Datasheet

Angular gearboxes with bevel and flange are suitable for transmitting the rotary motion between two shafts at right angles.

In combination with a mechanical position indicator type **OP3**, manual adjustment and direct reading of a measured value of angular or linear movements is possible - even if the shaft is in an uncomfortable position.

- Several orientations and connection possibilities
- Available with ratio (standard) 1:1, 1:2, 2:1
- Movements on ball-bearings, minimal angular and axial clearance, water-proof

Technical characteristics

Dimensions Diameter Shaft, Hollow shaft Length Hollow shaft Shaft	overall, see section: versions and dimensions Ø14 mm 15 mm 66 mm (standard)
Material Hollow shaft, shaft Housing Bevel gear	 Stainless steel (AISI 303) Die-cast aluminium housing, black anodized (standard) Steal, hardened (Pronox)
Bearing	Ball-bearings
Weight	300 g
Reduction ratios	1:1 1 (standard) 1:2 2 *in reducing* (standard) 2:1 0,5 *in multiplying* (standard)
Output torque	max. 3 Nm
Axle load	Radial load 15 kg Axial load 1.5 kg (see Fig. 6)
Gearbox Straight bevel gears	 Straight gearing (standard)

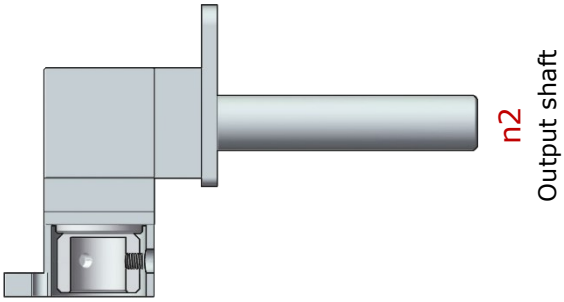
Mounting positions Version examples

RINV-OP64 Gearbox with mechanical position indicator type OP3 and rotary knob

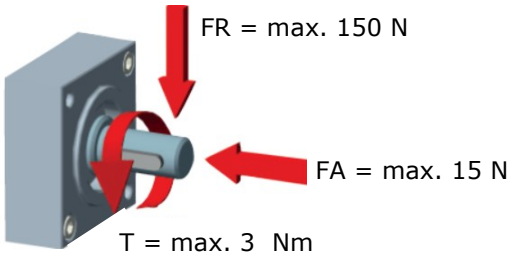
Fig. 1	**Fig. 2**	**Fig. 3**	**Fig. 4**
			

Willtec Messtechnik GmbH & Co.KG • Eschenweg 4 • 79232 March-Hugstetten • Germany
Fon: +49 (0) 7665/93465-0 • Fax: +49 (0) 7665/93465-22
www.willtec.de • Email: info@willtec.de

Reduction ratios

RINV-OP64	
Fig. 5	Examples
	1:1 n1 = 1.000 1/min n2 = 1.000 1/min i = 1
	1:2 *in reducing* n1 = 1.000 1/min n2 = 500 1/min i = 2
Reduction ratios i = n1 : n2 at i > 1 *in reducing* at i < 1 *in multiplying*	2:1 *in multiplying* n1 = 1.000 1/min n2 = 2.000 1/min i = 0,5

Radial and axial load

RINV-OP64	
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. 6).	
Fig. 6	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

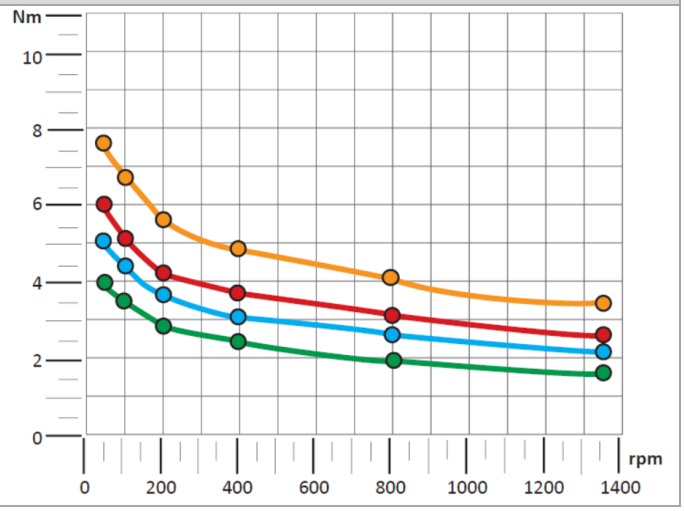
Mounting

The RINV-OP is supplied in the version (standard) as shown in the dimension drawing.
To change the mounting position of the two flanges (flange on OP side and fixing flange for RINV-OP on machine side), remove the two fixing screws, turn the two flanges to the desired position and retighten the fixing screws.
To fix the machine side, insert the shaft into the hollow shaft RINV-OP, fix the flange to the fixed part of the machine and tighten the set screws through the flange bores.

