

Technical Manual Modulation Box

Schwank
INNOVATIVE HEATING SOLUTIONS



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Content

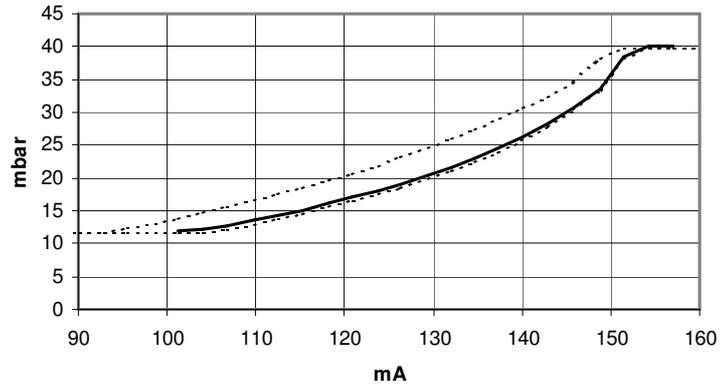
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1. Operation

The ThermoControl Plus M together with the Modulation Box provides modulation control for the heater that is equipped with the Honeywell Modureg V7335A Series 2000 pressure regulator.

The outlet pressure and therefore the heating power of the heater can be modified by the operating current connected to the coil of V7335A Modureg (see Figure 1). The Module generates the operating current in the modulation range (factory settings: 12...40 mbar), (see Figure 2).

Figure 1: Operating characteristic provided by the module without hysteresis (continuous line). (Dotted lines: original V7335A Modureg characteristic with hysteresis).



The ThermoControl Plus M measures the temperature and in order to reach and keep the desired value sends digital code signals to the Modulation Box to set the current and so the outlet pressure to the necessary value.

The value of the code signal varies between 0...25. This code signal is coming from the relay output terminal of the ThermoControl Plus M (see Figure 3.). The code signal is provided by On/Off switching of the 230V,50Hz. The times and the relative positions of the On and Off periods contain the digital code (see Figure 2.) and the Modulation Box decodes it.

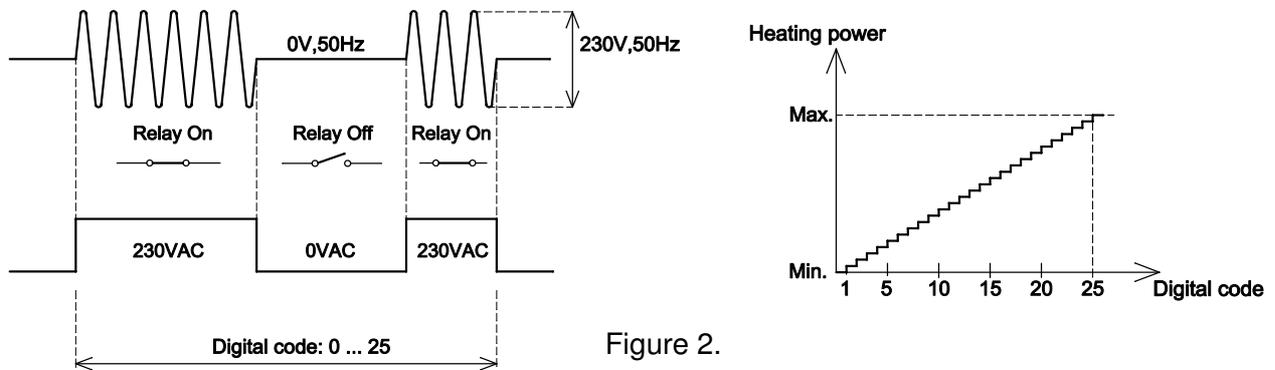


Figure 2.

Main features:

The Modulation Box switches a stable current to the coil of the Modureg. So the outlet pressure will not depend on the resistance of the coil (the coil resistance is largely varies with its warming up).

The Modureg operates with significant hysteresis. The Module practically eliminates this hysteresis with an electronic procedure.

The Box provides an electronically optimized characteristic between heating power and code steps (see Figure 2.) so every one code step generates the same power step value.

As the communication between the ThermoControl Plus M and the Modulation Box is made only by the line signals: 230V,50Hz (On signal); 0V,50Hz (Off signal) the result is a very stable operation without any noise problem.

2. Connections

Connect the Modulation Box to the ThermoControl Plus M 1, 2, 4 by 4-wire standard power cable. Several Boxes can be connected in parallel in a Zone if necessary.

Place the control mode "Regelung" selector Jumper inside the ThermoControl Plus M unit to upper "Modulation" position (see ThermoControl Plus M manuals). This selection changes the control mode from 2-stage to modulation control in every selectable program versions.

Inside the Modulation Box there is a LED light: it indicates existence of 230V,50Hz on terminal "I.". When a modulation code signal arrives to terminal "M" the LED light switches off for the time of the "On" periods of the code signal, so operation can be checked.

