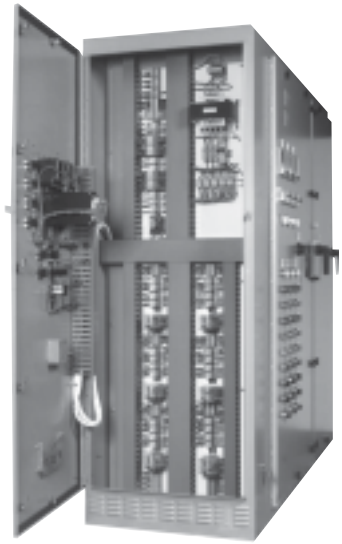
Electric Heating Control Panels

Caloritech™ control panels are designed for automatic control of electric heaters utilizing proven concepts and procedures developed from our experience with thousands of installations.

Our panels feature conservative designs with switching devices, fusing and internal wiring derated from the manufacturer's specified maximum allowable currents.

Approved panels are available up to 4000 Amps and 600V. We provide the design drawings, bills of material, replacement parts, operating instructions and component manuals.

The most basic model is the CPP-CPB which can accept remote mounted controls and make the balance of your wiring neat, reliable and cost effective. Complete standard packages with contactor power switching (CPA) or staged contactor (CPS) or solid state switching (CPE) allow your to select the degree of sophistication required to meet process and budget requirements.



Control panels can be built to meet various environmental requirements including dust, oil, water corrosive or hazardous materials.

Other optional features might include remote setpoint, proportioning, process variable retransmission, alarms, remote annunciation, dual energy and peak load controls, current/voltage/wattage metering and interfacing PLC's.

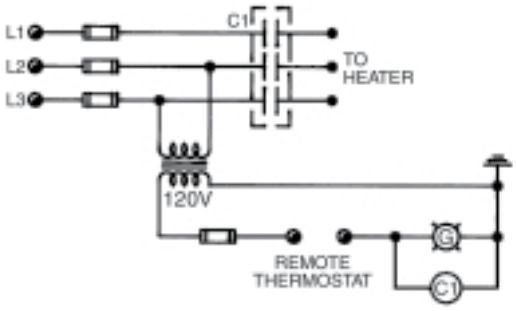
Type CPP Control Panels

The Caloritech™ Power Pack consists of a prewired contactor, transformer, pilot light and fuses in a Type 4 enclosure for a quick and convenient installation. Control circuits are 120 VAC.

Panels can be build to meet weather resistant or hazardous location specifications. Check factory for details.

To Order Specify

Catalog number and special features



Type CPP Control Panels (Enclosure size 12" x 10" x 5" deep)

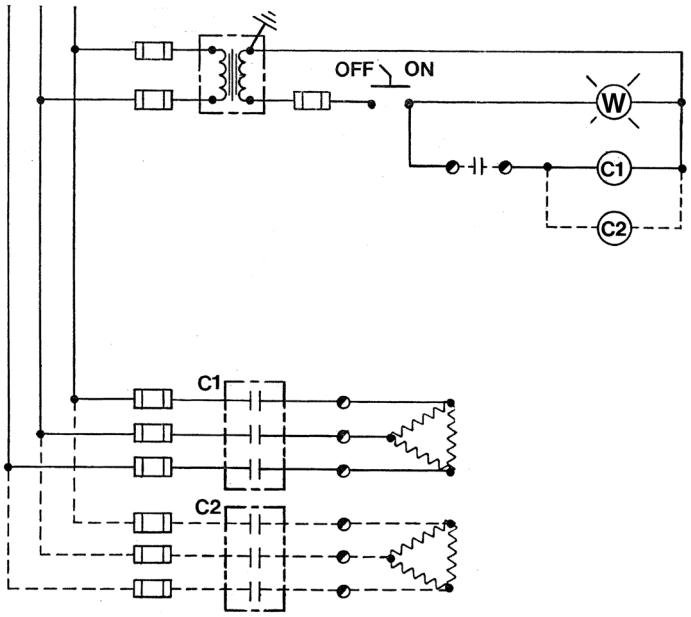
Primary Voltage	Fused Rating (Amps)	Load Rating (Amps)	Catalog Number
600V	30	24	CPP308
480V	30	24	CPP307
600V	50	40	CPP508
480V	50	40	CPP507
600V	60	48	CPP608
480V	60	48	CPP607

