
Operating Instructions

for Metal and Rubber Hose Lines



Because of their flexible elements and mechanisms, HKS hose lines are susceptible to damage of all types and adverse loads in operation. For reliable operation of a hose line and, thus, the complete system and pressure device, carefully and completely read the following instructions and regulations and strictly observe. If these should appear to be doubtful or incomplete, consult HKS in any case.

1. Packaging / storage / transportation

- 1.1 Up to starting installation, the HSK hose lines must be stored in the transportation packaging in a dry, cool, dust-free room protected from light and reasonably ventilated. It is not permitted to store in the open protected from the weather. No solvent, fuels, chemicals or similar must simultaneously be stored. In particular, make sure that no condensation forms on the hose lines.

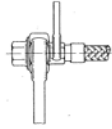

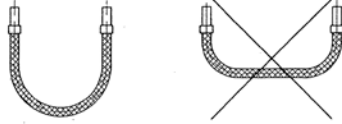
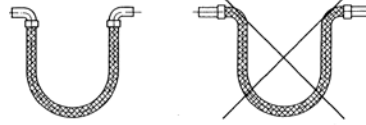
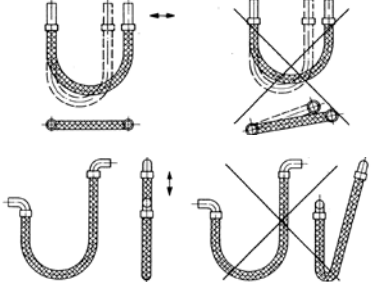
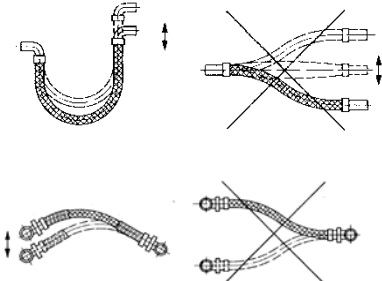
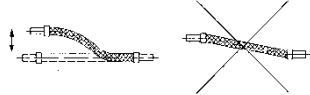
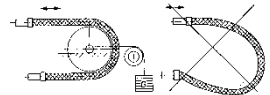
2. Assembly/installation instructions, commissioning

- 2.1 HKS hose lines must only be installed and commissioned by trained, skilled installation personnel. Prerequisite for safe operation is the correct and professional installation!
- 2.2 Before installation, completely remove the packaging and check the hose line for any damage during transportation and /or storage, in particular for corrosion caused by damage to the surfaces. Also the voids between the hose corrugations (applicable to stainless steel corrugated hoses) – inside and outside - must be free from all substances or material. Only fully serviceable hose lines must be installed! If in doubt, consult HKS!
- 2.3 If the hose line has fixed flanges, their bolt holes must align with the connection flange on the pipeline.
- 2.4 The installation length (EL) is dependent on the operating conditions.
- 2.5 Hose lines must not be torsionally loaded. This must be observed particularly by the installation of hose lines with fixed flanges and with a bolted fitting. Fundamentally, when installing all types of hose line, make sure that no tube torsional stresses act on the hose lines.
- 2.6 If hoisting devices are used to install the hose lines, these must not be attached to the sensitive parts, e.g. the hose.
- 2.7 When installing, make sure that the hose and braid is not damaged (e.g. by weld spatter, thermal stress, dents, scratches, impacts, falling objects, contamination etc.) and that no foreign objects get between the corrugation. The corrugations must be clear internally and externally and remain clear, so that the hose line can function correctly (applicable to stainless steel corrugated hoses). For extreme mechanical stresses, the hose should have an external protective jacket.
- 2.8 Insulation must only be installed after previous consultation with HKS on the hose lines.
- 2.9 No electrical current, e.g. from welding tasks must be conducted through the hose lines, otherwise destruction of the hose can occur.
- 2.10 The hose line should be installed so that uninhibited visual inspection for integrity can be carried out at regular intervals. If defects are visible, e.g. dents, cracks, corrosion, discolouration or irregular deformation, immediately inform HKS and/or replace the hose line.

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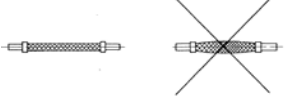
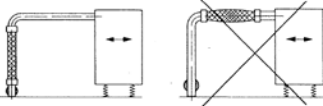
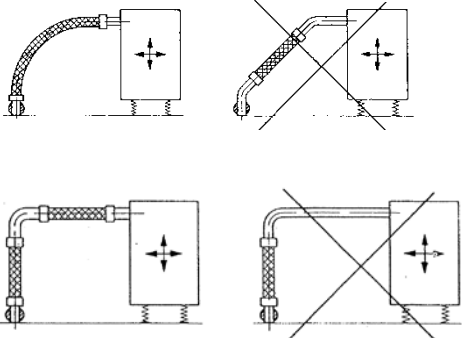
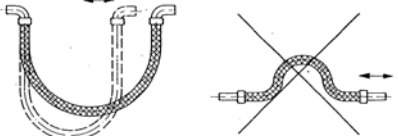
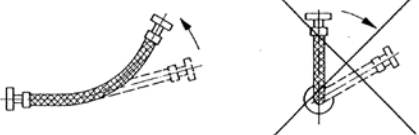