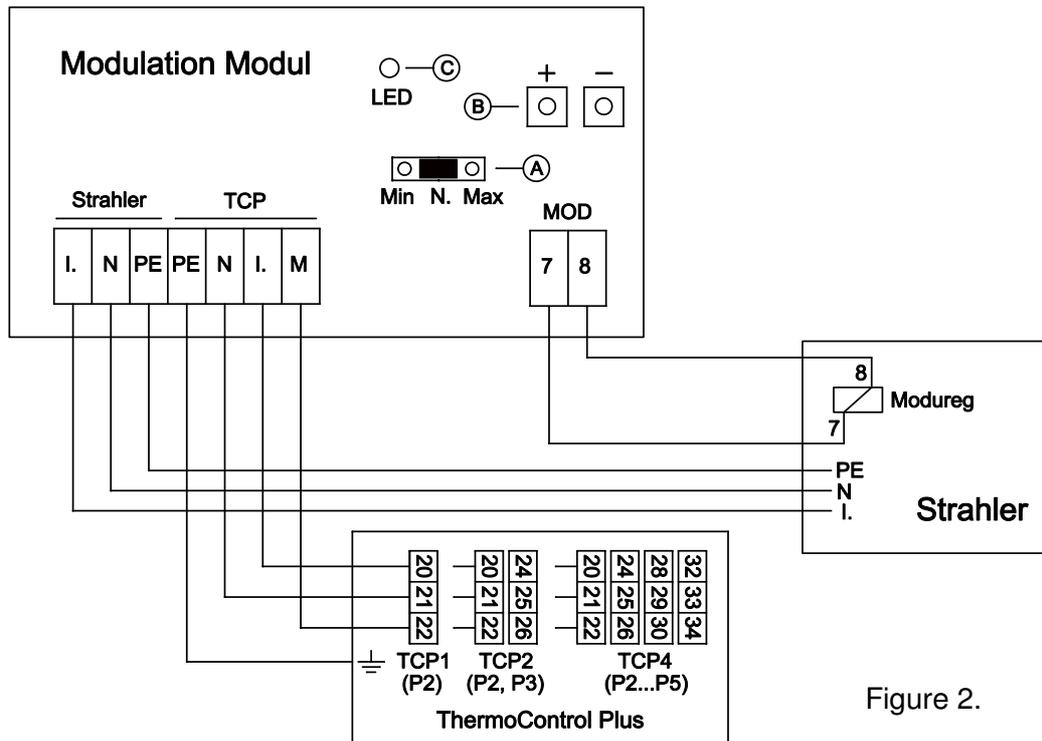


Figure 2.

On the front panel of ThermoControl Plus M you can push the DISP button to display the actual value of heating power in %. The start value of this display that belongs to the beginning of the modulation range is set to 50% (factory setting). You can modify this start display value in the Setup Menu between 0...90% (see ThermoControl Plus M manuals).



3. Setup function

Modulation Box / Honeywell Hubmagnet V7335 modureg

The factory setting of the operating pressure range is 40/12 mbar. In case a different value has to be set the output current value in the Modulation Box has to be changed.

Please follow below mentioned procedure [e.g. 30/15 mbar]:

- Switch the jumper at the ThermoControl Plus M to **“Modulation”**
- Switch on the **“Chimney sweeper”** mode at the ThermoControl Plus M
- Ensure that the input pressure at the gas pressure regulator is sufficient enough [e.g. 34 mbar]
- Switch the jumper within the Modulation Box to **“Min”** (Jumper **“A”**, refer to connection diagram)
- Push the **“+/-”** button (button block **“B”**) so that the measured nozzle pressure will be 1 mbar below the required minimum value (e.g. 14 mbar). If the value can not be adjusted, the mechanical limitation at the lifting magnet (large adjusting screw) needs to be amended. Afterwards continue with adjusting to the required minimum value.
- To adjust the maximum pressure, the jumper has to be switched to **“Max”**. With the **“+/-”** buttons adjust the value to 1 mbar above the required pressure (e.g. 31 mbar). In case the value can not be adjusted the mechanical limitation of the lifting magnet (small adjusting screw) needs to be amended. Afterwards continue with adjusting to the required minimum value.
- Check the minimum value and re-switch the jumper to **“min”** position and adjust the value if necessary (e.g. 14 mbar).
- Adjustment of the mechanical pressure range of the lifting magnet:
Place the jumper of the Modulation Box to the **“N”** position.
“Chimney sweeper” mode needs to be still switched on.
Disconnect the power supply (clamp 7 / 8) of the Modulation Box or the connector of the lifting magnet.
Adjust the minimum value to the required nozzle pressure (e.g. 15 mbar) at the lifting magnet.
Re-connect the electrical connection at the Modulation Box (clamp 7 / 8) or the connector of the lifting magnet and adjust the required maximum value (e.g. 30 mbar) at the lifting magnet.
- Switch off the **“chimney sweeper”** mode.

4. Technical Parameters

Outputs:

- Terminal 7-8: DC current.
- Maximal operating range: min. 40 mA ... max. 164 mA
- Max. load resistance: 174 Ohm
- Factory settings for operating range: 104 mA...155 mA
- Max voltage on opened 7-8 terminals: 50VDC.
- Connecting device: Honeywell V7335A Series 2000 pressure regulator built on the VK4105 gas valve.
- Terminal PE, N, I.: Switched 230V/50Hz signals

Inputs:

- Terminals: PE, N, I. Mo: Switched 230V,50Hz signals.

Power consumption:

- 230V/50Hz 10VA

Fuse:

- 5x20mm. max 63 mA (F)

Connections:

- Screw terminals, wire section max 4 mm²

Safety and EMC standards:

- EN 601010-1; EN 61326

Operating/Storage temperature:

- 0...+50 °C / -10...+60 °C

Protection:

- IP55

Dimensions:

- 170 x 130 x 85 mm

Case:

- Watertight plastic case