

Dry Disconnect Coupling TD

Operating instruction



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1 Introduction

These operating instructions describe how to safely assemble and operate the TD dry disconnect coupling.

- Read these operating instructions carefully prior to assembling and operating the product.
- These operating instructions must be retained for the entire service life of the dry disconnect coupling.
- Make sure that this instruction manual is accessible to the operator at all times.
- These operating instructions must be passed on to each subsequent owner or user of the dry disconnect coupling.
- Insert every supplement issued by the manufacturer.
- Note the other applicable documents.

1.1 Validity

These operating instructions apply exclusively to the assembly and operation of type TD dry disconnect couplings manufactured by Stäubli Hamburg GmbH.

1.2 Target Group

These operation instructions for the TD dry disconnect coupling are aimed at operators and planners of industrial facilities where saturated steam or hot water is used for cleaning and heating. The dry disconnect coupling is a two-sided sealing quick coupling for steam hose lines that allows secure coupling and decoupling without any escape of steam.

1 Introduction

1.3 Warnings, symbols and markings

1.3.1 Warnings in this documentation

These operating instructions use warnings to prevent injuries to persons or damage to equipment.

→ Read and observe all warnings.

The warnings are identified by the following symbols and signal words:

 DANGER
Imminent danger! Failure to observe this warning may result in serious injury or death.

 WARNING
Possible danger! Failure to observe this warning may result in serious injury or death.

 CAUTION
Hazardous situation! Failure to observe this warning may result in minor injuries or damage to equipment.

1.3.2 Symbols and markings

These operating instructions use symbols and markings to ensure easy and quick comprehension.

Symbol	Description
✓	A prerequisite that must be fulfilled before you begin an action.
→	An action involving one or more steps, the sequence of which is not relevant.
1. 2. 3. ...	An action involving multiple steps, the sequence of which is relevant and therefore specified.
•	First level list
(see Chapter xx, p. xx)	Cross reference to a specific location in these operating instructions

Table 1-3-1: Symbols and signs

! NOTE
Important information for understanding or optimising the assembly sequences.

1 Introduction

1.4 Fields of application

The dry disconnect coupling is designed for the use on steam hose lines. No specific flow direction is prescribed for the medium being conveyed.

1.4.1 Industries

- Plant engineering and construction
- Power plant construction
- Chemical industry
- Food processing industry
- Process technology
- Tank cleaning
- **Filling systems for:**
 - railroad tank waggons
 - tanker trucks
 - ships
 - tank containers

1.4.2 Media

- Saturated steam
- Hot water

2 Safety instructions

2.1 Intended use

Series TD dry disconnect couplings are provided for the use on steam hose lines as product cut-off valves according to the Pressure Equipment Directive.

They are provided for safely coupling and decoupling steam hose lines without the escape of steam.

The dry disconnect coupling is provided exclusively to convey the approved media. The material stability of the variant used must be tested as part of the facility approval process

Any other use shall be regarded as improper use. Examples of misuse include:

- For use outside the specified pressure and temperature ranges, see Chapter 6.4.

2.2 Special note regarding the use in ex areas

As the fitting is exclusively heated by the flowing media, there is no temperature classification of the fitting. Design measures working against excessive heating of the outer cover ensure a high degree of safety.

The safe usage of the device according to the specified temperature parameters (see Chapter 6.4.3) within the EX zones defined by the operator is the operator's responsibility.

The current guidelines regarding explosion protection must be observed at all times.

It is the operator's responsibility that the operating temperatures are never exceeded.

2 Safety instructions

2.3 Applied standards and directives:

BGR 132 - 2004; DIN EN 1127:2007; DIN EN 13463-1:2009; DIN EN 13463-5:2003;
EX- RL 2014/34/EU.

The proper usage of the device within an EX zone defined by the operator has to be checked on the basis of the above specifications.

2.4 Safety regulations:

The operator of the dry disconnect coupling is responsible for complying with all relevant legal regulations and directives.

