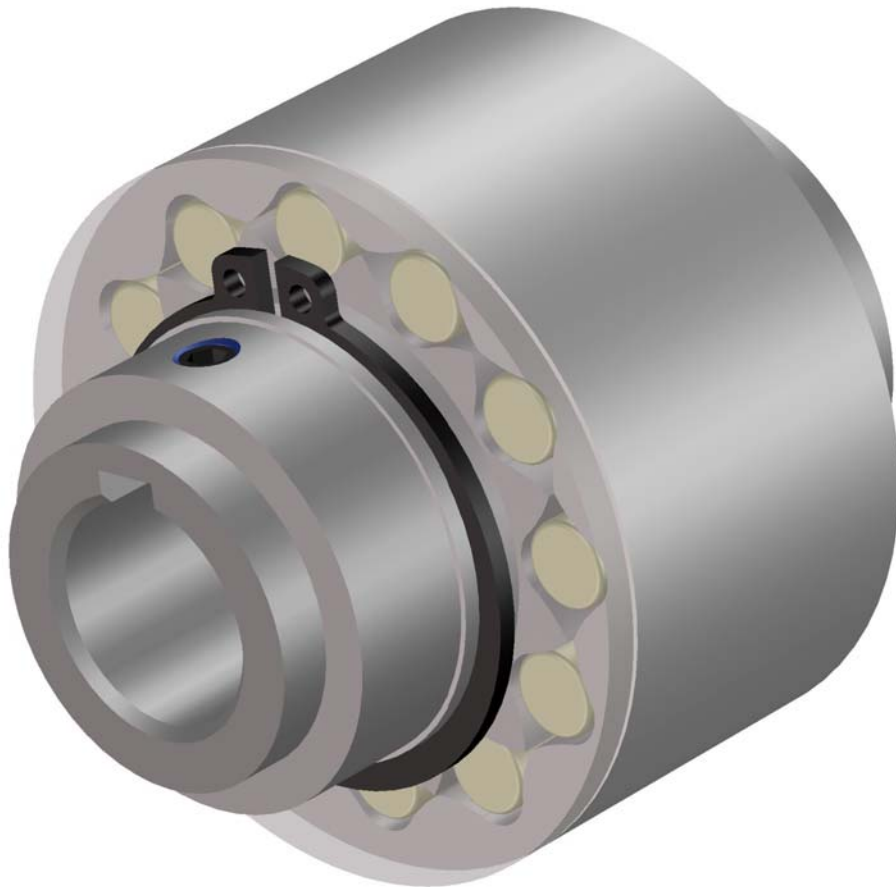


Assembly and operating instructions TSCHAN®
Elastic coupling

ROLLASTIC®



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1 Notes on safety

The present assembly and operating instruction (AOI) constitutes a part of the coupling supply. Always keep the AOI near the coupling well accessible.

Make sure that all persons charged with the assembly, operating, service, and maintenance have read and understood the AOI and follow all the points:

- Avert hazards for body and live of the user and third parties.
- Ensure the operating safety of the coupling.
- Avoid the loss of use and environmental impairment through false handling.

In the case of transport, mounting, dismounting and maintenance, attention is to be paid to the relevant regulations for industrial safety and for environmental care.

The coupling may only be operated, mounted, serviced and maintained by authorised and trained personnel.

In the interest of further development, we reserve the right to make changes which serve technological progress.

By the use of accessories and spare parts, which were not originally manufactured by TSCHAN GmbH, we are not responsible for any resulting damage or liability or guarantee.

2 Function

The coupling ROLLASTIC[®] is a torsionally elastic shaft coupling.

It balances out angular, radial, and axial shaft misalignments within defined limits. The torque is transmitted through 12 elastic buffers loaded in shear and pressure. The elastic buffers of Polyurethane (Vk83) can dampen shocks and torsional vibrations and are resistant to oil.

When the buffers are removed, it is easily possible to check the rotational direction of the drive.

The coupling is usable in every sense of rotation and installation position.

2.1 Appropriate Use

- In order to ensure a faultless, lasting operation of the coupling it must be laid out according to the layout instructions e.g. DIN 730 part 2 (or also catalogue ROLLASTIC[®]) with an operating facture corresponding to the operating conditions.
- Apart from incorporating a finished bore hole with parallel key groove (see “6.2 Finished borehole”) no further changes can be carried out on the coupling.
- The coupling may only be used within the framework of the conditions defined in the performance and delivery contract.
- Every change of the conditions of use or the operating parameters necessitates a new verification of the coupling layout.

