



Read carefully before putting into operation and keep well !

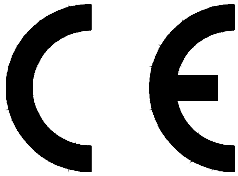


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1 Technical data / Technical description

Engine	Diesel engine 3,1 kW at 3000 rpm
Stirrer	hydraulic driven, rotation speed max. 18/min
Burner	Propane medium pressure burner, connected load 1,5 bar, nominal capacity 50 kW
Heating of melting material	directly
Usable content	approx. 250 Liter
tank content hydraulic oil	23 l, oil on base of mineral oil according to DIN / ISO of viscosity class 68 , e.g.: Homberg-Hydralub H, ESSO-Nuto H 68, Aral-Vitam GF 68, Mobil DTE 26
Medium sound level at full speed in 7,5 m distance	74 dB(A)
Dimensions/Weights:	
Length	4.100 mm
Width	1.620 mm
Height	1.920 mm
Tyres	155 R 13 79T
Dead weight	approx. 600 kg
perm. total weight	935 kg
Externally applied load max.	100 kg

2 Safety instructions

2.1 General

This instruction manual helps you to become familiar with the RK 250 and to use it in the best way. You will find helpful informations how to recognize and avoid danger.

Thus you will contribute to your own safety, lower repair costs and increase lifetime of your machine.

This instruction manual has to be read and understood by all persons who work with the machine or carry out maintenance and service work before the beginning of the work. The RK 250 may be operated, attended and maintained only by persons who are at least 18 years old, familiar with the handling of the machine and with the heating system and instructed in the safety regulations and the risks.

These technical rules apply for the RK 250 including the heating system and the safety systems. Official rules, regulations for prevention of accidents and the regulations of the employer's liability insurance association and of the DVGW are not affected from this.

Installation

RK 250 boilers have been designed to be used outdoors. For operation in closed areas or below ground level, special accessories are required and special safety measures to be observed. No inflammable materials must be stored close to boilers which are in operation.

The RK 250 has to be fixed in a solid position. Prior to be used, it has to undergo a safety check. It must not be positioned close to pits and digs or on inflammable underground.

Filling

The RK 250 must not be filled up beyond the filling mark (90 % of the boiler volume). Be careful during refilling because of the danger of splashing. Refilling should be done equivalent to the quantities which have been used up. Total emptying of the vessel only must be done at switched off burner, because the vessel bottom could disperse on account of overheating.

Gas supply

The RK 250 must be used only with regulated gas pressure (1.5 barÜ). It is absolutely necessary to use a fix adjusted medium pressure regulator 1,5 bar and a hose failure valve. It is not allowed to use open fire in order to speed up vaporization.

Propane gas hoses are to be protected against damages and checked every day. The general rules for application of liquid gas are to be observed. High pressure hoses for liquid gas only (pressure class 30 with 5 mm wall thickness, corr. To DIN 4815, Part 1) are to be used.

Gas bottles should be kept in vertical position, protected against falling and against direct sunlight. Empty bottles should be closed firmly and guard should be screwed on.

Connecting to a truck

When the RK 250 is connected to the truck, the outline cable must be attached certainly to the trailer coupling of the pulling vehicle. Ensure, that the carrying wheel is positioned in the upper lock position and the support is secured in the behind highest position.

Check lighting before travelling.

If no gas bottle supports with covering are mounted ex-works, the gas bottles have to be taken out of the support prior to travelling and transported secured separately in a suitable vehicle. Connecting the machine to a vehicle is only allowed if the permissible total weight is not exceeded!

In case of exceeding the permissible total weight the registration (StVZO) extinguishes.

Emergency power-off

In case of danger the drive engine can be stopped with all it's functions immediately by means of actuating the "Emergency power-off"(ignition key). After it has been ensured, that the danger has been eliminated, start the machine again.

2.2 Dangers at handling the machine

The RK 250 is designed according to the state of the art and the acknowledged technical rules. Nevertheless the use of the machine can result in danger for life or material assets. The machine may be used only

- o in unobjectionable safe condition
- o for the determined application.

Disturbances which could affect the safety have to be eliminated immediately.

