



TC6644 UNIVERSAL CONTROLLER – INSTRUCTION MANUAL

DESCRIPTION OF OPERATION

Pressing the SEL (Select) button will activate the back light for 60 seconds.
 There are four lines of display on the main screen, press SEL button to toggle between the lines.
 The first line displays the parameter, e.g. TEMP.°C or HUMID %RH etc.
 The second line displays the measured variables, e.g. +25.0 and setpoint, SP: +23.0
 The third line displays the three analogue output voltages (0-10Vdc), AO1, AO2, AO3.
 Use the Up/Down arrows to change the setpoints.

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TECHNICAL DATA

ITEM	DESCRIPTION
Supply Voltage	18 - 265V AC/DC
Temp. Operating range	-20°C to 120°C
Frequency	50 – 60 Hz
Power Consumption	2 W nominal – up to 5 W with external load
Model	TC6644
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. Default setting 10K.
- Smart Sensors	TR3800, TR3840, & TR3700 (Temp & Humidity) TR3740
- 0-10Vdc / 4-20mA Sensors	Humidity, Pressure, Flow, Carbon Monoxide & Carbon Dioxide etc.
Analogue Outputs	AO1, AO2 & AO3 0 – 10Vdc , 10mA Short Circuit Protected
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

GETTING STARTED : Selecting the Menu. Factory Default Menu 001. 2 Stage reverse cycle & electric heat.

To select a different Menu, press and hold the SEL button for approx. 10 seconds to display current menu. i.e. > +001 TEMP. Use the Up or Down arrow to scroll to the Menu number required. i.e. 005 TEMP. See table below. Press SEL button to select. Press SEL button again > INPUTS displayed > scroll down to SAVE AND EXIT > Press SEL button > return to main screen.

MENU	TEMPERATURE - All Menu's have 3 Analogue (0-10Vdc) output for modulating valves or actuators
001	2 Heat, 2 Cool – Rev. Cyc, , 1 Heat – On/Off
002	3 Heat, 3 Cool – Reverse Cycle
003	4 Heat – On/Off
004	3 Stage On/Off Heat & 1 stage Cool – On/Off
005	2 Heat , 2 Cool – On/Off
006	1 Stage On/Off Heat & 3 Stage Cool – On/Off
007	4 Cool – On/Off
008	4 Stage Time proportional heat control
009	3 Stage Time proportional heat & 1 Stage control
010	2 Stage Time proportional heat & 2 Stage cool control On/Off
011	1 Heat – Time Prop. 3 Cool – On/Off
012	2 Heat, 1 Cool – On/Off, Thermal Valve Cool PWM
013	1 Heat, 1 Cool – On/Off, T/V Heat, T/V Cool PWM
014	Wide Temperature Range. -50°C to 500°C
019	Temperature Setback
MENU	TEMPERATURE - All Menu's have 3 Analogue (0-10Vdc) output for modulating valves or actuators
025	2 Heat, 2 Cool – Rev. Cyc, and system stop / start Fan Control
026	1 Heat, 2 Cool – On/Off, and system stop / start Fan Control
027	2 Stage Rev. Cyc with O/A Economy Cycle & Fan Control
033	3 Stage Rev. Cyc, Differential O/A Economy Cycle
036	3 Stage Rev. Cyc, Differential Enthalpy Economy Cycle
037	2 Zone 1Stage Heat Pump and Econ. Cycle
038	2 Zone x 1 Heat On/Off & 1 Cool On/Off
039	Dual Zone Differential Control of Supply Air

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GETTING STARTED : Selecting the Menu CONT.

MENU	TEMP. & HUMID. – Smart Sensor required. 3 x analogue outputs for valves, dampers or humidity.
041	2 Heat, 2 Cool – Rev. Cyc, 1 De-Humid On/Off
042	1 Heat, 2 Cool On/Off, 1 De-Humid On/Off
043	1 Heat, 1 Cool On/Off, 1 Humid, 1 De-Humid On/Off
	HUMIDITY. – Humidity Transmitter required. 3 x analogue outputs for humidity & De-humidity control.
051	Humidity 0 – 100% 2 R/A 2 D/A On/Off
053	Absolute Humidity
	Low Pressure Control. i.e. Air pressure control. Pressure Transmitter required.
061	Pressure range 0 – 25 Pa, 2 R/A, 2 D/A – On/Off - 4 relay & 3 analogue outputs for dampers or VSD control.
062	Pressure range 0 – 50 Pa, 2 R/A, 2 D/A – On/Off – As per Menu 061
063	Pressure range 0 – 100 Pa, 2 R/A, 2 D/A – On/Off – As per Menu 061
064	Pressure range 0 – 250 Pa, 2 R/A, 2 D/A – On/Off – As per Menu 061
065	Pressure range 0 – 500 Pa, 2 R/A, 2 D/A – On/Off – As per Menu 061
066	Pressure range 0 – 1000 Pa, 2 R/A, 2 D/A – On/Off – As per Menu 061
	Medium Pressure Control. i.e. Water pressure control. Pressure Transmitter required.
067	Pressure range 0 – 400 kPa, 2 R/A, 2 D/A – On/Off – As per Menu 061
068	Pressure range 0 – 1000 kPa, 2 R/A, 2 D/A – On/Off – As per Menu 061
	High Pressure Control. i.e. Refrigerant pressure control. Pressure Transmitter required.
069	Pressure range 0 – 3000 kPa, 2 R/A, 2 D/A – On/Off – As per Menu 061
	VOLTAGE RELAY
081	Relay Module 4 Stage On/Off & Proportional control. Adjustable output from one com. 0-10Vdc input signal
	CO. Carbon Monoxide Control. Carpark Fan auto control. CO Smart sensor or Transmitter required.
091	Gas CO 0 – 100 ppm, 2 R/A, 2 D/A – On/Off 4 relay & 3 analogue outputs for fan start, damp. or VSD control.
092	Gas CO 0 – 200 ppm, 2 R/A, 2 D/A – On/Off As per Menu 091
093	Gas CO 0 – 300 ppm, 2 R/A, 2 D/A – On/Off As per Menu 091
096	Gas CO 0 – 100 ppm and Temperature. As per Menu 091 plus temp. Control . Smart Sensor required.
	CO2. Carbon Dioxide Control. Automatic ventilation control. CO2 Transmitter required.
101	Gas CO2 0 – 2000 ppm, 2 R/A, 2 D/A – On/Off 4 relay & 3 Analog. outputs for fan start, damp. or VSD control.
	REFRIGERANT Gases
111	Gas R22 0 – 2000 ppm, 2 R/A, 2 D/A – On/Off
112	Gas R134A 0 – 2000 ppm, 2 R/A, 2 D/A – On/Off
113	Gas R410A 0 – 2000 ppm, 2 R/A, 2 D/A – On/Off
121	DUTY STANDBY
	SCHEDULE
	TIMED EVENTS
	TIME AND DATE
	FACTORY RESET
	FACTORY REST - ALL
	EXIT

To Reset Controller to Factory Settings. Default Configuration Menu 001.

Press and hold the SEL button for approx. 10 seconds. The current menu will be displayed, i.e. > + 001 TEMP. Press Down arrow and scroll to FACT RST ALL > press SEL button > RESTTING DB PLEASE WAIT displayed. After 30 secs > + 001 TEMP is displayed > select menu > press SEL button > INPUTS displayed > scroll down to SAVE AND EXIT > Press SEL and return to main screen.

