

Rittal – The System.

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Stationary busbar cutting unit CW 120-S



4055.710

Operating instructions

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



Foreword

Dear Customer,

We thank you for choosing our Rittal product. Read these operating instructions carefully before using your new unit for the first time and retain them together with the supplied Product Control Card so they can be consulted when required.

We wish you every success.

Kind regards
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We are always happy to answer any technical questions regarding our entire range of products.

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1 CE labelling

Rittal GmbH & Co. KG confirms the conformity of the stationary busbar cutting unit with machine directive 2006/42/EC and with EMC directive 2014/30/EU. An appropriate declaration of conformity has been issued. It can be found at the end of this document, on the Rittal Homepage or accompanies the unit as separate document.

2 Safety instructions

2.1 Symbols in these operating instructions

The following symbols are used in this documentation:



Warning!

A hazardous situation which may lead to death or serious injury if the instructions are not followed.



Caution!

Hazardous situation which may lead to (minor) injuries if the instructions are not followed.



Note:

Important notices and indication of situations which may result in material damage.

- This symbol indicates an "action point" and shows that you should perform an operation or work step.

2.2 Symbols on the unit

The following symbols are attached to the unit.



Warning of laser radiation.



Risk of being crushed or cut by moving unit components.



Observe the operating instructions.



Wear safety goggles.

2.3 General safety instructions

When working with high-pressure hydraulic units, improper handling and/or poor maintenance can damage the unit and cause severe injuries. Consequently, observe all the following safety instructions and contact our service team should you have any questions.

Caution...

- ... when handling hydraulic oil. The oil can become very hot after longer operation. There is a risk of injury!
- To extend the service life of the unit, the hydraulic cylinder should not travel to the limit stop under full pressure.
- Risk of environmental contamination! Collect any escaped hydraulic oil and prevent it from entering the sewer system or the surface and ground water.

Always...

- ... machine busbars made of copper or aluminium.
- ... position busbars centred and perpendicular in the unit.
- ... remove objects and foreign bodies from the work area.
- ... observe the maximum permitted dimensions of the workpieces.
- ... inspect electrical and hydraulic connection lines for damage before deploying the unit.
- ... use the prescribed hydraulic pump.
- ... ensure the secure footing of the unit.
- ... observe the information contained in the operating instructions.
- ... instruct new users in the safe use of the unit.
- ... wear safety goggles when working with the unit.
- ... observe the local, country-specific regulations.
- ... store and deploy the unit in dry and well ventilated spaces.

Never...

- ... deploy the unit when parts are damaged or missing.
- ... make any changes to the unit or remove the warning signs.
- ... reach in the work area of the blade.
- ... look intentionally and directly at the laser light.
- ... open couplings under pressure.
- ... apply pressure to unconnected hose couplings.
- ... exceed the maximum operating pressure.
- ... operate the unit unattended.
- ... subject the unit to corrosive materials.
- ... deploy the unit unless the operating instructions have been read and understood completely.
- ... store or operate the unit at temperatures above 45 °C (113 °F).
- ... deploy the unit in an explosion risk area.

2.4 Personal protective equipment

The operating and maintenance personnel must always wear personal protective equipment when working on the unit. The personal protective equipment comprises at least the following components:

- Safety work shoes: for all work on the unit
- Safety goggles: for all work on the unit
- Gloves: for loading and unloading the unit

2.5 Residual risks when using the unit

There is danger that during operation a hydraulic hose bursts or a screw fastening leaks. This means oil can escape at high pressure.

- Always wear your personal protective equipment for all work performed on the unit (see section 2.4 "Personal protective equipment").

There is the danger that small particles are ejected at high speed from the machining area (e.g. because of tool breakage).

- Always wear your personal protective equipment for all work performed on the unit (see section 2.4 "Personal protective equipment").

If the unit machines busbars made of an impermissible material or from an excessively thick material, there is the risk of the tools becoming damaged and tool parts splitting off.

- Perform machining on materials only in accordance with the proper usage (see section 3 "Proper usage") and the technical specifications (see section 4 "Technical specifications").

3 Proper usage

The "stationary busbar cutting unit CW 120-S" (Model No. 4055.710) is a single-acting high-pressure hydraulic unit for clean cutting copper or aluminium bars with a maximum width of 120 mm and a maximum height of 12 mm. The unit is not suitable for cutting structural steels or tool steels. The electro-hydraulic pump (Model No. 4055.720) with the associated foot-operated switch (Model No. 4055.712) must be used as the drive for the "stationary busbar cutting unit".

