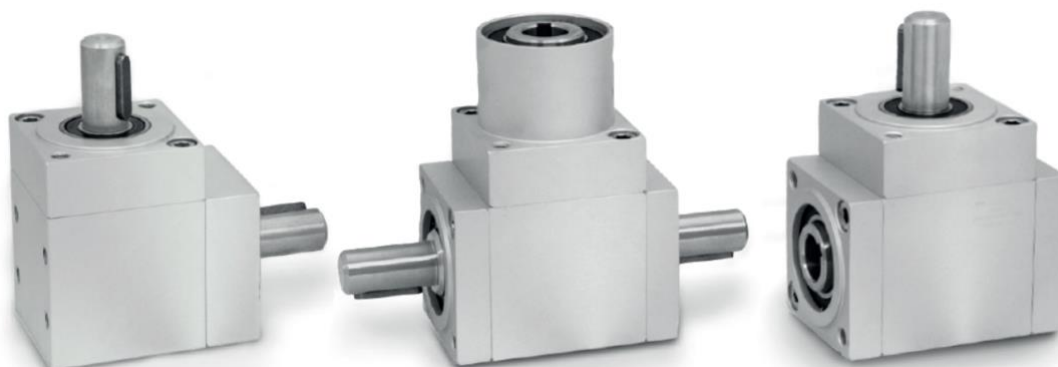


Datasheet



- Angular gearboxes with bevel and spiral bevel gears are suitable for transmitting the rotary motion between two shafts at right angles.
- Models with spiral bevel gears are available in all versions; spiral gearboxes achieve higher precision, silent operation and enable 30% higher efficiency.
- All bevel gears have ball-bearings; minimal angular and axial clearance.

Technical characteristics

Dimensions	overall, see section: versions and dimensions	
Diameter	Ø 20 mm (standard)	
Shaft, hollow shaft	42 mm <u>effective length</u> , 42,5 mm <u>construction dept.</u> (standard)	
Length Hollow shaft	40 mm (standard); at standard with keyways or on request	
Shaft		
Material		
Hollow shaft, shaft	Stainless steel (AISI 303)	
Housing	Die-cast aluminium housing, anodized natural (standard), black anodized or stainless steel (AISI 303) (optional)	
Bearing	Ball-bearings, hardened bevel gears	
Weight	2500 g	with 2 outputs
	2700 g	with 3 outputs
Version		
A	with 2 outputs	
B	with 3 outputs	
C	with 3 outputs (with opposite rotation)	
D	with 3 outputs, 2 through hollow shafts	
Reduction ratios ¹⁾	1:1	1 (standard)
	1:2	2 <i>in reducing</i> (standard)
	2:1	0,5 <i>in multiplying</i> (on request in version A, B, C, not available in version D), see Fig. 5, 6
Torque	90 Nm	
Axle load	Radial load	150 kg
	Axial load	15 kg (see Fig. 7)
Gearbox		
Straight bevel gears	Straight gearing (standard), see Fig. 1	
Spiral bevel gears	Spiral-shaped gearing, see Fig. 2	
Tolerance between gears	0,1° to 0,75°	
Lubrication	Grease fitting (optional)	

¹⁾ Gear ratios of 1:2 and 2:1 are only available with spiral bevel gears.



To choose the most suitable gearbox, please refer to the following tables of technical characteristics, efficiency diagrams, as well as the corresponding versions with dimension drawings of the gearboxes.

Datasheet



Direction of rotation

Version A	Version B	Version C	Version D	

The direction of rotation depends on the configuration and the positioning; see section Versions with dimension drawings.

Bevel gears

Fig. 1	Fig. 2	Spiral gearboxes	
Straight bevel gears	Spiral bevel gears	with 2 shafts	with 3 shafts

Spiral gearboxes (Fig. 2) achieve higher precision, silent operation and enable 30% higher efficiency. Gear ratios of 1:2 and 2:1 are only available with spiral bevel gears.

