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# ***IVT 290 A/W***

## ***Electric boiler***



## **User Guide**

Art. no: 12322

Version 1.0



# **Thank you for choosing a heating installation from IVT Industrier AB**

We hope that our heating installation meets your expectations and gives you many years of energy saving. We want you and your family to enjoy a good economy at the same time as you actively safeguard the environment. We have taken today's demands on heating systems into consideration and believe that your Optima heat pump with 290 A/W will give you many useful functions in the future. Your system features an advanced control unit that monitors and controls the temperature in the house as well as the hot water and contributes towards improved overall economy. The system has, for example, a holiday function, that is to say the heat pump can be set at a "low level" while you are away on holiday.

IVT is the leading heat pump manufacturer in the Nordic Countries. More than every second heat pump comes from IVT. We have worked with solutions to reduce energy consumption on the environment's terms for more than 30 years. Today, we can present the widest range of heat pump systems for efficient energy saving in all types of housing and properties.

Guide IVT 290 A/W Electric boiler  
IVT Industrier AB, 2007/09  
Article number: 12322  
Version 1.0

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# For the user

## Important information

Electric boiler IVT 290 A/W belongs to the latest family of heating products from IVT Industries. In heat pump systems with Optima 600, 900 and 1100, 290 A/W is used as electrical additional heat and for production of hot water.

The electric boiler is available in two versions, 9 kW or 13.5 kW.

The heat pump system is controlled by a Rego 800 control unit, which is in 290 A/W. The control unit controls and monitors the total system using different settings for heating, hot water, other operations and maintenance. The settings are made by the installer and the user via a control panel.

This guide contains a description of 290 A/W, what it consists of, maintenance, etc. The control unit and settings for Optima with 290 A/W are described in the Optima guide. It is important, as the user, that you read through the Optima guide.



### Note

For a comprehensive understanding please read the Guide for Optima 600-1700. There the Rego 800 monitoring and control system is fully described.



### Note

**Only a trained and qualified technician may carry out repairs to this machine. Incorrect repairs can lead to serious risks to the user, and a reduction in savings. Visits from an authorised Service representative to make corrections or adjustments after such a repair, cannot in such cases be carried out free of charge, not even during the warranty period.**

## General

Electric boiler IVT 290 A/W can be used free-standing or together with air/water heat pump IVT Optima 600-1100, which forms a complete solution for both heating and hot water. The hot water heater is in the electric boiler and is stainless steel. The hot water heater has a protective anode that is maintenance free and is suitable for all types of water.

The electric boiler is installed indoors and the heat pump is installed outdoors. The heat pump collects energy from outside air. The energy is transferred via heated water to the electric boiler for further transfer out into the house's heating system (radiators and/or underfloor coils) and for heating the hot water.

The Rego 800 control unit, in the electric boiler, controls and monitors the whole installation. It contains a control panel with graphic presentation. Most settings needed to give the installation the best possible function in your house, are made via the control panel by the installer (or are preset in the factory). In addition, you can affect operation in different ways, for example, by increasing/decreasing the heating, obtaining extra hot water etc., using the control panel.

There are a number of sensors in the system to assist adjusting heating and hot water production for different demands. These give the control unit information about for instance the current outdoor temperature and hot water temperature.

The unit can be supplied with a power guard (option). The task of the power guard is to temporarily disconnect the electrical additional heat when using other power demanding appliances so that the main fuse does not blow.

### Electric boiler 290 A/W

(placed indoors)



Control unit with control panel

### Optima heat pump

(placed outdoors)



### Power guard, option

(placed indoors)



# This is how your electric boiler works

## The electric boiler produces hot water and additional heating

The electric boiler produces hot water and heating, (additional heat together with Optima)  
The electric boiler contains a double shelled hot water heater. There is an electric element which heats the water in the heating water (outer shell).

The system heats the hot water based on information from a sensor in the hot water heater and the settings in the control unit. The electric element is also used to produce extra high hot water temperature, which is reached via a hot water peak.

## Principles in different demand situations

**Optima produces heat and there is no hot water requirement:**  
Optima heats the heating water according to the flow sensor (T1) and the temperature settings in the control unit. The heating water is fed through 290 A/W without passing through the hot water heater.

**Optima produces heat and there is a hot water requirement:**  
In this case, the hot water sensor (T3) indicates that the hot water needs heating. The heating water from Optima passes through the hot water cylinder's outer shell and heats up the hot water until the hot water requirement is met. While it is doing so, no heat is produced. The switch between heating and hot water production occurs automatically at a certain time interval.

