THERMO-ELECTRIC BATTERY CHARGER

LOW COST Continuous Reliable Power!

NEW & IMPROVED

- Ideal power source for critical automation and data applications like SCADA, flow computers, gas metering, volume correctors and odorization
- TEC's continuous power output...night, day, rain, sleet, snow or wind...results in lower system cost than equivalent solar panel system and equipment
- Output actually improves in harsh weather
  TEC-2 produces 1.7 to 2.0 watts -- Equivalent to 14 to 40 watt solar panel
  TEC-8 produces 6.3 to 7.3 watts -- Equivalent to 40 to 150 watt solar panel
- Operates on a very small volume of natural gas or propane:
  TEC-2 uses: 1.0 CFH gas [0.03 M^3/Hour]
  0.33 CFH propane [0.01 M^3/Hour]
  TEC-8 uses: 3.0 CFH gas [0.08 M^3/Hour]
  1.0 CFH propane [0.03 M^3/Hour]
- Microprocessor controlled for fast, easy "one button" startup
- Status output for remote monitoring
- 2" [5.08 cm] pipe or wall mountable
- CSA Approved for Class 1, Division 2, Group D hazardous locations. Evaluated to CSA and ANSI/UL standards for use in Canada and the United States

TEC-2™

TEC-8™

ZEUS™ POWER SYSTEMS

PGI International
Excellence Through Innovation
713-466-0056 800-231-0233
sales@pgiint.com www.pgiint.com

ISO 9001:2000 Certified Quality System

C SA US

TEBC
Rev. 13
4-11-07

OVERVIEW

NEW and IMPROVED TEC-2 and TEC-8 Battery Chargers.
Wind, sleet, snow, rain, and dark of night. You can depend on TEC to deliver power to your data, communication, and automation applications. All you need is a little natural gas or propane.

TEC-2 and TEC-8 supply 12 and 24 volt batteries with up to 7.3 watts of *continuous power,* regardless of available sunlight that could limit solar panel applications.
TEC continuously charges lead acid batteries to always meet your power requirement regardless of available sunlight or inclement weather. TEC's small, robust, self-contained package makes installment quick and easy and virtually eliminates theft and vandalism. TEC extends its companion battery life by continually monitoring state-of-charge and temperature to optimize its charge and minimize deep battery cycles.

TEC: Continuous operation returns low cost, improved performance to equivalent solar panel/battery systems
TEC-2 generally produces from 1.7 to 2.0 watts of *continuous* power, depending on load, weather conditions, and altitude. That output is roughly equivalent to a 14 to 40-watt solar panel, depending on available sunlight. For example, a TEC-2 would be equivalent to a 20-watt solar panel stationed to receive 6 sun-hours per day or a 40-watt solar panel stationed to receive 2 sun-hours per day Similarly, TEC-8 generally produces from 6.3 to 7.3 watts of *continuous* power, roughly equivalent to a 40 to 150-watt solar panel system under the same conditions.

TEC: No Large Safety Factor and No Uncertainty
Automation and communication systems at critical and remote locations demand sustained power and no down-time so costly safety factors must often be considered to ensure reliability. Solar panel systems generally require significant safety factors, including larger batteries and battery banks, to accommodate worst case scenarios and days with limited sunlight. Even then you may not be safe.

TEC eliminates the large safety factor considerations and delivers power regardless of weather conditions or sunlight. TEC *continuously* charges the battery while your application draws it down and then goes into "sleep mode" when the battery is once again fully charged. TEC's controlled, continuous feed eliminates deep battery cycles that shorten battery life. With TEC, simply select the battery required to handle application power surges, hit the fast "one button" startup switch, and let it run. No worries.

How Does TEC Work?
TEC uses the same safe, reliable catalyst technology that has been heating equipment in the natural gas industry for over 30 years. The package is Class 1, Division 2 approved and could be installed in almost any location where natural gas and propane are available. The units consume a small amount of fuel [TEC-2 uses 1.0 CFH gas (0.03 M^3/Hour) or 0.33 CFH propane (0.01 M^3/Hour); TEC-8 uses 3.0 CFH gas (0.08 M^3/Hour) or 1.0 CFH propane (0.03 M^3/Hour)] in a recently improved flameless oxidizing catalyst.