CPB & CPA Control Panels

Type CPB Control Panels

Type CPB panels are basic control units used to interface with electric heaters having remotely located thermostats, limit controls, percentage timers, or other control components. This series of panels does not include a disconnect switch but does include the following:

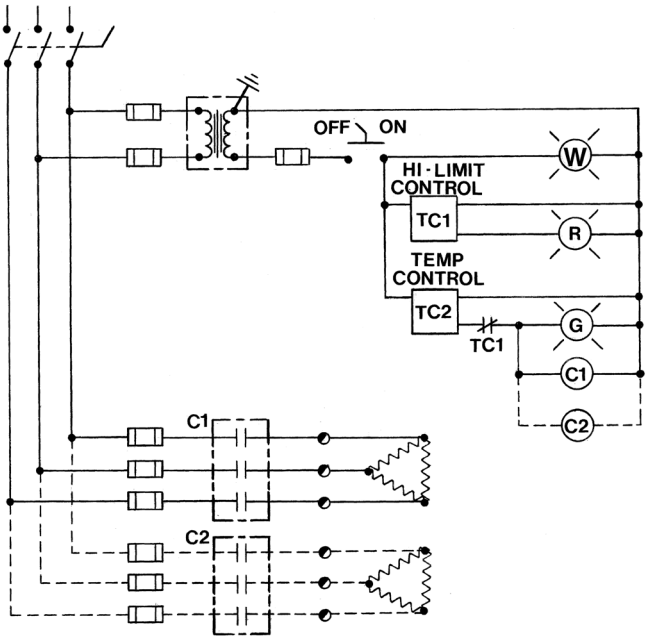
- Type 4 weather resistant enclosure with hinged door
- Fused magnetic contactor(s)
- On-off switch and pilot light
- Fused control circuit transformer with 120V secondary control voltage
- Terminal blocks for connection of externally located control devices



Type CPA Controls

Type CPA fully packaged control panels are suitable for use in a variety of electric heater installations. The CPA series includes:

- Type 4 weather resistant enclosures with hinged doors
- Disconnect switch with door interlock
- Fused control circuit transformer with 120V secondary control voltage
- On-off switch
- Fused magnetic definite purpose contactor(s)
- Digital indicating configurable microprocessor based temperature control (Series UT320)
- Electronic high limit, manual or auto reset
- Pilot lights for “system on”, “heat on”, “high limit”



Type CPB Control Panels (Type 4 Enclosures) 208V, 240V, 480V, 600V, (1 or 3 Phase)

Fused Rating (Amps)	Max. Load (Amps)	No. of Circuits	Amps Per Circuit	Panel Size (in)	Catalog Number
30	24	1	24	16x12x6	CPB30
40	32	1	32	16x12x6	CPB40
50	40	1	40	16x12x6	CPB50
60	48	1	48	16x12x6	CPB60
80	64	2	32	20x16x6	CPB80
100	80	2	40	20x16x6	CPB100
150	120	3	40	24x20x6	CPB150
200	160	4	40	24x20x6	CPB200

Type CPA Control Panels (Type 4 Enclosures) 208V, 240V, 480V, 600V, (1 or 3 Phase)

Disconnect Size (Amps)	Max. Load (Amps)	No. of Circuits	Amps Per Circuit	Panel Size (in)	Catalog Number
30	24	1	24	24x40x8	CPA30
60	48	1	48	24x20x8	CPA60
100	80	2	40	24x20x8	CPA100
200	160	4	40	36x24x8	CPA200

To Order Specify

Panel catalog number, voltage, phase, temperature range, type of sensor, optional high limits if required and any other special features.

CPB & CPA

CPS Control Panels (Contactor Stages)

The CPP, CPB and CPA panels on the previous pages switch all of the load(s) ON in one or optionally two stages as controlled from the main temperature control. If a greater amount of staging is required, the CPS panel is ideal. This series includes a modulating temperature control driving a step control which in turn brings on a number of contactor stages. Time delay between steps is adjustable to match the system dynamics.

CCI Thermal normally sizes stages between 35 to 40 Amps for best control and to optimize contactor and wire sizes.

The standard process control is the UT350 series. This control is configured to a 4-20 mA proportioning output to drive the step control. Other controls are available as options.

