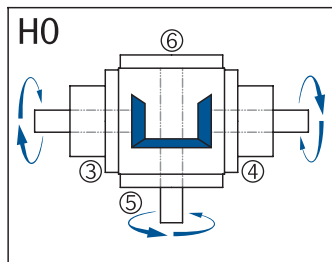
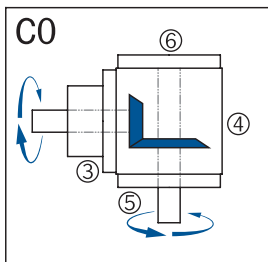
# Models and Rotational Directions



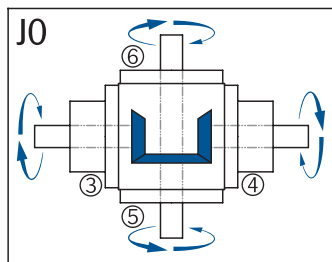
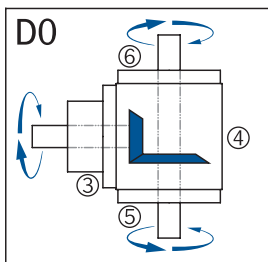
**Models A0 and F0** have shafts with single bearings. The input and output sides are symmetrical at transmission ratios between 1:1 and 2:1. Also available as model M0 with 2 pinion shafts.



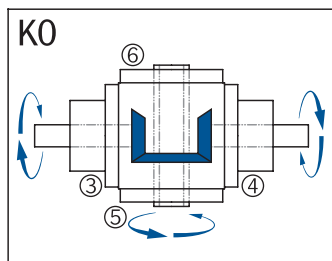
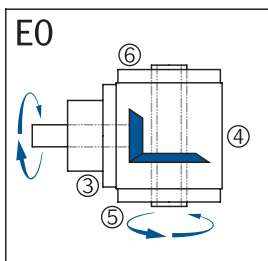
In **models B0 and G0**, the output shaft has bearings on both sides and extends out away from the side where its bevel gear is located. In this design the shafts have the same direction of rotation.



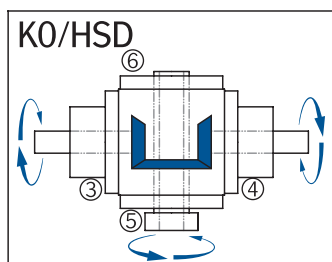
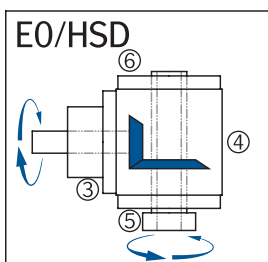
In **models C0 and H0**, the output shaft has bearings on both sides and extends out to the side where its bevel gear is located. In this design the shafts have opposing directions of rotation.



**Models D0 and J0** have a straight-through output shaft. If units are intended for arrangement in series, they can be supplied with reinforced straight-through shafts and bearings.



**Models E0 and K0** have a straight-through hollow shaft. The following options are available:  
- without keyway, - with spline profile, - with polygonal profile.



**Models E0/HSD and K0/HSD** have a stepped hollow shaft without a keyway and a shrunk-on disc for positive torque transmission. The guide side is fitted with a bronze guide bushing.



# Radial and Axial Forces

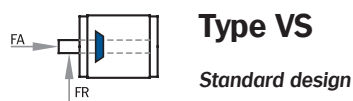
This does not apply for Type L

The permissible radial loads given in the tables are valid between the shaft ends for the speeds and torques listed. The more conservative direction of loading was assumed in calculating these values. Higher radial loads are permissible if the direction of stress application and of radial rotation are carefully calculated. – please consult us on this.

Axial forces FA can be absorbed without further supplementary calculation up to a level of approx. 50% of the permissible radial forces. If the axial forces exceed these values by a significant margin or if simultaneous FR and FA forces occur, please consult us.



Größe size	T Nm	n1 (1/min) - FR(N) Welle d2					
		3000	1000	500	250	100	50
065	< 12	180	250	300	350	450	550
	> 12	150	210	250	290	380	460
090	< 30	300	400	470	580	700	800
	> 30	250	330	390	490	590	670
120	< 80	470	620	720	900	1150	1400
	> 80	390	520	600	750	960	1170
140	< 140	700	870	1150	1370	1700	2000
	> 140	590	730	960	1140	1420	1670
160	< 220	1200	1600	1900	2200	2850	3300
	> 220	1000	1340	1590	1840	2380	2750
200	< 500	2200	1700	3200	3900	5000	6200
	> 500	1840	1420	2670	3250	4170	5170
230	< 750	4600	5150	7200	9450	11250	13100
	> 750	3833	4292	6000	7875	9375	10917
260	< 950	7000	8600	11200	15000	17500	20000
	> 950	5830	7170	9330	12500	14580	16670
350	< 2400		18100	21100	26150	34200	40200
	> 2400		15083	17583	21792	28500	33500



Größe size	T1 Nm	n1 (1/min) - FR(N)					
		3000	1000	500	250	100	50
090	< 20	390	510	620	730	960	1150
	> 20	320	420	510	610	800	960
120	< 60	580	770	960	1150	1460	1690
	> 60	480	640	800	960	1220	1410
140	< 90	1210	1750	2020	2230	3010	3540
	> 90	1010	1460	1680	1860	2500	2950
160	< 150	1670	2330	2750	3330	4170	5420
	> 150	1390	1940	2290	2780	3470	4510
200	< 350	2670	3580	4170	5420	6670	8330
	> 350	2220	2990	3470	4510	5560	6940
230	upon request						
260	< 650	7010	10900	13000	15000	18000	22000
	> 650	5840	9080	10800	12500	15000	18000
350	upon request						

## Position of Vent Filter

In lubrication types B1 and B2, the gearbox is supplied with a vent filter. The possible locations of the filter are given in the table below. When ordering, the customer should specify the side of the gearbox on which the filter should be installed.

E.G.: E4=vent on side 4. If no vent filter location is specified in the order, the location will be determined by GAM.

		Filter position					
		1	2	3	4	5	6
Type VS Model B0 - D0	E2						
	E4						

# Lubrication

Transmission Ratios  $i = 1:1 - 6:1$

Ambient temperature - 10 °C - +30 °C

Operating time 100% / h

n2 [1/min]	Size								
	065	090	120	140	160	200	230	260	350
200	A	A	A	A	A	A	A	A	B 0
300	A	A	A	A	A	A	B 0	B 0	B 0
400	A	A	A	A	A	B 0	B 0	B 0	B 0
500	A	A	A	A	B 0	B 0	B 0	B 1	B 1
600	A	A	A	B 0	B 0	B 0	B 1	B 1	B 1
700	A	A	B 0	B 0	B 0	B 1	B 1	B 1	B 1
800	A	B 0	B 0	B 0	B 0	B 1	B 1	B 1	B 1
900	A	B 0	B 0	B 0	B 1	B 1	B 1	B 1	B 1
1000	A	B 0	B 0	B 1	B 1	B 1	B 1	B 2	B 2
1100	A	B 0	B 0	B 1	B 1	B 1	B 2	B 2	B 2
1200	B 0	B 0	B 1	B 1	B 1	B 1	B 2	B 2	B 2
1500	B 0	B 0	B 1	B 1	B 1	B 2	B 2	B 2	C
1600	B 0	B 1	B 1	B 1	B 1	B 2	B 2	B 2	C
1700	B 0	B 1	B 1	B 1	B 2	B 2	B 2	C	C
1800	B 0	B 1	B 1	B 1	B 2	B 2	B 2	C	C
2200	B 0	B 1	B 1	B 2	B 2	C	C	C	C
3000	B 1	B 1	B 2	B 2	C	C	C	C	C
3400	B 1	B 2	B 2	B 2	C	C	C	C	C

Operating time 30% / h

n2 [1/min]	Size								
	065	090	120	140	160	200	230	260	350
400	A	A	A	A	A	A	A	A	B 0
500	A	A	A	A	A	A	B 0	B 0	B 0
700	A	A	A	A	A	B 0	B 0	B 0	B 1
800	A	A	A	A	B 0	B 0	B 1	B 1	B 1
900	A	A	A	B 0	B 0	B 0	B 1	B 1	B 1
1000	A	A	B 0	B 0	B 0	B 1	B 1	B 1	B 2
1100	A	A	B 0	B 0	B 0	B 1	B 1	B 1	B 2
1200	A	A	B 0	B 0	B 0	B 1	B 1	B 2	B 2
1300	A	A	B 0	B 0	B 1	B 1	B 2	B 2	B 2
1400	A	B 0	B 0	B 0	B 1	B 1	B 2	B 2	C
1500	A	B 0	B 0	B 1	B 1	B 2	B 2	B 2	C
1700	A	B 0	B 0	B 1	B 1	B 2	B 2	C	C
1900	A	B 0	B 1	B 1	B 1	B 2	B 2	C	C
2000	B 0	B 0	B 1	B 1	B 2	B 2	C	C	C
2200	B 0	B 0	B 1	B 1	B 2	C	C	C	C
2300	B 0	B 1	B 1	B 1	B 2	C	C	C	C
2800	B 0	B 1	B 1	B 2	B 2	C	C	C	C
3000	B 0	B 1	B 2	B 2	C	C	C	C	C
3300	B 0	B 1	B 2	B 2	C	C	C	C	C

