OPERATING INSTRUCTIONS

ROTARY TABLE

Type: MRT
Size: 650

The operating instruction must be studied carefully before taking the rotary table into operation!!!

Rückle-Order- No 4613000269
Machine Number 1017142
Customer-Order-No 4500823711
Model 2016

Edition 2016-12-13
## Operating Instructions - MRT -

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ZOLLERN Rückle GmbH & Co.KG - Zaininger Straße 13-15 - 72587 Römerstein 1  
Tel.++49(0)7382 9373-0   Fax ++49(0)7382 9373-49  
E-Mail: service.rueckle@zollern.com - http:www.zollern.com
### Data sheet MRT

- **Type:** MRT  
- **Customer:** HELLER  
- **Housing-size:** 650  
- **Mach.-No:** 1017142  
- **Customer Order:** 4500823711  
- **Order:** 4613000269  
- **TB-No:** TB2616C  
- **Delivery date:** 31.05.2016  
- **Art.No:** 1470506  
- **Remark:** with clamping pallet

#### Dimensions

- **Bearing:** YRT 580  
- **Table D=980**

#### Drive

- **Product:** Siemens  
- **Serial No:** YF H5625 8548 03 001  
- **Rated:** 50 Nm  
- **RPM:** 1500  
- **Ratio:** 1:144 + 1:1,379 (40/29)  
- **Total:** 1:198,62  
- **RPM of Table Plate:** 10  
- **by RPM (motor):** 1976,21

#### Wormgear

- **Module:** 4,7/4,8  
- **System:** Duplex  
- **Ratio:** 1:144

#### Hydraulic

- **Product:** Customer  
- **Typ:** Pressure

#### Clamping

- **Hyd.:** 60 bars  
- **Clamp-force:** 398 kN  
- **quantity zyl:** 1  
- **Clamp:** hydraulically  
- **Unclamping:** non pressure

#### Measuresystem

- **Product:** Heidenhain  
- **Serial No:** 52 279 662  
- **Typ:** RCN 8380  
- **Ratio table:** 1:1  
- **Resolution:** 1/1000°  
- **by:** 4+5 time - evaluation  
- **Place of axes:** Concentr 0,01  
- **pl-wobble:** 0,01

#### Lubrication

- **Table:** grease  
- **Gearwheels:** -  
- **Worm shaft:** circular lubrication
Designated use of machine

The tables are designed as indexing tables exclusively for machining parts or family of parts defined in the purchase order. The scope of supply of the machine is specified in the technical specifications of the machine.

Any use departing from the specified functions must be regarded as being outside the limits of its designated use. ZOLLERN Rückle GmbH & Co.KG cannot be held liable for any damaged resulting from such use. The risk of such misuse lies entirely with the user.

Operating the machine within the limits of its designated use also involves observing the instructions contained in the operating manual and complying with the inspection and maintenance intervals.

Nevertheless, the machine is a potential source of danger if it is operated or maloperated by insufficiently trained personal or if it is not used for its proper use.

Never make any modifications without written approval by ZOLLERN Rückle GmbH & Co.KG.
ZOLLERN Rückle rotary tables comply with state-of-the-art technology and are designed and constructed with particular reference to operating safety. As high quality accessories for machine tools they must not be used other than for the prescribed purpose and only by fully trained personnel, since any failure to observe the instructions, rules and regulations relating to the technology could result in a risk to life and limb, endanger the machine and the user`s property and impair the efficient performance of the plant. For this reason, we recommend that the instructions contained in this operating manual be strictly observed by the user and that any person in the company involved in the setting-up, operation, maintenance or repair of the machine should confirm his familiarity with the content of the operating manual in writing, in a document which also clearly lays down areas of responsibility and authority.

The following instructions must be observed:

- Any procedure which could impair the operating safety of the machine must be avoided.

- The operator is required to ensure that unauthorized personnel do not work on the machine.

- The operator is required to report immediately any changes to the machine which affect safety.

- The user is required to maintain the machine in a serviceable condition at all times.

- The user must obtain an undertaking from operating personnel that protective garments will be worn in accordance with the guidelines laid down by the relevant trade association.

- By issuing suitable instructions and making provision for corresponding inspections, the user must ensure that the workstation at and around the machine is kept clean and tidy.
- Above all, items of safety equipment must never be removed or rendered ineffectual, given that their purpose is to protect the life and limb of the operating personnel.

