HANSA-FLEX

TECHNICAL INFORMATION
COUPLINGS

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Technical Information: Couplings

1. General information

This technical information relates to all types of hydraulic couplings.

The instructions and guidance are to be observed or implemented and describe precautionary measures that, if not adopted, can lead to severe injury or risk to life for users or third parties or to material damage to plant and equipment or adversely impact the environment.

All work must be performed by suitably qualified and knowledgeable personnel. National accident prevention regulations or local safety rules imposed by the operator must also be observed.

This technical information gives instruction and guidance on the use of couplings and makes no claim of completeness. HANSA-FLEX AG in cooperation with its partner, the International Hydraulics Academy (IHA), offers training courses for a deeper knowledge of the subject.

2. Safety instructions

Careless or incorrect handling or the wrong choice of hydraulic couplings or accessories may result in damage to property and/or personal injury! Caution: Risk to life!

Incorrect handling of couplings and/or the non-use of personal protective equipment can have the following effects, for example:

- Injuries caused by components set in motion or lowering as a result of the failure of the hydraulic circuit
- Injuries caused by the escape of fluids under high pressure
- Injuries from hose line whiplash
- Injuries caused by the explosion or ignition of flammable media
- Injuries caused by contact with the fluid (very hot, very cold, toxic, corrosive, …)
- Injuries caused by touching coupling parts or other components carrying very hot or very cold fluids
- Functional impairment of plant, equipment or tools connected to the system

The following information on the selection and handling of hydraulic couplings represents additional safety instructions that must also be taken into account when using our products.

- Safety precautions: Systems, plant and equipment must be designed such that risk to personnel is excluded in the event of the failure of the coupling or the hose. The same approach should be taken in order to avoid property and environmental damage.
- Responsibility of the employer (operator): The employer is, for example, responsible for all measures that affect the choice of suitable products and observance of safety precautions.

The plant operator (employer) must, in particular, ensure that:
- The coupling is used only for its intended purpose
- The coupling may be operated only if it is in a technically flawless and serviceable condition
- The operating personnel must be adequately familiarised with how the coupling works and its safety instructions
- No safety equipment may be removed and/or disabled during operation of the couplings
- Couplings may not be installed or removed in a pressurised state (this does not apply to couplings that have been designed to be "coupled under pressure". Please refer to the manufacturer's requirements and instructions.)

Design / selection criteria for couplings

The following points must be taken into account, (not exhaustive):
- Resistance to aggressive media
- Working pressures
- Operating temperatures
- Size (use charts to achieve the required transmission of power. Take into account volumetric flow, pressure loss and flow velocity.)
- Coupling and/or uncoupling under pressure (is the item in question suitable – observe the coupling pressures)
- Special applications or ambient conditions (is premature wear or failure to be expected, e.g. due to UV radiation, salt water, chemicals etc. or due to radiant heat etc.)
- Locking (has the right locking method for the particular application been selected?)
- Certifications (are there particular requirements?)
- Vacuum operation
- External forces (tension and shear forces, vibrations etc.)
- Do all of the properties of the coupling meet the specifications?

3. Technical information

Criteria for the selection of the coupling type and variant
- Consider the recommended area of use in the light of the manufacturer's information and your own experience
- Function as shut-off at one or both ends
- Type of lock or other safety devices and checks against disconnection
- Designed to be coupled under pressure with and/or without a tool
- Type and method of working of shut-off
- Are the required safety factors maintained? E.g. 4:1 (burst pressure / max. working pressure)
- Selection of the correct coupling components: Sleeve ("female"), plug ("male")
- Equivalence of system pressure and max. working pressure of the coupling
- Temperature ranges for the proposed use
- Connection types for connecting into the pipeline network
- Materials required for the coupling components including seals
- Should the design of the coupling be "leak-free"?
- Size of the coupling, taking into account the volumetric flow and pressure loss requirements

3.1 Installation instructions

Arrangement in the pipeline system

Based on practical experience, we recommend the sleeve in the case of plug-in couplings and the fixed part in the case of screw couplings be installed as fixed in position and the plug or loose part be attached to the flexible hose end.

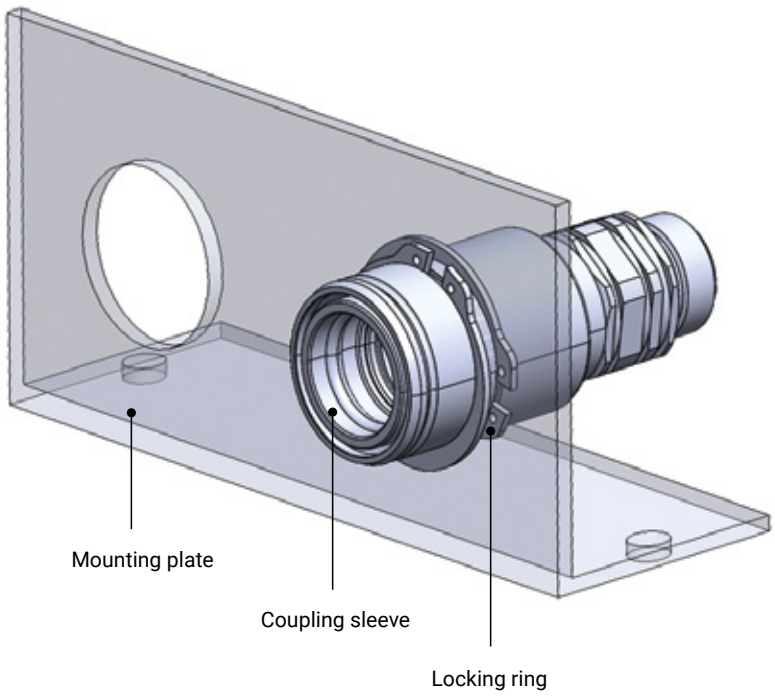
The connection type designed to be coupled under pressure (UDK) must be mounted on the line that is under pressure. The counter piece must be depressurised in order to be coupled.

