



TC5044-MK4

UNIVERSAL CONTROLLER

TEMPERATURE HUMIDITY PRESSURE CARBON MONOXIDE & CARBON DIOXIDE & TIME SCHEDULING

DESCRIPTION

The TC5044 is a programmable controller that does not need to be programmed. It has pre-programmed blocks for temperature, humidity, pressure, flow, CO & CO₂.

The TC5044 has 40+ pre-programmed function blocks. It is only necessary to scroll through the functions and select one. The controller is then programmed. The default program (001) is 2 Stage Reverse Cycle. This is also used for 1 Stage Reverse Cycle. Any parameter of the program can also be changed, e.g. : proportional bands, relay on and off points, PWM rates, PI & PID functions, etc.

Inbuilt Timeclock with User Friendly programmable 7 - day time schedule and programmable holidays (default holidays pre-programmed except variable holidays each year).

The Timeclock can be enabled on Menu 25 / 26 with the ability of programming the 4 relays and 3 analogue outputs independently. It can also operate as a stand-alone Timeclock. The controller is housed in a 4 DIN module 70 x 88 x 62 mm enclosure. It comes with its own DIN rail mount or can be mounted on a standard 35mm DIN mounting rail. The TC5044 controller has a 2 x 16 character LCD display with white backlighting, 4 x blue relay status LED's and 3 push button's for INCREASE, DECREASE & SELECT.

The controller will operate with 1K, 2K and 10K NTC thermistor sensors and existing Regulator remote setpoints. It will also operate with PTC 1K Nickel and 1K Platinum sensors. The default is the 10K thermistor sensor. Up to 4 Smart Sensors can be connected to the controller. The controller will accept 2 or 3 wire 4 – 20mA / 0-10VDC inputs for Temperature, Humidity, Pressure, Flow, CO and CO₂.

There are 3 analogue outputs, plus one diode protected output of AO3. The analogue outputs are short circuit proof for low voltages. They will even protect against 24vac connected to them. The output will open circuit under fault conditions and will reset when the fault is removed.

There are 4 relay outputs, Relay 1 is a SPCO contact and Relays 2, 3 & 4 are SPNO contacts. The relays are rated at 5A 250VAC. The power supply will operate over the range of 18 – 265V AC/DC. It can power CO₂ sensors and other sensors requiring an external 24VDC power supply. The 24VDC output is available from terminal 1 when operating from a 2 wire 4-20mA or 3 wire 0-10vdc transducer. It can also power small damper and valve actuators directly without requiring an external 24VAC transformer, from Terminal 5.

LCD DISPLAY

This is a 2 x 16 character LCD display with white backlighting. The top line will display the Temperature / Humidity / Pressure / Flow / CO or CO2. This line will remain permanently displayed in normal mode. The second line display the setpoint. This can be adjusted by using the Raise / Lower buttons to change the setpoint. Temperature is adjustable in 0.5°C increments. A third line displays the three analogue outputs.

CONFIGURATION MENU

The TC5044 controller can be configured for many different modes of operation. The standard programs are listed in the table below. To select a program, hold the Select button for 10 seconds. Using the Increase / Decrease buttons ,step through the program you require. Press the Select button twice, scroll down to save and exit. The standard programs can be altered for different applications.