3 Storage

On receipt of the goods, the supply is to be checked immediately for completeness and correctness. Possible damages incurred during transit and / or missing parts are to be notified in writing.

The coupling parts can be stored in their delivered standard-state for 6 months in a dry, roofed place at normal room temperature. For a longer storage duration a long-term preservation is necessary (consult TSCHAN GmbH). The elastic buffers must not be subjected to ozone containing mediums, direct solar influence or strong light sources with ultraviolet-light. The relative humidity should not exceed 65%. In the case of proper storage the characteristics of the elastic buffers remain unchanged for almost up to three years.

4 Construction

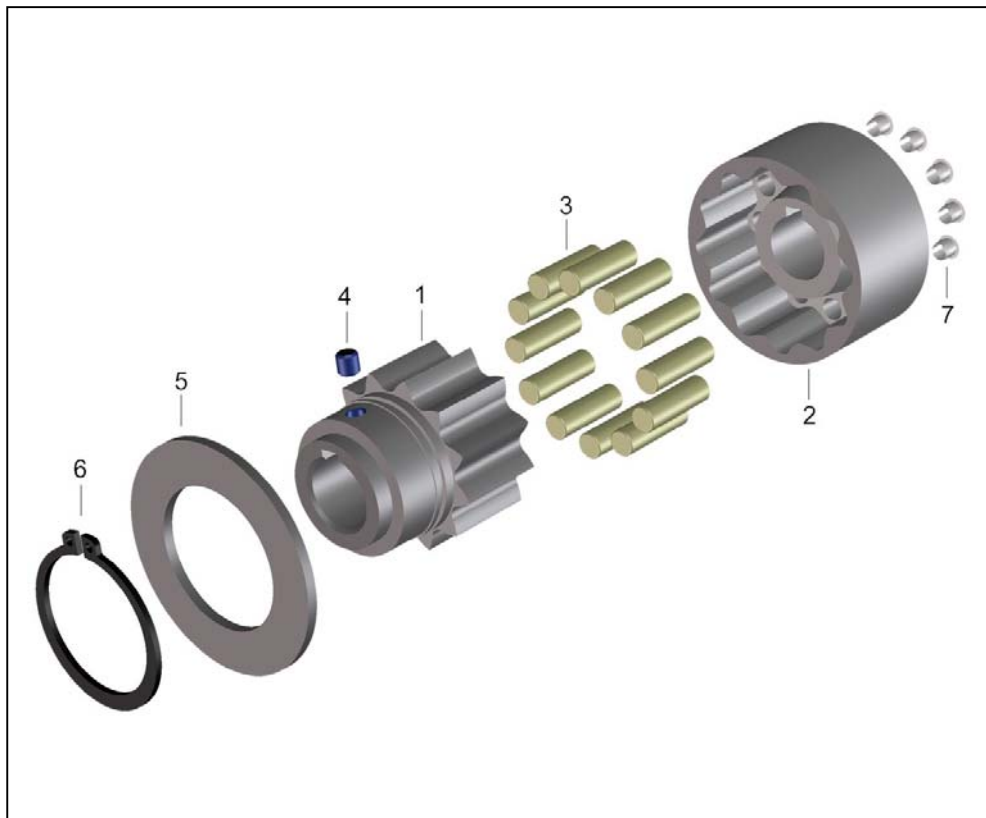


Fig. 1 Construction ROLLATIC®

<u>Pos.</u>	<u>denomination</u>
1	interior hub part 301
2	housing part 300
3	elastic buffers part 031 – 1 set = 12 units
4	setscrew
5	cover ring part 305
6	circlip
7	caps - optional