4 Technical specifications

Technical specifications	
Model No. and designation	4055.710 stationary busbar cutting unit CW 120-S
Max. pressure	700 bar (10150 psi)
Max. cutting force	230 kN (52200 lbs)
Max. delivery rate	1.95 l/min (0.5 gal/min)
Permissible materials	Copper, aluminium
Max. busbar width	120 mm (4.72")
Max. busbar height	12 mm (0.47")
Laser (line laser)	4.0 mW, Class 1 laser; MTBF>10,000 h
Weight	20.5 kg (40 lbs)
Permissible hydraulic pump	Electro-hydraulic pump (Model No. 4055.720)

Tab. 1: Technical specifications

5 Available accessories

Available accessories	Model No.
Electro-hydraulic pump	4055.720
Foot-operated switch	4055.712
Support rollers for busbars	4055.714

Tab. 2: Available accessories

6 Unit description

The "stationary busbar cutting unit" is equipped with a high-performance single-acting hydraulic cylinder (9) that achieves a cutting force of approximately 23 tons for a maximum pressure of 700 bar.

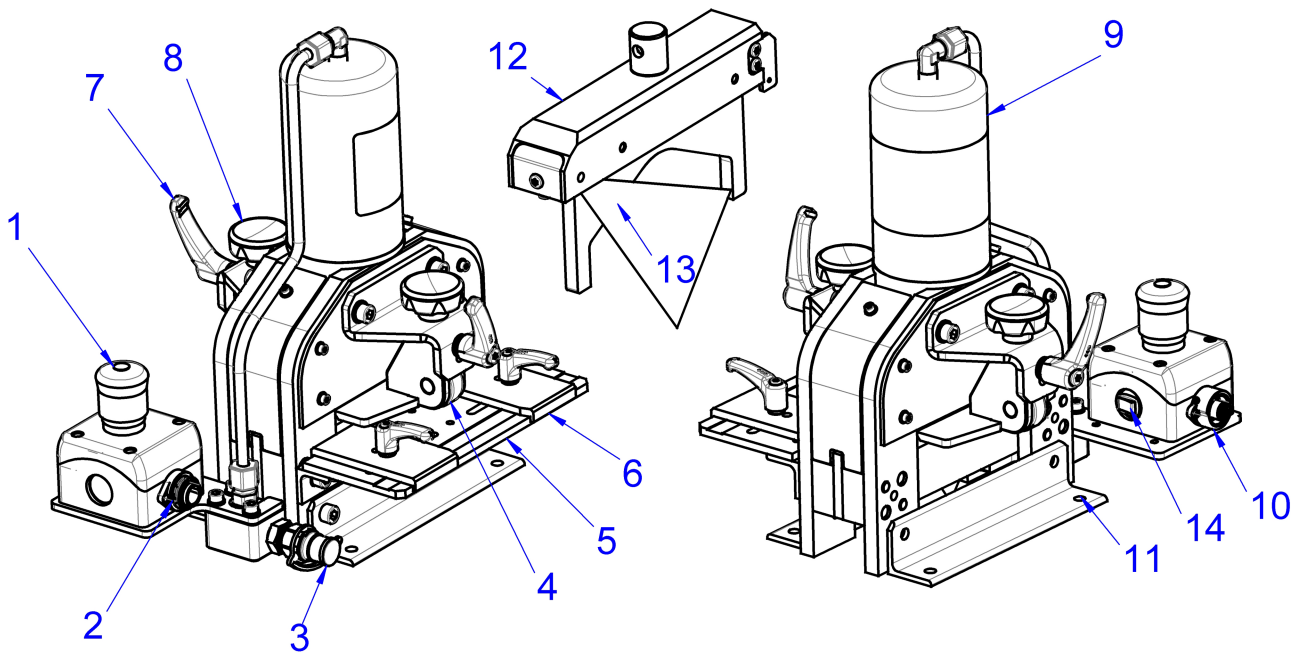


Fig. 1: Front and rear view

Key

- 1 Emergency stop switch
- 2 Connection socket (7-pin) for the control cable
- 3 Connection for hydraulic hose
- 4 Retainer with ball bearings
- 5 Supporting table
- 6 Side guide plates
- 7 Locking lever for retainer
- 8 Clamping screws for retainer
- 9 High-pressure hydraulic cylinder
- 10 Connection socket (4-pin) for the foot-operated switch
- 11 Holes for fastening to the work table
- 12 Cutter bar with integrated line laser
- 13 Blade
- 14 ON/OFF switch for laser

The cutting force is transferred uniformly via the cutter bar (12) to a replaceable blade (13).