Efficiency diagrams and tables

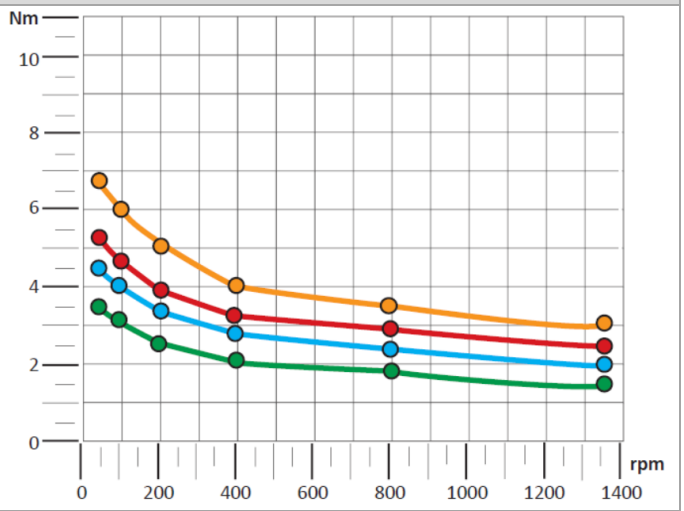
Output torque with ratio 1 (1:1)

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%				



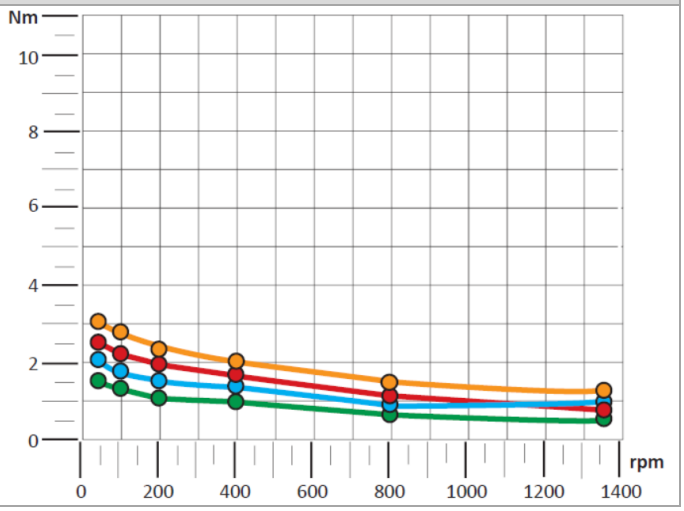
Output torque with ratio 2 (1:2)

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%				



Willtec Messtechnik GmbH & Co.KG • Eschenweg 4 • 79232 March-Hugstetten • Germany
Fon: +49 (0) 7665/93465-0 • Fax: +49 (0) 7665/93465-22
www.willtec.de • Email: info@willtec.de