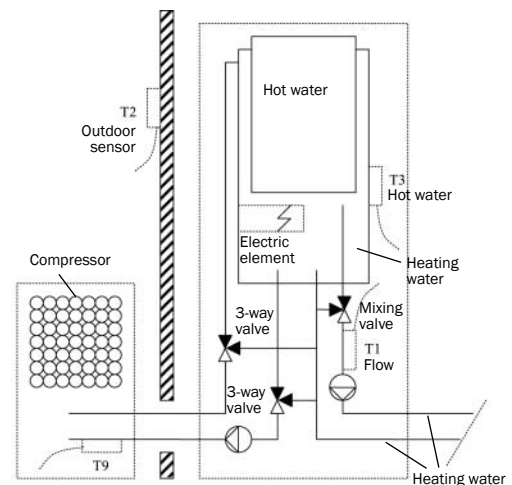
**Optima needs additional heat in order to satisfy a heating requirement:**  
In this case, the electric element heats the heating water in the outer shell of the hot water heater. This heating water is fed into the heating system in suitable amounts thereby increasing the flow temperature.

**Extra hot water and hot water peaks:**  
When these requirements must be met, the control unit ensures that hot water is first heated by the compressor together with the electric element, then only by the electric element until demand is met.

**At outdoor temperatures lower than approx -20°C:**  
In the event of too low an outdoor temperature, the compressor stops and all heating of heating water and hot water occurs via an electric element in 290 A/W. The outdoor temperature is displayed via the outdoor sensor (T2)

**Summer season:**  
In this case, there is no heat production and the compressor is idle. When a hot water requirement occurs, the compressor starts and meets the demand. Extra hot water and hot water peaks function as described previously.

Outline drawing Optima and 290 A/W



## 290 A/W (Stand Alone)

### Hot water production

The electric element keeps the water heater hot via the sensor for hot water (T3), which is on the heater's outer shell.

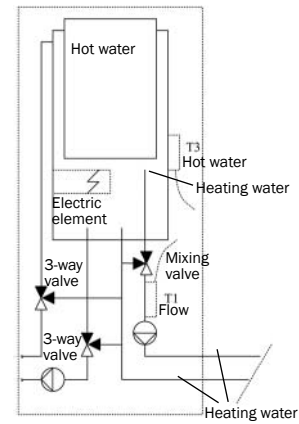
### Heat production

In the event of a heat demand, the shunt valve opens under the water heater and releases heat to the radiator system. The temperature of the radiator system is regulated via the flow line sensor (T1) and the heating settings in the control unit.

### Extra hot water and hot water peaks

The electric element ensures an increase of the temperature in the water heater so that the desired demand is met.