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INPUTS

The TC6644 temperature default inputs are : (a) Smart Sensor or (b) 10k NTC thermistor sensor.

Optional input types :

Thermistor NTC : 2K i.e. ET45 Controller

Thermistor NTC : 1K i.e. Delta Dore Controller – Not TCU model.

Platinum PTC : 1K

Nickel PTC : 1K

Thermistor PTC

Current Loop : 4-20mA

Voltage Input : 0-10Vdc

To Change the default temperature sensor input to optional input types. See below.

Press and hold SEL button for approximately 10 seconds until current Menu is displayed : i.e. > + 005 TEMP.

Press SEL button again. INPUTS / OUTPUTS displayed.

Press SEL button again and select INPUTS. SENSOR displayed.

Press SEL button again. THERMISTOR, 4-20mA and SMART SENSOR is displayed. Select THERMISTOR.

Press SEL button again. The current sensor will be displayed. i.e. 10K. Scroll up/down to required selection. E.g. 2K, 1K etc.

Press SEL button again. + 2K displayed.

Press SEL button again. + NUM THRMS = 1/2/3/4 displayed. This allows you to select the number of thermistors in circuit.

Select the number in circuit. E.g. 1. Press SEL button. RUN CONTROL displayed. Scroll down to Exit , press SEL and then

INPUT/OUTPUT displayed. Scroll down to SAVE & EXIT.

Press SEL button and TC6644 will return to main operating screen.

To change the temperature sensor to a temperature transmitter (4-20mA).

After entering Menu (see above) select 4-20mA instead of THERMISTOR.

Press SEL button.

4mA value is displayed. E.g. 20 (20°C) Change and/or select current value. 20mA value displayed. E.g. 25 (25°C).

Change and/or select current value, press SEL button. NUM 4-20mA = 1/2 displayed (number of Transmitters in circuit).

Select number in circuit. E.g. 2. Press SEL button. . RUN CONTROL displayed. Scroll down to Exit , press SEL and then

INPUT/OUTPUT displayed. Scroll down to SAVE & EXIT.

Press SEL button and TC6644 will return to the main screen.

Pressure or Gas Menu's. Default setting is 4-20mA.

To change to 0-10Vdc . Press and hold SEL button for 10 seconds.

The current Menu will be displayed : i.e. > + 061 PRESS.

Press SEL button. INPUTS/OUTPUTS displayed.

Press SEL button to select INPUTS.

Press SEL button to select SENSOR.

Press SEL button to select 0-10V.

Press SEL button. 0V value shown. i.e. 0.00 (0.00Pa) Adjust if required.

Press SEL button. 10V value shown. i.e. 25.00 (25.00Pa) Adjust if required.

Press SEL button. RUN CONTROL displayed. Scroll down to EXIT.

Press SEL button. INPUT/OUTPUT displayed. Scroll down to SAVE & EXIT.

Press SEL button to return to main operating screen.

To Change Setpoint control. Default setting is by the Up/Down arrows on TC6644.

Press and hold SEL button for 10 seconds. The current Menu will be displayed : i.e. > + 005 TEMP.

Press SEL button again, to select. INPUTS/OUTPUTS displayed. Select INPUTS and press SEL button.

SENSOR, SETPOINT & EXIT displayed. Select SETPOINT and press SEL button.

INTERNAL, EXTERNAL, SMART SENSOR and EXIT displayed. Scroll to selection. E.g. EXTERNAL

Press SEL button. See below for the different selection.

EXTERNAL selection. Following selections displayed.

REGULATOR

CUSTOM

EXIT

Press Up/Down arrow to required selection. E.g. REGULATOR. Press SEL button. EXTERNAL – Scroll down to EXIT.

INPUT/OUTPUT displayed. Scroll down to SAVE & EXIT. Press SEL button to return to main screen.

INTERNAL selection. To change temperature increments from 0.5° to 0.1° .

Select internal with SEL button : SP CHG = 0.5 & SP CHG = 0.1 displayed. Select 0.1 and press SEL button.

INPUT/OUTPUT displayed. Scroll down to SAVE & EXIT. Press SEL button to return to main screen.

SMART SENSOR selection.

If Smart Sensor is connected to the TC6644 , it is automatically controlled from the Smart Sensor.

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INPUTS

To set up address of the two duct smart sensors for menu 33 & 27

Under the lid of the TP3801 duct probe there are two dip switched.
 Set both switches 1 and 2 to off positions to select O/A (outside air)
 Set switch 1 to on position and switch 2 to off position for R/A (return air sensor)



1 2
 OFF OFF = O/A
 ON OFF = R/A

To set up address of the two duct smart sensors for menu 36

Under the lid of the T3701 duct probe there are two dip switched.
 Set both switches 1 and 2 to off positions to select O/A (outside air)
 Set switch 1 to on position and switch 2 to off position for R/A (return air sensor)



1 2
 OFF OFF = O/A
 ON OFF = R/A

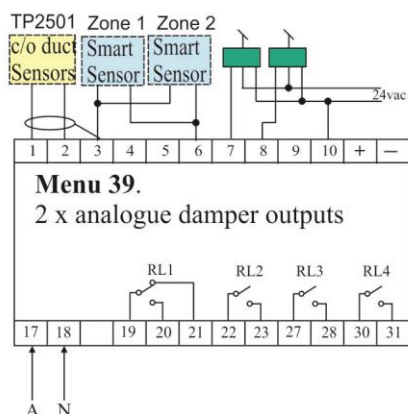
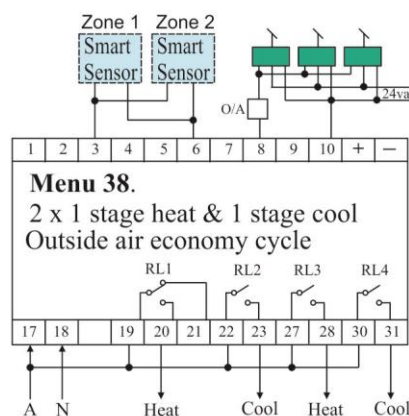
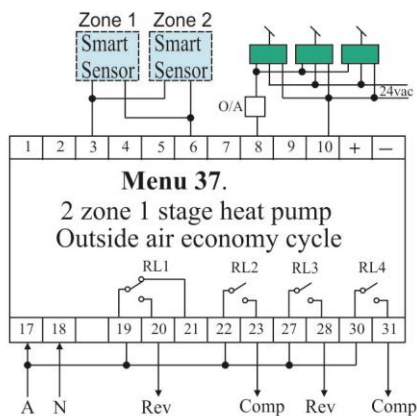
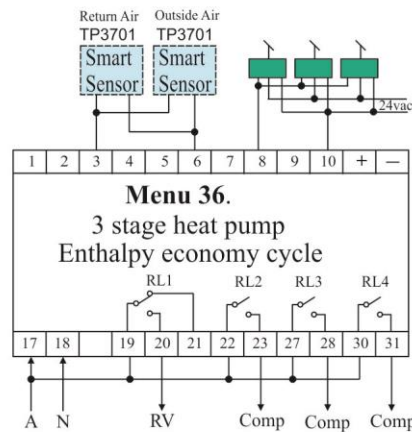
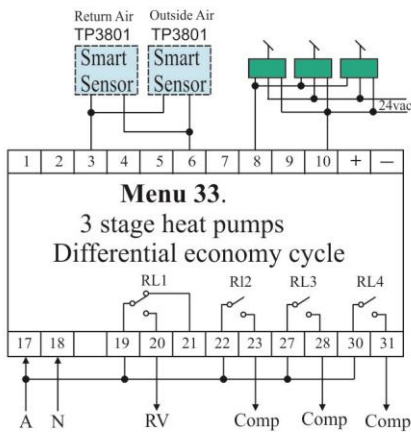
To set up the address of the two smart sensors on menus 37, 38 & 39. See below.

