

Product Information Packet

Model TLC-1 400HC

Heat/Cool Solid State Liquid Chiller

with Integral TC-3400 Temperature Control & RS-485

Part #6-B0G0-1-0D0

Thank you for your purchase. Information has been enclosed regarding the installation, specifications, and wiring of your solid state assembly.

Please read and follow all instructions carefully before installation. Only qualified technicians should install this equipment.

If you have any questions with your equipment, please do not hesitate to call us toll free at (888) TECA-USA (832-2872), we will be happy to assist. We are open from 8:00 am to 4:30 pm Central Time.

Included in this packet you will find:

Getting Started

Product Literature and Specifications

Wiring Drawing # SK130708

Temperature Control Literature Set-Up and Communications Information

Warranty Information

TC-3400 Manual and CD

The logo for Teca, featuring the word "teca" in a bold, lowercase, sans-serif font. A vertical line is positioned to the left of the letters "t" and "e".

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GETTING STARTED:

(Read entire instructions before operating)

STEP #1 This unit should operate with the bottom feet resting on a flat surface. The internal heat exchanger is cooled by a tubeaxial fan. It is necessary to keep the inlet/outlet air path free from any restrictions that may impede your cooling performance. A 6" minimum spacing from the rear of the unit to any obstruction is required. External tubing with insulation has been provided for a total of 12' plumbing line. Trim the tubing and insulation as necessary to minimize the ambient thermal load. 4 clamps have been provided to attach the tubing (2 to the quick connectors provided and 2 for your load connectors). The tubing lines are a 3/8" inner diameter. Connect the external plumbing lines to the device(s) being cooled.

STEP #2 Low fluid and low flow indicators have been provided on the front panel. It is necessary to fill the internal reservoir before you apply power. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE PUMP The internal reservoir holds approximately 500 ml of fluid. The "add fluid" light will come on when the reservoir is approximately 1/2 full. There is a visual indicator of the water level on the side of the unit. Distilled water is the recommended fluid for temperatures to 5°C. For temperatures below 5°C, a 30% glycol 70% distilled water mix is suggested. Remove the reservoir cap located at the top left corner of the unit and fill the reservoir. Keep the reservoir cap off until the external plumbing is filled and the reservoir is topped off.

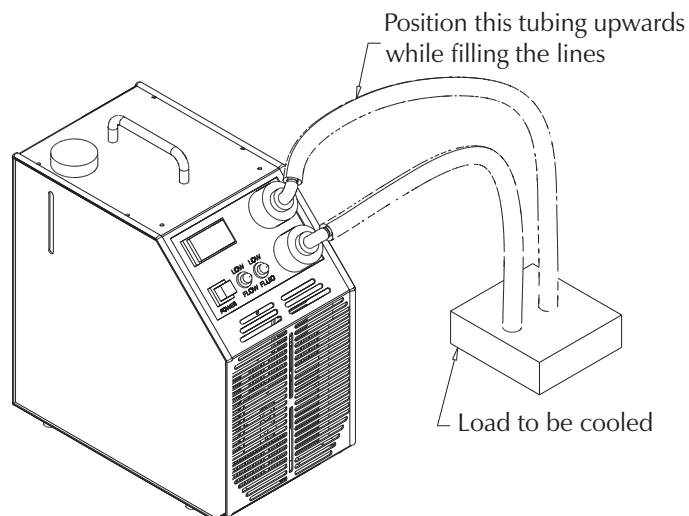
STEP #3 Connect the power cord to an appropriate outlet. The power cord must be connected to a receptacle protected by a circuit protected per local and or national codes. While you are filling the external lines, position the supply quick connect upwards. (See Figure A) This will assist in removing air trapped in the lines. At this point, depress the power switch on the front panel to turn the system on. For a 12' plumbing line, it should take about 30 seconds before the "add fluid" light illuminates. At this point, turn the power off and add additional fluid. Re-apply power. Another 30 seconds or so should be enough time to completely fill the lines. Turn off the power switch and top off the reservoir. Reattach the reservoir cap securely.

Please Note: It may be necessary to add fluid to the reservoir from time to time. The "add fluid" indicator will illuminate if the reservoir requires a refill. If the "low flow" indicator light appears, check to see if there are any obstructions or leaks within the plumbing lines.