- ➔ Dry disconnect couplings must only be commissioned, operated and maintained in accordance with the following regulations and standards.
 - Operating instructions
 - Other applicable documents (country-specific ordinances on pressure equipment, operational safety, hazardous goods and environmental protection)
 - Regulations for systems in areas where there is a risk of explosion

This applies in particular to the prevention of sparking caused by mechanical movements, static electricity, to the earthing of system components and the volume resistance of the conductive hose line.
 - System-specific regulations and requirements
 - Equipment and product safety legislation for pressure equipment
 - Valid international, national and regional regulations
 - Accident prevention regulations
- ➔ Ensure that the dry disconnect coupling, tank and product line are accepted by suitably qualified personnel (experts, trained personnel, professional training, professional experience) and that acceptance is documented by these persons.
- ➔ Observe all approval procedures, required test regulations and test periods.
- ➔ Pre-commissioning and post-maintenance inspections must only be carried out by suitably qualified personnel (experts, trained personnel, professional training, professional experience) Take account of the certified specialist requirement in accordance with §62 I WHG.
- ➔ Check the dry disconnect coupling within the inspection intervals applicable to the system to ensure that it is in proper condition and free of leaks. Document the results of the inspections.

2 Safety instructions

- ➔ If the dry disconnect coupling is part of a system that requires testing, have the dry disconnect coupling checked by the expert during the first and all subsequent inspections.
- ➔ Implement all the necessary measures for inspection, maintenance and repair in accordance with the national regulations in the country of use.

2.5 Personnel qualification

The operator is responsible for ensuring that assembly, maintenance, commissioning is only carried out by educated and trained specialists.

At this point, we would like to draw your attention to the certified specialist requirement in accordance with §62 WHG.

The operator must provide competent and trained personnel, who can demonstrate in their dealings with hose lines, dry disconnect couplings, a familiarity with the respective conveyed medium and its potential hazards, the relevant safety regulations and the regulations of the relevant professional associations.

- ➔ Make sure that the personnel have understood and can implement these operating instructions.
- ➔ Make sure that the personnel know and comply with the relevant accident prevention and safety regulations.
- ➔ Make sure that the personnel are using suitable protective clothing/equipment.
- ➔ Make sure that the personnel is particularly qualified regarding the handling of approved couplings within the ex area.

2.6 Safe handling

- Before operating the dry disconnect coupling, check it to ensure that it functions properly and is free of leaks.
- Wear suitable personal protective equipment – in particular protective gloves – when coupling and decoupling.
- Always keep your protective suit closed in the hazard area.
- Lower the temperature to $\leq 50^{\circ}\text{C}$ before coupling or assembling.

WARNING

Hot surfaces!

When using the coupling, please make sure that the surface temperature does not exceed 70°C during operation.

This can result in scalds and/or burns.

CAUTION

Failure to observe the notes may result in hazard of injury and death and / or substantial damage to the equipment. Safe operation of the equipment is only ensured after proper assembly, commissioning and maintenance by qualified personnel with full observance of the operating instructions.

3 Storage and transport

- ➔ Only transport and/or store the dry disconnect coupling in the cleaned condition.
- ➔ Always transport and/or store the dry disconnect coupling in the cleaned condition.
- ➔ Cover openings with screw-on caps to prevent any impairment of the surfaces / mating surfaces and to protect these against contamination.
- ➔ Make sure that no damage can occur at the storage location as a result of corrosion or extreme temperatures.

4 Scope of delivery

The dry disconnect coupling is delivered ready to use.

5 Tools

For assembling the dry disconnect coupling:

Wrench with suitable width across flats (see Table 6-3).

Wrench is not included in scope of delivery.

Professional use of tools and personal protective equipment must be made sure.