## Outline diagram 290 A/W stand-alone

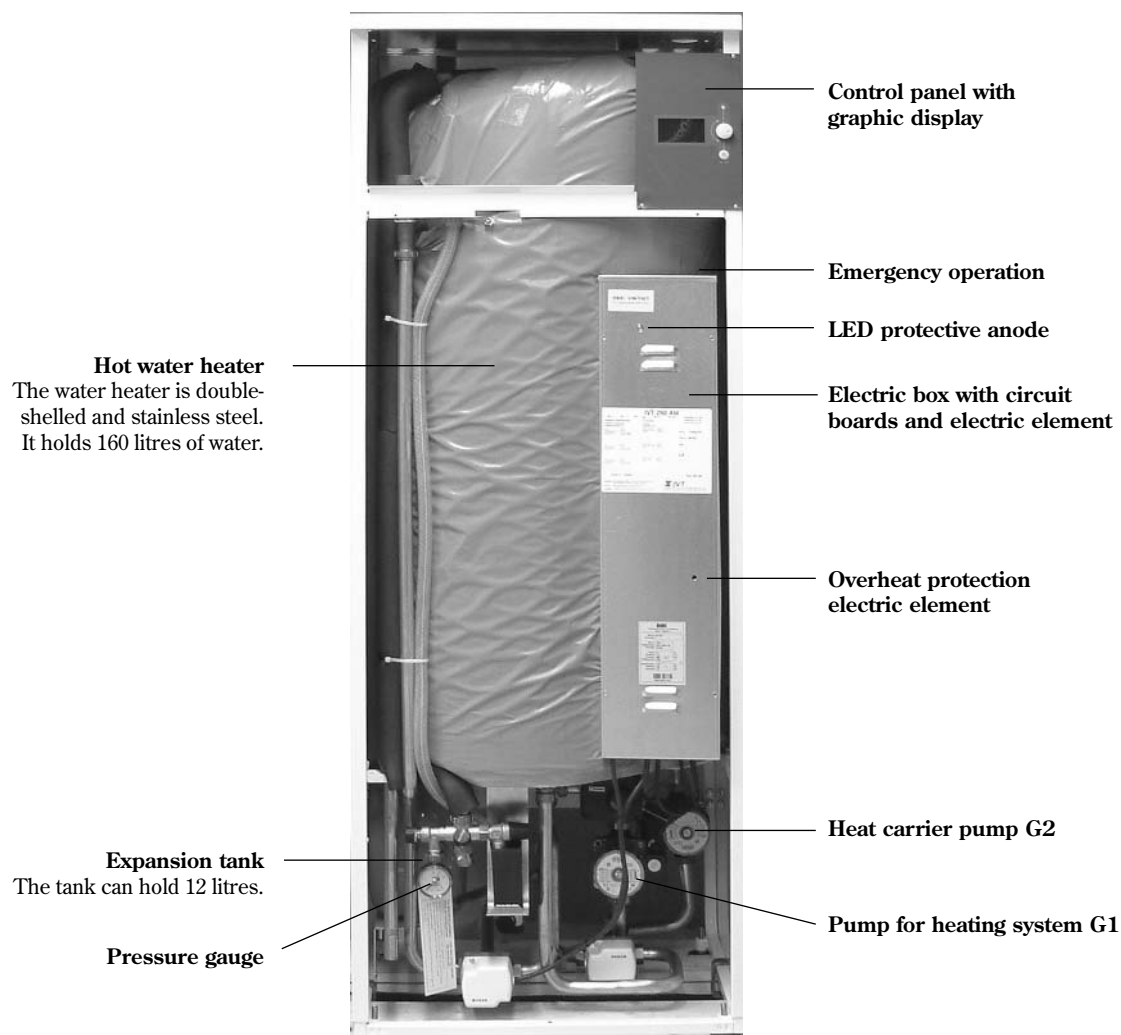


290 A/W stand-alone

## Component parts

### IVT 290 A/W

The picture shows the electric boiler with the front panel removed.  
See also *Maintenance*.



#### Connecting area

The necessary connections of water for heating, hot water, as well as inlet and outlet to/from Optima are made here. In addition, there are 3-way valves, mixing valves etc.

# Maintenance

## Check the pressure gauge

(Twice a year)

The pressure gauge in the lower section of the electric boiler must be checked twice a year. This is particularly important during autumn when the heating season starts. The pressure gauge should be at 0.5 – 1.5 bar. If the pressure is lower than 0.5 bar, fill with water up to around 1.0 bar. The knob for topping up the heating water is located in the connection area.

## Clean the discharge water vessel

(Twice a year)

Wash the discharge water vessel with warm water and anti-bacterial cleaning agent to remove dirt and algae. Rinse and check that the water runs off through the hose.

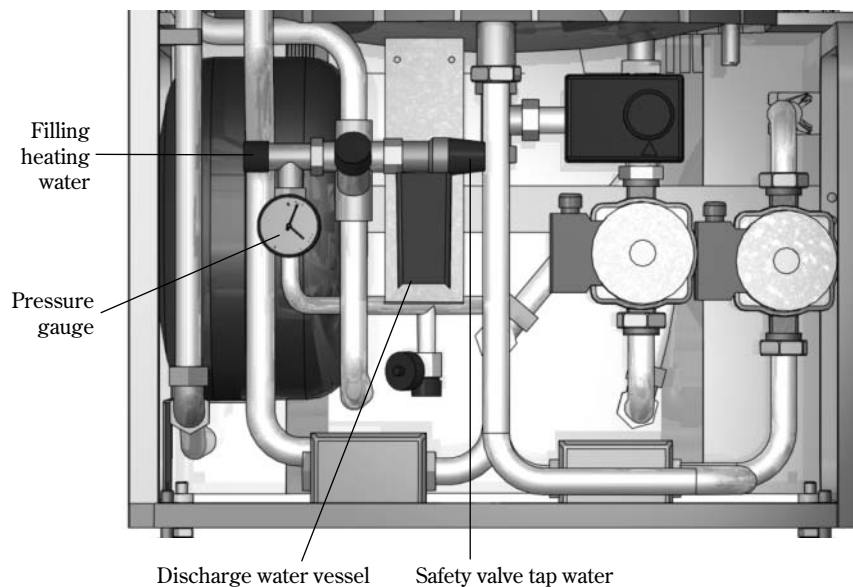
## Check the safety valves

(Twice a year)

Check the safety valves for tap water and heating water by opening and closing them using the valve knobs.

Water may drip from the escape pipe, this is normal. The pipe opening must never be sealed.

If the hot water heater must be drained, call a service engineer.



## What to do if a fault occurs

The control unit has an advanced monitoring system that gives alarms if anything unforeseen happens in the system. Most alarms correct themselves. There is never a risk of affecting something when you reset an alarm once or twice. In the event of recurring alarms, contact your dealership/service technician.

