

MULTI COUPLINGS

MULTIPLE LINES CONNECTED IN A SINGLE STEP

Stauff multi couplings enable multiple hydraulic lines to be connected in only a single coupling operation. As part of its recently launched MCS Multi Coupling System, Stauff is offering a comprehensive standard product range for many different applications. However, the final form of the product is often only realised in conjunction with the OEM when the configuration, connections and design are tailored to the specific application.

Boris Mette, *Head of Marketing Communication,
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01 Integrated flat-face quick-release couplings provide a clean, low-leakage connection, assisting a reproducible coupling process even with regular coupling and uncoupling



In mobile hydraulics, hydraulic lines have to be disconnected and reconnected time and time again with regular changing of attachments – this must be done cleanly, with no risk of mistakes, in a leak-proof manner, and often under time pressure. There is a risk of incorrect connections, particularly when there are multiple lines. At the same time, each connection needs to be reliably leak-tight.

This coupling and decoupling process is significantly simplified by multi couplings. They combine multiple individual hydraulic couplings in a common housing and, depending on the model, enable two, four, five or six lines to be simultaneously connected or disconnected in a single step. To achieve this, the fixed half of the coupling is mounted on the machine. The mobile half sits on the bundle of hoses connected to the attachment.

Flat-face coupling inserts integrated on both sides ensure a clean, drip-free connection. When coupling, all lines are connected simultaneously and securely locked in place by an ergo-

MULTI COUPLINGS PROVIDE A CLEARLY DEFINED INTERFACE BETWEEN THE MACHINE AND ATTACHMENT

onomic hand lever, without the need for additional tools. Defined guidance of both halves ensures that all connections are correctly aligned. This produces a reliably reproducible interface that prevents incorrect connections, especially with frequently equipment changes. Set-up and downtimes are considerably minimised by the reduced number of steps, as well as by the possibility of coupling the systems under residual pressure.

MODELS AND VERSIONS

A range of different Stauff multi couplings is available covering a wide spectrum of applications. Multi couplings for hydraulic systems are designed for two, four, five or six lines, and are available in nominal sizes from DN 6 (¼") to DN 25 (1"). Operating pressure

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03 Typical applications for multi couplings include agricultural machinery, construction and mining machinery, and municipal vehicles (shown here in a mobile drill).

DESIGNS AND APPLICATIONS

The number of lines to be connected is the first selection criterion. Multi couplings for two lines – often referred to as 2-way multi couplings – are ideal for simple hydraulic operations. For instance, they can connect the flow and return lines of a single operation, and so can be used for grippers, tipping functions or similar consumers with double-acting hydraulic cylinders.

Four-line multi couplings typically combine two hydraulic functions and are used where control or auxiliary functions need to be connected alongside the primary function. Traditional applications range from attachments with separate control hydraulics to grippers with auxiliary functions and front loaders in agriculture. In addition to saving time, multi couplings for four and more lines clearly demonstrate a further benefit of the system: the more lines that have to be connected, the greater the risk of mixing up connections when using single couplings. Reliable coupling in a single operation is a major benefit especially for users without special hydraulic knowledge.

COMPLEX HYDRAULICS

Multi couplings with five connections are suitable when there is a higher number of functions. They are needed when, additional control or leakage oil connections are required in addition to working lines, as is the case with hydraulically demanding attachments in construction or agriculture. Multiple circuits need to be connected clearly and securely with specialised municipal and special-purpose vehicles.



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res of up to 350 bar are possible depending on the size. Multi couplings are compatible with standard connection threads, such as BSP, NPT, UNF or metric threads, and can be integrated into international hydraulic systems.

They are made of high-strength materials, such as steel, aluminium or reinforced plastics. In addition, high-quality surface coatings are used to ensure reliable corrosion protection. Stauff's proven zinc/nickel coating, for instance, is used as standard with steel. This makes multi couplings suitable for even demanding operating conditions involving, dirt, moisture, strong vibrations, or high mechanical stresses.

Six-line multi couplings are available for high-performance multi-function attachments. Typical applications can be found in construction, forestry and municipal engineering, for instance with complex grippers, attachments with multiple control functions, or hydraulically demanding special solutions. 6-way multi couplings provide for quick attachment changes, even with a high number of functions.

SPECIAL SOLUTION: INTEGRATED ELECTRICAL CONNECTION

Alongside hydraulics, electrics are also playing an increasingly important role with mobile machinery. Electric excavators, cranes, telescopic loaders and other machines are equipped with sensors and actuators for automatic functions and predictive maintenance. A special design of 5-way multi coupling has been developed for modern, complex attachments with the possibility of integration of an electrical connector.

This means that five operating, control or leakage oil lines can be connected, with an additional placeholder for an electrical connector that can be freely selected and fitted by the customer. The integrated flat-face quick-release couplings ensure a clean,

low-leakage hydraulic connection, whilst the electrical connector guarantees reliable signal transmission for sensors, valve control or condition monitoring.

FROM OFF-THE-SHELF TO A CUSTOMISED ASSEMBLY

Selection of a suitable multi coupling depends on various factors resulting from the respective application. Factors to be considered include the number of hydraulic lines, integration of electric functions, the power parameters of each individual line, connection thread, specific installation, and available space.

This makes it clear that multi couplings are not standardised products, but rather customised assemblies. Stauff MCS Multi Coupling Systems is a range of products on the basis of which Stauff Engineering configures assemblies in close collaboration with the OEM.

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„STAUFF IS QUITE CLEARLY A PROJECT PARTNER HERE“

Mrs Hausmann, what is the actual benefit of multi couplings?

“Multi couplings provide a clearly defined interface between the machine and attachment”. Multiple lines are connected in a single step and the coupling process can be reproduced, reducing the risk of incorrect connections. Multi Coupling Systems are aimed at manufacturers for whom operating convenience and the resulting safe operation of their equipment plays a key role.

In which sectors are multi couplings specifically called for?

Typical applications include agricultural machinery with attachments that need to be changed, construction and mining machinery, as well as forestry machines and municipal vehicles. They are also used in industrial plants with modular components. We are operating here in pressure ranges up to a maximum of 350 bar. Multi couplings are not suitable for high-pressure applications.

Why is a standard range often insufficient with OEM customers?

This is because a standard range provides the overall structural forms but cannot meet every specific design requirement. Many different parameters need to be considered within a structural form, from the position of each individual line, the threaded connections, to the available space. Multi couplings need to be configured to be as individual as the conditions in which they are used in hydraulics. Stauff is quite clearly a project partner here.



Svenja Hausmann is Product Manager for Quick-release Couplings at Stauff Germany. She is the central contact for OEMs interested in multi couplings.

What does cooperation with Stauff look like?

In relation to Stauff Line, Stauff Engineering is often closely involved in the design of the hydraulic line system. OEMs appreciate the advice they receive plus working closely with our Engineering team. Custom configuration of a multi coupling is a seamless integral part of our operation. Customers come to us with their technical requirements. We then translate the OEM's specification into a specific coupling design, fine tune it together with them, and then transfer it into production.

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