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Electro-hydraulic pump CW 120-S



4055.720

Operating instructions

ENCLOSURES

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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 label

Rittal GmbH & Co. KG confirms the conformity of the electro-hydraulic pump with the machine directive 2006/42/EC and with the EMC directive 2014/30/EU. An appropriate declaration of conformity has been issued. This can be found at the end of this document, on the Rittal home page or it accompanies the unit as a separate document.

2 Safety instructions

2.1 Symbols in these operating instructions

The following symbols are used in this documentation:



Warning!

Hazardous situation that may lead to death or serious injury if the instructions are not followed.



Caution!

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



Note:

Important notes and indications for situations that may result in material damage.

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

2.2 Symbols on the pump

The following symbols are placed on the pump.



Observe the operating instructions.



Wear safety goggles and ear muffs.



Equipment temperature.

2.3 General safety instructions

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

Caution...

- ... when handling hydraulic oil. The oil can become very hot after extended operation. There is the risk of injury!

- To extend the service life of the associated tools, they should not be traversed under full pressure to the block or to the limit stop.
- Risk of environmental contamination! Collect any escaped hydraulic oil and prevent it from entering the sewage system or from contaminating the surface water and groundwater.

Always...

- ... work with the ventilation screw so that the tank can "breathe" during pumping.
- ... transport with the sealing screw plug so that the hydraulic oil cannot escape.
- ... ensure good ventilation.
- ... inspect the electrical and hydraulic connection lines for damage before using the pump.
- ... select the mains voltage appropriate for the pump.
- ... ensure the secure footing of the pump.
- ... observe the operating instructions.
- ... familiarise new users in the safe use of the pump.
- ... wear safety goggles and ear muffs when working with the pump.
- ... observe the local, country-specific regulations.
- ... store and use the pump in dry and well-ventilated spaces.

Never...

- ... change the pump or remove warning signs.
- ... use the pump when damaged or parts are missing.
- ... use with unknown or damaged tools.
- ... open couplings when they are under pressure.
- ... apply unconnected hose couplings under pressure.
- ... use the pump without proper familiarisation.
- ... operate the pump unattended.
- ... bring the pump into contact with corrosive substances.
- ... use the pump without reading and understanding the operating instructions beforehand.
- ... store or operate the pump at temperatures above 45 °C (113 °F).
- ... use the pump in explosion-endangered spaces.

2.4 Personal protective equipment

The operating and maintenance personnel must always wear personal protective equipment for all work performed on the pump. The personal protective equipment comprises of at least the following components:

- Safety work shoes: For all work on the pump
- Safety goggles: For all work on the pump
- Ear muffs: They must be worn when working nearer than 500 mm from the pump.

2.5 Residual risks when using the pump

There is the danger of oil escaping from the pump when it is transported horizontally or when tilted excessively.

- When transporting the pump, ensure that it always remains upright.

During operation, there is the risk that a hydraulic hose bursts or that a screw fastening leaks. This can cause oil to escape at high pressure.

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

3 Proper usage

The "electro-hydraulic pump CW 120" (Model No. 4055.720) is a single-acting radial-piston pump designed for use with single-acting hydraulic tools with automatic oil return and adequate pressure stability.

4 Scope of supply

Scope of supply
Electro-hydraulic pump (4055.720)
Hydraulic hose with control cable (2 m)
Cable adaptor for foot-operated switch (4-pin to 7-pin)
Operating instructions

Tab. 1: Scope of supply

5 Technical specifications

Technical specifications	
Model No. and designation	4055.720 electro-hydraulic pump CW 120
Power consumption	1300 watts
Load speed	2860 RPM
Voltage	230 V, 50 Hz.
I_{max} @700 bar	5.7 A
Hydraulic medium	HLP 46 oil
Max. pressure	700 bar (10150 psi)
Max. flow rate	1.1 l/min (0.29 gal/min)
Filling volume of the tank	3.2 l (0.85 gal)
Working volume	2.2 l (0.58 gal)
Weight	29 kg (64 lbs)
Noise emission	92 dB(A) at distance of 300 mm from the motor
Vibration on the handle	AC = 3.5 mm/s ² and VC = 3.2 mm/s
Operating temperature range	15 °C...40 °C (indoor)
Relative humidity	20%...70%

Tab. 2: Technical specifications

6 Available accessories

Available accessories	Model No.
Hydraulic hose (3 m)	4055.807
Foot-operated switch	4055.712

Tab. 3: Available accessories

7 Unit description

The single-acting hydraulic pump is a single-stage radial-piston pump equipped with a high-performance electric motor (1), which with three pump elements achieves excellent flow rates. The electrical supply cables can be wrapped around the two stable carrying handles (2) located on both sides of the pump.