6 Design and mode of operation

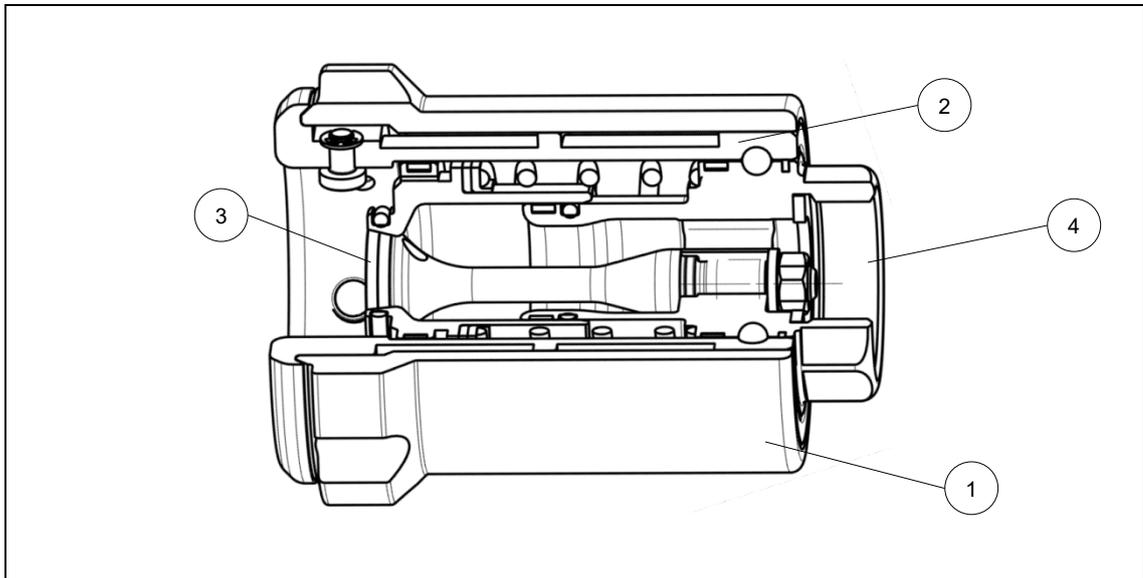


Figure 6-1: TDM dry disconnect coupling parts - female section

- | | |
|-----------------|--|
| 1 Handle sleeve | 3 closing cone |
| 2 TDM housing | 4 Swivel joint with G1" screwed connection |

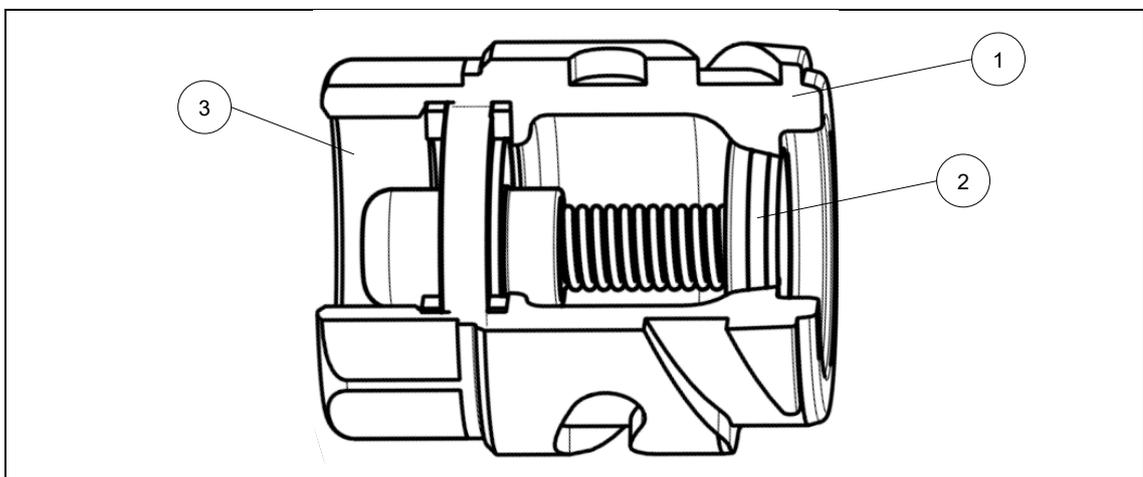


Figure 6-2: TDV dry disconnect coupling parts - male section

- | | |
|----------------|--------------------------|
| 1 Housing | 3 G1" screwed connection |
| 2 closing cone | |

6.1 Mode of operation

The type TD dry disconnect coupling consists of two coupling halves called male section (TDV) and female section (TDM), which in the decoupled state are each closed by a cut-off valve. The connection of both coupling halves is secured via a bayonet catch. Turning the TDM by 120° on the TDV establishes a pressure-tight connection; the valves are opened to unblock the cross-section. Decoupling closes both parts using a spring-loaded valve.

