





# Operating Instructions Maier Rotary Joints

Betriebsanleitung MP.docx -Version 3 – 06.05.2014

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## 1 Safety

### 1.1 Intended use

Maier rotary joints are devices which may only be used to connect pressurized pipes to rotating pressurized systems. Rollers or wheels with blow mould through the inside of which flow fluids are typical examples of such rotating pressurized systems. The series MP multi-channel rotary joints are suitable for the simultaneous passage of a single or several fluids. Primarily, these fluids are air, gases, water or hydraulic oil. Other fluids are possible; please contact the manufacturer. The limit values specified in the enclosed "Specifications and Spare Parts" must not be exceeded in the application.

Never modify the rotary joint as this may cause hazards. Install, operate and maintain the rotary joint only as described in these operating instructions. We shall not be liable for any damage whatsoever caused by failure to observe these operating instructions.

These operating instructions do not contain all information important for the safe operation of the unit. Always comply with all national and local regulations applicable at the installation site as well as all regulations concerning the prevention of accidents.

Use only genuine Maier spare parts or Maier-approved standard norm parts for repairs. If you use other parts, this may have adverse effects on the safety of the unit.

### 1.2 Requirements concerning installation and maintenance staff as well as operators

Only staff that has read and fully understood these operating instructions and that is fully aware of the dangers resulting from the unit as well as the appropriate safety precautions may work with Maier rotary joints. Such staff must have at least the knowledge of a trained locksmith or industrial mechanic who has experience with pressurized components.

### 1.3 Dangers



**Warning!**

**If you touch hot parts or come into contact with hot media escaping under high pressure, this may result in dangerous burns.**

⇒ You must provide effective shielding from such hazards.



**Warning!**

**If the rotary joint blocks, hoses can be turn off and hot media may escape under high pressure.**

- ⇒ Always observe the design and mounting information in chapter 3. It is recommended to equip the rotary joint with a torque monitoring system.
- ⇒ Ensure that the unit is regularly maintained as per chapter 7

### 1.4 Safety precautions

Always observe the following safety precautions for the operation of the unit:

- MP rotary joints (**with the exception of MPV**) must be re-lubricated if operated at temperatures exceeding 80 °C (176 °F). See table 4, "Specifications and Spare Parts" for further details.

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## 2 Design and function

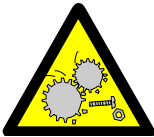
### 2.1 Function and components

Maier rotary joints are devices which allow you to connected pressurized pipes to rotating pressurized systems. A typical example of such rotating pressurized systems are rollers or wheels with blow mould through the inside of which flow fluids.

The connection between the stationary and the rotating pressurized systems depends on the rotary joint version.

**Please refer to our catalog and the corresponding outline drawings for further information.**

## 3 Information on design and mounting



### Caution!

**Damage to components caused by vibrations and heat expansion.**

⇒ **Use only flexible hoses to connect the unit!**

- For the connection, use flexible hoses suitable for the application conditions between the supply system and the rotary joint housing. This compensates for heat expansion and vibrations.
- Never apply torsional, tensile or pressure loads to the hoses. Observe the minimum bending radius quoted by the manufacturers. Never use axial compensators.
- Only operate the rotary joint with a sufficiently dimensioned torque support or driving element. The support or driving element must allow for axial and radial movements of the housing.
- Install a torque monitoring system or a vibration monitoring system (e.g. FAG or SKF) with connection to the emergency shutdown system in order to avoid bearing damage and consequential damage. If the monitoring system is activated, the rotation of the roller should be stopped immediately and the supply of the fluid should be interrupted upstream of the hoses.
- For smooth operation of rotary joint ensure concentricity at the machine.
- Any leaking fluid must be discharged in a safe way via the connections provided.  
**Note:** **Series MPV** rotary joints have a permanent leakage. A return line must be mounted to connection "L" to return it to the hydraulic tank with continuous gradient. Verify correct dimensioning. (See "Specifications and Spare Parts", table 1, "Pressure in leak discharge line".)
- See table 1, "Specifications and Spare Parts" for the quality of the fluid.
- **Series MPV only:** Standby operation without volume flow and pressure with max.  $10\text{min}^{-1}$  for max. 10 minutes.