The "low flow" indicator appears when the flow is approximately 0.3 liter/min or less.

STEP #4 A digital temperature controller has been provided. Hold the * button and adjust ▼▲ to adjust the set point. More detailed temperature control information has been included with your product information packet. We suggest changing the temperature controllers programming to a PID control method and then performing an autotune for better temperature control.

We hope you enjoy your new Ameritemp™ series liquid chiller. If you have any questions, please do not hesitate to call our technical department @ 888-TECA-USA (888-832-2872).



TLC-1400 Liquid Chiller

Air Cooled

120 VAC, 240 VAC Input
410 Watts

FEATURES

- Compact (only 12" X 14" bench top footprint)
- Weighs approximately 59 lbs. (27 kg)
- Integral PID "tunable" temperature control
- Ambient temperature up to +50°C
- No compressor, fluorocarbons or filters
- Virtually maintenance-free operation
- Remote Sensibility™
- Un-cooled, 500mL reservoir
- Front to back air-flow system
- Stainless steel exterior housing
- Low fluid level and low flow warning
- Integral power supply
- Self priming pump/reservoir
- Cool and Heat/Cool versions



TC-3400 FEATURES

- RS-485 communications (optional)
- Communications Software (optional)

INCLUDES

- 3/8" ID Hose (12')
- Hose insulation (12')
- 3/8" CPC low pressure drop shut off fittings

SPECIFICATIONS

| MODEL | PART NUMBER | PERFORMANCE RATING | VOLTAGE VAC BTU/HR | CURRENT AMPS. 50/60 HZ | WEIGHT LBS. (KG) | MAX OPERATING TEMP °C | TEMP. CONTROL | HEATING OPTION (HC SUFFIX) AMBIENT | FLUID TEMP RANGE °C |
|------------|--------------|--------------------|-----------------------|---------------------------|---------------------|--------------------------|---------------|--|------------------------|
| TLC-1400 | 6-B0G0-0-000 | 1400-1450 | 120 VAC | 7.0 | 59 (26.7) | 50°C (+122 F) | TC-3400 | | -5/65 |
| TLC-1400HC | 6-B0G0-1-000 | 1400-1450 | 120 VAC | 7.0 | 59 (26.7) | 50° C(+122 F) | TC-3400 | 400 Watt | -5/65 |
| TLC-1402 | 6-B0G2-0-000 | 1400-1450 | 240 VAC | 4.0 | 59 (26.7) | 50°C (+122 F) | TC-3400 | | -5/65 |
| TLC-1402HC | 6-B0G2-1-000 | 1400-1450 | 240 VAC | 4.0 | 59 (26.7) | 50°C (+122 F) | TC-3400 | 400 Watt | -5/65 |

TLC-1400

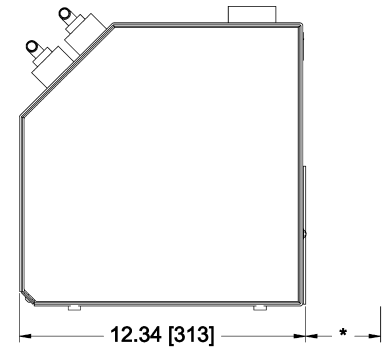
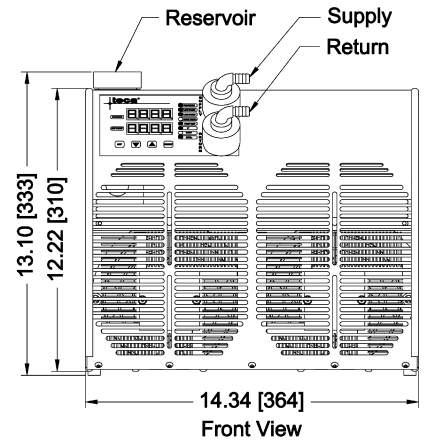
ENVIRONMENTS

