

INSTRUCTION FOR USE

WORM-GEAR UNIT



TYPE RT/MRT..A

Dimension:
28 - 180

Gear ratio:
5 : 1 - 100 : 1

Output:
0,06 - 15 kW

Torque:
5 - 2540 Nm



EC – Declaration of Conformity

Manufacturer: TOS ZNOJMO, akciová společnost
Družstevní 3
Czech Republic, 669 02 Znojmo

Equipment: Worm-gear unit

Type/Model: MRT, RT - 28,30,40,50,60,70,80,100,120,150,180

Equipment description: The products have been designed to drive other equipment. The gear unit is connected with another equipment through a hollow shaft or an output shaft with a full shaft. The MRT modification includes el. motor, the RT modification has not any motor.

The equipment fulfils all relevant provisions:

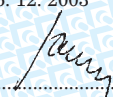
- the Government Decree No. 170 / 1997 of the Code, in the wording of the the Government Decree No. 15 / 1999 of the Code, the Government Decree No. 283 / 2000 of the Code and the Government Decree No. 251 / 2003 of the Code (complies with the regulation 98 / 37/ES)
- standards: ČSN EN 292-1:2000; ČSN EN 292-2 + A1:2000, ČSN EN 294:1993; ČSN EN 614-1:1997, ČSN EN 953:1998, ČSN EN 1937:1997

Assessment of conformity was carried out by the organization:

Strojírenský zkušební ústav, s.p.
odštěpný závod Jablonec nad Nisou
Final Protocol No. 31-3031 from 2003-11-28
Certificate No.: E-31 20900-03

We hereby declare the equipment is safe when applied in compliance with the design purpose. The manufacturing procedure accepts and performs all provisions providing conformity of all machinery introduced to the market with technical documentation and principal requirements.

Ve Znojmě 6. 12. 2003


Ing. Miroslav Pavlas

Member of the Board of Directors


Ing. Vladimír Šmidák

Chairman of the Board of Directors

The present declaration does not guarantee the qualities within the sense of responsibility of the product
Safety regulations specified in the product documentation must be adhered to.

akciová společnost



CERTIFIKÁT

podle nařízení vlády č. 170/1997 Sb., ve znění nařízení vlády č. 15/1998 Sb., nařízení vlády č. 263/2000 Sb. a
nařízení vlády č. 251/2005 Sb. (odpovídá směrnici 98/37/EC)

CERTIFICATE/ZERTIFIKAT

according to the Directive 98/37/EC / laut der Richtlinie 98/37/EG

Číslo:

Manufacturernr.

E-31-20900-03

Držitel certifikátu:
Owner of certificate
Besitzer von Zertifikat

TOS ZNOJMO, akciová společnost
Br. Znojmo II 3
62-688 02 ZNOJMO

Výrobek
Manufacturernr.
Hersteller

TOS ZNOJMO, akciová společnost
Br. Znojmo II 3
62-688 02 ZNOJMO

Výrobek
Product
Produkt

Šneková přemětníková
Warm gear reducers
Schneckengetriebe

Typ/Model:
Type/Modell / Typ/Modell

MRT; RT - 28, 30, 40, 50, 60, 70, 80, 100, 120, 150, 180

Podklad pro vydání certifikátu:
Basis of certificate
Unterlage für Zertifikatsausgabe

Závěrečný protokol č. 31-2091 ze dne 2003-11-28
Final Test Report No. 31-2091 dated 2003-11-28
Abschlussprotokoll Nr. 31-2091 vom 2003-11-28

Applikační normy:
Standards applied
Benutzte Normen

ČSN EN 282-1:2000; ČSN EN 282-2+A1:2000; ČSN EN 294:1993;
ČSN EN 614-1:1997; ČSN EN 603:1998; ČSN EN 1037:1997

Strojírenský zkušební ústav, s. p., potvrzuje, že výše uvedený výrobek splňuje technická požadavky
nařízení vlády č. 170/1997 Sb., ve znění nařízení vlády č. 15/1998 Sb., nařízení vlády č. 263/2000 Sb. a
nařízení vlády č. 251/2005 Sb. (odpovídá směrnici 98/37/EC)

Strojírenský zkušební ústav - Engineering Test Institute hereby confirms that the above mentioned product complies with the
technical requirements of Government Order no. 170/1997 Coll. in the wording of Government Order no. 15/1998 Coll.,
Government Order no. 263/2000 Coll. and Government Order no. 251/2005 Coll. (corresponds with EC Council Directive
98/37/EC).