- If the removal of items of safety equipment is necessary for the repair or maintenance of the machine, it must first be shut down in accordance with the specified procedure and the safety equipment reinstalled immediately on the completion of the work.

- The maintenance of electrical equipment must not be carried out other than by persons qualified to work on electrical power installations and, as far as is necessary and feasible, the machine must be switched off at the main switch to ensure that the electrical system of the machine is without power downstream of the main switch.

⚠️ **DANGER!** Electrical voltages can mean **danger to life** if not handled properly.

- Before work is undertaken on any hydraulic system, particular care must be taken to ensure that the system is relieved of pressure, since even with the motor switched off, it may still be under high pressure.

- Processing operation on unstabile or drumming workpieces and the impact of cutting tools edges can produce loud noises. In such cases, the corresponding regulations for protection against noise must be observed, if necessary, by the wearing of ear defenders.

- For reason of safety, no unauthorized conversions of, or modifications to, the machine are permitted.

**Attention:**

The tables are designed as indexing tables and it is not allowed to drive continuously at maximum seed, because the table would become too hot and this could lead to damaged!

please look at sheet 2.800
admissible continuous operation (ED):
for rotary tables MRT

\[ ED = (\frac{nd}{nk})^2 \times 100\% \]

ED = continuous operations [%]
n\(_d\) = continuous rotations [2 per minute]
n\(_k\) = intermittent operating [max 8 per minute]

The max. running time (turn on cycle) takes 15min

for example:
\( n_{\text{max}} = 8 \) per minute

\[ ED = (\frac{2}{8})^2 \times 100\% = 6,25\% \]

that means, for a running time of max. 15 min results a continuous operation of 1,0 min and a cool down time of 14,0 min
General Description

The round tables model MRT are prepared for connection to a NC control. The construction of the rotary table is matched accordingly. A sturdy combined axial- radial roller bearing connects the solid basic housing with the table board.

A hydraulic- mechanical clamping device locks the table board after having reached the basic element position. By means of a adjustable worm gear the main drive will be free from play. The worm wheel is made of highly wear resisting bronze, the worm shaft hardened ground. Both parts are running in oil bath. Generally, the drive of the worm shaft is performed by a d.c. motor. The path measuring is carried out by means of an absolut shaft encoder at the worm shaft or at the center line. The clamping release of the table board can be effected by a built- on hydraulic or also by the machine hydraulik.

The solid construction of the rotary table permits the application of all metal- cutting processing machines. The modular unit construction permits the addition of other driving motors and also other measuring systems without great efforts.

During the machining with coolants the inside of the table is kept clean by means of efficacious sealings.

Handling

The table must be handled at the corresponding eye bolts. Make sure that the table is suspended in a straight way because otherwise oil may be penetrating in the lateral areas.

Clamping of the components ( work pieces )

The table boards of the circular tables are of very sturdy design. In spite of this fact it happens sometimes that these table boards are being distorted when clamping uneven components. Therefore it is absolutely necessary that prior to clamping the device or component must be checked as to whether its clamping surface is plane.
Generally:

The aim of intermediate storage is to keep the machine in a perfect condition. Depending on the location and duration of intermediate storage, measures may have to be taken to protect the machine against external influences.

The table is coated (exposed machine surfaces), according to its destination (e.g. overseas). If, after delivery, the table is not assembled immediately, it must be stored as follows:

**Measures required for:**

- **a brief storage period;** storage in heated rooms (approx. 20°C) with only slight temperature fluctuations.
  - Preserve all bare metal parts with preserving oil.
  - Cover the machine properly to prevent dust ingress.
  - Placed on a wooden foundation with an adequate load-carrying
  - Free of vibrations
  - In a dry room at approximately 20°C
  - Covered against penetration of dust and moisture.

- **a lengthy storage period;** storage in unheated rooms at temperatures not below approx. -20°C (storage location must be dry and weatherproof!).
  - Preserve all bare metal parts with high-resistance preserving agent.
  - Weld-seal the machine and accessory components in polyester film after adding desiccant.
  - Every 12 weeks the round table must be tested in all its features.

Incorrect storage will lead to damage to electrical components, bearings and sealings.
Description of functioning

In the basic setting, the table is hydraulically clamped. When the "Start" instruction is given, the hydraulic pressure is reduced. (The rest pressure in the tankpipe shouldn’t be over 2 bar, otherwise the clamping wouldn’t be complete free). After a delay of time by 0,2 seconds the desired dividing process can be carried out by the driving motor.