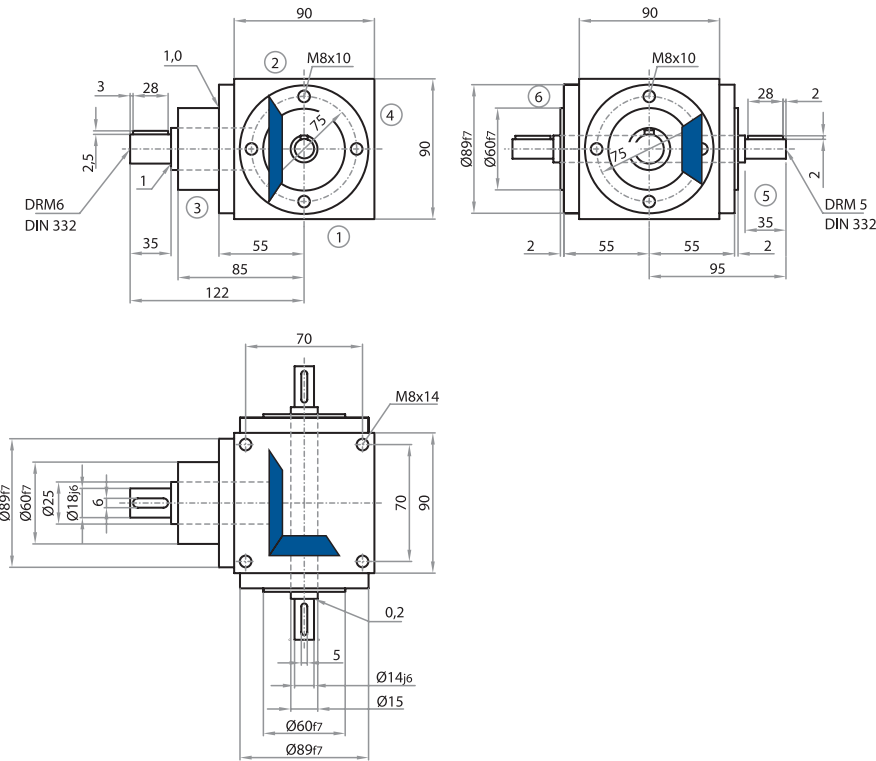
	Code	Lubrication	Venting Filter	Viscosity ISO VG
Standard	A	Dip lubrication	no	460
	B 0	Dip lubrication	no	220
	B 1	Dip lubrication	yes	220
	B 2	Dip lubrication	yes	68
	C	Spray lubrication	yes	68
	F 00	Grease lubrication	no	00
NOTOX	A	Dip lubrication	no	460
	B 0	Dip lubrication	no	220
	B 1	Dip lubrication	yes	220
	B 2	Dip lubrication	yes	68
	F 00	Grease lubrication	no	00

# Type VS

## Bevel Gearboxes

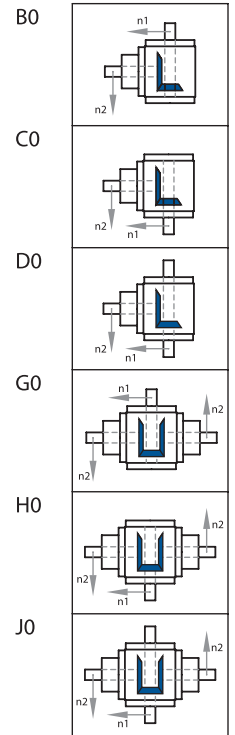
Ratio	n <sub>1</sub> 1/min	n <sub>2</sub> 1/min	kW Nm	Size								
				090	120	140	160	200	230	260	350	
<b>1.5:1 - 2:1</b>			<b>P1Nt</b>	<b>3,80</b>	<b>6,20</b>	<b>10,00</b>	<b>15,00</b>	<b>26,00</b>			<b>42,00</b>	
<b>1.5:1</b>	3000	2000	P1N	5,51	13,45	24,91	40,78	72,75	upon request	189,58	upon request	
			T2N	25,00	61,00	113,00	185,00	330,00		860,00		
	2400	1600	P1N	4,59	11,46	22,22	36,15	63,49		158,72		
			T2N	26,00	65,00	126,00	205,00	360,00		900,00		
	1500	1000	P1N	3,20	8,60	17,08	27,78	48,17		104,71		
			T2N	29,00	78,00	155,00	252,00	437,00		950,00		
	1000	667	P1N	2,35	6,32	12,87	20,59	37,13		73,50		
			T2N	32,00	86,00	175,00	280,00	505,00		1000,00		
	750	500	P1N	1,93	5,18	10,47	16,26	30,31		55,11		
			T2N	35,00	94,00	190,00	295,00	550,00		1000,00		
	500	333	P1N	1,36	3,70	7,34	11,56	22,02		36,70		
			T2N	37,00	100,00	200,00	315,00	600,00		1000,00		
	250	167	P1N	0,74	1,84	3,76	6,07	11,04		18,40		
			T2N	40,00	100,00	204,00	330,00	600,00		1000,00		
	50	33	P1N	0,15	0,37	0,76	1,29	2,18		3,64		
			T2N	40,00	100,00	210,00	355,00	600,00		1000,00		
				<b>T2max</b>	<b>40,00</b>	<b>100,00</b>	<b>210,00</b>	<b>360,00</b>	<b>600,00</b>		<b>1000,00</b>	
	<b>2:1</b>	3000	1500	P1N	3,80	9,26	16,53	28,11	51,25		133,92	
T2N				23,00	56,00	100,00	170,00	310,00		810,00		
2400		1200	P1N	3,17	8,07	14,68	25,53	45,24		112,43		
			T2N	24,00	61,00	111,00	193,00	342,00		850,00		
1500		750	P1N	2,23	6,03	11,41	20,25	35,13		78,53		
			T2N	27,00	73,00	138,00	245,00	425,00		950,00		
1000		500	P1N	1,65	4,40	8,38	14,88	27,56		57,87		
			T2N	30,00	80,00	152,00	270,00	500,00		1050,00		
750		375	P1N	1,24	3,30	6,86	11,57	21,90		48,36		
			T2N	30,00	80,00	166,00	280,00	530,00		1170,00		
500		250	P1N	0,82	2,20	4,96	8,27	14,60		33,07		
			T2N	30,00	80,00	180,00	300,00	530,00		1200,00		
250		125	P1N	0,41	1,10	2,48	4,41	7,30		16,53		
			T2N	30,00	80,00	180,00	320,00	530,00		1200,00		
50		25	P1N	0,08	0,22	0,50	0,88	1,46		3,31		
			T2N	30,00	80,00	180,00	320,00	530,00		1200,00		
				<b>T2max</b>	<b>30,00</b>	<b>80,00</b>	<b>180,00</b>	<b>320,00</b>	<b>530,00</b>		<b>1200,00</b>	

# Type VS 090

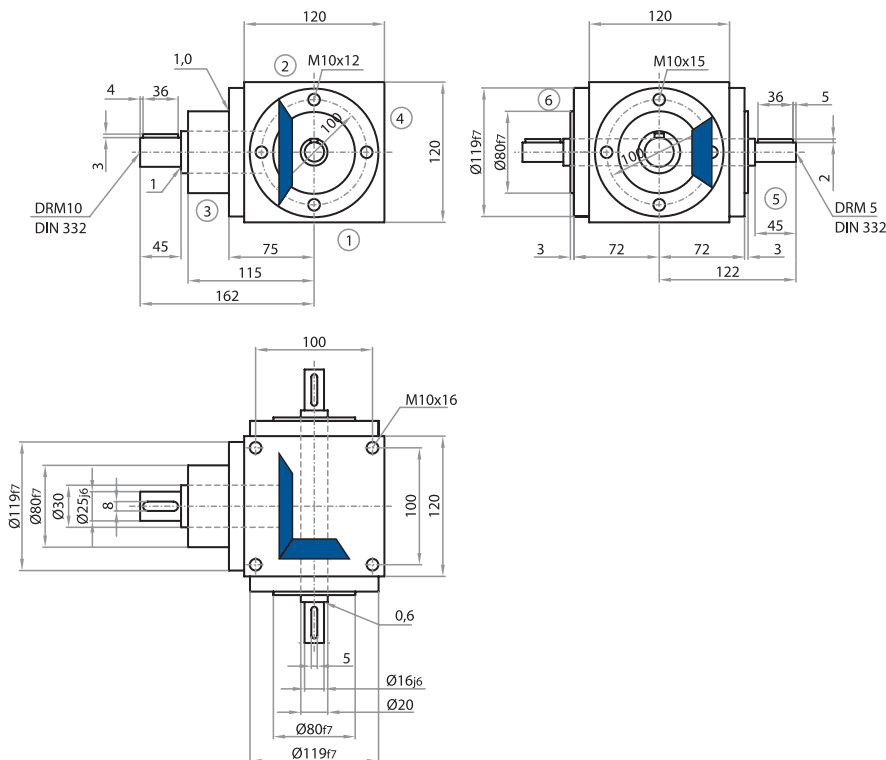


**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4.  
 Alternatively, also possible in the grid dimension of 75x75 on sides 5 & 6.  
 Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model