This is described further in the Optima guide and also describes what actions you can take.

### Example of an alarm:

When an alarm is triggered, an alarm window is displayed and a warning signal sounds. The alarm window displays the alarm causes and the time and date that the alarm occurred.

When you press the menu dial, *Acknowledge* is marked, the alarm symbol goes out in the menu window and in the alarm log and the warning signal is muted. The heat pump starts again within 15 minutes if heating is required. If the fault has not been rectified the lamp will remain lit and the status lamp will stop flashing red and will light red continuously. Should several alarms have occurred on the heat pump, view the alarm log where all alarms are counted. For active alarms, the alarm symbol lights.

### Protective anode

At the top of the hot water cylinder, under the insulation, there is an electronic protective anode. Its purpose is to prevent corrosion. The cylinder must be filled with water for the anode to work. There is a LED in the electric box that shows a red or a green light. If green, the protective anode is operating and working normally.

Should large amounts of hot water be drawn off (when filling a bath for instance) the diode lamp may show a red light for a short time even though there is no fault. If the lamp shows red for more than 10 hours, the anode is faulty and a service engineer must be called. You can wait until the next working day if the fault occurs on a holiday.

### Overheat protection electric element

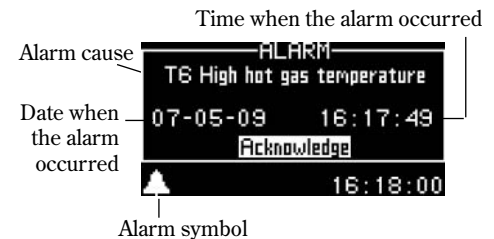
The button for resetting the electric element overheat protection is on the front of the electric box. This is a protection device that should normally not trip. If, however, it does trip, reset it by pressing in the button firmly. If the overheat protection device trips frequently, call a service engineer to establish the cause.

### Emergency operation

There is a switch on the top of the electric box that shows a green light in normal operation. If a fault occurs in the control unit and heat production stops, emergency operation can be activated manually using the switch, which then goes out. Emergency operation can also be activated automatically (and then the switch continues to be lit).

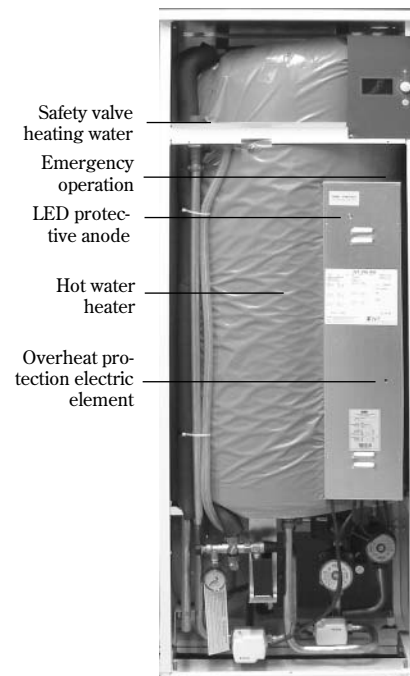
The additional heat takes over the heat production during emergency operation. Heating can therefore be obtained until the dealer or authorised service technician has remedied the fault.

This function must not be confused with Alarm mode, which means that the compressor stops, for safety, due to an active alarm. Heat production is still controlled by the control unit.



#### Note

If you deactivated the alarm buzzer under Advanced *no warning signal is heard.*



# Technical information

## Technical information

IVT 290 A/W		
Output electric element	kW	9/13.5
Output circulation pump	kW	0.2
Electrical supply		400V 3N~ 50Hz
Max. power consumption	kW	9.2/13.7
Fuse size	AT	16/25
Max. working pressure	bar (MPa)	2.5 (0.25)
Hot water heater volume	l	163
Expansion tank	l	12
Overheat protection	°C	90
Min. flow heating system	l/s	0
Pump for heating system G1	Wilo Star RS 25/6-3	
Heat carrier pump G2	Wilo Star RS 25/6-3	
Dimensions (WxDxH)	mm	600x615x1660
Weight, excluding water	kg	122
Weight, including water	kg	347

## Sensor table

The table shows all sensor resistance at different temperatures.

Temperature (°C)	kΩ
-40	154.300
-35	111.700
-30	81.700
-25	60.400
-20	45.100
-15	33.950
-10	25.800
-5	19.770
0	15.280
5	11.900
10	9.330
15	7.370
20	5.870
25	4.700
30	3.790
35	3.070
40	2.510
45	2.055
50	1.696
55	1.405
60	1.170
65	0.980
70	0.824
75	0.696
80	0.590
85	0.503
90	0.430



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