

# TTC40F

3-phase controller for electric heating, 230 or 400 V / 40 A



*TTC40F is a 3-phase controller intended for timeproportional control of electric heaters, radiators, etc. The controller is capable of controlling both D- and Y-connected loads.*

- ✓ Built-in temperature controller with 0...10V signal for control of output unit
- ✓ Automatic adaptation to connected 230 or 400V supply voltage
- ✓ Can be controlled using an external 0...10 V-control signal
- ✓ For DIN-rail mounting
- ✓ Settable min. and max. limitation
- ✓ Adjustable cycle time

## Application

TTC40F is a 3-phase triac controller for control of electric heaters. The device is connected in series between the power supply and an electric heater or radiator.

TTC40F has a temperature controller with inputs for sensors placed, for instance, in a supply air duct or room. It can also be controlled using an external control signal.

The controller utilises stepless, time-proportional control. I.e.: the ratio between on-time and off-time is varied in order to fit the present heating requirement.

Example: A controller output of 50 % will equal an on-time of 30 s and an off-time of 30 s if the cycle time is 60 s. The cycle time is adjustable 6...60 s.

Triac control is considerably more accurate than on/off control, meaning increased heating comfort and lowered energy costs.

## Function

TTC40F has a built-in function for automatically adapting the control mode as needed:

### Supply air control

For rapid temperature changes, the supply air controller will function as a PI-controller. The P-band will be 20K with an I-time of 6 minutes.

### Room temperature control

For slower temperature changes, the room controller will function as a P-controller. The P-band will be 1.5K. The

supply air controller will retain the same settings as before. During room temperature control, the supply air temperature can be provided with a min. or max. limitation.

#### **Control of larger loads**

In cases where the electric heater is larger than the capacity of TTC40F, the load can be divided and controlled by use of a TT-S4/D or TT-S6/D step controller in combination with the TTC40F. Slave control of one or more TTC25/TTC40F units via the TTC40F is also possible.

#### **External control signal**

TTC40F can also be run against a 0...10 V DC control signal from another controller. 0 V input signal will give 0 % output and 10 V input will give 100 % output.

Minimum and maximum limit functions are not active when using an external control signal.

## Technical data

### 1 General

|                                       |  |
|---------------------------------------|--|
| <b>Supply voltage</b>                 | 3-phase, 210...255 / 380...415 V AC. Automatic adaptation                |
| <b>Power output</b>                   | Max. 40 A, min. 4 A/phase. At 400 V, max. effect will be 27 kW           |
| <b>Safety function</b>                | The feed to the TTC should be interlocked with a high temp. limit switch |
| <b>Power emission</b>                 | 70 W at full load  |
| <b>Cycle time</b>                     | Factory setting 60 sec. Adjustable 6...60 sec                            |
| <b>Indicator</b>                      | Red LED, lit when power is pulsed to heater                              |
| <b>Ambient temperature, operation</b> | 0...40°C   |
| <b>Ambient humidity</b>               | Max 90 %rH   |
| <b>Storage temperature</b>            | -40...+50°C  |
| <b>Protection class</b>               | IP20   |

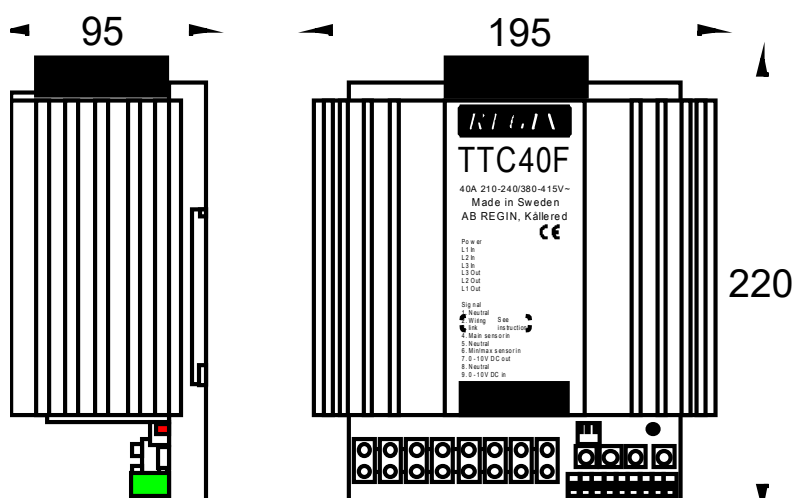
### 2 Control unit

|  |  |
|--|--|
| <b>Sensor inputs</b>                       | Main and min./max. sensor. Min./max. sensor: working range 0...60°C  |
| <b>Main setpoint</b>                       | 0...30°C. Other areas dependant on connected sensor.<br>Includes external setpoint (e.g. TG-R430)  |
| <b>Control parameters, primary control</b> | Rapid control circuits: PI-function with a P-band of 20K and I-time of 6 minutes. Slower control circuits: P-function with a P-band of 1.5 K |
| <b>Setpoint, min. limitation</b>           | 0...30°C   |
| <b>Setpoint, max. limitation</b>           | 20...60°C  |
| <b>Control parameters, limitation</b>      | PI-function with a P-band of 20K and an I-time of 6 minutes  |
| <b>Output signal, controller</b>           | 0...10 V. Connected to control input of output unit by wire strap (terminal 7-9)   |
| <b>Control input</b>                       | For external control signal 0...10 V.  |



This product carries the CE-mark. More information is available at [www.regincontrols.com](http://www.regincontrols.com).