Bituminous, insulating, sealing and filler compounds are prone to spontaneous ignition when overheated. During operation, the RK 250 therefore has to be constantly supervised by the operating crew.

Self-ignition

Suitable fire-fighting material has to be held ready and to be used for extinguishing mastic asphalt material that may have caught fire (sand and foam or dry extinguishers). Water must not be used!

When refuelling the engine use funnel in order to avoid overflowing of the diesel.

Thermal oil (optional feature)

Regularly check oil level, but only in cold condition and refill.

Caution! Danger of violation by outgoing hot oil!

Exhaust fumes

It is to be observed that nobody can be endangered by escaping exhaust fumes.

Danger of burns

Wear gloves and suitable protective clothing during operation.

Open fire prohibited

It is not allowed to use open fire in order to speed up vaporization.

Agree signals

Because of the noises it can be difficult to communicate during operation. Therefore the operators have to agree about signals and operating sequence prior to start work.

Protect against rolling

Protect the boiler against rolling by means of suitable measures (hand brake, wedges).

Furthermore the behind support has to be put into the next higher hole prior to start work in order to support the boiler in operating position.

2.3 Determined application

The RK 250 is used for heating of casting compounds like bituminous-, insulating-, and priming- compounds and for thermoplastic masses for road markings. All other or extended use is not according to designation.

GRÜN is not reliable for any damage resulting from improper use. Use according to designation means as well

- o observing the instruction manual
- o following the service and maintenance instructions.

2.4 Original spare parts and safety

Changes to design and equipment by unauthorized persons are not allowed. Damaged parts have to be replaced by original spare parts. If this is not observed the safety of the machine may be affected. GRÜN is not reliable for any damage resulting from the use of other than original spare parts.

The device has to be checked according to the operating conditions if necessary, but at least once a year by an expert for its working safe condition!

Our service for your safety: Make a maintenance contract with us!

3 Application

The RK 250 is used for heating of casting compounds like bituminous-, insulating-, and priming- compounds and for thermoplastic masses for road markings.

Fill in motor oil before using the machine the first time. Check the motor oil level regularly.

Thermal oil (optional feature)

Prior to initiation fill up thermal oil (approx. 60 l) through the connection piece. Use standard thermal oil with an allowed temperature of at least 330°C. Ask the supplier of the thermal oil for details and observe his instructions carefully.

Recommended thermal oils: Homberg BM/ Shell Thermia E/ARAL Farolin/ Esso T.

Close the connection piece carefully making sure that the gasket is positioned properly.

Regularly check oil level, but **only in cold condition** and refill.

Caution! Danger of violation by outgoing hot oil!

3.1 Initiation:

Before heating empty the condensate container at the thermal oil expansion tank. After that insert the container again and arrest it.

3.1.1 Burner

On the burner and on the control unit a mark is given for what boiler types they are suitable. Check for conformity before putting into operation. Burner and safety equipment have to be supervised for proper function.

Insert the control unit with thermometers and gas control valves through the therefore supposed threaded connection pieces into the vessel and screw them on.

Hose connections

Establish hose connections between burner unit and control unit (see chapter 7 control unit, too)

- a) "gas outlet – burner unit" to "gas inlet – control unit"
- b) "main burner valve – burner unit" to "gas outlet – control unit"

Screw GRÜN medium pressure regulator 1,5 barÜ and hose failure valve 8 kg/h on the gas bottle and make hose connection to the burner gas input "Bottle connection" of the burner unit. Check, if all connections are gasproof.

Fill the boiler with small pieces of bitumen up to the height that the agitating arms are covered.

Make sure that the drain cock is closed completely.

Close the burner valve, then open the valve of the gas bottle and activate the hose failure valve by pressing the button.

Temperature of casting compound

Adjust the required temperature of the casting compound at the lateral adjusting knob at the control unit and reset later during heating corresponding to the thermometer display.

Control range: approx. 150 - 300°C.

Setting value 15 = approx. 150°C
Setting value 20 = approx. 190°C

Setting value 23 = approx. 220°C
Setting value 25 = approx. 250°C

Temperature control range

The standard temperature control range is between approx. 150 - 300°C. Delivery of control units with other control ranges on request.