The single-pedal foot-operated safety switch is connected with the cutting unit via the 4-pin socket (10). In dangerous situations, an additional emergency stop switch (1) can stop the pump immediately and return the blade to its initial position. The combination of supporting table (5), side guide plates (6) and retainers (4) ensures a reliable, perpendicular guiding of the busbars. The clamping screws

(8) set the height of the retainers that are fixed at the required position with the locking levers (7).

A line laser integrated in the cutter bar (12) simplifies the exact positioning of the busbar. The four holes (11) in the frame can be used for the fixed mounting of the unit on a table or workshop trolley.

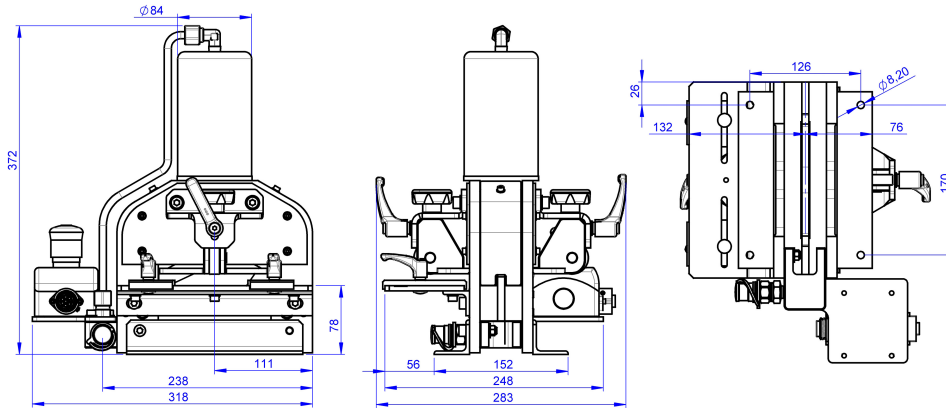


Fig. 2: Dimensions

7 Commissioning

You receive a fully assembled "stationary busbar cutting unit" as well as detailed operating instructions.

- On receiving the goods, check them for possible transport damage and the delivery for completeness.
- In the event of problems, contact the manufacturer or your vendor without delay.
- In any case, read the complete operating instructions as well as all supplied documents before commissioning.



Caution!

When recommissioning the unit, there is the risk that incorrect storage or missing corrosion protection can block unit components and so cause dangers.

- **Before recommissioning, ensure the smooth running of all components and the correct function of all safety equipment (see section 10 "Maintenance and inspection").**

- Wear your personal protective equipment, in particular gloves and safety work shoes, also for the transport and installation of the unit (see section 2.4 "Personal protective equipment").
- Ensure that the surface on which the unit is placed is flat and sufficiently stable.
- Inspect the hydraulic hose and the control cable for crushing and any other damage. Never use damaged hydraulic supply lines or electrical supply cables.



Note:

The hydraulic hose and the electrical control cable for the unit are supplied as set in a stable safety protection tube. As supplied, the hydraulic hose is filled with hydraulic oil HLP46.

- Inspect the mains cable and plug of the hydraulic pump for damage. Do not use the electro-hydraulic pump should there be any damage!
- Place the unit secure and stable to ensure a safe positioning of the unit.

**Note:**

Rittal recommends that the unit is fastened using the four holes in the frame on a worktable or workbench.

- Connect the hydraulic hose to the hydraulic connection (fig. 1, 3) and the electrical control cable to the electrical connection (fig. 1, 2) of the unit.

**Caution!**

If the unit is operated with a non-approved pump, there is risk of injury caused by bursting components of the hydraulic circuit.

- **Ensure that only the electro-hydraulic pump, in conjunction with the unit, as specified in the technical specifications is deployed.**

**Note:**

There is risk of hydraulic oil escaping in the event of a defective valve or when the hydraulic hose is disconnected under pressure.

- Ensure that the hydraulic system is pressure-free before disconnecting or reinserting the hydraulic hose.

