Operating Manual
Crimping Machine CM 25-1

Read this Operating Manual prior to beginning any work!

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1. Preface:

This Operating Manual should facilitate your knowledge

Crimping Machine CM 25-1

of the device and enable you to properly use it as intended.

This Operating Manual contains important instructions for the safe and efficient operation of the Crimping machine. Observance of these instructions will help to avoid risks and dangers, lower downtime and repair costs, and extend the service life of the equipment. The pneumatic CM 25-1 Crimping machine has been designed in accordance with the latest state of technology and recognised safety-related regulations. The machine must be used only in a technically fault-free condition with due care afforded safety and potential hazards. The manufacturer will not be liable for arbitrary modifications to the machine, nor for modifications to the safety equipment. The Crimping machine is outfitted for two working strokes, which the user can set individually based on the structural shape and cross-sectional area of the connector, and which allow for operation with or without the protective cover, depending on the working stroke. Actuation of the working stroke takes place by means of a foot switch. As an option, actuation by hand is also possible.

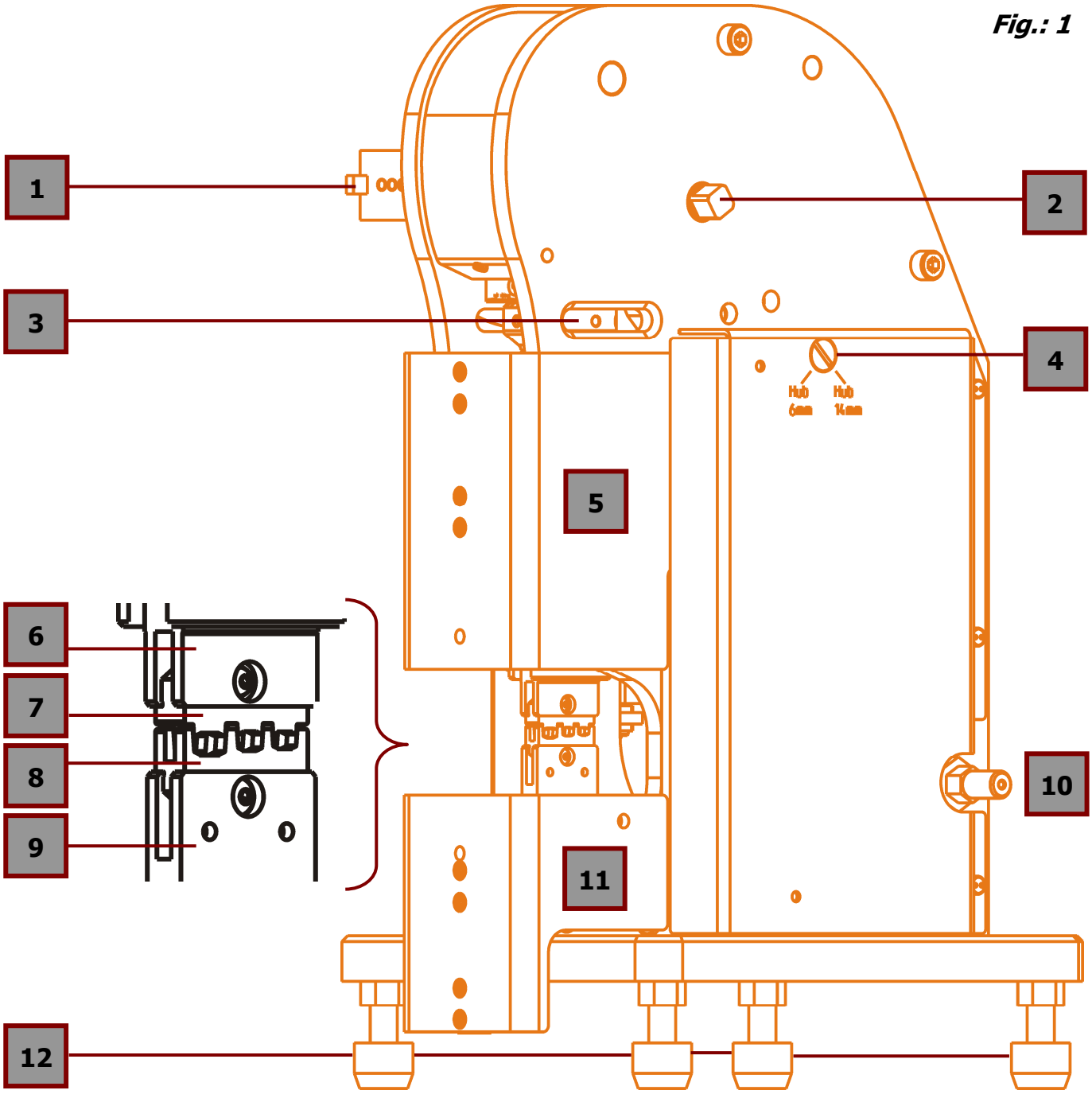
⚠ **NEVER WORK ON COMPONENTS WHEN VOLTAGE IS APPLIED!**