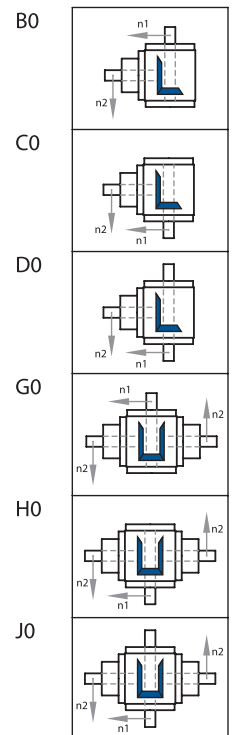


# Type VS 120



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 5 & 6.  
 Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## Model



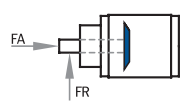
### Power Ratings, Torque Ratings [n = min-1, P = kW, T = Nm] VS 090

i =	1.5:1	P1N	2:1	P1N
n1	n2	T2N	n2	T2N
3000	2000	5,51 25,00	1500	3,80 23,00
2400	1600	4,59 26,00	1200	3,17 24,00
1500	1000	3,20 29,00	750	2,23 27,00
1000	667	2,35 32,00	500	1,65 30,00
750	500	1,93 35,00	375	1,24 30,00
500	333	1,36 37,00	250	0,82 30,00
250	167	0,74 40,00	125	0,41 30,00
50	33	0,15 40,00	25	0,08 30,00
<b>P1Nt</b>		<b>3,80</b>		<b>3,80</b>
<b>T2max</b>		<b>40,00</b>		<b>30,00</b>

### VS120

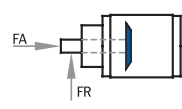
i =	1.5:1	P1N	2:1	P1N
n1	n2	T2N	n2	T2N
3000	2000	13,45 61,00	1500	9,26 56,00
2400	1600	11,46 65,00	1200	8,07 61,00
1500	1000	8,60 78,00	750	6,03 73,00
1000	667	6,32 86,00	500	4,40 80,00
750	500	5,18 94,00	375	3,30 80,00
500	333	3,70 100,00	250	2,20 80,00
250	167	1,84 100,00	125	1,10 80,00
50	33	0,37 100,00	25	0,22 80,00
<b>P1Nt</b>		<b>6,20</b>		<b>6,20</b>
<b>T2max</b>		<b>100,00</b>		<b>80,00</b>

### Radial Forces (N)

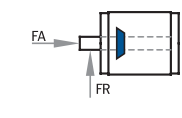


T2 Nm	n2 (1/min)			
	1500	1000	500	250
< 30	300	400	470	580
> 30	250	330	390	490

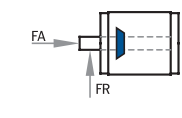
### Radial Forces (N)



T2 Nm	n2 (1/min)			
	1500	1000	500	250
< 80	470	620	720	900
> 80	390	520	600	750



T1 Nm	n1 (1/min)			
	3000	1000	500	250
< 20	390	510	620	730
> 20	320	420	510	610



T1 Nm	n1 (1/min)			
	3000	1000	500	250
< 60	580	770	960	1150
> 60	480	640	800	960

For more information and reinforced bearings, refer to general information.

Axial forces FA = 50% of radial forces - refer to general information.

### Moments of Inertia J(kgcm<sup>2</sup>)

Model	Ratio	
	1.5:1	2:1
B0, C0	0,8312	0,4858
D0	0,8462	0,5008

### Gearbox Weights (kg)

Model	app. Weight
B0, C0	5,1
D0	5,1
G0, H0	6,6
J0	6,6

reduced to the input shaft (n1)

### Moments of Inertia J(kgcm<sup>2</sup>)

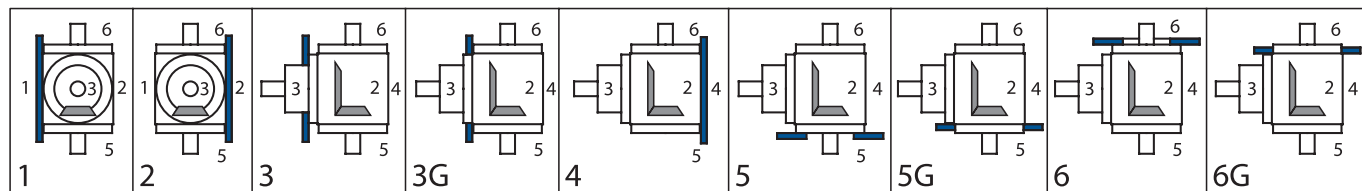
Model	Ratio	
	1.5:1	2:1
B0, C0	3,6203	2,0872
D0	3,6615	2,1284

### Gearbox Weights (kg)

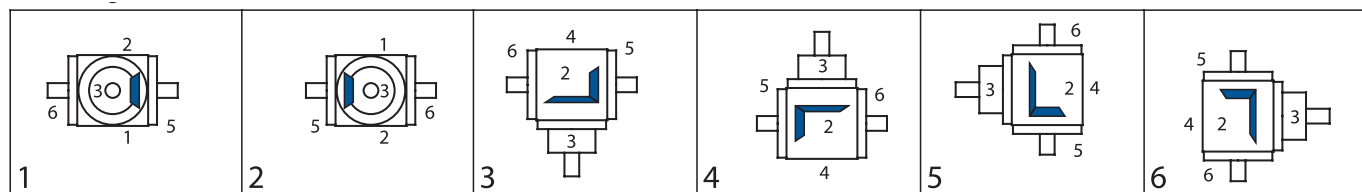
Model	app. Weight
B0, C0	18,5
D0	18,8
G0, H0	22,7
J0	23

reduced to the input shaft (n1)

### Mounting Side



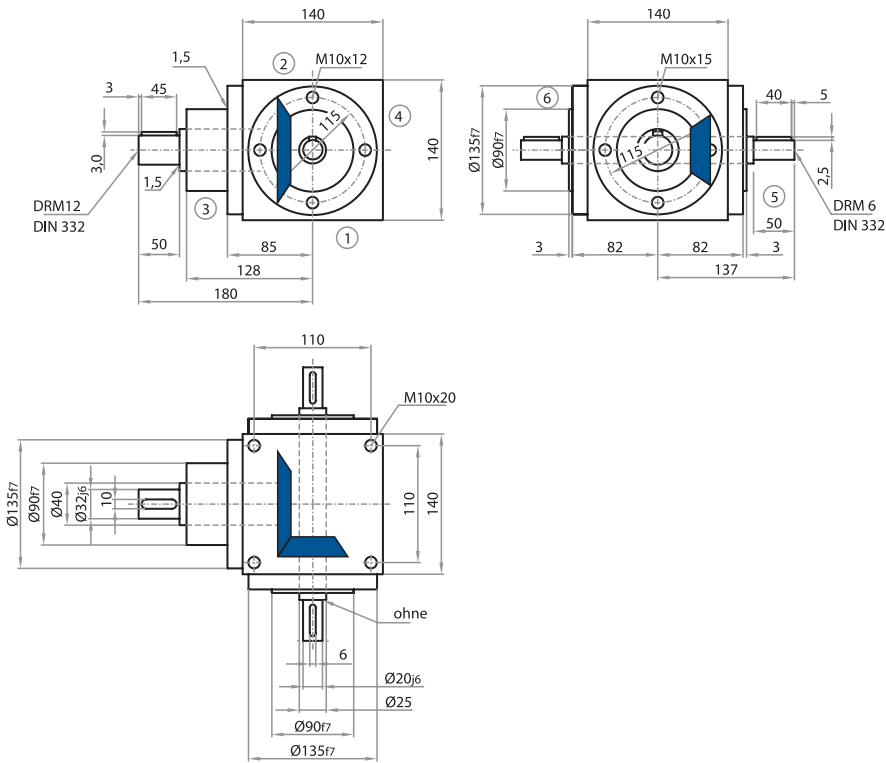
### Mounting Configuration (downward-facing side)



### Example of Order

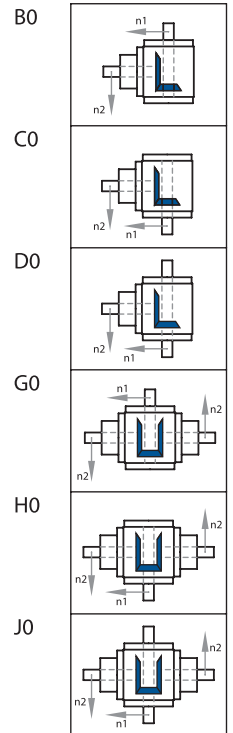
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
V		090		2:1		D0		1		1		-	500 / 0000=Standard	