- Bench top
- Laboratory
- Industrial

COOLING CAPACITY

410 Watts @ 0 °C ΔT (standard)

DIMENSIONS

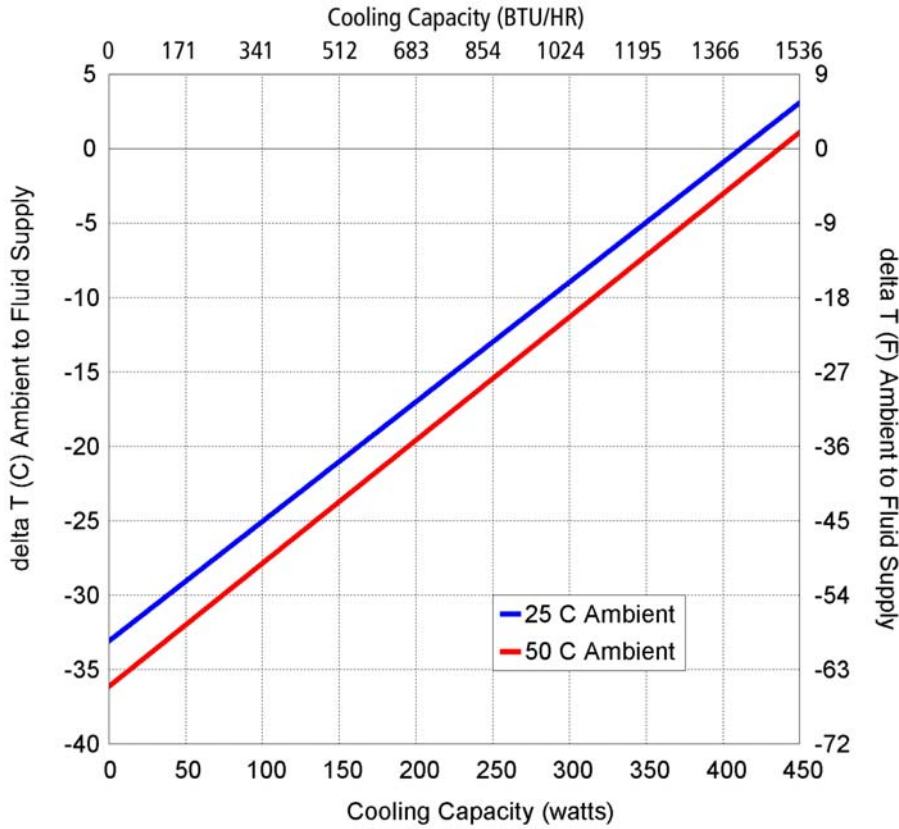


* Minimum recommended clearance 3".
Dimensions: Inches [Millimeters]