(Adjust the temperature of the thermal oil at the lateral adjusting knob „Thermal oil“ at least 50°C higher than the required temperature of the casting compound, but maximal to 300°C.)

Ignition of the burner

Pull the burner approx. 20 cm out of the stove. Press the button of the safety pilot and light pilot burner, keeping the button pressed for 20 – 30 seconds. The pilot burner will now remain burning. Push the burner back into the stove as far as possible. Open the burner valve.

Because filled casting compounds tend to **burn**, the warming-up has to be carried out very carefully.

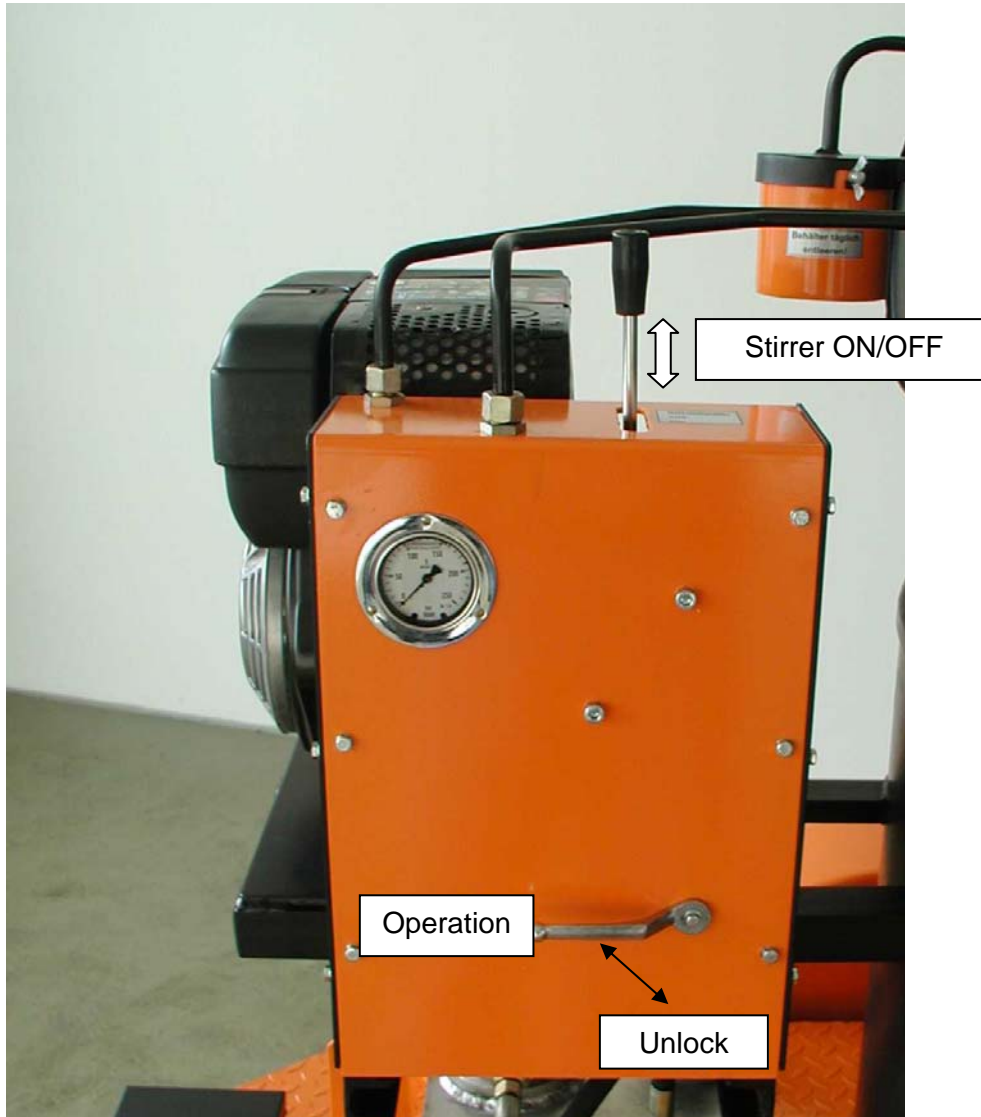
Thermostat control

During the heating the thermostatic control is not yet active, because the temperature sensor is not yet surrounded off.by liquid material. Therefore the heating has to be supervised constantly and if necessary the burner has to be switched

Expiration of the ignition flame

If the pilot burner extinguishes during operation for any reason, the gas supply to the pilot burner is blocked Automatically after 1 minute. Then the pilot burner has to be lighted manually again as mentioned-above.