## 4 Transportation and storage

- Use suitable lifting gear to transport the rotary joint.
- Avoid shocks and impacts.
- Store the rotary joints only in the original package.
- If the rotary joint itself or the facility in which the rotary joint is installed is to be preserved, make sure the preservation agent and the seals of the rotary joint are compatible.
- Make sure the storage conditions specified in "Specifications and Spare Parts" are met.

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### 5 Mounting

#### 5.1 Mounting the rotary joint to the roller

- Carefully clean the contact zones at the seals.
- Mounting the rotary joint to roller W:
  - with fixed flange 4 - as per figure A.
  - with K flange 2 and inner ring - as per figure B.
  - rotor with thread - as per figure C.
- The rotary joints are always shipped with O ring seals (6) or with flat packing (7) or with other suitable seals for all circuits.
- Fasten the rotary joints with screws 8. When inserting the flange into the roller, make sure that the circuits of the flange match those of the machine. To avoid errors, our flanges are always equipped with a hole for a guide bolt.
- Tighten screws 8. See the "Specifications and Spare Parts", page 2, table 3 for the maximum torque.
- During the initial commissioning or after any type of maintenance work that includes other machine parts mounted to the rotary joint, the rotary joint must be flushed for cleaning; it must not rotate while being flushed.

#### **Very important!**

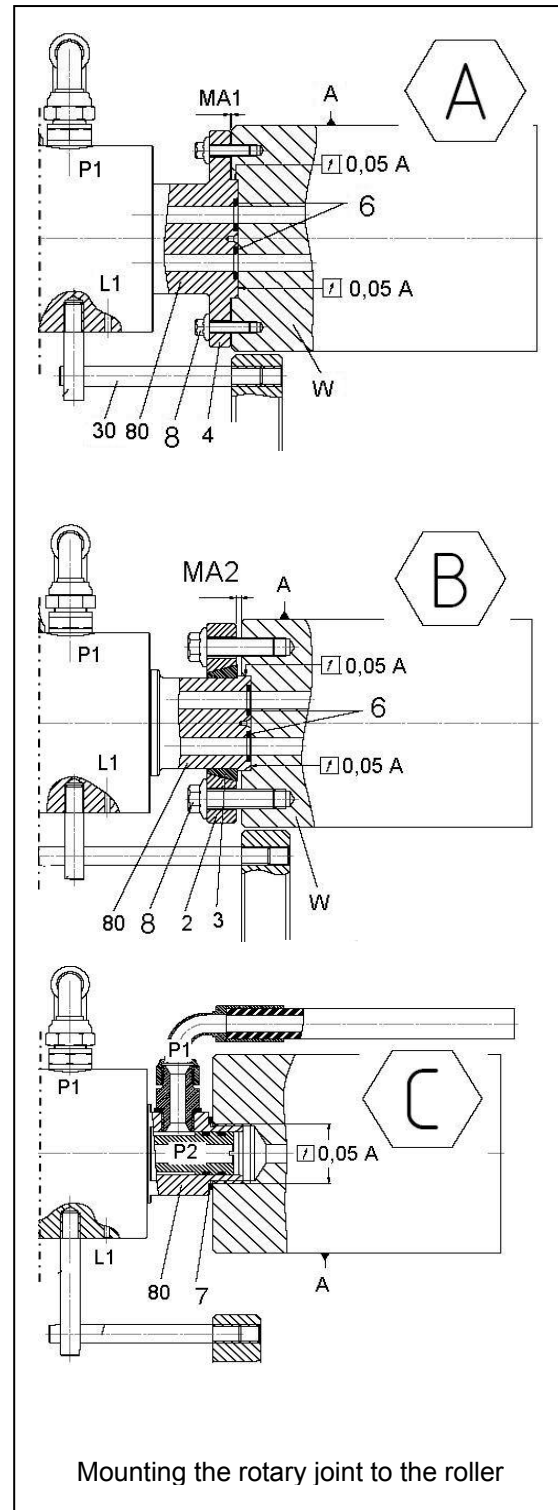
- Assure the minimum distance MA - otherwise leakage will occur at the sealing element and the rotary joint and the inner pipe will be damaged:  
drawing A: MA = 1mm (0.04")  
drawing B: MA ≥ 1 mm (0.04")

#### **Torque support**

In order to keep the rotary joint from rotating, the torque support must be mounted to the housing of the rotary joint (Pos.L1) and to a suitable part of the machine. No tension allowed. Make sure there is sufficient play between equipment and support element both in axial and radial directions.