Strojírenský zkušební ústav - Prüfinstitut der Maschinenbaulabor, Státní zkušební ústav, bestätigt, dass das i. o. Produkt die
technischen Anforderungen der Regierungsvorschrift Nr. 170/1997 Sg., in Wortlaut der Regierungsvorschrift Nr. 15/1998
Sg., Regierungsvorschrift Nr. 263/2000 Sg. und Regierungsvorschrift Nr. 251/2005 Sg. erfüllt (entspricht der Richtlinie Nr.
98/37/EG).

V Brně dne 2003-11-28
Dra dated / in Dra am

Platnost do 2008-10-31
Expiry date / Gültig bis

Strojírenský zkušební ústav, s. p.
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Ing. Josef Bezd
Fühdrl / Director / Direktor



CERTIFICATE

The TÜV CERT Certification Body
of TÜV Management Service GmbH

certifies in accordance
with TÜV CERT procedures that

TOS ZNOJMO, akciová společnost
Družstevní 3
CZ-669 02 Znojmo

has established
and applies a Quality System for

**Development, Design, Manufacture, Distribution
and Service of Gearboxes, Geared Motors and
Drives, Production of Mechanical Parts**

An audit was performed, Report No. 70033750

Proof has been furnished that the requirements
according to

ISO 9001 :2000

are fulfilled. The certificate is valid until December 2005

Certificate Registration No. 12 100 17839

March, December 15, 2002



09 6 704-46-66

TÜV

MANAGEMENT SERVICE

A handwritten signature in black ink, appearing to be "R. G.", written over a horizontal line.

TÜV CERT Certification Body
of TÜV Management Service GmbH
Unternehmensgruppe TÜV SÜD Deutschland

Content

INSTRUCTIONS FOR USE

SERVICE AND MAINTENANCE OF WORM-GEAR UNITS

CHAPTER	PAGE
1 Application	4
2 Technical data	4
3 Safety	6
4 Noise emission.....	8
5 Transport	8
6 Preservation removal	9
7 Mounting	9
8 Lubrication, troubleshooting.....	10
9 Storage.....	12
10 Spare parts.....	12
11 Accessories	14
12 Scrapping and disposal	16
13 Guarantee	16
Acceptance Certificate	17



Instructions for use

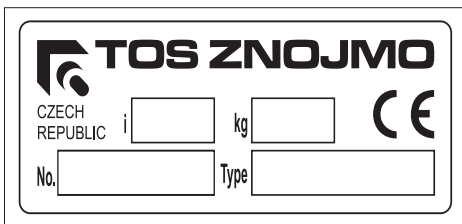
Service and maintenance of worm-gear units

1) Application

The worm-gear units have been designed to drive **other equipment**. A worm-gear unit is connected with another equipment through a hollow shaft or an output shaft with a full shaft I or II. The gear unit is provided with an el. motor and can be installed and operated at workplaces complying with the ČSN EN 60 204-1 standard. Electrical equipment of machinery: Part 1: General Requirements.

2) Technical Data

Each worm-gear unit is provided with a name plate.



Type: gear unit type

kg: gear unit mass

No: serial No.

i: gear ratio

The name plate shown in the figure includes also identification data, which shall be specified together with the job number, see the Acceptance Certificate, page 17, anytime you contact our commercial or technical department.

RT Type: worm-gear unit with a full shaft on the input shaft – without motor.

MRT type worm-gear unit with a hollow input shaft combined with a flange enabling el. motor installation or further completing with flange equipment according to IEC. The application of motor of IM B14 (IM 3681) feature allows to reach compact appearance.

MRP type: worm-gear unit with front countershaft.

MRT x RT type: combination of worm-gear units aimed to reach high gear ratio.

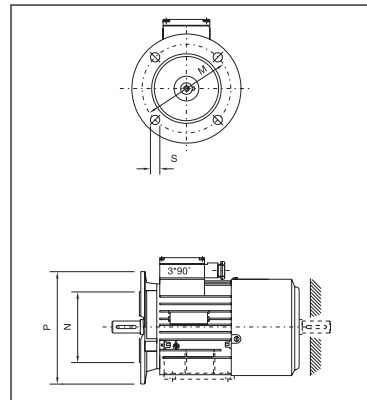


Material applied:

- gearboxes of MRT-RT gear units of sizes 28 to 80 DIN 1725-26-AISi9Cu3
- gearboxes of MRT-RT gear units of sizes 100 to 180
cast iron GG 20 ČSN 422420
- feet and flanges of MRT-RT of sizes 28 to 120 aluminium
DIN 1725-26-AISi9Cu3
- feet and flanges of MRT-RT of sizes 150 to 180
cast iron GG 20 ČSN 422420
- worm – steel DIN 1.1731-16MnCr5 (ČSN 414220)
- worm wheel – CuSn12Ni DIN 1705
- bearings – SKF or equivalent
- input shaft – MRT type – dimensions according to IEC 72
- output shaft – with one or two full shafts (separate as accessories)
ČSN 411600, dimensions according to IEC 72, female threaded full shaft
according to DIN 332 DS type
- flanges dimensions – MRT type – for el. motor installation according
to IEC 72 – see the Table 2.1
- lubrication – synthetic oil
- surface finish – MRT-RT, no finish with sizes 28 to 80, varnishing
if required, polyurethane coat with MRT-RT of sizes 100 to 180