## Dimensions



[mm]

[mm], unless otherwise specified

## Wiring

### Power

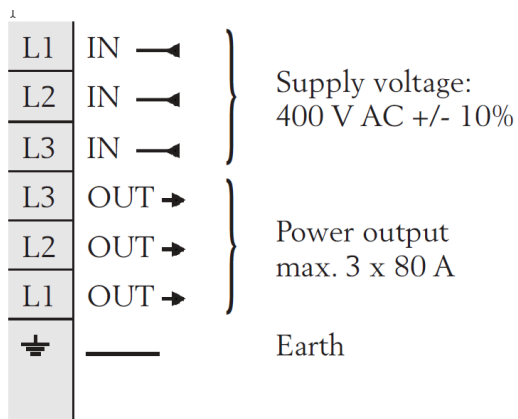


Fig. 1



**Note!** When controlling Y-connected loads, the load must be symmetric and the signal neutral must not be connected!

### Room temperature control

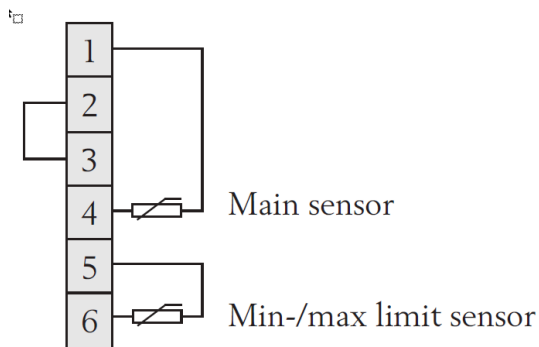


Fig. 2

### Room temperature control with external setpoint

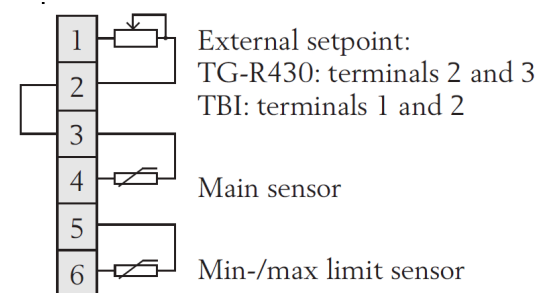


Fig. 3

### Constant supply air

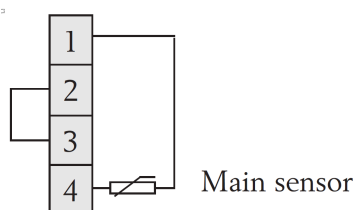


Fig. 4

### External signal 0...10 V DC

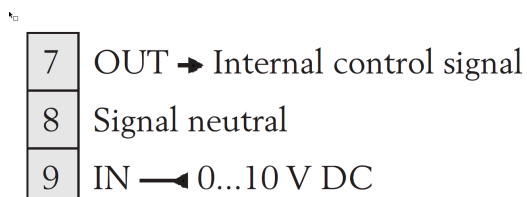


Fig. 5

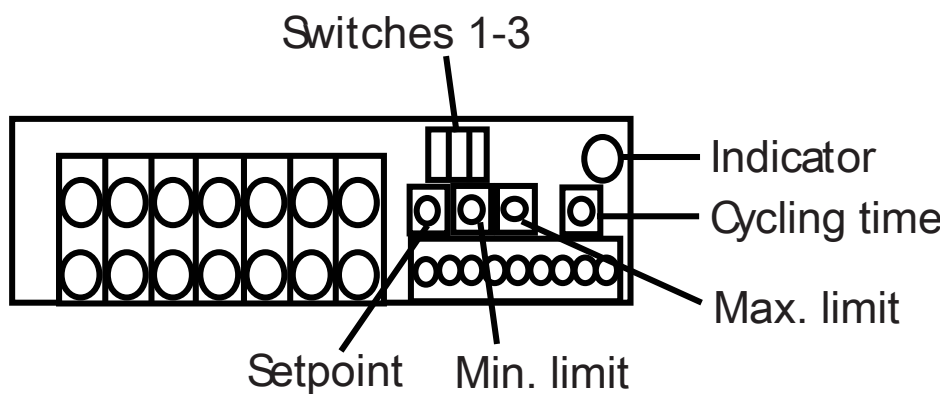


Fig. 6

#### Operating switches:

1. Setpoint:
  - Up: Built-in setpoint
  - Down: External setpoint
2. Min. temp. limit.:
  - Up: Activated
  - Down: Deactivated
3. Max. temp. limit.:
  - Up: Activated
  - Down: Deactivated

Min. and max. limit. function can be active simultaneously

### Documentation

All documentation can be downloaded from [www.regincontrols.com](http://www.regincontrols.com).