



Coupling elements without coupling stroke

threaded-body type, ND 4, depressurised coupling, max. operating pressure 200 bar



1 Description of the product

Application

Coupling elements are used on machine tools with pallet changing systems in order to transmit hydraulic oil and compressed air from the machine tool table to the fixture.

Description

These automatically closing couplings have a flat surface and do not have protruding elements for sealing. Therefore exact positioning is not required and a radial positioning misalignment of up to 2 mm is admitted.

Cleaning of the coupling surfaces is easily possible due to the flat surfaces.

Because of the omitted active axial coupling stroke completely new solutions for the coupling motion can be realised.

2 Validity of the documentation

This document applies to the following products:

The coupling elements without coupling stroke as per data sheet F 9.461. The following types or part numbers are concerned:

Threaded-body type S (standard spring)

with sealing ring at the front face

- 0461-021
- without sealing ring at the front face
- 0461-022

Threaded-body type L (reduced spring force)

with sealing ring at the front face

- 0461-011
- without sealing ring at the front face
- 0461-012

Screw-in tool

- 2010-906

3 Target group of this document

- Specialists, fitters and set-up men of machines and installations with hydraulic expert knowledge.

Qualification of the personnel

Expert knowledge means that the personnel must

- be in the position to read and completely understand technical specifications such as circuit diagrams and product-specific drawing documents,
- have expert knowledge (electric, hydraulic, pneumatic knowledge, etc.) of function and design of the corresponding components.

An expert is somebody who has due to its professional education and experiences sufficient knowledge and is familiar with the relevant regulations so that he

- can judge the entrusted works,
- can recognize the possible dangers,
- can take the required measures to eliminate dangers,

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- knows the acknowledged standards, rules and guidelines of the technology.
- has the required knowledge for repair and mounting.

4 Safety instructions

DANGER

Danger of life / heavy health damages

Stands for an imminent danger.

If it is not avoided, death or very severe injuries will result.

WARNING

Person damage

Stands for a possibly dangerous situation.

If it is not avoided, death or very severe injuries will result.

CAUTION

Easy injuries / property damage

Stands for a possibly dangerous situation.

If it is not avoided, minor injuries or material damages will result.

Hazardous to the environment

 The symbol stands for important information for the proper handling with materials that are hazardous to the environment.

Ignoring these notes can lead to heavy damages to the environment.

Mandatory sign!

The symbol stands for important information, necessary protection equipment, etc.

Note

This symbol stands for tips for users or especially useful information. This is no signal word for a dangerous or harmful situation.

5 For your safety

5.1 Basic information

The operating instructions serve for information and avoidance of dangers when installing the products into the machine as well as information and references for transport, storage and maintenance.

Only in strict compliance with these operating instructions, accidents and property damages can be avoided as well as trouble-free operation of the products can be guaranteed.

Furthermore, the consideration of the operating instructions will:

- avoid injuries
- reduce down times and repair costs,
- increase the service life of the products.

5.2 Safety instructions

The product was manufactured in accordance with the generally accepted rules of the technology.

Observe the safety instructions and the operating instructions given in this manual, in order to avoid personal damage or material damage.

- Read these operating instructions thoroughly and completely, before you work with the product.
- Keep these operating instructions so that they are accessible to all users at any time.
- Pay attention to the current safety regulations, regulations for accident prevention and environmental protection of the country in which the product will be used.
- Use the ROEMHELD product only in perfect technical condition.
- Observe all notes on the product.
- Use only accessories and spare parts approved by the manufacturer in order to exclude danger to persons because of not suited spare parts.
- Respect the intended use.

- You only may start up the product, when it has been found that the incomplete machine or machine, in which the product shall be mounted, corresponds to the country-specific provisions, safety regulations and standards.
- Perform a risk analysis for the incomplete machine, or the machine.

Due to the interactions between the product and the machine/fixture or the environment, risks may arise that only can be determined and minimized by the user, e.g.:

- generated forces,
- generated movements,
- Influence of hydraulic and electrical control,
- etc.