The catalyst heats one side of an array of peltier thermoelectric modules while the other side is cooled by natural convection through aluminum fins to the environment. The temperature difference developed across the modules generates safe, electrical power.

TEC's self-contained starting system for the catalytic heater makes starting as simple as flipping a switch to turn the system ON and pressing a button to open the gas safety valve. The generated power is conditioned by a high efficiency switching power supply to provide the ideal temperature compensated battery charging current and voltage to the battery.

Internal diagnostics detect possible system problems, while alarm codes and charger state are saved in non-volatile memory to assist in trouble shooting. You can remotely monitor the system status using the open collector alarm output.

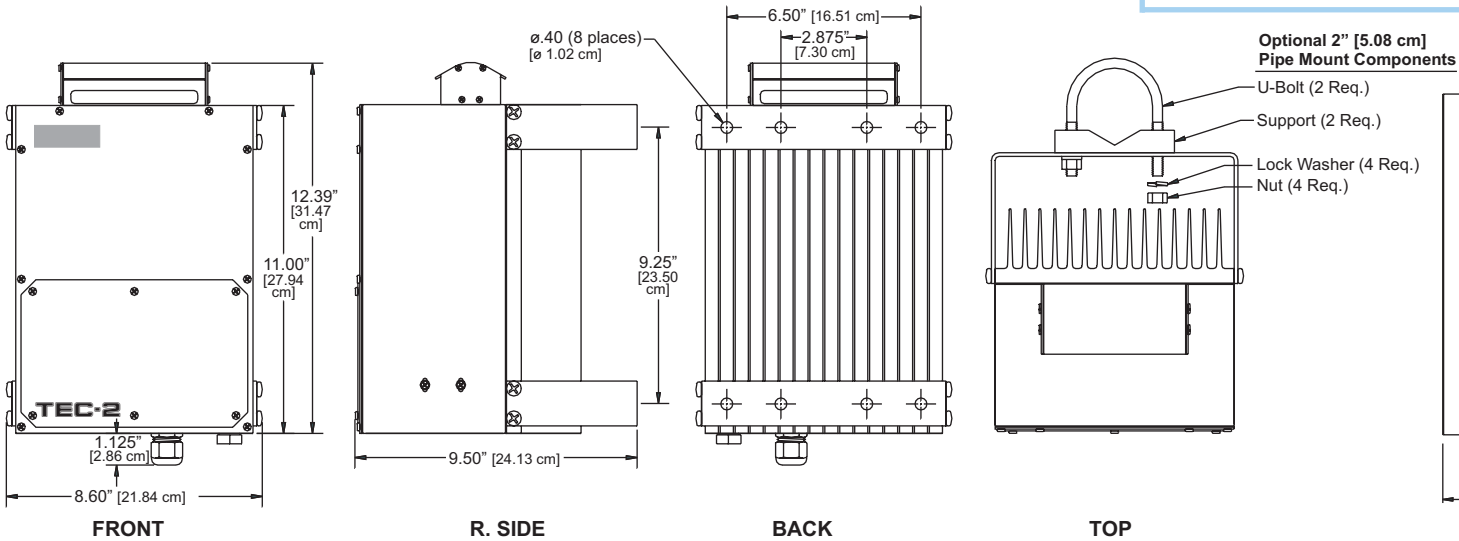
TEC-2 can easily power transmitters and most flow computers, while TEC-8 may be your choice for larger applications such as communications and automation packages. Multiple TEC units can be run in parallel to power larger requirements.

Download PGI's Power Requirements Worksheet from our website at www.pgiint.com/thermoelectric.asp to determine which system is right for your application.

PRODUCT WARRANTY
PGI International warrants its products to be free from defects in material and/or workmanship for a period of one (1) year from date of shipment. This guarantee is valid only if such products have been used in normal applications consistent with our recommendations. Our liability is limited to repair or replacement and no responsibility is assumed for consequential damage or expense. Any controversy arising out of the sale of PGI International products shall be determined in accordance with the laws of the State of Texas, United States of America (USA). PGI International reserves the right to change materials, specifications or designs without notice. PGI International will not be obligated to install or furnish such changes on products previously sold.