Attention!
The delay of time by 0,2 seconds is necessary, for guarantee, that the clampingring is lifted and the clamping released.
The drive motor transmits the indexing movement to the table top via an intermediate gear unit and a backlash-free worm gear unit.

After the indexing movement, the table is clamped again hydraulically.

Barrier air

If cooling water are used for the operation, it is advisable to provide the table with barrier air. For that purpose a bore R 1/8" is provided at the housing where the compressed air, 1 bar, is connected. (Look at page 4.500)

Putting into operation

Prior to the putting into operation the table must be carefully cleaned from rust preventing agent and grease.

For tables with oil filling oil must be filled in up to the middle of the oil sight glass (please refer to lubrication)
1. Compressed air (air purge)

The compressed air used with the rotary tables must correspond to DIN-ISO 8573-1 quality classes.

1.1 Compressed air quality classes for DIN ISO 8573-1

The quality of the compressed air is subdivided in different classes, which subdivide again with respect to the requirement of the application. The standard is based on the manufacturer’s specifications, regarding limits of the compressed air purity for its units and machines. The standard DIN ISO 8573-1 defines the quality classes of the compressed air regarding:

1.1.1 Particle size and density

Determination of the size and concentration of particulate matter in the compressed air. (class 4 see table 1.2).

1.1.2 Oil content

Determination of the remaining quantity of aerosols and hydrocarbons in the compressed air. (class 4 see table 1.2).

1.1.3 Pressure dew point

Determination of the temperature, on which the compressed air can cool off without water vapor condensing. The pressure dew point changes with the air pressure (class 4 see table 1.2).

1.2 Compressed air quality classes (DIN ISO 8573-1)

<table>
<thead>
<tr>
<th>Max. remaining water content</th>
<th>Max. remaining dust content</th>
<th>Max. oil content mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remaining water g/m³</td>
<td>Pressure Dew point °C</td>
<td>Particulate impermeability mg/m³</td>
</tr>
<tr>
<td>0,003</td>
<td>-70</td>
<td>0,1</td>
</tr>
<tr>
<td>0,117</td>
<td>-40</td>
<td>1</td>
</tr>
<tr>
<td>0,88</td>
<td>-20</td>
<td>5</td>
</tr>
<tr>
<td>5,953</td>
<td>+3</td>
<td>8</td>
</tr>
<tr>
<td>7,732</td>
<td>+7</td>
<td>10</td>
</tr>
<tr>
<td>9,356</td>
<td>+10</td>
<td>-</td>
</tr>
</tbody>
</table>
1.3 Water in the compressed air

Through water, corrosion emerges and causes lubricating films, the outcome will be mechanical defects. In low temperatures, the water in the compressed air piping can freeze and can cause frost damage, diameter reduction and blockage. Processing of the compressed air is therefore important and has advantages.

1.3.1 Water content of the air

<table>
<thead>
<tr>
<th>Temperatures below 0°C</th>
<th>Max. Humidity</th>
<th>Temperatures above 0°C</th>
<th>Max. Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dew point °C</strong></td>
<td><strong>Dew point °C</strong></td>
<td><strong>Max. Humidity g/m³</strong></td>
<td><strong>Max. Humidity g/m³</strong></td>
</tr>
<tr>
<td>-10</td>
<td>3,238</td>
<td>0</td>
<td>4,868</td>
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<tr>
<td>-15</td>
<td>2,156</td>
<td>10</td>
<td>9,356</td>
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<td>-20</td>
<td>1,38</td>
<td>15</td>
<td>12,739</td>
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<td>-25</td>
<td>0,88</td>
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<td>17,148</td>
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<td>-30</td>
<td>0,55</td>
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<td>22,83</td>
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<td>-35</td>
<td>0,33</td>
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<td>30,078</td>
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<td>-40</td>
<td>0,198</td>
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<td>39,286</td>
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<td>0,117</td>
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<td>50,672</td>
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<td>0,067</td>
<td>45</td>
<td>64,848</td>
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<td>0,038</td>
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<tr>
<td>Designation</td>
<td>Function</td>
<td>Check</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>Table board</td>
<td>Released without pressure</td>
<td>Pressure switch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clamped hydraulicly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividing-Motor</td>
<td></td>
<td>Shaft encoder</td>
<td></td>
</tr>
<tr>
<td>pallet</td>
<td>unclamped</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>clamped</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pallet</td>
<td>unclamped</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>clamped</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ t = 0.2 \text{ sec.} \]
Clamping

The table top is clamped on the body by centrical mounted clamping cylinder.

