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1. Generally

1.1 Importance of the operating instructions

The set of operating instructions is a document important for safe use of the **ALFRA DSP-120 Hydraulic Punch**.

The operating instructions must be carefully read and understood before using the machine.

1.2 Use in accordance with the operating instructions

The **ALFRA DSP-120 Hydraulic Punch** is used for punching round, square and rectangular holes in conjunction with our hydraulic cylinder Article No. 02012.

The thickness of the sheet steel (St 37) to be punched must not exceed 3 mm.
(depending on the diameter of the hole)

The requirements and limiting values given in these operating instructions must be kept.

Any other application shall be deemed to be improper use.

1.3 Improper application

Further, use beyond the limits stated in point 1.2 is not in accordance with the operating instructions and is therefore improper.

All guaranties for the machine become invalid if it is used improperly.

Attention: Before starting the pump, check the oil level in the tank in order to avoid the pump breaking down. The oil level should reach exactly the middle point of the marking on the indicator. Use only ALFRA hydraulic oil. All claims under the guarantee become invalid if other oils or fluids are used.

Attention: Check the connection values with the specification given on the name-plate, in order to avoid damage to the pump's electro-motor. Connection to an incorrect voltage supply will lead to damage to the motor.

Failure to follow the warnings and instructions can lead to damage to the equipment and injury to persons.

2.4 Workplace for the operating personnel

The workplace must enable the operator to work free of danger. There must be adequate standing space for the operator and the workplace must be sufficiently lighted. It must be ensured that in cases of danger, the operator can quickly leave the workplace (emergency exit).

2.5 Dangers from electrical energy

The electricity supply must accord with the machine specification. Each time before the machine is switched on the current supply and the electrical components must be checked for damage. If a malfunction occurs, the machine must be switched off immediately and attended to by a skilled person.

2.6 Dangers from hydraulic energy

The hydraulic components must be checked every time before the machine is started. Of particular importance here are leaks at connection points and the condition of the pipes and hydraulic hoses. Damage must be repaired immediately. Leaks in the hydraulic system as well as being a danger to the environment can also lead to serious injury caused by the very high pressure of escaping hydraulic oil. The hydraulic hoses should be replaced every six years.

3. Technical specification

<i>Weight</i>	<i>7.5 kg (without cylinder)</i>
<i>Connection values</i>	<i>220 V 50-60 Hz</i>
<i>Power consumption</i>	<i>0,4 kW</i>
<i>Solenoid valve</i>	<i>12 V</i>
<i>Nominal speed</i>	<i>1650 rpm</i>
<i>Operating pressure</i>	<i>700 bar max.</i>
<i>Ambient temperature range</i>	<i>minus 5 ° to plus 50 °C</i>
<i>Duty cycle factor</i>	<i>20% max.</i>
<i>Short-time service</i>	<i>S 2</i>
<i>Intermittent service</i>	<i>S 3</i>
<i>Oil capacity</i>	<i>1.2 litres</i>
<i>Flow rate, at</i>	<i>700 bar - 0.2 l/min</i>
	<i>20 bar - 2.0 l/min</i>
<i>Sound pressure level (L equiv)</i>	<i>82.7 dB(A)</i>

5. Operating materials

Type of hydraulic oil HLP 32 viscosity classification

6. Operation

6.1.1 Checking on delivery

Check all parts visually for any transport damage.

If transport damage is found or if the consignment is incomplete, inform the haulage contractors immediately.

Transport damage is not included under the guarantee.

The haulage contractors are liable for all costs of repair and replacement where damage has been caused during transport.

Safety First

Read carefully all directions and warning and safety instructions. Observe all safety precautions so as to avoid personal injury or damage to property when operating the system. ALFRA shall not be liable for damage or injury arising from improper use of the product, insufficient maintenance and/or incorrect operation of the product and system.

Please contact **ALFRA** if you have any queries concerning safety precautions or types of application.

6.1.2 Testing before initial start up

Observe the following in addition to the checks given in point 6.1.1.
The hydraulic hose is connected to the valve outlet. The hose must be tightly fixed to the connection.

WARNING: If Teflon tape is used on the thread, take great care that parts of the tape are not torn away and enter the hydraulic system. Teflon tape does not dissolve, collects in passages and thus restricts the flow of oil. The result is damage to the equipment.

On initial assembly of the hydraulic system, air is trapped in the components. In order to ensure safe and smooth operation, the air must be removed from the cylinder by running the system for several cycles without any loading to the cylinders. The system is free of air when the cylinders move in and out without jerking.

6.1.3 Operating

1. Motor
2. Solenoid valve
3. Housing
4. Oil tank
5. Oil level indicator
6. Hydraulic hose
7. Pressure valve
8. Hand switch (or foot switch)
9. Hydraulic cylinder



The machine is notable on account of its extremely simple operation.