Table 2.1 (9.1 catalogue)

Flanges dimensions according to IEC 72				
M	P	N	FF	FT
65	80	50	5,8	M5
75	90	60	5,8	M5
85	105	70	7	M6
100	120	80	7	M6
115	140	95	10	M8
130	160	110	10	M8
165	200	130	12	M10
215	250	180	15	M14
265	300	230	15	M14
300	350	250	18,5	M16





3) Safety:

The worm-gear unit **must** be fixed. Rotary parts **must** be protected with a safety cover and provided with warning identification. The worm-gear unit **may not** be overloaded. In case of overload danger during start, shocks or blocking a safety clutch **must** be provided. Permissible radial load F_{rad} **shall not** be exceeded (see the Table 3.1 and 3.2).

Table 3.1 (8.1 catalogue) Max. permissible radial and axial load /N/ for ball bearings

		RT 28; 30		RT 40		RT 50		RT 60		RT 70	
	min ⁻¹	F_{ax}	F_{rad}	F_{ax}	F_{rad}	F_{ax}	F_{rad}	F_{ax}	F_{rad}	F_{ax}	F_{rad}
n_1	1400	20	100	40	200	60	300	70	340	70	360
n_2	187	130	660	170	870	220	1100	330	1650	420	2090
n_2	140	150	730	190	960	240	1220	360	1810	460	2300
n_2	112	160	790	210	1030	260	1310	390	1950	490	2470
n_2	93	170	840	220	1090	280	1390	420	2080	530	2630
n_2	70	180	920	240	1200	310	1530	460	2280	580	2890
n_2	56	200	990	260	1300	330	1650	490	2460	620	3120
n_2	47	210	1050	270	1370	350	1750	520	2610	660	3300
n_2	35	230	1160	300	1520	390	1930	580	2880	730	3650
n_2	28	250	1250	330	1630	420	2080	620	3100	790	3930
n_2	23	270	1330	350	1740	440	2220	660	3310	840	4190
n_2	17,5	290	1460	380	1910	490	2430	720	3620	920	4590
n_2	14	310	1570	410	2060	520	2620	780	3900	990	4950

Table 3.1 (8.1 catalogue) – cont.

		RT 80		RT 100		RT 120		RT 150		RT 180	
	min ⁻¹	F_{ax}	F_{rad}	F_{ax}	F_{rad}	F_{ax}	F_{rad}	F_{ax}	F_{rad}	F_{ax}	F_{rad}
n_1	1400	90	450	130	650	170	850	260	1300	500	1550
n_2	187	500	2490	580	2880	810	4050	1100	5480	1190	5950
n_2	140	550	2740	630	3170	890	4460	1210	6040	1310	6550
n_2	112	590	2950	680	3410	960	4800	1300	6510	1410	7060
n_2	93	630	3140	730	3630	1020	5110	1380	6920	1500	7510
n_2	70	690	3450	800	3990	1120	5610	1520	7610	1650	8260
n_2	56	740	3720	860	4300	1210	6050	1640	8200	1780	8890
n_2	47	790	3940	910	4560	1280	6410	1740	8690	1890	9430
n_2	35	870	4350	1010	5030	1410	7070	1920	9590	2080	10400
n_2	28	940	4680	1080	5420	1520	7620	2070	10330	2240	11210
n_2	23	1000	5000	1160	5790	1630	8140	2210	11030	2390	11960
n_2	17,5	1100	5480	1270	6340	1780	8910	2420	12080	2620	13110
n_2	14	1180	5900	1370	6830	1920	9600	2600	13010	2820	14120



Table 3.2 (8.2 catalogue) Max. permissible radial and axial load /N/ for taper roller bearings