# Type VS 140

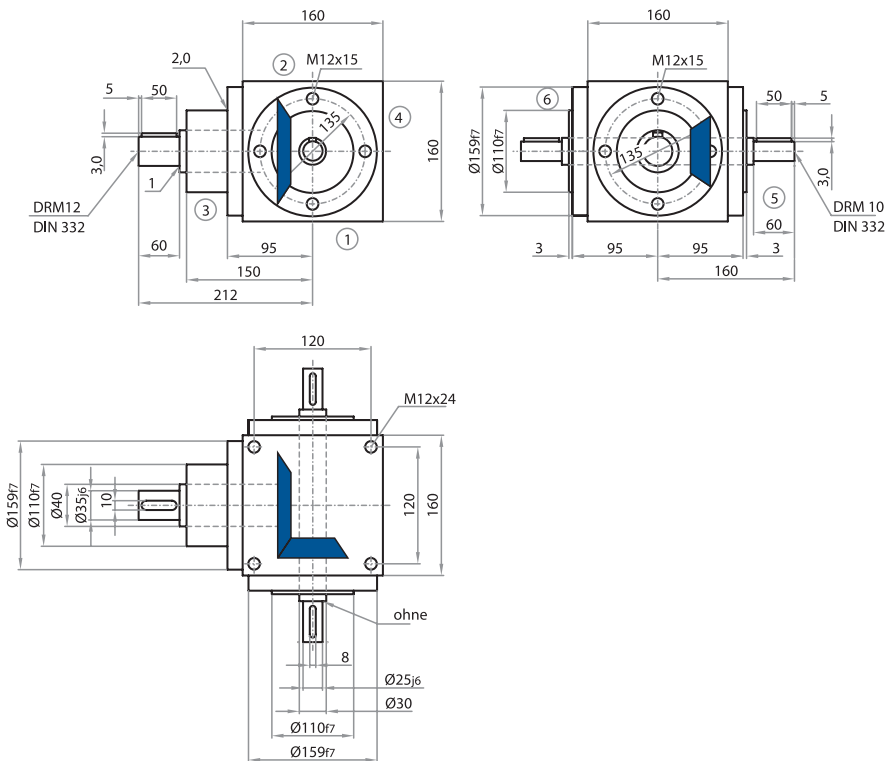


**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## III Model

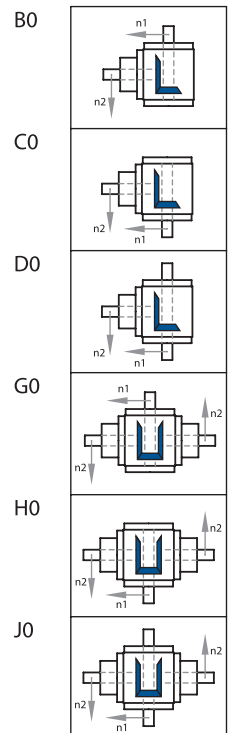


# Type VS 160



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible in the grid dimension of 130x130 on sides 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

## III



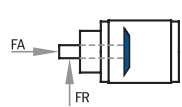
### Power Ratings, Torque Ratings [n = min-1, P = kW, T = Nm] VS 140

i =	1.5:1	P1N	2:1	P1N
n1	n2	T2N	n2	T2N
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	0,5 180
<b>P1Nt</b>		<b>10,00</b>	<b>10,00</b>	
<b>T2max</b>		<b>210,00</b>	<b>180,00</b>	

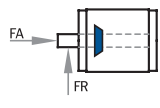
### VS 160

i =	1.5:1	P1N	2:1	P1N
n1	n2	T2N	n2	T2N
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
<b>P1Nt</b>		<b>15,00</b>	<b>15,00</b>	
<b>T2max</b>		<b>360,00</b>	<b>320,00</b>	

### Radial Forces (N)



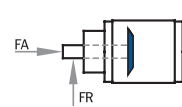
T2	n2 (1/min)					
Nm	1500	1000	500	250	100	50
< 140	700	870	1150	1370	1700	2000
> 140	590	730	960	1140	1420	1670



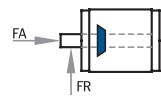
T1	n1 (1/min)					
Nm	3000	1000	500	250	100	50
< 90	1210	1750	2020	2230	3010	3540
> 90	1010	1460	1680	1860	2500	2950

For more information and reinforced bearings, refer to general Information.

### Radial Forces (N)



T2	n2 (1/min)					
Nm	1500	1000	500	250	100	50
< 220	1200	1600	1900	2200	2850	3300
> 220	1000	1340	1590	1840	2380	2750



T1	n1 (1/min)					
Nm	3000	1000	500	250	100	50
< 150	1670	2330	2750	3330	4170	5420
< 150	1390	1940	2290	2780	3470	4510

Axial forces FA = 50% of radial forces - refer to general information.

### Moments of Inertia J(kgcm<sup>2</sup>)

Model	Ratio	
	1.5:1	2:1
B0, C0	8,0202	4,8667
D0	8,1210	4,9675

### Gearbox Weights (kg)

Model	app. Weight
B0, C0	18,5
D0	18,8
G0, H0	22,7
J0	23

reduced to the input shaft (n1)

### Moments of Inertia J(kgcm<sup>2</sup>)

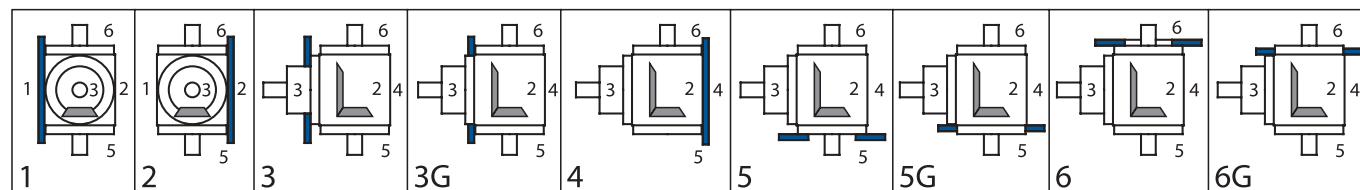
Model	Ratio	
	1.5:1	2:1
B0, C0	15,4728	8,8348
D0	15,6986	9,0606

### Gearbox Weights (kg)

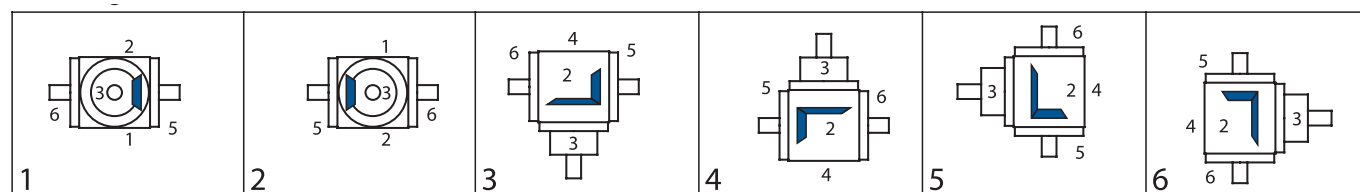
Model	app. Weight
B0, C0	27
D0	27,4
G0, H0	33,5
J0	33,9

reduced to the input shaft (n1)

### Mounting Side



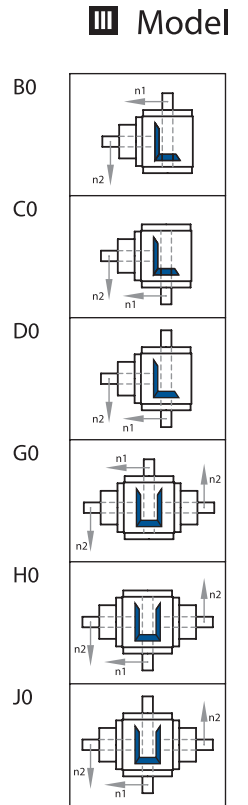
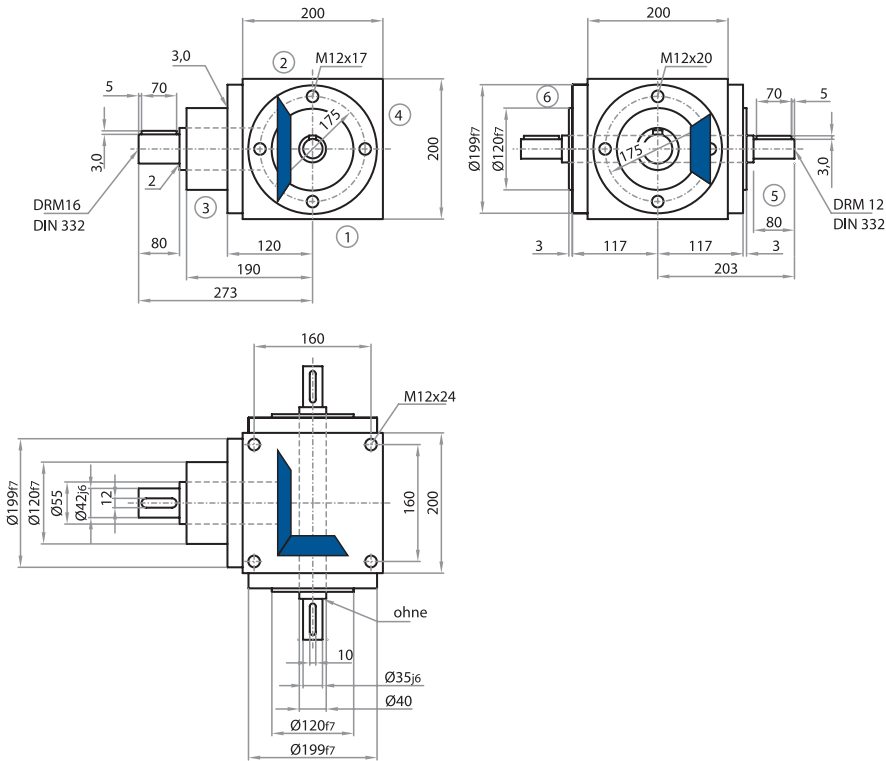
### Mounting Configuration (downward-facing side)



