

**USER MANUAL**

**RUBBER EXPANSION JOINTS**

**Fig. 700**

**Version: 2/2016**  
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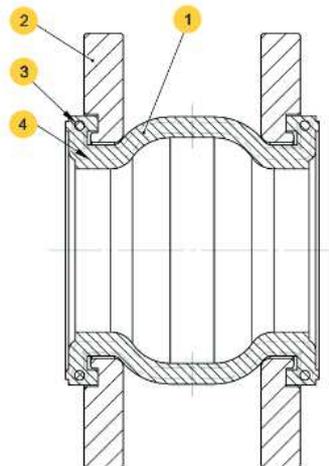
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**1. Product description**

Rubber expansion joints protect installations against the effects of expansion, compression, movement and bending of the system. They are used to attenuate the noise and vibration, thus allowing to reduce the pressure water hammer.



1. Body - EPDM
2. Flange - galvanized carbon steel / stainless steel 1.4401
3. Safety ring - carbon steel
4. Synthetic cord - nylon

**2. Requirements for maintenance staff**

The staff assigned to assembly, operation and maintenance works must have the appropriate qualifications for this work. If during operation the hot part of the rubber expansion joints can cause burn, user is obliged to protect it against touching.

**3. Transport and storage**

Rubber expansion joints should be stored in dry and dark place. Avoid exposure to direct sunlight. Protect from moisture and mechanical damage. Storage temperature should not exceed  $-10^{\circ}\text{C}$  and  $50^{\circ}\text{C}$ . Do not use connection holes for transport - for this purpose use part of the valve body located between the connecting flanges. Use flexible slings

#### 4. Application

- Industrial installations of cold and hot water
- District heating systems and ventilation
- Compressed air installations\*

\* group 2 gases DN 32-50 PS=16 bar  
 DN 65-100 PS=10 bar

Terms of use

Temperature: min. -20°C max. 100°C

Nominal pressure: DN 32 – 300 16 bar  
 DN 350 – 600 10 bar

**Notes: In order to more accurately determine the applicability of the product, please use the following tables of operating pressures and temperatures.**

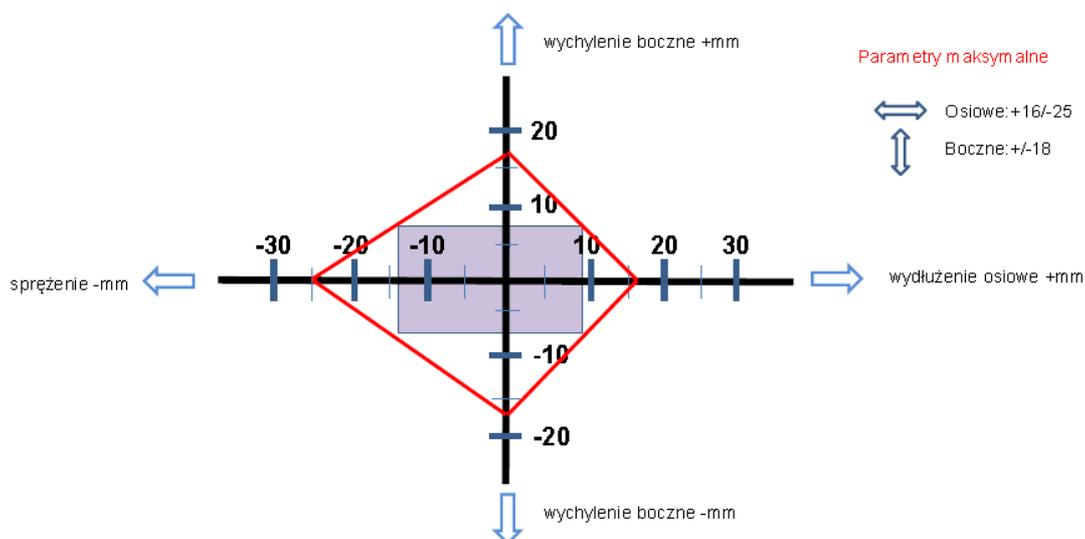
DN	PN	Ambient temperature	50°C	60°C	70°C	80°C	90°C	100°C	
DN32 - DN300	16	bar	16	12,4	10,0	10,0	10,0	6,5	6,4
DN350 – DN600	10		10	11,5	10,0	10,0	10,0	3,2	3,0

#### 5. Maximum permissible operating deviation of the rubber expansion joints from a neutral position defined by dimension “L”.