Observe the information in section 3.



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### 5.2 Connection of a hose for leakage

**Series MPV** rotary joints have a permanent leakage (required by the design) which escapes at connection L.

Therefore, a hose must be connected to connection L (1/8 ") which supplies the escaping hydraulic oil back to the oil tank (continuous gradient).

Do not use fixed lines as they might obstruct the radial and axial movement of the rotary joint.

- The escaping oil is not pressurized and has a maximum temperature of 80 °C (176 °F).
- Observe the maximum pressure in the line for the leakage, see table 1, "Specifications and Spare Parts" for values.
- Only use flexible hoses that are resistant to media.

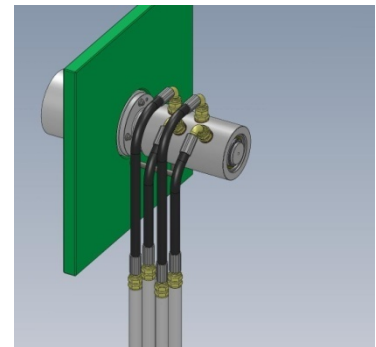


### 5.3 Flexible connection rotary joint - supply network

Never use fixed pipes to connect rotary joints in order to avoid uncontrolled loads on the bearings. Use flexible hoses to connect the rotary joint.

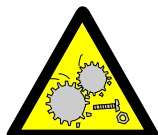
#### Installation notes:

- Avoid external strain caused, for example, by rubbing on the floor or on edges.
- No tension allowed, axial and radial motion of the rotary joint must not be obstructed.
- Never apply torsional, tensile or pressure loads to hoses.
- Observe the minimum bending radius quoted by the manufacturers.
- Never use axial compensators.
- Make sure the requirements of the Pressure Equipment Directive 97/23/EC are met.
- For safety reasons, use only hoses with at least quadruple braid



**Hoses are wearing parts. If a damage to a hose might cause injuries, you must take appropriate precautions to prevent injuries.**

## 6 Operation



### Caution!

**Danger of damage if the rotary joint is not operated as per instructions.**

- ⇒ **Never operate the rotary joint beyond the application data specified in the "Specifications and Spare Parts"!**
- ⇒ **Observe the limitations specified in section 1.1!**

### 6.1 Observe and check during operation

Check the following during operation:

- Check for centric arrangement of the rotor with reference to the roller cog. The radial deflection at the rear area of the housing must not exceed the values in chapter 5.2 (Admissible concentricity tolerance). Place a dial gauge from the idle machine frame onto the rotary joint housing to check.
- Check and record the quality of the fluid in the facility.
- Check for visible leaks at the relief connection of the rotary joint. The operating behavior of the installed seals does not change suddenly. If a seal is beginning to fail, this is indicated by increasing leakage. Regular checks allow you to acquire values concerning the operating behavior of the rotary joint installed in the system. (Exception series MPV, see chapter 3)

### 6.2 Troubleshooting

Problem	Reason	Repair
Leakage at the housing via the relief hole. (Exception series MPV, see chapter 3)	Seal damaged or worn	Install new seals. Check the quality of the fluid and the status of the rotor.
Limit torque exceeded	<ul style="list-style-type: none"> <li>• Rolling bearing damage</li> <li>• Seal damage</li> <li>• Moving parts touching</li> </ul>	Inspection of the rotary joint or the system.

## 7 Maintenance

### 7.1 Safety during maintenance

Only staff that has read and fully understood these operating instructions and that is fully aware of the dangers resulting from the unit as well as the appropriate safety precautions may work with Maier rotary joints. Such staff must have at least the knowledge of a trained locksmith or industrial mechanic who has experience with pressurized components.

#### **Only perform work on the rotary joint when the machine/system is off and compression free.**

Allow the rotary joint to cool down before you take up work or wear safety equipment to protect against the heat.

Always wear safety glasses when performing work on the rotary joint to protect against escaping fluid.

Use only genuine Maier spare parts or Maier-approved standard norm parts for repairs. If you use other parts, this may have adverse effects on the safety of the unit.

Maier offers on site service by experts. We can also train your service staff - just get in touch with us!

If you have to remove protective equipment to perform the work, refit such equipment when you are done and check it for proper operation.

Make sure to properly tighten all screws (see section "Specifications and Spare Parts").

Always observe the safety information in chapter 1, page 2.