		RT 28; 30		RT 40		RT 50		RT 60		RT 70	
	min ⁻¹	F _{ax}	F _{rad}	F _{ax}	F _{rad}	F _{ax}	F _{rad}	F _{ax}	F _{rad}	F _{ax}	F _{rad}
n ₁	1400	20	100	40	200	60	300	70	340	70	360
n ₂	187	160	790	370	1850	470	2350	820	4090	920	4620
n ₂	140	170	860	400	2010	510	2570	890	4460	1010	5040
n ₂	112	160	790	430	2150	550	2750	950	4470	1080	5390
n ₂	93	180	920	760	2280	580	2900	1010	5040	1140	5700
n ₂	70	200	980	500	2480	630	3160	1100	5490	1240	6210
n ₂	56	210	1060	530	2650	680	3380	1170	5870	1330	6640
n ₂	47	230	1140	560	2790	710	3560	1240	6190	1400	7000
n ₂	35	260	1310	610	3050	780	3890	1350	6760	1530	7640
n ₂	28	280	1400	650	3260	830	4160	1450	7230	1630	8170
n ₂	23	300	1490	690	3460	880	4420	1530	7670	1730	8670
n ₂	17,5	320	1610	750	3760	960	4790	1660	8320	1880	9410
n ₂	14	350	1730	800	4020	1030	5130	1780	8900	2010	10060

Table 3.2 (8.2 catalogue) – cont.

		RT 80		RT 100		RT 120		RT 150		RT 180	
	min ⁻¹	F _{ax}	F _{rad}	F _{ax}	F _{rad}	F _{ax}	F _{rad}	F _{ax}	F _{rad}	F _{ax}	F _{rad}
n ₁	1400	90	450	130	650	170	850	260	1300	500	1550
n ₂	187	960	4800	1310	6550	1760	8780	1870	9330	1930	9650
n ₂	140	1050	5230	1430	7150	1910	9870	2040	10180	2100	10520
n ₂	112	1120	5590	1530	7640	2050	10240	2180	10880	2250	11250
n ₂	93	1180	5920	1620	8080	2160	10820	2300	11510	2380	11900
n ₂	70	1290	6440	1760	8800	2360	11790	2510	12530	2590	12960
n ₂	56	1380	6890	1880	9410	2520	12600	2680	13400	2770	13850
n ₂	47	1450	7260	1980	9910	2660	13280	2820	14120	2920	14600
n ₂	35	1590	7930	2170	10830	2900	14510	3090	15430	3190	15950
n ₂	28	1700	8480	2320	11580	3100	15510	3300	16490	3410	17050
n ₂	23	1800	9000	2460	12280	3290	16460	3500	17500	3620	18090
n ₂	17,5	1950	9760	2670	13330	3570	17860	3800	18990	3920	19640
n ₂	14	2090	10440	2850	14260	3820	19100	4060	20130	4200	21000



Radial load F_{rad} : aa half of the slip-on full shaft (see the sketch) is considered the origin of radial force F_{rad} for the determination of this value. If the radial force on the shaft acts within a longer distance, max. permissible load **must** be reduced. E.g. only 80 % of the value shown in the table is acceptable for the loading in the point of 75 % of the full shaft. Load higher by 25 % can be allowed for the load in the point of 30 % of the full shaft length. If pulley, chain wheel or gear wheel, etc. is installed on the outlet shaft, the radial load can be determined from the following formula and the figure 3.1:

$$F_{rad} = \frac{T_2 \times k \times 2000}{D}$$

F_{rad}	=	radial load /N/
T_2	=	output torque /Nm/
D	=	rated diameter of pulley (pitch circle) /mm/
k	=	load factor 1.20 for chain wheels 1.25 for front gear wheels 1.50 for pulleys

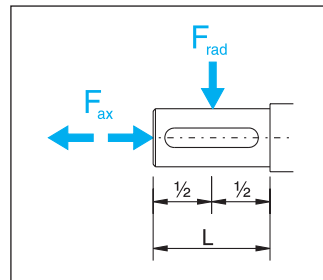


Fig. 3.1

It means the radial load of the shaft can be decreased by increasing the pulley diameter, if possible. If radial load is still high or the force acts on the full shaft within long distance, external support in bearings **must** be applied for the transfer of forces.

Axial load F_{ax} : the values specified present about 20% of permissible radial load F_{rad} .

4) Noise Emission:

acoustic pressure level A, when using A balance filter, does not exceed 70 dB. Measured according to ČSN EN 60034-9, ČSN ISO 3740, ČSN ISO 3744 and ČSN ISO 3746 standards.

5) Transport:

worm-gear units are delivered in wooden casing, provided with KORING preservation for 3 months and are fixed to prevent undesirable movement in the casing. Prevention against vibrations or fall is necessary. Check the package properly **prior to opening** to identify prospective damage.



Check if the gearbox was not damaged during transport immediately when delivered. If so record together with the forwarder the range of the damage in a protocol. Inform the worm-gear unit seller or producer at once.

6) Preservation Removal:

is not required. In case the gear unit has been sprayed with a varnish, preservation shall be removed with an agent which **will not** damage rubber packing or previous layer of varnish.

