

UNCONTROLLED  
COPY

**Water Heater**

**Fault Codes**

## **Thermo Pro 50 Eco**

Thermo Pro 50 Eco - D 24 V ADR  
(Diesel, dangerous-goods transport)

5.1 Fault code table (fault codes, flash codes)

\*: Indicator lamp of control element flashing: Number of long flash pulses after 5 short flash pulses

Fault code (analogue)	Fault code (hexadecimal)	Error message	possible causes	Recommended action in workshop
F00 or <b>0*</b>	F01 F81 F91 F92 F07	No component fault	Fuses	Check fuses F1, F2 and F3
			Electrical wiring	<ul style="list-style-type: none"> <li>Check battery connections: + at 12 / - at 9 / + at 3 (switch-on signal), connector X8</li> <li>Check control element: check contacts of W-bus cable (yellow cable)</li> </ul>
			Heater lock-out	Delete heater lock-out
			Control unit defective	Replace control unit
F01 or <b>1*</b>	F02 F82 F4E	No start	Fuel system	Check fuel level Check fuel filter Check tank extracting device and fuel line for leaks Bleed fuel system
			Combustion air / exhaust line	Check combustion air/exhaust line for foreign objects and clean if necessary
			Burner unit	<ul style="list-style-type: none"> <li>Clean burner unit or replace if necessary</li> <li>Check glow plug</li> </ul>
			Fuel system	Check fuel level Check fuel filter Check tank extracting device and fuel line for leaks Bleed fuel system
			Burner unit	Clean burner unit or replace if necessary
F02 or <b>2*</b>	F03	Flame failure	Fuel system	Check fuel level Check fuel filter Check tank extracting device and fuel line for leaks Bleed fuel system
			Burner unit	Clean burner unit or replace if necessary
F03 or <b>3*</b>	F04	Supply Voltage too high	Power supply	Check battery
	F84	Operating voltage too low		Check electrical connections
F04 or <b>4*</b>	F05	Flame was detected prior to combustion	Exhaust gas temperature sensor defective	<ul style="list-style-type: none"> <li>Check operation of exhaust gas temperature sensor, replacing if necessary</li> <li>Check fuel system upstream pressure to fuel pump</li> <li>Check delivery quantity of fuel pump</li> </ul>
F06 or <b>6*</b>	F14 F94	Temperature sensor	Wiring	<ul style="list-style-type: none"> <li>Check wiring for damage, break and short-circuit</li> <li>Resistance check</li> </ul>
			Temperature sensor defective	Check operation of temperature sensor, replacing if necessary
F07 or <b>7*</b>	F08 F88	Fuel pump	Wiring	Check wiring for damage, break and short-circuit
			Fuel pump DP42 faulty	Replace fuel pump DP42
F08 or <b>8*</b>	F09 F89 F95	Combustion air fan	Combustion air fan blocked	Check operation of combustion air fan, replacing if necessary
			Combustion air fan defective	Replace combustion air fan

## 5 Malfunctions and troubleshooting

## Thermo Pro 50 Eco

\*: Indicator lamp of control element flashing: Number of long flash pulses after 5 short flash pulses