2.11 Some further design and installation instructions are described and graphically illustrated in the following table:

<p>In order to prevent damaging torsion to the hose, hoses with fittings should always be installed using two spanners, refer to figure.</p>	
<p>For welded and soldered connections, the connection hose - connecting element must be protected from overheating and damage by the welding splatter by a moist asbestos cloth. The open flame must always be kept away from the hose.</p>	
<p>The length of the hose must be designed so that the radius of the bend is never less than the minimum.</p>	
<p>Kinking of the metal hose is prevented by using pipe elbows.</p>	
<p>Movement must be in the hose plane, otherwise the hose is subject to torsion.</p>	
<p>Movement is only permitted along the axis of the hose. Torsion results in premature failure.</p>	
<p>The installation illustrated in the preceding rows of the table should only be used to compensate for alignment errors or small vibrations. Installation is better carried out in accordance with the adjacent sketch.</p>	
<p>For horizontal installation, the weight of the hose and medium must be contained by a guide.</p>	

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<p>The hose must be installed with no tension. Axial compression is not permitted. The hose can buckle. Deflection only transverse to the axis of the hose.</p>	
<p>The hose must be installed at right angles to the direction of vibration.</p>	
<p>If movement occurs in 2 directions, (a) 90° elbow applications or (b) 2 metal hoses must be provided.</p>	
<p>To absorb greater axial lifting motion, the hose must be installed in a U shape.</p>	
<p>Deflection and the hose axis must be in one plane, otherwise the hose can be damaged due to impermissible torsional stress.</p>	

2.12 It is imperative to observe the general valid and relevant safety and accident prevention regulations.

3. Operation

- 3.1 HKS hose lines must only be operated within the limits of the design conditions in accordance with the data from the manufacturer.
- 3.2 HKS hose lines must only be operated within the permitted pressure range. For the upper and lower limit of the permitted pressure range (minimum operating pressure, maximum operating pressure PS), refer to the HKS order documents.. If no lower operating pressure limit is stated in the HKS order documents, this is 0 bar as standard.
- 3.3 Prevent impacts within the system.
- 3.4 HKS hose lines must only be operated within the permitted temperature range. For the upper and lower limit of the permitted temperature range (minimum operating temperature, maximum operating temperature TS), refer to the HKS order documents. If no lower operating temperature limit is stated in the HKS temperature , this is -10 °C as standard.
- 3.5 The hose line must only be exposed to media for which it has been intended and designed. If no information is given in the HSK order documentation, it is only suitable for the medium of air or H₂O.
- 3.6 The formation of condensate on the external surfaces of the hose line must be prevented by the appropriate actions, unless it is not specially designed for this.
- 3.7 For safe operation of the hose line and, thus the whole system, it is imperative to observe and adhere to all of the information and instructions.

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4. Maintenance

- 4.1 HKS hose lines do not usually require any special maintenance. However, carry out thorough visual inspections at regular intervals. If contamination can ingress between the corrugations, carry out cleaning periodically (applicable for stainless steel hoses). Cleaning must be carried out considering the material of the hose lines and the environment, using agents and tools approved for the appropriate material. If aggressive substances should come into contact with the hose lines, externally or internally, these must be immediately and thoroughly cleaned using a copious quantity of clean water.
- 4.2 For all questions and ordering of spare parts, it is imperative to state the type and works number of the product (stamped on the type plate).

5. Repair

- 5.1 If repair of a hose line is required in an exceptional case, the tasks or modifications to the hose and connecting parts of the hose line (e.g. welding, cutting or soldering tasks) must only be carried out by staff from HKS, or companies authorized by HKS.
- 5.2 If a repair is not possible, it is possible for HKS to rectify the damage at short notice by supplying a new hose. In such a case, HKS detailed information should be given to HKS about how the damage occurred and operating conditions, so that it is perhaps possible for HKS to suggest improvement procedures.
- 5.3 For all questions and ordering of spare parts, it is imperative to state the type and works number of the product (stamped on the type plate).

6. Warranty

- 6.1 HKS assumes the warranty for their products in accordance with the provisions of the Federal Republic of Germany (verification by the delivery note and invoice). Damage that occurs through natural degeneration (wear), overload or incorrect handling, are excluded from the warranty.

7. Environmental Protection

- 7.1 Product, accessories and packaging should be environmentally-friendly recycled.