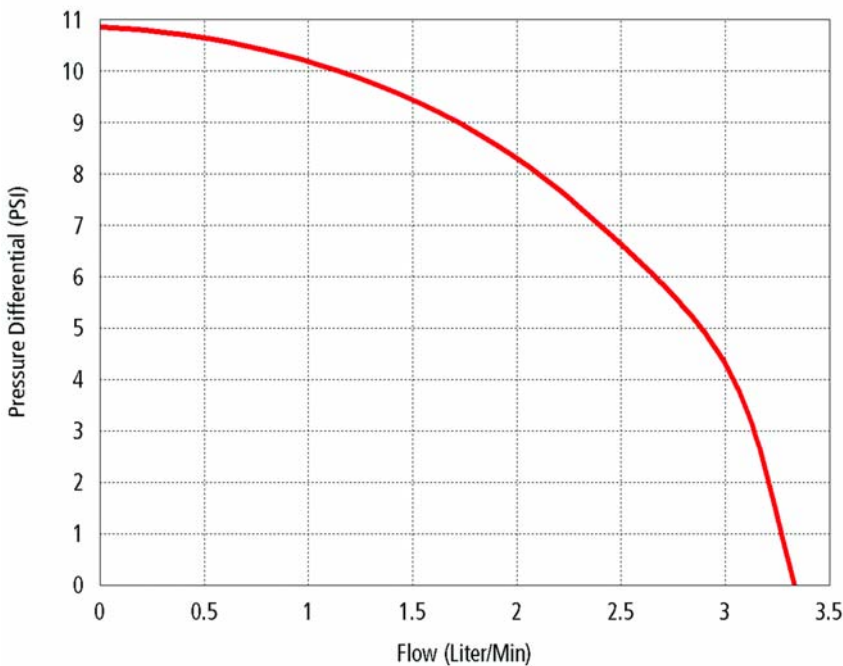
Ambient Air Path

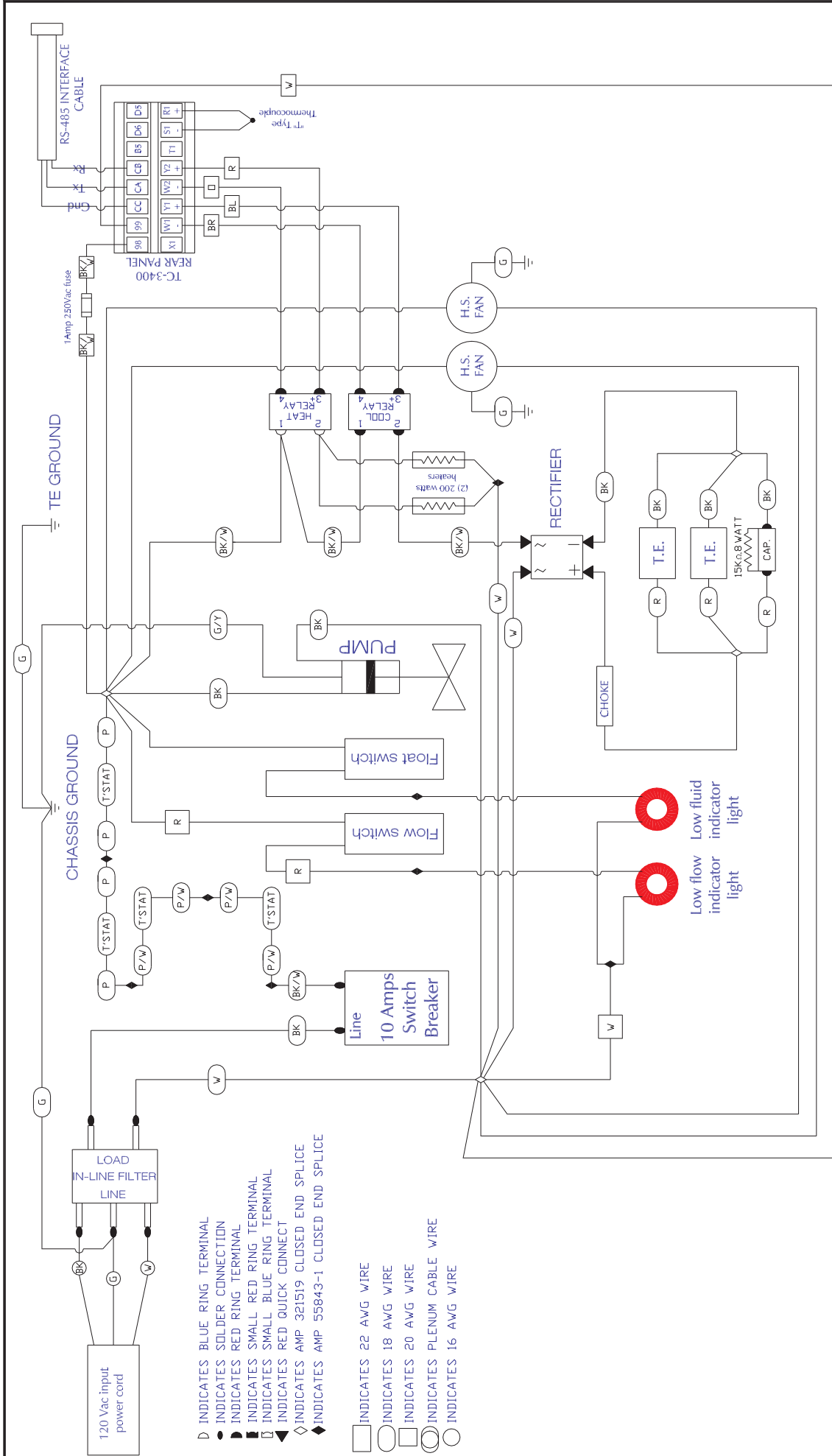
PERFORMANCE CURVE



| Equation of line: $y = \Delta T(^{\circ}\text{C})$ $x = \text{Capacity (Watts)}$ | | |
|--|-------------------|-------------------|
| Ambient Temp | 25°C | 50°C |
| Fluid Supply | $y = .08x - 33.1$ | $y = .08x - 36.1$ |