For unclamping the hydraulic pressure goes down.

The table can move for dividing.

Attention !!

There is no restpressure in the tubes allowed.
The diameter of the tubes should not be chosen to small.

Palletindexing and- clamping

The pallet will be down to the table surface. When the clamping cylinder goes down, the pallet get be fixed by the mounted indexing bolts, afterwards the pallet get clamped on the connecting surface.

By clamping the pallet an the connecting surface the air holes, which are cleaning the surface, get be closed and the resultation airpressure can be used for control "pallet clamped".
Rundtisch

241

241.1

381842 FLS
Schmiere-Quetschbuch
Durchnittswerthalten
0.4 L/min

3910 MTR
1.2 L/min

4.4 bar

H 10000-14000
Befestigungssoll
Betriebsmedium
Schmierung SAE 8W
nach SAE 206 und ISO 51512

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Schmierplan

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MA/B

02/2015

AMD
Lubrication

The table must be filled up to the middle of the oil sight glass. The oil filling amount is ca. 11 litre.
For the lubrication of the worm gear is a pump fitted at the housing, which suck the oil from the oil bath.
Gear oil SAE 80W API GL-4 SAE J 306 after DIN 51512 according to recomendation for lubricants should be used.
The oil filling must be changed after approximately 2000 operating hours, but once a year.
Further lubricating points are not being provided.

Axial- radial Roller Bearing

This bearing has been provided with a life grease during the assembly and is therfore maintenance- free.

Clamping

For releasing of the table we recommand hydraulic oil (HLP 46 ISO).

NOTICE

Cleaning by means of compressed air should be avoided.
<table>
<thead>
<tr>
<th>Characteristic and Application</th>
<th>Method of Lubrication</th>
<th>Symbol</th>
<th>Viscosity</th>
<th>Agip</th>
<th>ARAL</th>
<th>BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic Oil</td>
<td>Circulation system lubrication</td>
<td>HLP 46</td>
<td>41.4 - 50.6</td>
<td>Agip OSO 46</td>
<td>Aral Vitamin GF 46</td>
<td>BP Energol HLP 46</td>
</tr>
<tr>
<td>Lubricating Oil for normal load bearing points and guideways</td>
<td>Pressure lubrication</td>
<td>CGLP 68</td>
<td>61.2 - 74.8</td>
<td>Aral EXIDIA 68</td>
<td>BP Energol HPL-D 46</td>
<td></td>
</tr>
<tr>
<td>Bearing points and guideways which are subject to high load / anti - stick - slip</td>
<td>Pressure lubrication</td>
<td>CGLP 220</td>
<td>198 - 242</td>
<td>Aral EXIDIA 220</td>
<td>BP Energol HPL-D 46</td>
<td></td>
</tr>
<tr>
<td>Gear Oil for normal load Control mechanism, high load Drilling heats, Pallid tooth system, high load Gear mechanism load</td>
<td>Dip lubrication and circulation system lubrication</td>
<td>CLP 68</td>
<td>61.2 - 74.8</td>
<td>Aral BLA SIA 68</td>
<td>Aral Degol BG 68</td>
<td>BP Energol HGL 68</td>
</tr>
<tr>
<td>Gear Oil for Worm gear, gear with high load</td>
<td>Splash</td>
<td>CLP 220</td>
<td>198 - 242</td>
<td>Aral BLA SIA 220</td>
<td>Aral Degol BG 220</td>
<td>BP Energol HGL 220</td>
</tr>
<tr>
<td>Spindle Oil for high-speed ball and roller bearings</td>
<td>Circulation and Oil mist</td>
<td>HL 10</td>
<td>9.0 - 11.0</td>
<td>Aral RADAULA 10</td>
<td>Aral Vitamin GF 10</td>
<td>BP Energol HLP 10</td>
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<tr>
<td>Slideways of measuring machines</td>
<td>Pressure lubrication</td>
<td>HL 10</td>
<td>9.0 - 11.0</td>
<td>Aral RADAULA 10</td>
<td>Aral Vitamin GF 10</td>
<td>BP Energol HLP 10</td>
</tr>
<tr>
<td>Anti-friction bearing grease</td>
<td>Packed Graissage and Grease gun lubrication</td>
<td>K 3 K</td>
<td>Walkpenetr ation nach DIN 51 804 220 - 250</td>
<td>Aral GR MU3</td>
<td>Aral Aralube HL 3</td>
<td>BP Energrease LS 3</td>
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</tbody>
</table>