6 Application

6.1 Intended use

These products are used in the industrial sector, to transfer hydraulic oil or compressed air from the machine table to the fixture. An example would be a machine tool with palette changing systems.

Furthermore the following are intended uses:

- Use within the capacity indicated in the technical characteristics (see data sheet).
- Use as per operating instructions.
- Compliance with service intervals.
- Qualified and trained personnel for the corresponding activities.
- Mounting of spare parts only with the same specifications as the original part.

6.2 Misapplication

WARNING

Injuries, material damages or malfunctions!

- Do not modify the product!

The use of these products is not admitted:

- For domestic use.
- On pallets or machine tool tables in primary shaping and metal forming machine tools.
- If due to vibrations or other physical / chemical effects damages of the products or seals can be caused.
- In machines, on pallets or machine tool tables that are used to change the characteristics of the material (magnetise, radiation, photochemical procedures, etc.).

- In areas for which special guidelines apply, especially installations and machines:
 - For the use on fun fairs and in leisure parks.
 - In food processing or in areas with special hygiene regulations.
 - For military purposes.
 - In mines.
 - In explosive and aggressive environments (e.g. ATEX).
 - In medical engineering.
 - In the aerospace industry.
 - For passenger transport.
- For other operating and environmental conditions e.g.:
 - Higher operating pressures than indicated on the data sheet or installation drawing.
 - With hydraulic fluids that do not correspond to the specifications.

Special solutions are available on request!

7 Installation

WARNING

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

- Improper connection can lead to escapes of oil under high pressure at the connections.
- Mounting or dismounting of the element must only be made in depressurised mode of the hydraulic system.
- Connection of the hydraulic line as per DIN 3852/ISO 1179.
- Unused connections have to be locked professionally.
- Use all mounting holes.

Injury by high-pressure injection (squirting out of hydraulic oil under high pressure)!

Wear, damage of the seals, ageing and incorrect mounting of the seal kit by the operator can lead to escapes of oil under high pressure.

- Before using them make a visual control.

Poisoning due to contact with hydraulic oil!

Wear, damage of the seals, ageing and incorrect mounting of the seal kit by the operator can lead to escapes of oil.

Incorrect connection can lead to escapes of oil at the ports.

- For handling with hydraulic oil consider the material safety data sheet.
- Wear protection equipment.

7.1 Design

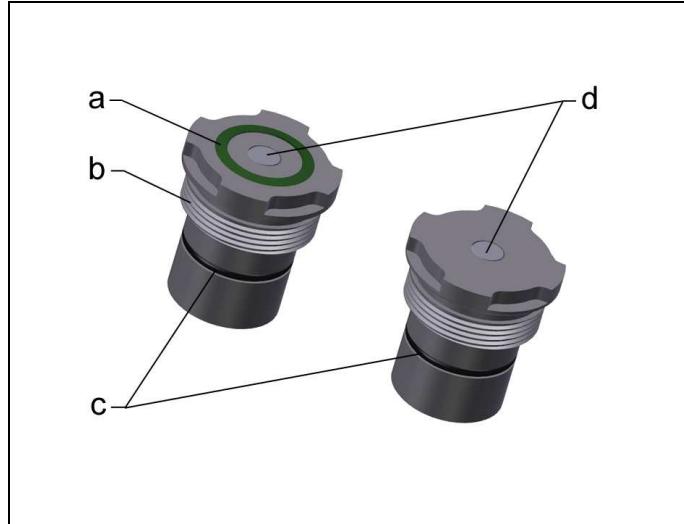


Figure 1: Design - Coupling elements without coupling stroke

a Sealing ring	c O-ring
b Body	d Closing cone

7.2 Installation

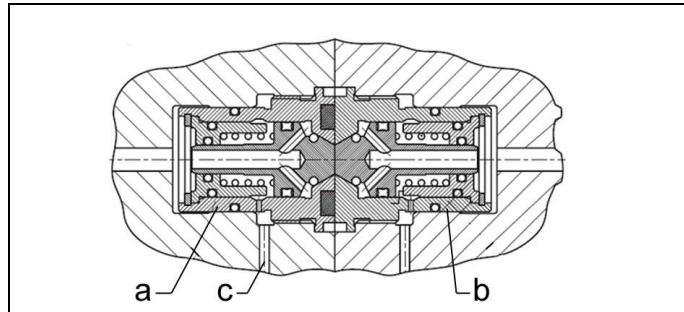


Figure 2: Coupling situation - closed

a Coupling with sealing ring at the front face	b Coupling, flush-faced
c Venting hole	

