



**TTC40F is a controller for controlling 3-phase electric heating batteries. TTC40F is a controller which provides a high degree of versatility at a reasonable price.**

- \* The same unit for 3-phase 230V and 3-phase 400V. Automatic voltage adaption.
- \* Can control both star-connected and delta-connected loads.
- \* PI-control for constant supply air temperature control and P-control for room temperature control with automatic function adaption.
- \* Minimum and maximum limits adjustable.
- \* TTC40F is a complete controller for use with Regin temperature sensors.
- \* TTC40FX is controlled by a 0 - 10V signal from another controller.

## Function

TTC40F is a 3-phase triac controller for controlling electric heating up to 40 A. It is made for DIN-rail mounting in an electric cabinet or other enclosure. TTC40F is to be connected in series between power-supply and an electric heater and can control both Y- and Delta- connected loads. TTC40F can also control assymetrical Delta-loads.

### Function

The controller pulses the entire power output ON/OFF. The controller utilises time-proportional control, the ratio between On-time and Off-time is varied to fit the prevailing heating requirement. E.g. ON = 30 sec. and OFF = 30 sec. gives 50% output power. The cycle-time (the sum of on-time and off-time) is adjustable 6-60 sec.

This control accuracy contributes to reduced energy costs and to the increased comfort of an even temperature. Since the current is switched by semi-conductors (triacs) there are no moving parts that can wear out. As the current is switched at zero phase angle, network disturbance is eliminated.

TTC40F automatically adapt control mode to suit the dynamics of the controlled object.

### Supply air temperature control

For rapid temperature changes, TTC40F will work as a PI-controller with a fixed proportional band of 20K and a fixed reset time of 6 minutes.

### Room temperature control

For slow temperature changes, TTC40F will work as a P-controller with a fixed proportional band of 2K. When running room temperature control the supply air temperature can be maximum and/or minimum limited.

### Controlling larger electric heaters

At larger loads TTC40F can be combined with step controller TT-S4/D or TT-S6/D. See under section 2.

### TTC40FX

This controller has to be controlled by a 0 - 10V signal from another controller.

## Models

TTC40F	Triac controller for Regin NTC sensors.
TTC40FX	Triac controller for external signal 0-10 V DC only .

## Technical data

### General

Supply voltage	3-phase 210-255/380-415 V AC 50-60 Hz. Automatic adaption.
Power output	Maximum 40A/phase. Minimum 4A/phase. Both Y- and Delta- connected loads.
Ambient, running	Maximum 30°C with no condensation. N.B. TTC40F generates 70W
Ambient, storage	-40 - +50°C.
Humidity	90% RH maximum.
Dimensions (w x h x d)	192 x 222 x 95 mm.
Form of protection	IP20
CE	This product conforms with the requirements of European EMC standards CENELEC EN 50081-1 and EN 50082-1, European LVD standards IEC 669-1 and IEC 669-2-1 and carries the CE mark.

### Control unit parameters TTC40F

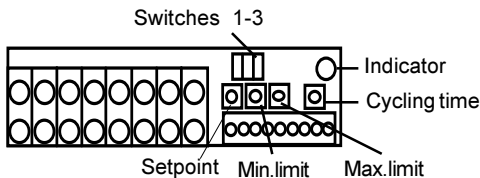
Proportional band	(Supply air temperature control) 20K, fixed.
Reset time	(Supply air temperature control) 6 minutes, fixed.
Proportional band	(Room temperature control) 2K, fixed.
Indicator	LED that is lit when power is pulsed to the heater.
Sensor inputs	Two (2) inputs for main sensor and maximum/minimum sensor. See Section 6-100 for choice of sensor. N.B. Max/min sensor must be 0...60°C.
Setpoint	Selectable, either internal setpoint potentiometer or external setting device.
Signal input	0 - 10V DC when running against other controllers.
Signal output	0-10 V connected to the output unit by wire strap (terminals 7-9).A

### Setting options

Setpoint	0 - 30°C, adjustable. The choice of sensor determines the controller setpoint range.
Minimum limits	0 - 30°C, adjustable.
Maximum limits	20 - 60°C, adjustable.
Cycle time	6 - 60 seconds, adjustable.
Night set-back	Possible by using Night Set-back unit NS/D , see datasheet section 1 position 325.

### TTC40FX

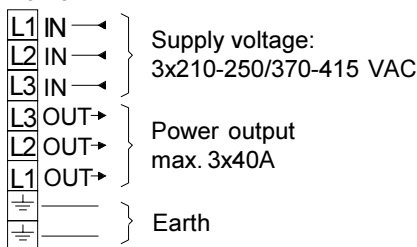
Input	Only for external input signal 0-10 V DC with adjustable cycling time. No internal control unit. No min- or maximum limiting, all other technical data as above.
-------	--



Switches	1	2	3
	Setpoint	Minimum limit	Maximum limit
	Up: Internal, Down: External	Up: Active, Down: Not active	Up: Active, Down: Not active

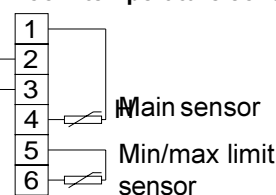
## Wiring and dimensions

### Power

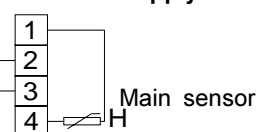


On TTC40F terminals 7 and 9 are connected by a factory-mounted wire strap.

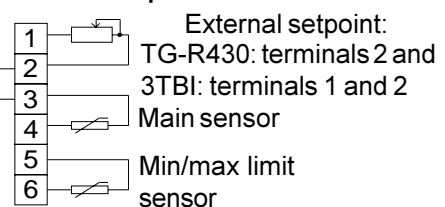
### Room temperature control



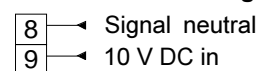
### Constant supply air



### Room temperature control with external setpoint



### TTC40FX external signal 0-10V DC



TTC40FX is without terminals 1-7.

FOR INDOOR CLIMATE WITH OPTIMUM CONTROL

### AB Regin

Box 116, SE-428 22 Källered, Sweden  
Visiting address: Bangårdsvägen 35

Phone: +46 31 795 44 60  
Fax: +46 31 795 38 50

www.regin.se  
E-mail: info@regin.se

Org.nr: SE5564145502  
Säte: Mölndal