2. Technical specifications

Type:	CM 25-1
W x H x D:	325 x 500 x 280 mm
Weight:	30 kg
Crimping force:	25 kN (2.5 t) at 5 to 6 bar
Crimping time:	< 1 s
Crimping area:	up to 50 mm² (wire-end sleeves)
Continuous sound pressure level:	< 70 dB (A)
Compressed air demand:	0.75 l/working stroke at 6 bar operating pressure
Operating pressure:	5 to 6 bar (dry compressed air, oiled and filtered)
Crimp inserts:	from the PEW 12 crimp system (Rennsteig Werkzeuge GmbH, Viernau, Germany)

2.1 Configuration / Design

Fig.: 1



1	Counter with reset button	5	Movable protective cover, upper	9	Lower adapter attachment with adapter
2	Counter-positioner square end	6	Upper adapter attachment with adapter	10	Compressed air connector with pressure reduction and stop
3	Plunger with adjusting ring and scale	7	Die, upper section	11	Movable protective cover, lower
4	Slewing shaft for stroke adjustment	8	Die, lower section	12	Adjustable feet

3. Transporting the unit

As a rule, it must be ensured that damage due to careless loading and unloading of the unit is avoided. The transport company is responsible for any damage occurring during transport.

Attention: The Crimping machine should be checked for possible transport damage after carefully removing the packing materials.

Any damage detected should be immediately confirmed by the carrier and reported to RENNSTEIG WERKZEUGE GmbH, Viernau, Germany. It must be noted that certain calibration tasks can be carried out only at the installation site.

4. Limitations of liability

The manufacturer assumes no liability for damage resulting from:

- ⇨ Non-compliance with the Operating Manual
- ⇨ Improper or unauthorised utilisation
- ⇨ Operation by untrained or unskilled persons
- ⇨ Arbitrary conversion of the unit
- ⇨ Technical modifications
- ⇨ Use of replacement parts that have not been released by the manufacturer

5. Requirements at the installation site

- ⇨ Minimum load bearing capacity of the worktable: 45 kg
- ⇨ Overall space requirements for the machine: HxWxD = 500 x 500 x 300 mm
- ⇨ The work area foreseen for operating personnel is 1.5 qm
- ⇨ Worktable height adapted to the size of the operator
- ⇨ Sufficient lighting must be provided at the installation site

6. Installing the Crimping machine

1. The unit should be positioned at its ultimate location. The unit is aligned horizontally by means of adjustable feet and is secured in this position with counter-nuts. It must be ensured that the unit is installed in a stable position!
2. Connect the compressed air supply lines. The built-in pressure regulator is adjusted at the factory with pressure limited to max. 6 bar. It must be ensured that the compressed air connecting hose is laid out in a safe manner.
3. The unit should be checked for leak-tightness and proper operating pressure after connecting the supply line.