Wälzlager w artungsfrei: gefettet mit / packed with / graissage avec
Anti-friction bearings, maintenance-free: KLÜBER ISOFLEX NBU 15
<table>
<thead>
<tr>
<th>Kennzeichnung</th>
<th>Symbol</th>
<th>Esso</th>
<th>FINA</th>
<th>Mobil</th>
<th>Shell</th>
<th>TEXACO</th>
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<tbody>
<tr>
<td>HLP 46</td>
<td>CASTROL HYSPIN AWS 46</td>
<td>NUTO H 46</td>
<td>FINA HYDRAN 46</td>
<td>Mobil DTE 25</td>
<td>Hydrauliköl HLPD 46</td>
<td>Drucköl HLP 46-C</td>
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<tr>
<td>CGLP 68</td>
<td>CASTROL MAGNA BD 68</td>
<td>FEBIS K 68</td>
<td>FINA ARTAC EP 68</td>
<td>Mobil Vactra Oil No. 2</td>
<td>Shell Tellus S3 M46</td>
<td>Shell Tellus S2 M46</td>
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<tr>
<td>CGLP 220</td>
<td>CASTROL MAGNA CF 220</td>
<td>FEBIS K 220</td>
<td>FINA ATRAC EP 220</td>
<td>Mobil Vactra Oil No. 4</td>
<td>Shell Tonna S3 M68</td>
<td>Shell Tonna S2 M68</td>
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<tr>
<td>CLP 68</td>
<td>CASTROL ALPHA ZN 68</td>
<td>SPARTAN EP 68</td>
<td>FINA GIRAN 68</td>
<td>Mobilgear 626</td>
<td>Shell Omala S2 G 68</td>
<td>Rando Oil HD C-68</td>
</tr>
<tr>
<td>CLP 220</td>
<td>CASTROL ALPHA ZN 220</td>
<td>SPARTAN EP 220</td>
<td>FINA GIRAN 220</td>
<td>Mobilgear 630</td>
<td>Shell Omala S2 G 220</td>
<td>Meropa 220</td>
</tr>
<tr>
<td>CLP 320</td>
<td>CASTROL ALPHA ZN 320</td>
<td>SPARTAN EP 320</td>
<td>FINA GIRAN 320</td>
<td>Mobilgear 632</td>
<td>Shell Omala S2 G 320</td>
<td>Meropa 320</td>
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<tr>
<td>HL 10</td>
<td>CASTROL HYSPIN VG 10</td>
<td>NUTO H 10</td>
<td>FINA CIRKAN 10</td>
<td>Mobil Velocite Oil No. 6</td>
<td>Shell Morina S2 BL 10</td>
<td>Rando Oil 10</td>
</tr>
<tr>
<td>K 3 K</td>
<td>SPHEROL Ap 3</td>
<td>BEACON 3</td>
<td>FINA MARSON L3</td>
<td>Mobilux 3</td>
<td>Shell Gadus S2 V100 3</td>
<td>Multifak 30</td>
</tr>
</tbody>
</table>

Extrem hochtourige Wälzlager, wartungsfrei: gefettet mit / patched with / graissage avec

ZOLLERN Rückle GmbH & Co.KG - Zaininger Straße 13-15 - 72587 Römerstein 1
Tel.+49(0)7382 9373-0  Fax ++49(0)7382 9373-49
E-Mail: service.rueckle@zollern.com - http:www.zollern.com
**Belt tension**

The adjustment at the belt tension is happen when you change the axle base.
You can check the right belt tension after two different treatment:

1. Bend method
2. Frequency meter method

For the right reference input look at the following pages

1. Bend method:
   In this method get the belt shifting measured the right push force $F_v$ (look at following page)

2. Frequency meter method:
   In this method get measured the right oscillation (look at the following page)

**Procedure :**

At first you must release the screw at the motor or at the motor plate. Now, you can displace the motor or the motor plate through a belt stretcher.

In the top of the motor plate or in the top of the housing is a hole with a screwed sealing plug. You can measured at this hole by frequency or bend. At last you must tighten the screw at the motor or the motor plate.