PUMP CURVE





| | | | | | |
|---|----------|---|----------|---|----------|
| INFORMATION DISCLOSED HEREIN IS THE CONFIDENTIAL PROPERTY OF TECA CORP RECIPIENT SHALL NOT USE THE INFORMATION IN ANY UNAUTHORIZED MANNER. FINISH: | | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DECIMALS .0005 FRACTION .0005 | | THERMOELECTRIC COOLING AMERICA CORP TLC-1400 HC WITH TC-3400 + RS-485 WIRING DIAGRAM | |
| DATE: | 07/18/13 | DRAWN BY: | AA | SCALE: | D8750 |
| REV. LEVEL: | | DRAWING #: | SK130708 | MASTER: | SK130702 |
| DESCRIPTION: | | APPROVED: | | | |

TC-3400 Temperature Controller

PID Temperature Control

OVERVIEW

The TC-3400 temperature controller series simplifies your temperature control requirements.

The controller options reduce system complexity and the cost of control loop ownership. The TC-3400 is a high performance PID temperature controller in space-saving, panel-mount 1/32 DIN size EIA 485 communications and standard NEMA-4X IP66 sealing make the TC-3400 versatile and suitable for wide range of environments.

FEATURES

Advanced PID Control Algorithm

- Offers TRU-Tune™ + adaptive control to provide tighter control for demanding applications
- Provides auto-tune for fast, efficient start up

Configuration

- Systems come preconfigured for PID cooling application
- "Canned" configuration for different applications available

Parameter Save and Restore Memory

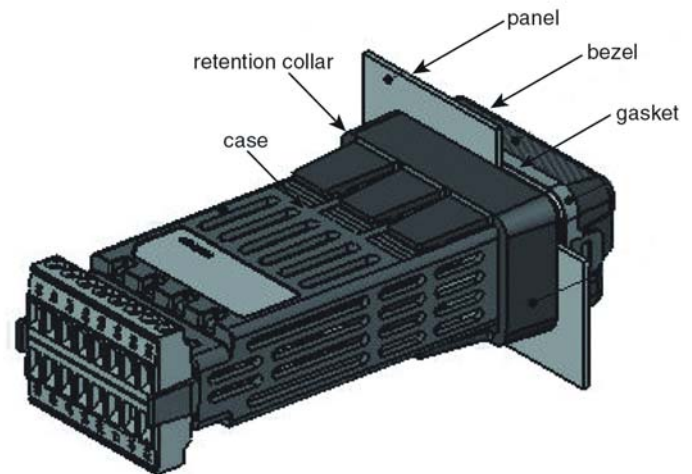
- Reduce service requirement and down time

Heat-Cool Operation

- Provides application flexibility with accurate temperature and process control

P3T Armor Sealing System

- NEMA-4X and IP66 offers water and dust resistance that can be cleaned and washed down
- Backed up by UL 50 independent certification to NEMA-4X specification



SPECIFICATIONS

Line Voltage/Power:

- 85 to 264V~(ac), 47 to 63Hz
- 12 to 40Vdc OR 20 to 28V~(ac), +10/-15 percent; 50/60Hz, ± 5 percent
- 10VA maximum power consumption
- Data retention upon power failure via nonvolatile memory
- Compliant with SEMI F47-0200, Figure R1-1 voltage sag requirements @ 24V~(ac) or higher

Environment:

- -18 to 65°C (0-149°F) operating temperature
- -40 to 85°C (-40-185°F) storage temperature
- 0 to 90 percent RH, non-condensing

Accuracy:

- Calibration accuracy and sensor conformity ± 0.1 percent of span, $\pm 1^\circ\text{C}$ @ the calibrated ambient temperature and rated line voltage
- Types R, S B; 0.2 percent