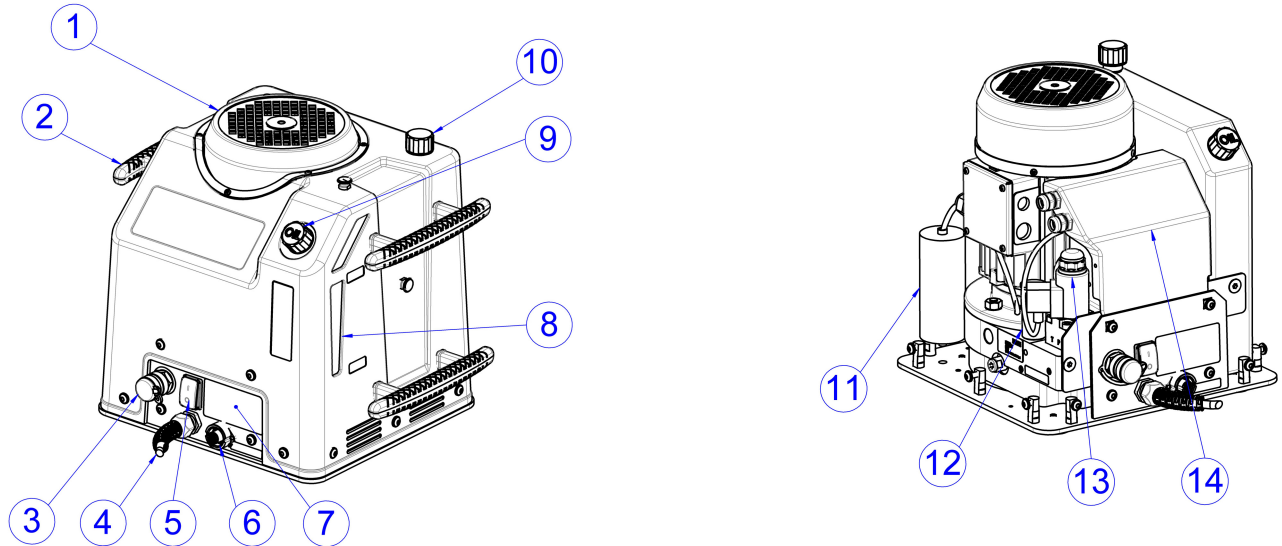


Fig. 1: Front and interior view

Key

- 1 Drive motor
- 2 Carrying handles
- 3 Oil lead connection
- 4 Mains cable
- 5 Mains switch
- 6 Control cable connection (7-pin)
- 7 Rating plate
- 8 Viewing window for checking the oil level
- 9 Tank opening with ventilation screw
- 10 Screw plug
- 11 Operating capacitor
- 12 Pressure relief valve
- 13 Magnetic valve
- 14 Control electronics

The mains cable (4), the connection for the control cable (6) and the rating plate (7) are located at the front. The pump can be placed in ready mode via the master switch (5) and then activated with the control signals of the single-pedal safety foot-operated switch. The oil level inside the tank can be checked at any time from the viewing window (8) next to the carrying handles. The installed induction motor is particularly smooth-running and includes an operating capacitor (11). The integrated magnetic valve (13) controls the created oil flow and retains the pressure in the tool during the pause function. If the operating pressure in the tool exceeds the maximum pressure set for the pump, the pressure relief valve (12) opens and the oil flows back to the pump tank. During operation, the tank opening (9) is closed with the air permeable ventilation screw; for transport, the tank opening is closed with the sealing screw plug (10). When activated, an integrated emergency stop power circuit (24 V) interrupts the power supply for the motor and the magnetic valve, and returns the tool to its initial position.