### Example of Order

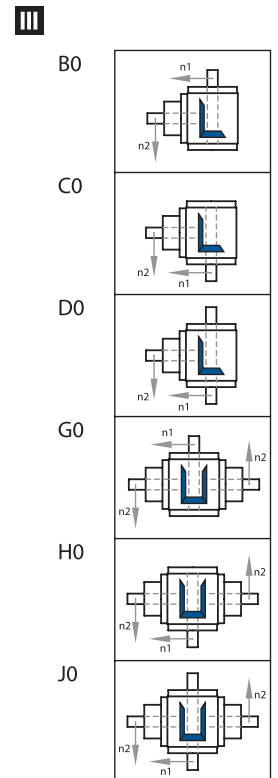
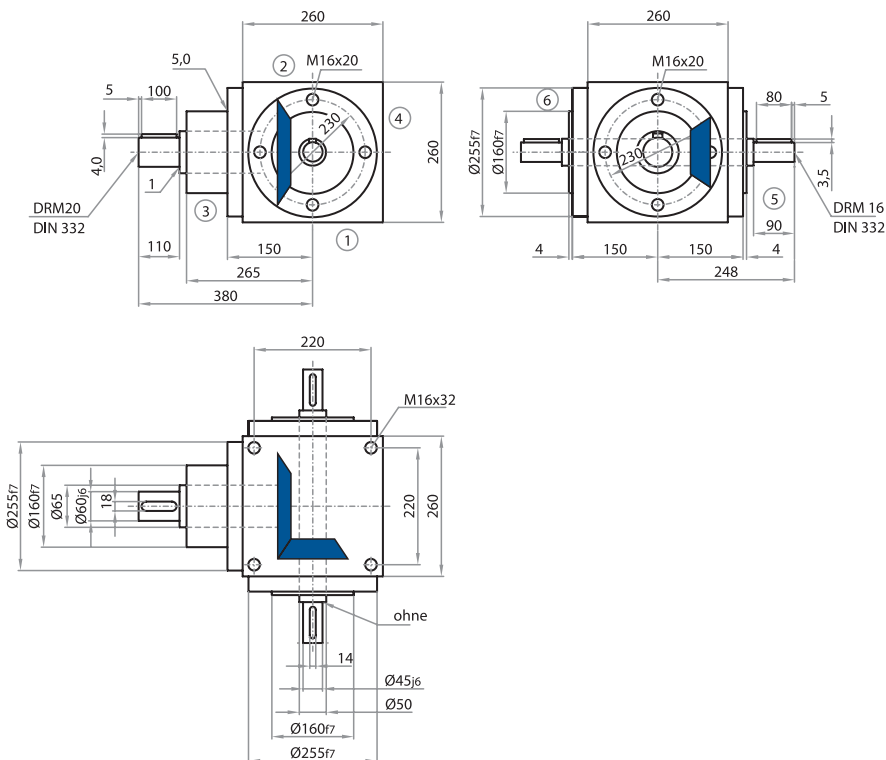
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n2max	Design
	VS	140		2:1		D0		1		1		-	500 / 0000=Standard	

# Type VS 200



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.

# Type VS 260



**Note:** Standard fastening thread in the housing only on sides 1, 2 & 4. Alternatively, also possible on sides 5 & 6. Mounting holes are shown on all sides for reference only. Mounting holes must be specified at time of order.



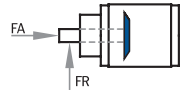
### IV Power Ratings, Torque Ratings VS 200

i = n <sub>1</sub>	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N
3000	2000	72,75 330	1500	51,25 310,00
2400	1600	63,49 360	1200	45,24 342,00
1500	1000	48,17 437	750	35,13 425,00
1000	667	37,13 505	500	27,56 500,00
750	500	30,31 550	375	21,90 530,00
500	333	22,02 600	250	14,60 530,00
250	167	11,04 600	125	7,30 530,00
50	33	2,18 600	25	1,46 530,00
<b>P1Nt</b>		<b>26,00</b>		<b>26,00</b>
<b>T2max</b>		<b>600,00</b>		<b>530,00</b>

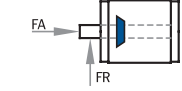
### VS 260

i = n <sub>1</sub>	1.5:1 n <sub>2</sub>	P1N T2N	2:1 n <sub>2</sub>	P1N T2N
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	73,5 1000	500	57,87 1050
750	500	55,11 1000	375	48,36 1170
500	333	36,7 1000	250	33,07 1200
250	167	18,4 1000	125	16,53 1200
50	33	3,64 1000	25	3,31 1200
<b>P1Nt</b>		<b>42,00</b>		<b>42,00</b>
<b>T2max</b>		<b>1000,00</b>		<b>1200,00</b>

### Radial Forces (N)



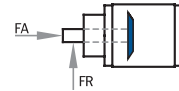
T2 Nm	n <sub>2</sub> (1/min)			
	1500	1000	500	250
< 500	2200	1700	3200	3900
> 500	1840	1420	2670	3250



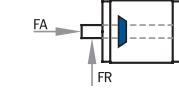
T1 Nm	n <sub>1</sub> (1/min)			
	3000	1000	500	250
< 350	2670	3580	4170	5420
> 350	2220	2990	3470	4510

For more information and reinforced bearings, refer to general Information.

### Radial Forces (N)



T2 Nm	n <sub>2</sub> (1/min)			
	1500	1000	500	250
< 950	7000	8600	11200	15000
> 950	5830	7170	9330	12500



T1 Nm	n <sub>1</sub> (1/min)			
	3000	1000	500	250
< 650	7010	10900	13000	15000
> 650	5840	9080	10800	12500

Axial forces FA = 50% of radial forces - refer to general information.

### Moments of Inertia J (kgcm<sup>2</sup>)

Model	Ratio	
	1.5:1	2:1
B0, C0	48,1230	26,6926
D0	49,2795	27,8491

### Gearbox Weights (kg)

Model	app. Weight
B0, C0	18,5
D0	18,8
G0, H0	22,7
J0	23

reduced to the input shaft (n<sub>1</sub>)

### Moments of Inertia J (kgcm<sup>2</sup>)

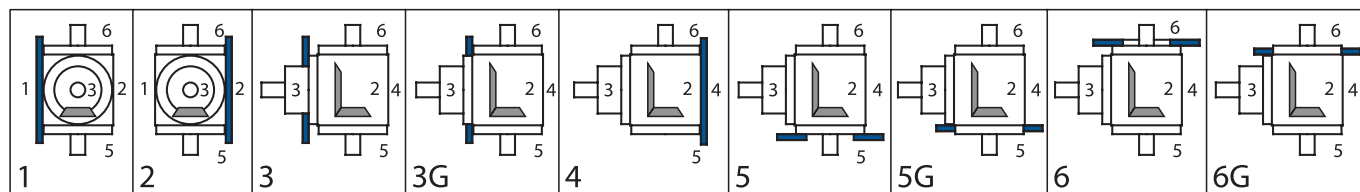
Model	Ratio	
	1.5:1	2:1
B0, C0	281,9693	137,4610
D0	286,8342	142,3258

### Gearbox Weights (kg)

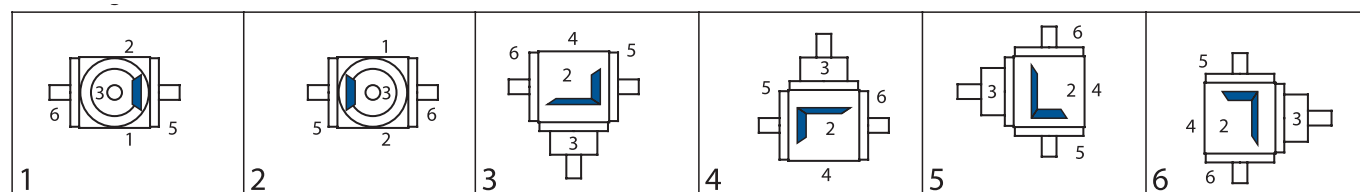
Model	app. Weight
B0, C0	83
D0	84,5
G0, H0	107
J0	108,5

reduced to the input shaft (n<sub>1</sub>)