**Chance of toothed belt**

The toothed belt should be checked, if necessary changed, after approximately 2000 operating hours, but once a year.
**Provided By:** Heiko Winterstein  
ZOLLERN Rucklele GmbH & Co.KG  
Zainingerstrasse 13-15  
Roemerstein, Baden-Württemberg 72587  
Germany  
0738293730 Phone

**Application:** Belt tension

### INPUT

<table>
<thead>
<tr>
<th>Drive Information</th>
<th>DriveR</th>
<th>DriveN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known Belt: Poly Chain GT2 - 8MGT-640 - 62.00 mm</td>
<td>29 Teeth</td>
<td>40 Teeth</td>
</tr>
<tr>
<td>Speed Ratio: 1.38 Down</td>
<td>RPM: 2000.0</td>
<td>1450.0</td>
</tr>
<tr>
<td>Input Load: 30 N-m</td>
<td>Maximum Rim Speed: 33 m/s</td>
<td>33 m/s</td>
</tr>
<tr>
<td>Service Factor: 1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Power: 48 N-m</td>
<td>Bushings Checked: TL</td>
<td></td>
</tr>
<tr>
<td>Center Distance: 181.5 mm</td>
<td>Belts Checked: Poly Chain GT2</td>
<td></td>
</tr>
</tbody>
</table>

### SELECTED DRIVE

<table>
<thead>
<tr>
<th>Belt Type: Poly Chain GT2 - 8M</th>
<th>Belt</th>
<th>DriveR</th>
<th>DriveN</th>
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</thead>
<tbody>
<tr>
<td>Part No: 8MGT-640-62</td>
<td>29 Teeth</td>
<td>8M-40S-62</td>
<td></td>
</tr>
<tr>
<td>Product No: 9275-09020</td>
<td>Non-Stock Item</td>
<td>7726-24040</td>
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<tr>
<td>Speed Ratio: 1,38 Down</td>
<td>Top Width: --</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>dN RPM: 1450.0</td>
<td>Weight: 186 g</td>
<td>3.1 kg</td>
<td></td>
</tr>
<tr>
<td>Rated Load: 181.97 N-m</td>
<td>Rim/Belt Speed: 7.7 m/s</td>
<td>7.6 m/s</td>
<td></td>
</tr>
<tr>
<td>Belt Pull: 1286 N</td>
<td>RPM: 724.9</td>
<td>2000.0</td>
<td></td>
</tr>
<tr>
<td>Center Distance: 181.5 mm</td>
<td>Bore: --</td>
<td>12.7 mm - 54.0 mm</td>
<td></td>
</tr>
<tr>
<td>Install/Take-Up Range: 146.4 mm to 182.2 mm</td>
<td>Bushing Part No: --</td>
<td>2012</td>
<td></td>
</tr>
<tr>
<td>Pitch Diameter: --</td>
<td>--</td>
<td>73.85 mm</td>
<td></td>
</tr>
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### TENSION

<table>
<thead>
<tr>
<th>New Belt</th>
<th>Used Belt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rib/Strand Deflection Distance: 3.62 mm</td>
<td>3.62 mm</td>
</tr>
<tr>
<td>Rib/Strand Deflection Force: 95 to 100 N</td>
<td>80 to 85 N</td>
</tr>
</tbody>
</table>

**Sonic Tension Meter**  
Belt Frequency: 136 to 142 Hz  
505C/507C Model STM Settings: Weight: 4.7 g/m, Width: 62 mm/#R, Span: 181 mm

**NOTES**

- Drive over-designed and efficiency may be reduced.
- The belt length was user specified.
- The belt width was user specified.
- Over design requires that a minimum static tension be used to insure proper operation.
- Installation allowance falls out of the specified center distance range.
- The DriveR pulley is a special order item. Bore and bushing are not known.
- This report: (1) only applies to Gates' products; (2) contains confidential information; (3) may only be disclosed to support the sale or maintenance of our products; and (4) is not a guarantee of performance.
- Buyer has sole responsibility for the selection and testing of products for any intended use which may not include flight-related aircraft applications.
Adjustment of Duplex worm:

The worm gear is nearly free from play. After a lengthy operation the clearance of the worm may become too big because of wear and must be adjusted.

Measuring of worm clearance

1st method: Release of table board and measuring of radial clearance at the outside diameter (to be turned by hand with a lever in clamping groove.)

2nd method: Measuring of clearance by means of mounted path measuring systems by measuring the reverse play digitally.