By operating the hand or foot switch, the motor is started, and the piston in the hydraulic cylinder is withdrawn (when using ALFRA hole punchers) or extended (when using the ALFRA Press 150 E).

The cylinder piston can be held in any position.

The machine operated up to 700 bar. When this pressure is reached, the safety valve automatically reduces the pressure to zero and re-starts building up pressure.

The machine weighs only 7.5 kg and is among the lightest and most efficient electro-hydraulic pumps of its kind.

The pump should stand level.

Before starting the pump, open the oil filler cap by about one turn to allow air to enter or escape.

Ensure that all hose connections are tight and use only high pressure connecting pieces which are designed for a pressure up to 1000 bar (already fitted during manufacture).

Check the oil level indicator to ensure that there is sufficient oil in the tank. The oil level should be exactly in the middle of the marking on the oil level indicator. Top up if necessary.

Before using the pump, please press the solenoid valve switch a few times to the "Off" position of the hand switch or foot switch so that the air in the pipeline can escape.

In order to hold the cylinder piston in the required position or to hold it at the required pressure level during work, the solenoid valve switch must be pressed to the "On" position of the hand switch or foot switch. The cylinder piston remains in the same position when the pressure from pressing is released. If "Off" is pressed again the pressure falls away and the cylinder piston returns slowly to the starting position.

If it is also necessary to arrest the return movement of the cylinder piston, all that is required is for the switch to be pressed to the "On" position again.

After use, switch generally to "Off" to avoid the pump being constantly under pressure.

Close the filler cap to avoid loss of oil and the entry of dirt.

Working with the hole puncher

Punching performance:

Punch with 9.5 mm thread	Steel plate to 2.0 mm with $F = 370 \text{ N/mm}^2$
Punch with 11.1 mm thread	VA plate to 2.0 mm with $F = 600 \text{ N/mm}^2$
Punch with 19.0 mm thread	Steel plate to 3.0 mm with $F = 370 \text{ N/mm}^2$
Punch with 19.0 mm thread	VA plate to 2.5 mm with $F = 600 \text{ N/mm}^2$
Punch with size 6 axis	Steel plate to 1.75 mm with $F = 370 \text{ N/mm}^2$
Punch with size 5 axis	Steel plate to 2.0 mm with $F = 370 \text{ N/mm}^2$
Punch with size 3 axis	Steel plate to 2.5 mm with $F = 370 \text{ N/mm}^2$
Punch with size 2 axis	Steel plate to 3.0 mm with $F = 370 \text{ N/mm}^2$
Punch with size 1 axis	Steel plate to 3.0 mm with $F = 370 \text{ N/mm}^2$
Punch with size 0 axis	Steel plate to 3.0 mm with $F = 370 \text{ N/mm}^2$

1. Pre-drilling with twist drill or multi-stage drill

Diameter of hole with standard punches:

- with screws $\varnothing 9.5 \text{ mm}$ min. $\varnothing 11.0 \text{ mm}$
 - with screws $\varnothing 11.1 \text{ mm}$ min. $\varnothing 13.0 \text{ mm}$
 - with screws $\varnothing 19.0 \text{ mm}$ min. $\varnothing 20.4 \text{ mm}$ *)
- *) finer pre-drilling and then punching is also possible.

2. Screw the hydraulic screw with the short $\varnothing 19.0 \text{ mm}$ threaded side fully into the hydraulic cylinder.
3. Set a correctly sized distance bush with the die plate onto the hydraulic screw.
Use of a distance bush is, depending on the size of the tool, absolutely essential.
4. Slide the hydraulic screw through the pre-drilled hole and screw on the round stamp from the rear side, or set the square or special-shaped stamp on the axis guide and secure with the particular counter nut.

Please note: Stamps which have been screwed or placed on must be screwed on to a minimum of the full height of the stamp or sit to the full height on the axis guide. Afterwards, adjust the die plate to the cross marking provided with the help of the division marking.

5. Activate the hand or foot switch ("On") and let the pump work only in short intervals. Take care that the stamp does not come to rest on the die plate after the punching process is complete.
The waste piece falls easily away from the die plate if you punch away from the die plate edge.
Move the cylinder to the starting position by activating the hand or foot switch ("Off").
6. Unscrew the round stamp or loosen the counter nut. Remove the waste from the die plate.

We give a six month guarantee against material, design or manufacturing defects, excepting wear parts such as O-rings and seals.

