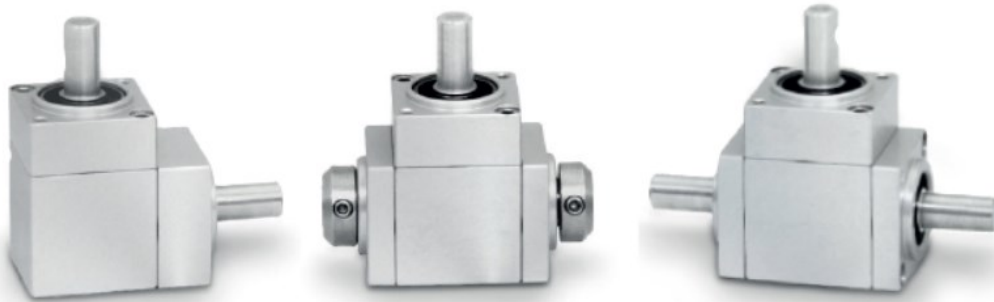


# Datasheet



- 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 Diameter Hollow shaft, shaft Length Hollow shaft Shaft	overall, see section: versions and dimensions  Ø8 mm (standard); Ø10, Ø12 and Ø14 mm (optional) 15 mm <u>effective length</u> , 16 mm <u>construction depth</u> (standard) 16 mm (standard); at standard with keyways or on request
Material Hollow shaft, shaft Housing  Bearing	Stainless steel (AISI 303) Die-cast aluminium housing, anodized natural (standard), black anodized or stainless steel (AISI 303) (optional) Ball-bearings, hardened bevel gears
Weight	145 g with 2 outputs 150 g with 3 outputs 200 g with 4 outputs
Version A B C D E	with 2 outputs with 3 outputs with 3 outputs (with opposite rotation) with 3 outputs, 2 through hollow shafts with 4 outputs
Reduction ratios <sup>1)</sup>	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	4 Nm
Axle load	Radial load 15 kg Axial load 1,5 kg (see Fig. 7)
Gearbox Straight bevel gears Spiral bevel gears	Straight gearing (standard), see Fig. 1 Spiral-shaped gearing, see Fig. 2
Tolerance between gears	0,1° to 0,75°
Lubrication	Grease fitting for continuous operation (optional)

<sup>1)</sup> 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	Version E
The direction of rotation depends on the configuration and the positioning; see section Versions with dimension drawings.				

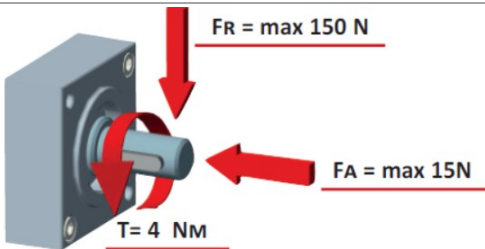
Bevel gears			
Fig. 1	Fig. 2	Spiral gearboxes	
<b>Straight bevel gears</b>	<b>Spiral bevel gears</b>	with 2 shafts	with 3 shafts
Spiral gearboxes (Fig. 2) achieve higher precision, silent operation and enable 30% higher efficiency. Gear ratios of 1:2 and 2:1 are only available with spiral bevel gears.			

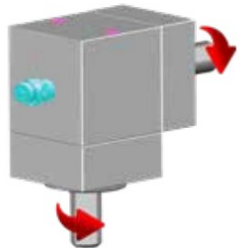

Reduction and multiplying ratio			
Fig. 3	Fig. 4	Fig. 5	Fig. 6
Clockwise	Clockwise	Example	
<u>Reduction ratios</u> $i = n1 : n2$ at $i > 1$ in reducing at $i < 1$ in multiplying		1:2 in reducing $n1 = 1.000$ 1/min $n2 = 500$ 1/min $i = 2$	* 2:1 in multiplying $n1 = 1.000$ 1/min $n2 = 2.000$ 1/min $i = 0,5$ * (not available in version D)
The ratio (Fig. 5 and 6) and configuration is determined by the <b>n1</b> shaft (which is always shown on the opposite side of the fixing bores), the others shaft following clockwise (Fig. 3 and 4).			

