Types of faults

On a hot water machine the possible faults can be divided up into the following types:

Pump faults

See chapter about trouble-shooting in 40C.

Faults which are read out on display

The fault code includes following readouts, which are symptoms of the direct or indirect cause of faults.

A and ▤ show abnormal power consumption

C shows symptom from temperature sensor

F shows symptom from flow control

L shows symptom from flame sensor

P shows symptom from phase sequence pressure switch

U shows PC board fault

Faults which are not read out on display

Operation disturbances which are due to wear and tear, lack of maintenance or abnormal influences with symptoms such as reduced performance, operation stoppage, starting failure and operation with smoke development.

Error-code

Fault code		Cause	Remedy	
First	Second	Power consumption xInom,/time	Outer check	Inner check
A	1	1,10 30 min.	Voltage, max. variation +/- 10%. The cable of the machine, plug and extension cables. High pressure nozzle for dirt or scale formation.	Pressure faces and bearings of the wobble disc. The bearings of the motor. The opening pressure of the pump. The boiler tube for scale deposits. The mobility of the by-pass valve.
A	2	1,15 12 min.		
A	3	1,20 7 min.		
A	4	1,30 4 min.		
A	5	1,50 2,5 min.		
A	6	1,80 1,2 min.		
A	7	2,00 5 sec.	Breaking of phase. Fuses on network. Frozen pump.	Motor wires for breaking of phase. Ignition transformer. Start/operation capacitor.
A	A	0,00 5 sec.		Fuse SI 1 on PC board. Phase L3 on the secondary side of the contactor. Y1, Y2, Y3, K1. 24V connection on the transformer.
=	≡	Motor protection adjustment under 5 amp.		

Fault code		Symptom	Cause		
First	Second		Outer	Inner	Check
C	1	B3 Temp. sensor disconnected.	Plug disconnected. Wire defective.	Sensor defective.	Resistance at 20°C = approx. 539 Ω.
C	2	B3 Temp. sensor short-circuited.	Wire defective.	Sensor defective.	Resistance at 20°C = approx. 539 Ω.
C	3	B3 Temp. sensor more than 175°C.	Corroded plug connection. High pressure nozzle blocked.	Water quantity too small. Oil pressure too high.	Resistance at 20°C = approx. 539 Ω. By-pass valve. Oil pressure.
F	1	B1 / B2 Flow switch, contact made.	Wires defective. Coil on oil pump disconnected.	Reed switch defective. Flow switches are sticking. Fuse SI 1 on PC board defective. Transformer defective.	The flow switches. The magnet coils Y1, Y2, Y3, K1 + 24V supply. The magnets have different poles.
F	2	B1 / B2 Flow switches disagree for more than 4 seconds.	Air in system.	Sluggishly turning magnet. Defective Reed switch. Bad connection.	Injector. Hoses for leaks. Flow switches.
L	1	B5 Flame sensor disconnected.	Defective connection to flame sensor.	Flame sensor defective.	Check B5, see section C - El. control.
L	2	B5 Flame sensor short-circuited.	Defective connection to flame sensor.	Flame sensor defective.	Check B5, see section C - El. control.
L	3	B5 Flame failure.	Oil filter in tank blocked. Water in tank. Suction hose defective. The quantity of air too high.	Ignition failure. Oil pump defective. Flame sensor dirty. Oil nozzle defective.	Ignition electrode adjustment. Oil pressure. Replace oil nozzle. Air nozzle in bottom cabinet.
L	4	B5 The flame is not put out.	Oil residue in boiler bottom.	Solenoid valve Y2 leaky. Oil pressure too high.	Do + solenoid valve.

Fault code		Symptom	Cause		
First	Second		Outer	Inner	Check
P	1	Phase sequence incorrect.	Air hose connection to B6 open.	Pressure switch B6 defective.	B6 in following data, see under Function, El. control.
P	2	Phase sequence pressure switch short-circuited.	Air hose connection to B6 closed.	Do	Do
U	1	Microprosessor defective (RAM).	Replace PC board		
U	2	Do (RAM)	Replace PC board		
U	3	Do (A/D)	Replace PC board		
U	4	Do (timer)	Replace PC board		

C H A	**Unstable timer function. The other functions are O.K.**

Performance faults

Performance faults are not read out on the display. The symptom is reduced performance of the pump effect or the boiler effect. Re. the pump we also refer to 40C, chapter D.

The symptom of reduced boiler effect is a lower water outlet temperature than the set value. The possible causes for this are as follows:

Scale deposits in boiler tube:
Scale formation acts as insulation and reduces heat transfer to the water. The result is raised flue gas temperature = increased flue gas loss.

Cause 1: The hardness of the water > 30 dH
Remedy: Adjust the softening pump. Descale boiler tube.

Cause 2: Softening pump defective.
Remedy: Replace pump. Clean hoses for crystals, replace if necessary.

Sooted boiler tube:
Soot has the same effect as scale deposits, i.e. that they are both insulating against the heat transfer to the water and results in increased flue gas temperature = increased flue gas loss. Other symptoms are that the machine smokes during operation.

Cause 1: Air deficiency.
Remedy: Check:air adjustment, hole plugs in air nozzle in cabinet bottom and fan tightening to boiler.

Cause 2: Bad oil/air mixture.
Remedy: Check oil pressure and oil quality. Replace the oil nozzle. Adjust air diffuser.

Cause 3: Unfinished combustion.
Remedy: Check bottom insulation, boiler top gasket between tube and inner boiler jacket in top cover. Check burner tube.

Cause 4: Unstable ignition.
Remedy: Check electrodes. Adjust the air quantity (less air).

Cause 5: Leaky solenoid valve on pump. Y2.
Remedy: Check/replace solenoid valve Y2.

Low oil pressure:

Cause 1: Incorrect adjustment.
Remedy: Adjust pump pressure, max. 13.5 bar.

Cause 2: Filter blocked, defective pump.
Remedy: Replace filter/pump. Empty and clean tank.

Full water quantity at steam stage:

Cause 1: Mechanical defect of by-pass valve or solenoid valve (is stock).
Remedy: Check by-pass valve.

Cause 2: Electrical defect solenoid valve Y3.
Remedy: Check plug and wires. Replace coil.