Reduction and multiplying ratio

Fig. 3	Fig. 4	Fig. 5	Fig. 6
Clockwise	Clockwise	Example	
<u>Reduction ratios</u> $i = n1 : n2$ at $i > 1$ in reducing at $i < 1$ in multiplying		1:2 in reducing $n1 = 1.000 \text{ 1/min}$ $n2 = 500 \text{ 1/min}$ $i = 2$	* 2:1 in multiplying $n1 = 1.000 \text{ 1/min}$ $n2 = 2.000 \text{ 1/min}$ $i = 0,5$ * (not available in version D)

The ratio (Fig. 5 and 6) and configuration is determined by the **n1** shaft (which is always shown on the opposite side of the fixing bores), the others shaft following clockwise (Fig. 3 and 4).

Datasheet



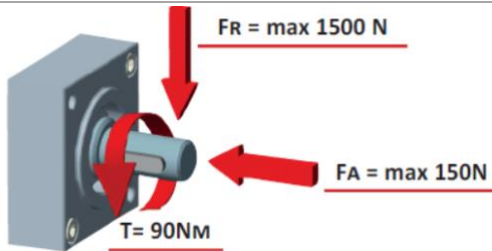
Loads

The loads on the gearbox must be considered as a whole and in relation to the superstructure, such as structural misalignments, vibrations, acceleration or deceleration, shocks, vibration, etc.

Two types of shaft loads must be considered:

radial FR (radial force) and axial FA (axial force) loads (Fig. 7).

Fig. 7



FR = radial load, FA = axial load

The radial load acts in a perpendicular direction to the shaft/axis.

The axial load acts in the same direction of the shaft/axis; when ordering please take into account, whether it is pull or push type.

T = torque

Grease fitting

Fig. 8

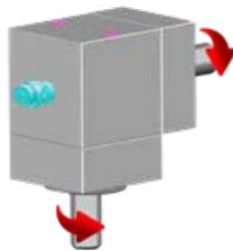


Fig. 9



The **grease fitting** is recommended when the working conditions do not correspond to the parameters indicated in the efficiency diagrams and tables (page 4); to extend the life cycle and in case the mounting position does not allow easy replacement.

The standard position of the grease fitting is shown in Fig. 8 and Fig. 9. If a different position is required, please contact our technical department.



Maintenance

Check at regular intervals that there are no leaks in the gearbox. Depending on the operating time, it is necessary to top up the correct amount of lubricant at variable intervals.

For an optimum operation we recommend the following **lubricants**:

- Long-life grease for use in continuous operation, with very good wear and corrosion protection behaviour (recommended for use in a temperature range from -20 °C to 150 °C).
- For applications in the food and pharmaceutical industry, synthetic H1 grease with good low- and high-temperature behaviour, good water resistance and corrosion protection as well as high ageing and oxidation stability (recommended for use in a temperature range from -40 °C to 140 °C).

If you have any further questions, please contact our technical department.

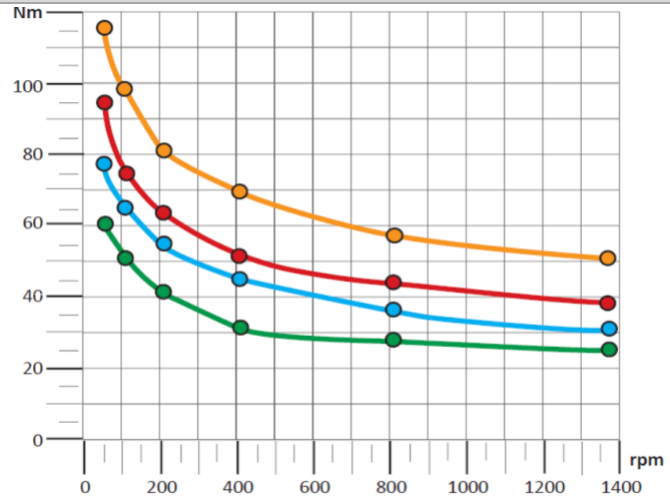
Datasheet

Efficiency diagrams and tables

Output torque with ratio 1 (1:1)