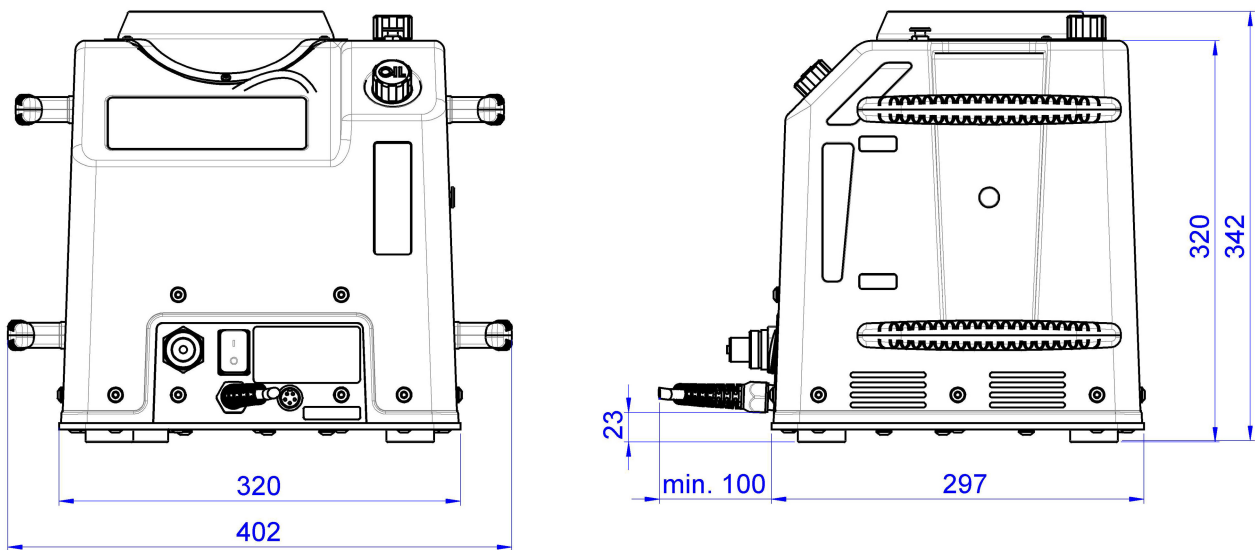


Fig. 2: Dimensions

8 Commissioning

You receive a fully assembled electro-hydraulic pump as well as detailed operating instructions.

- After receiving the delivery, check it for possible transport damage and the scope of supply for completeness.
- Should there be any problems, contact the manufacturer or vendor without delay.
- Before commissioning the pump, always read the complete operating instructions as well as all supplied documents.



Caution!

There is the risk of injury when lifting the pump in its packaging or by the raised pump falling (total weight approx. 30 kg).

- Please note the maximum weights that may be lifted by individuals. It may be necessary to use lifting gear.
- Do not stand below the raised pump.



Caution!

When recommissioning the pump, there is the risk that an improper storage or missing corrosion protection can lead to danger because of blocked unit components.

- Before recommissioning, ensure the smooth operation of all components as well as the correct function of all safety equipment (see section 11 "Maintenance and inspection").

- Also wear your personal protective equipment for transport and installation of the pump, in particular, gloves and safety work shoes (see section 2.4 "Personal protective equipment").
- Ensure that the installation surface on which the pump is placed is flat and adequately strong.
- Check the oil level through the side viewing window and, if required, add new HLP 46 hydraulic oil.

**Note:**

In the normal state, the oil level of the hydraulic pump should lie between the "Min" - "Max" markings on the side of the pump housing. This ensures adequate hydraulic oil is available to fill the cylinder and to prevent the pump from running dry when using the associated tools.

- Check the mains cable and plug of the pump for damage. If damaged, do not use the pump!
- Check the hydraulic hose for crushing or other damage. Never use a damaged hydraulic hose.
- Connect the hydraulic hose with the quick-release coupling of the pump and the tool.

**Note:**

There is the danger that hydraulic oil can escape should there be a defective valve or the hydraulic hose is disconnected under pressure.

- Ensure that the hydraulic system is not under pressure before disconnecting or inserting the hydraulic hose.

- 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.

- Connect the unit or tool with the control cable to the 7-pin flange socket of the pump.
- Turn the mains switch of the hydraulic pump to the "I" position to place the pump in ready mode.