- Then insert the supply cable of the foot-operated switch in the 4-pole connector (fig. 1, 10).
- Before the first use, the sealing screw plug (black) at the tank opening must be replaced with the air permeable ventilation screw (orange) so that air can flow into the oil tank during work.

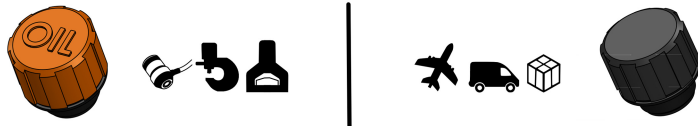


Fig. 3: Replacing the screw plug or ventilation screw (example illustration)

**Note:**

To prevent hydraulic oil from escaping, the sealing screw plug must be reinserted in the tank opening for subsequent transport of the unit.

Screw the sealing screw plug into the thread at the front of the electro-hydraulic pump to ensure quick and safe access when required.

**Note:**

Observe the details in the operating instructions of the electro-hydraulic pump.

- Turn the mains switch of the hydraulic pump to the "I" position to place the pump in ready mode.



Warning!

If a dangerous situation occurs when working with the unit, stop all dangerous movements of the unit without delay.

- In a dangerous situation, press the red emergency stop switch (fig. 1, 1) on the unit to stop the operation!
- As an alternative, press the foot-operated switch beyond the first pressure point. This also causes the work operation to stop immediately.

After triggering an emergency stop:

- Turn the emergency stop switch slightly so that it returns to its initial position. The pump is returned to ready mode. It can then be reactivated by actuating the foot pedal.
- If the emergency stop was activated via the foot-operated switch: release the foot-operated switch by pressing the blue silicone cover at the side (see fig. 4).



Note:

The electro-hydraulic pump is equipped with an emergency stop power circuit that is activated by the emergency stop switch of the connected unit to stop the motor immediately and to deactivate the integrated magnetic valve.

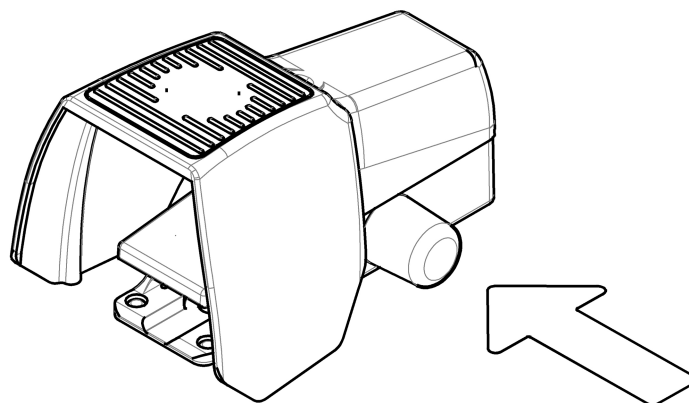


Fig. 4: Releasing the foot-operated switch



Note:

To extend the service life of the laser, it should be switched off for longer machining pauses (> 10-15 minutes).

8 Cutting busbars



Warning!

When cutting busbars, the blade can be a risk for cutting or crushing parts of the body.

- Ensure that nobody intervenes in the cutting area, in particular, after starting a cutting operation.
- In a dangerous situation, press the red emergency stop switch on the unit or alternatively the foot-operated switch beyond the first pressure point to stop the operation!

- Loosen the clamping levers on the side guide plates (fig. 1, 6) of the supporting table and set the guide plates to the width of the busbar.

- To ensure centred guiding of the workpiece below the cutting blade, always adjust both guide plates.
This is essential for an even cut.
- Mark the desired workpiece length centred on the busbar.
- Now introduce the busbar from the side of the support roller (fig. 1, 5) starting in the cutting unit.
- Loosen the clamping screws (fig. 1, 8) of the two retainers and set them to the material thickness of the workpiece.
The correct setting of the guide plates and retainers ensures a better cutting result.



Note:

The support rollers available as an accessory can also be used. They must be adjusted to the height of the cutting unit, and permit a fast and easy machining of the busbars.

- Actuate the switch for the laser (fig. 1, 14) to switch on the line laser.
- Now push the busbar through the cutting unit until the length marking is located exactly below the red laser line.
The workpiece with the correct length results on the side without the supporting table.



Warning!

When cutting busbars, there is the danger that small particles are ejected at high speed from the machining area.