The high limit is a 543 manual reset, with K thermocouple for -20°C to 1100°C (-4°F to 2012°F).

CPS Features

- Type 12 dust tight enclosure
- Type 4 weather resistant encl. optional
- Door interlocked disconnect
- 2 to 12 fused contactors
- Fused control circuit transformer
- On/Off selector switch & pilot light
- Pilot lights for each stage
- High limit trip pilot light
- UT350-00 digital indicating control, field or factory configurable
- 54-302121-206 manual reset limit

To Order Specify

Panel catalog number, voltage, phase, number of stages, optional features and 921 configuration.

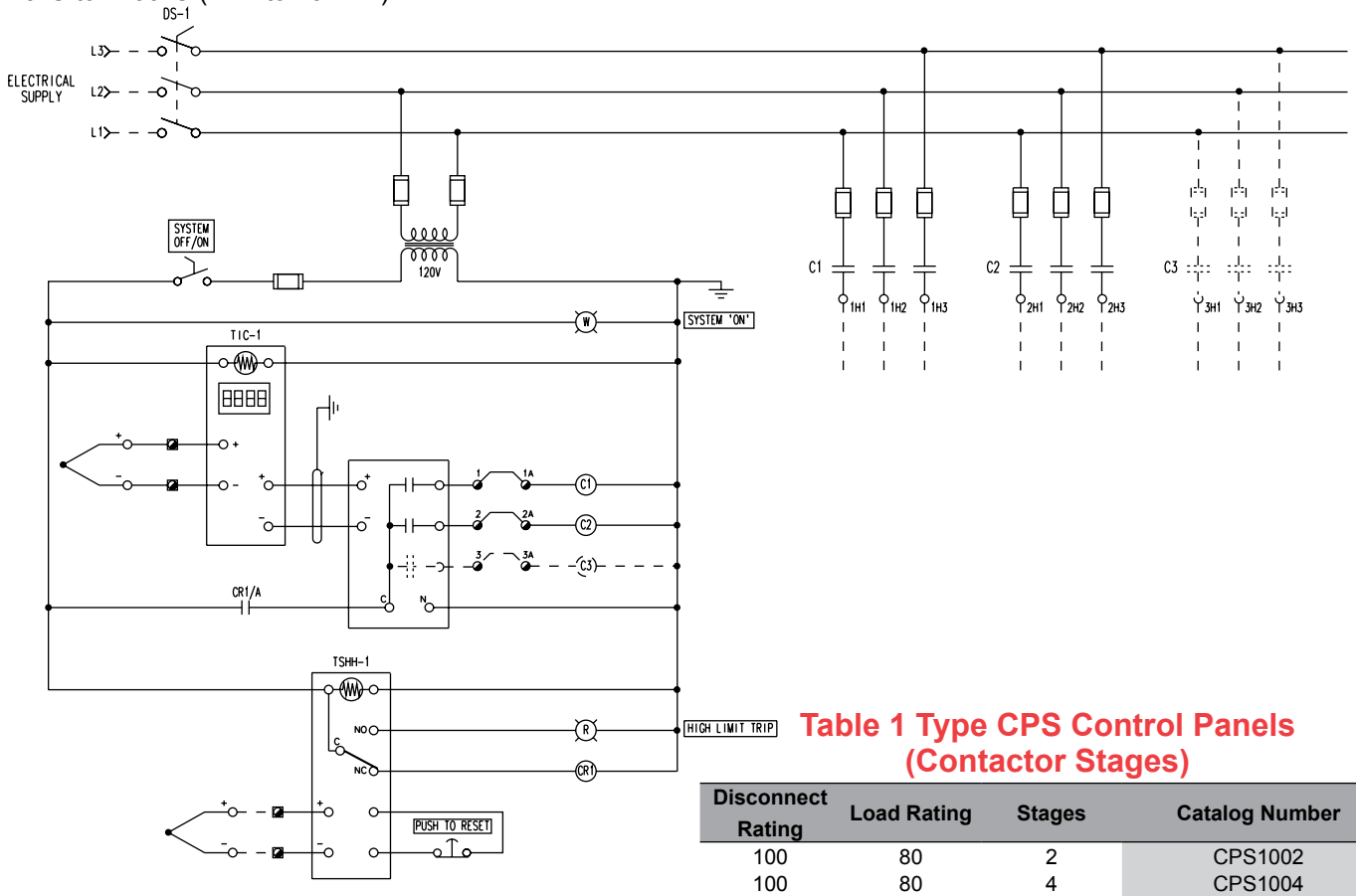


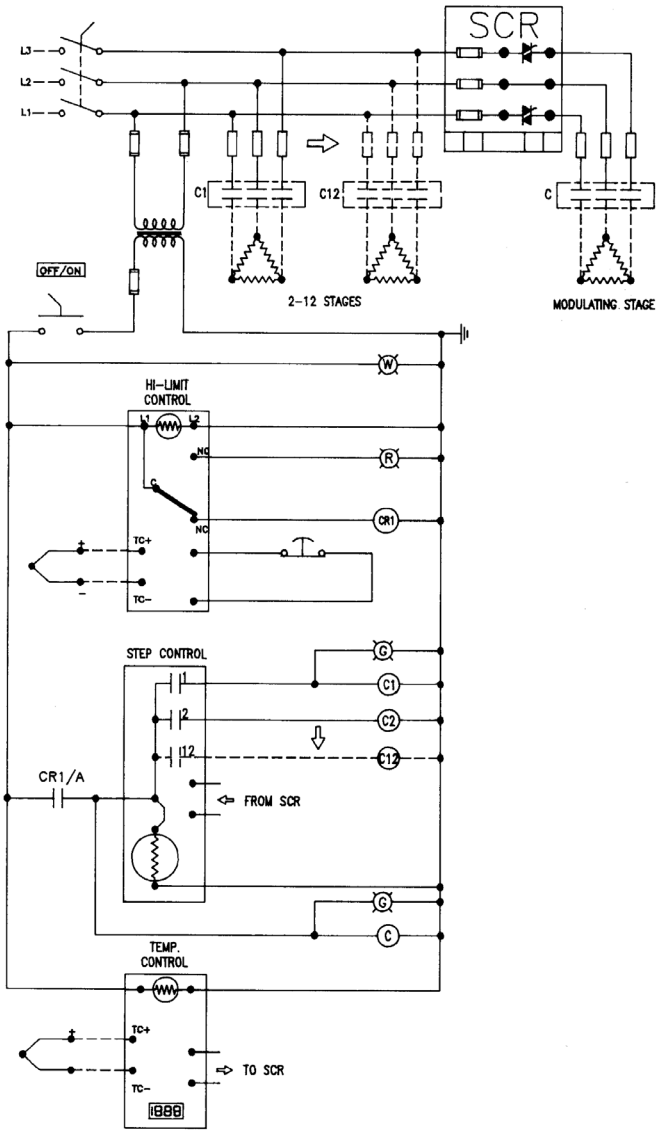
Table 1 Type CPS Control Panels (Contactor Stages)

Disconnect Rating	Load Rating	Stages	Catalog Number
100	80	2	CPS1002
100	80	4	CPS1004
200	160	4	CPS2004
200	160	6	CPS2006
400	320	6	CPS4006
400	320	8	CPS4008
400	320	12	CPS40012

CPS (Contactor Stages)

CPSS Control Panels (Base Load - SCR)

The CPSS control panel uses a combination of contactor stages controlled by a step control and an SCR solid state power control for fine tuning. Typically the SCR stage switches 20 to 30% of the total load with contactors making up the balance.



Standard features are shown below but other components and features are available to meet specific process requirements.

The control package automatically determines when extra base load contactor steps need to be brought in or dropped out. Many adjustments such as proportioning band, zero and span, and time delay between stages are field adjustable to fine tune to the process.

Features

- Type 12 dust tight enclosure
- Type 4 weather resistant encl. optional
- Door interlocked disconnect switch
- Fused contactors
- Fused control circuit transformer
- On/Off selector switch & pilot light
- I^2t fused SCR
- High limit trip pilot light
- Heating stages pilot light
- UT350-00 Process Control
- 54-302121-206 manual reset limit

To Order Specify

Panel catalog number, voltage, phase, optional features or modifications, types of scans and control configuration.