**i** For use in continuous operation, a grease nipple is provided which must be refilled at different intervals depending on the operating conditions.

# Datasheet



Loads	
<p>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 <b>FR</b> (radial force) and axial <b>FA</b> (axial force) loads (Fig. 7).</p>	
<p><b>Fig. 7</b></p> 	<p>FR = radial load, FA = axial load</p> <p>The radial load acts in a perpendicular direction to the shaft/axis.</p> <p>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.</p> <p>T = torque</p>

Grease fitting	
<p><b>Fig. 8</b></p> 	<p><b>Fig. 9</b></p> 

**i** 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.

**i** **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.

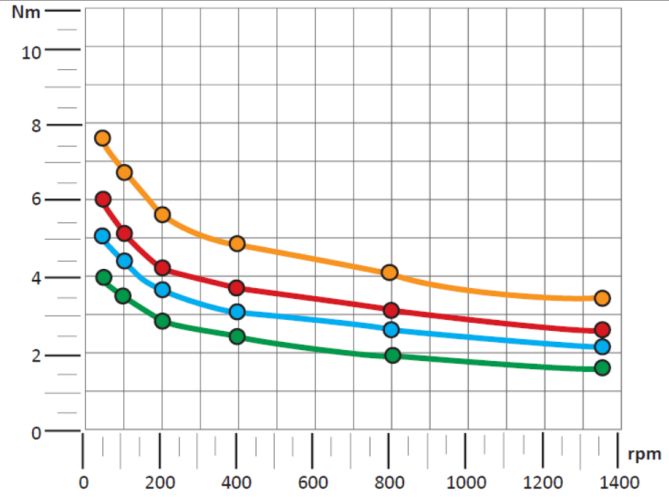
# Datasheet

## 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
6	4	7,8	5,2	50
5,3	3,5	6,9	4,5	100
4,4	2,9	5,7	3,7	200
3,8	2,5	4,9	3,2	400
3,2	2,1	4,1	2,7	800
2,7	1,8	3,5	2,3	1400

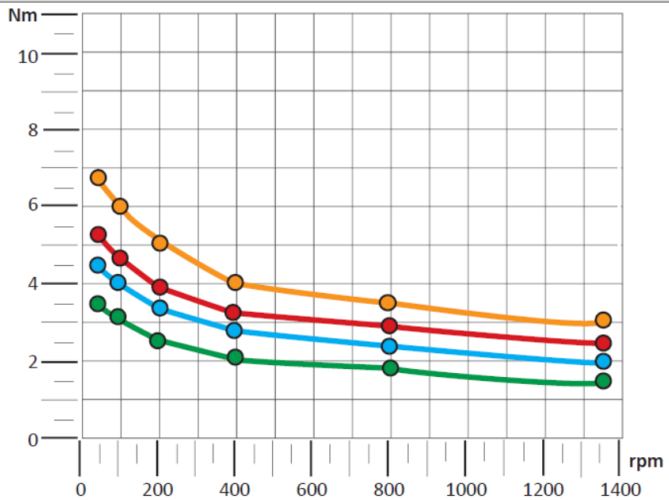
Efficiency - Leistung = 90%



### 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
5,3	3,5	6,9	4,5	50
4,6	3,1	6	4	100
3,9	2,6	5	3,4	200
3,3	2,2	4,3	2,8	400
2,8	1,9	3,6	2,5	800
2,4	1,6	3,1	2,1	1400