7) Mounting:

The following shall be kept while installing the gear unit and putting it into operation:

- outer vibrations and high ambient temperature shall not occur, any obstacles preventing air flow as well as heat sources shall be removed from the worm gear unit vicinity
- protective switches and clutches shall be applied in case of load with shocks, other wise the worm-gear unit could be damaged
- connected aligned shafts and clutches shall be assembled in accordance with respective instructions for use of the supplier of clutches
- the holes of parts at the end of the output shaft require H7 tolerance and shall be locked with feathers
- diameters of shafts slid in the hollow shaft require h7 tolerance
- matched surfaces shall be perfectly cleaned and protected against seizing and corrosion prior to assembly
- the gear unit shall be mounted on a flat, finished surface or just slid on the output shaft and torque shall be transferred to the support
- parts slid on the shaft shall be threaded at the shaft front side
- gear units which were out of operation for a long period shall be treated according to the instructions of the chapter on [storage](#)
- gear units shall be protected against solar radiation and extreme weather effects
- oil filling shall be checked in accordance with the Acceptance Certificate (page 17) – gear units without lubricant – filled as required – see the Table 8.3
- the connecting shaft shall be inserted into the hollow shaft and locked along its whole length
- gear units, size 100 to 180, shall be filled with oil in accordance with the Table 8.3 and the transport plug shall be replaced with a bleeder screw
- under operation gear unit conditions shall be checked visually once per 24 hours at least
 - a) lubrication leakage – proper function of oil seal – replace a faulty one
 - b) fouled surface of the gear unit – remove impurities



8) Lubrication and Troubleshooting:

NOTE: The kind of oil filling is specified in the Acceptance Certificate - page 17. The worm-gear units are generally delivered with filling; if required they are delivered without filling.

Shaft seal – the shaft seal is replaced if damaged and does not fulfil its function.

Lubricant replacement – the gear units are filled with synthetic oil. They are filled with mineral oil if required by the customer. Mineral oil shall be replaced for the first time after 400 working hours, then by each 4000 hours.

Synthetic and mineral lubricants **must not** be mixed. When another kind of lubricant is intended to be used, the gear unit shall be cleaned unconditionally.

Table 8.1 (12.1 catalogue) **Lubricating intervals – hours**

tempe- rature °C	load	mineral oil	synthetic oil
< 60	permanent	4000	long-term
< 60	intermittent	6000	
> 60	permanent	2000	
> 60	intermittent	4000	

Lubricant replacement procedure – drain the lubricant heated by operation, clean the gearbox with a flushing agent which **shall not be** aggressive to rubber packing of the shaft and to the varnish. Dry the gear unit and fill the lubricant, see the Table 8.3.

Table 8.2 **Lubricants**

ambient temp	-10 °C – +50 °C		-30 °C – +100 °C	-40 °C – +120 °C	-10 °C – +60 °C
lubricant	mineral oil		synthetic oil		synthetic grease
load	normal	heavy	normal and heavy		normal and heavy
OMV	Öle HST 320 EP	Öle HST 460 EP	Öle PG 460 EP	Öle PG 220 EP	Duraplex EP 00
Agip	Blasia 320	Blasia 460	Blasia S	–	–
Aral	Degol BG 320	Degol BG 460	Degol GS 220	Degol PAS 230	Aralub BAB EP
Castrol	Alpha SP 320	Alpha SP 460	Alpha SH 220	–	Alphagel
ESSO	Spartan EP 320	Spartan EP 460	–	–	Grease S420
Klüber	Lamora 320	Lamora 460	Syntheso HT220	Syntheso HT220	Strugtovis P Liquid
Mobil	Mobilgear 632	Mobilgear 634	Glycoil 30	–	Glycoil Grease 00
Shell	Omala EP 320	Omala EP 460	Tivela Oil WB	Omala HD 320	Tivela GL 00
Optimol	Optigear BM 320	Optigear BM 460	Optiflex A 220	–	Longtime PD 00
Total	Carter EP 320	Carter EP 460	–	–	–
Paramo	Paramol CLP 320	Paramol CLP 460	–	–	–



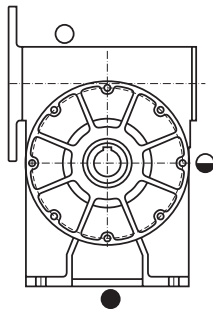
Table 8.3 (7.2 catalogue) Quantity of lubricant

type	quantity of oil (l)	type	quantity of oil (l)
MRP 40	0,13 + 0,05	MRT/RT 28	0,02
MRP 50	0,21 + 0,05	MRT/RT 30	0,02
MRP 60	0,36 + 0,15	MRT/RT 40	0,10
MRP 70	0,46 + 0,20	MRT/RT 50	0,17
MRP 80	0,70 + 0,20	MRT/RT 60	0,36
MRP 100	1,60 + 0,30	MRT/RT 70	0,46
MRP 120	2,20 + 0,40	MRT/RT 80	0,70
MRP 150	4,00 + 0,30	MRT/RT 100	1,60
MRP 180	7,00 + 0,30	MRT/RT 120	2,20
		MRT/RT 150	4,00
		MRT/RT 180	7,00