Fault code (analogue)	Fault code (hexadecimal)	Error message	possible causes	Recommended action in workshop
F09 or <b>9*</b>	F8A	Glow plug / electronic ignition unit interruption	Wiring	Check wiring for damage, break and short-circuit
	F0A	short-circuit in electrical circuit	Glow plug defective	Check operation of glow plug, replacing if necessary
F10 or <b>10*</b>	F06	Heater overheats	Heater overheats	Check coolant level, bleed coolant circuit
				Check operation of coolant pump
			Overheating protection defective	Check wiring for damage, break and short-circuit
				Check operation of overheating protection, replacing if necessary
F11 or <b>11*</b>	F0B F8B	Coolant pump short circuit	Wiring	Check wiring for damage, break and short-circuit
		Interruption	U4847 Econ coolant pump defective	Replace coolant pump
F12 or <b>12*</b>	F16	Battery disconnecter or electronic battery switch short-circuit	Electronic battery switch wiring faulty	Check wiring for damage, break and short-circuit
				Check power intake of battery disconnecter
F13 or <b>13*</b>	F13	Vehicle fan power circuit short circuit	Wiring	Check wiring for damage, break and short-circuit
			Vehicle fan relay	Check wiring for damage, break and short-circuit
				Check operation of vehicle fan relay, replacing if necessary
F14 or <b>14*</b>	F1B FAB	Overheat sensor short circuit	Wiring	Check wiring for damage, break and short-circuit
		Interruption	Overheating sensor defective	Check operation of overheating sensor, replacing if necessary
F15 or <b>15*</b>	F2E F22	The glow/ignition-element power circuit is defective	Wiring	Check glow plug wiring for damage, break and short-circuit
			Glow plug defective	Check operation of glow plug, replacing if necessary
F16 or <b>16*</b>	F4F	Exhaust gas temperature too high	Exhaust gas temperature sensor defective	Check wiring for damage, break and short-circuit
				Check operation of exhaust gas temperature sensor, replacing if necessary
			Heater fouled	Check burner <ul style="list-style-type: none"> <li>• Visual inspection with cleaning, replace burner if necessary,</li> <li>• Visual inspection with cleaning, replace burner head if necessary</li> <li>• Visual inspection with cleaning of inner heat exchanger surface (replace the heat exchanger if necessary)</li> </ul>
F17 or <b>17*</b>	F31 F4D	Exhaust-gas temperature sensor: open or short circuit	Wiring	Check wiring for damage, break and short-circuit
			Exhaust gas temperature sensor defective	Check operation of exhaust gas temperature sensor, replacing if necessary

5.2 Troubleshooting (fault symptoms)

Symptom		Possible cause	Possible troubleshooting
A	Heater does not respond, no component running, operation indicator remains off	Operating voltage	<ul style="list-style-type: none"> <li>- Check fuses (F2, F3). Unlock heater, see section 5.</li> <li>- Measure supply voltage to heater connector X2, pin 1.</li> </ul>
		Operation indicator (control element or ON/OFF switch)	<p>Operating indicator control element</p> <ul style="list-style-type: none"> <li>- Check fuse F2</li> <li>- Measure supply voltage on the switch with function display S4, pin A</li> <li>- Check continuity against earth on connector with function display S4, pin F</li> </ul>
B	Heater will not start, briefly starts up then switches immediately to afterrunning, operating indicator flashing	DP42 fuel pump	<p style="text-align: center;"><b>CAUTION</b></p> <p>The fuel pump must not be operated with the operating voltage. Power must not be supplied to the pump when a control unit is connected.</p> <ul style="list-style-type: none"> <li>- Check fuel line connection to fuel pump DP42. Connect Webasto Thermo Test and evaluate.</li> <li>- Check clear passage and seating of the flat spring contacts of the fuel pump connector and line</li> <li>- Measure resistance of fuel pump DP42 (resistance at <math>22 \pm 5^\circ\text{C}</math>: <math>0.8 \pm 0.1 \text{ ohm}</math>)</li> <li>- Setpoints: resistance at <math>25^\circ\text{C}</math>: 4.95 to 5.45 ohm</li> </ul>
		Combustion air fan	<ul style="list-style-type: none"> <li>- Check exhaust system and air intake system (see symptom C 'Excess smoke from heater during start-up phase'). Connect Webasto Thermo Test and evaluate.                             <ul style="list-style-type: none"> <li>• Set target speed of 6000 rpm</li> </ul>                             Listen for grinding and start-up noises. Start up to the specified speed must be heard. The error message "Fan motor stiff" must not be activated.                         </li> <li>- In the event of short-circuit or break: check fan wiring</li> </ul>
		Coolant pump U4847 Econ 24V Coolant pump UP500	<ul style="list-style-type: none"> <li>- Check coolant level. Connect Webasto Thermo Test and evaluate. Switch on component test via Webasto Thermo Test, touch pump with your hand, the pump is operating if slight vibration can be felt.</li> <li>- Check wiring</li> <li>- Check self-bleeding position, see section 8.4</li> </ul>
		Temperature sensor	<ul style="list-style-type: none"> <li>- Check coolant level. Connect Webasto Thermo Test and evaluate. Check cold resistance of the temperature sensor.</li> <li>- Setpoints: internal resistance of the coolant pump <math>20 \pm 1 \text{ kOhm}</math></li> </ul>
		Glow plug	<ul style="list-style-type: none"> <li>- Connect Webasto Thermo Test and evaluate. Measure glow plug resistance at glow plug connector X5. See "Electrical test of glow plug" on page 34</li> <li>- Setpoints: cold resistance at <math>22 \pm 5^\circ\text{C}</math>: <math>0.8 \pm 0.1 \text{ ohm}</math></li> </ul>