Under the cover of the Smart sensor there are two dip switches
 Set switch 1 to off position and switch 2 to on position to select zone 1
 Set both switches 1 and 2 to the on positions to select zone 2



1 2
 OFF ON = ZONE 1
 ON ON = ZONE 2

Typical TC6644 wiring diagrams



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OUTPUTS

To Change the default relay switching points. See below.

Press and hold SEL button for approximately 10 seconds until current Menu is displayed : i.e. > + 005 TEMP.

Press SEL button again. INPUTS / OUTPUTS displayed.

Scroll down to OUTPUTS, press SEL button.

RELAY, ANALOGUE, & EXIT displayed. Select RELAY and press SEL button.

RELAY 1, RELAY 2, RELAY 3, RELAY 4 and EXIT is displayed.

See below for example Menu selections. Refer to default relay settings and operating modes on Page 6.

ON / OFF Control. E.g. Menu 5.

Scroll to required relay and press SEL button. ON/OFF displayed. Press SEL again.

ON POINT displayed. i.e. 1.00 (RL3) or -1.00 (RL1) . This is the ON point above or below (-) temperature setpoint.

Adjust and press SEL button. OFF POINT displayed. i.e. 0.5 or -0.5. This is the OFF point above or below (-) setpoint.

Adjust and press SEL button and returns to RELAY screen. Repeat as required for other relays , then scroll down to EXIT.

Press SEL button, returns to INPUT/OUTPUT screen. Scroll to SAVE & EXIT. Press SEL button. Return to main screen.

DUAL Relay Control systems.

Reverse Cycle. Menu's 1, 2, 25 & 41.

Select relays 3 & 4 (relays 2,3,4 in Menu 2). COMPRESSOR displayed.

PRI ON POINT (heat mode) displayed. i.e. – 1.00 (Comp. On point in heat). Adjust as required , press SEL button.

PRI OFF POINT displayed. i.e. -0.5 (Comp. Off point in heat). Adjust as required, press SEL button.

SEC ON POINT (Cool mode) displayed. i.e. 1.00 (Comp. On in cool). Adjust as required , press SEL button.

SEC OFF POINT displayed. i.e. 0.5 (Comp. Off point in cool). Adjust as required , press SEL button.

Returns to RELAY screen. Exit to main screen as above.

Temperature & Humidity. Menu's 41, 42 & 43.

Sub-mode 1. Temperature relays.

Sub-mode 2. Humidity relays.

REV VALVE. To adjust On/OFF point for reversing valve (s). RELAY 1

Adjust as above if required.

PWM/TP Control. Time proportional control of heat relays. E.g. Relay 1 & Relay 2 in Menu 005.

Select PWM/TP . Press SEL again. ON POINT displayed.

Adjust and press SEL button. OFF POINT displayed. Adjust as required , press SEL button.

TIMEBASE (S) displayed, cycle time before action. i.e. 10 (seconds). Adjust and press SEL button.

MIN DUTY CYC % displayed . Relay OFF point in cycle. Adjust and press SEL button.

MAX DUTY CYC % displayed . Relay ON point in cycle. Adjust and press SEL button.

Returns to RELAY screen. Exit to main screen as above.

Analogue Outputs. 3 x 0-10Vdc to modulate valves, actuators, VSD's, SSR's etc.

Enter into OUTPUTS as described above and select ANALOG. Press SEL button.

ANALOG 1, ANALOG 2 & ANALOG 3 and EXIT displayed.

Analog 1 : 0-10Vdc RA.

Analog 2 : 0-10Vdc DA.

Analog 3 : 0-10Vdc RA.

Select Analog output to be changed , press SEL button. 0-10V displayed. (On/Off or PWM/TP can be selected).

Press SEL button, PROPORTIONAL and PID displayed. E.g. Select PROPORTIONAL.

ON POINT displayed. i.e. 1.00 or -1.00.

Temperature in degrees (°C) above or below setpoint for maximum output (10Vdc).

Adjust and press SEL button. OFF POINT displayed. i.e. 0.50 or -0.50.

Temperature in degrees (°C) above or below setpoint for minimum output (0Vdc).

Adjust and press SEL button. Returns to Analog screen. Repeat for other Analogs as required.

Scroll down to EXIT and press SEL. Returns to INPUT/OUTPUT screen. Scroll to SAVE and EXIT.

Returns to main screen.

Change 0-10Vdc proportional to PID Control Function.

Select PID and press SEL button.

PROPNL (Proportional) BAND displayed. E.g. 6 Raise or lower value if required, press SEL button.