### V Mounting Side



### VI Mounting Configuration (downward-facing side)



### Example of Order

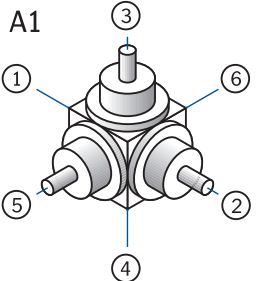
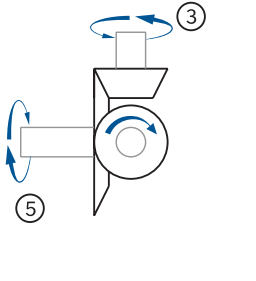
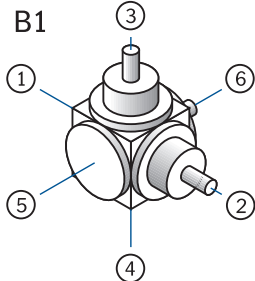
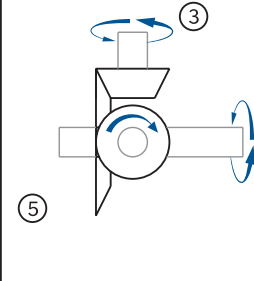
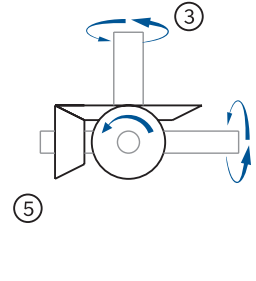
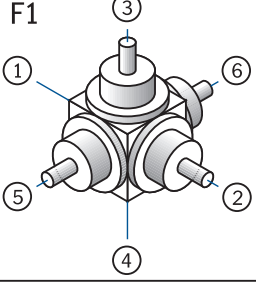
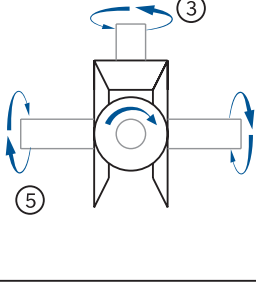
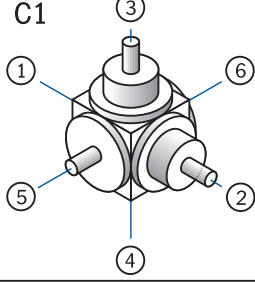
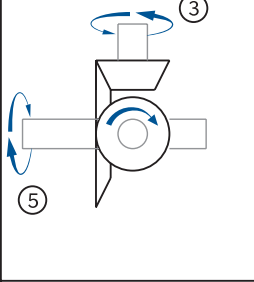
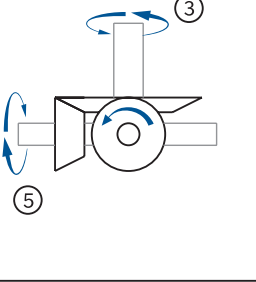
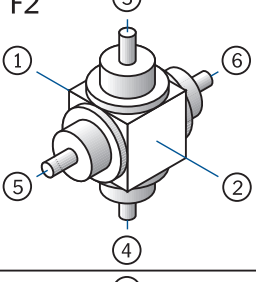
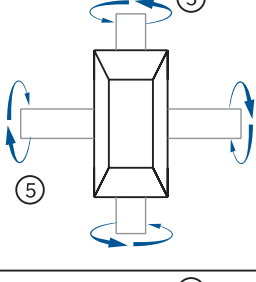
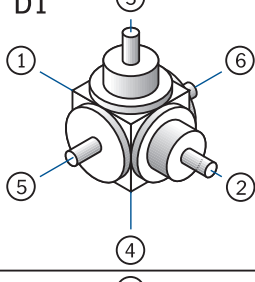
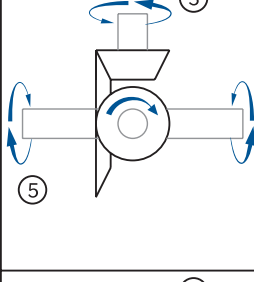
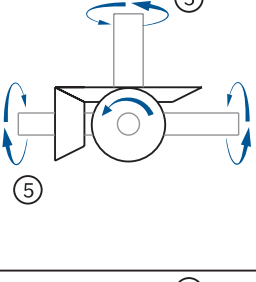
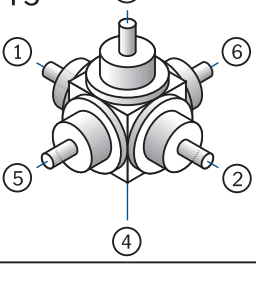
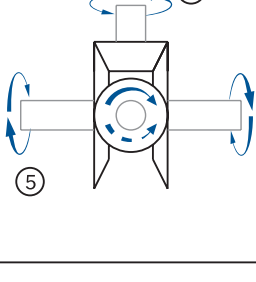
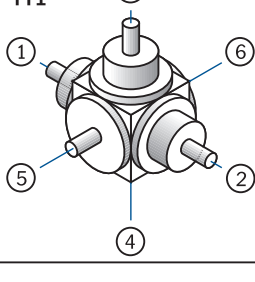
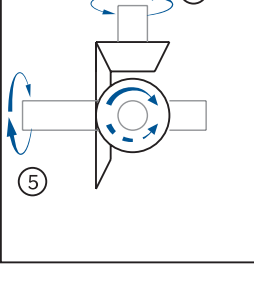
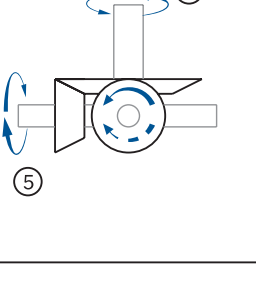
I	Type	Size	IV	Ratio	III	Model	V	Mounting Side	VI	Mounting Config.	IV	Speed	n <sub>2max</sub>	Design
	VS	200		2:1		D0		1		1		-	300 / 0000=Standard	

# Multi Shaft Gearboxes

## Multi-Shaft Gearboxes = Gearboxes with shafts on x, y and z axis

The modular construction of our bevel gearboxes makes it possible to produce a wide range of design variants. The dimensions are the same as those of the standard versions. With the exception of  $i=1:1$ , all transmission ratios are available.

(Exception: model F2 is also available in  $i=1:1$ !)

Type V				Type VS	
<b>A1</b> 		<b>B1</b> 			
<b>F1</b> 		<b>C1</b> 			
<b>F2</b> 		<b>D1</b> 			
<b>F3</b> 		<b>H1</b> 			

Type V		Type VS		
		<b>H2</b> 		
<b>F4</b> 		<b>G1</b> 		
<b>E1</b> 		<b>G2</b> 		
<b>K1</b> 		<b>J1</b> 		
<b>K2</b> 		<b>J2</b> 		

# Additional Products

# KLC



## Major Features

- Bellows coupling with radial clamping hubs.
- Short overall length.
- Welded hub bellow connection.
- Same day delivery available.
- Low cost.

## Material

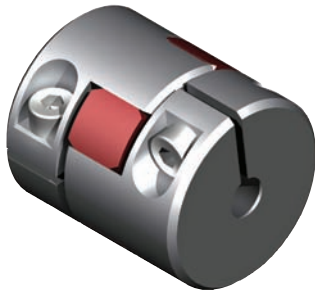
- Stainless steel bellow; steel hubs

## Technical data/Dimensions

Size KLC	Nominal Torque	Moment of Inertia	Torsion Resistance	Max. Lateral Misalign- ment	Mass	Screw Size	Torque to Tighten Screws	Outer Diameter	Length	Bore Range	
	Nm (lb-in)	10 <sup>-3</sup> kgm <sup>2</sup> (lb-in <sup>2</sup> )	Nm/arcmin (lb-ft/Deg)	mm (inch)	kg (lbs)		Nm (lb-in)	mm (inch)	mm (inch)	min. mm (inch)	max. mm (inch)
KLC-25	25	0.09	3.5	0.2	0.22	M5	10	50	61	10	28
	(221)	(0.31)	(154.9)	(0.008)	(0.5)		(89)	(1.969)	(2.402)	(0.394)	(1.102)
KLC-50	50	0.22	6.5	0.2	0.43	M6	18	60	67	15	34
	(443)	(0.75)	(287.7)	(0.008)	(0.9)		(159)	(2.362)	(2.638)	(0.591)	(1.339)
KLC-125	125	0.75	12	0.2	0.9	M8	40	77	81	16	43
	(1106)	(2.56)	(531.1)	(0.008)	(2)		(354)	(3.031)	(3.189)	(0.63)	(1.693)

Coupling must be selected so nominal torque is higher than highest operational torque of the application (i.e., during acceleration).  
Bore diameters smaller than the minimum are possible but reliable transmission of nominal torque cannot be guaranteed.

# EKC



## Major Features

- Low cost elastomer coupling for motion control applications
- Quick standard delivery (same day delivery available)
- Star-shaped elastomer element with involute tooth profile and high shore hardness ensures zero backlash over life of product.
- Elastomer spider compensates for small shaft misalignments.

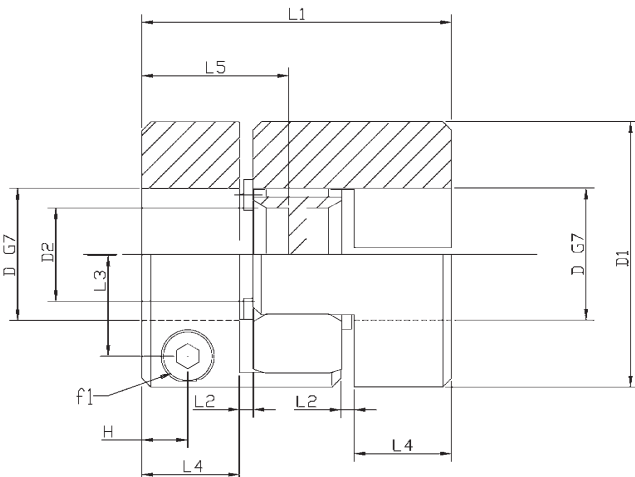
## Material

- Anodized aluminum hubs and polyurethane 92 Shore A, 98 Shore A, and 72 Shore D spiders available