OUTPUT TORQUE WITH RATIO 1/1 DREHMOMENT MIT ÜBERSETZUNG 1/1				
● TM dc	● TR dc	● TM dsp	● TR dsp	rpm
90	60	117	78	50
75,7	50,4	98,4	65,5	100
63,7	42,4	82,8	55,1	200
53,5	35,7	69,5	46,4	400
45	29,9	58,5	38,8	800
39,1	26,1	50,8	33,9	1400

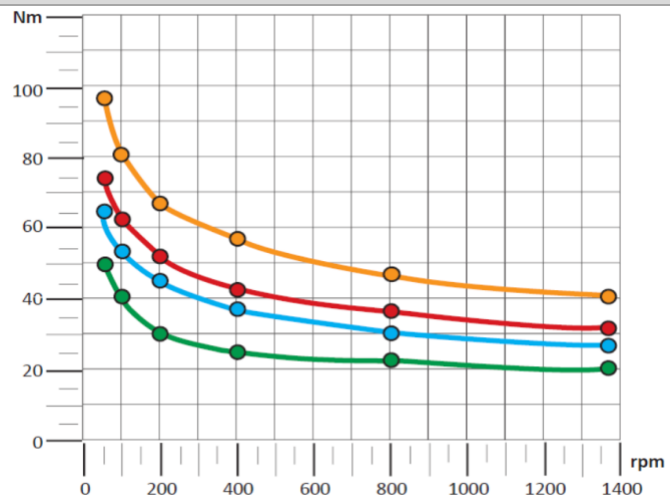
Efficiency - Leistung = 90%



Output torque with ratio 2 (1:2)

OUTPUT TORQUE WITH RATIO 1/2 DREHMOMENT MIT ÜBERSETZUNG 1/2				
● TM dc	● TR dc	● TM dsp	● TR dsp	rpm
75	50	97,5	65	50
63	42	81,9	54,6	100
53	35,3	68,9	45,9	200
44,6	29,9	58	38,7	400
37,5	24,9	48,7	32,3	800
32,6	21,7	42,4	28,2	1400

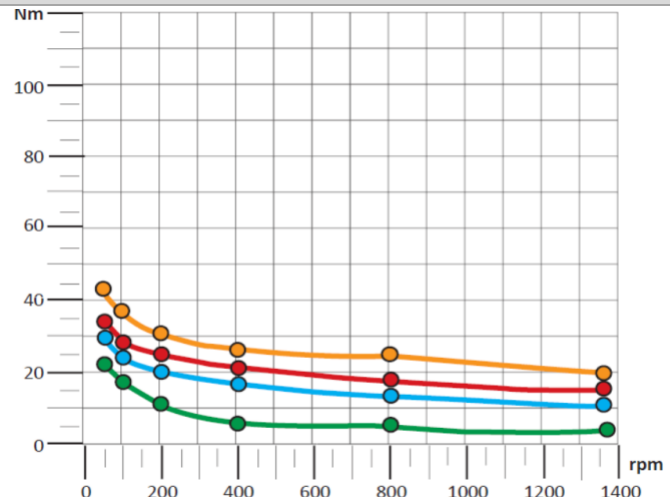
Efficiency - Leistung = 90%



Output torque with ratio 0,5 (2:1)

OUTPUT TORQUE WITH RATIO 2/1 DREHMOMENT MIT ÜBERSETZUNG 2/1				
● TM dc	● TR dc	● TM dsp	● TR dsp	rpm
33,8	22,5	43,9	29,2	50
28,4	18,9	36,9	24,5	100
23,9	15,9	31	20,6	200
20	13,3	26	17,3	400
16,9	11,2	22	14,5	800
14,7	9,8	19,1	12,7	1400