**Warning!**

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

- **In a dangerous situation, press the red emergency stop switch on the connected unit to stop the pump motor and to deactivate the magnetic valve!**
- **Alternatively, actuate the foot-operated switch beyond the first pressure point. This also causes the operation to be stopped immediately.**

9 Positioning the pump during operation

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After initiating an emergency stop:

- Turn the emergency stop switch on the connected unit slightly so that it returns to its initial position.
The pump is placed in ready mode again. It can be reactivated by actuating the foot pedal.
- If the emergency stop was initiated using the foot-operated switch: release it by pressing the blue silicone cover at the side of the foot-operated switch (see fig. 4).

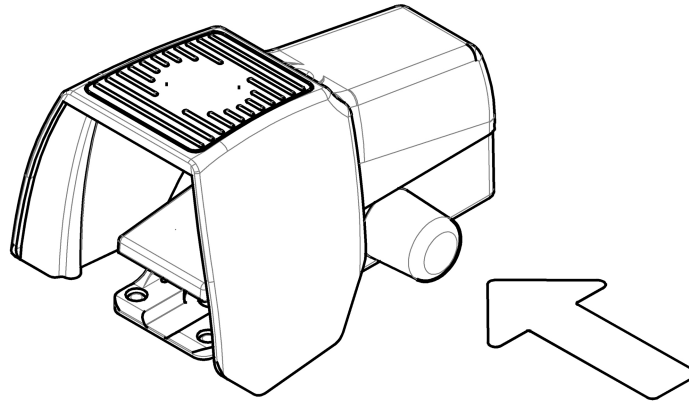


Fig. 4: Releasing the foot-operated switch

- Position the required material in the tool and, depending on the machining, ensure the material is centred.
 - Always observe the details in the operating instructions as well as the usage data and special features of the connected tool!
 - Do not use any tools that show damage or whose handling is not familiar!
- Actuate the foot-operated switch to the first pressure point (approximately half-pressed, which corresponds to a force of approximately 20 kg).
The pump motor and the magnetic valve are activated to allow oil to flow into the tool.
 - Depending on the associated tool, the machining operation can be interrupted with a pause function. Although the motor is stopped, the magnetic valve remains activated so that the tool does not travel backwards and pressure remains in the system.
- After the operation, release the foot-operated switch or actuate the stop switch to deactivate the pump and the magnetic valve.
The oil can now flow back from the tool to the pump tank and the tool travels back to its initial position.
- To switch off the pump, turn the mains switch to the "0" position.
- Before transport, remove the ventilation screw and close the tank opening with the screw plug to prevent hydraulic fluid from escaping (see section 8 "Commissioning").

9 Positioning the pump during operation

The pump oil tank is closed with the ventilation screw during operation and so not sealed. To prevent hydraulic oil from escaping or overflowing, the pump must not be used when excessively tilted (fig. 5). The side viewing window on the pump housing serves for visual inspection.

After intensive use, foam may form on the oil surface. Excessive tilting of the pump can cause foam to escape through the ventilation screw at the tank opening.

- Consequently, where possible, ensure horizontal positioning of the pump.

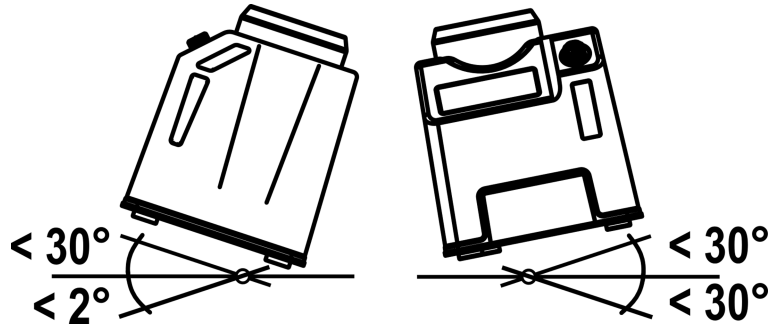


Fig. 5: Positioning the pump during operation

10 Oil change

Regular maintenance of your hydraulic pump can extend the service life of the seals and the moving parts. To remove deposits and small suspended particles from the tank, the hydraulic oil must be replaced completely for frequent use of the hydraulic pump. The first oil change should be performed after approximately 50 operating hours, and then annually.



Caution!

There is the risk of injury caused by hydraulic oil escaping during the oil change.