- Type T below -50°C ; 0.2 percent
- Calibration ambient temperature @ $25^\circ\text{C} \pm 3^\circ\text{C}$ ($77^\circ\text{F} \pm 5^\circ\text{F}$)
- Accuracy span 540°C (1000°F) minimum
- Temperature stability $\pm 0.1^\circ\text{C}/^\circ\text{C}$ ($\pm 0.1^\circ\text{F}/^\circ\text{F}$) rise in ambient maximum

Agency Approvals:

- UL®/EN 61010 Listed
- UL® 1604 Class 1 div. 2
- UL® 50, NEMA 4X, EN 60529 IP66
- CSA 610110 CE
- RoHS, W.E.E.E.

Controller:

- Auto-tune with TRU-TUNE™ + adaptive control algorithm
- Control sampling rates: input 10Hz, outputs 10Hz

Wiring Termination:

- Input, power and controller output terminals are touch safe removable 12 to 22 AWG

Universal Input:

- Thermocouple, grounded or ungrounded sensors
>20M Ω input impedance
3 μA open sensor detection
Maximum of 200 Ω source resistance
- RTD 2- or 3-wire, platinum, 100 Ω and 1000 Ω @ 0°C calibration to DIN curve (0.00385 Ω / $\Omega/^\circ\text{C}$)

Serial Communications:

- Isolated communications EIA 485
- Industry standard RS-485 Modbus® RTU
- RS-232 via RS-485/232 converter

TC-3400

PART NUMBER AND ORDERING

| | | | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|---|---|---|
| 34 | - | X | X | X | - | X | X | - | X | X | X |
|----|---|---|---|---|---|---|---|---|---|---|---|

Input voltage

- 0: Universal AC - 85 to 264Vac, 47 to 63 Hz
- 4: 12/24Vdc - 12 to 40Vdc, 20 to 28Vac

Functions

- 2: Heat/Cool -No relay
- 3: Cooling with relay (package defined below)
- 4: Heating/Cooling with relays (package defined below)

Switching Volts & Amps

- A: None, drive signal only - no relays
- B: Cool only, VAC switching, 120/240Vac, 10 Amps
- C: Cool Only, VDC switching, 0-100 VDC, 12 Amps
- D: Cool Only, VDC switching, 0-100 VDC, 20 Amps
- E: Cool Only, VDC switching, 0-100 VDC, 40 Amps
- F: Heat/Cool, VDC switching, 0-100 VDC, 12 Amps
- G: Heat/Cool, VDC switching, 0-100 VDC, 20 Amps
- H: Heat/Cool, VDC switching, 0-100 VDC, 40 Amps
- I: Heat/Cool, Heat: 120/240 VAC, 10 amps Cool: VDC switching, 0-100 VDC, 12 Amps
- J: Heat/Cool, Heat: 120/240 VAC, 10 amps Cool: VDC switching, 0-100 VDC, 20 Amps
- K: Heat/Cool, Heat: 120/240 VAC, 10 amps Cool: VDC switching, 0-100 VDC, 40 Amps
- L: Heat/Cool, Heat: 0-100 VDC, 12 Amps Cool: VAC switching, 120/240 VAC, 10 amps
- M: Heat/Cool, Heat: 0-100 VDC, 20 Amps Cool: VAC switching, 120/240 VAC, 10 amps
- N: Heat/Cool, Heat: 0-100 VDC, 40 Amps Cool: VAC switching, 120/240 VAC, 10 amps
- O: Heat/Cool, Reverse Polarity, 0-100 VDC, 12 Amps
- P: Heat/Cool, Reverse Polarity, 0-100 VDC, 20 Amps
- Q: Heat/Cool, Reverse Polarity, 0-100 VDC, 40 Amps
- R: Heat/Cool, VAC switching, 120/240 VAC, 10 amps