5 Technical data

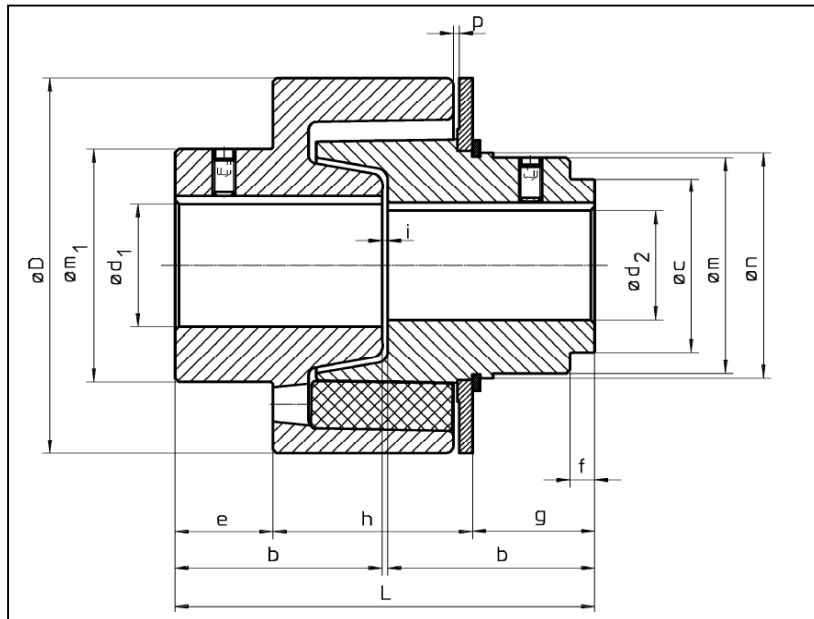


Fig. 2 ROLLASTIC®

Table 1 Technical data:

size	n_{\max} [min ⁻¹]	T_{Cnom} Vk83 [Nm]	T_{Cpeak} Vk83 [Nm]	Elastic buffer Ø x length
R 065	9100	40	80	8 x 25
R 080	7400	70	150	10 x 30
R 100	5900	150	290	12,5 x 38
R 130	4500	320	630	16 x 50
R 160	3700	600	1180	20 x 60
R 200	2900	1200	2360	25 x 75
R 260	2200	2500	5000	32 x 100
R 300	1900	4000	8000	37 x 118

- Vk83 = buffer of Polyurethane / yellow

size	d_1 max [mm]	d_2 max [mm]	D [mm]	L [mm]	b [mm]	c [mm]	e [mm]	f [mm]	g [mm]	h [mm]	i [mm]	m_1 [mm]	n [mm]	weight unbored [kg]
R 065	22	22	65	71	35	31	14	5	21	36	1	40	40	0,9
R 080	28	30	80	102	50	38	25	6	33	44	2	49	48	1,6
R 100	35	35	100	122	60	48	35	7	32	55	2	62	60	3,0
R 130	45	45	130	142	70	60	30	8	41	71	2	78	78	6,3
R 160	55	58	160	163	80	72	28	10	50	85	3	100	100	11,4
R 200	70	70	200	223	110	92	52	13	65	106	3	124	122	23,5
R 260	80	90	260	283	140	110	57	15	87	139	3	160	155	56,6
R 300	105	105	300	343	170	130	80	18	100	163	3	185	180	83,0

The torque T_{Cnom} and T_{Cpeak} is valid for:

- Ambient temperatures of -30 °C to +30 °C for buffers of Polyurethane (Vk83)
- Operation within the stipulated alignment values.

During the layout of the coupling according to DIN 740 part 2 (or also catalogue ROLLASTIC®) different factors must be considered:

- according to the starting frequency a starting factor S_z
- in dependence of the operating conditions an impact factor, f_B

With circumferential speeds of more than 22 m/s, we recommend to balance the coupling parts.

6 Assembly

6.1 Pay attention before the assembly



- **Injury hazard!**
- **Switch-off the drive before all work on the coupling!**
- **Secure the drive against unintentional switching on and rotating!**
- **Incorrectly tightened screws can cause serious person injuries and material damage!**

- Before starting to install the coupling, make sure that the necessary tools are at disposal.
- Make sure that the intended rotational speeds and torques as well as the ambient temperatures do not exceed the values indicated in "5 Technical Data".
- The maximum permissible borehole diameter must not be exceeded.
- Check whether the shaft hub connections can safely transmit the occurring operating torques.
- The standard TSCHAN tolerance for the finished boreholes is fit H7.
- Standard parallel key slot is according to DIN 6885 page 1, width tolerance JS9.
- Check the dimensions and tolerances of shafts, hub boreholes, parallel keys and slots.
- According to accident prevention rules all freely rotating parts must be protected by stationary protective devices against unintentional touching and against falling objects.
- The coverings are to be designed in such a way that no dust can deposit itself on the coupling.