Efficiency - Leistung = 90%



Datasheet



Glossary

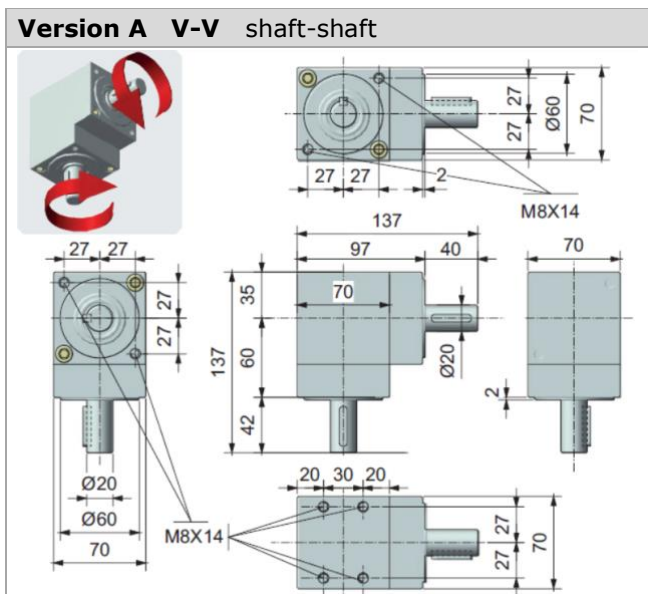
F_R	Radial load
F_A	Axial load
R	Force
T	Torque
T_M	Maximum torque
T_R	Recommended torque
T_A	Actual torque
T_O	Output torque
T_I	Input torque
P_n	Power
N	Newton
Nm	Newton meter
f_u	Factor of use
i	Gear ratio
rpm	Revolutions per minute (rpm)
n_1	Entry shaft
n_2	Outlet shaft
dc	Straight bevel gears
dsp	Spiral bevel gears
M	Solid shaft
F	Hollow shaft
D	Through hollow shaft

Datasheet

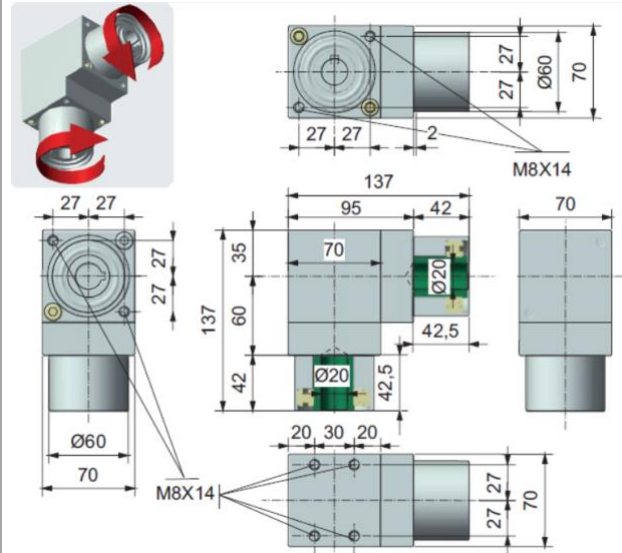
Versions with dimension drawings

Available outputs		
V = shaft	H = hollow shaft	D = through hollow shaft (only for version D)

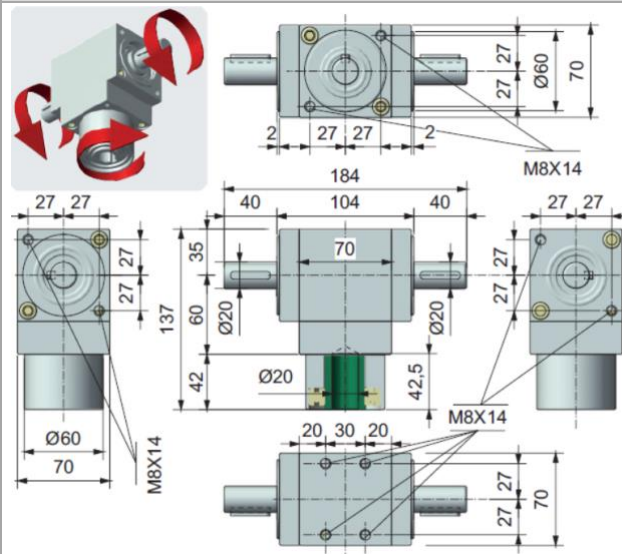
All dimensions in mm



Version A H-H hollow shaft-hollow shaft



Version B H-V-V hollow shaft-shaft-shaft



Datasheet

<p>Version C V-V-V shaft-shaft-shaft (opposite rotation)</p>	<p>Version C V-H-H shaft-hollow shaft-hollow shaft (opposite rotation)</p>
<p>Version C H-V-V hollow shaft-shaft-shaft (opposite rotation)</p>	<p>Version C H-H-H 3 x hollow shaft (opposite rotation)</p>

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Datasheet

Applications

The angular gearboxes are suited for industrial use and can be universally used for spindle drives in any mounting position.