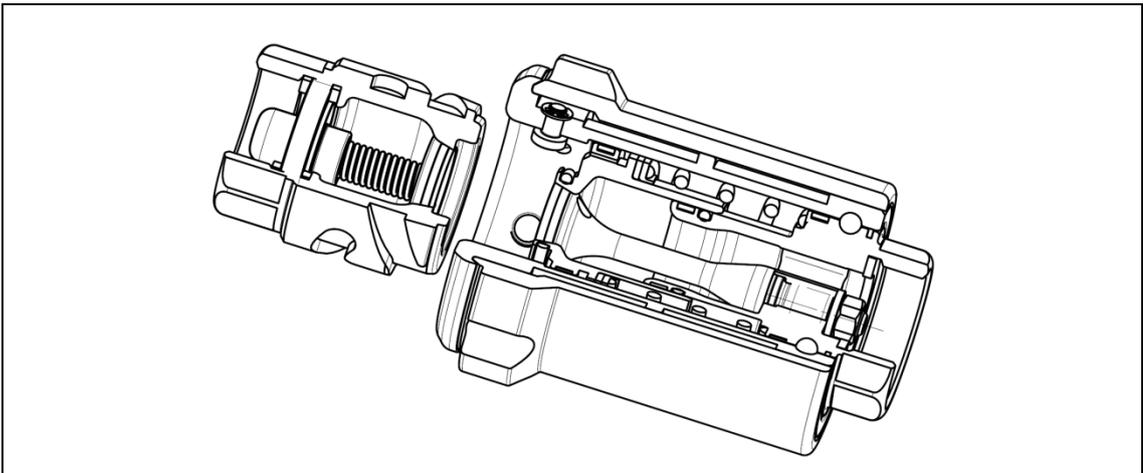


Figure 6-3: TDM and TDV in the decoupled state

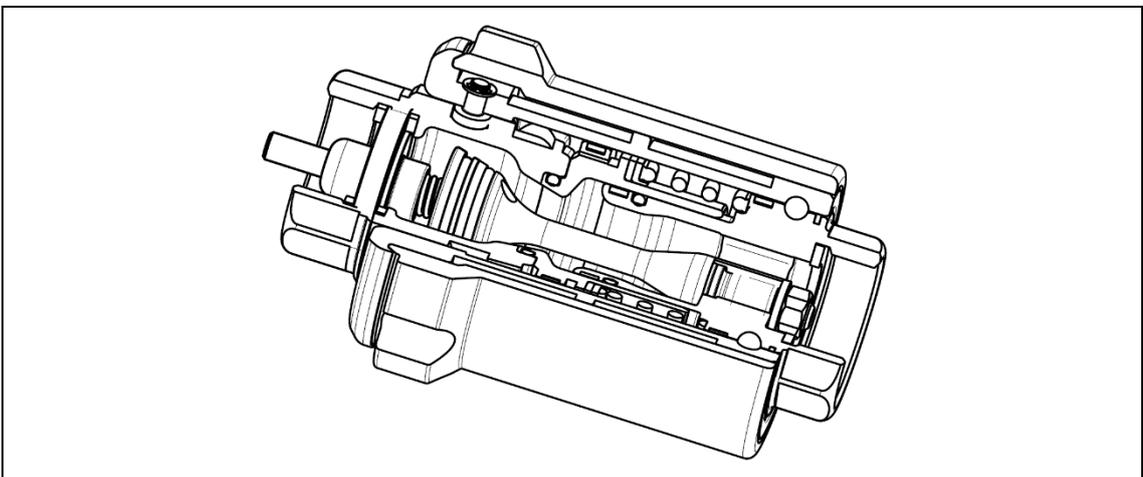


Figure 6-4: TDM and TDV in the coupled state

6 Design and mode of operation

6.2 Marking

Each coupling half is provided with a marking.

The marking contains the following information:

Marking	Meaning
TÜV A 312-14	Component marking
CE 0575  II 2G T(x)	CE marking with Ex marking
Manufacturer code: Stäubli Hamburg	Manufacturer identification
579.0025100.xxxxx-xx	Item number to identify the product
No.1038/11	Serial number/year of manufacture
Plant no. 74865/1.4571	Plant number/material identifier (casing)
DN PN	Nominal width, pressure stage

Table 6-1: Marking on the casing

6.3 Nominal widths and pressure stages and width across flats

Nominal width	Connection variant	Pressure stage	Width across flats
DN25	G1"	PN 16	38
		PN 25	38

Table 6-2: Nominal widths and pressure stages and width across flats.