DN	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
L (mm)	95	95	105	115	130	135	170	180	205	240	260	265	265	265	265	265
Compression (mm)	10	10	10	15	15	20	20	20	20	30	30	30	30	30	30	30
Elongation (mm)	6	6	6	8	8	12	12	12	12	14	14	14	14	14	14	14
Lateral deflection (mm)	10	10	10	12	12	16	16	16	16	25	25	25	25	25	25	25
Angular deflection (°)	25	25	25	25	25	15	15	15	15	8	8	8	8	8	8	8
K <sub>vs</sub> (m <sup>3</sup> /h)	27,7	50,8	75,1	133,0	181,6	317,7	499,0	834,5	1477,8	-----	-----	-----	-----	-----	-----	-----
Weight (kg)	2,70	2,98	4,12	4,86	5,76	6,74	9,28	11,28	17,12	25,20	31,52	40,26	54,44	61,82	63,66	119,00

Operating deflections of the rubber expansion joints should be included in the area of a rectangle.

*Example: for the assumed compression -14mm and elongation of 9mm, maximum lateral displacement may not exceed +/- 8mm*

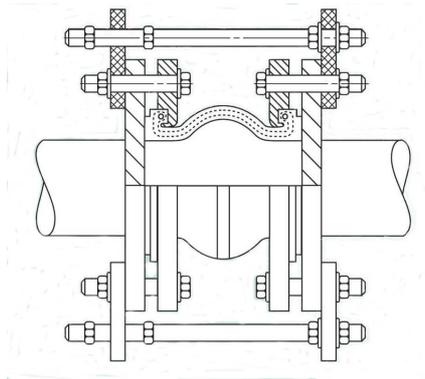


## 6. Installation

The installation should be designed so that the rubber expansion joints was not used as a support element. The pipeline should be equipped with fixed supports and sliding guides in the appropriate place. Counter flanges should be clean and free of burrs and oil and should fit the mounting area of the rubber bellow. Where the mounting of the rubber expansion joint takes place after the pump, on the discharge side, or when the pressure exceeds the values in the table tie rods needs to be installed.

Nominal diameter DN	Maximum pressure value bar
15 - 100	12.2
125 - 250	9.3
300 - 350	6.2
400 - 600	3.1

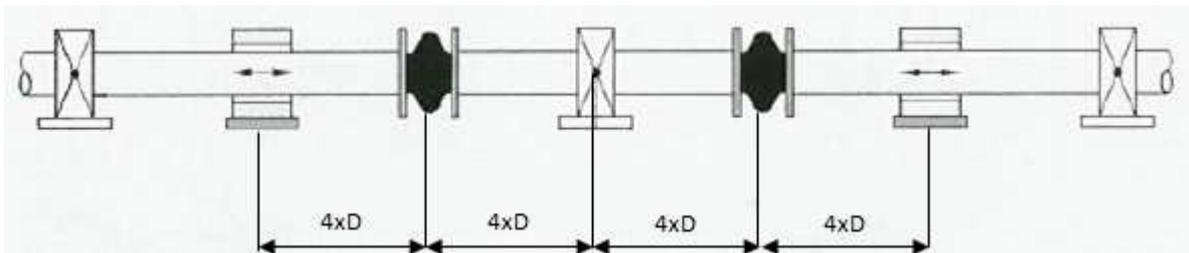
### rubber expansion joints with tie rods



### number of control rods depending on the diameter

Nominal diameter DN	number of control rods
32 - 300	2
350 - 600	4

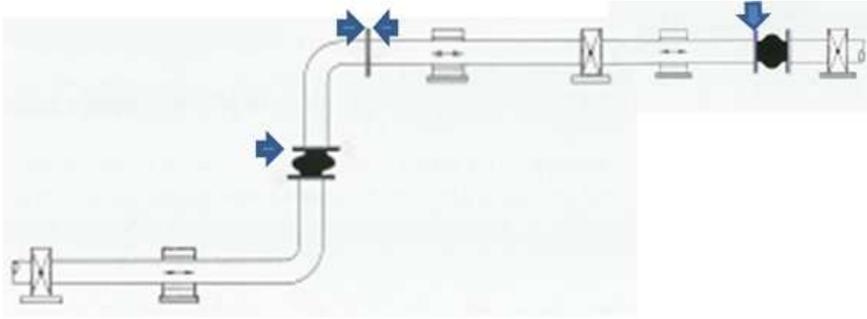
### basic installation scheme



When two successive sliding supports are used, the distance between them can be  $14 \times D$ , where  $D$  is the diameter of the pipe.

Counter flanges between which the rubber expansion joints is mounted should be parallel and the distance between the rebate should

be consistent with "L". The permissible deviation of the installation dimension is max. +/- 5 mm.