6.2 Finished borehole

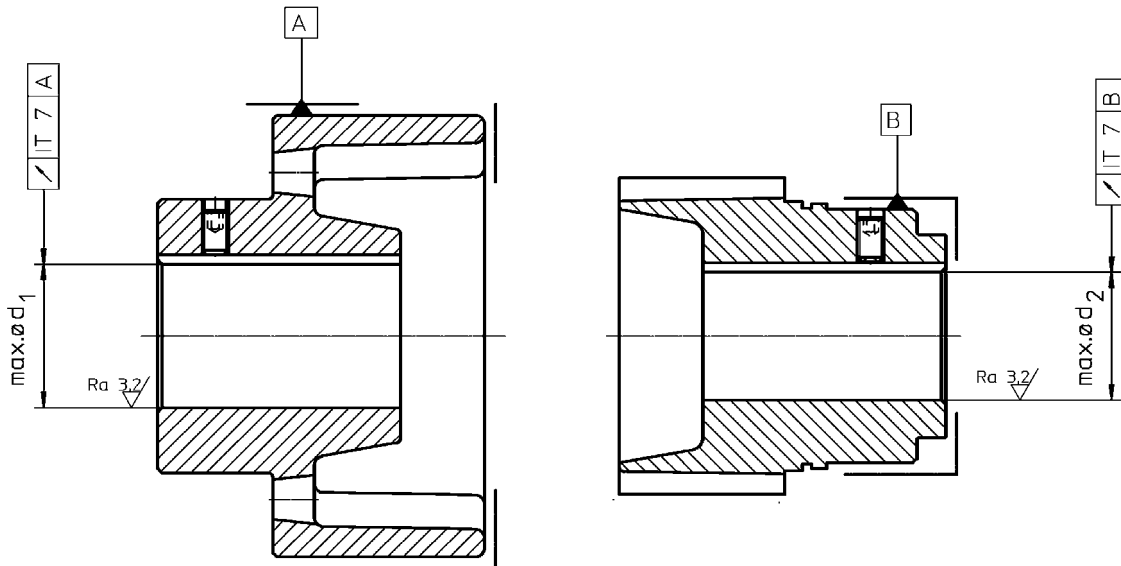
For the completion of the finished borehole in a coupling hub, pay attention to following procedure:

- Clean the coupling hub of preservatives.
- Tighten the coupling hub to the faces labelled with Γ and carefully align the coupling hub.
- The indicated values in table 1 for $\varnothing d_{1\max}$ and $\varnothing d_{2\max}$ are valid for a parallel key connection according to DIN 6885/1 and must not be exceeded.
- Choose the borehole fit so that during the union with the shaft tolerance a wringing fit and/or an interference fit as for example at H7/m6 is carried out.
- Provide a setscrew for axial securing on the hub back above the parallel key slot.

In the case of other shaft hub connections consultation with TSCHAN GmbH is necessary.



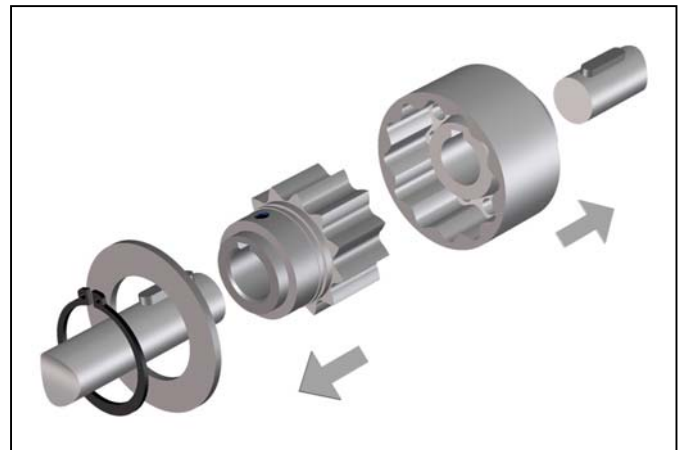
- The maximum indicated borehole diameters are valid for keyed connections according to DIN 6885/1 and must not be exceeded.
- If these values are exceeded, the coupling can break.
- Flying off coupling fragments are a danger to life!