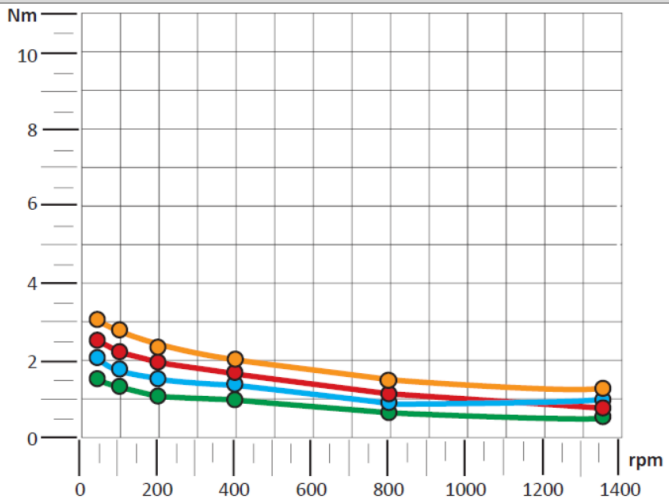
Efficiency - Leistung = 90%



### 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
2,4	1,6	3,1	2,1	50
2,1	1,4	2,7	1,8	100
1,8	1,2	2,3	1,5	200
1,5	1	2	1,3	400
1	0,8	1,3	1	800
0,8	0,7	1	0,9	1400

Efficiency - Leistung = 90%



# Datasheet



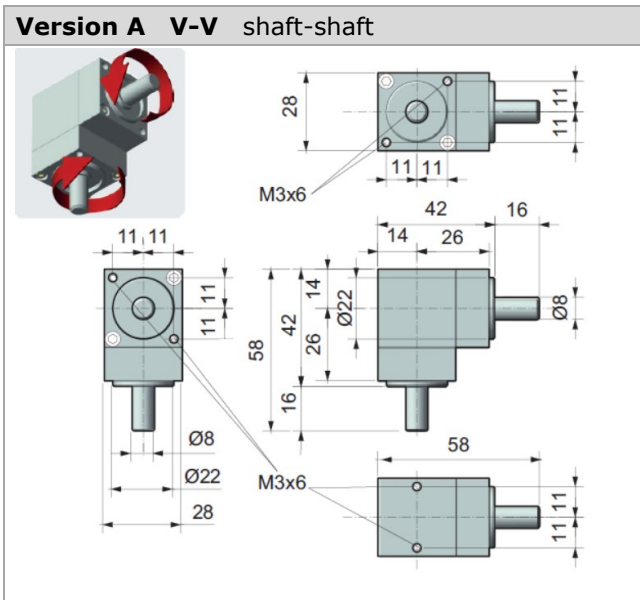
<b>Glossary</b>	
$F_R$	Radial load
$F_A$	Axial load
R	Force
T	Torque
$T_M$	Maximum torque
$T_R$	Recommended torque
$T_A$	Actual torque
$T_O$	Output torque
$T_I$	Input torque
Pn	Power
N	Newton
Nm	Newton meter
fu	Factor of use
i	Gear ratio
rpm	Revolutions per minute (rpm)
n1	Entry shaft
n2	Outlet shaft
dc	Straight bevel gears
dsp	Spiral bevel gears
M	Solid shaft
F	Hollow shaft
D	Through hollow shaft