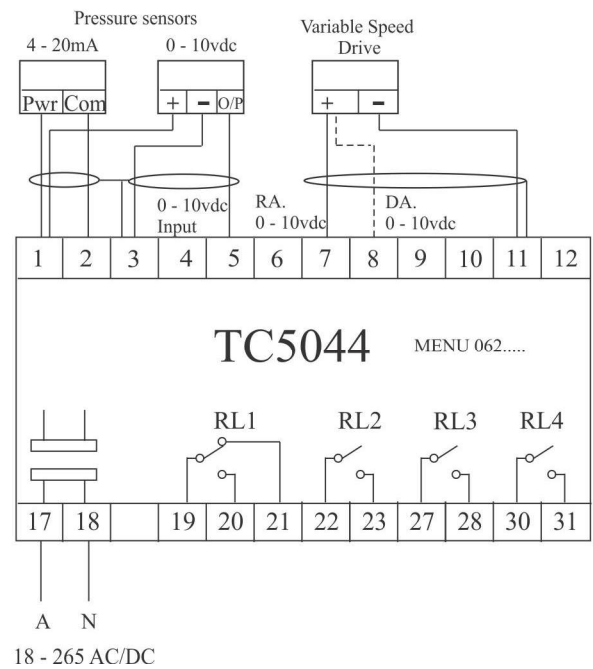
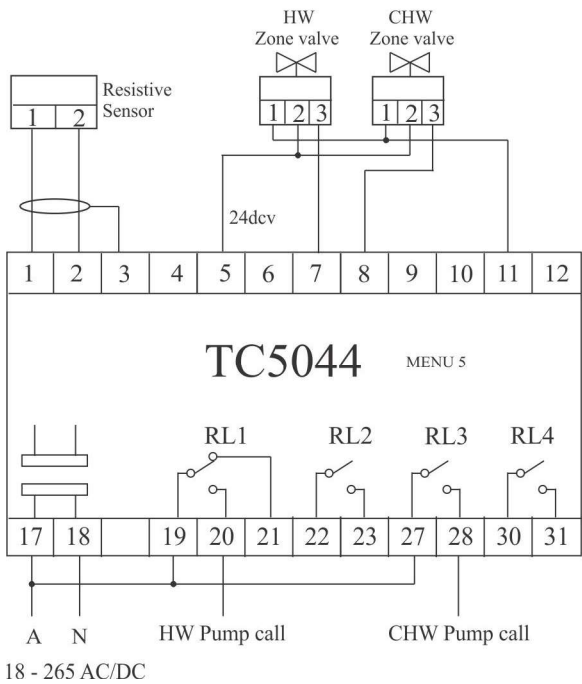
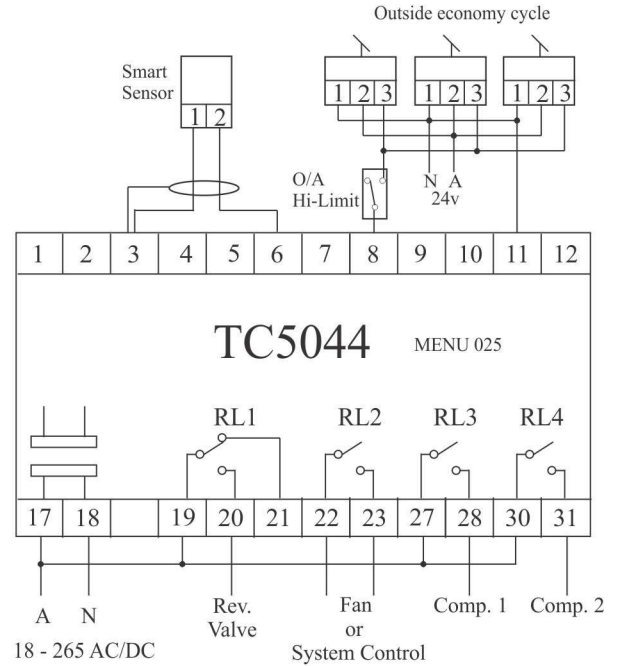
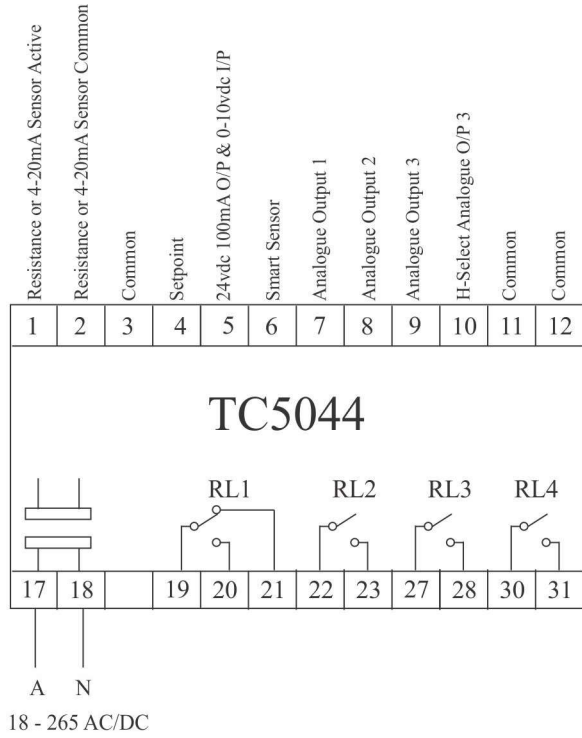
	TEMPERATURE		HUMIDITY
001	2 Heat, 2 Cool – Rev. Cyc, , 1 Heat – On/Off	051	Humidity 0 – 100% 2 R/A 2 D/A On/Off
002	3 Heat, 3 Cool – Reverse Cycle	053	Absolute Humidity
003	4 Heat – On/Off		PRESSURE
004	3 Stage On/Off Heat & 1 stage Cool – On/Off	061	Pressure 0 – 25 Pa, 2 R/A, 2 D/A – On/Off
005	2 Heat , 2 Cool – On/Off	062	Pressure 0 – 50 Pa, 2 R/A, 2 D/A – On/Off
006	1 Stage On/Off Heat & 3 Stage Cool – On/Off	063	Pressure 0 – 100 Pa, 2 R/A, 2 D/A – On/Off
007	4 Cool – On/Off	064	Pressure 0 – 250 Pa, 2 R/A, 2 D/A – On/Off
008	4 Stage Time proportional heat control	065	Pressure 0 – 500 Pa, 2 R/A, 2 D/A – On/Off
009	3 Stage Time proportional heat & 1 Stage control	066	Pressure 0 – 1000 Pa, 2 R/A, 2 D/A – On/Off
010	2 Stge Time proportional heat & 2 Stge cool control On/Off	067	Pressure 0 – 400 KPa, 2 R/A, 2 D/A – On/Off
011	1 Heat – Time Prop. 3 Cool – On/Off	068	Pressure 0 – 1000 KPa, 2 R/A, 2 D/A – On/Off
012	2 Heat, 1 Cool – On/Off, Thermal Valve Cool PWM	069	Pressure 0 – 3000 KPa, 2 R/A, 2 D/A – On/Off
013	1 Heat, 1 Cool – On/Off, T/V Heat, T/V Cool PWM		VOLTAGE RELAY
014	Wide Temperature Range. -50°C to 500°C	081	Relay Module 4 Stage On/Off & Proportional control
019	Temperature Setback		CO CARBON MONOXIDE
	FAN CONTROL	091	Gas CO 0 – 100 ppm, 2 R/A, 2 D/A – On/Off
025	2 Heat, 2 Cool – Rev. Cyc, Fan Control	092	Gas CO 0 – 200 ppm, 2 R/A, 2 D/A – On/Off
026	1 Heat, 2 Cool – On/Off, Fan Control	093	Gas CO 0 – 300 ppm, 2 R/A, 2 D/A – On/Off
027	2 Stage Rev. Cyc, with O/A Economy Cycle & Fan Control	096	Gas CO 0 – 100 ppm and Temperature
	Note: Time Delays on Compressors are 6 minutes Start to Start. 2 Minutes Stop to Start – Menu 25 Only .		CO2 CARBON DIOXIDE
	O/A ECONOMY CYCLE & DUAL TEMPERATURE	101	Gas CO2 0 – 2000 ppm, 2 R/A, 2 D/A – On/Off, Prop.Ctrl
033	3 Stage Rev. Cyc, Differential O/A Economy Cycle		REFRIGERANT GASES
036	3 Stage Rev. Cyc, Differential Enthalpy Economy Cycle	111	Gas R22 0 – 2000 ppm, 2 R/A, 2 D/A – On/Off
037	2 Zone 1 Stage Heat Pump and Econ. Cycle	112	Gas R134A 0 – 2000 ppm, 2 R/A, 2 D/A – On/Off
038	2 Zone x 1 Heat On/Off & 1 Cool On/Off	113	Gas R410A 0 – 2000 ppm, 2 R/A, 2 D/A – On/Off
039	Dual Zone Differential Control of Supply Air		2 x FAN AND 1 STAGE COOL DUTY CHANGE OVER
	TEMPERATURE & HUMIDITY	121	Duty Standby
041	2 Heat, 2 Cool – Rev. Cyc, 1 De-Humid On/Off		SCHEDULE
042	1 Heat, 2 Cool On/Off, 1 De-Humid On/Off		TIMED EVENTS
043	1 Heat, 1 Cool On/Off, 1 Humid, 1 De-Humid On/Off		TIME AND DATE
			FACTORY RESET
			FACTORY REST - ALL
			EXIT