## Technical data/Dimensions

Coupling Size	Rated Torque* Nm (lb-in)	Elastomer	Elastomer Color (Red is standard)	Moment of Inertia $10^{-3} \text{kgm}^2$ (lb-in <sup>2</sup> )	Torsion Resistance Nm/arcmin (lb-ft/Deg)	Max. Lateral Misalign- ment mm (inch)	Mass kg (lbs)	Torque to Tighten Screws Nm (lb-in)	Bore Range (D)		Standard Bore Sizes
									min.	max.	
								mm (inch)	mm (inch)		
EKC-5	5 (44)	92 Sh A	Yellow	0.0060 (0.0204)	0.008 (0.35)	0.15 (0.0059)	0.045 (0.1)	5.65 (50)	5 (0.1969)	15 (0.5906)	6, 8, 10, 11, 12, 14 0.25", 0.375", 0.5"
		98 Sh A	Red		0.013 (0.58)	0.09 (0.0035)					
		72 Sh D	White		0.018 (0.81)	0.04 (0.0016)					
EKC-25	25 (221)	92 Sh A	Yellow	0.0407 (0.1390)	0.109 (4.84)	0.1 (0.0039)	0.14 (0.31)	13.00 (115)	8 (0.3150)	20 (0.7874)	10, 11, 12, 14, 16, 19, 20 0.375", 0.5", 0.625", 0.75"
		98 Sh A	Red		0.182 (8.06)	0.06 (0.0024)					
		72 Sh D	White		0.255 (11.29)	0.03 (0.0012)					
EKC-35	35 (310)	92 Sh A	Yellow	0.1667 (0.5696)	0.268 (11.869)	0.14 (0.0055)	0.28 (0.62)	13.00 (115)	13 (0.5118)	28 (1.1024)	14, 16, 19, 20, 24, 28 0.5", 0.625", 0.75", 1"
		98 Sh A	Red		0.447 (19.78)	0.1 (0.0039)					
		72 Sh D	White		0.626 (27.69)	0.05 (0.0020)					
EKC-80	80 (708)	92 Sh A	Yellow	0.3825 (1.3071)	0.346 (15.32)	0.15 (0.0059)	0.53 (1.17)	27.68 (245)	19 (0.7480)	38.1 (1.5)	19, 20, 24, 28, 32, 35 0.75", 1", 1.25", 1.375", 1.5"
		98 Sh A	Red		0.577 (25.53)	0.11 (0.0043)					
		72 Sh D	White		0.808 (35.74)	0.06 (0.0024)					
EKC-110	110 (974)	92 Sh A	Yellow	1.1026 (3.7677)	0.661 (29.25)	0.17 (0.0067)	0.96 (2.12)	27.68 (245)	24 (0.9449)	45 (1.7717)	24, 28, 32, 35, 38, 40 1", 1.25", 1.375", 1.5"
		98 Sh A	Red		1.102 (48.76)	0.12 (0.0047)					
		72 Sh D	White		1.542 (68.26)	0.07 (0.0028)					

\*Higher torques permissible at larger bores



Dimension	EKC-5	EKC-25	EKC-35	EKC-80	EKC-110
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
L1: Overall Length	35 (1.38)	66 (2.6)	78 (3.07)	90 (3.54)	114 (4.49)
L2: Gap	1.5 (0.06)	2 (0.08)	2 (0.08)	2.5 (0.10)	3 (0.12)
L3: Radial Bolt Location	10 (0.39)	14.5 (0.57)	20 (0.79)	25 (0.98)	30 (1.18)
L4: Hub Thickness	11 (0.43)	25 (0.98)	30 (1.18)	35 (1.38)	45 (1.77)
L5: Engagement	16.5 (0.65)	31.5 (1.24)	37.5 (1.475)	43 (1.69)	55 (2.165)
D1: Hub OD	30 (1.18)	40 (1.57)	55 (2.17)	65 (2.56)	80 (3.15)
D1*: Overall OD (w/ bolts)	32 (1.26)	45 (1.77)	57 (2.24)	72 (2.83)	83 (3.27)
D2: Elastomer ID	10.5 (0.41)	18 (0.71)	27 (1.06)	30 (1.18)	38 (1.5)
H: Axial Bolt Location	5 (0.2)	11 (0.43)	10.5 (0.41)	11.5 (0.45)	15.5 (0.61)
f1: Screw Size	M4	M6	M6	M8	M8

Red: 98 Shore A

Yellow: 92 Shore A

White: 72 Shore D



Coupling must be selected so rated torque is higher than highest operational torque of the application (i.e., during acceleration).

## Torsion-Resistant Servo Couplings and Safety Couplings in a Wide Range of Types and Sizes

### Bellows Couplings

- Torque values from 0.44 Nm to 44,000 Nm allow use of servo motors
- High torsional rigidity, low inertia, zero backlash and misalignment compensation
- Can be used at temperatures up to 570°F without any limitations and maintenance free
- Patented Press-Fit method of joining the bellow to the hubs can withstand harsh environments where glued connections cannot
- High speeds: rotational speeds up to 25,000 RPM without additional balancing



#### KM Series

- Provides the best balance between coupling stiffness and shaft misalignment compensation
- Aluminum hubs provide low inertia for servo systems
- Radial clamping hub with EASY Clamp system for easy install/uninstall
- Bore range: 3 mm - 85 mm
- Torque range: 0.4 Nm - 1300 Nm



#### KR Series

- Unique bellows design yields the highest performance in stiffness, for the most demanding servo applications.
- Radial clamping hub with EASY Clamp system for easy install/uninstall
- Bore range: 14 mm - 75 mm
- Torque range: 25 Nm - 540 Nm



#### KP Series

- Similar to the KM coupling
- Shorter in length to provide an even higher torsional stiffness, but lower misalignment capability
- Aluminum hubs provide low inertia for servo systems
- Radial clamping hub with EASY Clamp system for easy install/uninstall
- Bore range: 3 mm - 75 mm
- Torque range: 2 Nm - 550 Nm



#### KSS Series

- Similar to the KR coupling
- Self-centering conical bushings for high clamping forces
- Short length and high torque
- Bore range: 15 mm - 70 mm
- Torque range: 25 Nm - 1500 Nm



#### KG Series

- Similar to the KLC coupling
- Radial clamping hub with EASY Clamp system for easy install/uninstall
- Additional sizes
- Bore range: 6 mm - 90 mm
- Torque range: 5 Nm - 1300 Nm



#### KPP Series

- Plug-in design with high stiffness
- EASY Clamp system for easy install/uninstall
- Short length
- Bore range: 9 mm - 75 mm
- Torque range: 20 Nm - 550 Nm



#### KGS Series

- Similar to the KG coupling
- Split hubs allow the coupling to be installed onto shafts that cannot be moved
- Custom lengths
- High stiffness
- Bore range: 12 mm - 62 mm
- Torque range: 40 Nm - 700 Nm



#### KPS Series

- Expandable split shaft design
- EASY Clamp system for easy install/uninstall
- For hollow bore applications
- Bore range: 3 mm - 75 mm
- Torque range: 2 Nm - 550 Nm



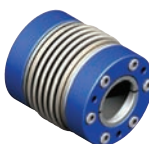
#### KSD Series

- High clamping forces and high torque
- Maximum misalignment with short length
- Self-centering conical bushings
- Bore range: 15 mm - 97 mm
- Torque range: 20 Nm - 2500 Nm



#### WDS Series

- Drive shaft coupling with split hubs
- Lengths up to 20 feet
- High speeds and low inertia
- Bore range: 6 mm - 85 mm
- Torque range: 15 Nm - 1600 Nm



#### KHS Series

- High speeds up to 25,000 rpm
- Very low inertia
- High stiffness
- Bore range: 6 mm - 60 mm
- Torque range: 15 Nm - 600 Nm



#### WDE Series

- Drive shaft coupling with split hubs
- Lengths up to 10 ft
- Medium to high speeds with low inertia
- Bore range: 14 mm - 70 mm
- Torque range: 40 Nm - 500 Nm

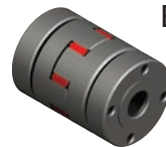
## Elastomer Couplings

- The use of elastomer spiders with shore hardness ratings from 72 D to 98 A permit dampening of vibration caused by system resonance
- An affordable alternative if high stiffness is not critical
- The involute shaped teeth of the elastomer spider and jaws are preloaded and will not loosen over time. Ensures zero backlash and allows for easy plug-in assembly



### EKM Series

- Excellent dampening capabilities
- Easy to mount radial clamping hubs
- Same day delivery
- Bore range: 3 mm - 70 mm
- Torque range: 3 Nm - 1000 Nm



### ESM Series

- Excellent dampening capabilities
- High speeds
- Aluminum version available
- Bore range: 6 mm - 60 mm
- Torque range: 10 Nm - 1000 Nm



### EKZ Series

- Drive shaft coupling with radial clamping hubs
- Excellent dampening capabilities
- Lengths up to 6 feet
- Bore range: 10 mm - 70 mm
- Torque range: 20 Nm - 700 Nm



### EKS Series

- Excellent dampening capabilities
- Expandable split shaft design
- For hollow bore applications
- Bore range: 8 mm - 70 mm
- Torque range: 8 Nm - 700 Nm

## Protect Your Investment from Crashes and Jams with Safety Couplings

- Low inertia; compensation of misalignment
- Zero backlash; high torsional stiffness
- Patented Press-Fit method joins bellows to the hubs to withstand harsh environments
- Automatic re-engagement: occurs every 360°
- Integrated bearing support: eliminates the need for support inside the pulley and enables compact size
- Degressive cup spring characteristic: immediate torque drop-off



### SKB-KP Series

- Single point 360° re-engagement
- Adjustable torque
- Maximum misalignment and high stiffness
- Bore range: 6 mm - 75 mm
- Torque range: 2 Nm - 800 Nm



### SKB Series

- Radial clamping hub connection to the shaft
- Single point 360 degree re-engagement
- Integrated ball bearing for the highest true running accuracy
- Adjustable torque
- Very high clamping forces and torque range
- Bore range: 6 mm - 100 mm
- Torque range: 2 Nm - 3000 Nm



### SKB-KS Series

- Single point 360° re-engagement
- Adjustable torque
- Self-centering conical bushings
- Bore range: 6 mm - 58 mm
- Torque range: 2 Nm - 800 Nm



### SKY Series

- Similar to the SKB but with a taper lock bushing to connect to the mating shaft



### SKB-EK Series

- Single point 360° re-engagement
- Adjustable torque
- Excellent dampening capabilities
- Bore range: 7 mm - 70 mm
- Torque range: 2 Nm - 800 Nm



### SKG Series

- Single point 360° re-engagement
- Integrated bearing to support pulleys and sprockets
- Adjustable torque with self-centering hub
- Bore range: 12 mm - 62 mm
- Torque range: 2 Nm - 1500 Nm



### SKB-ES Series

- Single point 360° re-engagement
- Adjustable torque with self-centering conical hubs
- Excellent dampening capabilities
- Bore range: 7 mm - 60 mm
- Torque range: 2 Nm - 800 Nm



### SKX-L Series

- Single point 360° re-engagement
- Adjustable torque
- Bore range: 7 mm - 58 mm
- Torque range: 2 Nm - 800 Nm
- Our most economical in-direct drive safety coupling



If you need high precision gear reducers, couplings and/or linear slide kits at a reasonable cost and you value innovation and excellent service, take a close look at our product line. You will find a wide range of products all created to minimize your design and installation time, minimize space requirements, and maximize your machine's performance.