- Compact and modular designs, adaptable, easy assembly. The favourable price-performance ratio and small installation space enable a cost-effective system solution.
- Manual or motorised adjustments with matching flange, adapter, flexible shafts and couplings or motor, optionally with position indicators and clamping elements, complete a sensible assembly group in machine and plant construction.

Angular gear with rigid shaft



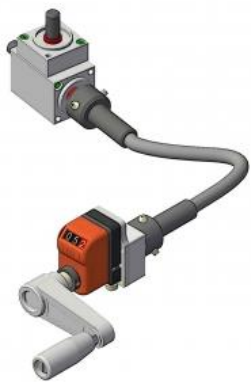

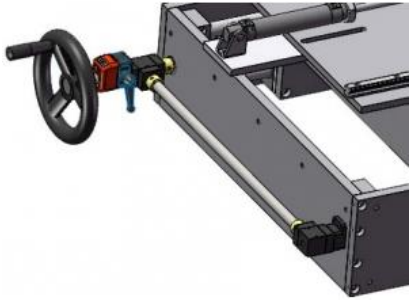
Transmitting the rotary motion, direct connection via rigid shaft.

Angular gear with flexible shaft



Transmitting rotary motion via one or more flexible shafts where a direct connection is not possible in any other case; for example, to connect two axes or shafts which are not perfectly aligned.

Datasheet

Further applications		
		
Transmitting the rotary motion, connection via shaft block flange with flexible shaft to the coupling, and position indicator with crank handle.	Transmitting the rotary motion, direct connection via rigid shaft to the coupling and position indicator with handwheel.	



Figures show angular gear with flexible or rigid shaft, shaft block flange, clamping elements and position indicator.

Areas of application

Packaging, food, pharmaceutical, plastic, wood, sheet metal, glass, winding, construction road machines, also on traditional machines and special applications in metal construction, lifting technology, conveyor technology, linear technology, special plant engineering, etc.

Ordering example

Type	66/8	-		-		-	A	-	1	-	V20-H20	-	ING
------	------	---	--	---	--	---	---	---	---	---	---------	---	-----

Gearbox ¹⁾

- = bevel gears (standard)
- SP = spiral bevel gears (optional)

Housing material

- = anodized transparent (standard)
- ES = anodized black (optional)
- VA = stainless steel (AISI 303) (optional)

Version

- A** = with 2 outputs
- B** = with 3 outputs
- C** = with 3 outputs (with opposite rotation)
- D** = with 3 outputs, 2 through hollow shafts

Reduction ratio ¹⁾

- | | | |
|-----|-------|--|
| 1 | = 1:1 | (standard) |
| 2 | = 1:2 | <i>in reducing</i> (standard) |
| 0,5 | = 2:1 | <i>in multiplying</i> (on request in version A, B, C,
not available in version D) |

Version shaft

- V** = Shaft; with keyway at standard
H = Hollow shaft with blind hole; through hollow shaft only with version D

Diameter shaft ²⁾

- 20** = Ø 20 mm (standard);

Length shaft ²⁾

- Shaft: 40 mm (standard)
Hollow shaft: 42 mm effective length, 42,5 mm construction dept (standard);
further lengths available on request

Option

- ING** = Grease fitting



- 1) Gear ratios of 1:2 and 2:1 are only available with spiral bevel gears.
- 2) Further lengths and diameters are available on request.

Manufacturer:



The manufacturer reserves the right to make changes to the products that it deems necessary for their improvement without prior notice.