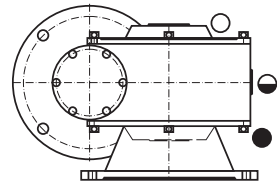
Table 8.4

position	RT 100	RT 120	RT 150	RT 180
	L	L	L	L
B 3	1,1	2,0	4,0	7,0
B 6	1,1	2,0	4,0	7,0
B 8	0,6	1,1	2,8	3,5
B 5	1,1	2,0	4,0	7,0

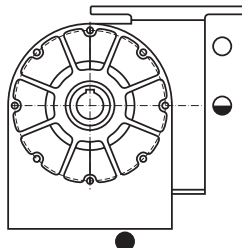
B3 position



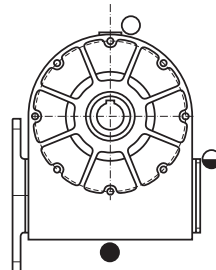
B5 position



B6 position



B8 position





Troubleshooting – incorrect repairs could cause faulty function or damage of the gear unit. The producer performs skilled and post-guarantee repairs of the worm-gear units.

9) Storage:

If a gear unit will be stored or out of operation for a longer period, it is important to **protect** its external surface against corrosion. Such preservation should be renewed according to its type and ambient environs. The store should be dustfree, dry and without vibrations. Storage rooms temperature should range within 0 – 40 °C: ± 10 °C/ is permissible. Gear units delivered without oil filling **shall be** filled with oil through filling holes and plugged – see the Table 8.3. **It is advised** to turn the shaft by min. one revolution once per 3 – 4 months. Gear units filled with oil shall be stored and transported in the mounting position. If a long-term storage period in the open air or in insufficient conditions is expected, producer's advice is **necessary**.

10) Spare parts:

The order of separate spare parts shall include the number and the name of the part, whole type description, identical when ordering complete worm-gear unit, or a **serial number**, see the rating plate and the job number – page 17.

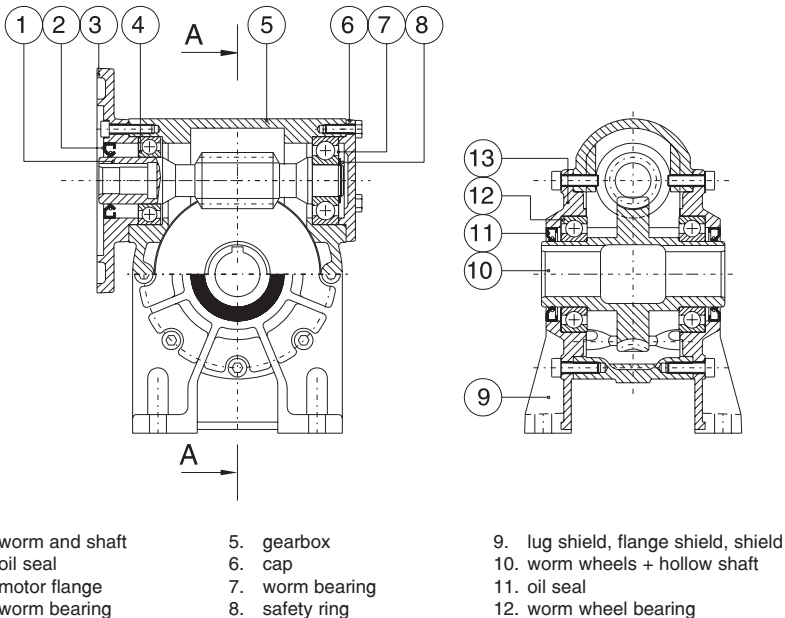




Fig. Worm wheel support

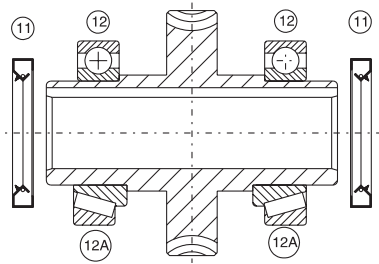


Table 10.1 (13.1 catalogue) Bearings and oil seal of worm wheels

type	12	12A	11
28	6005 25x47x12	7005 25x47x12	25x40x7
30	6005 25x47x12	7005 25x47x12	25x40x7
40	6006 30x55x13	32006 30x55x17	30x47x7
50	6007 35x62x14	32007 35x62x18	35x50x7
60	6008 40x68x15	32008 40x68x19	40x55x7
70	6009 45x75x16	32009 45x75x20	45x60x8
80	6010 50x80x16	32010 50x80x2	50x65x8
100	6011 55x90x18	32011 55x90x23	55x72x10
120	6013 65x100x18	32013 65x100x23	65x85x12
150	6216 80x140x26	30216 80x140x28,25	80x100x10
180	6218 90x160x3	32218 90x160x42,5	90x110x12