TEC-2

DIMENSI



SPECS

A complete system includes the charger in a 304 SS enclosure, mounting hardware, supply shut-off valve with strainer, Battery Interface Module and a 20' [6.09 m] Battery Interface Harness.

MODEL OPTIONS

TEC-2	-XXXXXXXX
TEC-8	-XXXXXXXX
* TEC-2C	-XXXXXXXX
* TEC-8C	-XXXXXXXX

**Canada Only - Max 15 PSI Inlet Pressure*

AVAILABLE OPTIONS

D = External Diagnostic Interface (allows connection of diagnostic cable without removing front cover)
F = 50' [15.24 meters] Battery Interface Harness (Replaces std 20' [6.09 m])
P1 = CS 2" [5.08 cm] U-bolts & nuts for mounting
P2 = SS 2" [5.08 cm] U-bolts & nuts for mounting
R = Propane Fuel Orifice
S = Wire Screen Heat Shield (Prevents contact with top of unit)
T = Tamper Resistant Hardware
U = Strainer Only, Less Shut-Off Valve
V = 24 Volt System (12V Standard)

SPECIFICATIONS

Charger Output	Temperature compensated charge curve for 12 volt gel-cell standard; Optional 24 volt curve & constant voltage available
Output Power	TEC-2: Greater than 1.7 Watts continuous at 68°F ambient (20°C) TEC-8: Greater than 6.3 Watts continuous at 68°F ambient (20°C)
Remote Battery Temp Sensor	Silicone diode with 12' of cable
Alarm	LED Monitor; NPN open collector, 30V max, 200mA max
Transient Protection	Bi-directional TVS, 1500 Watt peak pulse power dissipation; 1 Amp PTC over current protection
Electrical Connections	Liquid tight wire fitting; Can be removed to allow for ½" conduit fitting
Wire Connections	Screw cage clamp; 14 AWG Max
Fuel Connection	1/4" FNPT, 0.5 to 250 PSI [0.34 to 17.22 bar]
Fuel Consumption	Natural Gas: TEC-2: 24 cubic feet per day [0.68 M^3/Day] TEC-8: 72 cubic feet per day [2.04 M^3/Day] Propane: TEC-2: 0.22 gallons per day [0.87 liters/day; 1 pound/day] TEC-8: 0.66 gallons per day [2.50 liters/day; 3 pounds/day]
Operating Temp Range	-40°C (-40°F) to 50°C (120°F)
Enclosure	NEMA 3R; Wall mount or optional 2" [5.08 cm] pipe mount TEC-2 and TEC-8: 304 SS with anodized aluminum cooling fins
Weight	TEC-2: 22 pounds [9.97 kg] TEC-8: 50 pounds [22.67 kg]
Gas BTU Range	900 - 1100 BTU/Cu. Ft. Natural Gas [31,783-38,845 BTU/M^3] 2400 - 2600 BTU/Cu. Ft. Propane [84,755-91,817 BTU/M^3] (Consult factory for gas supply outside this range)