- **Always wear your personal protective equipment for all work performed on the unit (see section 2.4 "Personal protective equipment").**

- Press the foot-operated switch to the first pressure point (foot pedal pressed approximately half the distance, corresponds to a force of approx. 20 kg) to start the cutting operation.
The hydraulic pump is activated and feeds oil to the tool.
- After completing the cutting operation, release the pressure from the foot-operated switch to deactivate the pump.
The hydraulic oil now flows from the cutting unit back to the oil tank of the pump. The blade travels back to its initial position.



Note:

The unit housing does not have any switch for ending the cutting operation. To protect the unit and the hydraulic pump, we recommend that the cutting operation is ended immediately after separating the busbar. To extend the service life of the laser, it should be switched off for longer machining pauses (> 10-15 minutes).

- To switch off the pump, turn the mains switch to the "0" position.

9 Replacing the cutting blade

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9 Replacing the cutting blade



Caution!

When replacing the cutting blade, there is the risk of injury caused by sharp edges.

- Ensure that the blade replacement is performed by appropriately authorised persons.
- Wear your personal protective equipment when replacing the cutting blade (see section 2.4 "Personal protective equipment").

- Place the unit without material securely on the table.

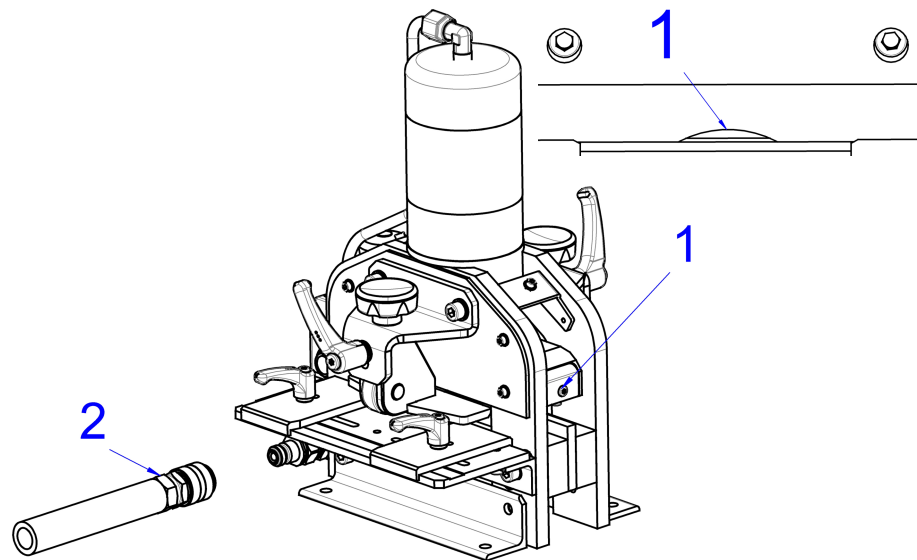


Fig. 5: Blade in the lower position

- Activate the hydraulic pump and allow the blade to travel down until only a small curvature (1) can be seen between the blade and the counter cutter.
- Switch off the hydraulic pump and immediately disconnect the hydraulic coupling (2) at the cutting unit so the cutter bar remains at the bottom position.

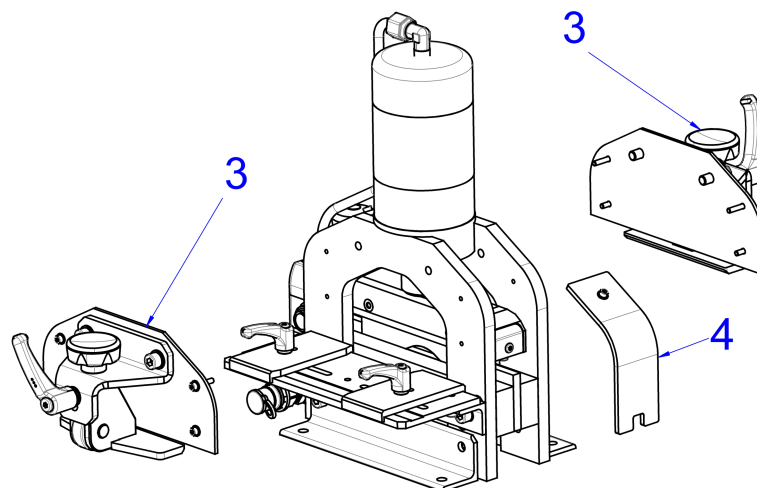


Fig. 6: Dismantling the retainers

- Dismantle the two retainers (3) and the side protective inspection window (4).