## 5 Malfunctions and troubleshooting

## Thermo Pro 50 Eco

Symptom		Possible cause	Possible troubleshooting
C	Excessive smoke from heater during start-up phase	Glow plug	See symptom B, glow plug
		Fuel pump DP42	See symptom B, fuel pump DP42
		Combustion air fan	See symptom B, combustion air fan
		Fuel connection	<ul style="list-style-type: none"> <li>– Check fuel level and fuel supply from the tank</li> <li>– Check integration in the vehicle's fuel system</li> <li>– Check fuel lines for leaks, kinks and clogging, especially in the area of line connectors on the intake side</li> <li>– Disconnect fuel line from heater, hold hose in a collection container and operate the fuel pump with Webasto Thermo Test. (measured value fuel delivery rate 115 ml/h*Hz). Fuel should be delivered free of bubbles</li> </ul>
		Exhaust system and air intake system	<ul style="list-style-type: none"> <li>– Check lines for blockages</li> <li>– Rectify any leaks in the intake line and exhaust pipe (no CO<sub>2</sub> in intake air)</li> <li>– Make sure that the exhaust line outlet is not located beneath the intake line inlet.</li> <li>– Make sure that the intake line and exhaust line are installed in accordance with the installation instructions, see Thermo Pro 50 Eco Installation Instructions</li> <li>– Make sure that there is sufficient distance from the interior fresh air intake to the vehicle</li> </ul>
		Burner unit	<ul style="list-style-type: none"> <li>– Removal and visual inspection</li> <li>– If the fuel pipe to the burner unit is blocked, replace the burner unit</li> </ul>
D	Heater goes out prematurely	Undervoltage detection	<ul style="list-style-type: none"> <li>– Check fuses (F2, F3)</li> <li>– Webasto Thermo Test, observe supply voltage to switched-on heater. Setpoints:: The voltage must not fall below 20.0 V for more than 10 consecutive seconds</li> </ul>
		DP42 fuel pump	See symptom B, fuel pump DP42
		Combustion air fan moves stiffly	See symptom B, combustion air fan
		Fuel connection	See symptom C, fuel connection
		Coolant circuit	<ul style="list-style-type: none"> <li>– Check integration into the coolant circuit of the vehicle in accordance with the Thermo Pro 50 Eco installation instructions. Remove kinks and chafing points.</li> <li>– Check heater, water connection, coolant pump and hoses for leaks, rectifying if necessary</li> <li>– Make sure that the coolant circuit is bled correctly</li> <li>– Check circulation in coolant circuit</li> </ul>
		Exhaust system and air intake system	See symptom C, exhaust system and air intake system
		Burner unit	See symptom C, burner unit
E	Irregular combustion noise	DP42 fuel pump	See symptom B, fuel pump DP42
		Burner unit	See symptom C, burner unit
F	Excessive smoke from heater during heating phase	DP42 fuel pump	See symptom B, fuel pump DP42
		Fuel connection	See symptom C, fuel connection
		Exhaust system and air intake system	See symptom C, exhaust system and air intake system
		Burner unit	See symptom C, burner unit

Symptom		Possible cause	Possible troubleshooting
G	Heater running, vehicle interior cold	Vehicle blower	<ul style="list-style-type: none"> <li>– Check fuse F1</li> <li>– Check coolant temperature (K5 switches at approx. 30 °C)</li> <li>– Check switching signal at relay K5, ground at Pin 85 and positive at Pin 86, (audible, see wiring diagram in Thermo Pro 50 Eco installation instructions)</li> <li>– Check coolant temperature of-signal line (green/white, gr/w), Pin 86 on K5</li> </ul>
H	Excessive smoke from heater during after-running period	Exhaust system and air intake system	See symptom C, exhaust system and air intake system
I	Smell of fuel	Fuel connection	See symptom C, fuel connection
		DP42 fuel pump	See symptom B, fuel pump DP42
		Glow plug	See symptom A, glow plug
J	Smell of exhaust in vehicle interior	Exhaust system and air intake system	See symptom C, exhaust system and air intake system
K	Coolant loss	Coolant pump U4847 Econ Coolant pump UP500	See symptom B, coolant pump
		Coolant circuit	See symptom D, coolant circuit