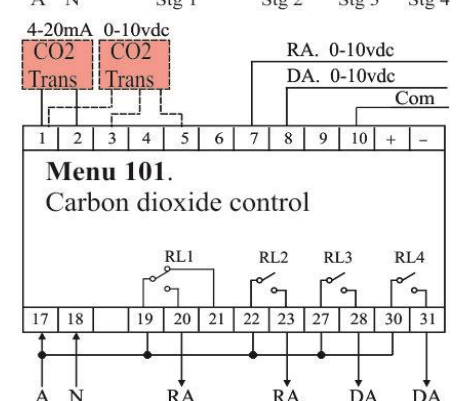
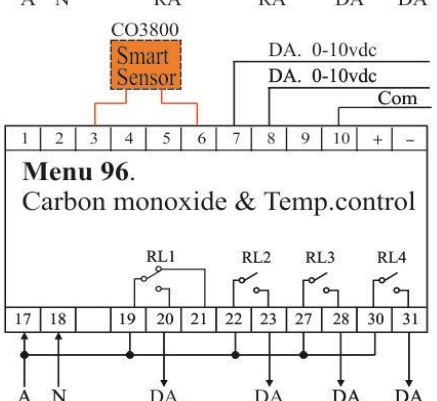
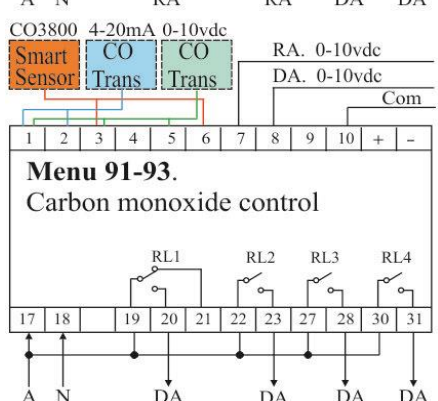
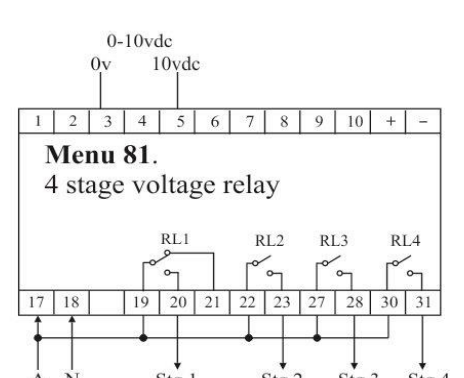
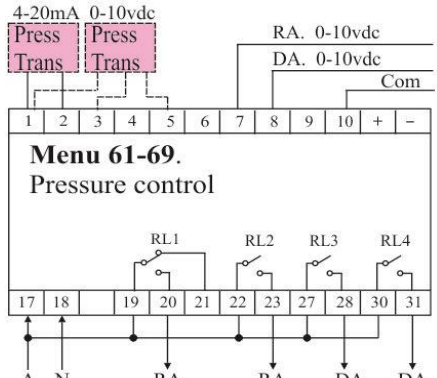
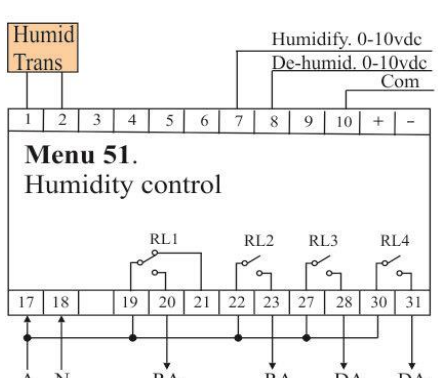
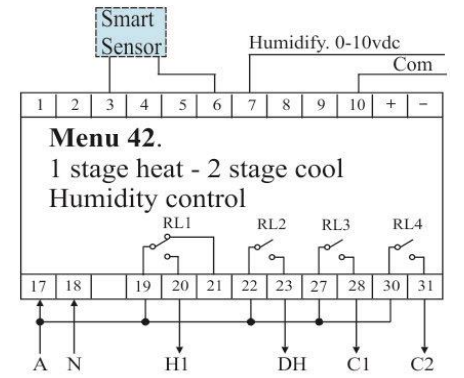
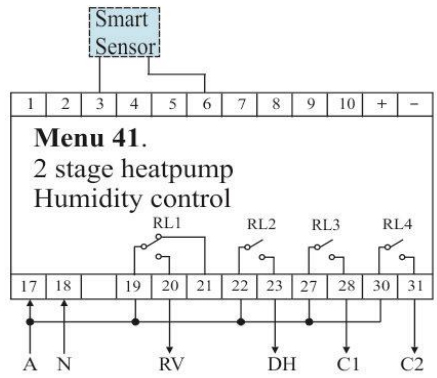
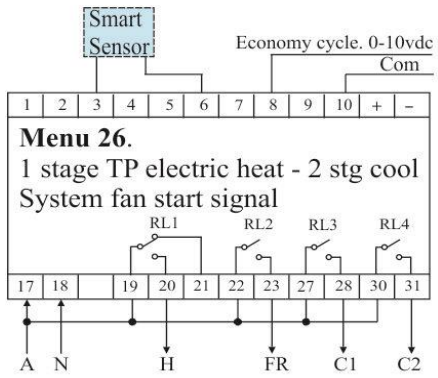
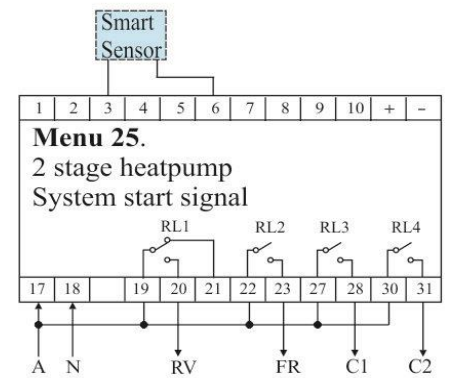
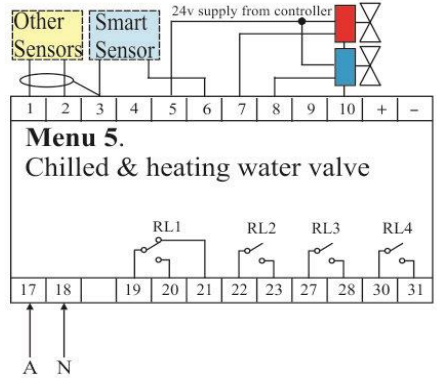
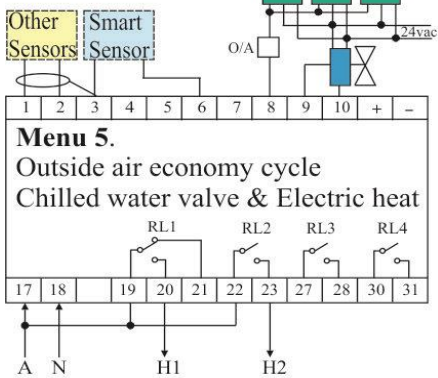
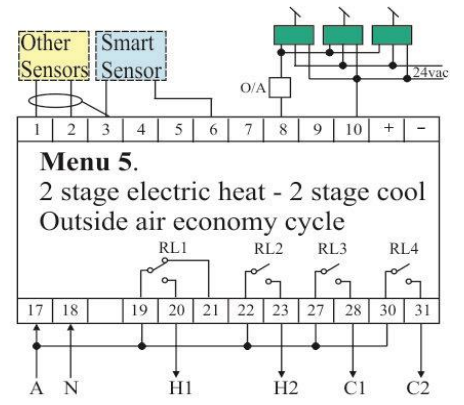
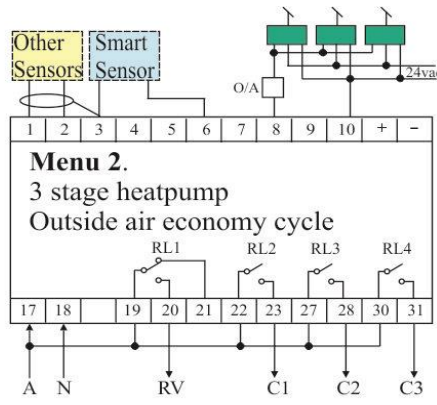
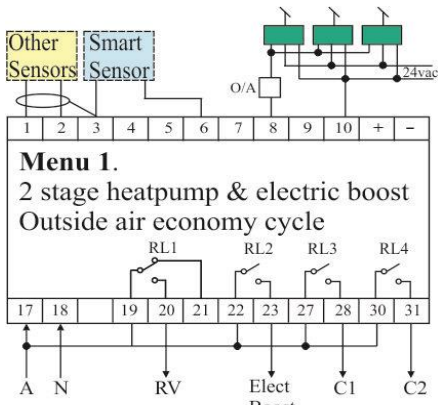
INTEGS TIME (secs) displayed. E.g. 22.00. Raise or lower value if required, press SEL button.

DERVTV TIME (secs) displayed. E.g. 3.00. Raise or lower value if required, press SEL button. Returns to Analog screen.

Change other Analogs as required and scroll down to EXIT and press SEL button.

Returns to INPUT/OUTPUT screen. Scroll to SAVE and EXIT and return to main screen.