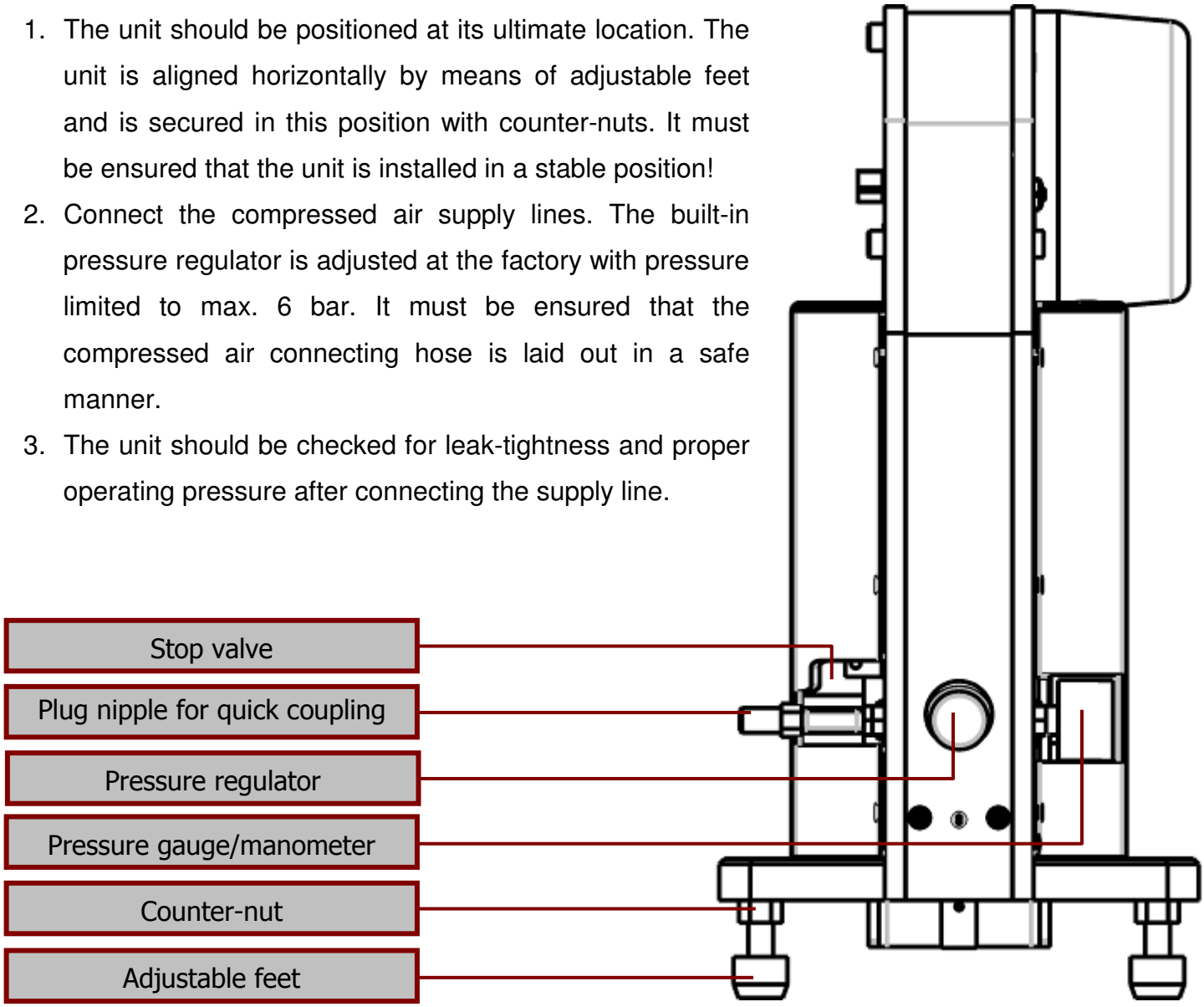


Fig.: 2

7. Commissioning / Preparation / Operation

7.1 Safe operations /Crimping procedures

Several important rules must be noted prior to working with the Crimping machine. The machine must be operated only by trained personnel in order to prevent injury to persons or damage to the machine. Prior to beginning work, the operator must ensure that all safety equipment is in proper working order. For example, the protective cover must be mounted, should not show any signs of visible damage and should not have a gap of greater than 6 mm. The machine must be put into service only after these checks have been made.

- Open the stop valve, drive the upper die and the upper and lower protective covers to their start positions
- The working stroke setting can be determined from the position of the slewing shaft (Fig. 1/4) and from the gap between the upper and lower dies
- Insert, position and fix the crimp contact in the lower die or, as appropriate, with the use of a contact attachment (locator)
- Insert and position the wire, stripped of insulation, into the contact
- Actuate the foot switch to trigger the working stroke

FOR TASKS WITH WORKING STROKES OF LESS THAN 6 MM, A PROTECTIVE COVER IS NOT NEEDED. FOR TASKS WITH WORKING STROKES UP TO 14 MM, THE PROTECTIVE COVER WILL FIRST CLOSE AUTOMATICALLY BEFORE THE CRIMPING PROCEDURE IS STARTED. ONCE THE SAFETY DISTANCE OF < 6 MM HAS BEEN REACHED, TRIGGERING OF THE WORKING STROKE IS EXECUTED AUTOMATICALLY. (see "7.3 Adjusting the working stroke")

- Release the foot switch after successful completion of the crimp so the machine can return to the start position.
- Remove the crimped connector

7.2 Protective equipment

With working stroke settings of less than 6 mm (pinch-protection), the protective cover remains in the start position. With working stroke settings of 14 mm, the protective cover closes automatically when the Crimp machine is actuated with the foot switch. Only afterwards is the crimping process released for execution. Modifications to the protective cover are permitted only within the context of complying with legal occupational safety regulations (EN 294 and EN 349). This applies in particular to additional apertures or openings that may have been introduced. These must be adapted to the respective application scenario and must not impair the operating safety of the machine. All openings and gaps must be ≤ 6mm. The protective cover is replaceable and can be reordered from the manufacturer.

7.3 Adjusting the working stroke

⚠ AS A RULE, ADJUSTMENT OF THE WORKING STROKE MUST TAKE PLACE WITH THE UNIT IN AN UNPRESSURIZED STATE. IT IS ABSOLUTELY ESSENTIAL TO ENSURE THAT THE CRIMP DIES HAS BEEN INSTALLED.

The CM 25-1 Crimping machine is designed to handle a variety of applications. The machine is outfitted for two working strokes. At working strokes of up to 14 mm, the protective cover is actuated automatically. With structurally small connectors and low cross-section profile cables, a working stroke of < 6mm is sufficient. In this work setting, the upper and lower protective covers are not driven together when the foot switch is actuated. At working strokes of up to 6 mm, use of the protective cover is not required by law. At working strokes of up to 14 mm, use of the protective cover is mandatory. In this context, there may not be any openings greater than 6 mm in the protective cover (see 7.2 "Protective equipment").

Stroke adjustment is performed as follows:

- Close the air supply by means of the stop valve (Fig. 3/1)
- Bleed the machine via the RESET button (Fig. 3/2), whereby the protective cover closes automatically
- Using a wrench key, rotate the counter-positioner square end in the direction of the arrow (Fig. 3/3) until the crimp dies touch.
- With a screwdriver, press in the slewing shaft against the pressure spring and slew it to the appropriate stop according to the markings (Fig. 3/4).
- Remove the screw driver from the slewing shaft; the slewing shaft must have audibly engaged at the stop.