Note

Coupling

The coupling with the sealing at the front face should be mounted into the interchange part (e.g. pallet or changing fixture) and the coupling with the flat front face into the stationary component, since this version is more appropriate for manual or automatic cleaning.

Venting hole

The venting hole for the spring area is important for a perfect functioning of the coupling. No liquids and swarf must enter from the exterior.

7.3 Operation

⚠ WARNING

Injuries due to non-compliance of the operating instructions!

- The product may only be operated, if the operating instructions - especially the chapter "Safety instructions" have been read and understood.

⚠ CAUTION

Risk of injury!

Due to spring-loaded components hand or fingers can be squeezed.

- Wear personal protection equipment!

Material damage

Product and customer's installation can be damaged due to penetrating dirt.

- last clean the nipple with compressed air before coupling is made.

ℹ Note

Axial forces

The axial forces generated in the coupling situation have to be compensated externally by force fit or form fit.

Coupling process

During the coupling process the flat faces of the coupling elements must always contact each other, axial clearance is not admitted (see technical characteristics).

Sealing surfaces

The sealing surfaces on the face of the coupling elements have to be cleaned before coupling, to ensure the tightness in coupled condition. We recommend to wash the elements and finally clean them with compressed air. Protection covers should be used as far as possible.

Uncoupling

In uncoupled mode, the pressure in the line must be always lower than the minimum opening pressure to make sure that the couplings remain closed.

Function

These patented couplings do not open their check valves as usual by mutual pushing open via the coupling stroke but due to the pressure increase in the hydraulic line.

ℹ Note

Material damage

With hydraulic pressure very high forces are generated. The fixture or machine must be in the position to compensate these forces.

The internal check valves of both coupling elements are designed as pistons. In depressurised mode they are maintained closed by a pressure spring. As soon as a pressure is built up in the line, which is higher than the force of the pressure spring, coupling at the pressure generator side will be opened. Now the pressure is also available at the front face of the opposite coupling and opens this coupling correspondingly. The line has free passage to the connected cylinder.

If the line will be relieved from pressure, the couplings close automatically as soon as the pressure drops below the closing pressure.

8 Maintenance

8.1 Cleaning

⚠ CAUTION

Avoid damages of the moved components

Avoid damages of the moved components (rods, plungers, bolts, etc.) as well as of wiper and seal.

Aggressive cleaning agents

The product must not be cleaned with:

- Corrosive or corroding components or
- Organic solvents as halogen or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.), because this can destroy the seals.

The sealing surfaces on the face of the coupling elements have to be cleaned before coupling, to ensure the tightness in coupled condition. We recommend to wash the elements and finally clean them with compressed air. Protection covers should be used as far as possible. Previous cleaning of the smooth sealing areas is possible by means of rubber wipers.

In the case of heavy contamination, the cleaning has to be made in shorter intervals.

8.2 Regular checks

ℹ Note

Life

In order to obtain a long life, sealing surfaces should be free of contamination.

Swarf or contamination in the hydraulic oil lead to increased wear or damage at the guides, running surfaces and seals. Position tolerances have to be kept (parallel working)!

⚠ CAUTION

Material damage!

If the coupling is not guided in parallel, coupling nipple and coupling mechanism will be damaged.

- The axial forces generated in the coupling situation have to be compensated externally positively or non-positively.
- According to the version the coupling elements can be coupled and uncoupled against pressure or only in depressurised mode.
- Use hydraulic oil as per ROEMHELD data sheet A 0.100.