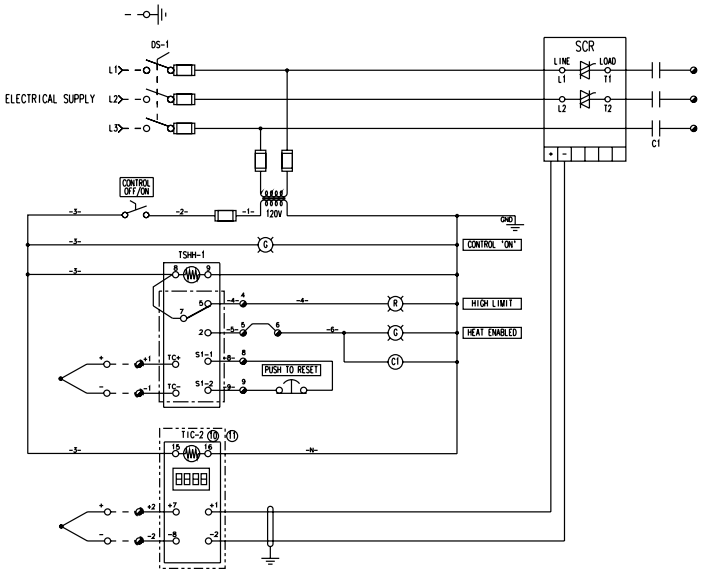
Table 1 Type CPSS Control Panel (Baseload & SCR)

Disconnect Rating	Maximum Stages & Amps		Catalog Number
	Base Loads	SCR Rating	
175A	4X30A	60A	CPSS1704 60
400A	6X50A	90A	CPSS4006 90
600A	8X60A	120A	CPSS6008 12
800A	10X60A	180A	CPSS8010 18
800A	12X50A	180A	CPSS8012 18

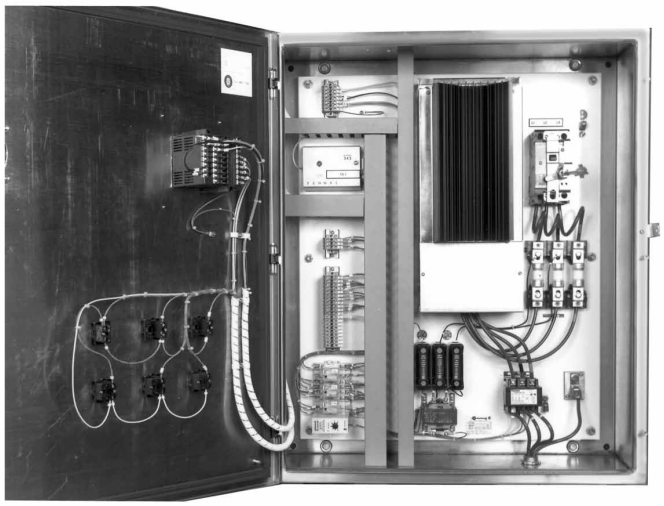
CPE Control Panels

The CPE Control panel features full SCR control. Multiple backup contactors are used to protect and facilitate wiring to the process heater.

Where necessary, the type 12 enclosures include fans and vents to keep ambient temperatures to a safe level. For type 4 or weather resistant applications check factory.



Standard features are show below but components and features are available to meet specific process requirements.



Features

- Type 12 dust tight enclosure
- I^2t fused SCR
- High limit trip pilot light
- UT350-00 process control
- 54-302121-206 manual reset limit

To Order Specify

Panel catalog number, voltage, phase, optional features or modifications, types of scans and control configuration.

Table 1 Type CPE Control Panel

Disconnect Rating	Backup Contactors	SCR	Catalog Number
30A	1X30A	25A	CPE030
80A	2X30A	70A	CPE080
100A	2X50A	90A	CPE100
175A	3X50A	120A	CPE175
200A	4X50A	180A	CPE200
400A	8X50A	350A	CPE400
600A	10X60A	500A	CPE600
800A	14X60A	650A	CPE800