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DEFAULT RELAY SETTINGS FOR MENU'S

Relay Output Settings - Red = Reverse Acting, Blue = Direct Acting, Green = Dual Acting										
Notes: On/Off Values relative to Setpoint.										
Menu	Function	Relay 1		Relay 2		Relay 3		Relay 4		Notes
		ON	OFF	ON	OFF	On	Off	ON	OFF	
001	2 Stage Rev.Cyc & 1 Stage Elec Heat	-0.25	0.00	-1.00	-0.50	-1.00	-0.50	-1.50	-1.00	RL1 - Reverse Valve, RL2 - Elec Heat, RL3/4 - Compressor
002	3 Stage Reverse Cycle	-0.25	0.00	-1.00	-0.50	-1.50	-1.00	-2.00	-1.50	RL1 - Reverse Valve, RL2/3/4 - Compressor
003	4 Stage Heat	-0.50	0.00	-1.00	-0.50	-1.50	-1.00	-2.00	-1.50	
004	3 Stage Heat/ 1 Stage Cool	-1.00	-0.50	-1.50	-1.00	-2.00	-1.50	+1.00	+0.50	
005	2 Stage Heat/ 2 Stage Cool	-1.00	-0.50	-1.50	-1.00	+1.00	+0.50	+1.50	+1.00	
006	1 Stage Heat/ 3 Stage Cool	-1.00	-0.50	+1.00	+0.50	+1.50	+1.00	+2.00	+1.50	
007	4 Stage Cool	+0.50	0.00	+1.00	+0.50	+1.50	+1.00	+2.00	+1.50	
008	4 Stage Heat. Time Prop Heat Cycle	-0.50	0.00	-1.00	-0.50	-1.50	-1.00	-2.00	-1.50	TP 100 Sec Time Base
009	3 Stage Heat TP/1 Stage Cool	-1.00	-0.50	-1.50	-1.00	-2.00	-1.50	+1.00	+0.50	TP 100 Sec Time Base
010	2 Stage Heat TP/2 Stage Cool	-1.00	-0.50	-1.50	-1.00	+1.00	+0.50	+1.50	+1.00	TP 100 Sec Time Base
011	1 Stage Heat TP/3 Stage Cool	-1.00	-0.50	+1.00	+0.50	+1.50	+1.00	+2.00	+1.50	TP 100 Sec Time Base
012	2 Stage Heat/Therm Vlv Cool. 24v Cool Pump Call, PWM 40sec Time Base	-1.00	-0.50	-1.50	-1.00	+0.50	+0.25	+1.25	+0.25	RL1/2 - Heat, RL3 - CHW Pump, RL4 - Therm Cool Valve
013	Thermal Valve PWM. 240VAC Heat/Cool Call, PWM 40sec Time Base	-0.50	-0.25	-1.25	-0.25	+0.50	+0.25	+1.25	+0.25	RL1 - HWP, RL2 - Therm Heat, RL3 - CHW Pump, RL4 - Therm Cool
014	1 Stage Heat/ 1 Stage Cool High Temp	-2.50	0.00	-5.00	-2.50	-5.00	-7.50	+20.00	+25.00	
019	2 Stage Heat/ 2 Stage Cool Adjustable After Hours Setback	-1.00	0.00	-1.50	-1.00	+1.00	0.00	+1.50	+1.00	Night Setback
25	2 Stage Rev.Cyc & Fan Control	-0.25	0.00	Fan Control		-1.00	-0.50	-1.50	-1.00	Use with TR38XX Smart Sensors
26	2 Stage Heat & Fan Control	-1.00	-0.50	Fan Control		+1.00	+0.50	+1.50	+1.00	Use with TR38XX Smart Sensors
27	Reverse Cycle Temp and Fan Control with Differential Temp Economy	-0.25	0.00	Fan Control		-1.00	-0.50	-1.50	-1.00	Use with TR38XX Smart Sensors
033	Reverse Cycle Temp and Differential Temp Economy Cycle	-0.25	0.00	-1.00	-0.50	-1.50	-1.00	-2.00	-1.50	Use with TR38XX Smart Sensors
036	Reverse Cycle Temp and Enthalpy Economy	-0.25	0.00	+1.00	+0.50	+1.50	+1.00	+2.00	+1.50	User with TR37XX Smart Sensors
037	2 Zone 1 Stage Reverse Cycle	-0.25	0.00	-1.00	-0.50	-0.25	0.00	-1.00	-0.50	RL1/2 - AC 1R/C and Comp, RL 3/4 AC 2 R/C and Comp
038	2 Zone 1 Stage Heat/Cool	-1.00	-0.50	+1.00	+0.50	-1.00	-0.50	+1.00	+0.50	
039	Zone and Duct	-1.00	0.00	-2.00	-1.00	-3.00	-2.00	-4.00	-3.00	

TC6644 UNIVERSAL CONTROLLER – INSTRUCTION MANUAL

DEFAULT RELAY SETTINGS FOR MENU'S

Relay Output Settings - Red = Reverse Acting , Blue = Direct Acting , Green = Dual Acting										
Notes: On/Off Values relative to Setpoint.										
Menu	Function	Relay 1		Relay 2		Relay 3		Relay 4		Notes
		ON	OFF	ON	OFF	On	Off	ON	OFF	
041	2 Stage Rev. Cycle and Humidity Control	-0.25	0.00	+5.00	0.00	-1.00 +1.00	-0.50 +0.50	-1.50 +1.50	-1.00 +1.00	User with TR37XX Smart Sensors RL2 - Humidity
042	1 Stage Heat/2 Stage Cool & Humidity Control	-1.00	-0.50	+10.00	+5.00	+1.00	+0.50	+1.50	+1.00	User with TR37XX Smart Sensors RL2 - Humidity
043	1 Stage Heat/1 Stage Cool & Humidity/Dehumidity Control	-10.00	-5.00	+10.00	+5.00	-1.00	-0.50	+1.00	+0.50	User with TR37XX Smart Sensors RL1/2 - Humidity
051	Humidity Control On/Off	-5.00	0.00	-10.00	-5.00	+5.00	0.00	+10.00	+5.00	
053	ABS Humidity Control	-1.00	0.00	-2.00	-1.00	+1.00	0.00	+2.00	+1.00	Grams/Kg
061	Pressure 0-25Pa	-2.50	0.00	-5.00	-2.50	+2.50	0.00	+5.00	+2.50	
062	Pressure 0-50Pa	-5.00	0.00	-10.00	-5.00	+5.00	0.00	+10.00	+5.00	
063	Pressure 0-100Pa	-10.00	0.00	-20.00	-10.00	+10.00	0.00	+20.00	+10.00	
064	Pressure 0-250Pa	-20.00	0.00	-40.00	-20.00	+20.00	0.00	+40.00	+20.00	
065	Pressure 0-500Pa	-40.00	0.00	-80.00	-40.00	+40.00	0.00	+80.00	+40.00	
066	Pressure 0-1000Pa	-100.00	0.00	-200.00	-100.00	+100.00	0.00	+200.00	+100.00	
067	Pressure 0-400kPa	-30.00	0.00	-60.00	-30.00	+30.00	0.00	+60.00	+30.00	
068	Pressure 0-1000kPa	+50.00	0.00	+100.00	+50.00	+150.00	+100.00	+200.00	+150.00	
069	Pressure 0-3000kPa	+100.00	0.00	+200.00	+100.00	+300.00	+200.00	+400.00	+300.00	
081	4 Stage Voltage Relay	+3.00	+1.00	+5.00	+3.00	+7.00	+5.00	+7.00	+9.00	
091	CO Gas 0-100 ppm	Alarm		+10.00	0.00	+30.00	+20.00	+20.00	0.00	Use with CO3800
092	CO Gas 0-200 ppm	+10.00	0.00	+10.00	+20.00	+30.00	+20.00	+30.00	+20.00	
093	CO Gas 0-300 ppm	+10.00	0.00	+10.00	+20.00	+30.00	+20.00	+30.00	+20.00	
096	CO Gas 0-100 ppm, Temp	Alarm		+1.00 (Temp)	0.00 (Temp)	+20.00	0.00	+20.00	0.00	Use with CO3800
101	CO2 Gas 0-2000 ppm	-200.00	0.00	-400.00	-200.00	+200.00	0.00	+400.00	+200.00	
111	Refrig Gas R22 0-2000 ppm	-200.00	0.00	-400.00	-200.00	+200.00	0.00	+400.00	+200.00	
112	Refrig Gas R134a 0-2000 ppm	-200.00	0.00	-400.00	-200.00	+200.00	0.00	+400.00	+200.00	
113	Refrig Gas R410a 0-2000 ppm	-200.00	0.00	-400.00	-200.00	+200.00	0.00	+400.00	+200.00	
121	Duty / Standby	Fan Control		+0.50	+0.25	Fan Control		+0.50	+0.25	Fault/time changeover cool only