■ **Wear your personal protective equipment during the oil change (see section 2.4 "Personal protective equipment").**

- Withdraw the mains plug.
- Remove the screw plug and screw the 1/2" threaded nozzle (fig. 6, 2) with the silicone hose (fig. 6, 1) into the tank opening (included in the scope of supply).
- Tilt the pump diagonally forward and allow the oil to flow into a collecting vessel.

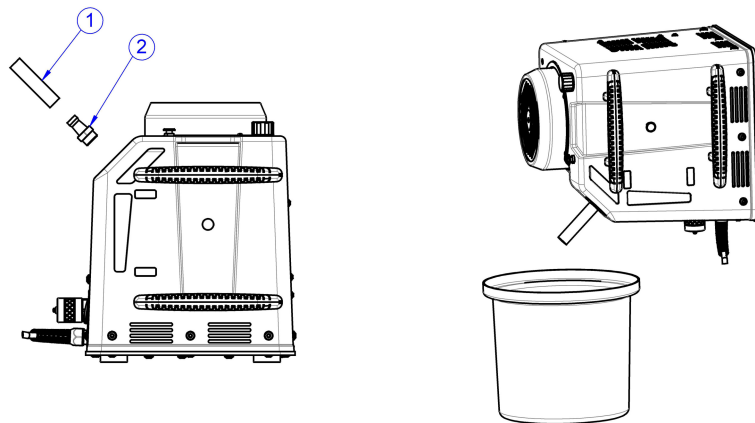


Fig. 6: Oil change

- Return the pump to the horizontal position and remove the threaded nozzle with the silicone hose.
- Fill the tank with HLP 46 hydraulic oil to the "Max" marking (approximately 3 litres).

The pump must first be bled before tools and cylinders are used for first time.

- To bleed the pump, insert the supplied coupler on the end coupling of the hose package.
- Activate the pump and allow the supplied oil to flow back into the opened tank. To do this, tilt the hydraulic pump slightly to allow the trapped air bubbles to dissipate easier.
- Allow the aggregate to supply oil for approximately 60-120 seconds.

Once the oil flows uniformly and without air bubbles or interruptions from the hose, the pump is bled adequately and ready for further use.

- Remove the coupler from the hose.
- Finally, check the oil level.
- For further use of the pump, close the tank opening with the ventilation screw, otherwise with the screw plug.



Caution!

In particular, when performing an oil change, escaping hydraulic oil can endanger the environment!

- **Collect any escaped hydraulic oil and prevent it from entering the sewage system or from contaminating the surface water and groundwater.**

11 Maintenance and inspection

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

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



Caution!

While the hydraulic pump is switched on, there is the danger of the connected unit starting, e.g. by an inadvertent actuation of the foot-operated switch, and so risk of injury in the area of the unit components.

- **For all maintenance and repair work, ensure that the mains plug of the pump has been withdrawn to prevent inadvertent starting.**

Before every use...

- ... Visually inspect the 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, tight fit of the hydraulic couplings.
- ... Check the correct function of the foot-operated switch.

Once after 50 operating hours...

- ... Perform a complete oil change with 3 litres of HLP 46 hydraulic oil (see section 10 "Oil change").

Weekly...

- ... Clean the motor space externally with dry compressed air.
- ... Check the correct function of the emergency stop switch of the connected tool for activated pump.
- ... Check the correct function of the safety shutdown at the foot-operated switch.

**Warning!**

There is the risk of injury caused by defective safety equipment.

- If when checking the safety shutdown, the pump is not shutdown, bring the pump to a standstill immediately.
- Have the safety shutdown equipment repaired without delay.
- Recommission the pump only after the repair work has been completed.

Monthly...

- ... Check the oil level and, when necessary, add HLP 46 hydraulic oil to the "Max" marking.
- ... Check the markings and warning signs on the pump for readability and damage, and replace, when necessary (see section 2.2 "Symbols on the pump").

Annually...

- ... Perform a complete oil change with 3 litres of HLP 46 hydraulic oil (see section 10 "Oil change").

Every 6 years...

- ... Replace the hydraulic hose.

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

12 Dismantling and disposal

- Also wear your personal protective equipment for the dismantling and disposal of the pump, in particular, gloves and safety work shoes (see section 2.4 "Personal protective equipment").
- To switch off the hydraulic pump, turn the mains switch to the "0" position.
- Before transport, 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.
The hydraulic hose can be disconnected safely without hydraulic fluid escaping when the hydraulic pump is switched off or when the hydraulic system is pressure-free.