Use as a quick release coupling

If the sleeve of a plug-in coupling is used as a quick release coupling, then in this case you connect the plug of the coupling to the hose line.

The sliding sleeve of the sleeve is solidly connected by means of locking rings (in accordance with DIN 471) to the stiff bulkhead plate through a drilled hole. This enables single-handed operation of the plug-in coupling.

One way of installing a coupling as a quick release coupling is to use the SKM ZUB 3 12 quick release clip. An example of how this looks when installed with a sleeve is shown in the illustration below.



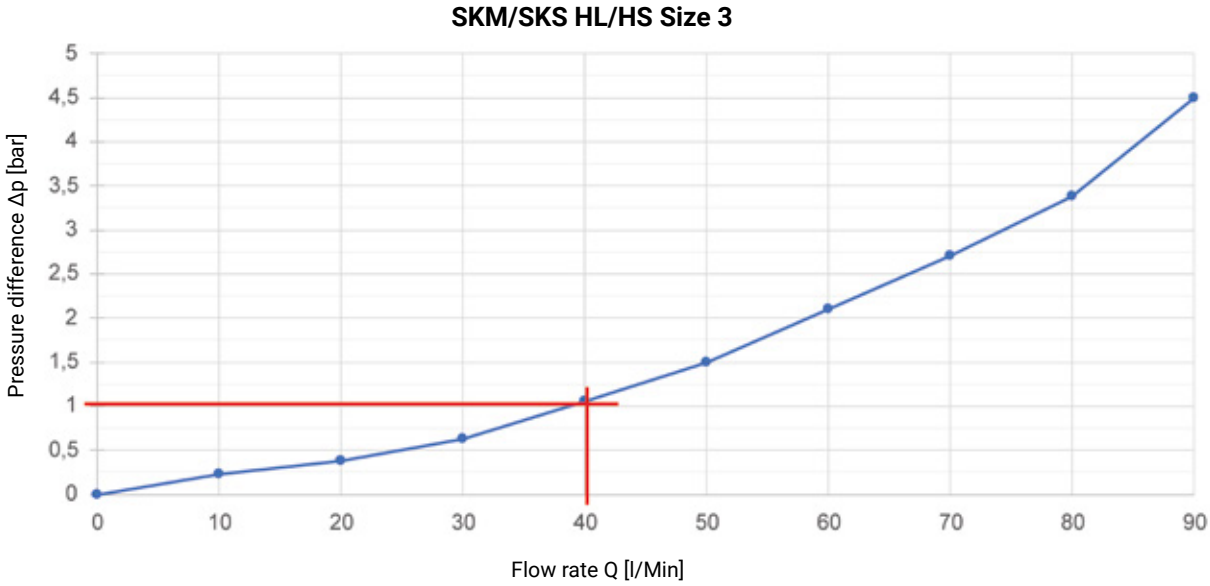
Installation

Align the coupling as vertically as possible to reduce bending loads. Caps should always be used on couplings that are not coupled in order to avoid contamination and/or damage.

3.2 Technical parameters

Pressure loss

The specified or permissible pressure loss is crucial for selecting the correct coupling size. The HANSA-FLEX Applications Advice team can provide information about pressure loss on request. An example of how to use a pressure loss graph is shown below:



HANSA-FLEX recommends couplings are designed such that a maximum pressure loss (max. pressure difference) of 1 bar is not exceeded.

Flow cross section

The flow through a coupling is determined by the cross-section of the coupling valve and not by the cross-section of the connection.

- The selection of the size is based on the flow characteristic curves and takes into account the flow volume and pressure loss. Different flow characteristic curves are used for each coupling series and component size.

Permissible pressures of the coupling halves

The permissible pressures for the coupling halves decoupled and coupled may be different.

Here is an example for a plug-in coupling:

- Permissible working pressure coupled 300 bar
- Permissible working pressure "female" decoupled 120 bar
- Permissible working pressure "male" decoupled 300 bar

Colour marking of couplings

Avoid the risk of confusion when coupling by using the HANSA-FLEX marking system. This system clearly marks the flow and return lines.

Safety factors

The safety factor burst pressure/working pressure is not 4:1 in every case with couplings. If the information you require is not given in the catalogue, please ask a member of the HANSA-FLEX Applications Consulting team.

Working pressure

Observe the permissible working pressure of the connection to which the coupling is to be attached.

Residual pressures/build-up of pressure due to warming of the pressure fluid

In such cases, use coupling systems that can be "coupled under pressure" or "coupled under residual pressure".

Ball and conical valves

Do not use a coupling with a ball or conical valve as a coupling partner.

Compatibility

Check whether the compatibility of plug-in couplings from different manufacturers complies with the relevant standard ISO 16028 or ISO 7241. ISO 14541 applies for standardised screw couplings.

Relevant product standards

DIN ISO 16028: Flush-face type, quick-action couplings - Specifications

DIN EN 7241 Series A and Series B: Dimensions and requirements of hydraulic quick-action couplings

ISO 14540: Dimensions and requirements for screw-to-connect quick-action couplings for use at a pressure of 72 MPa (720 bar)

ISO 14541: Dimensions and requirements for screw-to-connect quick-action couplings

ISO 5675: Agricultural tractors and machinery - General purpose quick-action hydraulic couplers

4. Maintenance

Couplings must be replaced immediately if

- Any part of the coupling is cracked, damaged or corroded
- There are leaks from the hose connection, valve or body of the coupling

5. Disposal information

Observe the local waste disposal regulations.