6.3 Coupling installation

- Clean the boreholes of the hub, the housing and the shaft ends before the installation. The surfaces must be clean, dry and grease-free.
- Push the cover ring and the circlip on the shaft end for the hub (Figure 3).
- Use suitable installation aids and hoists such as cranes or pulley blocks in the case of bigger couplings.

Fig. 3



- Pull the interior hub and the housing onto the shaft ends in their intended position (Figure 3).

Reference:

For easier installation a uniform warming of the hub and the housing to 80 °C to 120 °C is safe.



▪ **Warning!**

- **Only work with gloves as a protection against hot parts of the coupling!**

- Mount the hub and the housing so that the shaft ends are flush with the interior borehole opening (Figure 4).
- Pay attention to possible differing agreements!
- Secure available setscrews by tightening with an adhesive e.g. Loctite 222 against automatic loosening and flying out.

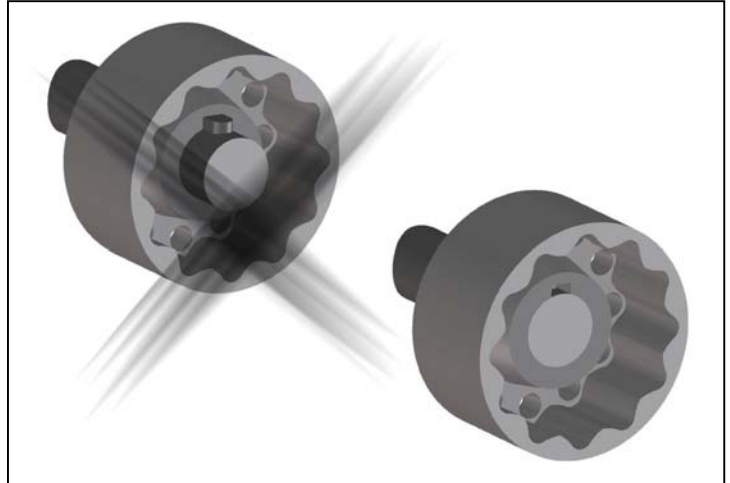


Fig. 4

ATTENTION!

Let the hot hub cool off to ambient temperature before the introduction of the elastic buffers.

- Push the shaftends with the mounted halves of the coupling together (Figure 5).
- Shift the cover ring in direction to the housing to the flange of the hub and fix it with the circlip.
- Adjust the coupling according to the following specifications in “7 Coupling adjustment”.
- After alignment insert the elastic buffers, see „9.1 Changing the elastic buffers“.

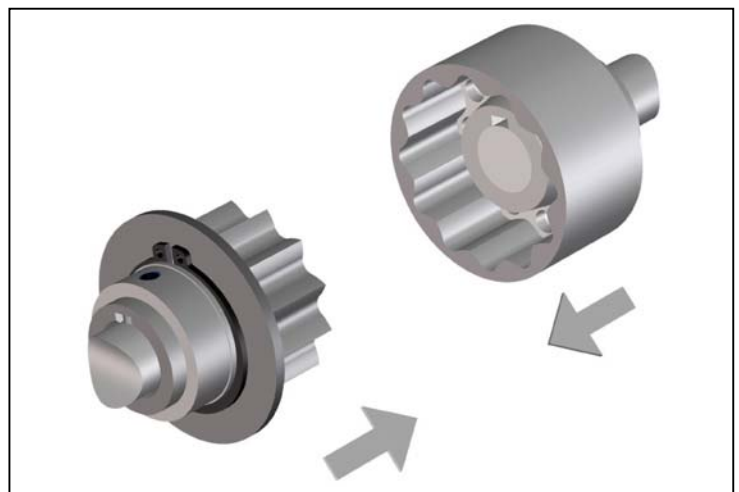


Fig. 5

7 Coupling Alignment



- **Injury hazard!**
- **Switch-off the drive before all work on the coupling!**
- **Secure the drive against unintentional switching on and rotating!**
- **Reference:**
- **An exact alignment of the coupling increases the service life of the elastic buffers and reduces danger.**
- **Do not exceed the maximum permissible displacement values. The overstepping of these values results in coupling damage and breakdown!**

- The maximum permissible displacement values indicated in the tables 2 to 4 are guiding values.
We recommend utilizing these values up to 50% only when aligning the coupling, so as to have sufficient reserves for thermal growth, foundation settlings etc. during service.
In special cases with high demands on quiet running or high rotating speeds it is possible that, in the three displacement levels, an alignment accuracy of $\leq 0,1 \text{ mm}$ is necessary.