Procedure for adjustment of worm

Adjustment to be carried out by an axial displacement of the worm shaft (by two different modules of the worm the tooth thickness is increasing).
1. Dismantle driving motor so that on the worm shaft an extended crank handle or similar thing can be fixed.
2. Release table board (during the entire adjustment process).
3. The bearing bush (1) will slightly pulled out after having removed the fastening screws (2).
4. The divided rings (5) can be taken out, when you screw at the extended crank handle against the adjust direction and the worm shaft (3).
5. By grinding the divided rings (5) the worm clearance will be diminished. Exact measurement cannot be determinde in advance, therefore process must be repeated several times (approx. 0,1-0,15mm per process).
### Acceptance sheet

**Type:** MRT  
**Housing-size:** 650  
**Mach-No:** 1017142  
**TB-No:** TB2616C  
**Art.No:** 1470506

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal</th>
<th>Actual</th>
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<tbody>
<tr>
<td>Wobble of table surface</td>
<td>0,010</td>
<td>0,003</td>
</tr>
<tr>
<td>Wobble of pallet supporting points</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flatness of table surface</td>
<td>0,015</td>
<td>0,006</td>
</tr>
<tr>
<td>Flatness of pallet supporting points</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentricity centre drilling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indexing bolts</td>
<td>0,005</td>
<td>0,002</td>
</tr>
<tr>
<td>centre line of indexing</td>
<td>0,005</td>
<td>0,002</td>
</tr>
<tr>
<td>Parallelism of table surface/ of pallet supp. points to ground/guideway</td>
<td>0,015</td>
<td>0,006</td>
</tr>
<tr>
<td>Angle of table surface/ of pallet supp. points to ground/guideway (by RGW/PKTW)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividing accuracy in angular second by VDI / DGQ 3441</td>
<td>P=9</td>
<td>P=4,97</td>
</tr>
<tr>
<td>Position of indexing bolts (by pallet clamping)</td>
<td>± 0,01</td>
<td>- 0,005</td>
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</tbody>
</table>

**Acceptance** Dangel / Frey  
**Date** 31.05.2016
<table>
<thead>
<tr>
<th>No.</th>
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<th>Rückle-art.-No.</th>
<th>Article designation</th>
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<tr>
<td>1</td>
<td>Encoder</td>
<td>1</td>
<td>7550-0688-1</td>
<td>RCN8380</td>
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<td>2</td>
<td>Adapter cable</td>
<td>1</td>
<td>7800-0972-2</td>
<td>643450-02</td>
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<tr>
<td>3</td>
<td>Screw plug</td>
<td>2</td>
<td>0007-0011</td>
<td>DIN908-M30x1,5</td>
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<tr>
<td>4</td>
<td>Flat sealing ring</td>
<td>2</td>
<td>0037-0046</td>
<td>DIN7603A-30x36x2</td>
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<tr>
<td>5</td>
<td>Oil sight glass</td>
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<td>5290-0052</td>
<td>240/TH-M30x1,5</td>
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<td>6</td>
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<td>7</td>
<td>Zurcon roto glyd ring</td>
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<td>5526-0052-1</td>
<td>TG5200500-Z80-V</td>
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<td>8</td>
<td>Lubrication pump</td>
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<td>5604-1212</td>
<td>FLMF12-2025+MGP</td>
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<td>9</td>
<td>Flow monitor</td>
<td>1</td>
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<td>MR1K-020GM004-212</td>
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<td>10</td>
<td>Plug</td>
<td>15</td>
<td>8008-0022</td>
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<td>1</td>
<td>4000-0253</td>
<td>Heller 00.902369</td>
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<td>Sword index</td>
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<tr>
<td>13</td>
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<td>5508-0176</td>
<td>234,62 x 2,62</td>
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<td>14</td>
<td>Plug</td>
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<td>8008-0019</td>
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<td>Assembly clamping device</td>
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<td>Servo drive</td>
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<td>20</td>
<td>Deep groove ball bearing</td>
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<td>6011-2106</td>
<td>6206-2RSR 30 x 62 x 16</td>
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<td>6006,2RSR 30 x 55 x 13</td>
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<td>158,42x2,62</td>
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<td>Toothed belt</td>
<td>1</td>
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<td>Polychain GT2 8MGT-640-62</td>
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<td>24</td>
<td>Snap ring</td>
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<td>0003-0037</td>
<td>DIN472-55x2</td>
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<td>0002-0026</td>
<td>DIN471-30x1,5</td>
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<td>26</td>
<td>Hexagon nut</td>
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<td>0051-0010</td>
<td>DIN439 M10</td>
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<td>Threaded pin</td>
<td>1</td>
<td>0034-0032</td>
<td>DIN915 M10x35</td>
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<td>28</td>
<td>Coupling mechanism</td>
<td>4</td>
<td>3900-0302</td>
<td>0460-659</td>
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<tr>
<td>29</td>
<td>Sealing</td>
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<td>30</td>
<td>Plug</td>
<td>2</td>
<td>8008-0081</td>
<td>D=14</td>
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</tbody>
</table>
**RCN 8xx0**