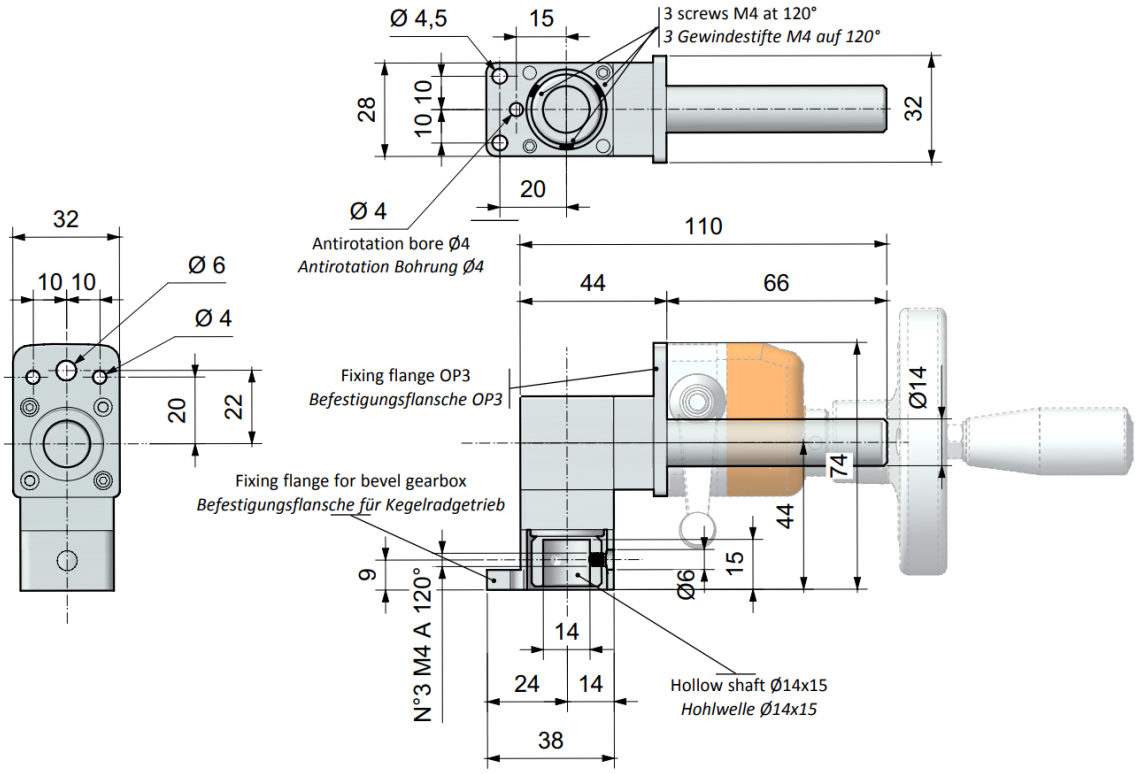
Glossary	
F_R	Radial load
F_A	Axial load
R	Force
T	Torque
T_M	Maximum torque
T_R	Recommended torque
T_A	Actual torque
T_O	Output torque
T_I	Input torque
Pn	Power
N	Newton
Nm	Newton meter
fu	Factor of use
i	Gear ratio
rpm	Revolutions per minute (rpm)
n1	Entry shaft
n2	Outlet shaft
dc	Straight bevel gears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

Willtec Messtechnik GmbH & Co.KG • Eschenweg 4 • 79232 March-Hugstetten • Germany
Fon: +49 (0) 7665/93465-0 • Fax: +49 (0) 7665/93465-22
www.willtec.de • Email: info@willtec.de

Datasheet

Versions with dimension drawings

RINV-OP64 Gearbox with mechanical position indicator type OP3, hand wheel and clamping flange



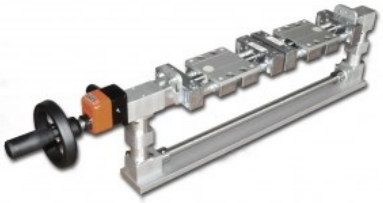
All dimensions in mm

Willtec Messtechnik GmbH & Co.KG • Eschenweg 4 • 79232 March-Hugstetten • Germany
Fon: +49 (0) 7665/93465-0 • Fax: +49 (0) 7665/93465-22
www.willtec.de • Email: info@willtec.de

Applications

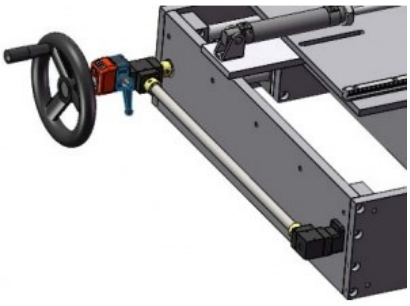
The angular gearboxes are suited for industrial use and can be universally used for spindle drives in any mounting position.

- 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.		

Willtec Messtechnik GmbH & Co.KG • Eschenweg 4 • 79232 March-Hugstetten • Germany
Fon: +49 (0) 7665/93465-0 • Fax: +49 (0) 7665/93465-22
www.willtec.de • Email: info@willtec.de

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	RINV-OP64	-	1:1	-

Reduction ratio

1:1 = 1:1 (standard)
1:2 = 1:2 *in reducing* (standard)
2:1 = 2:1 *in multiplying* (standard)

Length shaft [1)]

\- = 66 mm (standard), not specified

[1)] Further lengths 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.

Willtec Messtechnik GmbH & Co.KG • Eschenweg 4 • 79232 March-Hugstetten • Germany
Fon: +49 (0) 7665/93465-0 • Fax: +49 (0) 7665/93465-22
www.willtec.de • Email: info@willtec.de