Choose from:

- A wide range of inline and right-angle gearboxes with varying degrees of precision
- A unique and convenient mounting solution for attaching motors or gearboxes to linear slides
- A complete line of bellows, elastomer and safety couplings

Can't find what you're looking for? Just ask.

Even with our broad product range, we realize that you may not find a product that meets your exact requirements. Tell us what you need – with our flexible manufacturing we should be able to accommodate your special requirements. GAM can. Just ask!

## Linear Mount Products

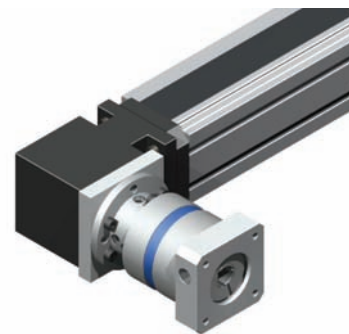
The Linear Mount Series takes the hassle out of mounting your motor gearbox to a linear ball screw or belt module.



### EPL-H

- Inline, hollow output for easy mounting to standard linear belts or ball screw modules

- EPL-H mounted to a module

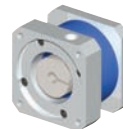


### EPL-H Gearboxes

- Our most popular in-line planetary with a unique hollow output and zero-backlash clamping ring
- Quick, simple, and low-cost solution used to mount onto any off-the-shelf linear belt or ball screw modules
- Precision gears
- Ratios up to 1000:1
- Frame sizes from 64 mm to 118 mm
- Same backlash and efficiencies as EPL Series

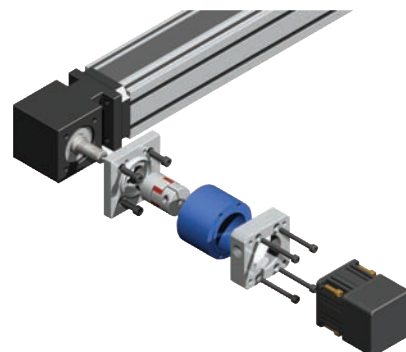
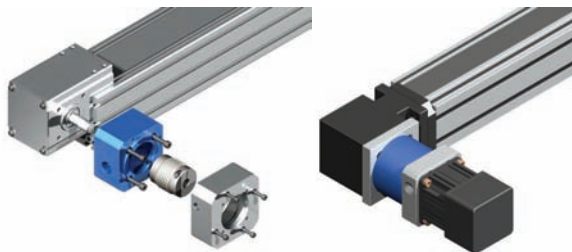
### Linear Slide Kit (LSK)

- Customized assembly to mount any motor or gearbox to any linear slide
- Coupling included
- Quick delivery



### LSK

- Standard LSK tailored to your exact mounting needs



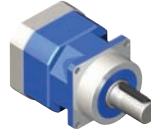
- Unique 1 or 2 piece design for high volume requirements

## Gear Reducers for Every Application Simple or Complex

### *Inline Gear Reducers*

#### I.M.P.A.C.T. (Integrated Modular Planetary and Coupling Technology) Series

- Precision gears provide low backlash and quiet operation
- Long design life of 20,000 hours
- Lubricated for life and comes ready to mount to your motor
- Output dimensions match those of many conventional planetary gearboxes on the market
- Ratios 3:1 to 100:1
- Frame sizes from 60 mm to 240 mm
- Backlash as low as 3 arc minutes
- Efficiencies at 95%



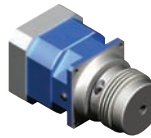
#### **SPL-W**

- Shaft output design for mounting pulleys and rack & pinion systems



#### **SPL-K**

- Integrated coupling output and lantern-housing
- Available with either a bellows coupling (KB) or elastomer spider coupling (KE)



#### **SPL-F**

- Integrated coupling output
- Available with either a bellows coupling (FB) or elastomer spider coupling (FE)

### *Right-Angle Gear Reducers*

#### Dyna Series

- Utilizes sophisticated hypoid gearing that combines the space and configuration advantages of worm gearing with the high efficiencies of bevel gearing
- High allowable axial and radial loading
- Ratios up to 15:1 in a single stage; 150:1 in two stages
- Frame sizes from 55 mm to 190 mm
- Backlash as low as 1 arc minute
- Efficiencies up to 96%



#### **DS-W**

- Single output shaft configuration



#### **DS-H**

- Hollow bore output configuration



#### **DS-T**

- Dual output shaft configuration



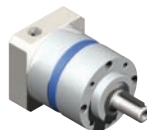
#### **DS-F**

- Flange output for more connection options, resulting in greater stiffness

## Inline Gearboxes

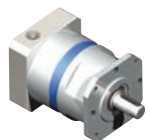
### EPL Series

- High quality, low-cost planetary gearbox
- Lightweight
- Fixed input with radial clamping ring for easy and quick mounting to motor
- Ratios 3:1 to 1000:1
- Frame sizes from 50 mm to 150 mm and NEMA 17 to 56
- Backlash as low as 8 arc minutes
- Efficiencies at 92%



#### EPL-W

- Metric output face



#### EPL-X (NEMA)

- NEMA output face

### SSP Series

- Excellent corrosion resistance – all 300 series stainless steel housing, adapter and shaft
- Viton output seal keeps contaminants out for an IP65 rating
- Standard food grade internal grease
- Frame sizes from 70 mm to 120 mm
- Ratios from 3:1 to 100:1



#### SSP

- All stainless steel version planetary gearbox

### FP Series

- Compact design
- Output flange allows easy connection of machine elements such as pinion gears, pulleys and more
- High tilting and torsional rigidity
- Ratios 4:1 to 91:1
- Frame sizes from 69 mm to 150 mm
- Backlash as low as 5 arc minutes
- Efficiencies at 94%



#### FP

- “Shaftless” planetary gearbox provides space and performance advantages



#### FP-FB

- Integrated coupling on the output for a compact and very high torsionally stiff package

## Right-Angle Gearboxes

### Dyna-Lite Series

- The advantages of a right-angle gearbox with the price and accuracy of an inline
- Low-cost hypoid gearbox
- Low backlash
- Compact and efficient
- Quick and easy motor mounting
- Ratios up to 15:1 in a single stage; 150:1 in two stages
- Frame sizes from 55 mm to 90 mm
- Backlash as low as 6 arc minutes
- Efficiencies up to 96%



#### DL-DW

- Drop-in for Dyna Series



#### DL-PW

- Drop-in for many right-angle and inline planetary gear reducers



#### DL-DH

- Drop-in for the GAM Dyna Series
- Hollow bore output with shrink disk clamping element



#### DL-PH

- Drop-in for many right angle and in-line planetary gear reducers
- Hollow bore output
- Available upon request (Call GAM)

## In-Line Gearboxes

### PE Series

- In-line planetary gearbox
- Suitable for Stepper and Servo motor applications
- Unmatched quality for its price point creates excellent value
- Fixed input sun-gear allows quick and accurate mounting of a motor
- Ratios 3:1 to 1000:1
- Frame sizes 50 mm to 118 mm (Metric) and NEMA 17 to 42



#### PE-W

- Metric output face



#### PE-N

- NEMA output face, mounts to any motor

## Right-Angle Gearboxes

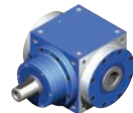
### Bevel Gearboxes (V-Series & VC Series)

- Durable spiral bevel gearbox suitable for motion control applications
- High allowable radial and axial loads on input and output shafts
- Available with or without integrated motor mount
- Ratios 1:1 to 6:1
- Frame sizes from 65 mm to 350 mm
- Backlash as low as 6 arc minutes
- Efficiencies up to 98%
- Drop-in versions available for many popular bevel gearboxes (Call GAM)



#### VC-W

- Single shaft, motor mount configuration (shown with motor mount)



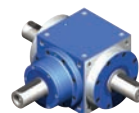
#### V-K

- Hollow shaft configuration (motor mount available)



#### V-S

- Hollow shaft configuration with shrink disk clamping collar (motor mount available)



#### V-T

- Dual shaft configuration (motor mount available)



#### V-R

- Four-shaft configuration (motor mount available)



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