TC6644 UNIVERSAL CONTROLLER – INSTRUCTION MANUAL

DEFAULT ANALOGUE (0-10Vdc) SETTINGS FOR MENU'S

Analogue Output Settings - Red = Reverse Acting, Blue = Direct Acting, Green = Dual Acting								
Notes: On/Off Values relative to Setpoint. Terminal 10 on TC5044 only is a High Select Output for AO3								
Menu	Function	Analogue 1		Analogue 2		Analogue 3		Notes
		ON	OFF	ON	OFF	ON	OFF	
001	2 Stage Rev.Cyc & 1 Stage Elec Heat	-1.00	0.00	+1.00	0.00	+2.00	0.00	
002	3 Stage Reverse Cycle	-1.00	0.00	+1.00	0.00	+2.00	0.00	
003	4 Stage Heat	-1.00	0.00	+1.00	0.00	+2.00	0.00	
004	3 Stage Heat/ 1 Stage Cool	-1.00	0.00	+1.00	0.00	+2.00	0.00	
005	2 Stage Heat/ 2 Stage Cool	-1.00	0.00	+1.00	0.00	+2.00	0.00	
006	1 Stage Heat/ 3 Stage Cool	-1.00	0.00	+1.00	0.00	+2.00	0.00	
007	4 Stage Cool	-1.00	0.00	+1.00	0.00	+2.00	0.00	
008	4 Stage Heat. Time Prop Heat Cycle	-1.00	0.00	+1.00	0.00	+2.00	0.00	
009	3 Stage Heat TP/1 Stage Cool	-1.00	0.00	+1.00	0.00	+2.00	0.00	
010	2 Stage Heat TP/2 Stage Cool	-1.00	0.00	+1.00	0.00	+2.00	0.00	
011	1 Stage Heat TP/3 Stage Cool	-1.00	0.00	+1.00	0.00	+2.00	0.00	
012	2 Stage Heat/Therm Viv Cool. 24v Cool Pump Call	-1.00	0.00	+1.00	0.00	+2.00	0.00	
013	Thermal Valve PWM. 240VAC Heat/Cool Call	-1.00	0.00	+1.00	0.00	+2.00	0.00	
014	1 Stage Heat/ 1 Stage Cool High Temp	-2.50	0.00	-5.00	-2.50	+2.50	0.00	
019	2 Stage Heat/ 2 Stage Cool Adjustable After Hours Setback	-1.00	0.00	+1.00	0.00	+2.00	0.00	
25	2 Stage Rev.Cyc & Fan Control	-1.00	0.00	+1.00	0.00	+2.00	0.00	Use with TR38XX Smart Sensors
26	2 Stage Heat & Fan Control	-1.00	0.00	+1.00	0.00	+2.00	0.00	Use with TR38XX Smart Sensors
27	Temp and Fan Control with Differential Temp Economy	-1.25	0.00	+1.25	0.00	+1.25	0.00	Use with TR38XX Smart Sensors
033	Temp and Differential Temp Economy Cycle	-1.25	0.00	+1.25	0.00	+1.25	0.00	Use with TR38XX Smart Sensors
036	Temp and Enthalpy Economy	-1.25	0.00	-1.00/+1.00	0.00	+1.25	0.00	
037	2 Zone 1 Stage Reverse Cycle	-1.00	0.00	+1.00	0.00	+2.00	+1.00	
038	2 Zone 1 Stage Heat/Cool	-1.00	0.00	+1.00	0.00	+2.00	+1.00	
039	Zone and Duct	+1.00	0.00	+1.00	0.00	+4.00	+2.00	
041	2 Stage Rev. Cycle and Humidity Control	-10.00	0.00	+1.00	0.00	+2.00	+1.00	
042	1 Stage Heat/2 Stage Cool & Humidity Control	-10.00	0.00	-1.00	0.00	+1.00	0.00	
043	1 Stage Heat/1 Stage Cool & Humidity/Dehumidity Control	-10.00	0.00	-1.00	0.00	+1.00	0.00	
051	Humidity Control On/Off	-1.00	0.00	+5.00	0.00	+10.00	+5.00	
053	ABS Humidity Control	-1.00	0.00	+1.00	0.00	+2.00	+1.00	

TC6644 UNIVERSAL CONTROLLER – INSTRUCTION MANUAL

DEFAULT ANALOGUE (0-10Vdc) SETTINGS FOR MENU'S

061	Pressure 0-25Pa	-2.50	0.00	+5.00	-2.50	+5.00	+2.50	
062	Pressure 0-50Pa	-5.00	0.00	+5.00	0.00	+10.00	+5.00	
063	Pressure 0-100Pa	-10.00	0.00	+10.00	0.00	+20.00	+10.00	
064	Pressure 0-250Pa	-20.00	0.00	+20.00	0.00	+40.00	+20.00	
065	Pressure 0-500Pa	-40.00	0.00	+40.00	0.00	+80.00	+40.00	
066	Pressure 0-1000Pa	-100.00	0.00	+100.00	0.00	+200.00	+100.00	
067	Pressure 0-400kPa	-30.00	0.00	+30.00	0.00	+60.00	+30.00	
068	Pressure 0-1000kPa	-100.00	0.00	+100.00	0.00	+200.00	+100.00	
069	Pressure 0-3000kPa	-300.00	0.00	+300.00	0.00	+600.00	+300.00	
081	4 Stage Voltage Relay	0.00	+10.00	+5.00	0.00	+5.00	+10.00	
091	CO Gas 0-100 ppm	+10.00	0.00	+10.00	0.00	+20.00	+10.00	Use with CO3800
092	CO Gas 0-200 ppm	-10.00	0.00	+10.00	0.00	+40.00	+20.00	
093	CO Gas 0-300 ppm	-10.00	0.00	+10.00	0.00	+20.00	+10.00	
096	CO Gas 0-100 ppm, Temp	+10.00	0.00	+1.00 (Temp)	0.00 (Temp)	+15.00	+2.00	Use with CO3800
101	CO2 Gas 0-2000 ppm	-200.00	0.00	+200.00	0.00	+400.00	+200.00	
111	Refrig Gas R22 0-2000 ppm	-200.00	0.00	+200.00	0.00	+400.00	+200.00	
112	Refrig Gas R134a 0-2000 ppm	-200.00	0.00	+200.00	0.00	+400.00	+200.00	
113	Refrig Gas R410a 0-2000 ppm	-200.00	0.00	+200.00	0.00	+400.00	+200.00	
121	Duty / Standby	-1.00	0.00	+1.00	0.00	+2.00	+1.00	

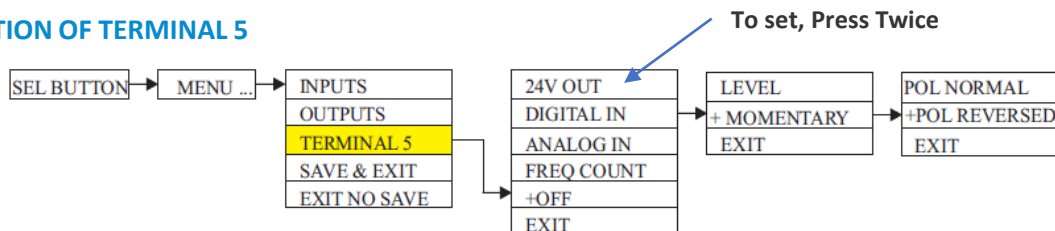
CONFIGURATION OF TERMINAL 5

NOTE : TO SETUP TERMINAL 5 – It first has to be disabled under the MENU. Once setup, you HAVE TO enable under applicable MENU.