7.1 Angular Misalignment

- Measure one complete revolution (360°) on the face of the outer diameter. Determine the largest deviation K_{w1} and the smallest deviation K_{w2} (Fig. 6). Calculate the angular misalignment:
 $\Delta K_w = K_{w1} - K_{w2}$.
- When aligning, observe the max. permissible angular misalignment $\Delta K_{w_{\max}}$ acc. to table 2.

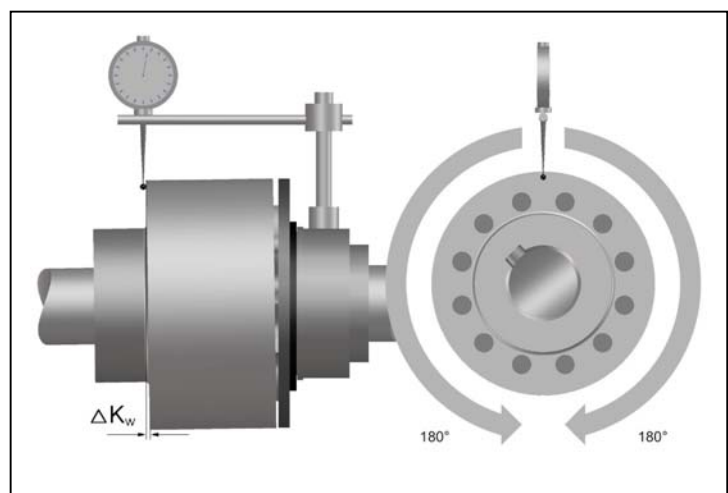


Fig. 6

Table 2 Maximum permissible displacement values - angular:

size	R 065	R 080	R 100	R 130	R 160	R 200	R 260	R 300
$\Delta K_{w_{\max}}$ [mm]	0,5	0,6	0,7	0,9	1,1	1,0	1,4	1,6

7.2 Radial Misalignment

- Measure one complete revolution (360°). Determine the largest deviation $Kr1$ and the smallest deviation $Kr2$ (Fig. 7).
Calculate the radial misalignment: $\Delta Kr = 0,5 \times (Kr1 - Kr2)$. Observe the preceding sign of the measured values.
- When aligning, observe 50 % of the maximum permissible radial misalignment ΔKr_{max} acc. to table 3.

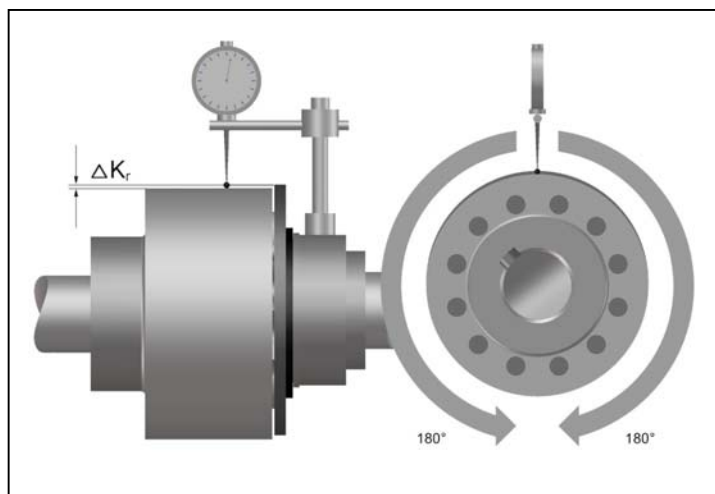


Fig. 7

Table 3 Maximum permissible displacement values - radial:

Typ	R 065	R 080	R 100	R 130	R 160	R 200	R 260	R 300
ΔKr_{max} [mm]	0,12	0,14	0,20	0,26	0,32	0,4	0,52	0,6

7.3 Axial Misalignment

- Measure the axial gap 'p' as shown in Fig. 8.
- The dimension of p must be in between the values p_{min} and p_{max} stated in table 4.