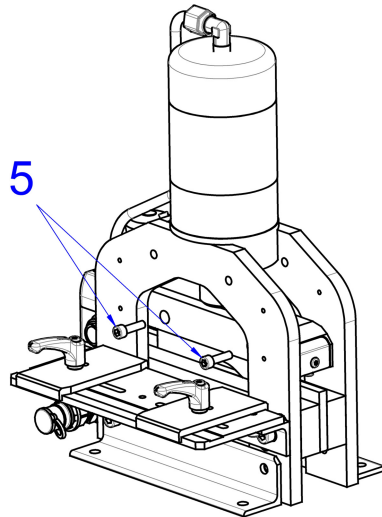


Fig. 7: Loosen the fastening screws

- Now loosen the two M8 screws (5) on the side of the cutter bar.
- Before removing the screws, secure the blade so it cannot fall.

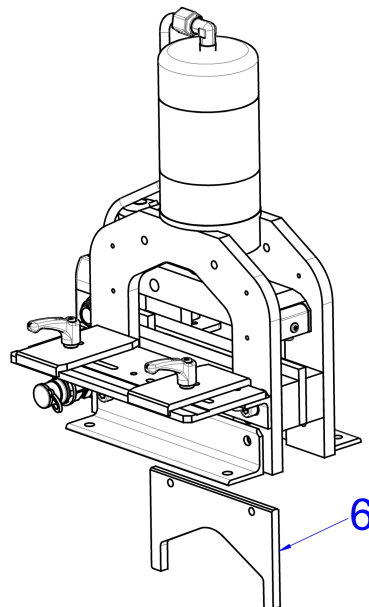


Fig. 8: Removing the blade

- Finally, remove the blade at the bottom of the cutting unit (6). Take care, the blade is sharp.

Installing the new blade:

- Insert the new blade from below and push upwards to the cutter bar.
- Screw in the two M8 screws (5) from the side with 15 – 20 Nm torque.
- Finally, screw on the retainers (3) and the protective inspection window (4), and reconnect the hydraulic hose.

10 Maintenance and inspection

The user is obliged to maintain and service the busbar cutting unit in accordance with the details in the operating instructions and in accordance with the country-specific standards and regulations.

The maintenance intervals are classified in accordance with the recommended frequency.



Caution!

When a unit has been switched on, there is the risk of it starting, such as for inadvertent actuation of the foot-operated switch with the associated risk of injury in the area of unit components.

- **Before any servicing and repair work, ensure that the unit mains plug of the connected hydraulic pump has been disconnected to prevent inadvertent starting.**

Before every use...

- ... Visually inspect the complete unit, hydraulic pump and hoses as well as the foot-operated switch for damage.
- ... Check all electrical and hydraulic connection lines for damage.
- ... Check the correct, secure attachment of the hydraulic couplings.
- ... Check the correct functioning of the foot-operated switch.

Weekly...

- ... Clean the complete unit. To prevent damage to the safety instructions on the unit, do not use any aggressive cleaning agents.
- ... Clean the blade and the counter cutters by blasting with dry compressed air.
- ... Grease the blade and counter cutters externally lightly with universal grease.



Note:

An inadequate protective film or an excessively long downtime of the unit can lead to corrosion and so impair the function of the components.

- ... Check the correct functioning of the safety shutdown on the foot-operated switch.
- ... Check the correct functioning of the emergency stop switch of the unit for the activated pump.



Warning!

There is risk of injury with defective safety equipment.

- **If the inspection of the safety shutdown equipment determined that they do not stop the unit, bring the unit to standstill immediately.**
- **Repair the safety shutdown equipment without delay.**
- **Operate the unit again only after the repair work has been completed.**

Monthly...

- ... Visually inspect the blade and counter cutters for defects or breakages, and replace when necessary.
- ... Check the markings and warning signs on the unit for readability and damage, and replace if necessary (see section 2.2 "Symbols on the unit").

Every 6 years...

- ... Replace the hydraulic hose.

Maintenance, inspections and repairs must be performed by qualified electricians in accordance with the regulations valid in the associated country.

