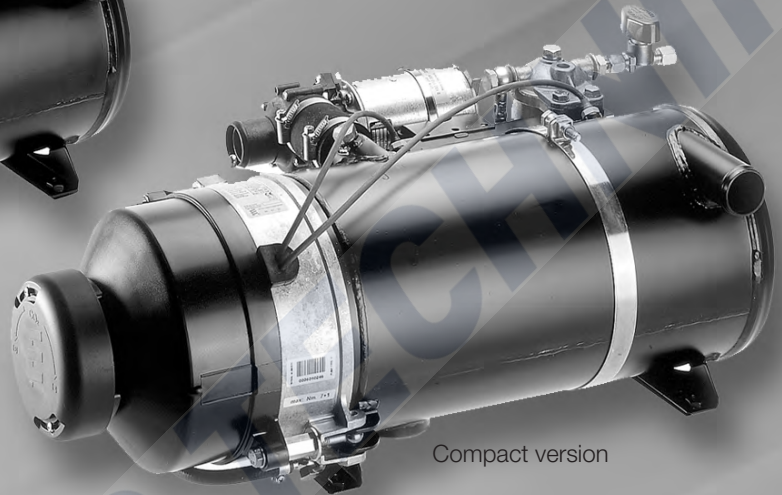


HYDRONIC L D16W

Diagnostics Flashing Fault Codes



Normal version



Compact version

Normal version

Hydronic 16 – 24 Volt
Hydronic 24 – 24 Volt
Hydronic 30 – 24 Volt
Hydronic 35 – 24 Volt

Order No.:

25 2165 02 00 00
25 1817 02 00 00
25 1818 02 00 00
25 1819 02 00 00

Basic unit No.:

25 2165 01 00 00
25 1817 01 00 00
25 1818 01 00 00
25 1819 01 00 00

Compact version

Hydronic 24 – 24 Volt
Hydronic 30 – 24 Volt
Hydronic 35 – 24 Volt

Order No.:

25 1817 05 00 00
25 1818 05 00 00
25 2041 05 00 00

Basic unit No.:

25 1817 01 00 00
25 1818 01 00 00
25 1819 01 00 00

**Water heaters for diesel fuel, operating
perating independently of an engine.**



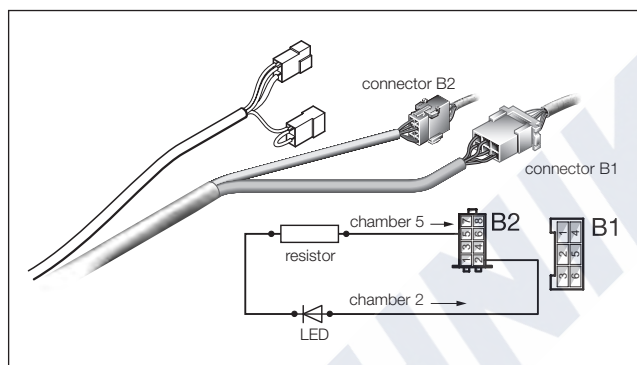
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4 Troubleshooting

Fault diagnosis – flashing code (LED with series resistor)

The electronic control box can store up to 5 faults. The defective component and type of fault are output by the control box as a flashing code and are displayed by an LED with series resistor (approx. 1 kΩ / 1W). The LED with series resistor is connected to the 8-pin connector of the heater cable harness (chamber 2, cable 1² bl/ws and chamber 5, cable 1² ge). The flashing codes of the defective components and the corresponding fault codes are described on page 12. Possible causes and remedial action are explained in the fault code tables (pages 21 – 24).

LED and series resistor



Sketch 5

Flashing code

	400 ms pause at the start of the flashing code	8 sec.	16 sec.
Operation without faults	[Solid bar]		
Flame detection photocell, Fault code 16, 51, 58	[Short pulse]	[Short pulse]	
Safety time exceeded, Fault code 50, 52	[Short pulse]	[Short pulse]	[Short pulse]
Flame cutout Fault code 54	[Short pulse]	[Short pulse]	
Overheating Fault code 12, 15	[Short pulse]	[Short pulse]	[Short pulse]
Burner engine Fault code 32, 33	[Short pulse]	[Short pulse]	
Undervoltage cut-off Fault code 11	[Short pulse]	[Short pulse]	[Short pulse]
Oversvoltage cut-off Fault code 10	[Short pulse]	[Short pulse]	[Short pulse]
Temperature sensor Fault code 14, 60, 61, 71, 72	[Short pulse]	[Short pulse]	[Short pulse]
Connection error Fault code 20, 21, 25, 37 – 39, 44 – 49, 80 – 83	[Short pulse]	[Short pulse]	[Short pulse]
Control box Fault code 90 – 97	[Short pulse]	[Short pulse]	[Short pulse]

Short pulse – flash duration: 0.4 sec.
 Long pulse – flash duration: 2.0 sec.
 Pause between the pulses: 0.4 sec.
 Period of a flashing sequence: 8.0 sec.