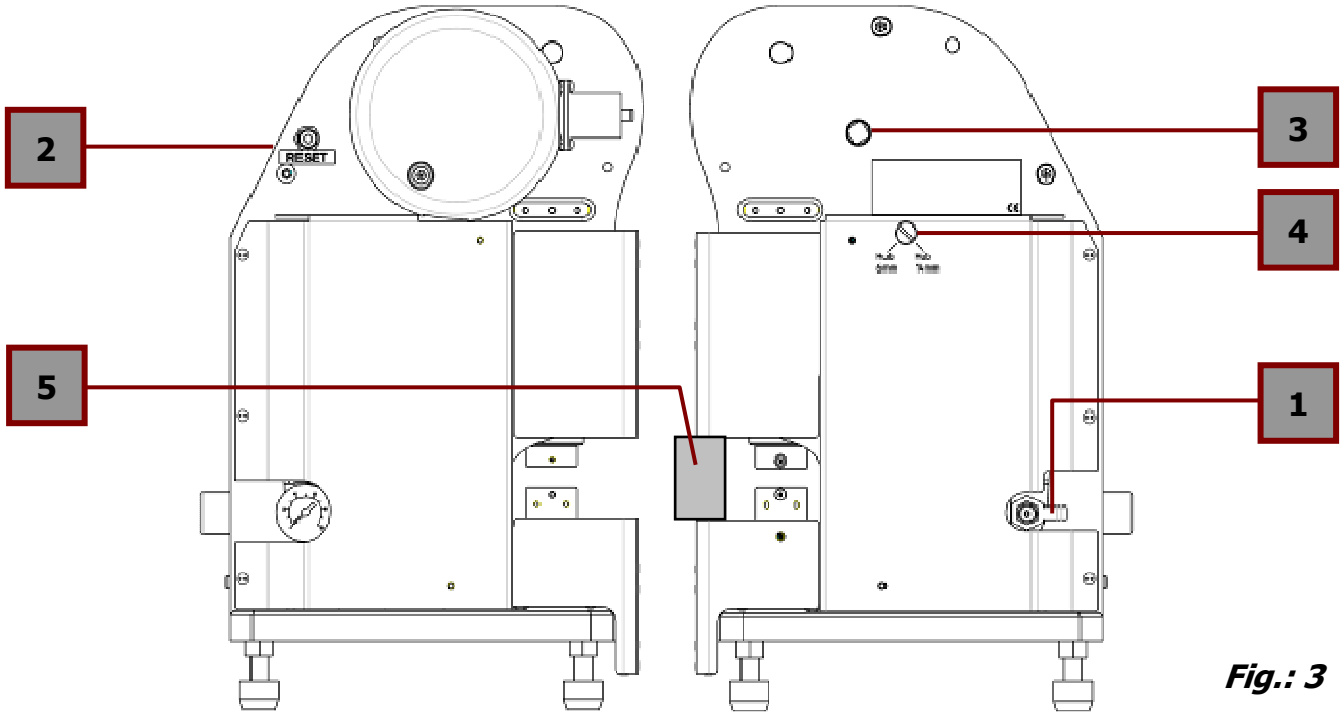


Fig.: 3

⚠ PRIOR TO CONNECTING THE CM 25-1 TO THE COMPRESSED AIR SUPPLY, THE WRENCH KEY SHOULD BE REMOVED FROM THE COUNTER-POSITIONER SQUARE END.

7.4 Changing tools

A tool change is undertaken as follows:

- Close the air supply by means of the stop valve (Fig. 3/1); open the protective cover by hand
- Place an adjusting aid between the upper and lower protective covers to prevent the protective cover sections from being driven together when the unit is unpressurized (Fig. 3/5)
- Bleed the machine by actuating the RESET button (Fig. 3/2)
- Using an SW 12 wrench key, rotate the counter-positioner square end (Fig. 3/3) in the direction of the arrow (red arrow) until the (unpressurized) crimp die set is closed
- Loosen the upper and lower crimp die attachment bolts with an SW 2.5 mm Allen wrench (Fig. 4/1); slightly open the die set with the counter-positioner
- Pull the crimp dies (Fig. 4/3) out of their adapters in the direction of the arrow (Fig. 4/2)
- Insert the new crimp dies into their adapters and lightly screw in the attachment bolts
- Check the accuracy of fit of the upper and lower dies by closing the die set; by rotating the counter-positioner (Fig. 3/3) with an SW 12 wrench key
- Remove the SW 12 wrench key from the counter-positioner
- Tighten the upper and lower adapter attachment bolts
- Remove the adjusting aid (Fig. 3/5); the protective cover will close by itself
- Open the stop valve (Fig. 3/1)

The machine will be driven to its start position and is ready for operation.