# Datasheet

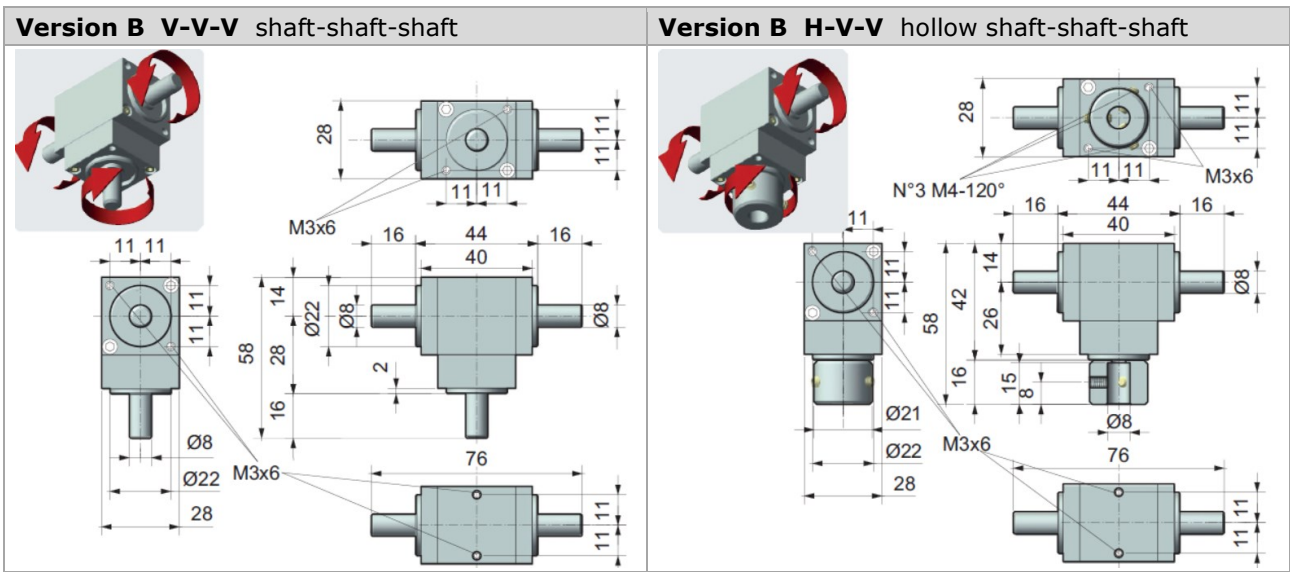
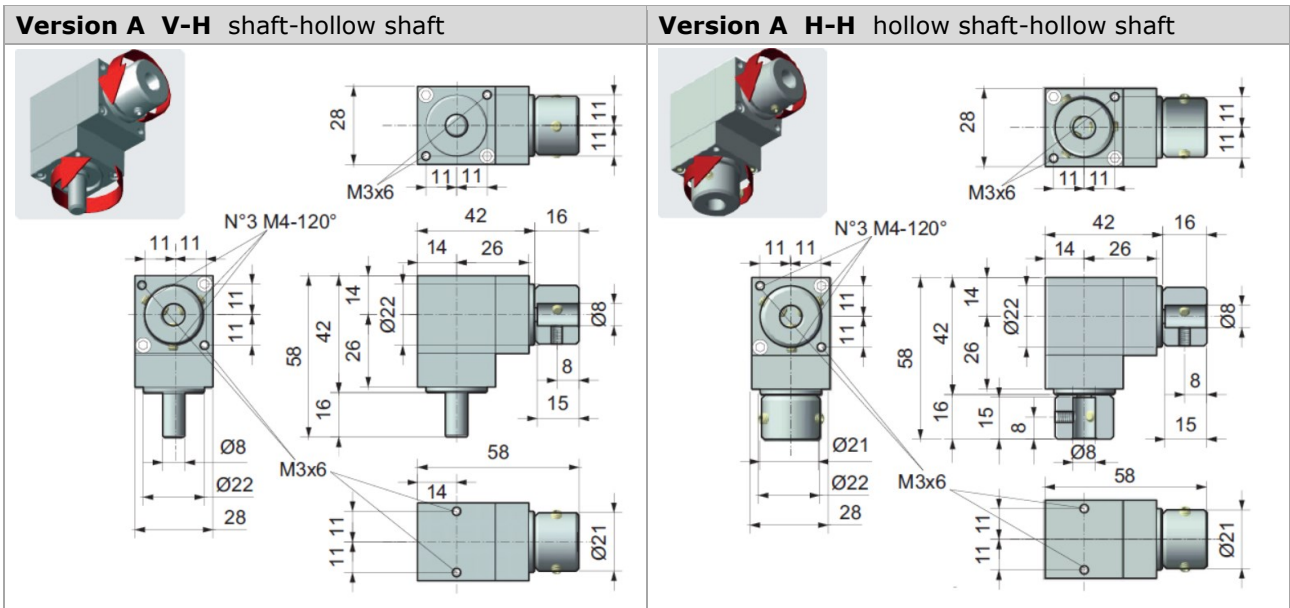
## Versions with dimension drawings