9 Trouble shooting

Trouble	Cause	Remedy
No flow	Not sufficiently together	Correct coupling stroke
	Coupling lifts off	Axial or coupling force higher than the retention force of the system
Coupling is leaky	Flat seal defect	Knife edge not correctly made
		If possible exchange seal or return for repair
In uncoupled mode leaky	Internal seal defect due to swarf	Exchange element

10 Technical characteristics

Characteristics of the type S (standard spring)

Type		0461 021 / 022
Max. operating pressure	[bar]	200
Max. flow rate	[l/min]	8
Minimum opening pressure coupled	[bar]	7
		6
Closing pressure on the consumer side coupled*	[bar]	3
Max. positioning tolerance, radial	[mm]	2
Max. positioning tolerance, axial	[mm]	+0.05

Characteristics of the type L (reduced spring force)

Type		0461 011 / 012
Max. operating pressure	[bar]	200
Max. flow rate	[l/min]	8
Minimum opening pressure coupled	[bar]	5
		5
Closing pressure on the consumer side coupled*	[bar]	2
Max. positioning tolerance, radial	[mm]	2
Max. positioning tolerance, axial	[mm]	+0.05

* The return pressure of a connected single-acting cylinder must be higher than the table value.

Note

Further information

- For further technical data see ROEMHELD data sheet.

11 Accessory

Note

Accessories

- See data sheet.

12 Storage

⚠ CAUTION

Storage of components!

- The product may not be exposed to direct solar radiation, because the UV light can destroy the seals.
- A storage differing from the storage conditions is inadmissible.
- In case of improper storage, the seals can embrittle and resinification of the anti-corrosive oil or corrosion at the element can occur.

The elements are tested by default with mineral oil. The exterior of the elements is treated with a corrosion inhibitor.

The oil film remaining after the test provides for a six-month interior corrosion protection, if stored in dry and uniformly tempered rooms.

For longer storage times, the element has to be filled with a non-resinifying corrosion inhibitor and the outside surfaces must be treated.

13 Disposal

⚠ DANGER



Hazardous to the environment

Due to possible environmental pollution, the individual components must be disposed only by an authorised expert company.

The individual materials have to be disposed as per the existing regulations and directives as well as the environmental conditions.

Special attention has to be drawn to the disposal of components with residual portions of hydraulic fluids. The instructions for the disposal at the material safety data sheet have to be considered.

For the disposal of electrical and electronic components (e.g. stroke measuring systems, proximity switches, etc.) country-specific legal regulations and specifications have to be kept.

14 Declaration of manufacture

Manufacturer

Römhled GmbH Friedrichshütte
 Römhledstraße 1-5
 35321 Laubach, Germany
 Tel.: +49 (0) 64 05 / 89-0
 Fax: +49 (0) 64 05 / 89-211
 E-mail: info@roemheld.de
 www.roemheld.com

Declaration of manufacture of the products

The coupling elements without coupling stroke as per data sheet F 9.461. The following types or part numbers are concerned:

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with sealing ring at the front face

- 0461-021

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with sealing ring at the front face

- 0461-011

without sealing ring at the front face

- 0461-012

Screw-in tool

- 2010-906

They are designed and manufactured in line with the relevant versions of the directives **2006/42/EC** (EC MSRL) and in compliance with the valid technical rules and standards.

In accordance with EC-MSRL and EN 982, these products are components that are not yet ready for use and are exclusively designed for the installation in a machine, a fixture or a plant.

According to the pressure equipment directives the products are not to be classified as pressure reservoirs but as hydraulic placing devices, since pressure is not the essential factor for the design, but the strength, the inherent stability and solidity with regard to static or dynamic operating stress.

The products may only be put into operation after it was assessed that the incomplete machine/machine, in which the product shall be installed, corresponds to the machinery directives (2006/42/EC).

The manufacturer commits to transmit the special documents of the products to state authorities on request.

The technical documentation as per appendix VII part B was prepared for the products.

Responsible person for the documentation:
Dipl.-Ing. (FH) Jürgen Niesner, Tel.: +49(0)6405 89-0.

Römhled GmbH
Friedrichshütte
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