### 7.2 Maintenance plan

MP/V rotary joints do not require re-lubrication if rated for max. 80 °C (176 °F), unless specifically indicated. See table 4, "Specifications and Spare Parts" for further details.



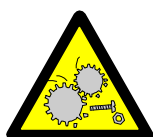
# Specifications and Spare parts

## Series MP

S-MP\_en - Version 1 – 06.05.2014

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### Attention!

**Danger of damage if the rotary joint is not operated as per instructions.**

- ⇒ **The specifications listed in this document are binding.**
- ⇒ **Never operate the rotary joint beyond the application data specified!**
- ⇒ **Use only approved media and lubricants!**
- ⇒ **We shall not be liable for any damage whatsoever caused by failure to adhere to limit values or use of unsuitable media and lubricants!**

**Table 1: Application data**

Series		MP	
Circuit (channels)		2 ... 10	
Nominal diameter DN	mm	06 ... 25	
Nominal diameter DN	inch	¼ ... 1	
Media		Hydraulic oil	Air, Gas, Water Vacuum
Filtration ratio	max. µm	50	50
Temperature	min ...max. °C	-10 ...80	-10 ...80
	min ...max. °F	14 ...176	14 ...176
Pressure PN,	min...max. bar	0 ...200	0 ...10
	min... max. psi	0 ...2900	0 ...145
Speed	max. min <sup>-1</sup>	200	
	max. rpm		

**Table 2: Transportation and storage**

Storage temperature	15 °C to 30 °C (59 °F to 86 °F)
Humidity	max. 65 %
Preservation	none; check compatibility with seal materials, if necessary

## Specifications and Spare parts

### Series MP

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**Table 3: Tightening Torques for Fastening Screws** in Nm (ft lbf) with friction in the thread and connecting surface with  $\mu = 0,14$  and ...

Property class <b>5.6</b> at a screw temperature of			
Size	20°C	100°C	
	68°F	212°F	
M 6	4,0 (2.95)	3,6 (2.66)	
M 8	10,0 (7.38)	9,0 (6.64)	
M 10	18 (13.28)	16 (11.80)	
M 12	37 (27.29)	33 (24.34)	
M 16	90 (66.38)	81 (59.74)	
M 20	175 (129.07)	158 (116.53)	
Property class <b>8.8</b> at a screw temperature of			
Size	20°C	100°C	
	68°F	212°F	
M 6	10,0 (7.38)	9,3 (6.86)	
M 8	24,0 (17.70)	22,3 (16.45)	
M 10	48 (35.40)	45 (33.19)	
M 12	82 (60.48)	76 (56.05)	
M 16	206 (151.94)	192 (141.61)	
M 20	400 (295.02)	372 (274.37)	

The property class is indicated by the designation of the fastening element. Please inquire for data on other materials or refer to outline drawing

**Table 4: Maintenance plan**

Interval	To be done	Explanations
Every 4 weeks	Check the rotary joint for leakage at the relief connections.	If the seal is beginning to fail, this is indicated by increasing leakage.
Every 8,000 hours	Check and replace roller bearings and seals.	Can be done by Maier customer service.
	Lubricate the roller bearings.	No lubrication required during operation.
Every 16,000 hours	Check and replace rotor.	Can be done by Maier customer service.

**Table 5: Troubleshooting**

Problem	Possible reason	Repair
Leakage escapes via the relief hole	Seal damaged or worn out	<ul style="list-style-type: none"> <li>Install new seal.</li> <li>Check the quality of the medium and the status of the rotor and the roller bearing.</li> </ul>