**Ø 60 mm**

**Allgemeine Hinweise • General Information • Informations générales • Informazioni generali • Información general**

**Achtung:** Die Montage und Inbetriebnahme ist von einer Fachkraft für Elektrik und Feinmechanik unter Beachtung der örtlichen Sicherheitsvorschriften vorzunehmen.

Die Steckverbinder dürfen nicht spannungsfrei verbunden oder gelöst werden.

Der Anschluss darf während der Montage nicht in Betrieb gesetzt werden.

**Note:** Mounting and commissioning is to be conducted by a specialist in electrical equipment and precision mechanics under compliance with local safety regulations. Do not engage or disengage any connections while under power.

**Attention:** Le montage et la mise en service doivent être réalisés par une personne qualifiée en électricité et mécanique de précision dans le respect des règles de sécurité locales. Le connecteur ne doit être branché ou débranché que hors tension. L’installation ne doit pas être mise en service pendant le montage.

**Attenzione:** far eseguire montaggio e messa in servizio da un tecnico specializzato in impianti elettrici e meccanica di precisione in conformità alle disposizioni di sicurezza locali. Collegare o staccare i collegamenti soltanto in assenza di tensione. Il connettore non deve essere messo in funzione durante il montaggio.

**Aviso:** El montaje y la puesta en marcha deben ser realizados por un especialista en electricidad y mecanica de precisión, observando las prescripciones locales de seguridad. Conectar o desconectar el conector sólo en ausencia de tensión. El accionamiento no debe estar en marcha durante el montaje.

**DIN EN 61340–5–1**
**DIN EN 61340–5–2**

**Maße in mm**
Dimensions in mm
Cotas en mm
Dimensiones en mm

**Vorsicht:** Der direkte Kontakt von Flüssigkeiten mit Messgeräten und Steckverbinder ist zu vermeiden!

**Caution:** Pay attention to the alignment ridge

**Attention:** Tenez attention à l’ergot d’orientation

**Attenzione:** Prestare attenzione al perno di

**Atención:** tener en cuenta el tope para la orientación

---

**Adapterkabel • Adapter cable • Câble adaptateur • Cavo adattatore • Cable adaptador**

**Click**

**Zum Abstechen muss die Steckerhülse etwas zurückgeschoben werden, um den Federring zu überwinden.**

**Pour la déconnexion, la douille de la prise doit être légèrement retirée pour vaincre la force du ressort.**

**Per lo smontaggio tirare leggermente la bussola del connettore per vincere la forza della molla.**

**Para desconectar debe desplazarse hacia atrás levemente el manguito del conector para vencer la presión del muelle.**
Empfehlungen - Recommendation - Recommandation - Consiglio - Recomendaciones

Zur Prüfung des Antriebs Prüfwerkzeug PWV verwenden. *) Stiftschlüssel Loschsechskant verwenden. **) Zur Vermeidung des Abrutschens M3-Schrauben verwenden.

Use the PWV testing tool to inspect for proper mounting. *) Use materially bonding anti-rotation lock. **) Use M3 screws to prevent sliding.

Pour la vérification du montage, utiliser l‘outil de contrôle PWV. *) Utiliser une sécurité de blocage anti rotation. **) Pour éviter le glissement, utiliser des vis M3.

Utilizar la herramienta de verificación PWV para comprobar el montaje. *) Utilizar el seguro del tornillo por adhesión. **) Utilizar tornillos M3 para evitar deslizamientos.

Kundenseitige Anschlusmaße mit Ringmutter

Required mating dimensions with ring nut.

Conditions requises pour le montage avec écrou à anneau.

Quote per il montaggio con ghiere di fissaggio.

Cotas de montaje requeridas con tuerca anular.

Kundenseitige Anschlusmaße, bei stirnseitiger Wellenanschaffung.

Required mating dimensions, shaft coupling on end face.

Conditions requises pour le montage, accouplement sur l‘arbre par la face frontale.

Quote per il montaggio con ghiere di fissaggio, Accoppiamento albero frontale.

Cotas de montaje requeridas, Acoplamiento del eje en la cara frontal.