Sketch 6



4 Troubleshooting

Overview of the individual test equipment and control units

The electronic control box can store up to 5 errors, which can be read out and displayed. The following test equipment can be used to query the fault memory in the control box and if necessary to delete the control box locking:

Test equipment	Order No.:
• Diagnostic unit	22 1529 89 00 00
additionally required:	
Adaptor cable	22 1000 31 66 00
• EDiTH customer service program	
– Basic adapter with software	22 1532 89 00 00
additionally required:	
Hydronic L extension	22 1539 89 00 00
– ISO adapter	22 1524 89 00 00
additionally required:	
Adaptor cable	22 1000 31 66 00
• Burner tester	22 1527 89 00 00

If a diagnostics cable is connected, the following control units can also be used to query the fault memory in the control box and if necessary to delete the control box locking:

Control units	Order No.:
• Module timer	22 1000 30 34 00
• TP5 radio remote control	22 1000 32 01 00
• EasyStart T	22 1000 32 88 00
• EasyStart R+	22 1000 32 80 00

Please note!

If the fault memory cannot be read out, check the diagnostics cable for correct laying and possible damage.

External diagnostic system

With an external, vehicle-specific diagnostic system
-> contact the vehicle manufacturer.

4 Troubleshooting

Diagnostic unit

(Order No.: 22 1529 89 00 00)

To connect the diagnostic unit, an additional adapter cable is required (Order No.: 22 1000 31 66 00).

The current fault is displayed as "AF" and a 2-digit number and is always written in the memory location F1. Preceding faults are moved to the memory locations F2 – F5, if necessary the contents of memory location F5 is overwritten.

Please note!

- Not only the defective component, but also a defective current circuit results in a fault being displayed.
- Fault code, fault description, cause / remedial action are described on Pages 21 – 24.

Connect diagnostic unit

- Disconnect the 8-pin connector of the heater's cable harness and connect the adapter cable.
 - Connect the diagnostic unit to the adapter cable.
- Display is as follows:



Query fault memory

- Use the [D] key to switch on the heater.
- Display is as follows:



- After 8 sec the following is displayed:
- Display is as follows:



Heater has no malfunction

or



e.g. current error / fault code 64

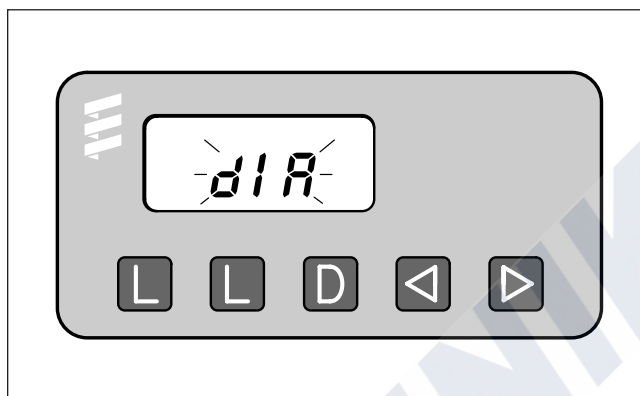
or



Fault diagnosis not possible

Possible causes:

- Adapter cable is not properly connected.
- Control box is defective or is not capable of diagnosing (not a universal control box).



Sketch 7

- [L] – Delete fault memory
- [L] – Delete fault memory
- [D] – Switch heater on / off, request diagnosis
- [◀] – Return, F5 – F1
- [▶] – Flow, F1 – F5, current fault (AF)

Display of the fault memory F1 – F5 or F5 – F1

- Press the [◀] or [▶] button again, or press several times, to display the fault memory.
- Display is as follows:



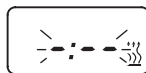
e.g. fault memory 2 / fault code 10

Please note!

Only the fault memory locations with an error assigned to them are displayed.