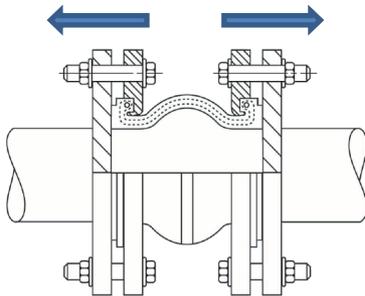
When mounting the rubber expansion joints in the vicinity of the pump, the distance of the rubber expansion joints from the nozzle should be  $1.5 \times DN$ .



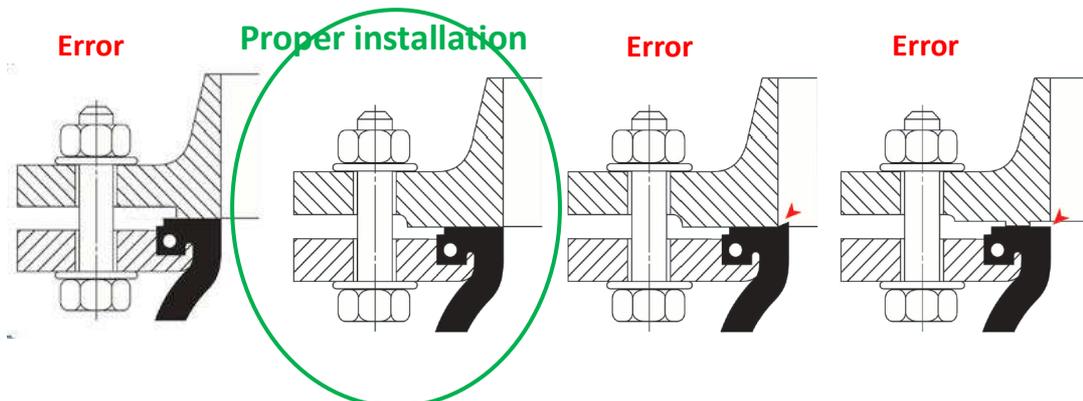
When mounting the rubber expansion joints system with a pretension (acceptable compression 5mm) first the rubber expansion joints should be installed between the rebates and only then you can immobilize the system. Failure to keep this order may lead to falling out of the sealing lip of the groove of the flange and damage of the rubber expansion joints.

### Recommendations for assembly.

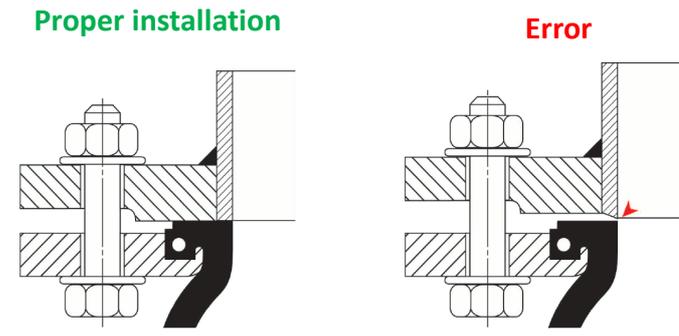
- nuts should be placed on the side of the counter flange.



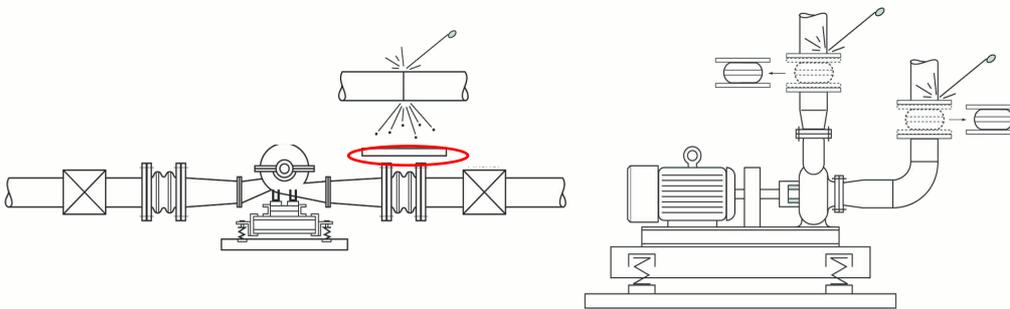
- counter flanges should be selected specifically. Proper surface of the sealing face must coincide with the surface of the rubber expansion joints. Proper selection is shown in Figure below.



- edge of the pipe protruding beyond the surface of the rebate can destroy the rubber expansion joints. The joint plane should be aligned.