Sensor

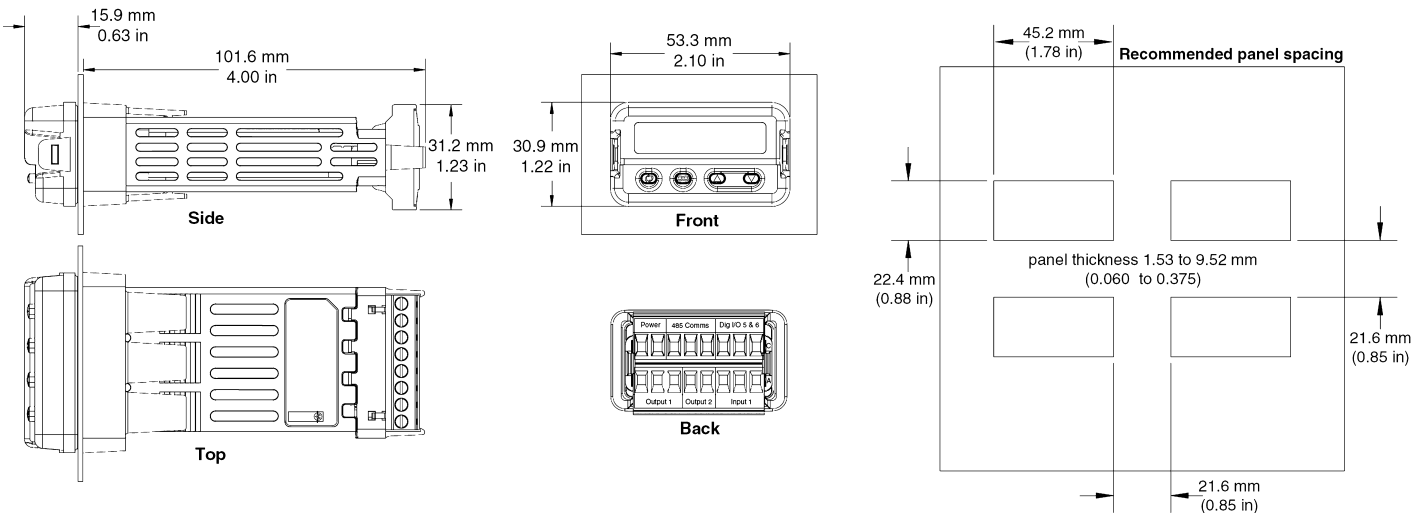
- 0: None
- 1: 3- Wire RTD - RTD-Probe
- 2: T type thermocouple (ring mount)

Communications

- 0: Basic communications used with standard **EZ Zone Configurator** allows the user to configure all the set up parameters including the ability to change set point, monitor the process temperature and initiate an Auto Tune
- 1: RS-232 complete communication for use with standard EZ Zone Configurator and optional **SpecView** or third party software, includes RS-232/RS-485 adapter
- 2: RS-485 complete communication for use with standard EZ Zone Configurator and optional **SpecView** or third party software

Options

DIMENSIONS AND CUTOUT



LIMITED WARRANTY

In the event a defect in material or workmanship is discovered in any of TECA's products within one year after the date they are delivered to Buyer, and if: (a) TECA is notified of the defect in writing by certified mail within 14 days of the date of discovery; (b) TECA may then either, at its sole discretion, inspect the product at Buyer's location, or require that the product be made available at Buyer's expense at TECA's premises for TECA's inspection within 14 days of the date of notification; and (c) the products are defective and the defects result from faulty materials and/or workmanship and not in any way from accident, misuse, misapplication, mishandling, modification, or alteration by the Buyer or the shipper, then TECA shall, at its sole option, repair or exchange defective products free of charge to Buyer, or credit to buyer the price of the defective products. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARE EXCLUDED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL TECA BE LIABLE FOR ANY CLAIM BASED UPON BREACH OF EXPRESS OR IMPLIED WARRANTY OR ANY OTHER DAMAGES WHETHER SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, LOST PROFITS, BUSINESS INTERRUPTION, OR LOSS OF BUSINESS OR CUSTOMER RELATIONSHIPS.

RETURNED GOODS, RESTOCKING CHARGES

In order to return merchandise for any reason (repair, replacement, or credit) a return authorization number must be issued by TECA. New merchandise may not be returned for credit beyond 60 days from shipment. Charges for incidental or other damages may also be made. All returned goods must be sent freight prepaid. A restocking charge of 15% will apply. On special equipment and custom modified equipment orders, additional incremental cancellation charges may be made.