SMART SENSORS

All the Smart Sensors will operate from the controller. Power and Comms are supplied over a 2 wire non-polarised connection. Up to four smart sensors can be connected to the controller. The controller will recognise how many are connected and will average the sensors. One of the sensors can be a display type TR3840.

When the TR3840 Smart Sensor with setpoint is connected, the TC5044 setpoint can be used to override the TR3840 setpoint to operate heating or cooling. This setpoint override will default back to the TR3840 setpoint after ten minutes.

CONNECTION DIAGRAM



TECHNICAL DATA

ITEM	DESCRIPTION
Supply Voltage	18 -265V AC/DC
Power Consumption	2 W nominal – up to 5 W with external load
Model	TC5044-MK4
Ambient Temp Operation	0 - 50°C
Ambient Humidity	Max. 90% RH
Dimensions	L 70 x H 88 x D 62mm
Weight	0.4 Kg
Wiring Terminal Size	4.0 mm ²
Inputs – Resistive Sensors	Thermistor 1K, 2K, 10K, Ni 1000R , Pt 1000R
- Smart Sensors	TR3800, TR3840, & TR3700 (Temp & Humidity)
- 0-10Vdc / 4-20mA Sensors	Humidity, Pressure, Flow, Carbon Monoxide & Carbon Dioxide etc.
Analogue Outputs	AO1, AO2 & AO3 0 – 10Vdc , 10mA Short Circuit Protected
	AO4 – Diode Protected Output of AO3
Relay Outputs	RL1 SPCO , RL2, RL3 & RL4 SPNO 250Vac 5 A Resistive
24 Vdc Power Supply	Output Current 100mA
Microcontroller	ST Processor : STM32F103ZG 32bit microprocessor
	72 MHz ARM Cortex – M3 , 1 Mbyte Flash
	96 Kbyte RAM , 12 Bit A/D Converter