11 Dismantling and disposal

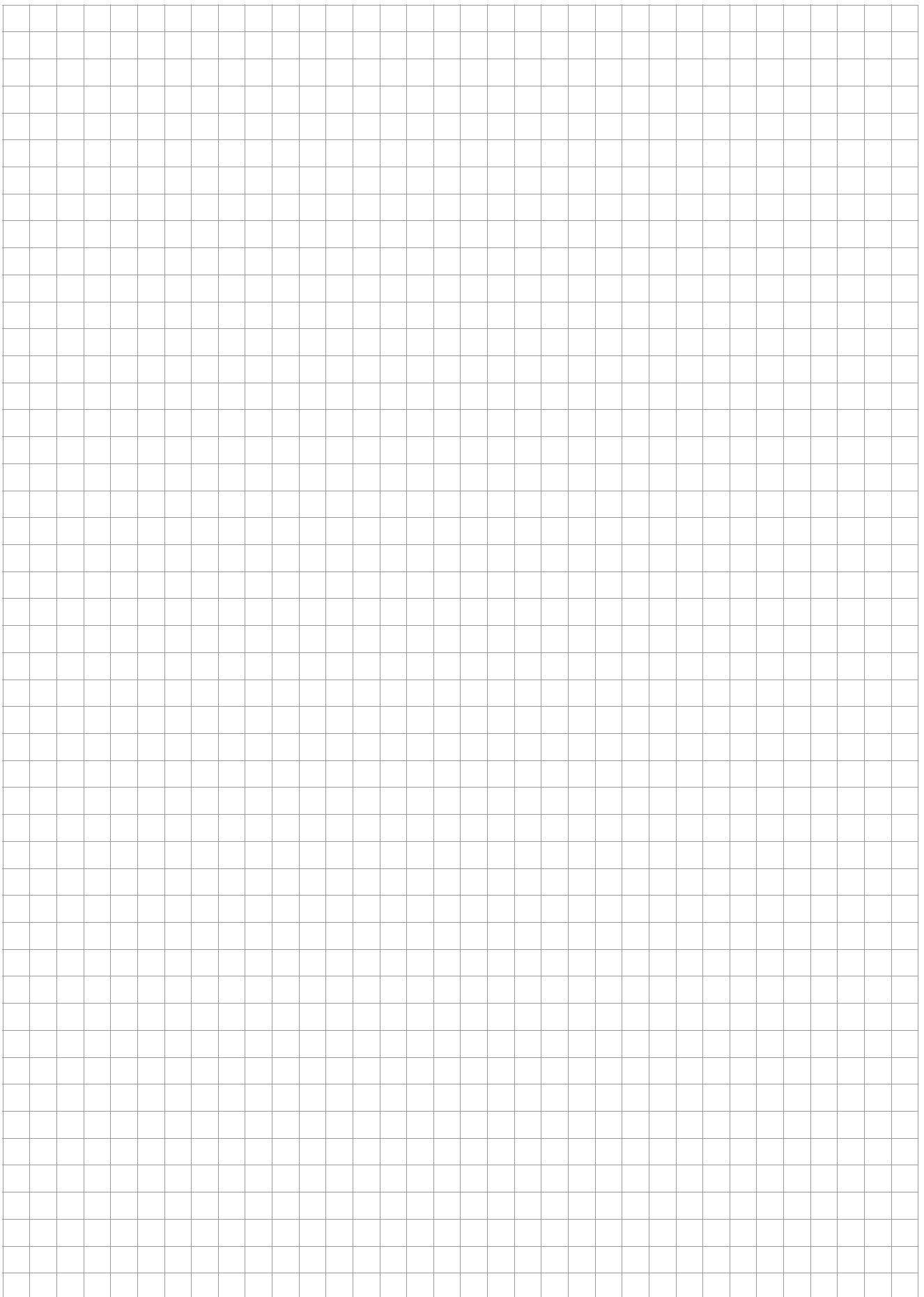
- Wear your personal protective equipment, in particular gloves and safety work shoes, also for the dismantling and disposal of the unit (see section 2.4 "Personal protective equipment").
- To switch off the hydraulic pump, turn the mains switch to the "0" position.
- Remove the ventilation screw and close the tank opening with the screw plug to prevent hydraulic fluid from escaping.
- Disconnect the supply cable of the foot-operated switch from the 4-pin connection.
- Disconnect the hydraulic hose from the hydraulic connection and the electrical control cable from the electrical connection of the unit.