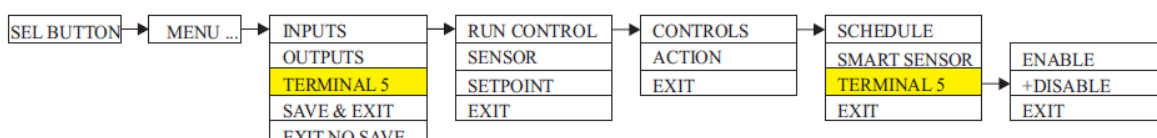
THERE ARE FIVE (5) SELECTIONS : TO SET, PRESS TWICE

- 24Vdc Output** : Suitable for small actuators only – Up to 1.5Watts MAX.
- DIGITAL IN** : Two selections – LEVEL – POL REV (Polarity Reversed)
(Only for Menu's 25 ,26 & 27) - POL NORM (Polarity Normal)
- MOMENTARY – POL REV (Polarity Reversed)
- POL NORM (Polarity Normal)
- ANALOGUE IN** : 0 – 10Vdc
- FREQ. COUNT** : Pulsed Inputs (Up to 1 kHz)
- OFF** (Factory Setting)
AFTER CHANGES MADE – SAVE & EXIT.

CONFIGURATION OF TERMINAL 5



TO ENABLE TERMINAL 5



TC6644 UNIVERSAL CONTROLLER – INSTRUCTION MANUAL

MENU'S 91 and 96 PURGE FUNCTION DESCRIPTION

Menu's 91 and 96 have a Purge Function which will automatically turn on the fan relay (relay 2) if the fan has not run for 24 hours . This is determined from the last fan run time ,which is updated when the fan is running. i.e. The last run time will be the time the fan turned off.

The 24 hours is determined on the hour only (not the minutes). So , if the fan last turned off at 16:37 ,then the purge will occur at 16:00 the next day.

The Purge Function will operate under the following conditions :

1. Time and Date must be setup on the TC5044 Controller
2. The purge time is set in minutes – between 0 – 60 minutes. If it is set for 0 minutes , then the purge is disabled .
3. 24 hours has lapsed since the system was powered up.
4. The purge function will only be performed between 8:00 – 17:00 ; so if it is 24hrs past the last fan runtime and it is 6:00, then the purge will be delayed until 8:00.
If it's already past 17:00 , then the purge will be delayed until 8:00 the next day.

Purge Time Setting :

Select → + 91 → CO → Purge → Adjust duration → Exit → Save and Exit

+ 96 → CO → Purge → Adjust duration → Exit → Save and Exit

TC6644 UNIVERSAL CONTROLLER – INSTRUCTION MANUAL

NETWORK COMMUNICATIONS

The TC6644 is a BACnet certified network controller with the following device profile: B-ASC

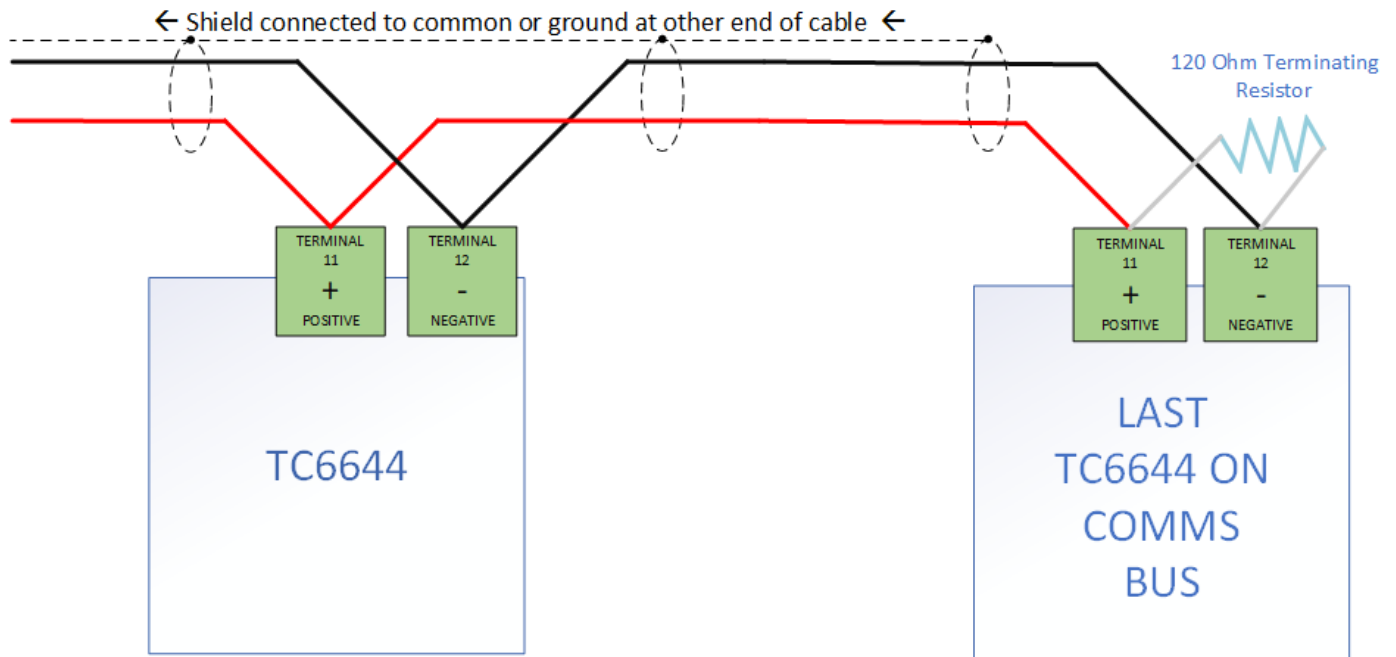
The TC6644 conforms to the latest BACnet protocol Version:1 Revision :19

For more information on the TC6644 BACnet objects please refer to the TC6644 EPICS statements found on our website.

CONNECTIONS

All BACnet devices must be daisy-chained (cable-in cable-out) except the last one which will have the terminating resistor. Single wire runs, star-connections or stubs will always cause communications problems and must not be used.

Use a shielded RS-485 data-bus cable similar to Beldon 82841 with 120 Ohm characteristic impedance. For long cable runs at a higher BAUD rate you might consider a similar cable but with a lower capacitance figure.