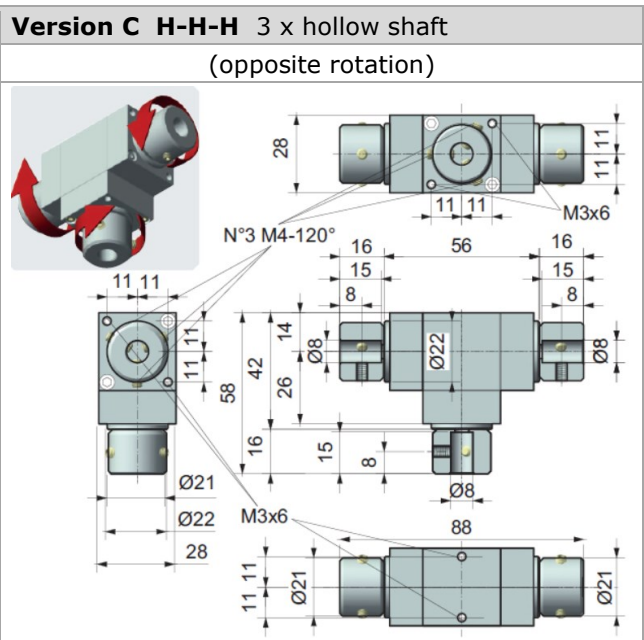
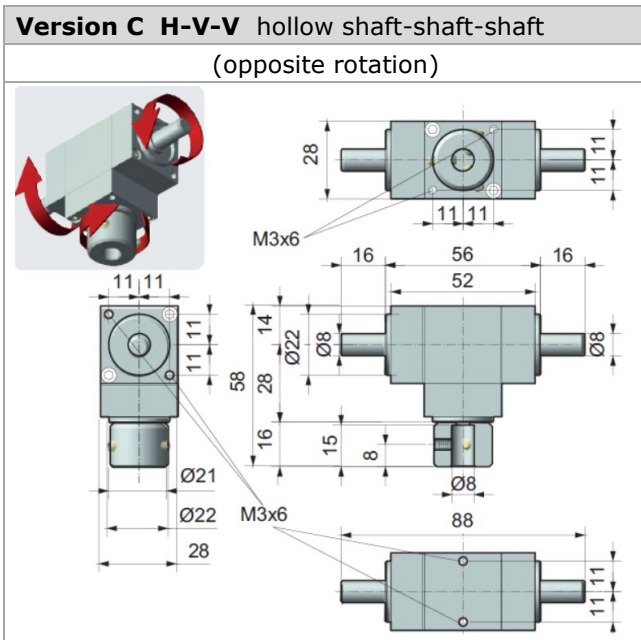
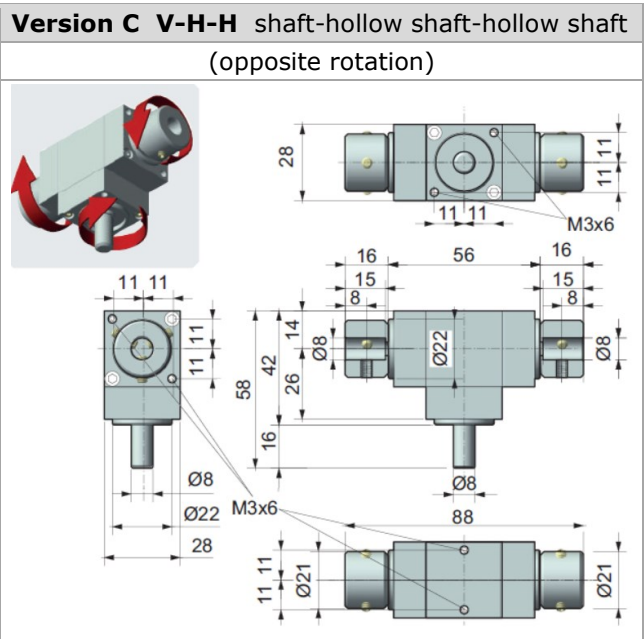
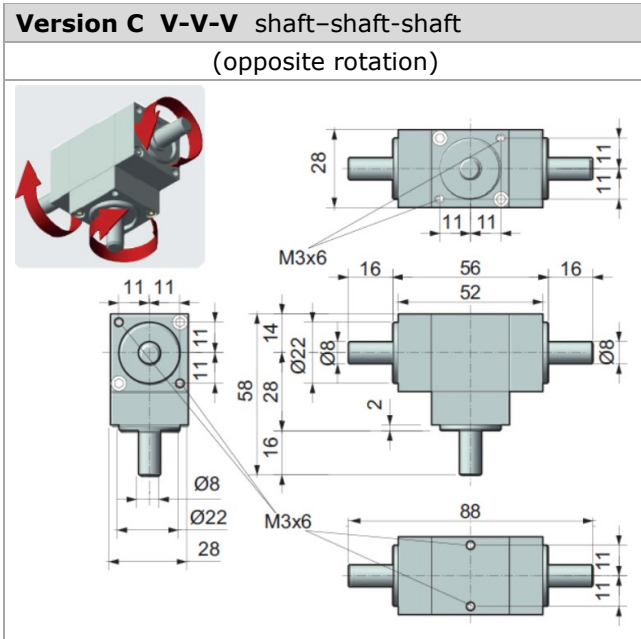
Available outputs		
V = shaft	H = hollow shaft	D = through hollow shaft (only for version D)