6 Design and mode of operation

6.4 Technical data

6.4.1 Materials

Component	Material no	Material identifier ¹
Casing, pressure-bearing parts	1.4571	X6CrNiMoTi17-12-2
Spring	1.4401	X12CrNi177

Table 6-3 Materials

6.4.2 Seals

Component	Material	marking
O-Ring	EPDM	70 EPDM 291
	FFKM	Kalrez™
Thread seal	NO	Novapress

Table 6-4 Seals

¹ Kalrez™, Viton™, Teflon™ = registered trademarks of DuPont

6.4.1 Temperature range

Material				Temperature range
Housing	Pressure stage	Component	Short description	
1.4571	PN16	O-Ring	EPDM	-10/180°C
	PN16/PN25		FFKM	-10/225°C
		Thread seal	NO	

Table 6-5: Temperature range

The permissible temperature range depends on the sealing material used and the medium conveyed and must be tested for the specific application.

! NOTE
Media temperature may reach 225°C in short-term operation!

7 Installation / assembly

- ➔ Before commissioning/assembly, read and follow the instructions in Chapter 2.
- ➔ Tightly screw the male section (TDV) on the threaded connection of the container / tank.
- ➔ Tightly screw the female section (TDM) on the threaded connection of the steam hose.

Tools required for assembly:

- ➔ Use a suitable tool for the wrench flats provided on the dry disconnect coupling.
 - ➔ For the thread sizes of the Table 6-3.
-
- ✓ Relieve pressure from the coupling halves / hoses
 - ✓ Lower the coupling temperature to $\leq 50^{\circ}\text{C}$
 - ✓ Provide proper tools for assembling

7.1 Dry disconnect coupling earthing:

Earthing is made via a conductive hose / pipeline consisting of a hose / pipe with a guaranteed electrical volume resistance of $R < 10\Omega$ and a conductive connection of the hose and pipe fittings that are connected to the earthing. The dry disconnect coupling female section is earthed via the connection thread to the hose / pipe fitting.

The dry disconnect coupling male section is earthed via the connection thread and the earthing of the entire tanker, tank lorry, industrial tank, etc.

7.2 Fitting the dry disconnect coupling

⚠ CAUTION

Risk of injury from sharp edges and burrs!

→ Wear protective gloves.

⚠ CAUTION

Risk of injury from hot media or hot surface!

Wear protective clothing.

→ Completely drain the product-conveying lines

→ Switch off the delivery process

Cool down the hoses / pipes and containers to $\leq 50^{\circ}\text{C}$.

✓ Read and follow the instructions in Chapter 2.

Proceed as follows:

1. Remove all packaging and screw-on caps.
2. Check the dry disconnect coupling for signs of damage.
3. Check whether the inserted sealing is present and damage-free.
4. Tightly screw the TDM to the end of the steam hose.
5. Tightly screw the TDV to the container.
6. Check that the connections are free of leaks.

8 Commissioning

- ➔ Only commence commissioning after the dry disconnect coupling is properly assembled and attached to the product lines.
- ➔ Observe operating instructions for the facility.
- ➔ Always check the following points before commissioning:
 - Check the dry disconnect coupling for signs of leaks.
 - Check that the connection from the system to the dry disconnect coupling is free of leaks.
- ➔ Check that the electrical volume resistance is $R < 10 \Omega$
- ➔ If there are signs of damage or if you are aware of pre-existing damage which could lead to malfunction, do not use the dry disconnect coupling.
- ➔ Prior to the initial commissioning, check the coupling's function once without applying pressure and media. Put the TDM on the TDV once - at the beginning and at the end of the coupling process an increased resistance must be overcome.
- ➔ Commission the facility. Observe the operating instructions for the system.

9 Operation

⚠ WARNING

Escape of steam!

Hot steam may cause scalds and burns.

- Wear suitable personal protective equipment in the hazard area.
- Always keep your protective suit closed in the hazard area.

⚠ WARNING

confusion danger

The coupling type TD is visually very similar with the coupling type TR. It is essential to ensure that no different coupling types are connected!

⚠ WARNING

Hot surfaces!