ATTENTION!
Consult TSCHAN GmbH if larger axial misalignments are expected during operation.

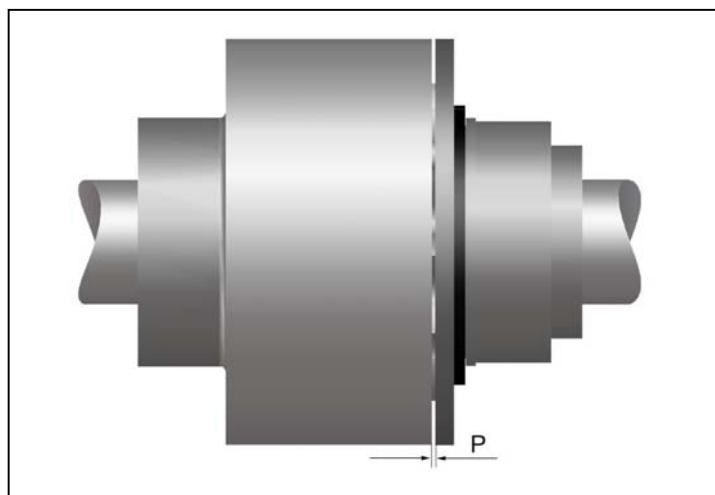


Fig. 8

Table 4 Recommended alignment values - axial:

size	R 065	R 080	R 100	R 130	R 160	R 200	R 260	R 300
p_{max} [mm]	1,5	2	2	2,5	4	4,5	5	7
p_{min} [mm]	0,5	1	1	1	2	2	2	3

8 Operation

When using the coupling attention is to be paid to its characteristics (see „5 Technical data“). These can in no case be exceeded without having a written agreement from TSCHAN GmbH.

In order to guarantee a faultless, lasting operation of the coupling, it must be laid out according to the regulations e.g. DIN 740 part 2 (or according to catalogue ROLLASTIC®) with an operating factor corresponding to its operating conditions.

Every change of the conditions of use or the operating parameters makes an inspection of the coupling layout urgently necessary.



- **Injury danger!**
- **Switch-off the drive before all work on the coupling!**
- **Secure the drive against unintentional switch-on and rotating!**
- **Due to incorrectly tightened screws parts can fly away and cause serious injuries to persons and damage to material!**
- **Check before commissioning the coupling the alignment and all screw fastenings for their specified tightening torque and/or firm seating!**
- **Before commissioning the plant install all protective devices against unintentional touching of free moving and/or rotating parts.**

Pay attention during the operation of the coupling to:

- Changed running noises
- Occurring vibrations

Attention!

- **If irregularities are found during operation of the coupling, the drive must be immediately switched off.**
- Detect according to the following table 5, “Operating faults and their possible causes” the faults and remove.
The listed faults are some examples which are supposed to facilitate fault location.
- **For fault finding and elimination all machine components and operating states are to be considered!**

Table 5 Operation Faults and Possible Causes:

Trouble	Cause	Risk Warning	Correction
Irregular running noises/ vibrations	Alignment fault	Considerable increase in coupling temperature. Premature wear of elastic buffers. Increased reaction forces act on connected machines.	<ul style="list-style-type: none"> - Disconnect drive - Remove cause for alignment fault - Re-align coupling - Inspect elastic buffers for wear
	Elastic buffers worn out	Coupling spin	<ul style="list-style-type: none"> - Disconnect drive - Check coupling components for damages and replace parts, if necessary - Replace elastic buffers - Verify alignment of coupling
	Unbalance	Considerable increase in coupling temperature. Premature wear of elastic buffers. Increased reaction forces act on connected machines	<ul style="list-style-type: none"> - Disconnect drive - Verify balance state of plant components and correct it, if necessary - Inspect elastic buffers for wear
	Loose screw connections	Loose parts may fly away and cause severe damage.	<ul style="list-style-type: none"> - Disconnect drive - Check coupling parts for damages, replace parts, if necessary - Verify alignment of coupling - Tighten screws to the specified tightening torque and secure them against working loose, if necessary, - Inspect elastic buffers for wear
Premature wear of elastic buffers	Alignment fault	Considerable increase in coupling temperature. Increased reaction forces act on connected machines.	<ul style="list-style-type: none"> - Disconnect drive - Remove cause for alignment fault - Re-align coupling - Replace elastic buffers
	Overload due to too high torque		<ul style="list-style-type: none"> - Disconnect drive - Verify coupling design in cooperation with TSCHAN GmbH - Replace coupling - Install larger coupling, if necessary