Delete fault memory

- Press both [L] buttons simultaneously until the following appears in the display:
- Display is as follows:



- If the fault memory has been deleted the most recent current fault is displayed. The current fault is not reset to 00 until the heater is restarted – provided there is no new, more recent fault.
- Display is as follows:





Heater has no faults




4 Troubleshooting

Fault code table

Fault code display	Fault description	Cause • Remedial action
000	No fault	--
010	Overvoltage cut-off	Overvoltage (> 30 volt) applied to control box for at least 20 seconds without interruption – heater not working. • Disconnect 18-pin connector at control box, start the vehicle's engine. Measure the voltage between PIN 15 (cable 2.5 ² rt) and PIN 16 (cable 2.5 ² br), if voltage > 30 volt → check generator controller.
011	Undervoltage cut-off	Under voltage (< 19 volt) applied to control box for at least 20 seconds without interruption – heater not working. • Disconnect 18-pin connector at control box, start the vehicle's engine. Measure the voltage between PIN 15 (cable 2.5 ² rt) and PIN 16 (cable 2.5 ² br). The measured value and the voltage at the battery should be the same. In case of a voltage drop, check the fuses, the supply cables, the negative connections and the positive support point on the battery for correct contact.
012	Overheating	Temperature at overheating sensor >130 °C • Check water circuit: – Check all hose connections for leaks – Vent water circuit – Check valves in water circuit, replace if necessary – Temperature difference between water inlet and water outlet must be <10 K, if not → check minimum flow rate of the heating medium, for values see technical data. • Check water pump, replace if necessary. • Check overheating sensor, replace if necessary, see diagram on page 36.
014	Difference between the overheating and temperature sensor is too large	Difference between measured values of the temperature sensor and overheating sensor impermissibly high for a lengthy time. • Check installation of both sensors, tighten sensor if necessary, tightening torque for both sensors 2.5 Nm + 0.5 Nm. • Check temperature sensor and overheating sensor, see diagram on pages 35 and 36. • Check minimum flow rate of the heating medium, see technical data for values.
015	Operating lock-out – Control box is locked	Fault code 012 "Overheating" three times in succession → fault code 015 is displayed. Unlock the control box by deleting the fault memory, see pages 15 to 20. • For remedial action see fault code 012.
016	Operating lock-out – control box is locked	Fault code 058 "flame in after-run" three times in succession → fault code 016 is displayed. Unlock the control box by deleting the fault memory, see pages 15 to 20. • For remedial action see fault code 058.
020	Ignition unit interruption  Danger! High voltage!	Control lead from ignition unit to control box is interrupted or short-circuited. • Check cable loom from ignition unit to control box, if necessary remove interruption or short circuit. • Check function of ignition unit only using burner tester, replace ignition unit if necessary. • If faults are not corrected by the remedial action listed above → replace control box.
021	Ignition unit earth short  Danger! High voltage!	Earth short in control lead from ignition unit to control box. • Check cable loom from ignition unit to the control box, if necessary remove earth short. • Check function of the ignition unit only using the burner tester, replace ignition unit if necessary. • If faults are not corrected by the remedial action listed above → replace control box.

4 Troubleshooting


Fault code table

Fault code display	Fault description	Cause • Remedial action
025	Diagnosis output short circuit	Cable 1 ² bl/ws from 18-pin control box connector, chamber 12 to 8-pin cable harness connector, chamber 2 has short circuit with + U _B . • Check cable and connections, if necessary remove short circuit.
032	Burner motor does not rotate at start	Impeller chafes or is blocked. Burner motor is defective.
033	Burner motor does not rotate during operation  Apply max. 12 volt at burner motor	Generator voltage is too low. • Check impeller for free running. • Check cables and connections to burner motor. • Check function of installed burner motor only using burner tester, replace burner motor if necessary. • If faults are not corrected by the remedial action listed above → replace control box. Fuel pump is blocked. • Check fuel pump for free running, replace burner if necessary.
037	Water pump fault	Check first: • Water pump Bus 2000 / FLOWTRONIC 6000 S is installed? • "Diagnosis" cable loom from the Bus 2000 water pump is connected? • Voltage applied to the Bus 2000 water pump? If yes – Disconnect plug-in connector from "Diagnose" cable loom. Heater start – If fault code 037 is no longer displayed, then check Bus 2000 water pump for dry running or blocking. – If fault code 037 is still displayed, then use remedial action as described for the water pump (standard design). • Water pump (standard design / FLOWTRONIC 5000 / 5000 S) is installed? If yes – Disconnect plug-in connector from "water pump" cable loom, apply voltage to 2-pin connector of the "water pump" connector and check function. If the water pump is functioning ok, then check fuse (15 A), cable loom and connections of the water pump → if fault code 037 still displayed, then replace the control box.
039	Vehicle blower control short circuit	Cable 1 ² sw from 18-pin control box connector, chamber 6 to 8-pin cable harness connector, chamber 7, on to blower relay is short-circuited. • Check cable and connections, if necessary remove short circuit. • Check installation of the relay. • Replace relay. • If faults are not corrected by the remedial action listed above, then replace control box.
044	Water pump Relay coil interruption	• Check installation of the relay at the control box. • Replace relay.
045	Water pump Relay coil short circuit	• If faults are not corrected by the remedial action listed above, then replace control box.
046	Solenoid valve interruption	"Solenoid valve" cable loom from control box (connector position "D") to solenoid valve is interrupted or has earth short. • Check cables and connections from solenoid valve, remove earth short if necessary. • Replace solenoid valve coil. • If faults are not corrected by the remedial action listed above, then replace control box.
047	Solenoid valve short circuit	"Solenoid valve" cable loom from control box (connector position "D") to solenoid valve has earth short. • Check cables and connections from solenoid valve, remove earth short if necessary. • Replace solenoid valve coil. • If faults are not corrected by the remedial action listed above, then replace control box.