The hydraulic pump must be properly disposed of or recycled in accordance with the country-specific regulations. The old oil must be drained completely before disposing of the pump (see section 10 "Oil change").

13 Error analysis

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13 Error analysis

Error	Check	Cause	Correction
The master switch does not illuminate when switched on	Check the power supply and mains cable	The mains cable is not or incorrectly inserted	Inspect the electrical connection by a qualified electrician and have it repaired
		Cable breakage or mains cable damaged	
		The fuse has been triggered by residual current	
The motor does not start or does not turn	Are the emergency stop switch and the foot-operated switch released?	The emergency stop switch is actuated or the foot-operated switch is actuated beyond the pressure point (20 kg)	Turn back the red cap of the emergency stop switch or press the silicone cap on the foot-operated switch to release it again
	Is the control cable of the tool connected?	Control cable not or incorrectly inserted	Inspect the electrical connection by a qualified electrician and have it repaired
	Has the appropriate tool with the correct activation been chosen?	The pin assignment and the push-button of the tool must be appropriate for the pump	Choose a compatible tool or contact the manufacturer
	Has the appropriate foot-operated switch been chosen?	The pin assignment and the push-button must be appropriate for the pump	Choose a compatible foot-operated switch or contact the manufacturer
	Has the electrical protection of the power supply triggered?	The power supply is not designed for the maximum power supply demand of the electric motor	Connect the motor to another suitable power supply
		The electrical protection is not dimensioned adequately	Use another protection, circuit-breaker 16 A Type B
	Do the control electronics function correctly?	The control electronics are defective or connected incorrectly	Inspect the electrical connection by a qualified electrician and have it repaired
	Is mains voltage present at the motor cable and at the motor terminal box?		Replace the component or have it repaired by the manufacturer / specialist vendor
	Can the fan impeller of the motor be moved? Always disconnect the mains plug!	The motor is blocked mechanically by overload, contamination or foreign bodies	Replace the component or have it repaired by the manufacturer / specialist vendor
The power contactor is not energised	The contactor is defective or contacts are burned-in	Replace the component or have it repaired by the manufacturer / specialist vendor	

Tab. 4: Error analysis

Error	Check	Cause	Correction
The electric motor turns only slightly or does not provide full power	Is an extension cable or cable drum used for connection to the power supply?	The cable is not rolled out completely	Roll out the cable completely
		The power loss (electrical resistance) is too high	Use a shorter extension cable or a cable with larger cable cross-section
	Is the deployed tool at the end position?	The pump can start only to a limited extent against the counter pressure (approx. 200-300 bar)	Allow the tool to travel back or reduce load on the hydraulic system or the tool
	Is the tool subject to high hydraulic pressure?		
	Check the starting and operating capacitors	The starting or operating capacitor is defective	Replace the component or have it repaired by the manufacturer / specialist vendor
The connected tool does not move	Are the emergency stop switch and the foot-operated switch released?	The emergency stop switch is actuated or the foot-operated switch is actuated beyond the pressure point (20 kg)	Turn back the red cap of the emergency stop switch or press the silicone cap on the foot-operated switch to release it again
	Is the power supply adequate?	See above	See above
	Does the motor turn?		
	Are the hydraulic couplings connected correctly?	The quick-release couplings are not latched completely or the coupling screwed joint is not closed completely The hydraulic couplings are self-closing and open only when they have been inserted or screwed in completely to the limit stop	Insert or screw in the coupling to the limit stop
		The hydraulic coupling is dirty and does not close correctly	Clean the coupling and insert or screw in to the limit stop Replace the component or have it repaired by the manufacturer / specialist vendor
	Does the magnetic valve open and allow oil to flow to the tool? Press hard on the plastic cap of the valve and detect a small movement	The magnetic valve is defective or overheated	Replace the component or have it repaired by the manufacturer / specialist vendor
Check the voltage supply of the magnetic valve	Incorrect control signal or circuit-board defective	Inspect the electrical connection by a qualified electrician and have it repaired Replace the component or have it repaired by the manufacturer / specialist vendor	