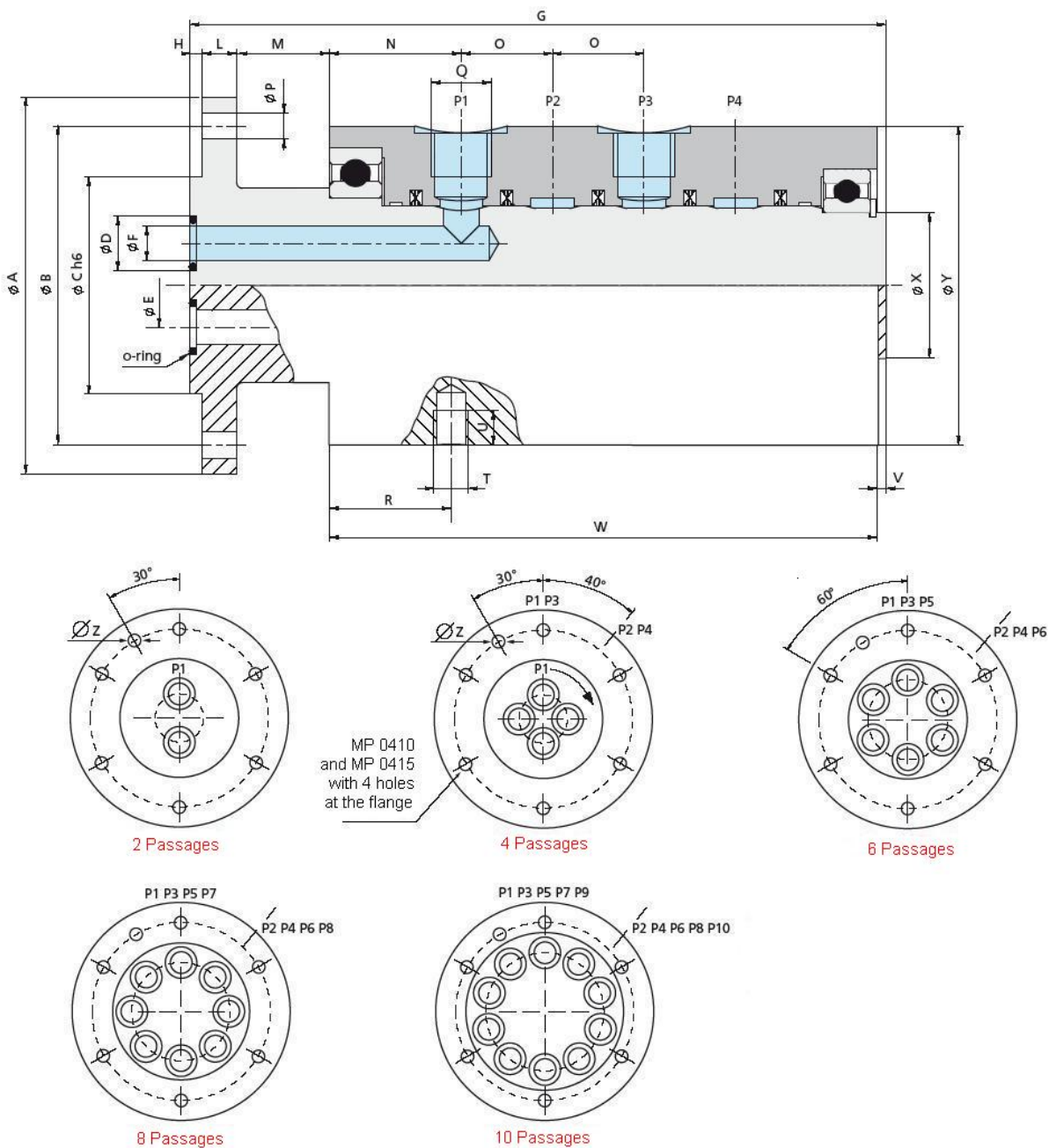
# Specifications and Spare parts

## Series MP

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Limit torque is exceeded	<ul style="list-style-type: none"> <li>• Roller bearing damaged</li> <li>• Seal damaged</li> <li>• Moving parts touch</li> </ul>	Inspection of the rotary joint or the system.
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### Dimensional drawing