3.1.2 Stirrer



Note: The unlock lever of the stirrer always has to be in position “Operation“ (see p. 8). As soon as enough melted material has collected at the bottom of the vessel, start the diesel engine according to the operating manual of the engine manufacturer and let it run for a few minutes in order to warm-up the hydraulic oil. The stirrer has to be put into operation by means of the hand lever at the hydraulic unit. The rotation speed of the stirrer is max. 18 rpm (at full speed). It can be adjusted if necessary by means of changing the engine speed of the diesel engine (gas pedal). In order to guarantee a smooth motion the stirrer speed should be at least 8 rpm.

Note: In order to avoid damage of the diesel engine it should not run permanently with low rotation speed. The stirrer can be switched of at any time by means of the hand lever.

Blockade of the stirrer

In case of overload the stirrer will be switched off automatically, the hand lever „jumps“ to position „off“. In this case unlock the stirrer by means of actuating the unlock lever into position “unlock“, after that set the lever to position „operation“ again. Restart the stirrer if some more material has been melted. If a restart is not possible or the stirrer stops again immediately, the inner of the vessel has to be checked for impurities e. g. metal parts.

Fill in casting compound

As soon as the stirrer works properly fill in additional material (small pieces of casting compound) up to half of the height of the vessel while the agitator keeps running. Fill in more material corresponding to the melting process. Caution! Be careful when refilling in order to avoid splashing of hot bituminous material! Danger of burns!

Temperature regulation

When the pre-selected temperature is reached the gas supply to the main burner is throttled and/or switched off automatically. The ignition burner remains in function and ignites the main burner again, if the adjusted temperature falls below again.

Caution!

In order to guarantee the switching function the temperature sensor of the control unit has to be surrounded by liquid material. Only take off casting compound in corresponding quantity. If for any reasons the ignition flame extinguishes, the gas supply is stopped by means of the safety pilot. The ignition flame has to be ignited again manually..

For temperature control attend the integrated thermometer.

3.2 Shutdown

First close gas bottle valves and switch off the stirrer by means of the hand lever.

Switch off the diesel engine by means of the stop lever

Close burner valve. The construction site only has to be left, if all gas valves are closed gasproof.

If several gas bottles are used in line, all gas bottle valves have to be closed.

Remove the ignition key and make sure that only authorized persons can get it.

4 Maintenance

Diesel engine and hydraulic aggregates have to be switched off before any maintenance work is done at the device. Remove the ignition key.

Make sure that the hydraulic system is depressurized completely before any maintenance or repair work is carried out (Attend manometer!).

Burner/Control unit

All components, which are in contact with gas, should be protected against mechanical and heat damages. They should be regularly checked.

All gas-leading parts, especially connecting hoses, screwings, valves and nozzles have to be protected against pollution and if necessary have to be cleaned as follows:

a) **Cleaning of the main filter** in the hose connection of the control unit (procedure is required, if pollution is visible or if burner output becomes lower):

Screw off gas hoses (turn hose nut clockwise) and remove dirt in front of the filter with a brush or with compressed air. If heavily polluted, screw out main filter with a screwdriver (7 mm, clockwise); blow through with compressed air or rinse with solvent; if required, replace filter. When fitting it again, tighten screwdriver moderately to avoid damages of the screw driver's notch.

b) **Cleaning of the burner nozzle** with integrated filter: Remove safety pilot burner and screw off burner head with connecting hose. Screw out nozzle with a spanner 6 mm (anti-clockwise). Clean or replace nozzle with filter insert.

Keep air funnels for primary and secondary air clean (main burner and pilot burner).