When the hydraulic pump is switched off or the hydraulic system is pressure-free, the hydraulic hose can be disconnected safely without any hydraulic fluid escaping.

The "stationary busbar cutting unit" must be properly disposed of or recycled in accordance with the country-specific regulations.

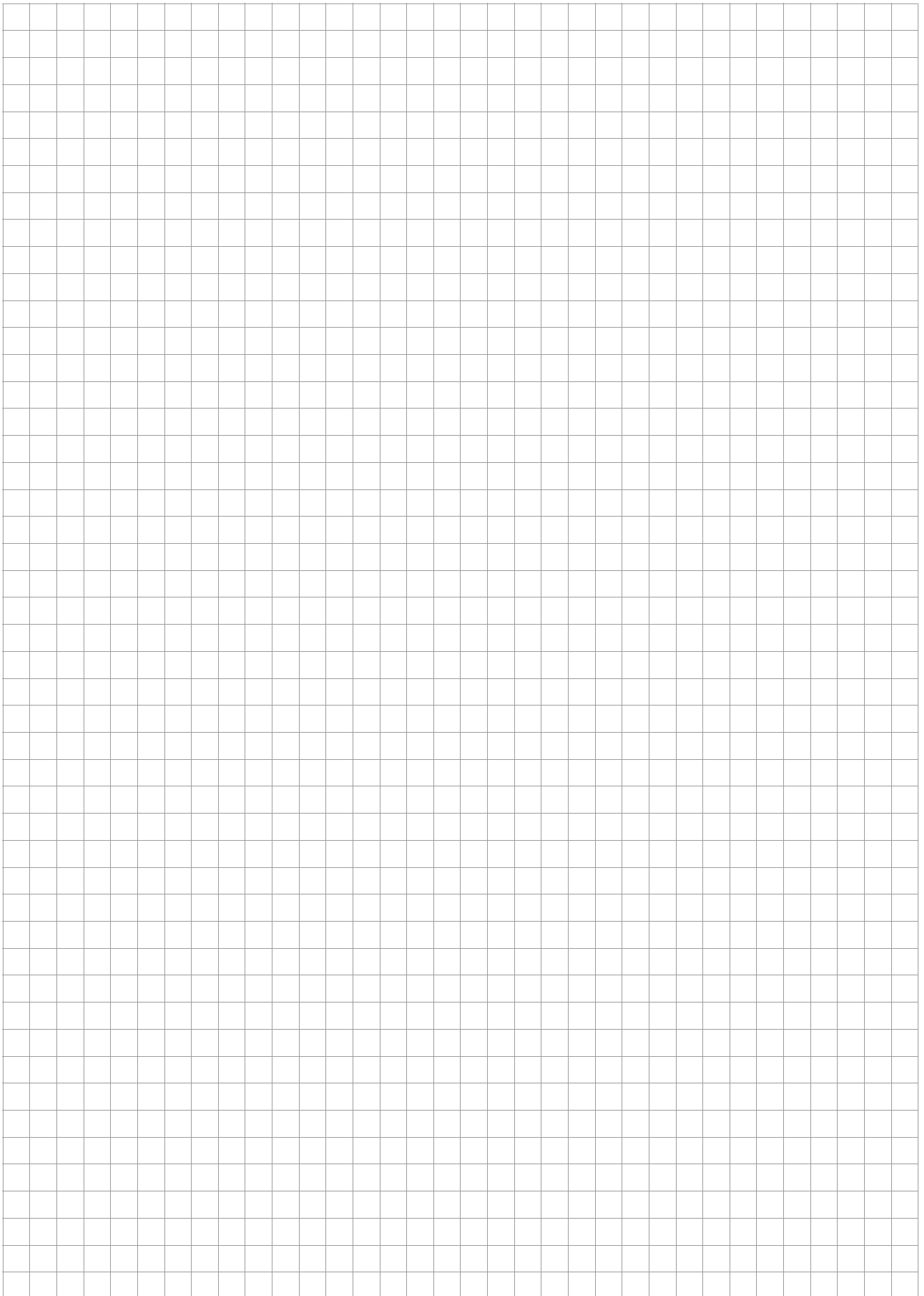
12 Contacts

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- For sales or service requests, please contact your local Rittal organisation which can be found at www.rittal.com/contact.



Notes

A large grid of graph paper for taking notes, consisting of 20 columns and 30 rows of small squares.



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