## Specifications and Spare parts

### Series MP

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#### Dimensions

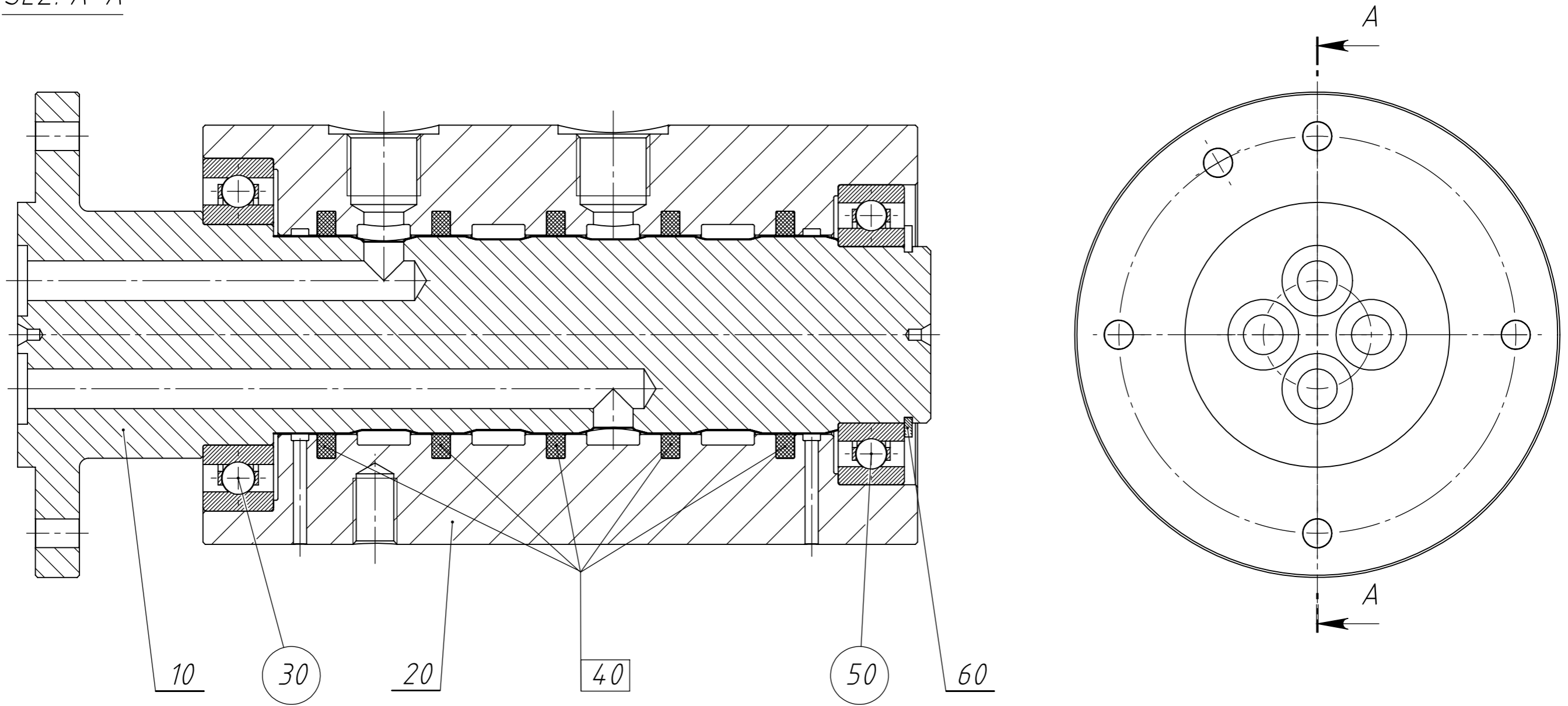
##### Dimensions

Type	MP0206	MP0406	MP0606	MP0806	MP1006	MP0210	MP0410	MP0610	MP0810	MP1010
Cod.Art.A	1119111	1119311	1119511	1119611	1119711	1119121	1119321	1119521	1119621	1119721
Cod.Art.B	1119112	1119312	1119512	1119612	1119712	1119122	1119322	1119522	1119622	1119722
Cod.Art.C	1119113	1119313	1119513	1119613	1119713	1119123	1119323	1119523	1119623	1119723
A	78	78	78	98	98	78	110	98	115	125
B	62	62	62	80	80	62	90	82	95	105
C	45	45	45	60	60	45	60	65	75	85
D	11	11	11	11	11	16	16	16	16	16
E	15	26	26	42	42	20	24,5	40	53	63
F	6	6	6	6	6	9	9	9	9	9
X	25	35	35	50	50	35	40	55	65	75
Y	81	89	89	104	104	94	95	109	125	140
G	145	178	219	275	318	156	207	269	348	408
H	5	5	5	5	5	5	4	5	5	5
L	8	8	8	10	10	8	10	10	12	12
M	21	21	21	21	21	21	28	28	33	33
N	42	37,5	37,5	39,5	39,5	45,5	41	43	46	48
O	26	20,5	20,5	21,5	21,5	29	26	26	28	28
P	6,5x6	6,5(x6)	6,5(x6)	6,5(x6)	6,5(x6)	6,5x6	6,5x4	8,5(x6)	8,5(x6)	8,5(x6)
Q	G1/4	G1/4"	G1/4"	G1/4"	G1/4"	G3/8	G3/8"	G3/8"	G3/8"	G3/8"
R	30	37	37	39	39	30	39	41	44	46
T	M8	M10	M10	M10	M10	M8	M10	M10	M10	M10
U	10	10	10	10	10	10	10	10	10	10
V	1	3	3	3	3	2	3	3	3	3
W	110	137	178	232	275	120	162	219	291	351
Z	4,5	4,5	4,5	4,5	4,5	4,5	6,5	6,5	6,5	6,5