Keep the exhaust funnels clean and take care, that they will not be distorted.

The vessel has to be cleaned from bitumen residues and to be checked for damages daily

The temperature sensor in the inner of the vessel has to be free of burned material residues in order to guarantee a correct transmission and/or regulation of the temperature..

Overflowing material has to be removed immediately from the boiler.

Thermal oil has to be exchanged annually. Recommended oils: Homberg BM, Shell Thermia E, ARAL Farolin, Esso T. Close the connection piece carefully making sure that the gasket is positioned properly.

Stirrer/Hydraulics:

Grease the lubricating point at the bearing of the agitator daily by a half turn of the grease cartridge. Refill the cartridge with grease if necessary.

Check the oil level of the hydraulic oil regularly at the inspection window of the hydraulic container. If necessary refill hydraulic oil.

Change the hydraulic oil at first after 50 operating hours, after that at least once a year. Use oil on mineral oil base according to DIN / ISO of the viscosity class 68, e.g.:

Homberg-Hydralub H, ESSO-Nuto H 68, Aral-Vitam GF 68, Mobil DTE 26

Check hydraulic filters for dirt accumulation regularly. Replace if necessary.

Check all screw connections of the hydraulic system for leakage regularly.

Engine

Maintenance of the diesel engine according to the manufacturer`s instructions.

High speed chassis

Grease the lubricating points regularly.

Keep reverse action lock working, regularly check function (reverse action lock of the overrunning brake has to release self-acting when driving forwards).

Assure, that the castle nuts at the joints of the height adjustment are tighten well and secured by means of clip connectors.

The wheel nuts have to be retighten at the new device as well as at changing the wheels after 500 km.

5 Fault clearance

In case of self-ignition of the melting material: Close lid and valves, switch off engine and stirrer. Extinguish the fire.

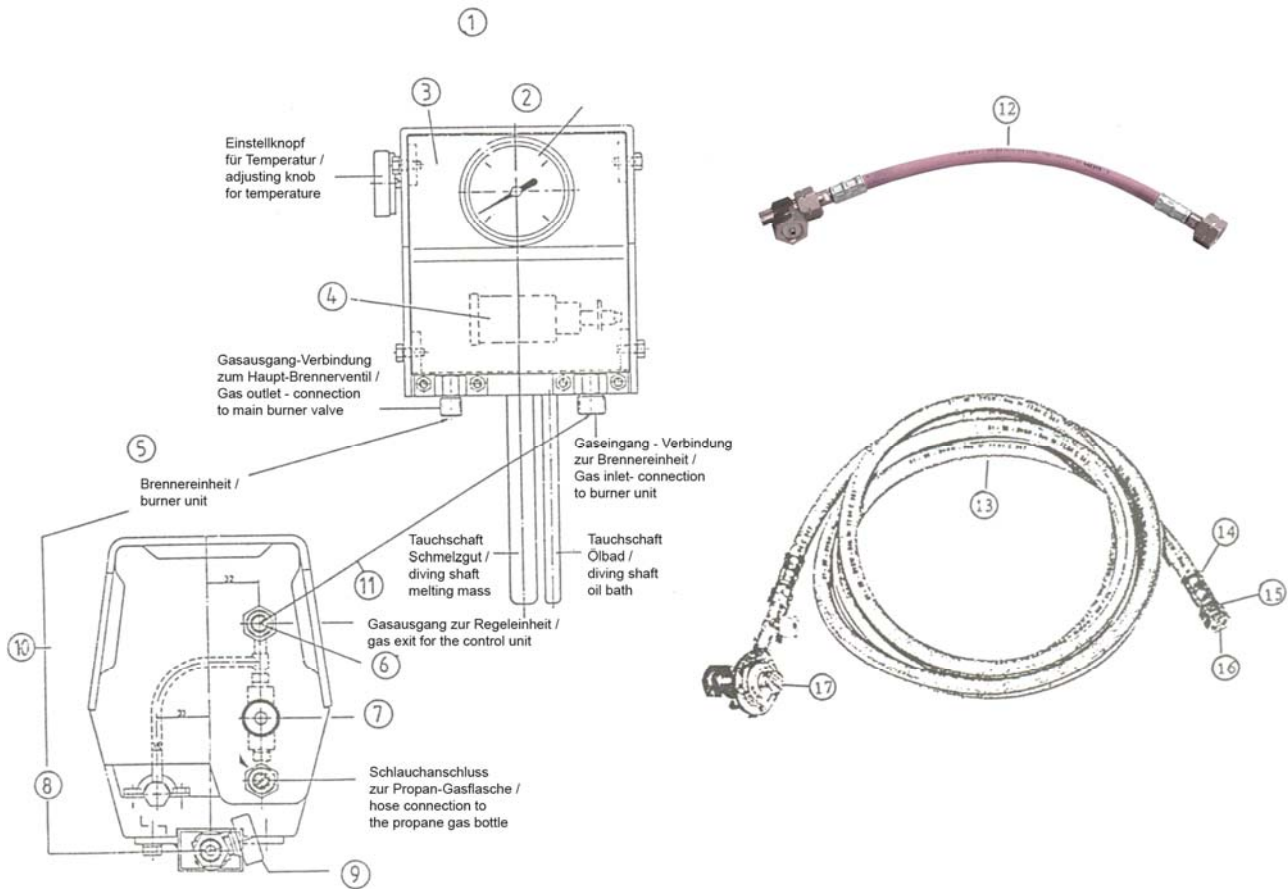
Faults at the burner unit: Close gas bottle valves. Carry out the maintenance of the burner as described in para. 4.