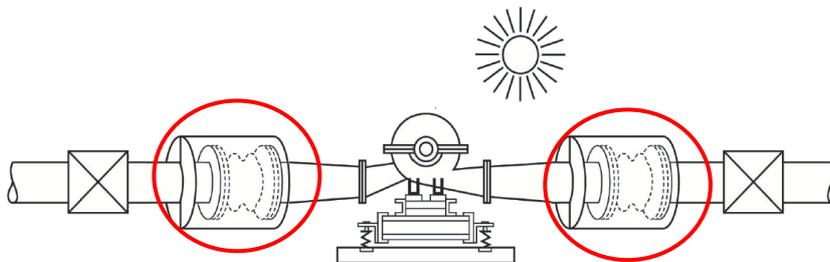
- at the time of assembly you should be careful near the rubber expansion joints. In particular when grinding and welding, rubber expansion joints should be covered. Installation of rubber expansion joints may be carried out by welding of counter-flanges.



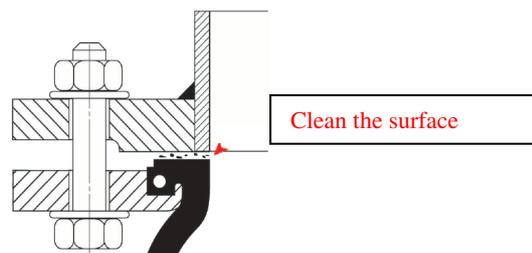
- in case of installation outside of the building, where the rubber expansion joints is exposed to direct sunlight the permanent cover should be provided.



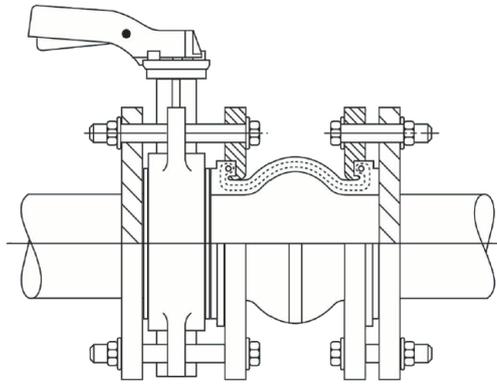
Rubber expansion joints must not be isolated



- immediately prior to installation, clean the contact surface of the rubber expansion joints and counter flange from the mechanical impurities, degrease them and remove the remaining paint if needed.



- for assembly do not use seals between the rubber expansion joints and the counter flange. Also, do not directly use the connection rubber/rubber that is, for example, throttle/rubber expansion joints.



- bolts which screw the compensator to the counter flange must be tightened alternately. The protruding rubber surface should be pressed evenly. Use a minimum of 3 passes, gradually increasing torque.

The first step is to tighten the screws by hand and the other two passages should be performed using a torque wrench. This will prevent the destruction of the sealing surface. Tightening torques are given below.

DN	Second passage	Third passage
32- 80	50Nm	80Nm
100 -250	60Nm	100Nm
300- 500	60Nm	120Nm
600	100Nm	200Nm

## 7. Service and repair

Periodically inspect rubber expansion joints. The first inspection should take place a week after the start-up and subsequent ones in cycles set by the user but not less frequently than once a year. Particular attention should be paid to external damage of the rubber of the rubber expansion joints, such as blisters, cracks and leaks, and its deformation. Please check unacceptable displacements and changes in the length of the installation, as well as corrosion and wear the assembly.

Each type of rubber is subject to natural ageing which means that the flexibility of the rubber elements decreases and its hardness in Shore degrees increases. It can be assumed that under normal circumstances hardness increases by an average of 1°/year. At higher temperatures, this value may be higher. Therefore, it is recommended to conduct regular checks of hardness in Shore degrees and replace rubber expansion joints, if the hardness exceeds 80° Shore. The initial hardness of the rubber expansion joints is approx.  $60 \pm 5^\circ$  Shore. The durability of the rubber expansion joints is also affected by external conditions, such as UV radiation.

For cleaning the rubber expansion joint do not use any sharp-edged objects, wire brushes or abrasive paper. Cleaning of the rubber expansion joints should be carried out with clean water and soap with a weak alkaline pH.

**It is forbidden to perform actions within the rubber expansion joint (loosening the fixing screws on the flanges) when the system is under pressure.**

## 8. Valve service discontinuity

After decommissioning and dismantling the rubber expansion joints must not be disposed of with household waste. The rubber expansion joints are made of materials which can be re-used. For this purpose, they should be delivered to designated recycling centres.

## 9. Warranty terms

ZETKAMA grants quality warranty with assurance for proper operation of its products, providing that assembly of them is done according to the user manual and they are operated according to technical conditions and parameters described in ZETKAMA's catalogue cards. The warranty period is 18 months from assembly date, however not longer than 24 months from sales date.

Warranty claim does not cover assembly of foreign parts and design changes done by user as well as natural wear.

Immediately after detection, the user should inform ZETKAMA about hidden defects of the product.

A claim should be prepared in written form and should be filed through the company, which provided the rubber expansion joint.

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