All dimensions in mm



# Datasheet

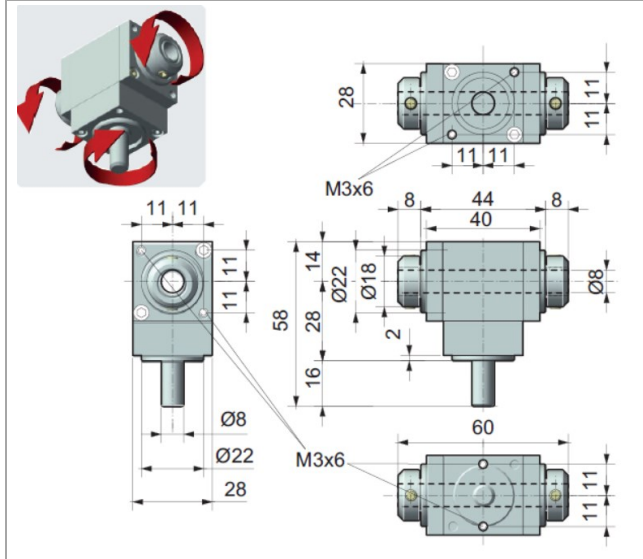




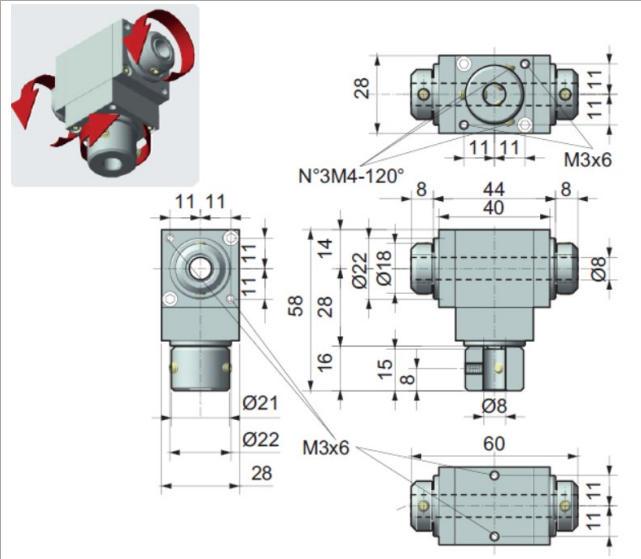


# Datasheet

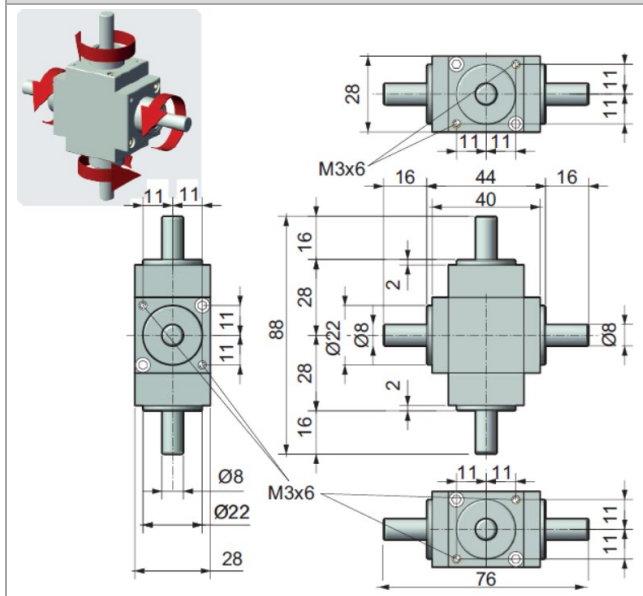
**Version D V-H-H** hollow shaft-shaft-shaft  
(with through hollow shaft)



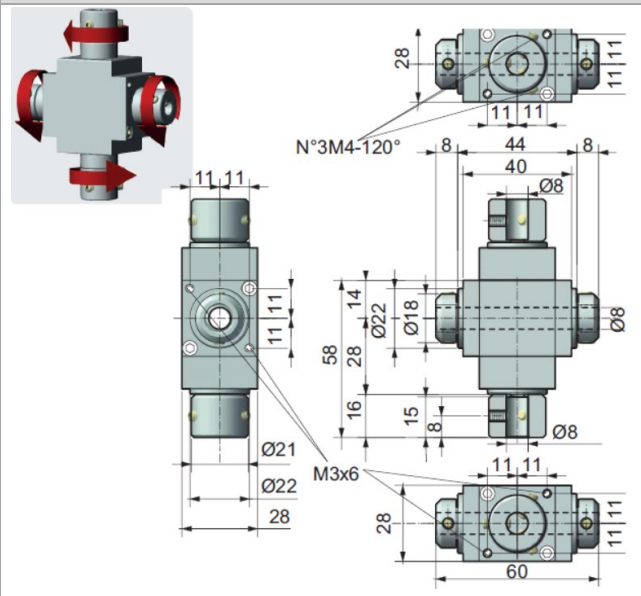
**Version D H-H-H** 3 x hollow shaft  
(with through hollow shaft)



**Version E V-V-V-V** 4 x shaft



**Version E H-H-H-H** 4 x hollow shaft



# 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.


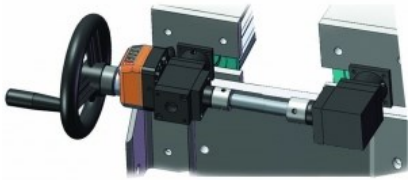
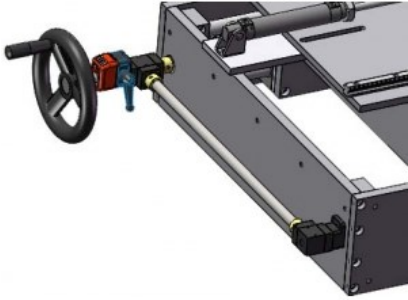
### Angular gear with flexible shaft



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		
		
<p>Transmitting the rotary motion, connection via shaft block flange with flexible shaft to the coupling, and position indicator with crank handle.</p>	<p>Transmitting the rotary motion, direct connection via rigid shaft to the coupling and position indicator with handwheel.</p>	



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.

# Datasheet

## Ordering example

**Type** 66/4 - - - A - 1 - V08-H08 - ING

### Gearbox <sup>1)</sup>

- = 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
- E = with 4 outputs

### Reduction ratio <sup>1)</sup>

- 1 = 1:1 (standard)
- 2 = 1:2 *in reducing* (standard)
- 0,5 = 2:1 *in multiplying* (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 <sup>2)</sup>

- 08 = Ø8 mm (standard); Ø10, Ø12 und Ø14 mm (optional)

### Length shaft <sup>2)</sup>

- Shaft: 16 mm (standard)
- Hollow shaft: 15 mm effective length, 16 mm construction depth (standard);

### Continuous use

- ING = Grease fitting for continuous operation (optional)



- <sup>1)</sup> Gear ratios of 1:2 and 2:1 are only available with spiral bevel gears.
- <sup>2)</sup> 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.