Fig. Worm support (Table – see page 14)

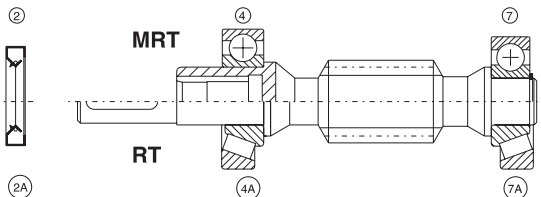




Table 10.2 (13.2 catalogue) Bearings and oil seal of the worm

type MRT - RT	IBC motor	MRT			RT	
		bearing 4	bearing 7	oil seal	bearing 4A-7A	oil seal 2A
28	56 63	HK 2016 20 x 26 x 16	6200 10 x 30 x 9	20 x 30 x 7	6200 10 x 30 x 9	10 x 26 x 7
30	56 63	HK 2016 20 x 26 x 16	6300 10 x 35 x 11	20 x 28 x 7	6201; 6300 12 x 32 x 10 10 x 35 x 11	12 x 32 x 7
		6004				
40	56 63 71	20 x 42 x 12 61905	6302 15 x 42 x 13	20 x 35 x 7 25 x 35 x 7	6302 15 x 42 x 13	15 x 26 x 7
		25 x 42 x 9 6005				
50	63 71 80	25 x 47 x 12 61906	6303 17 x 47 x 14	25 x 40 x 7 30 x 40 x 7	30303 17 x 47 x 15,25	17 x 35 x 7
		30 x 47 x 9 6006				
60	63 71 80 90	30 x 55 x 13 61907	6304 20 x 52 x 15	30 x 47 x 7 35 x 47 x 7	30304 20 x 52 x 16,25	20 x 35 x 7
		35 x 55 x 10 6006				
70	71 80 90	30 x 55 x 13 61907	6304 20 x 52 x 15	30 x 47 x 7 35 x 47 x 7	30304 20 x 52 x 16,25	20 x 35 x 7
		35 x 55 x 10 32007	20 x 52 x 15 30305	35 x 47 x 7 30305	20 x 52 x 16,25 30305	
80	71 80 90 100	32007 35 x 62 x 18	30305 25 x 62 x 18,25	30305 35 x 50 x 7	30305 25 x 62 x 18,25	25 x 40 x 7
100	80 90	32208 32208	31307 31307		32208 31307 32208 31307	
	100 112 90 100	40 x 80 x 24,75 32208	35 x 80 x 22,75 31307	40 x 62 x 12	40 x 80 x 24,75 35 x 80 x 22,75 32208 31307	40 x 56 x 8
120	112	40 x 80 x 24,75 32211	35 x 80 x 22,75 31309	40 x 62 x 12	40 x 80 x 24,75 35 x 80 x 22,75 31309	40 x 56 x 8
150	100 112 132	32211 55 x 100 x 22,75	31309 45 x 100 x 27,75	31309 55 x 80 x 10	31309 45 x 100 x 27,75	
180	112 132	31312	31312		31312	
	160	60 x 130 x 33,5	60 x 130 x 33,5	60 x 80 x 10	60 x 130 x 33,5	60 x 75 x 9

11) Accessories:

Shaft with one or two pins can be slip on the hollow output shaft. These shafts are delivered including feather or including a washer and a fixing screw. The shaft of the type with two pins is not axial locked in one direction. The locking is secured by proper installation of a transfer or connecting element (clutch, pulley, etc.).