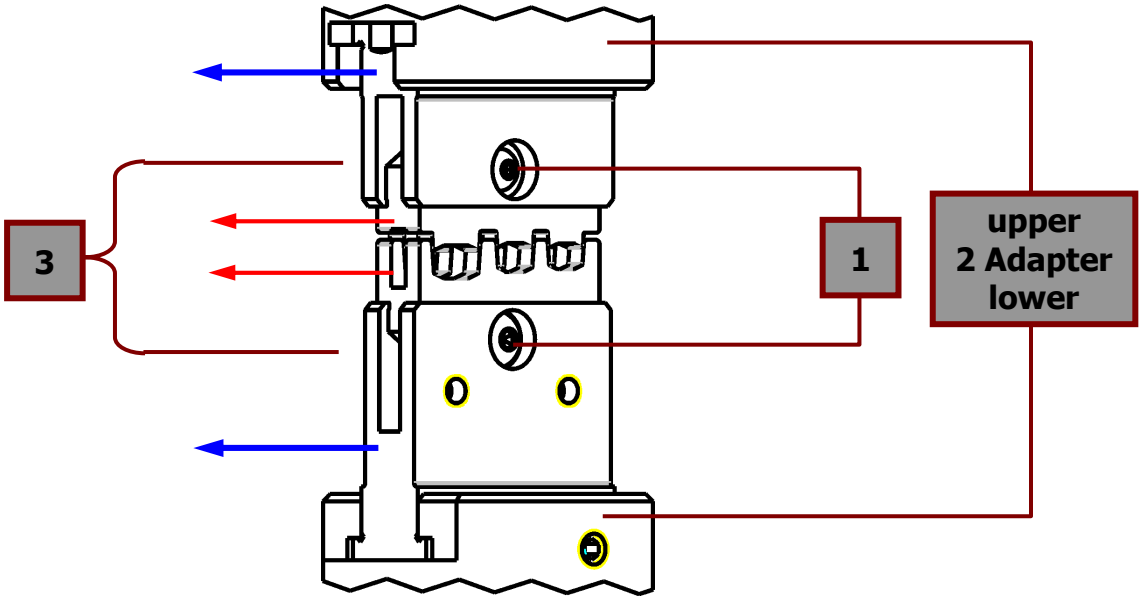


Fig.: 4

⚠ PRIOR TO CONNECTING THE CM 25-1 TO THE COMPRESSED AIR SUPPLY, THE WRENCH KEY SHOULD BE REMOVED FROM THE COUNTER-POSITIONER SQUARE END.

7.5 Changing the crimp position

The crimp die attachment can be rotated 360° at step increments of 22.5°.

Adjustment of the crimp position is undertaken as follows:

- Close the air supply by means of the stop valve (Fig. 3/1); open the protective cover by hand
- Place an adjusting aid between the upper and lower protective covers to prevent the protective cover sections from being driven together when the unit is unpressurized (Fig. 3/5)
- Bleed the machine by actuating the RESET button (Fig. 3/2)
- Loosen the upper and lower adapter attachments by turning the Allen wrench through the bore hole in the respective protective cover (Fig. 5/1) one turn each.
- Rotate the crimp die at 22.5° incremental steps to the desired position
- Check the parallelism of the upper die to the lower die (Fig. 6/1) by closing the crimp dies, using a wrench key
- to rotate the counter-positioner square end in the direction of the arrow (Fig. 3/3) until the crimp dies touch.
- Remove the SW 12 wrench key from the counter-positioner
- Tightened the bolts that were loosened on the upper and lower adapter attachments
- Remove the adjusting aid (Fig. 3/5)
- Open the stop valve (Fig. 3/1)

The machine will be driven to its start position and is ready for operation.

⚠ **PRIOR TO CONNECTING THE CM 25-1 TO THE COMPRESSED AIR SUPPLY, THE WRENCH KEY SHOULD BE REMOVED FROM THE COUNTER-POSITIONER SQUARE END.**

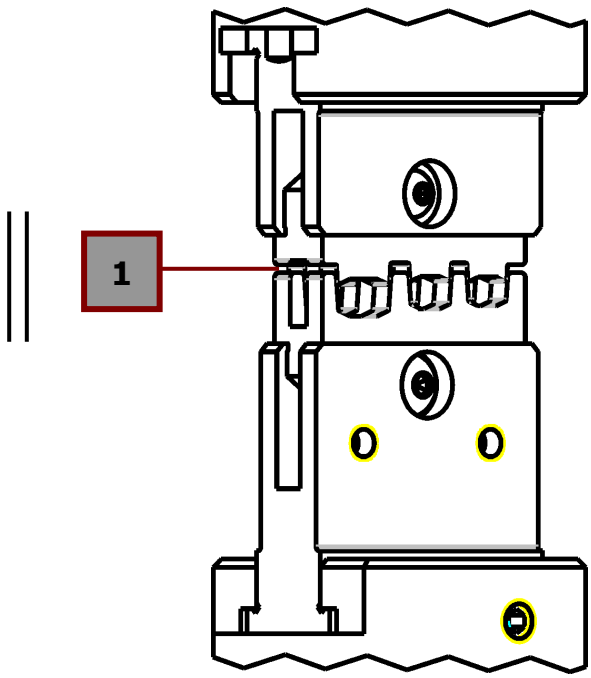


Fig.: 6

7.6 Replacing the adapter

Replacement of the adapter takes place in the following steps:

- Close the air supply by means of the stop valve (Fig. 3/1); open the protective cover by hand
- Place an adjusting aid between the upper and lower protective covers to prevent the protective cover sections from being driven together when the unit is unpressurized (Fig. 3/5)
- Bleed the machine by actuating the RESET button (Fig. 3/2)
- Loosen the upper and lower adapter attachments by turning the Allen wrench through the bore hole in the respective protective cover (Fig. 5/1) one turn each
- Rotate the upper adapter attachment 90° in a counter-clockwise direction so that the attachment bolts are facing the operator
- Loosen the adapter with an Allen wrench
- After loosening the adapter, turn back the adapter attachment 90°
- Loosen the lower adapter attachment by turning the Allen wrench through the bore hole in the lower protective cover (Fig. 5/2)
- Pull out the adapter attachment to the front in the direction of the arrow (blue arrow) (Fig. 4)
- Slide the optional adapter up to the stop pin in the adapter attachment and secure it with hexagon socket bolts; in so doing, the following applies:

⇨ The shorter adapter is for the upper attachment and the longer adapter is for the lower attachment

- If necessary, install the crimp die set (see Point 7.2 "Changing tools")
- Remove the adjusting aid (Fig. 3/5)
- Open the stop valve (Fig. 3/1)

The machine will be driven to its start position and is ready for operation.

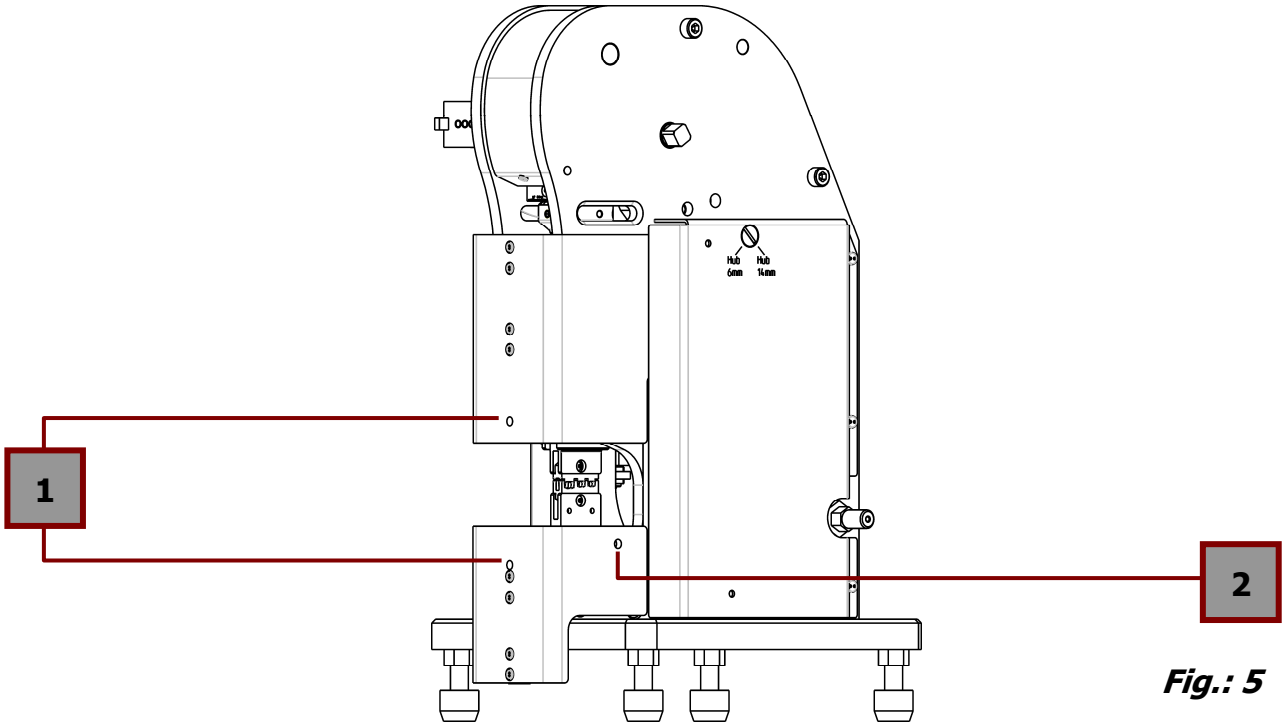


Fig.: 5

7.7 Crimping dimensions, fine adjustment

In order to guarantee fault-free crimping results, the CM 25-1 has been adjusted at the factory in such a manner that the crimp dies are firmly closed at bottom dead centre. Under certain conditions, such as after changing the dies, for example, it may be necessary to readjust the plunger stroke. For this, proceed as follows:

- Close the air supply by means of the stop valve (Fig. 3/1)
- Bleed the machine by actuating the RESET button (Fig. 3/2)
- Move the plunger (Fig. 7/4) to bottom dead centre until the scale and setting information are visible (Fig. 7/1) using an SW 12 wrench key on the counter-positioner square end (Fig. 3/3)
- Loosen the tensioning screw (Fig. 7/2) with an SW 3 mm Allen wrench
- Make the desired dimensional correction using the adjusting ring (Fig. 7/3), while inserting the Allen wrench in the auxiliary hole (Fig. 7/5) and turning it incrementally

Turning the adjusting ring one graduation mark affects plunger stroke by 0.05 mm

- When the correction is accomplished, fix the adjusting ring in place with the tensioning screw
- Open the stop valve (Fig. 3/1)

The Crimp machine will subsequently be driven to its start position and is ready for operation. The crimping process must now be simulated using the machine foot switch. The fault-free functioning of a machine cycle is tested in this manner. If a successful cycle is not warranted, then the crimping dimensions must be reduced as described in Chapter 7.8. The procedure must be repeated on a real crimp. The crimping dimension realised must be checked. A crimping height slide gauge from RENNSTEIG WERKZEUGE GmbH, for example, can be used for this.

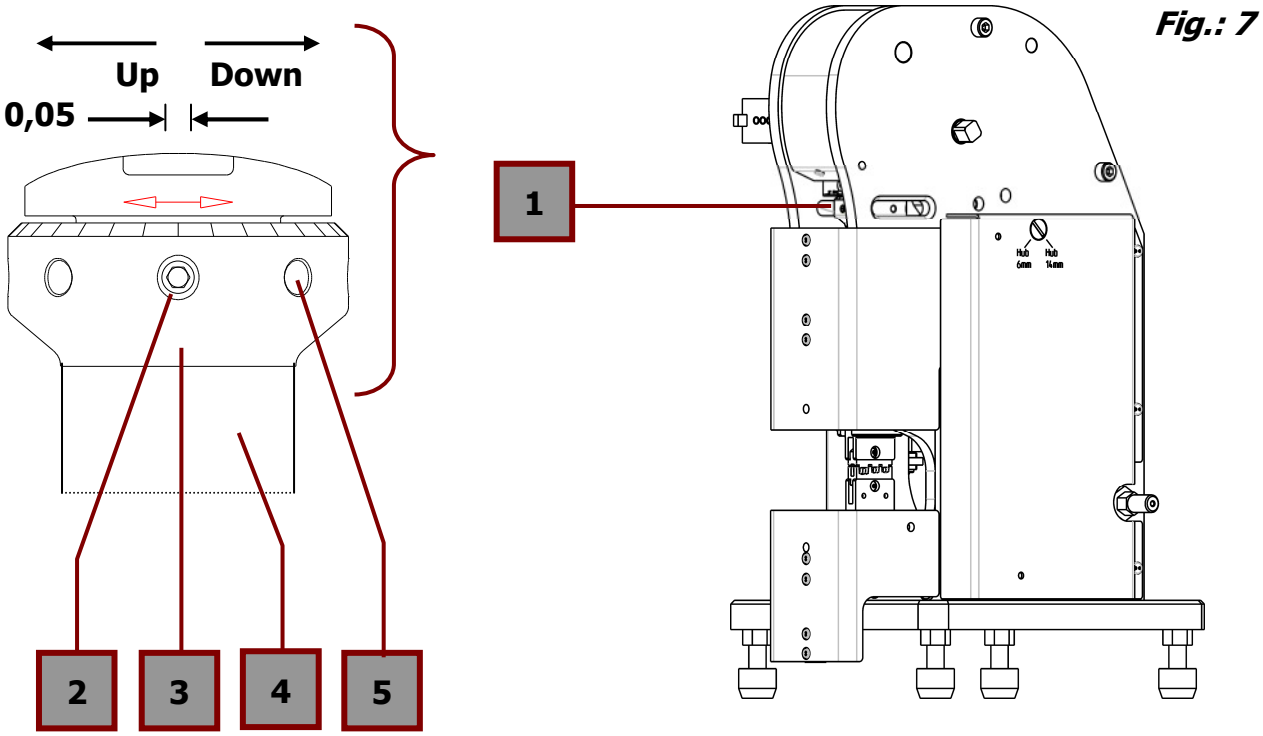


Fig.: 7

8. Maintenance and repair

- The CM 25-1 Crimping Machine is generally considered to be maintenance-free.
- Repairs must be carried out only by persons specifically qualified on the unit or by the manufacturer's technicians; only original replacement parts from the manufacturer are to be used.

8.1 Possible faults and fault rectification

Fault	Possible cause	Remedy
Crimping process does not complete	Improper pressure level in the pneumatic system	Close the stop valve. Press RESET. Open the pressure regulator to max. and check system pressure (designed for 6 bar)
	Foreign object in the crimp die	Close the stop valve. Press RESET. Remove foreign object and dismantle crimp die set as necessary (see 7.5 "Changing tools").
	Crimp die set does not align	Close the stop valve. Press RESET. Realign the crimp dies (see 7.5 "Changing tools")
	Improper contact used or wire cross-section too large	Select the correct contact, or the correct pressure point or die
Protective cover is triggered even at a working stroke of less than 6 mm	The fixing pin for locking the slewing shaft is not properly engaged.	Close the stop valve. Press RESET and manoeuvre the slewing shaft against the spring pressure until it is properly engaged (Fig. 1/4).