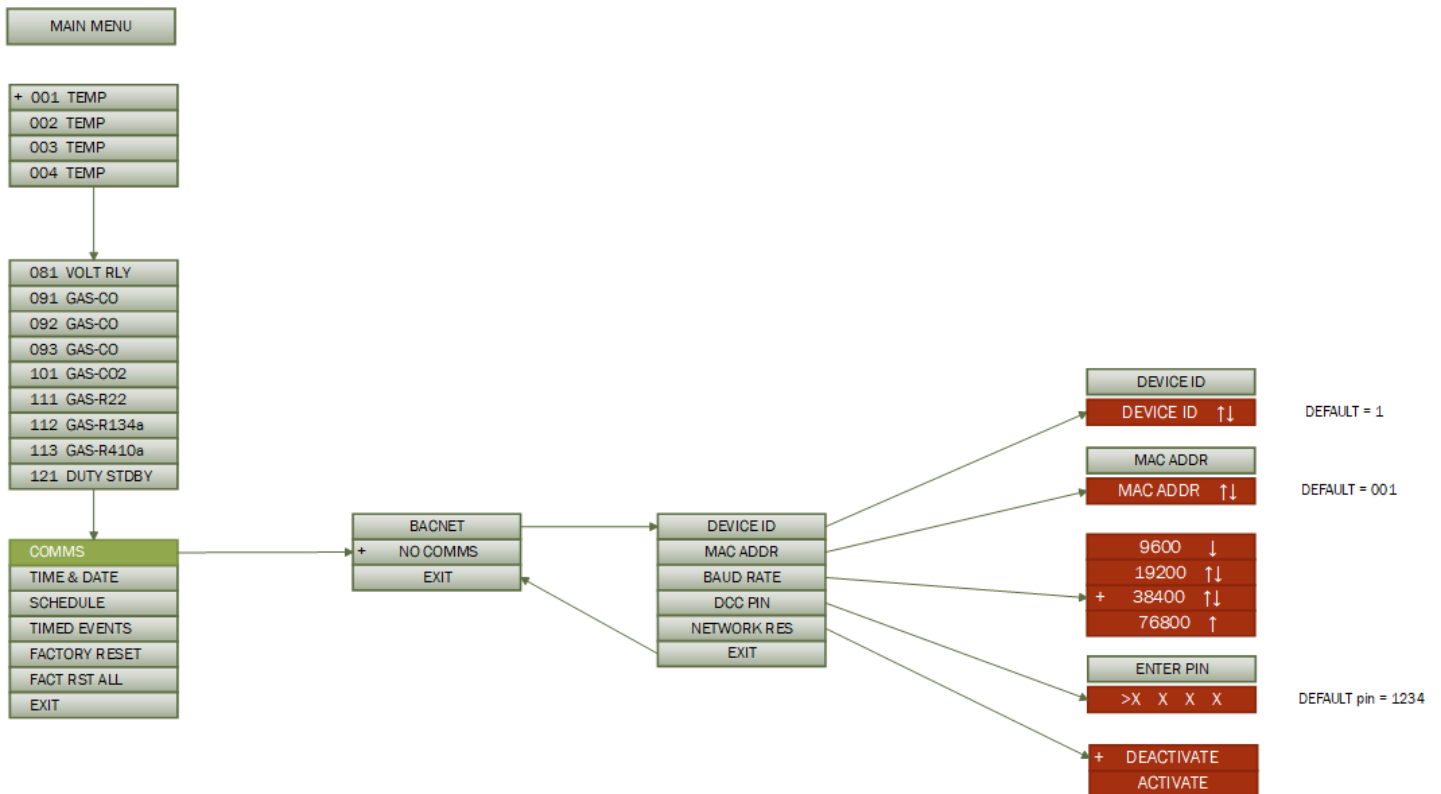
Note : A 120 Ohm terminating resistor should be connected to terminals

11 (+ ve) & 12 (- ve) on the last TC6644 at the end of the COMMS CABLE.

TC6644 UNIVERSAL CONTROLLER – INSTRUCTION MANUAL

COMMS MENU LAYOUT

The comms menu will allow you to set up all your communications parameters required to establish a BACnet connection.



Defaults:

- . NO COMMS
- . DEVICE ID = 1
- . MAC ADDR (mac address) = 1
- . BAUD RATE = 38400
- . DCC PIN (Device Communications Control PIN number) = 1234
- . NETWORK RES (Network Bias Resistors) = DEACTIVATED

*Normally you would ACTIVATE the NETWORK Resistors option if your network has no additional isolated external network power supply.

Make sure you use a unique DEVICE ID and MAC Address for each device on the same network bus.

TC6644 UNIVERSAL CONTROLLER – INSTRUCTION MANUAL

SETUP MENU'S 025 or MENU 026 . START – STOP – RUN ON

PRESS & HOLD THE SEL (Select) BUTTON UNTIL > + 001 TEMP DISPLAYED.

SCROLL DOWN TO THE TIME & DATE > PRESS SEL BUTTON > SET TIME > SET DATE > SELECT DAYLIGHT SAVING > YES/NO > SELECT DAYLIGHT SAVING START & STOP TIMES > + 001 DISPLAYED

SCROLL DOWN SCHEDULE > Press SEL BUTTON > LIST EVENTS DISPLAYED > SCROLL DOWN TO NEW EVENTS

PRESS SEL BUTTON > ADD EVENT ON TIME DISPLAYED > SET ON TIME > COPY TO DAYS DISPLAYED > USE DOWN ARROW TO SELECT, MON-FRI OR SAT & SUN > PRES SEL BUTTON > SCROLL DOWN TO EXIT

ADD EVENT OFF TIME DISPLAYED > SET OFF TIME > COPY TO DAYS DISPLAYED > USE DOWN ARROW TO SELECT, MON-FRI OR SAT & SUN
> PRESS SELECT BUTTON > SCROLL DOWN TO EXIT

SCROLL DOWN TO SAVE & EXIT > PRESS SEL BUTTON > TIME SCHEDULE SAVED

PRESS & HOLD THE SEL BUTTON UNTIL > +001 TEMP DISPLAYED

SCROLL DOWN TO MENU 025 OR 026 > PRESS SEL BUTTON UNTIL > INPUTS DISPLAYED

PRESS SEL BUTTON > RUN CONTROL DISPLAYED > PRESS SEL BUTTON > CONTROLS DISPLAYED

PRESS SEL BUTTON > SCHEDULE DISPLAYED > PRESS SEL BUTTON > DSIABLED DISPLAYED > SCROLL UP > SELECT ENABLE

PRESS SEL BUTTON > SCHEDULE DISPLAYED > SCROLL DOWN TO SMART SENSOR > PRESS SEL BUTTON > SELECT ENABLE

PRESS SEL BUTTON > SCHEDULE DISPLAYED > SCROLL DOWN TO EXIT

CONTROLS DISPLAYED > SCROLL DOWN > ACTION > SELECT STRT-STP-RUNON > RUNON TIME DISPLAYED > SELECT TIME IN INCREMENTS OF 0.5 HRS. MAX. 12 HRS > PRESS SEL BUTTON > CONTROLS DISPLAYED > SCROLL DOWN TO EXIT > SELECT

RUN CONTROL DISPLAYED > SCROLL DOWN TO EXIT > SELECT

INPUTS DISPLAYED > SCROLL DOWN TO SAVE & EXIT > SELECT

RETURNS TO MAIN SCREEN

PUSH BUTTON ON SMART SENSOR TO OPERATE SYSTEM BEFORE AND AFTER SCHEDULE TIMES.

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