Fig. Output shaft I and II

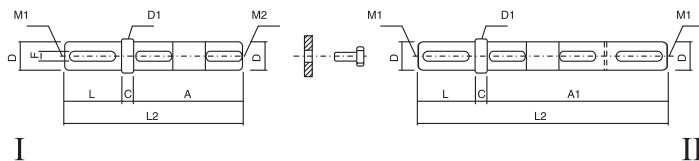




Table 11.1 Single shaft I and double shaft II with a washer, bolt and feather dimensions

type	A	A ₁	C	D ₁	D ₂	L	L ₁	L ₂	F	M	M	kg	
										DS DIN 332	I	II	
MRT-RT 28	56	89	3	14	17	30	120	87	5	M5	M5	0,1	0,15
MRT-RT 30	61	94	3	14	17	30	94	127	5	M5	M5	0,12	0,16
MRT-RT 40	80	132	5	19	23	40	182	130	6	M6	M6	0,3	0,4
MRT-RT 50	97	158	5	24	28	50	218	157	8	M8	M8	0,55	0,75
MRT-RT 60	118	185	5	25	30	60	250	183	8	M10	M8	0,7	0,9
MRT-RT 70	120	191	5	28	35	60	261	190	8	M10	M8	0,9	1,25
MRT-RT 80	138	205	5	35	40	60	270	203	10	M12	M8	1,5	2
MRT-RT 100	150	234	10	40	46	80	324	240	12	M16	M12	2,4	3,2
MRT-RT 120	170	264	10	45	51	90	364	270	14	M16	M12	3,4	4,6
MRT-RT 150	218	323	10	55	62	100	433	328	16	M20	M16	6,1	8,1
MRT-RT 180	262	377	10	60	68	110	497	382	18	M20	M16	8,4	11

Table 11.2 Trapezoidal screw

type	D	d	L	M ₁
				DS DIN 332
MRT-RT 28	Tr 12 x 3	8	180	M4
MRT-RT 30	Tr 12 x 3	8	180	M4
MRT-RT 40	Tr 16 x 4	10	240	M5
MRT-RT 50	Tr 20 x 4	14	300	M5
MRT-RT 60	Tr 25 x 5	18	370	M8
MRT-RT 70	Tr 25 x 5	18	370	M8
MRT-RT 80	Tr 32 x 6	24	480	M10
MRT-RT 100	Tr 40 x 6	32	600	M12
MRT-RT 120	Tr 40 x 6	32	600	M12
MRT-RT 150	Tr 50 x 6	40	700	M26

Fig. Trapezoidal screw

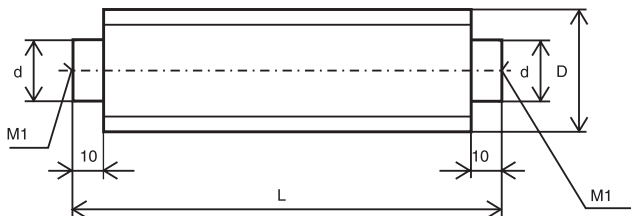
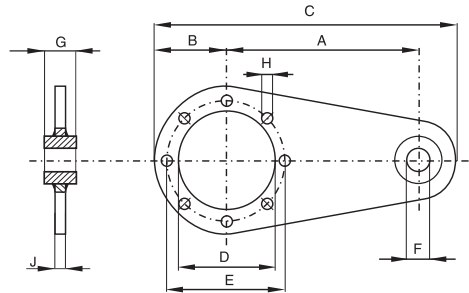




Table 11.3 Torque arm

type	A	B	C	D	E	F	G	H	J	mass kg
MRT-RT 28	80	34	132	24	54	8	6	4	3	0,20
MRT-RT 30	85	40	143	55	65	8	14	7	4	0,22
MRT-RT 40	100	39	161	50	65	8	14	7	4	0,25
MRT-RT 50	100	44	170	60	75	10	18	7	4	0,30
MRT-RT 60	150	53	233	70	85	10	20	9	5	0,57
MRT-RT 70	200	62,5	295	80	100	14	24	9	6	1,10
MRT-RT 80	200	77,5	315	110	130	14	24	11	6	1,25
MRT-RT 100	230	77,5	345	110	130	14	24	11	6	1,35
MRT-RT 120	260	95	395	130	165	16	26	13	8	2,50
MRT-RT 150	300	125	480	180	215	16	30	15	8	3,70
MRT-RT 180	350	150	545	230	265	25	30	17	8	4,00

Fig. Torque arm



12) Scrapping and Disposal:

After service life expiry worm-gear units shall be scrapped in compliance with respective regulations and laws on waste, crude oil matters disposal to prevent threat of people and living environment. Disassemble the gear unit, classify its parts according to their material, remove lubricant and deliver it to a specialised company for disposal.

13) Guarantee:

The guarantee is provided according to valid provisions of the **Law No. 513/91** (of the Commercial Code) in the wording of later regulations.

Cancellation of guarantee: in case the gear unit is used in defiance of the „Instructions of Use“ or incorrect intervention was carried out.

Final Quality Control shall comply with the ISO 9001:2000 directive and the quality manual.



ACCEPTANCE CERTIFICATE

Job No.:

Serial No.:

Lubricant:

Final Quality Control

Date:

Checked by: