Handling

All bevel gearboxes can be manually operated. Anyway most part of its application foresees a motorized handling, in many cases even direct. For the sizes from 86 to 250 included, it is possible to connect directly a standard IEC motor to the fast shaft of the bevel gearbox. Special flanges can be provided for all sizes made for hydraulic, pneumatic, brushless motors, as well as for direct current motors, permanent magnet motors, stepper motors and other special motors. It is also possible to realize special flanges for fixing the drive shaft by means of a shrink disk, in order to minimize the transmission backlash. The power curves determine the motoring power and the torque on the slow shaft, for each single bevel gearbox, in case of unique service factors, according to the model, size, ratio and revolution speeds.

ROTATION DIRECTIONS

The rotation directions depend on the mounting scheme. According to the chosen model, as a function of the required rotation direction, it's possible to choose the mounting scheme which best meets those requirements. We remind that, even if one only rotation direction of a shaft is changed from clockwise into anti-clockwise (and vice-versa), any other rotations of the bevel gearbox shafts direction must be reversed.

NON-STOP OPERATION

A non-stop operation occurs when the speed modulation gear is subjected to time constant torque and angular speed. After a transition period the revolutions become stationary, together with the surface temperature of the bevel gearbox and the ambient thermal exchange. It is important to check for wear phenomena and thermal power.

INTERMITTENT OPERATION

An intermittent operation occurs when high grade accelerations and deceleration overlap a revolution speed and torque (even at zero value), make it necessary to verify the ability to counteract the system inertia. A revision of the bevel gearbox and the input power is therefore necessary. It is important to check bending and fatigue strength parameters.

Lubrication

The lubrication of the inner transmission devices (gears and bearings) is made using a synthetic oil with extreme pressure additive: UNIMEC ATIR SH150. For a proper operation of the transmission it is advisable to steady check for lubricant leakage.

For all sizes a plug for lubricant filling-up is foreseen. The technical specifications and the application field for the lubricant inside the bevel gearboxes are listed below.

Lubricant	Application field	Operating temperature [°C]*	Technical specifications
UNIMEC ATIR SH150 (not compatible with polyglicol oils)	standard	0 : +200	AGMA 9005: E02 DIN 51517-3: CLP NF ISO 6743-6: CKD
Total Nevastane SL 220	food industry	-30 : +230	NSF-USDA: H1

* for operation temperatures between 80°C and 150°C Viton® seals should be used;
for temperatures higher than 150°C and lower -20°C it is advisable to contact our technical office.

The inner devices of the bevel gearboxes can be lubricated in two ways: by means of splash or forced lubrication. Splash lubrication does not require external interventions: when the fast shaft revolutions are lower than indicated in the graph below, its operation ensures that lubricant reaches all the components requiring lubrication. For revolution speeds higher than the indicated values, it may happen that the gears peripheral speed be such as to create centrifugal forces able to overcome the lubricant adhesivity. Therefore, in order to ensure a proper lubrication, a lubricant feeding under pressure is necessary (we suggest 5 bar) by means of a suitable oil cooling circuit. In case of forced lubrication it will be necessary to precise the mounting position and localization of the holes to be provided for the connection to the lubrication circuit.

For revolutions reaching the border values indicated in the above graph it is advisable to contact our technical office in order to evaluate the modus operandi. For very low revolutions of the fast shaft (lower than 50 rpm) the phenomena which normally generate splash could not be triggered off in a correct way. We suggest contacting our technical office in order to evaluate the most suitable solution to the problem.
In case of vertical axis mounting, the upper bearings and gears could not be properly lubricated. It is therefore necessary to indicate such situation in case of order, so that suitable grease holes can be foreseen. If no indication about lubrication is given at the ordering phase, it is understood that the application conditions fall within the conditions of an horizontal mounting with splash lubrication.

Backlash

The gears connection presents a natural and necessary backlash which is transmitted to the shafts. A particular care in the assembly allows to keep such value within 15'-20'. For particular applications, where the standard backlash should be further reduced, it is possible to reach a maximum value comprised between 5'-7'. It is important to remember that an excessive backlash reduction could induce the transmission to be blocked due to the interference between the gears. Furthermore, a too tight backlash would cause friction phenomena and consequently an efficiency reduction as well as an heating of the transmission.

The gears backlash tends to increase according to the wear ratio of the components, that is why after various running cycles we can logically expect an higher value than the value taken before the start-up. Finally it should be reminded that, due to the axial components of the transmission forces, the backlash measured under load can be different than the value taken when the bevel gearbox is unloaded. In case a very high precision is requested, it is advisable to mount shrink disks, both on the output and on the input shafts, because among standard couplings it is the only one ensuring a minimum backlash for the mounting on the machine.

Installation and maintenance

INSTALLATION

When positioning the bevel gearboxes and connecting them to the machines, the greatest of care is necessary in the alignment of the axes. In case of an imprecise alignment, the bearing would be overloaded, anomalous overheated, and it would be subjected to a greater wear with a consequent lifetime reduction and a noise increase. The transmission should be mounted so that movements and vibrations are avoided, and they should be properly fixed by means of bolts. We suggest effecting a proper cleaning and lubrication of the contact surfaces before assembling the connecting members, in order that any seizure or oxidizing problems be avoided. The assembly or disassembly must be carried out using tie rods and extractors through the threaded bore at the end of the shaft. For tight fittings, a shrink assembly is recommended, heating the members to beshrunk on to 80-100°C. Thanks to their particular cubic box form, bevel gearboxes can be mounted in any position. It should be given previous notice in case of a vertical mounting in order that a proper lubrication be foreseen.

PREPARING FOR SERVICE

All speed modulation gears are supplied filled with long lasting lubricant which ensures a perfect operation of the unit according to the power values indicated in the catalogue. The only exception is represented by the ones having an "add oil" label. The lubricant filling up to the right level is an installer's responsibility and it must be carried out when the gears are not in motion. An excessive filling should be avoided in order that any overheating, noise, inner pressure loss and power loss occur.

START-UP

All the units undergo a brief testing before being delivered to the client. However, several hours of running at full load are necessary before the bevel gearbox reaches its full running efficiency. In case of need, the bevel gearbox can be immediately set to work at full load; but, circumstances permitting, it is nonetheless advisable to subject it to a gradually increasing load to reach maximum load after 20 - 30 hours of running. It is also vital to take the precautions necessary to avoid overloading in the first stages of running. The temperatures reached by the bevel gearbox in these initial phases will be higher than the ones produced after the complete running-in of the same.

ROUTINE MAINTENANCE

Bevel gearboxes must be inspected once a month. Lubricant leakage should be checked for, and in case the oil level should be restored and the seals replaced. The lubricant control must be effected when the speed modulation gear is not working. The oil should be changed at intervals which will vary according to the working conditions; generally, in normal conditions and at the normal operation temperatures, it should be possible to obtain a minimum lubricant lifetime of 10.000 hours.

STORAGE

The bevel gearboxes must be protected from deposits of dust and foreign matter during storage. Particular attention must be paid to saline or corrosive atmospheres. We also recommend to:

- Periodically rotate the shafts to ensure proper lubrication of inner parts and avoid that the seals dry up, therefore causing lubricant leakage.
- For bevel gearboxes without lubricant completely fill-in the unit with rustproof oil. When servicing for use, completely empty the oil and refill with the recommended oil to the correct level.
- Protect the shafts with suitable products.

WARRANTY

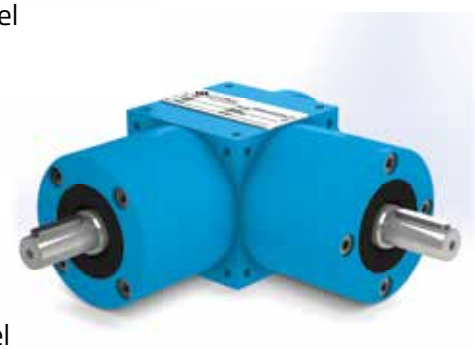
The warranty is valid only when the instructions contained in our manual are carefully followed.

Size 54 standard

RA Model

RM Model

RB Model



RX Model

RC Model

RS Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	0,02 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	4000 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	40 Nm (RA - RB - RC)
Solid shaft maximum moment	40 Nm (RM) - 130 Nm (RS)
Max input speed	4500 rpm
Main Gearbox Weight	2 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

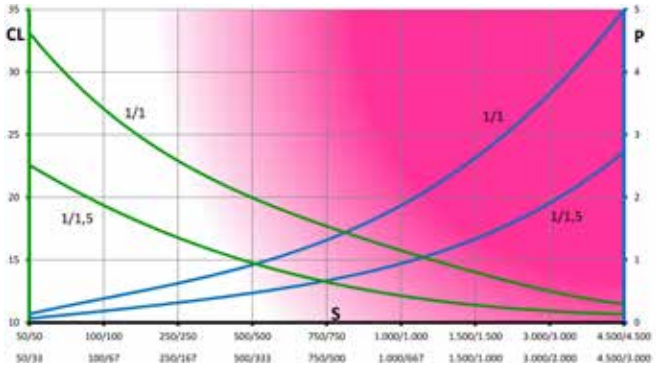
Specific features

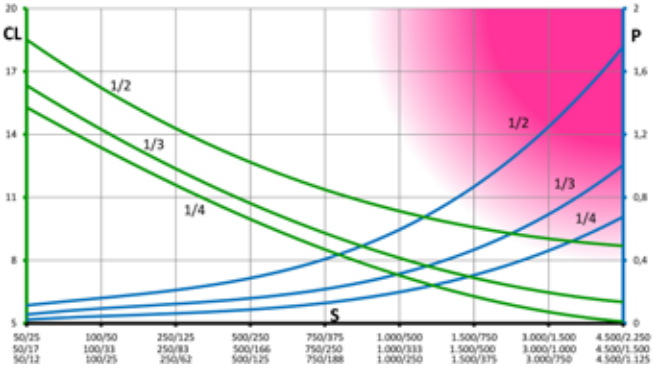
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 8°	+/- 5°	+/- 5°	+/- 5°	+/- 5°
Inertia moment	134 kg-mm²	50 kg-mm²	27 kg-mm²	16 kg-mm²	11 kg-mm²

Power curves

The magenta zone indicates a potential heating risk.
Working cycles must be carefully analized.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

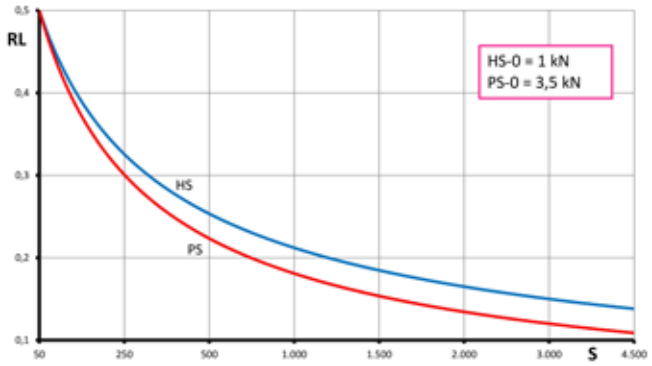


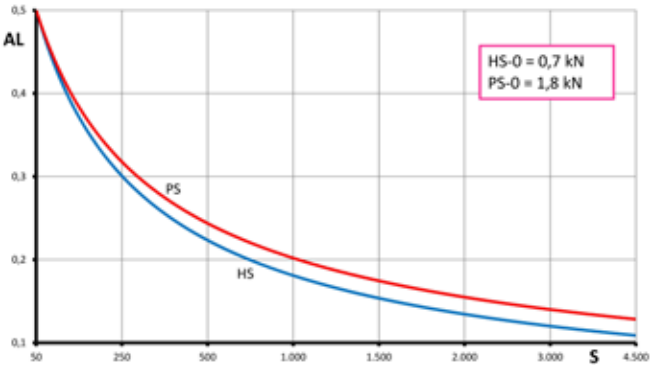


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





Construction Forms (1/1)


Form C1


Form C3


Form S1


Form S3


Form S4


Form S31

Construction Forms (1/1,5 1/2 1/3 1/4)


Form C2


Form C4


Form S2


Form S9


Form S10


Form S32

Size 86 standard

RA Model

RM Model

RB Model

RX Model

RC Model

RS Model

› Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	0,1 lt

› General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	3000 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	90 Nm (RA - RB - RC)
Solid shaft maximum moment	90 Nm (RM) - 320 Nm (RS)
Max input speed	4500 rpm
Main Gearbox Weight	6,5 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

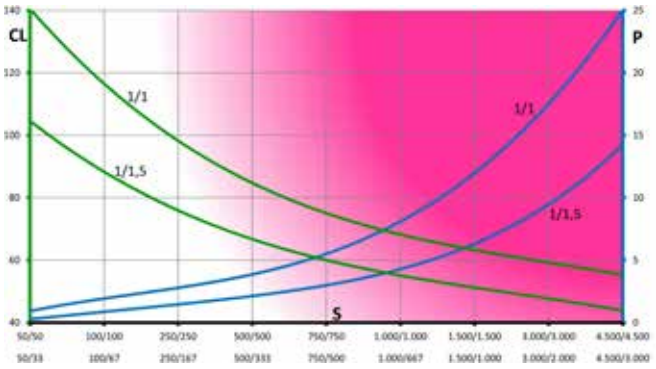
› Specific features

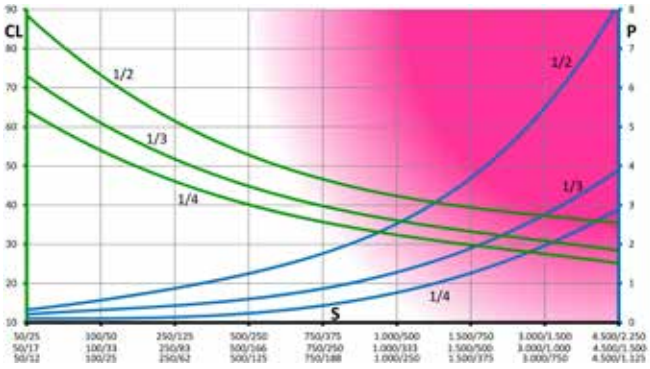
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 6,5°	+/- 6°	+/- 6°	+/- 6°	+/- 4,5°
Inertia moment	366 kg-mm²	136 kg-mm²	74 kg-mm²	37 kg-mm²	26 kg-mm²

Power curves

The magenta zone indicates a potential heating risk.
Working cycles must be carefully analized.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

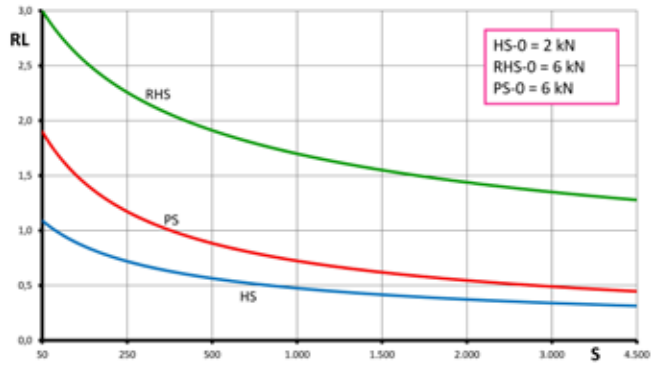


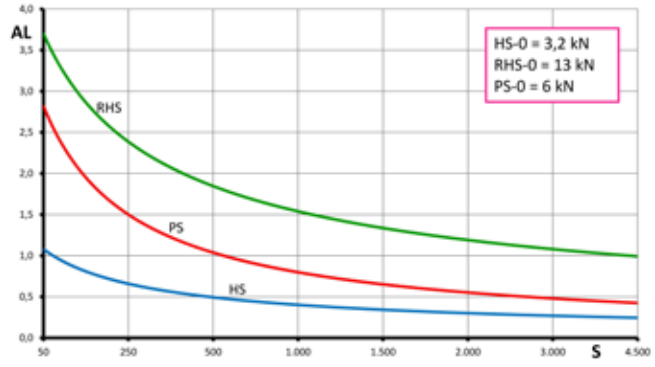


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





Motor Models

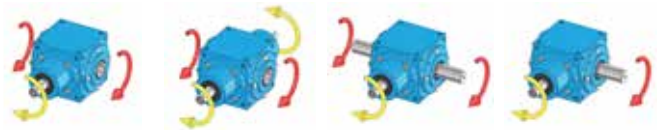
	IEC	Worm screw bore diameter	Centering diameter	Nominal power (4 poles motor)
	IEC 63 B5	11 mm	95 mm	0,25 kW
	IEC 71 B5 / B14	14 mm	110 mm / 70 mm	0,55 kW
	IEC 80 B5 / B14	19 mm	130 mm / 80 mm	1,1 kW
	IEC 90 B5 / B14	24 mm	130 mm / 95 mm	1,9 kW

Construction Forms (1/1)

Form C1 | Form C3 | Form S1 | Form S3

Form S4 | Form S31 | Form MC1 | Form MS1

Construction Forms (1/1,5 1/2 1/3 1/4)



Form C2 | Form C4 | Form S2 | Form S9

Form S10 | Form S32 | Form MC2 | Form MS2

Size 86 - Reinforced hub shaft

RK Model

RW Model

RY Model

RZ Model

RR Model

RP Model

› Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	0,1 lt

› General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	3000 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	90 Nm (RK - RY - RR)
Solid shaft maximum moment	90 Nm (RW) - 320 Nm (RP)
Max input speed	4500 rpm
Main Gearbox Weight	6,5 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

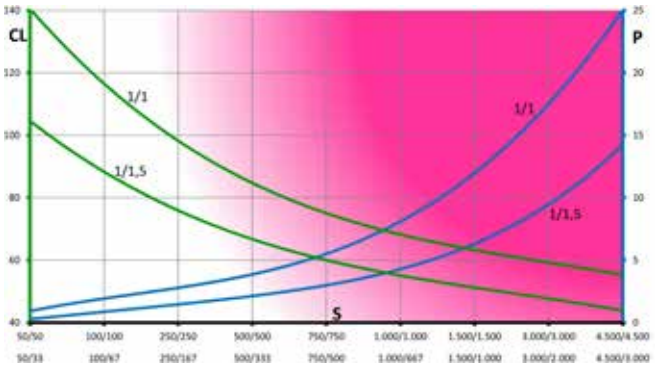
› Specific features

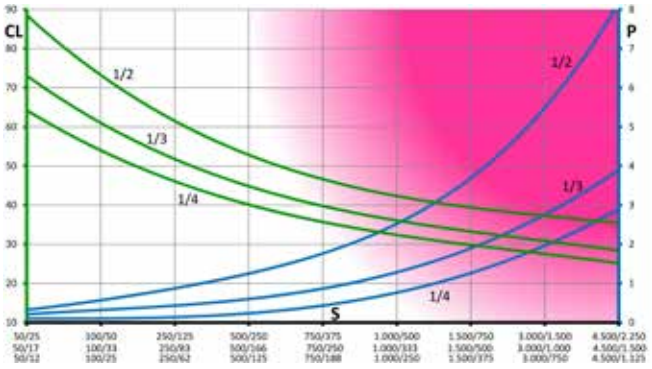
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 6,5°	+/- 6°	+/- 6°	+/- 6°	+/- 4,5°
Inertia moment	366 kg-mm²	136 kg-mm²	74 kg-mm²	37 kg-mm²	26 kg-mm²

Power curves

The magenta zone indicates a potential heating risk.
Working cycles must be carefully analized.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

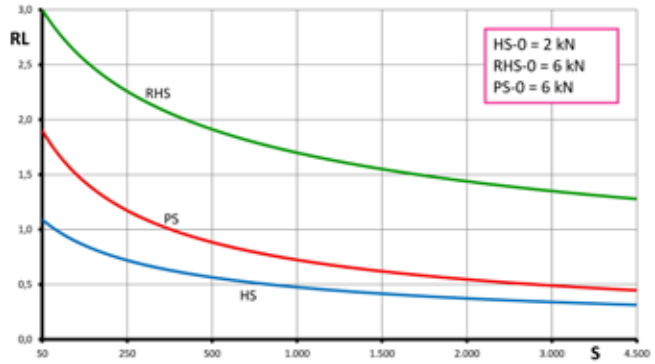


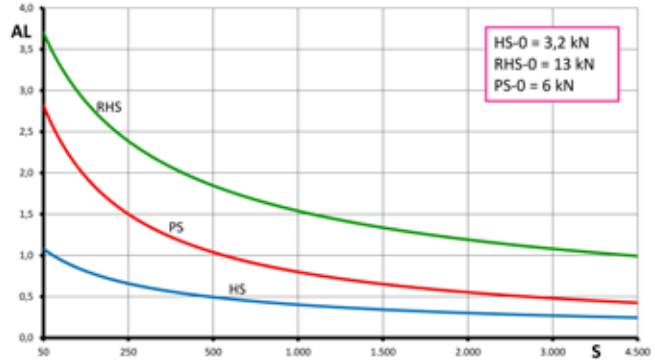


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





Construction Forms (1/1)


Form C1


Form C3


Form S1


Form S3


Form S4


Form S31

Construction Forms (1/1,5 1/2 1/3 1/4)


Form C2


Form C4


Form S2


Form S9


Form S10


Form S32

Size 110 standard

RA Model

RM Model

RB Model

RX Model

RC Model

RS Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	0,2 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	2500 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	180 Nm (RA - RB - RC)
Solid shaft maximum moment	180 Nm (RM) - 410 Nm (RS)
Max input speed	3000 rpm
Main Gearbox Weight	10 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

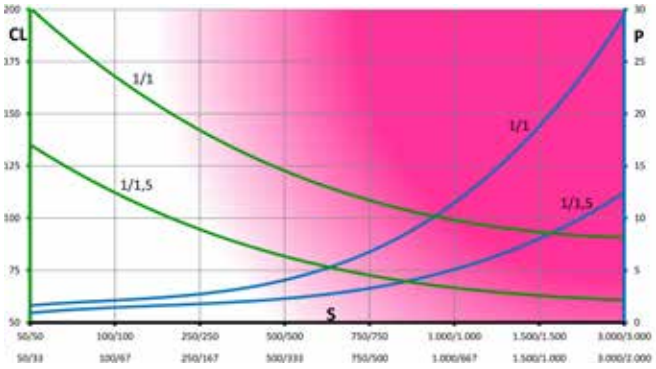
Specific features

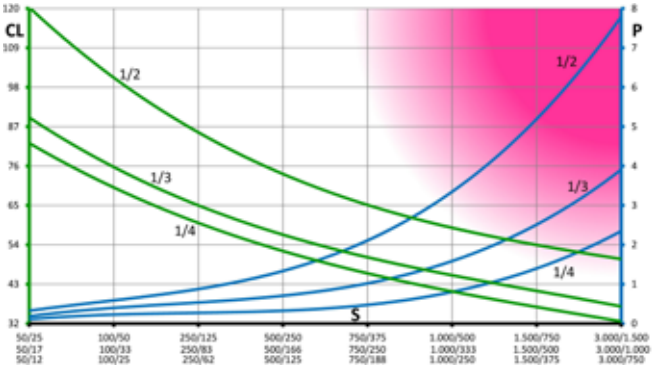
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 5,5°	+/- 5,5°	+/- 6°	+/- 4,5°	+/- 4,5°
Inertia moment	798 kg-mm²	300 kg-mm²	168 kg-mm²	89 kg-mm²	63 kg-mm²

Power curves

The magenta zone indicates a potential heating risk.
Working cycles must be carefully analized.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

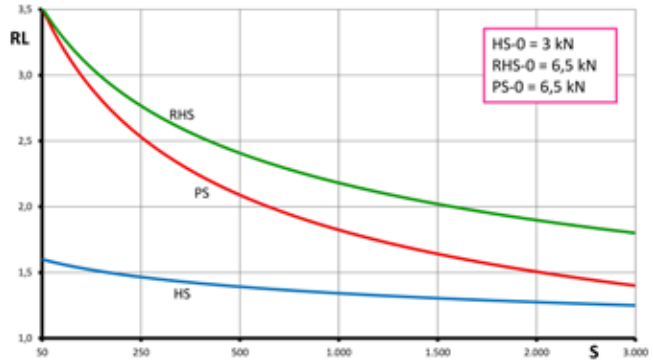


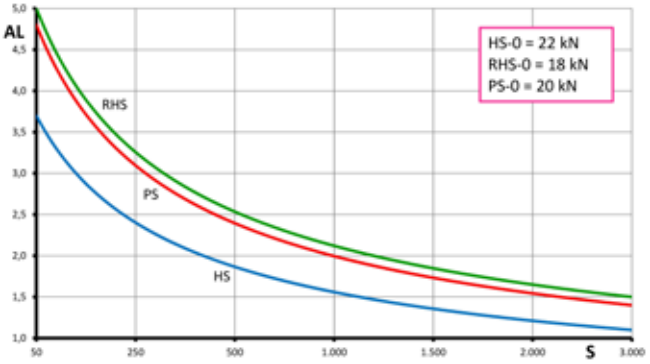


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





Motor Models

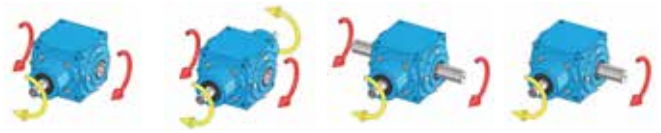
	IEC	Worm screw bore diameter	Centering diameter	Nominal power (4 poles motor)
	IEC 80 B5 / B14	19 mm	130 mm / 80 mm	1,1 kW
	IEC 90 B5 / B14	24 mm	130 mm / 95 mm	1,9 kW

Construction Forms (1/1)

Form C1 | Form C3 | Form S1 | Form S3

Form S4 | Form S31 | Form MC1 | Form MS1

Construction Forms (1/1,5 1/2 1/3 1/4)



Form C2 | Form C4 | Form S2 | Form S9

Form S10 | Form S32 | Form MC2 | Form MS2

Size 110 - Reinforced hub shaft

RK Model

RW Model

RY Model

RZ Model

RR Model

RP Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	0,2 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	2500 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	180 Nm (RK - RY - RR)
Solid shaft maximum moment	180 Nm (RW) - 410 Nm (RP)
Max input speed	3000 rpm
Main Gearbox Weight	10 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

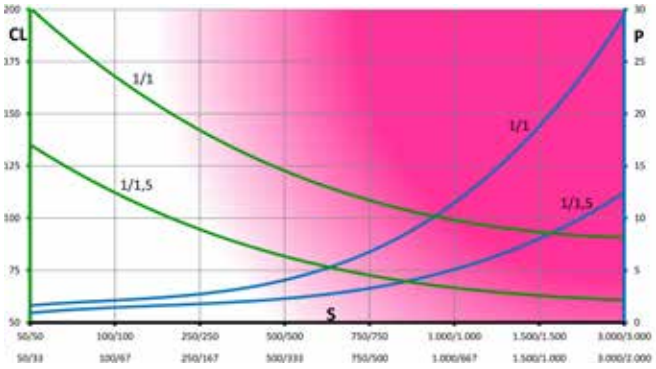
Specific features

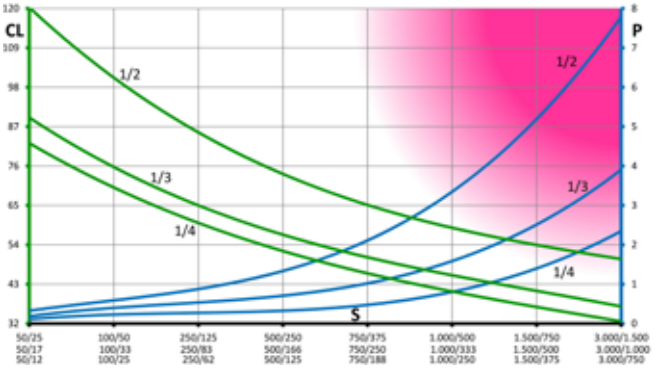
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 5,5°	+/- 5,5°	+/- 6°	+/- 4,5°	+/- 4,5°
Inertia moment	798 kg-mm²	300 kg-mm²	168 kg-mm²	89 kg-mm²	63 kg-mm²

› Power curves

The magenta zone indicates a potential heating risk.
Working cycles must be carefully analized.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

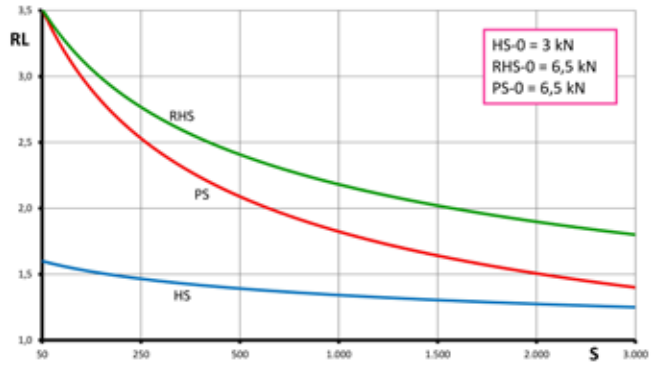


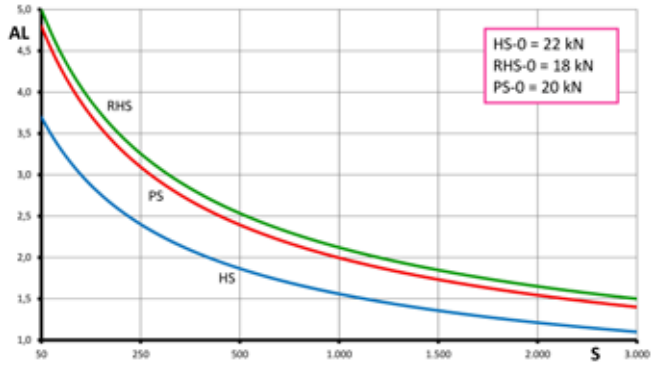


› Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





› Construction Forms (1/1)


Form C1


Form C3


Form S1


Form S3


Form S4


Form S31

› Construction Forms (1/1,5 1/2 1/3 1/4)


Form C2


Form C4


Form S2


Form S9


Form S10


Form S32

Size 134 standard

RA Model

RM Model

RB Model

RX Model

RC Model

RS Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	0,4 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	2000 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	320 Nm (RA - RB - RC)
Solid shaft maximum moment	320 Nm (RM) - 770 Nm (RS)
Max input speed	2500 rpm
Main Gearbox Weight	19 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

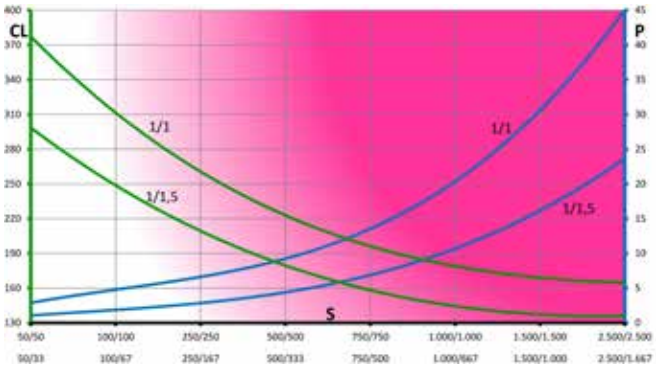
Specific features

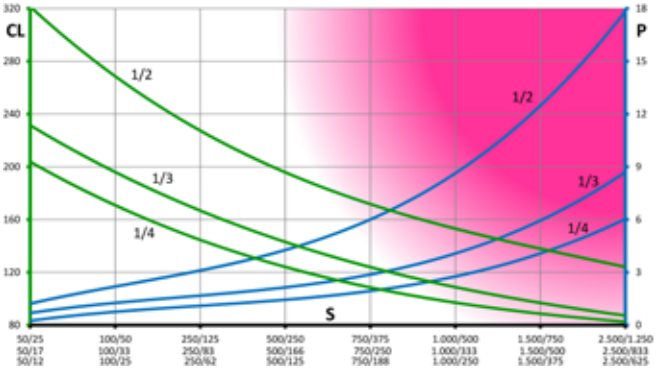
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 6,5°	+/- 5,5°	+/- 6,5°	+/- 5,5°	+/- 4,5°
Inertia moment	2590 kg-mm²	950 kg-mm²	535 kg-mm²	284 kg-mm²	207 kg-mm²

Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

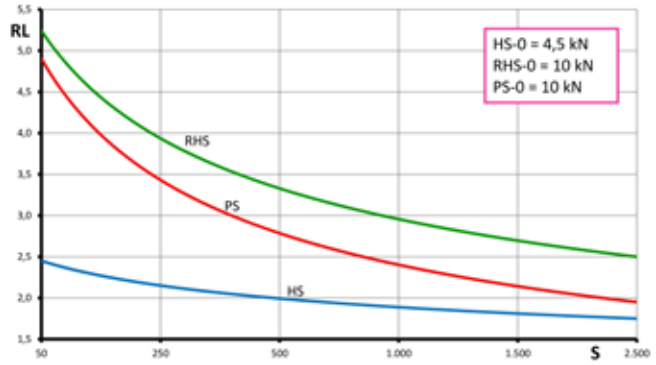


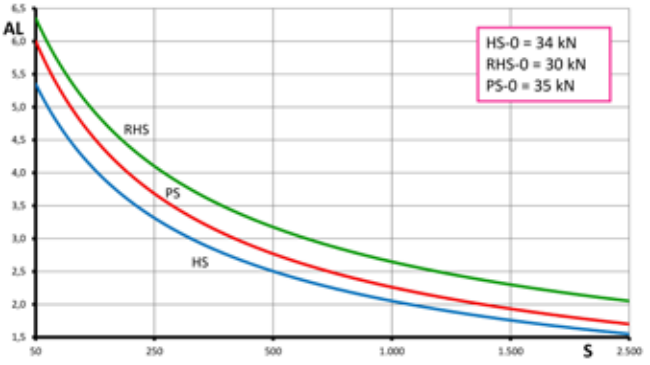


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





Motor Models

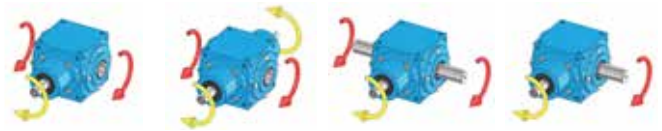
	IEC	Worm screw bore diameter	Centering diameter	Nominal power (4 poles motor)
	IEC 80 B5 / B14	19 mm	130 mm / 80 mm	1,1 kW
	IEC 90 B5 / B14	24 mm	130 mm / 95 mm	1,9 kW
	IEC 100-112 B5 / B14	28 mm	180 mm / 110 mm	5 kW
	IEC 132 B5 / B14	38 mm	230 mm / 130 mm	11 kW

Construction Forms (1/1)

Form C1 | Form C3 | Form S1 | Form S3

Form S4 | Form S31 | Form MC1 | Form MS1

Construction Forms (1/1,5 1/2 1/3 1/4)



Form C2 | Form C4 | Form S2 | Form S9

Form S10 | Form S32 | Form MC2 | Form MS2

Size 134 - Reinforced hub shaft

RK Model

RW Model

RY Model

RZ Model

RR Model

RP Model

› Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	0,4 lt

› General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	2000 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	320 Nm (RK - RY - RR)
Solid shaft maximum moment	320 Nm (RW) - 770 Nm (RP)
Max input speed	2500 rpm
Main Gearbox Weight	19 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

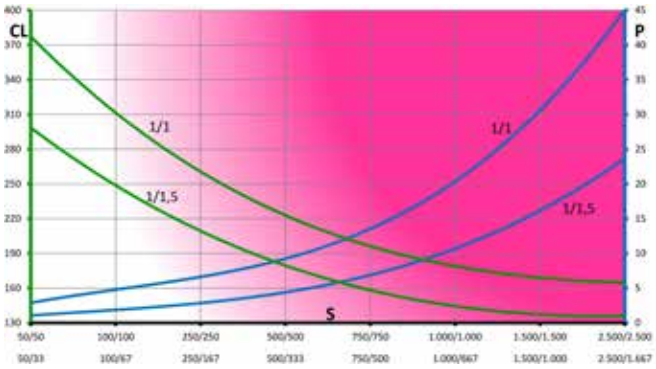
› Specific features

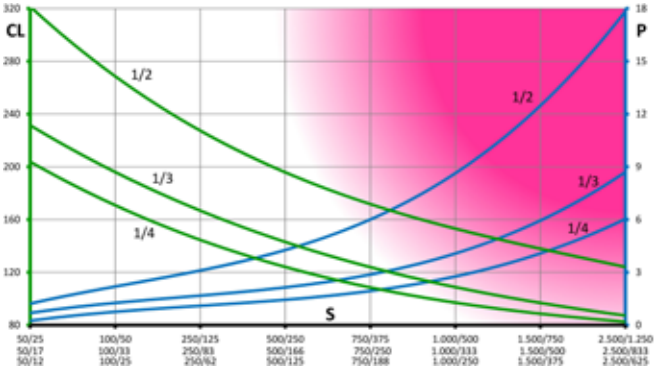
	Nominal Ratios 1/1	1/1,5	1/2	1/3	1/4
Phase between keys	+/- 6,5°	+/- 5,5°	+/- 6,5°	+/- 5,5°	+/- 4,5°
Inertia moment	2590 kg-mm²	950 kg-mm²	535 kg-mm²	284 kg-mm²	207 kg-mm²

Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

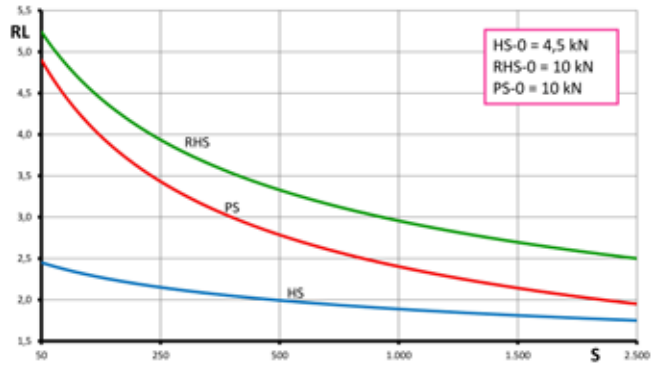


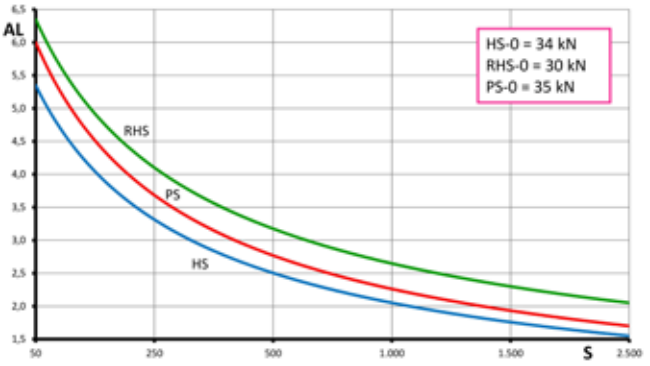


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





Construction Forms (1/1)

Form C1 | Form C3 | Form S1

Form S3 | Form S4 | Form S31

Construction Forms (1/1,5 1/2 1/3 1/4)

Form C2 | Form C4 | Form S2

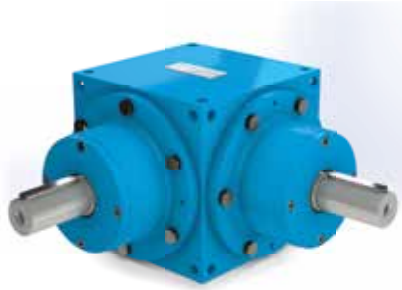
Form S9 | Form S10 | Form S32

Size 166 standard

RA Model

RM Model

RB Model



RX Model

RC Model

RS Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	0,9 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	1500 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	770 Nm (RA - RB - RC)
Solid shaft maximum moment	770 Nm (RM) - 2140 Nm (RS)
Max input speed	1800 rpm
Main Gearbox Weight	32 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

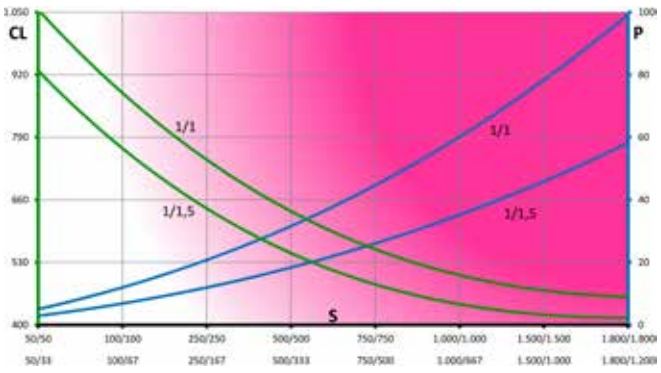
Specific features

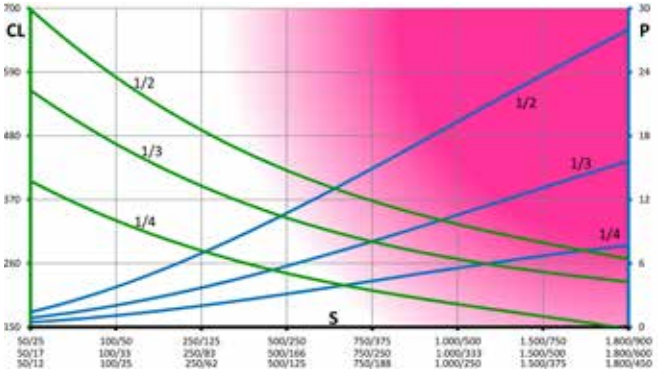
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 6,5°	+/- 6°	+/- 6,5°	+/- 5°	+/- 4°
Inertia moment	11170 kg-mm²	3970 kg-mm²	2130 kg-mm²	1013 kg-mm²	670 kg-mm²

Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

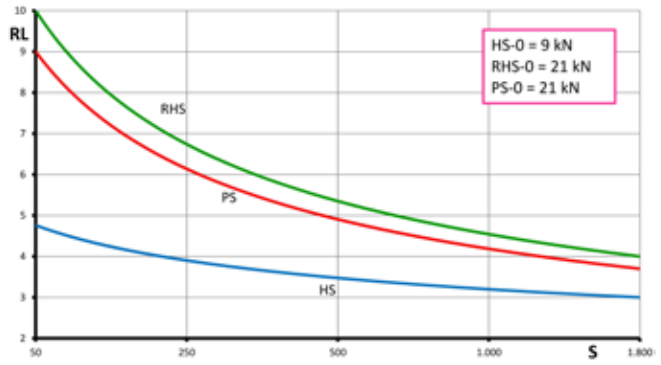


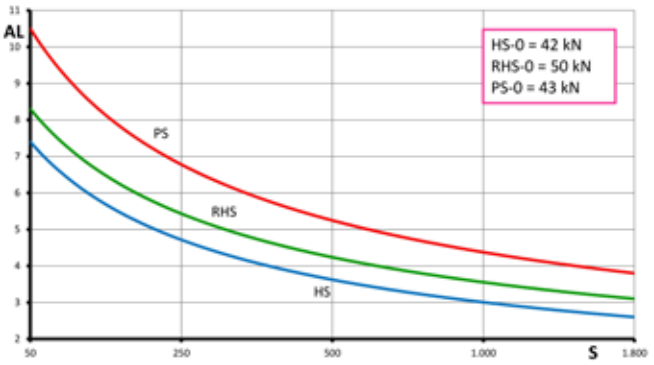


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





Motor Models

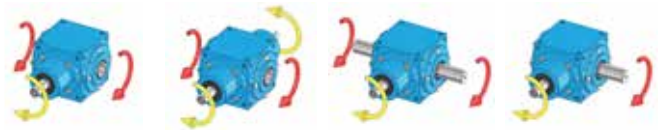
	IEC	Worm screw bore diameter	Centering diameter	Nominal power (4 poles motor)
	IEC 90 B5 / B14	24 mm	130 mm / 95 mm	1,9 kW
	IEC 100-112 B5 / B14	28 mm	180 mm / 110 mm	5 kW
	IEC 132 B5 / B14	38 mm	230 mm / 130 mm	11 kW
	IEC 160 B5 / B14	42 mm	250 mm / 180 mm	15 kW
	IEC 180 B5	48 mm	250 mm	22 kW

Construction Forms (1/1)

Form C1 | Form C3 | Form S1 | Form S3

Form S4 | Form S31 | Form MC1 | Form MS1

Construction Forms (1/1,5 1/2 1/3 1/4)



Form C2 | Form C4 | Form S2 | Form S9

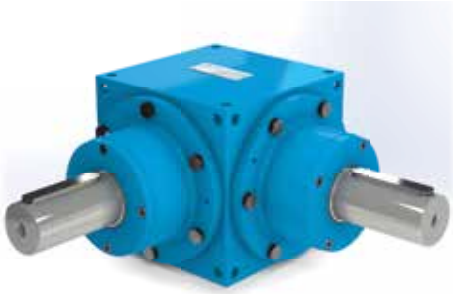
Form S10 | Form S32 | Form MC2 | Form MS2

Size 166 - Reinforced hub shaft

RK Model

RW Model

RY Model



RZ Model

RR Model

RP Model

› Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	0,9 lt

› General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	1500 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	770 Nm (RK - RY - RR)
Solid shaft maximum moment	770 Nm (RW) - 2140 Nm (RP)
Max input speed	1800 rpm
Main Gearbox Weight	32 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

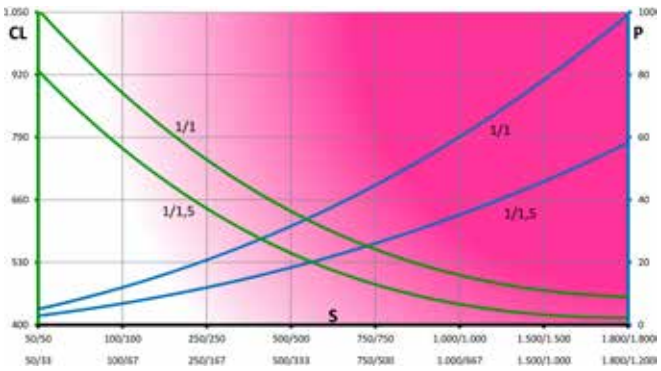
› Specific features

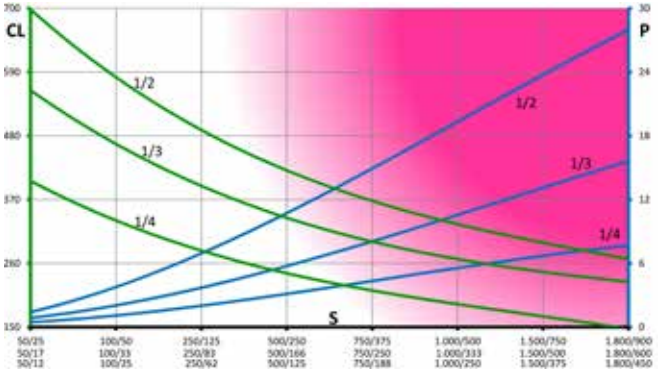
	Nominal Ratios 1/1	1/1,5	1/2	1/3	1/4
Phase between keys	+/- 6,5°	+/- 6°	+/- 6,5°	+/- 5°	+/- 4°
Inertia moment	11170 kg-mm^2	3970 kg-mm^2	2130 kg-mm^2	1013 kg-mm^2	670 kg-mm^2

› Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

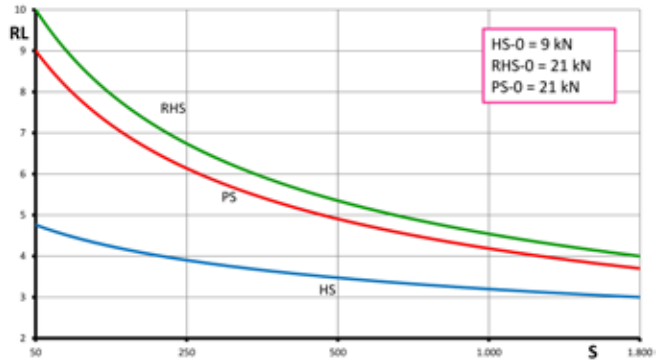


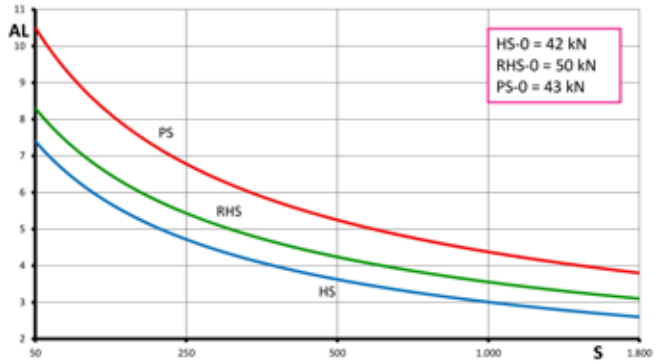


› Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





› Construction Forms (1/1)


Form C1


Form C3


Form S1


Form S3


Form S4


Form S31

› Construction Forms (1/1,5 1/2 1/3 1/4)


Form C2


Form C4


Form S2


Form S9


Form S10


Form S32

Size 200 standard

RA Model

RM Model

RB Model

RX Model

RC Model

RS Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	1,5 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	1000 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	1740 Nm (RA - RB - RC)
Solid shaft maximum moment	1740 Nm (RM) - 3900 Nm (RS)
Max input speed	1500 rpm
Main Gearbox Weight	55 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

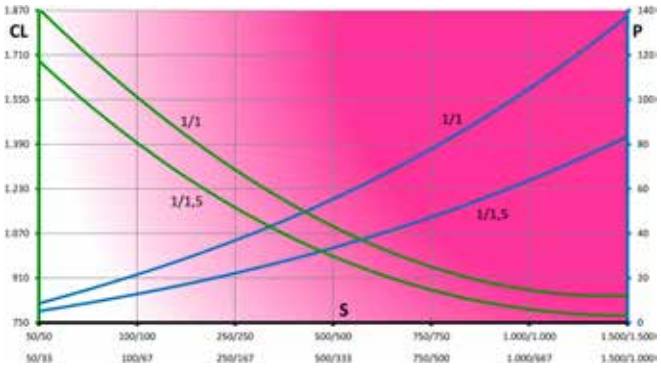
Specific features

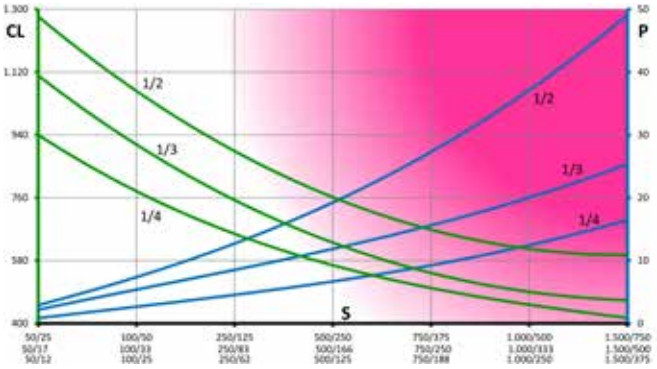
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 6,5°	+/- 5,5°	+/- 6,5°	+/- 5°	+/- 4°
Inertia moment	0,2625 kg-m²	10000 kg-mm²	5276 kg-mm²	2670 kg-mm²	1715 kg-mm²

Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

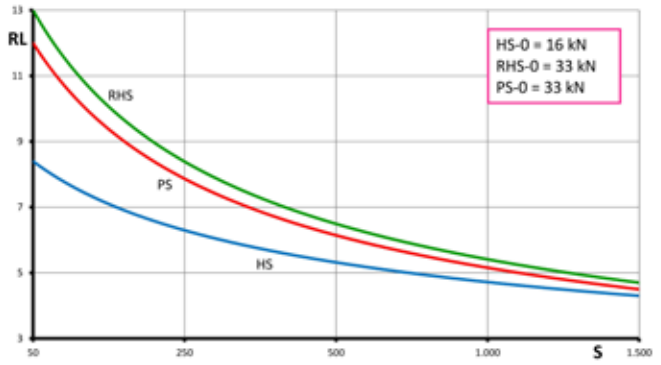


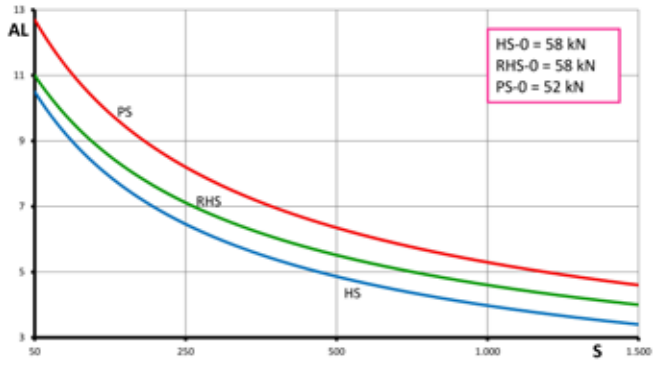


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





Motor Models

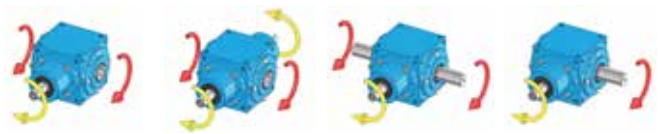
	IEC	Worm screw bore diameter	Centering diameter	Nominal power (4 poles motor)
	IEC 132 B5 / B14	38 mm	230 mm / 130 mm	9,2 kW
	IEC 160 B5 / B14	42 mm	250 mm / 180 mm	15 kW
	IEC 180 B5	48 mm	250 mm	22 kW

Construction Forms (1/1)

Form C1 | Form C3 | Form S1 | Form S3

Form S4 | Form S31 | Form MC1 | Form MS1

Construction Forms (1/1,5 1/2 1/3 1/4)



Form C2 | Form C4 | Form S2 | Form S9

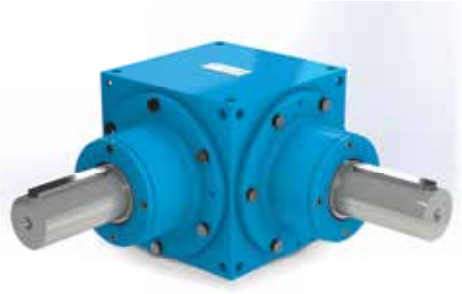
Form S10 | Form S32 | Form MC2 | Form MS2

Size 200 - Reinforced hub shaft

RK Model

RW Model

RY Model



RZ Model

RR Model

RP Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	1,5 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	1000 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	1740 Nm (RK - RY - RR)
Solid shaft maximum moment	1740 Nm (RW) - 3900 Nm (RP)
Max input speed	1500 rpm
Main Gearbox Weight	55 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

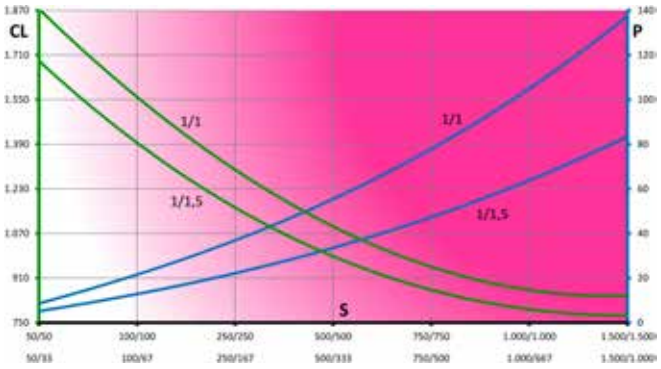
Specific features

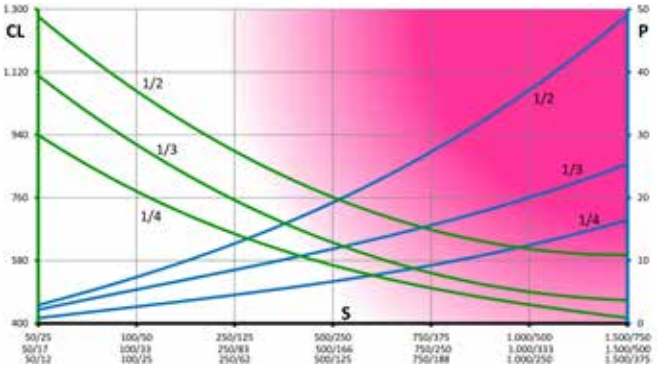
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 6,5°	+/- 5,5°	+/- 6,5°	+/- 5°	+/- 4°
Inertia moment	0,2625 kg-m²	10000 kg-mm²	5276 kg-mm²	2670 kg-mm²	1715 kg-mm²

› Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

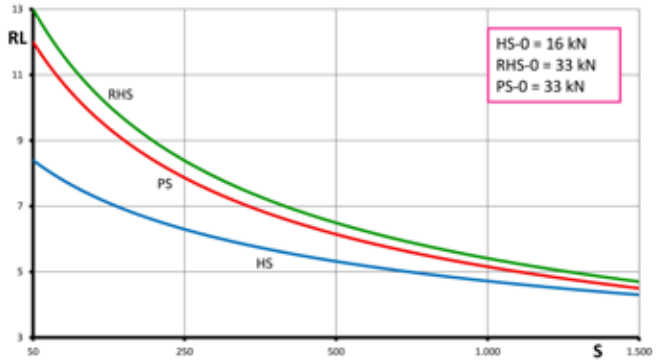


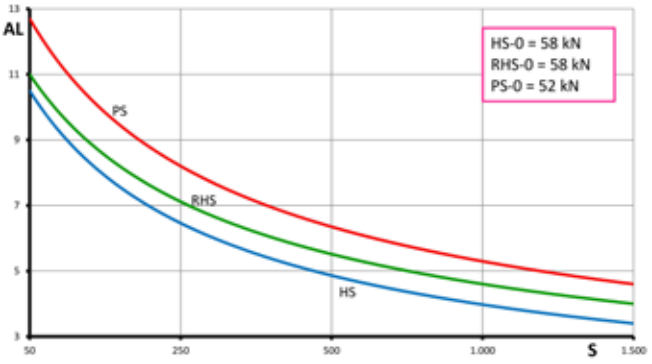


› Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





› Construction Forms (1/1)


Form C1


Form C3


Form S1


Form S3


Form S4


Form S31

› Construction Forms (1/1,5 1/2 1/3 1/4)


Form C2


Form C4


Form S2


Form S9


Form S10

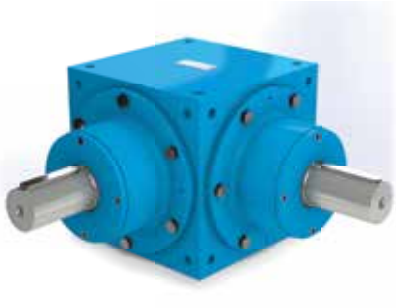

Form S32

Size 250 standard

RA Model

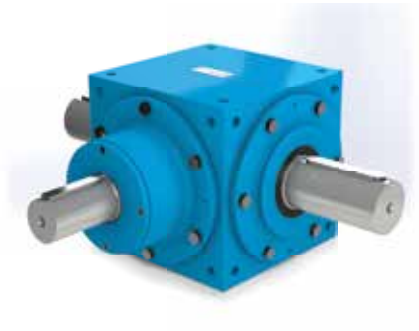
RM Model

RB Model



RX Model

RC Model



RS Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	3,1 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	800 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	3900 Nm (RA - RB - RC)
Solid shaft maximum moment	3900 Nm (RM) - 8000 Nm (RS)
Max input speed	1000 rpm
Main Gearbox Weight	105 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

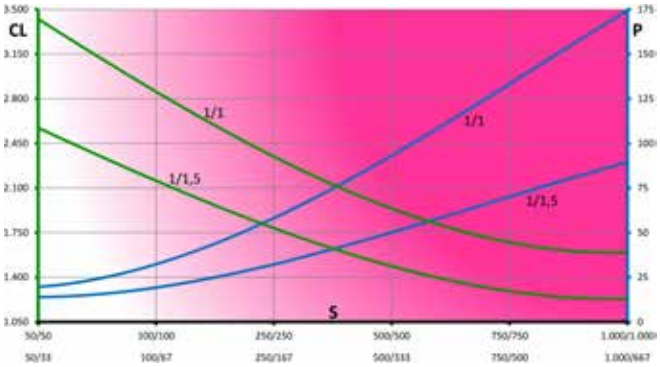
Specific features

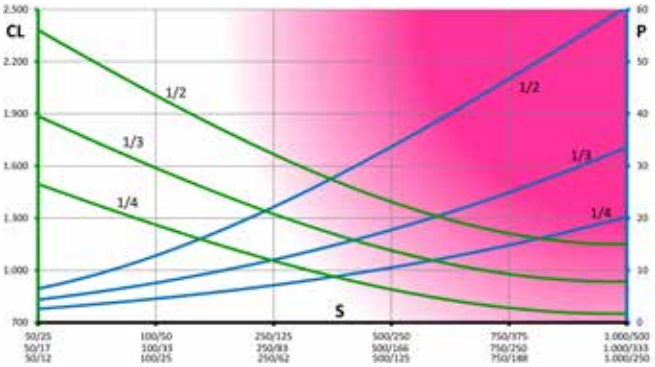
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 6°	+/- 5,5°	+/- 6°	+/- 5°	+/- 4,5°
Inertia moment	0,0915 kg-m^2	0,0328 kg-m^2	0,0177 kg-m^2	8670 kg-mm^2	5830 kg-mm^2

Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

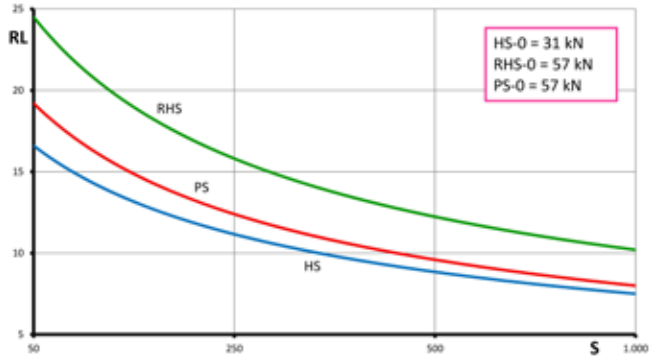


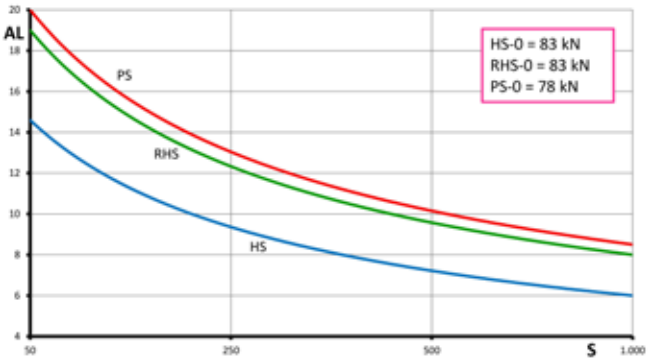


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]

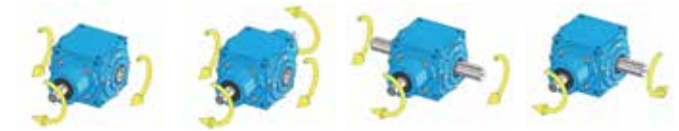




Motor Models

	IEC	Worm screw bore diameter	Centering diameter	Nominal power (4 poles motor)
	IEC 160 B5 / B14	42 mm	250 mm / 180 mm	15 kW
	IEC 180 B5	48 mm	250 mm	22 kW
	IEC 225 B5	55 mm	350 mm	45 kW
	IEC 250 B5	60 mm	450 mm	55 kW
	IEC 200 B5	55 mm	400 mm	30 kW

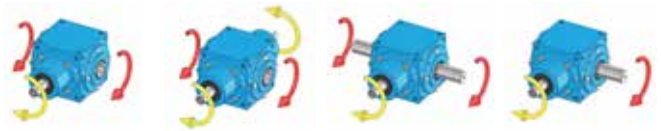
Construction Forms (1/1)



Form C1 | Form C3 | Form S1 | Form S3

Form S4 | Form S31 | Form MC1 | Form MS1

Construction Forms (1/1,5 1/2 1/3 1/4)



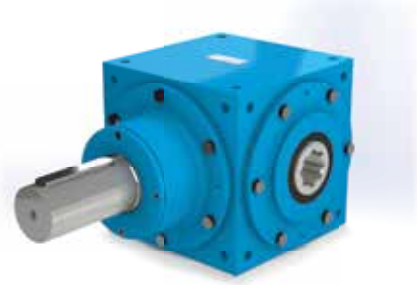
Form C2 | Form C4 | Form S2 | Form S9

Form S10 | Form S32 | Form MC2 | Form MS2

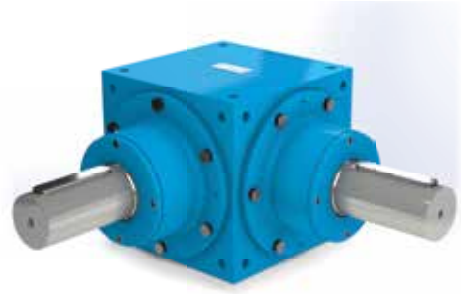
Size 250 - Reinforced hub shaft

RK Model

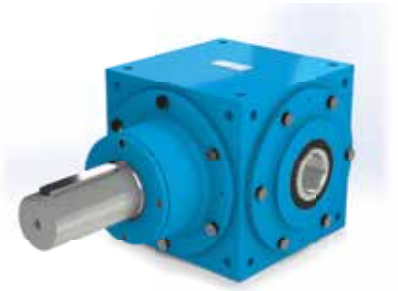
RW Model



RY Model



RZ Model



RR Model

RP Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	3,1 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	800 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	3900 Nm (RK - RY - RR)
Solid shaft maximum moment	3900 Nm (RW) - 8000 Nm (RP)
Max input speed	1000 rpm
Main Gearbox Weight	105 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

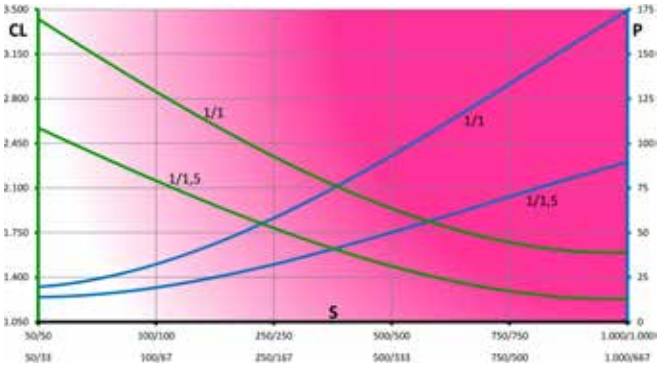
Specific features

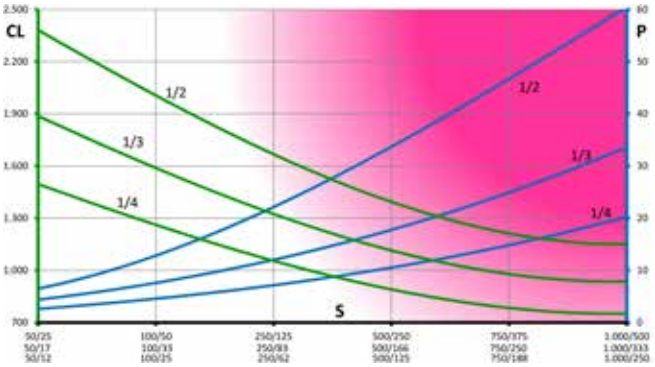
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 6°	+/- 5,5°	+/- 6°	+/- 5°	+/- 4,5°
Inertia moment	0,0915 kg-m²	0,0328 kg-m²	0,0177 kg-m²	8670 kg-mm²	5830 kg-mm²

Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

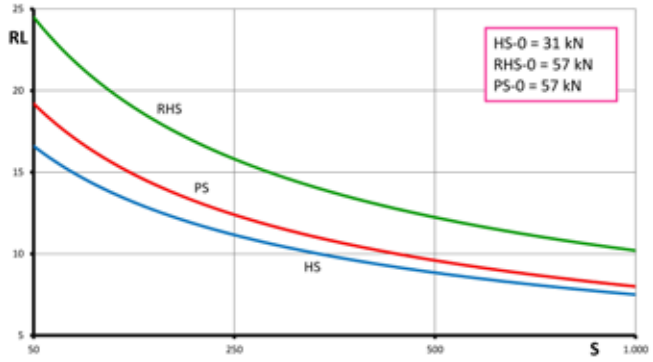


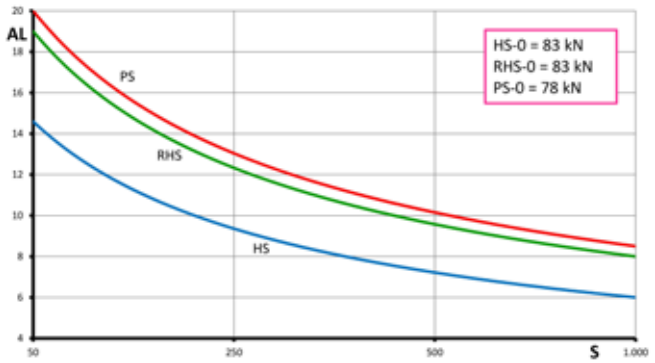


Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





Construction Forms (1/1)


Form C1


Form C3


Form S1


Form S3


Form S4


Form S31

Construction Forms (1/1,5 1/2 1/3 1/4)


Form C2


Form C4


Form S2


Form S9


Form S10

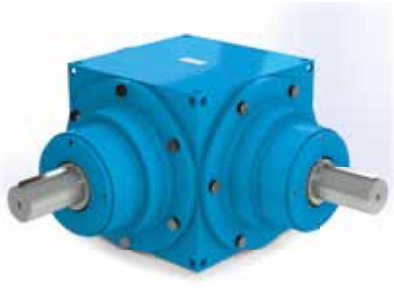

Form S32

Size 350 standard

RA Model

RM Model

RB Model



RX Model

RC Model

RS Model

Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	11 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	600 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	12000 Nm (RA - RB - RC)
Solid shaft maximum moment	12000 Nm (RM) - 14500 Nm (RS)
Max input speed	750 rpm
Main Gearbox Weight	175 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

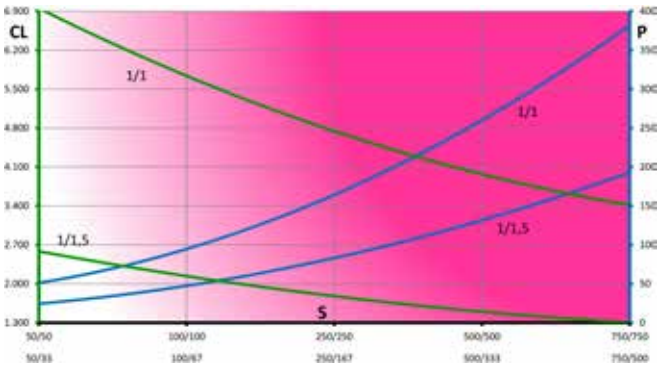
Specific features

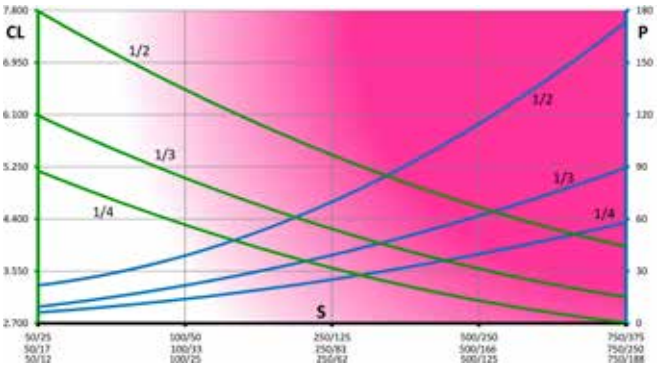
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 4°	+/- 4°	+/- 4°	+/- 3,5°	+/- 3,5°
Inertia moment	0,7553 kg-m²	0,2617 kg-m²	0,1392 kg-m²	61600 kg-mm²	35200 kg-mm²

› Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

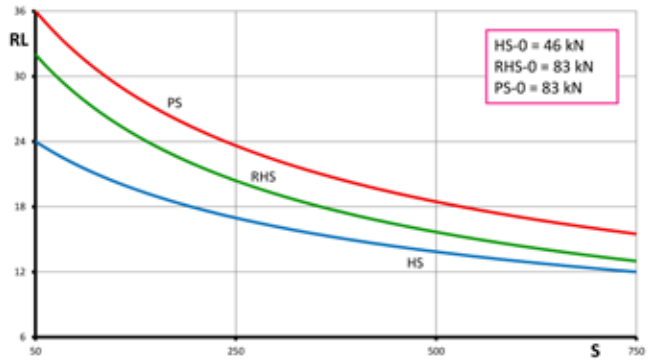


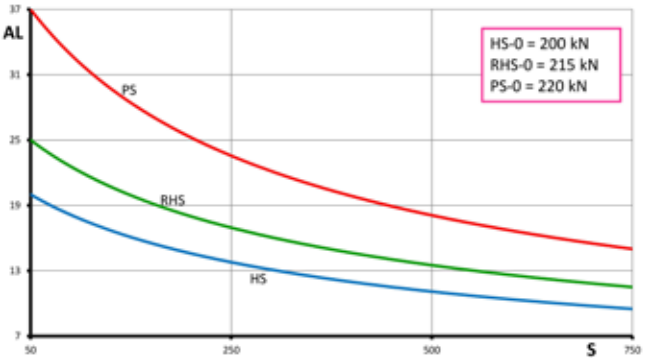


› Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





› Construction Forms (1/1)