➤ **If you have carried out all above-mentioned checks and the fault still remains, please call us
Phone: +49(0)271/3988110.**

6 Spare part lists

No.	Description	Part No.	No.	Description	Part No.
1	Control unit	0051 54 00	4	Wedge	0601 30 00
	Thermometer 0- 300°C	0051 72 01	5	Rear light left	0601 42 02
2	Burner unit	0051 52 00	6	Rear light right	0601 42 01
	Burner	0205 12 00	7	Triangle reflector	0601 43 00
3	Connection hose bilateral ¼"		8	Diesel engine	0901 04 03
	gas outlet burner unit			Schwing element	0589 00 05
	to gas outlet burner unit	0051 52 20	9	Carrying wheel complete	0601 18 02
	gas outlet control unit		10	7-pole connector	0601 44 01
	to main burner valve	0051 52 10	11	Spare wheel	0450 09 05
without pic..	Melting vessel „RK 250“	0248 30 00	12	Drain cock with handle	0231 33 00
	Hydraulic engine Hand lever valve	0251 56 17	o.Abb	Horizontal agitating arms complete	0248 41 06
		0251 56 11		Lower agitator spindle	0251 41 02
	Pressure valve	0251 56 12		Gear pump	0251 56 40
	Manometer	0470 20 47		Drain cock with handle	0231 32 00
	Diesel engine 1B20	0901 02 07		BAS 60	

CONTROL UNIT



Number	Description	Part No.
1	Control unit with gas regulation valve and thermometer	0051 5900
2	Thermometer	0051 7201
3	Gas regulation valve for melting material	0051 5307
	Adjusting knob	0050 2602
4	Gas regulation valve for oil bath	0051 5313
5	Burner unit	0051 5200
6	Main filter	0050 1507
7	Safety pilot	0050 1300
	Thermoelement	0050 1400
	Magnetic insertion for dto.	0050 0802
8	Pilot burner without nozzle support and CU-tube bend	0050 1100
	CU-tube bend with nozzle support, nozzle and connection rotary part	0050 1200
	Pilot burner nozzle with filter	0050 1205
9	Main burner valve	0246 1101
10	Connection hose gas outlet – control unit to main burner valve	0051 5210
11	Connection hose gas outlet – burner unit to gas inlet control unit	0051 5220
12	Two-bottle-connection for 11 and 33 kg gas bottles	1556 0000
	Sealing	1541 0001
13	3 m high-pressure hose with screw connections 3/8" left	1525 0000
	5 m high-pressure hose with screw connections 3/8" left	1526 0000
14	Hose clamp	1525 0004
15	Back nut 3/8"	1525 0003
16	Hose socket	1525 0002
17	Medium pressure regulator 1,5 barÜ with hose failure valve	1541 0000
	Sealing for medium pressure regulator	15410001