Trouble	Cause	Risk Warning	Correction
	Unacceptable temperatures	Material properties of the elastic buffers deteriorate. The negotiability is derogated. Coupling may spin.	<ul style="list-style-type: none"> - Disconnect drive - Replace elastic buffers - Re-align coupling - Adjust ambient temperature
	Contact with aggressive products	Material properties of the elastic buffers deteriorate. The negotiability is derogated. Coupling may spin.	<ul style="list-style-type: none"> - Disconnect drive - Check coupling parts for damages and replace parts, if necessary - Replace elastic buffers - Verify alignment of coupling - Prevent contact with aggressive products
	Torsional vibrations in the drive line	Considerable increase in coupling temperature. Premature wear of elastic buffers. Increased reaction forces act on connected machines.	<ul style="list-style-type: none"> - Disconnect drive - Analyse and eliminate cause for torsional vibrations - Check coupling parts for damages and replace parts, if necessary - Replace elastic buffers - Verify coupling alignment

9 Maintenance

The elastic coupling ROLLASTIC® have in operation a low-maintenance. The elastic buffers are subject to wear. The time at which the wear limit of the elastic buffers is reached depends on the service parameters and application conditions.



- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional switching on!**

On the occasion of routine inspections or maintenance of the equipment, check:

- alignment of coupling,
- state of elastic buffers. Replace the elastic buffers if diameter or length is smaller than 70% of the new conditions according to table 1.
- and remove dust deposits from coupling parts.

On the occasion of routine inspections or maintenance work on the drive equipment, or after 3 years at latest:

- Replace the elastic buffers

9.1 Replacement of the elastic buffers



- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional switching on!**

- Push back the circlip and the cover ring (Fig 9).
- If exist remove the caps (optional).
- Remove the elastic buffers (part 031) with a pin.
- To facilitate mounting, the elastic buffers can be coated with a lubricant before installing them (e.g. commercial roller bearing grease for Polyurethane Vk).
- Insert the new buffers.
- Shift the cover ring towards the housing and fix its position with the circlip in the groove of the hub (Fig. 9).

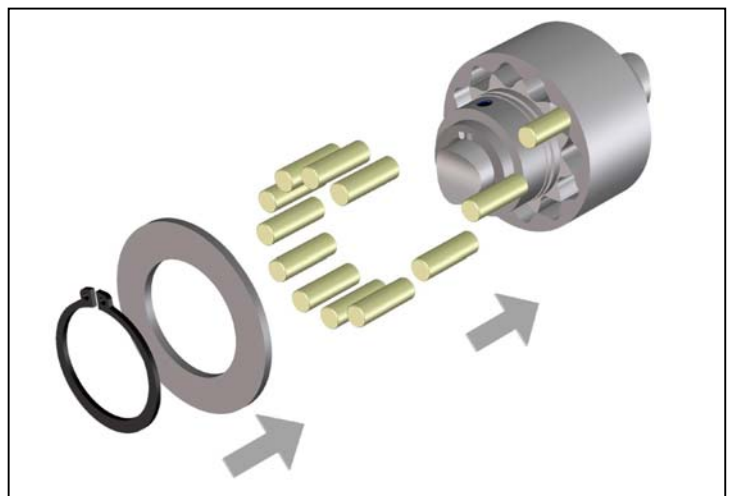


Fig. 9

- Check the alignment of the coupling according to “7 Coupling adjustment”.

Warning!

- **Before commissioning the plant install all protective devices against unintentional touching of free rotating parts.**
- **The covers have to be designed to prevent dust from depositing on the coupling parts.**
- **The cover must not touch the coupling and impair the proper operation of the coupling.**

We do not assume any responsibility or warranty for any damages resulting from the use of accessories or spare parts, which have not originally been manufactured by TSCHAN GmbH.

10 Waste Disposal

The waste disposal has to occur according to the specific regulations of the respective user country.