Form C1 | Form C3 | Form S1

Form S3 | Form S4 | Form S31

› Construction Forms (1/1,5 1/2 1/3 1/4)

Form C2 | Form C4 | Form S2

Form S9 | Form S10 | Form S32

Size 350 - Reinforced hub shaft

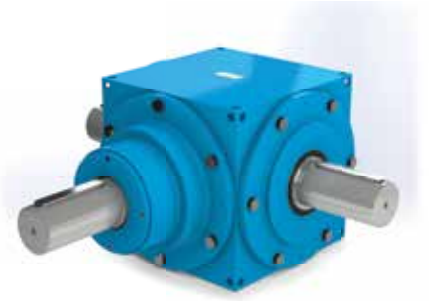
RK Model

RW Model

RY Model

RZ Model

RR Model



RP Model

› Materials

	Material	Norms	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	GJL 250	EN 1561:2011	Grey cast iron	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	11 lt

› General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	600 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	12000 Nm (RK - RY - RR)
Solid shaft maximum moment	12000 Nm (RW) - 14500 Nm (RP)
Max input speed	750 rpm
Main Gearbox Weight	175 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

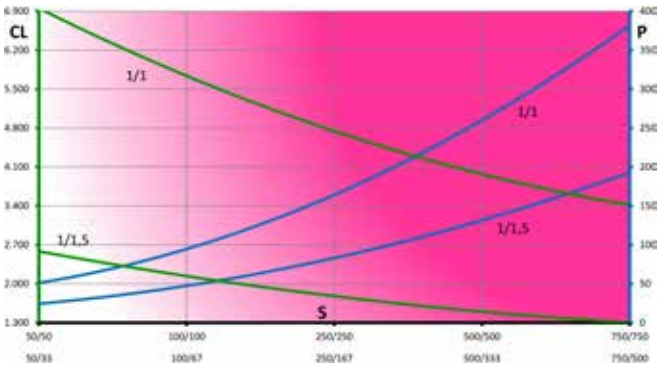
› Specific features

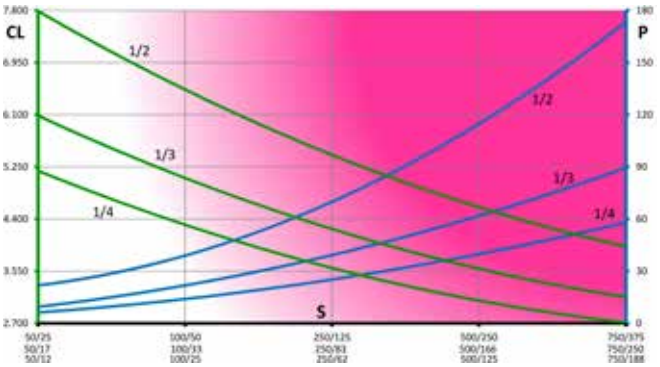
	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 4°	+/- 4°	+/- 4°	+/- 3,5°	+/- 3,5°
Inertia moment	0,7553 kg-m^2	0,2617 kg-m^2	0,1392 kg-m2	61600 kg-mm^2	35200 kg-mm^2

› Power curves

La zona magenta indica un potenziale rischio di accumulo di calore.
I cicli di lavoro devono essere analizzati con cura.

S = Rotational speed of the fast/slow shaft [rpm]
CL = Slow shaft torque [Nm]
P = requested input power [kW]

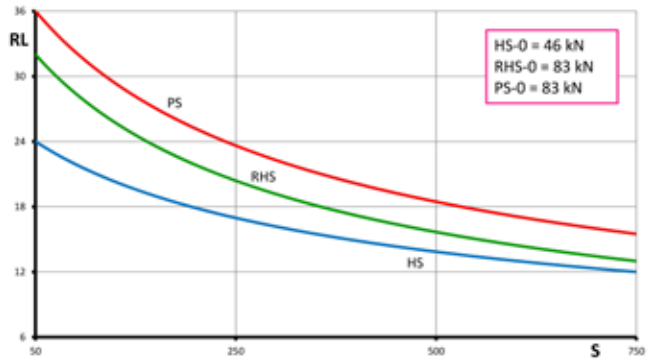


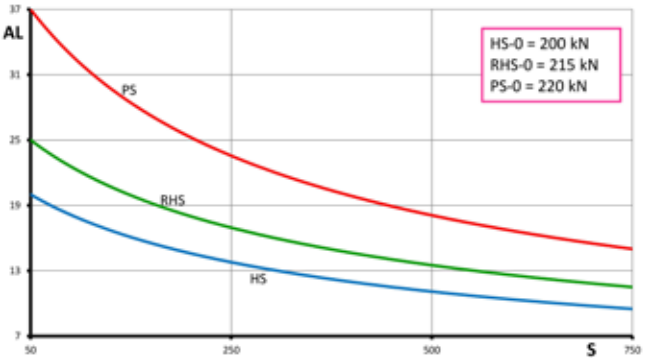


› Max admissible loads

S = Fast shaft rotational speed [rpm]
RL = Admissible radial load [kN]
AL = Admissible axial load [kN]
HS = Hub shaft

RHS = reinforced hub shaft
PS = Solid protruding shaft
HS-0 = Hub shaft static load [kN]
PS-0 = solid shaft static load [kN]





› Construction Forms (1/1)

Form C1 | Form C3 | Form S1

Form S3 | Form S4 | Form S31

› Construction Forms (1/1,5 1/2 1/3 1/4)

Form C2 | Form C4 | Form S2

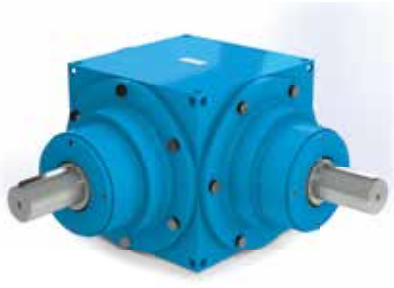
Form S9 | Form S10 | Form S32

Size 500

RA Model

RM Model

RB Model



RX Model

RC Model

RS Model

Materials

	Material	Normative	Specs	Indications
Hollow shaft / Solid shaft	C45	EN 10083-2:2006	Carbon steel	
Hub shaft	C45	EN 10083-2:2006	Carbon steel	
Carter	S235 J0	EN 10025-2:2005	Welded carbon steel	Completely machined on 6 faces
Bevel gears	17NiCrMo 6-4	EN 10084:2008	Casehardening alloy steel	Ground bores and planes. Gleason gears run by pair.
Lubricant	Unimec Atir SH150		Synthetic oil	28 lt

General features

Efficiency	90 %
Gear backlash	15' - 20'
Forced lubrication speed	300 rpm
Grease lubrication speed	100 rpm
Operating temperature	-10 °C / 80 °C

Hollow shaft maximum moment	54000 Nm (RA - RB - RC)
Solid shaft maximum moment	54000 Nm (RM - RS)
Max input speed	500 rpm
Main Gearbox Weight	1050 kg
Standard Working Conditions	25 °C - regular working - 10.000 hours of expected life

Specific features

	Nominal Ratios				
	1/1	**1/1,5**	**1/2**	**1/3**	**1/4**
Phase between keys	+/- 4°	+/- 4°	+/- 4°	+/- 3,5°	+/- 3,5°
Inertia moment	1,7372 kg-m^2	0,602 kg-m^2	0,32 kg-m^2	0,142 kg-m^2	81000 kg-mm^2

› Power curves

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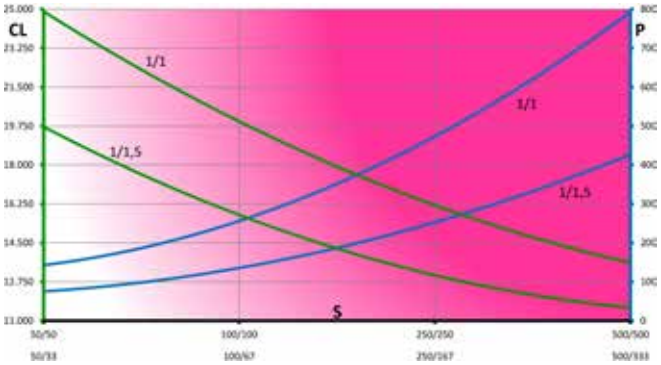

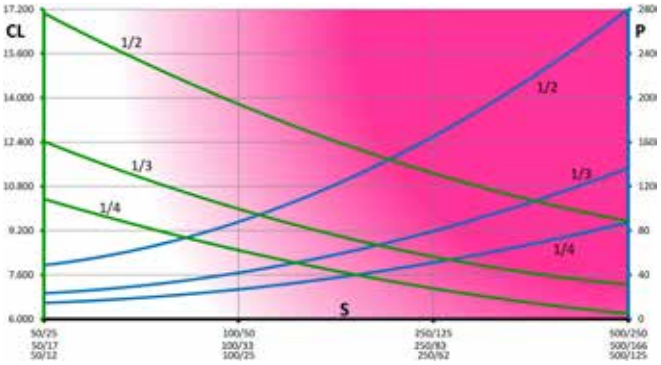

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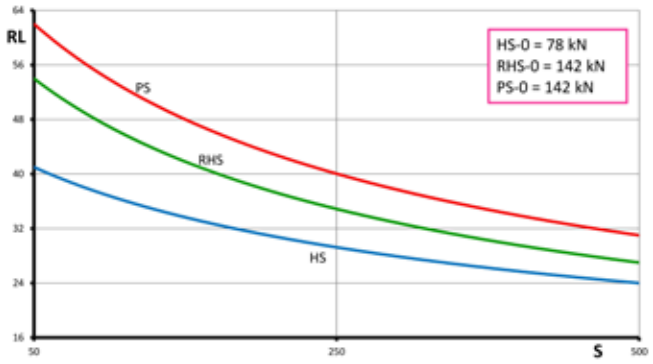

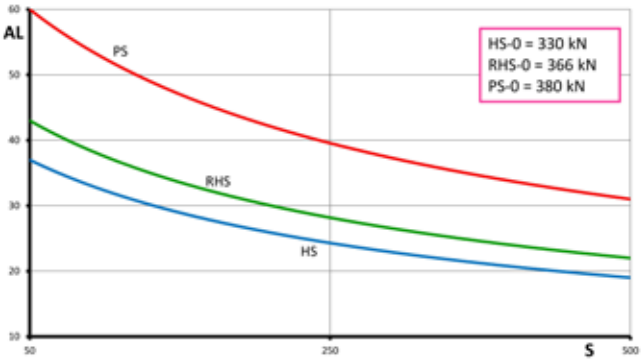

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