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Ihr Zeichen

Ihre Nachricht vom

Unser Zeichen

Durchwahl
(0271) 39 88-

Datum

EC-Declaration of Conformity as defined by Machinery Directive 98 / 37/ EC

Herewith we declare that the supplied model of

Motor – Agitator - Casting Compound Boilers RK indirectly heating,

Type:

RK 180i and RK 250i stationary or on high-speed trailer with brake mechanism,

complies with the following provisions applying to it:

EC Machinery Directive 98 / 37 / EC

Applied harmonized standards, in particular

EN 292	Safety of machinery
P1 + P2	Basic concepts, general principles for design
EN 294	Safety of machinery; Safety distances to prevent danger zones being reached by the upper limbs
EN 982	Safety of machinery, Safety requirements of fluid – Hydraulics
EN 1037	Safety of machinery, Prevention of unexpected start-ups

Applied national technical standards and specifications, in particular

DIN 30695 Ortsveränderliche Schmelzöfen (Melting stove witch is place changeable)

The procedure according Appendix V of Machine Directive was observed.

The Instruction manual to the machine be in hand in original version.

Niederdielfen, 31.10.2006

place, date

Head of Quality Management



Read carefully before putting device / machine into operation and keep well !

Checking hydraulical hose lines

Because of abrasion and damage the checking of the hose lines for operational safety and functional reliability is absolutely necessary.

Therefore hose lines have to be checked visually at regular intervals by a qualified person (called before: an expert) for external defects and for its operational safe condition.

The trade cooperative association rule ZH1/74 requires, that hose lines have to be checked prior to the first initiation and then at least once a year for their operational safe condition by an expert. If the producer of the machine makes more concrete specifications (e. g. 1x/2x/4x a year) in this point in the operation manual, they have to be attended! The check of the hose lines has to be documented in a written check report with date (e. g. at checking the machine).

1. Check criterions

- Damages of the outer coating up to the insertion (abrasion mark, cuts, cracks)
- Embrittlens of the outer coating (crack formation of the hose material)
- Deformations, which do not match the natural form of the hose line, in pressure-less or pressurized condition or at bending, e. g. disconnection of coating, blistering, crimp points, buckle points.
- Leakage at hose, hose line or armature
- Breaking loose of the hose from the armature
- Damage or deformation of the armature, which reduces the function and strength of the armature or the connection hose – armature
- Corrosion of the armature, which reduces the function and strength
- Is still a free movement of the hose line guaranteed or did crimp, shear or abrasion points by means of adding new machine parts or aggregates arise?
- Is ensured, that the hose lines do not come into traffic routes, even if the with the hose lines coupled aggregates are driven in end position?
- Have the hose lines been painted? (Explanation: Marking and cracks can not be recognized!)
- Has the storage and usage time been exceeded? (see paragraph 3)
- Have all coverings been mounted again after checking?
- Are, if necessary, additional pull-out-protections available or necessary?

Note: Hose lines have to be checked regularly for their operational safe condition.

2. At faulty hose connections:

If defects concerning the operational safe condition of a hose line are diagnosed, they have to be eliminated immediately or appropriate measures have to be taken. If necessary these hose lines have to be replaced prior to continuing work. Hose lines must not be repaired and must not be put together again with old parts!

If several hose lines have to be replaced simultaneously, it has to be ensured, that only hose lines are used, which are sized sufficiently referring to the expected stress in the corresponding connections and that a confusion of the connections is impossible.

Note: Faulty hose connections have to be replaced immediately!

3. Exchanging hose lines

Even if no safeguarding defects can be diagnosed, the operator has to ensure, that the hose lines are replaced in appropriate intervals. The usage time of the hose lines should not exceed 6 years, incl. the storage time of at most 2 years (see trade cooperative association rule ZH1/74, no. 5.4). Concrete specifications of the producer concerning the usage time have to be attended.

Technical committee engineering, manufacturing systems, steel construction at the South German Trade Cooperatice Association Mainz State 2003-10-16