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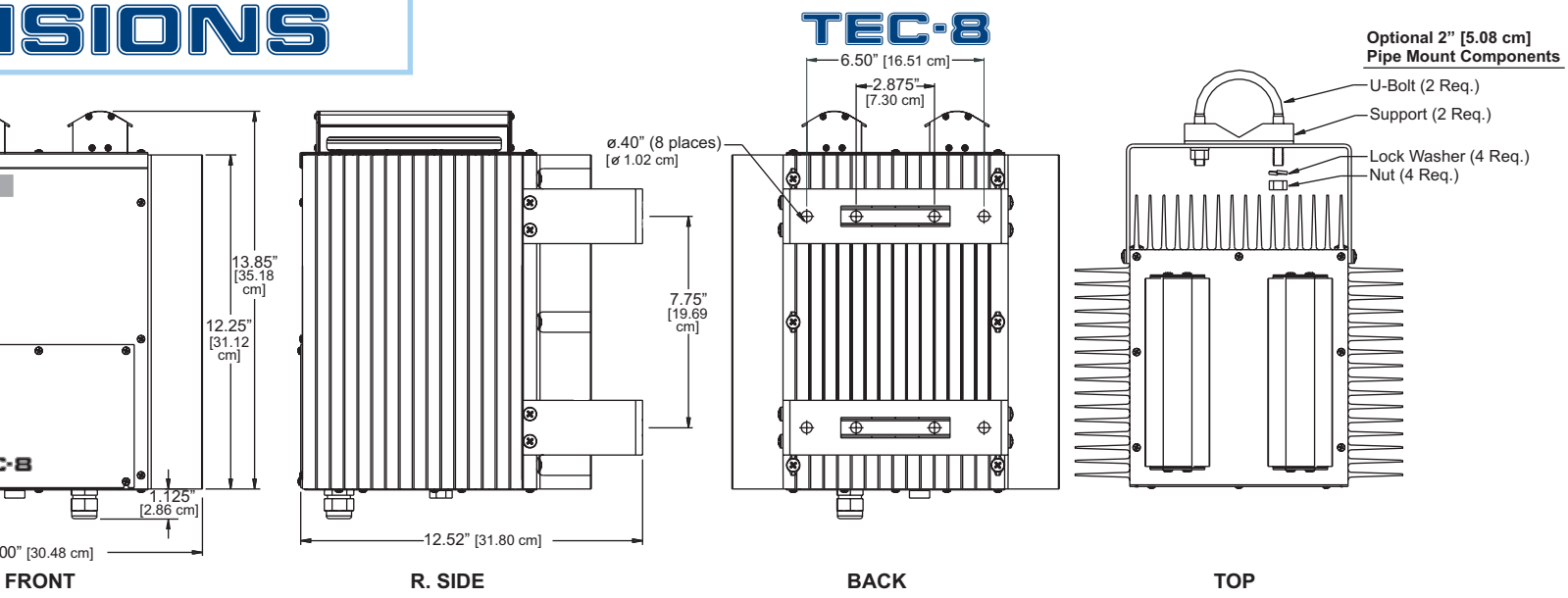


ACCESSORIES *(Ordered Separately)*

Cartridge Filter Canister *[For particulate H_20 & H_2S filtration - includes scrubber element & SS Mounting Bracket.]*

MODEL	OPTIONS
CFU	-XXXXX
*CFU-C	-XXXXX

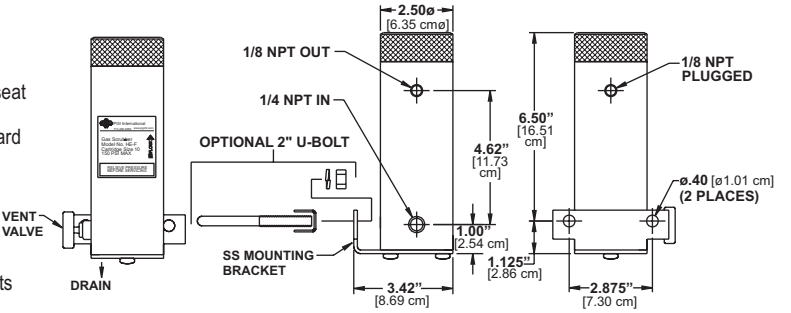
* = *Canada Only*

AVAILABLE OPTIONS

P1 = CS 2" [5.08 cm] U-bolts & nuts
P2 = SS 2" [5.08 cm] U-bolts & nuts
V1 = 1/4" M/F CS Teflon® packed hard seat seat inlet valve
V2 = 1/4" M/F 316 SS Teflon® packed hard seat inlet valve

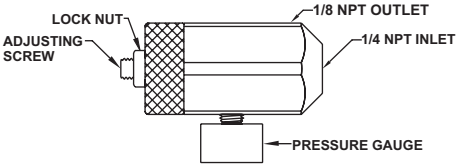
SPECIFICATIONS

Construction	Hard Anodized Aluminum
Mounting	SS bracket less U-bolts standard Option "P" for 2" [5.08 cm] pipe mount
Connections	1/4" NPT inlet and 1/8" NPT outlet ports
Drain	Valve operated (1/8" NPT port)
Max Operating Pressure	1440 PSI [99.21 bar] for model CFU 15 PSI [1.03 bar] for model CFU-C (Canada Only)



High Pressure Regulator *[Required if Supply Pressure >200 PSI [13.78 bar] - Not for use in Canada.]*