7. Fault finding and remedying

1. No oil flows from the pump

Fault	Remedy
a) air present in pump	open oil filler cap and activate the pump several times without load
b) oil level too low	top up hydraulic oil
c) oil filter soiled	remove and clean oil filter. fill with clean hydraulic oil
d) the valves do not operate properly due to soiling	have pump tested and cleaned by a specialist workshop
e) solenoid valves do not operate properly	check solenoid valve, possibly tension is too low, fluctuations in electrical supply, dirt in the valve. repair or replace with original spare parts

2. No build up of pressure

Fault	Remedy
a) relief valve is set too low	re-set relief valve with the aid of a 0 – 1000 bar manometer
b) relief valve is wedged	replace relief valve
c) dirt on valve seat causing also loss of oil	clean valve seat or replace valve if damaged

3. Forward and return movement of the cylinder piston is irregular

Fault	Remedy
a) air in cylinder or in hydraulic hose	ventilate as described in 1 a)
b) a partial vacuum develops in the oil tank	open oil filler cap
c) dirt on the valve seats	Wash the valve seats with a light oil. The valve seats must be replaced if they are damaged.

4. The hydraulic pressure fluctuates

Fault	Remedy
a) dirt on the valve seats	see 3.c)
b) dirt on the seat of the high pressure control valve or this is damaged	Dismantle this part and check the valve. Clean and re-place. Replace the valve if it is defective.
c) The oil temperature rises and its viscosity falls as a result of long continuous use or the ambient temperature is too high.	If the oil temperature rises to more than 50 °C, cease working with the pump and wait until the temperature has fallen.

5. The cylinder piston does not return to starting position

Fault	Remedy
a) the coupling is not properly connected	check the coupling
b) the air pressure in the oil tank is too high	open the filler screw
c) the cylinder piston is damaged or is dirty	check the cylinder piston and repair or replace if necessary

6. The pump loses oil

Fault	Remedy
a) the coupling pressings on the hydraulic hoses are not tight	replace the coupling pressings or hydraulic hose
b) the oil tank is not tight or is damaged	repair or replace the oil tank
c) O-rings or sealing rings are damaged	replace O-rings or sealing rings

7. The oil pump is too loud when running

Fault	Remedy
a) air in the pump	race the motor without load and release the air from the pump
b) insufficient oil in tank	top up
c) motor fixing screws are loose	tighten up the fixing screws If these screws are not loose, remove the pump motor from the oil tank and check the fixing screws.
d) the solenoid valve is not operating properly	check the magnet for adhesion, loss of voltage or coil overheating, or valve straining screws

8. Maintenance

All replacement parts are standardised, are easy to exchange and are practically maintenance free. Charcoal brushes should be replaced after long periods of operation and the level of oil in the tank should be checked regularly.

Check the hydraulic oil level in the tank after every 40 operating hours. Top up with oil when necessary (see point 6.1.3).

WARNING: Do not fill with oil when the hydraulic cylinder pistons are extended, as when oil is added while the pistons are extended, returning oil from the cylinders and hoses exceeds the capacity of the oil tank.

Oil change

Take care that no dust enters the oil flow system. This is one of the main causes of breakdown with the machine. Threads from cleaning cloths, hair, metal dust or dirt in the oil is sufficient to cause the unit to break down.

The oil in the pump decomposes as a result of oxidising. For this reason we recommend that the oil is changed every six months.

If the pump is frequently used in places where there is a lot of dust, we recommend that the oil is changed every three months. Use only the hydraulic oil stated.

Please observe the following when changing oil.

1. Remove all used oil from the oil tank.
2. Wash out with a light oil or washing oil.
3. Remove the cleaning agent completely and re-fill tank with new hydraulic oil. Pay attention to cleanliness when changing oil.

9. Repairing

We are available to carry out repairs:

Alfred Raith GmbH
II Industriestrasse 10
D-68766 Hockenheim
GERMANY
Telephone: (06205) 3051-0
Facsimile: (06205) 3051-135

10. Additional equipment

The DSP 120 ALFRA hydraulic pump can also be used for operating e.g. cable lug pressing units, cable cutters or other single acting cylinder units.

11. Guarantee

We guarantee our equipment if used properly for a period of **six months**. Excepted from the guarantee are wear parts such as O-rings and seals. Return the unit directly to us if it is out of order.

12. Disposal

After the operating materials or the unit itself have reached the end of their service

lives, they are to be disposed of according to the current state of technology.

Special care must be taken here in properly disposing of environmentally dangerous substances (oils etc.) and if necessary a specialist waste disposal company should be engaged.

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The information contained in these operating instructions may be altered without notice.

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Enclosures:

Spare Parts List DSP 120

Exploded Drawing DSP 120

Hydraulic Cylinder Spare Parts List 02012

Exploded Drawing 02012