

**Short pneumatic spring lifts - radial clearance**

**1. Application area**

The measuring procedures and the permitted radial clearance values for the pneumatic spring lift are documented in these operating standards.

These operating standards apply to pneumatic springs that have been designed before the publication of the VN 10.002 operating standards and for pneumatic springs with very short outer tube that cannot be measured in accordance with the procedures described in VN 10.002.

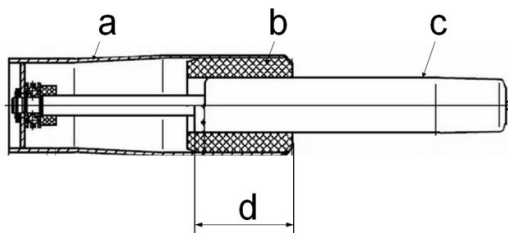
**2. Responsibility**

The quality control, product development and purchasing departments are responsible for compliance with and implementation of these operating standards.

**3. Change service**

Changes are implemented by the quality control and product development departments.

**4. Pneumatic spring lift design (informative)**



- a. outer tube
- b. guide sleeve
- c. pressure tube
- d. guide length

**5. Testing**

The test is carried out in a **retracted** pressure tube.

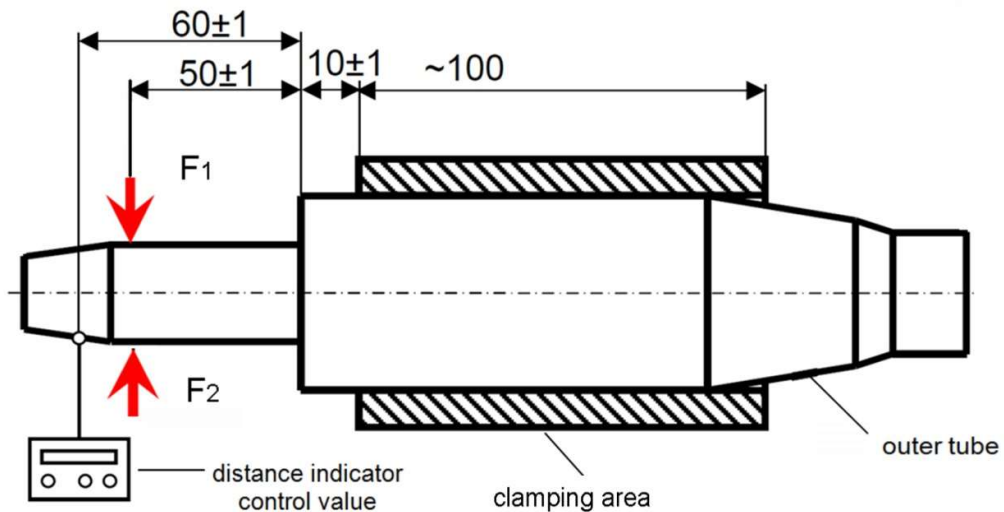
The pneumatic spring is securely attached to the outer tube. The pressure tube is subjected to a lateral load. The deflection (radial clearance) resulting from this process is measured as described below.

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**5.1 Test conditions**

- **Retracted** pressure pipe
- The test object must be at room temperature (between 18°C - 23°C) for at least 4 hours before the measurement.

**5.2 Test setup**



**s**

$$F_1/F_2 = 80_{+/-2} \text{ N}$$

- 5.2.1 Clamp the pneumatic spring in the measuring device on the outer tube so that it matches the image above
- 5.2.2 Apply force **F<sub>1</sub>**
- 5.2.3 Set dial gauge to zero
- 5.2.4 Relieve force **F<sub>1</sub>**
- 5.2.5 Apply force **F<sub>2</sub>** from the opposite direction described in Step 5.2.2
- 5.2.6 Write down value **s<sub>o</sub>** from the dial gauge in the measurement log
- 5.2.7 Relieve force **F<sub>2</sub>**
- 5.2.8 Rotate the outer tube 90° (**s<sub>90</sub>**) and repeat Steps 5.2.1 – 5.2.7

The largest values from the measurement of **s<sub>o</sub>** and **s<sub>90</sub>** is used to evaluate the radial clearance.

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**6. Permitted radial clearance values s**

Pneumatic spring type	Permitted guide clearance, mm
for non-telescoping outer tube	0,35
for telescoping outer tube	0,7

**7. Applicable documentation**

- Operating standard VN 10.002
- Measurement log

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Measurement log for recording the values in accordance with  
VN 10.003

Date:

Tester:

Project:

Part-Nr.:

ISIR-Nr.:

Measurement	$S_{0^{\circ}}$	$S_{90^{\circ}}$	$S_{max}$
1			
2			
3			
4			
5			

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