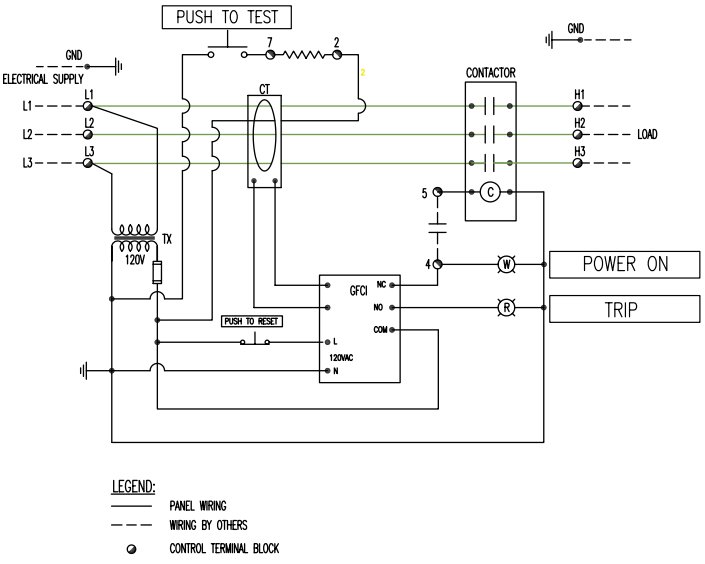
CPG Control Panels
Ground Fault Protection

The CPG series control panels are specifically designed to provide ground fault protection of permanently installed commercial and industrial heating equipment such as infrared radiant heaters. The CPG control panel is designed to protect the heating equipment from damage due to excessive leakage currents. It is not suitable to provide shock protection.

A factory wired ground fault sensor continually monitors the circuit for harmful leakage currents and opens the circuit when a threshold value has been reached. The wide 10mA to 100mA adjustable setpoint of the ground fault sensor provides protection of single or multiple heaters.

The CPG control panel is to be used in conjunction with other devices providing main circuit isolation, overcurrent or short circuit protection

Typical Schematic Diagram



Features

- Type 4 weather resistant enclosure
- Fused control circuit
- Adjustable 10mA fault trip level
- Suitable for single or multiple heater connection
- Pilot lights for power on and trip indication
- Push to test button
- Push to reset button to clear fault trip
- Terminal block for connection of supply, load and remote switch relay
- Custom designed units are available to meet specific requirements

To Order Specify

Panel catalog number, voltage, phase, load and optional features required.

Type CPG Control Panels
208V, 240V, 480V, 600V (1 or 3 Phase)

Supply Voltage	Phase	Max. Load (Amps)	Panel Size (in)	Catalog Number
120	1	20	12x12x6	CPG2011
240	1	20	12x12x6	CPG2031
240	1	40	12x12x6	CPG4031
208	3	40	12x12x6	CPG4023
240	3	40	12x12x6	CPG4033
480	3	40	12x12x6	CPG4073
600	3	40	12x12x6	CPG4083

CPG

Optional Control Equipment

The panel configurations shown on the previous pages are some of the most popular variations CCI Thermal has built. However, many specifications or process requirements dictate that we custom build a panel to suit. Caloritech™ panels are built under our ISO9001 quality program.
All panels are fully tested and meet required electrical approvals. Panels may include drawings, bills of material, and depending on the customer requirements, may include specific operating manuals, replacement parts lists, startup assistance, etc. Some available options are listed below:

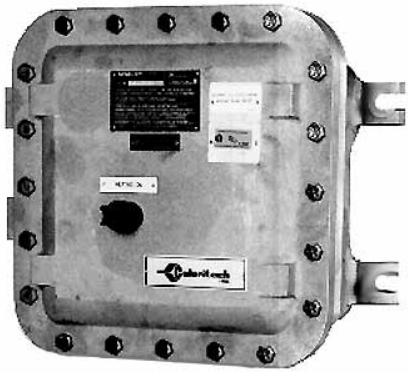
- Weather resistant enclosures
- Hazardous locations enclosures
- NEMA 4X or equivalent
- Breakers instead of disconnects or fuses
- Audible alarms or annunciation
- Input signals from transmitter, level or flow controls
- RTD sensors, different calibration thermocouples
- Retransmitted process variables
- Communications
- Remote set point
- Interface to PLC's
- Remote interlocks
- Time clocks
- Current, voltage, amperage, watt hour metering

Hazardous Location Panels

With the ***x-max***® line of enclosures (utilizing the unique "track and trolley" system), CCI Thermal can build economical control systems suitable for all hazardous locations.

The available models include basic push button stations, transformers, contactors, solid state relays and even windows for viewing digital displays.

For larger systems, other approved enclosures are available.



Although many process components must be located in the hazardous area, control components can often be located outside this area. It is good engineering design to do so when feasible.

However, when the need arises CCI Thermal has the experience and the capabilities to build safe, functional and cost effective systems for any location.