Tab. 4: Error analysis

13 Error analysis

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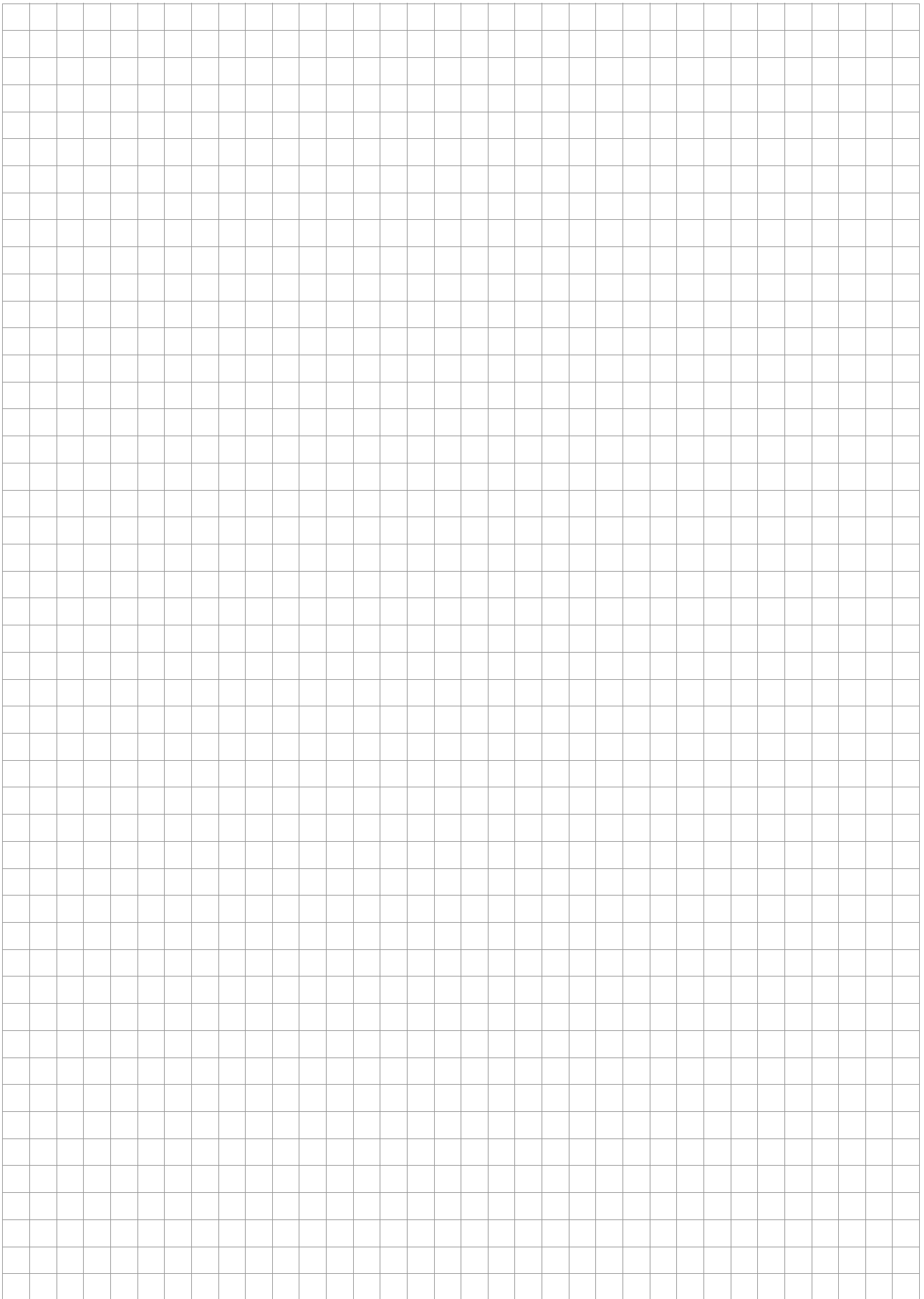
Error	Check	Cause	Correction
The tool does not extend fully or does not establish any pressure	Is the ventilation screw mounted on the tank?	No adequate ventilation of the tank	Screw the ventilation screw into the tank opening.
	Check the oil filling level	Insufficient oil in the tank	Add sufficient HLP 46 hydraulic oil
	Full pressure not established at the tool	Air in the system	Bleed the pump, hoses and tool
	Connect another tool and check its function	The tool is defective	Replace or repair the tool
	Does the oil foam and is sufficient oil in the tank?	The intake filter is dirty or blocked	Replace the component or have it repaired by the manufacturer / specialist vendor