##### Dimensions

Type	MP0215	MP0415	MP0615	MP0815	MP1015	MP0220	MP0420	MP0620	MP0820	MP0225	MP0425
Cod.Art.A	1119131	1119331	1119531	1119631	1119731	1119141	1119341	1119541	1119641	1119151	1119351
Cod.Art.B	1119132	1119332	1119532	1119632	1119732	1119142	1119343	1119543	1119643	1119153	1119353
Cod.Art.C	1119133	1119333	1119533	1119633	1119733	1119143	1119343	1119543	1119643	1119153	1119353
A	98	130	125	148	158	115	138	148	168	115	168
B	80	110	100	122	132	95	111	121	141	95	138
C	60	75	75	95	105	65	85	95	115	75	105
D	19	19	19	19	19	24	24	24	24	29	29
E	23	29	48	66	76	28	52	60	80	34	66
F	12	12	12	12	12	18	18	18	18	22	22
X	40	50	65	85	95	55	75	85	105	65	95
Y	106	110	128	158	175	123	145	160	198	146	179
G	167	240	322	401	468	198	297	378	463	204	382
H	5	4	5	5	5	5	5	5	5	5	5
L	10	12	14	16	16	12	16	16	16	12	20
M	23	32	40	45	45	35	45	45	45	28	55
N	47	45,5	47,5	51,553,5	52	53	55	55	59	56	65
O	32	31,5	31,5	31,5	31,5	38	38	38	38	42	52
P	6,5x6	9(x4)	12,5(x6)	12,5(x6)	12,5(x6)	8,5x6	12,5(x6)	12,5(x6)	12,5(x6)	8,5x6	17(x6)
Q	G1/2	G1/2"	G1/2"	G1/2"	G1/2"	G3/4	G3/4"	G3/4"	G3/4"	G1	G1"
R	37	42	44	48	50	40	46	48	52	44	54
T	M10	M12	M12	M12	M12	M10	M12	M12	M12	M10	M16
U	10	12	12	12	12	12	10	12	12	12	10
16V	2	3	3	3	3	3	2,5	3	3	3	4
W	127	189	256	238	395	146	224	305	390	156	294
Z	4,5	10,5	10,5	10,5	10,5	6,5	10,5	10,5	10,5	6,5	10,5

SEZ. A-A



- X SPARE PART
- X WEARING PART

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				Tolleranze secondo DIN 7168			
				Rugosità media Ra in µm		Piano controllo n° -	
				DIN ISO 1302 Serie 2		Scala	
				12.5/	3.2/	0.8/	0.1/
						Stato approvazione -	
				Data	Nome	Denominazione:	
				Dis.	18/12/08	MP0410C	
				Verif.	-		
				Norm.	-		
						Dis. n° MI.08.058.IST.0	
						Fgl. 1:1	
Ind.	Modifica	Data	Nome	Art. n° 1119323		Su base -	
Tabella di revisione				Sost. -		Sost. da -	

# Specifications and Spare parts

## Series MP

S-MP\_en - Version 1 – 06.05.2014

### TEILELISTE / PARTSLIST

VERSION : 25.10.2010

<b>DICKKOPF / ROTARY JOINT</b>	<b>MP 04</b>
<b>ART. NR. / ORDER NO.</b>	...
<b>ZEICHNG.NR. / DRAWING NO.</b>	...

<b>E = ERSATZTEIL / SPARE PART</b>		
<b>V = VERSCHLEIßTEIL / WEARING PART</b>		
<b>POS</b>	<b>BENENNUNG / DESIGNATION</b>	<b>E / V</b>
10	ROTOR	
20	HOUSING	
30	BALL BEARING	E
40	RADIAL SHAFT SEAL	V
50	BALL BEARING	E
60	RETAINER RING	

Example: Spare parts list for a 4 channel rotary joint, type MP ...  
 Please request the spare parts list for your specific rotary joint type from the factory