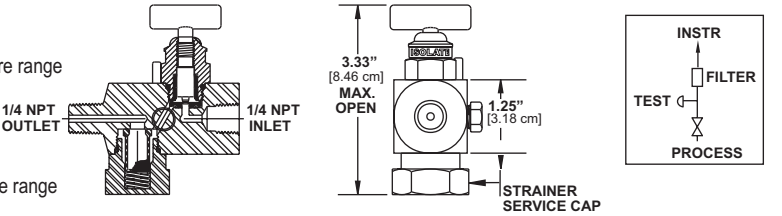
MODEL	SPECIFICATIONS
HPR	1440 PSI [99.21 bar] max inlet pressure 20 - 100 PSI [1.378 to 6.89 bar] output pressure range -40° to 200°F [-40° to 93.33°C] operating temperature range



Supply Shut-Off Valve w/ Strainer *[Easily serviceable fuel supply shut-off with 15 micron particle filter.]*

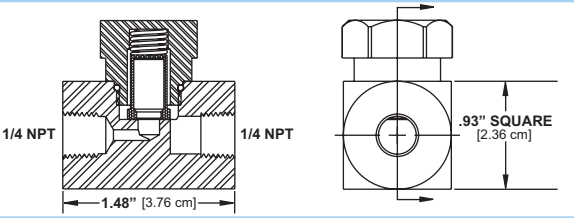
MODEL	SPECIFICATIONS
V-960EDT	1440 PSI [99.21 bar] max operating pressure -40° to 200°F [-40° to 93.33°C] operating temperature range 15 micron strainer
*V-964EDT	15 PSI [1.03 bar] max operating pressure -40° to 200°F [-40° to 93.33°C] operating temperature range 15 micron strainer

* = *Canada Only*



Filter Screen Module

MODEL	SPECIFICATIONS
V-908E (Aluminum) V-908S (SS)	1440 PSI [99.21 bar] max operating pressure -40° to 200°F [-40° to 93.33°C] operating temperature range 15 micron strainer



Display Keypad

MODEL	SPECIFICATIONS
SA-216	Display keypad enables reconfiguration, monitoring and diagnostics without a laptop (Requires SK-TE-C60-022)

Diagnostics Cable Assembly with Software

MODEL	SPECIFICATIONS
SK-TE-C60-022	Diagnostics cable (TEC to RS-232), includes Windows® software *(free software upgrades on www.pgiint.com)*

External Diagnostic Interface

MODEL	SPECIFICATIONS
SK-TE-C60-021	User installed "D" Option (allows connection of diagnostics cable without removing front cover)

RS-232 to USB Converter

MODEL	SPECIFICATIONS
TE-C50-104	USB-RS232 Serial Converter allows the diagnostics cable to be used with a USB port

Clamp On Diagnostic Current Meter

MODEL	SPECIFICATIONS
TE-C50-106	Clamp-On Milliamp meter simplifies trouble-shooting. BK Precision Model 316

Wire Screen Heat Shield

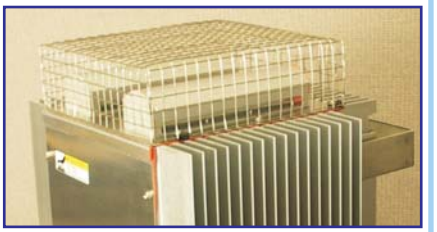
MODEL

TEC-2: SK-TE-C85-021
TEC-8: SK-TE-C85-022

SPECIFICATIONS

Prevents contact with top of TEC unit

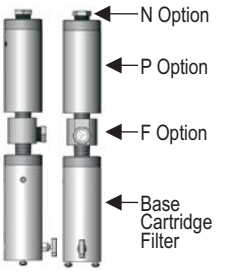
Factory installed "S" Option



Cartridge Filter Canister Assembly

MODEL

CFU
CFU-C *(Canada Only)*



SPECIFICATIONS

Drop in replacement for unit in heated enclosure system

OPTIONS: F =Indicator Plug Fitting
N =Indicator Plug
P =Piggy Back Canister

Optional configurations for heated enclosure include:
CFU-N, CFU-P, CFU-PN, CFU-FPN, CFU-FPPN
(add "C" for Canadian version)