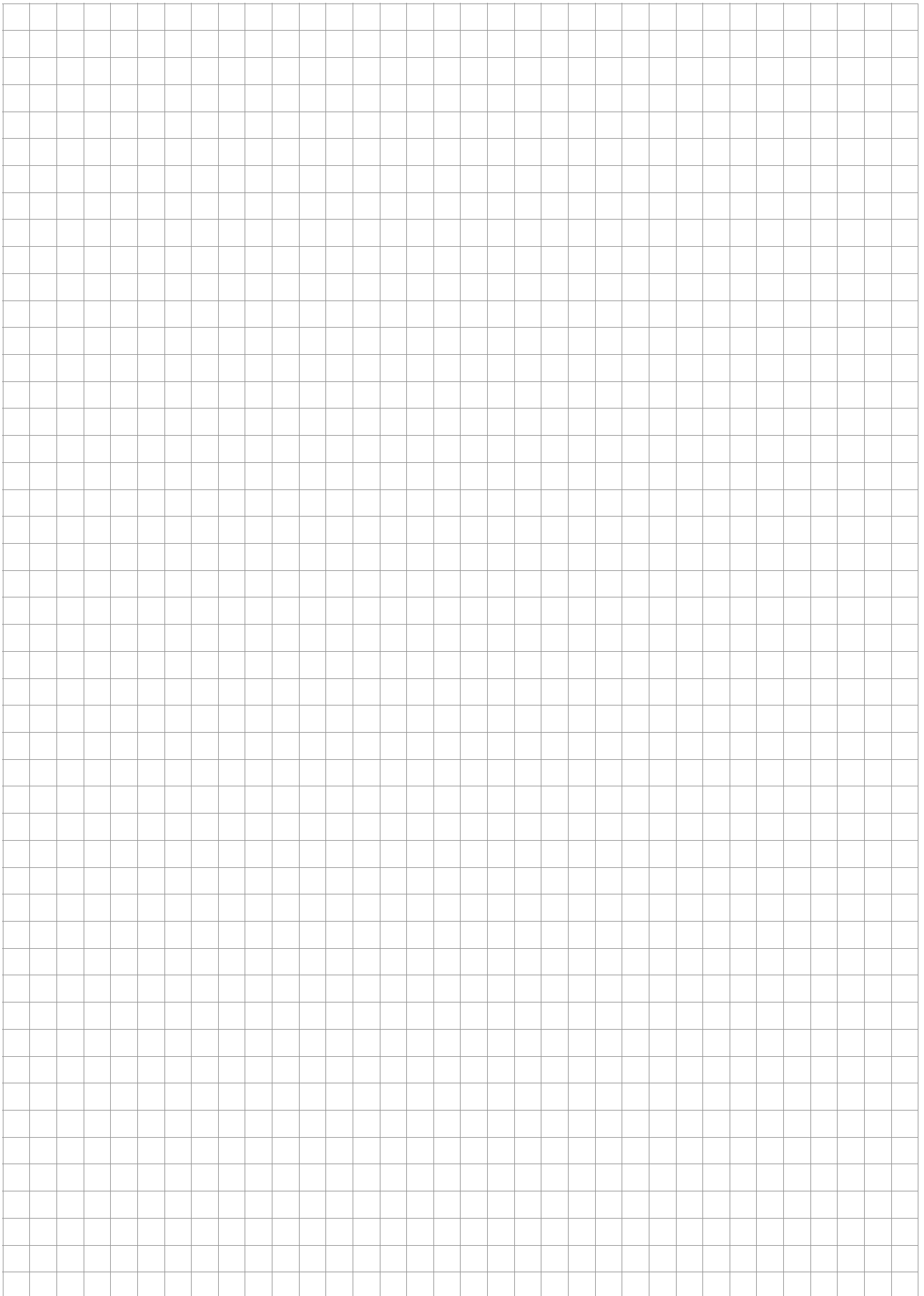
Tab. 4: Error analysis

14 Contacts

- For technical queries, please contact:
 - Phone: +49(0)2772 505-9052
 - E-mail: info@rittal.com
 - Homepage: www.rittal.com
- For sales or service requests, please contact your local Rittal organisation which can be found at www.rittal.com/contact.

Notes





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