When using the coupling, please make sure that the surface temperature does not exceed 70°C during operation.

This can result in scalds and / or burns.

- ✓ Read and follow the instructions in Chapter 2.
- ✓ Both product line ends are properly connected and ready for use.
- ✓ Operating pressure during coupling or decoupling < 6 bar.
- ✓ Cool the fitting down to ≤ 50°C.

9 Operation

9.1 Potential misuse

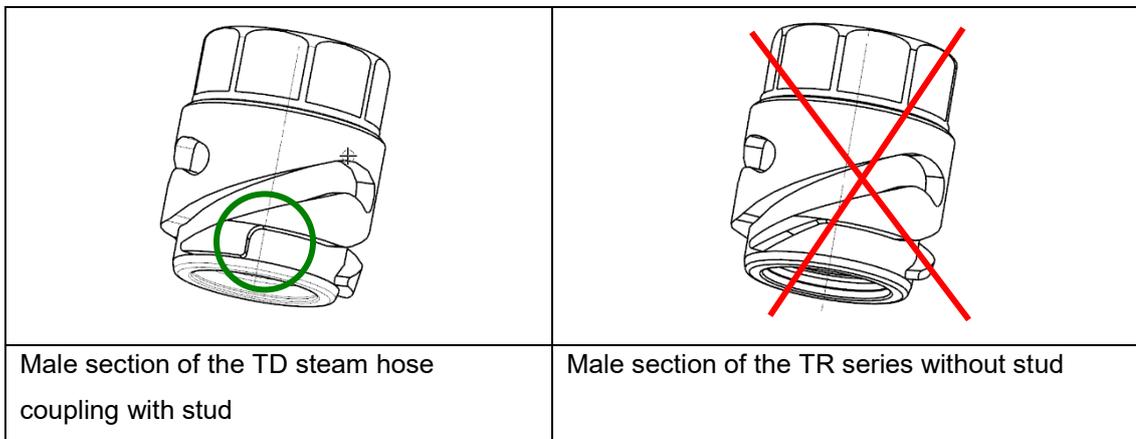


Fig. 9-1: Differences between TDV and TRV

The female section of the steam hose coupling may not be put on a male section of a TR series dry disconnect coupling with the same nominal width, since it is not guaranteed that the female section will close after decoupling. The figure shows the geometrical differences of both male sections.

10 Cleaning

- Each time before cleaning, check the dry disconnect coupling and connections for leaks.
- Only use suitable cleaning agents for cleaning.

10.1 Dismantling

- ✓ Read and follow the instructions in Chapter 2.
- ✓ Relieve pressure from the coupling halves.
- ✓ Lower the coupling temperature to $\leq 50^{\circ}\text{C}$.
- ✓ Provide proper tools for dismantling.

11 Maintenance / repair

- Do not use a damaged dry disconnect coupling.
- Check the technically perfect condition at least once a month.
- Maintenance on a regular basis, to be carried out after the facility inspection interval has expired at the latest.
- Do not reuse the dry disconnect coupling after leakage has been detected. Repair by the manufacturer is required in every case.
- Have maintenance and repairs to the dry disconnect coupling carried out by Stäubli Hamburg GmbH or by companies / persons authorised by Stäubli Hamburg GmbH.
- Perform visual inspections at regular intervals.
 - Check the dry disconnect coupling for signs of damage or defects.
 - Check that the dry disconnect coupling is in a functional state and free of leaks.
- Adhere to and document the specified maintenance intervals.

 CAUTION
Damage to the dry disconnect coupling caused by repairs carried out by unauthorised persons.
→ Do not attempt to carry out repairs yourself.
→ A defective dry disconnect coupling may only be repaired by Stäubli Hamburg GmbH or companies/persons authorised by Stäubli Hamburg GmbH.

12 Disposal

- ➔ Observe the relevant national and regional regulations when disposing of or recycling the dry disconnect coupling or its components.
- ➔ Should you have any questions on how to dispose of the dry disconnect coupling, please contact the manufacturer or an authorised specialist.

13 Warranty

Stäubli Hamburg GmbH accepts no responsibility for damages due to faulty installation, faulty handling, as well as negligent or incorrect maintenance.

The operator is solely responsible for the installation, operation and maintenance of the dry disconnect coupling.

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