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9. Technical documentation

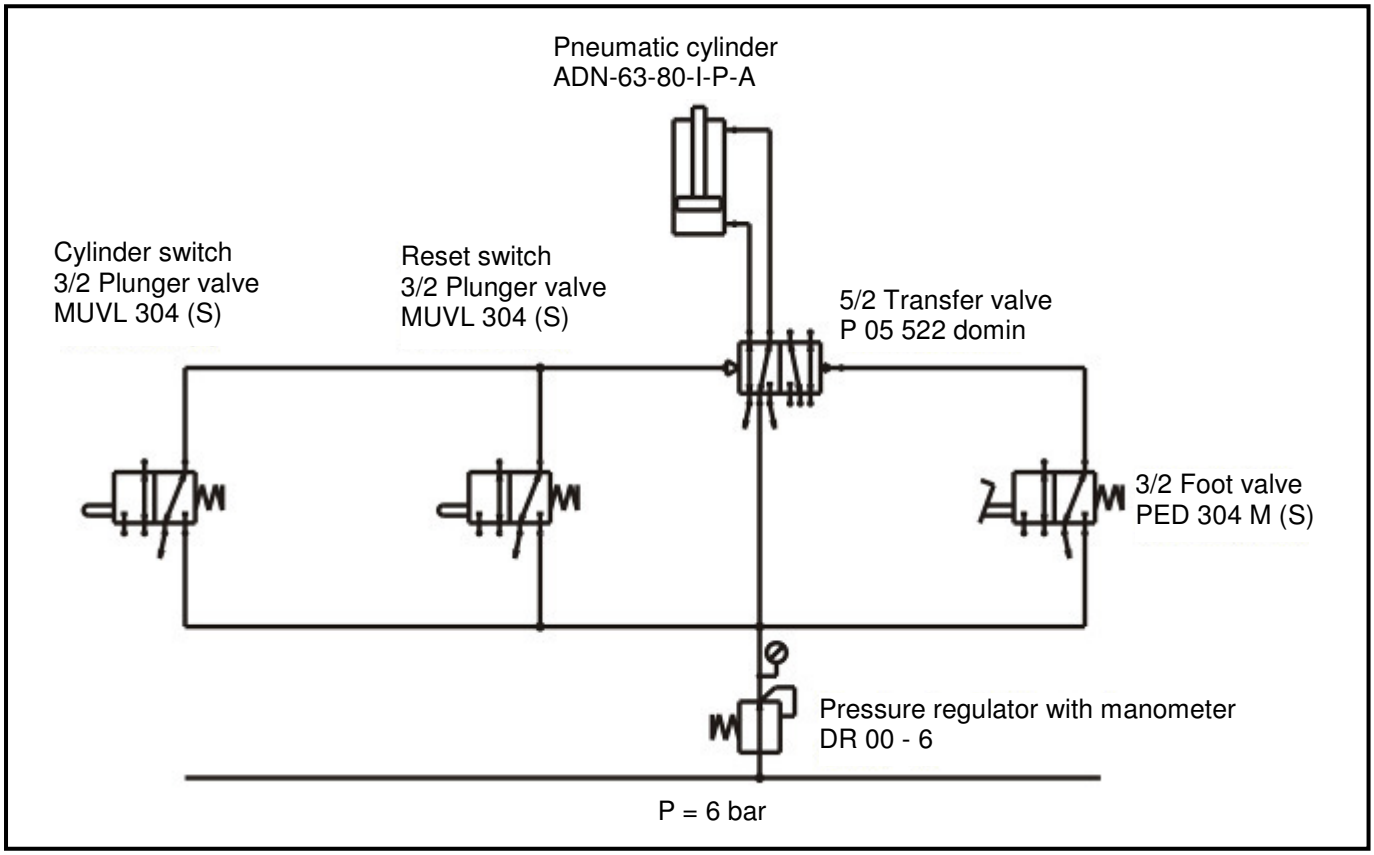

Fig.: Pneumatic circuit diagram

EC Declaration of Conformity
according to the EC Machinery Directive 2006/42 EC, Annex II

The Crimping Machine model

Type: CM 25-1 No.: _____

Year of manufacturer: _____

was developed, designed and manufactured in accordance with EC Directive 2006/42 EC at the sole responsibility of:

Company: Rennsteig Werkzeuge GmbH
An der Koppel 1
D-98547 Viernau, Germany

Responsible for documentation: Klaus Bamberger

The following EC directives and harmonised standards have been applied:

- EC Machinery Directive 2006/42/EC
- DIN EN 12100 Parts 1 and 2
- DIN EN ISO 13857
- DIN EN 349
- DIN EN 983
- DIN EN 1050
- DIN EN 13849

We hereby declare that the equipment within the scope of delivery as designated above represents a complete machine.

Viernau, on 18.05.2011

Managing Director, Sascha Zmiskol