4 Troubleshooting

Fault code table

Fault code display	Fault description	Cause • Remedial action
048	Nozzle block heating Relay coil interruption	<ul style="list-style-type: none"> • Check installation of the relay at the control box. • Replace relay.
049	Nozzle block heating Relay coil short circuit	
050	Operating lock-out Control box is locked	Control box locked by 10 start attempts without flame detection. Unlock the control box by deleting the fault memory, see pages 15 to 20. <ul style="list-style-type: none"> • For remedial action see fault code 052.
051	Flame detection photocell signals "Flame before fuel"	<ul style="list-style-type: none"> • Replace burner.
052	Safety time exceeded, no start  Danger! High voltage! Note when checking the ignition unit	No flame detected within the ignition phase. <ul style="list-style-type: none"> • Check combustion air inlet and exhaust system. • Check fuel supply (flow and return). • Check flame tube for correct installation in heat exchanger. • Check function of ignition unit only using burner tester, replace ignition unit if necessary. • Check distance between ignition electrodes, if necessary renew ignition electrodes. • Check electric cables and connections. • Check flame detection photocell for dirt, clean if necessary. • Replace fuel nozzle. • If faults are not corrected by the remedial action listed above, then replace control box.
054	Flame cutout during operation	Heater has ignited, the flame is detected and signals flame cutout twice within an operating time of 60 minutes. <ul style="list-style-type: none"> • Check fuel supply (flow and return). • Carry out CO₂ measurement. • Replace fuel nozzle. • If faults are not corrected by the remedial action listed above, then replace control box.
058	Flame does not extinguish during after-run	Flame detection photocell signals that flame has not extinguished 30 seconds after after-run "ON". <ul style="list-style-type: none"> • Check heat exchanger, clean if necessary, then carry out CO₂ measurement. • Test the solenoid valve using the burner tester, replace if necessary. • If fuel continues to be pumped during after-run → replace fuel pump. • If faults are not corrected by the remedial action listed above, then replace control box.
060	Temperature sensor interruption	Temperature value outside operating range. <ul style="list-style-type: none"> • Check plug-in connection with temperature sensor and cable to the control box. • Check temperature sensor, see diagram on page 35. • If faults are not corrected by the remedial action listed above, then replace control box.
061	Short circuit in temperature sensor	<ul style="list-style-type: none"> • Check plug-in connection with overheating sensor and cable to the control box. • Check overheating sensor, see diagram on page 36. • If faults are not corrected by the remedial action listed above, then replace control box.
071	Overheating sensor interruption	
072	Short circuit in overheating sensor	<ul style="list-style-type: none"> • Check plug-in connection with temperature sensor and cable to the control box. • Check temperature sensor, see diagram on page 35. • If faults are not corrected by the remedial action listed above, then replace control box.
081	Combustion indicator light short-circuit	

4 Troubleshooting

Fault code table

Fault code display	Fault description	Cause • Remedial action
083	Fault indicator light short circuit	Cable 1 ² gr from 18-pin control box connector, chamber 5 to 8-pin cable harness connector, chamber 6, on to fault indicator light is short-circuited. <ul style="list-style-type: none">• Check cable and connections, if necessary remove short circuit.• Check fault indicator light, replace if necessary.
090	Control box defective	<ul style="list-style-type: none">• Replace control box.
091	External interference voltages	Possible causes: <ul style="list-style-type: none">• Distance between ignition electrodes not ok -> check distance between ignition electrodes, if necessary renew ignition electrodes.• Interference voltages from charger or other sources of interference -> Remove interference voltages.• If faults are not corrected by the remedial action listed above, then replace control box.
092 093 094 097	Control box defective	<ul style="list-style-type: none">• Replace control box.