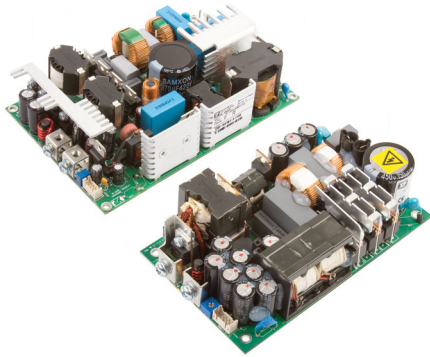


# 200/250 Watts

## CCB200/250 Series



- 200 & 250 W Convection Cooled
- Very Low Heat Loss
- +70 °C Full Power Operation (CCB200)
- Very High Efficiency up to 95%
- 5 V Standby, Inhibit & Power Fail Signals
- IT & Medical (BF) Safety Approvals
- 3 Year Warranty

### Specification

#### Input

|                         |  |
|-------------------------|--|
| Input Voltage           | • See derating curve   |
| Input Frequency         | • 47-63 Hz   |
| Input Current           | • 1.8/2.4 A typical at 115 VAC, full load (CCB200/250)<br>0.9/1.2 A typical at 230 VAC, full load (CCB200/250) |
| Inrush Current          | • 30 A typical at 230 VAC, cold start at 25 °C   |
| Power Factor            | • >0.9   |
| Earth Leakage Current   | • 250 µA max at 264 VAC/60 Hz  |
| No Load Input Power     | • <0.5 W when inhibit used (CCB200)  |
| Patient Leakage Current | • 100 µA max, 264 VAC 60 Hz  |
| Input Protection        | • Internal T5.0 A/250 V fuse in line and neutral   |

#### Output

|                                |  |
|--------------------------------|--|
| Output Voltage                 | • 12-48 VDC (see tables)   |
| Output Voltage Trim            | • ±3% CCB250, ±5% CCB200 (See Mechanical Details)                                |
| Initial Set Accuracy           | • ±0.5% V1, ±5% V2   |
| Minimum Load                   | • No minimum load required   |
| Start Up Delay                 | • 1 s typical  |
| Start Up Rise Time             | • 0.5 s typical  |
| Hold Up Time                   | • 16/20 ms min at 90 VAC (CCB250/200)  |
| Drift                          | • ±0.2% after 20 min warm up   |
| Line Regulation                | • ±0.5% max  |
| Load Regulation                | • ±1% V1, ±5% V2   |
| Over/Undershoot                | • 5% max   |
| Transient Response             | • 4% max. deviation, recovery to within 1% in 500 µs for a 50-75-50% load change |
| Ripple & Noise                 | • 1% pk-pk, 20 MHz bandwidth   |
| Overvoltage Protection         | • 115-140% Vnom, recycle input to reset (V1 only)                                |
| Overload Protection            | • 125-165% Inom V1 (CCB250), 110 - 150% Inom V1 (CCB200)                         |
| Short Circuit Protection       | • Continuous trip and restart (hiccup mode)                                      |
| Temperature Coefficient        | • 0.05%/°C   |
| Remote On/Off (Inhibit/Enable) | • Uncommitted isolated optocoupler diode, powered diode inhibits V1              |

#### Efficiency Isolation

- Up to 95%
- 4000 VAC Input to Output 2 x MOPP, 1500 VAC Input to Ground 1 x MOPP, 1500 VAC Output to Ground 1 x MOPP

#### Switching Frequency Signals

- See longform datasheet
- Power Fail Inhibit, 5 V Standby

#### MTBF

- 369/230 kWhrs to MIL-HDBK-217F at 25 °C, GB (CCB250/200)

### Environmental

#### Operating Temperature Cooling Operating Humidity Storage Temperature Operating Altitude Shock

- See derating curve & longform datasheet
- Convection cooled
- 95% RH, non-condensing
- -40 °C to +85 °C
- 3048 m for CCB250, 5000 m for CCB200
- ±3 x 30g shocks in each plane, total 18 shocks. 30g = 11ms (±0.5 ms), half sine, conforms to EN60068-2-27 & EN60068-2-47
- Single axis 10 - 500 Hz at 2g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6

#### Vibration

### EMC & Safety

#### Low Voltage PSU EMC Emissions

- EN61204-3, high severity level
- EN55011/32 level B conducted EN55011/32 level A radiated, See longform datasheet for level A
- EN61000-3-2, class A, >140w class C
- EN61000-3-3
- EN61000-4-3, level 3 Perf Criteria A
- EN61000-4-4, level 3 Perf Criteria A
- EN61000-4-5, installation class 3 Perf Criteria A
- EN61000-4-6, level 3 Perf Criteria A
- EN61000-4-11, 30% 10 ms, 60% 100 ms, 100% 5000 ms, Perf Criteria A, B, B, EN60601-1-2, 30% 500 ms, 60% 100 ms, 100% 10 ms, 100% 5000 ms, Perf Criteria A, A, A, B - 230 VAC. Consult longform datasheet for 115 V operation.

#### Harmonic Currents Voltage Flicker Radiated Immunity EFT/Burst Surge

#### Conducted Immunity Dips & Interruptions

#### Safety Approvals

- IEC60950-1 & IEC62368-1 CB report, UL62368-1, EN62368-1, IEC60601-1 CB report, UL60601-1, EN60601-1, EN60601-1, ANSI/AAMI ES60601-1, CSA22.2 No.60601-1 per cUL BF Rated, Including Risk Management, CE & UKCA meets all applicable directives & legislation.

### General

**Models and Ratings**

| Output Power | Output Voltage V1 | Max Output Current V1 | 5 V Standby (Optional) | Model Number |
|--------------|-------------------|-----------------------|------------------------|--------------|
| 200 W        | 12.0 V            | 16.7 A                | 5 V/0.5 A              | CCB200PS12   |
| 200 W        | 15.0 V            | 13.3 A                | 5 V/0.5 A              | CCB200PS15   |
| 200 W        | 24.0 V            | 8.3 A                 | 5 V/0.5 A              | CCB200PS24   |
| 200 W        | 28.0 V            | 7.1 A                 | 5 V/0.5 A              | CCB200PS28   |
| 200 W        | 48.0 V            | 4.2 A                 | 5 V/0.5 A              | CCB200PS48   |
| 200 W        | 56.0 V            | 3.6 A                 | 5 V/0.5 A              | CCB200PS56   |

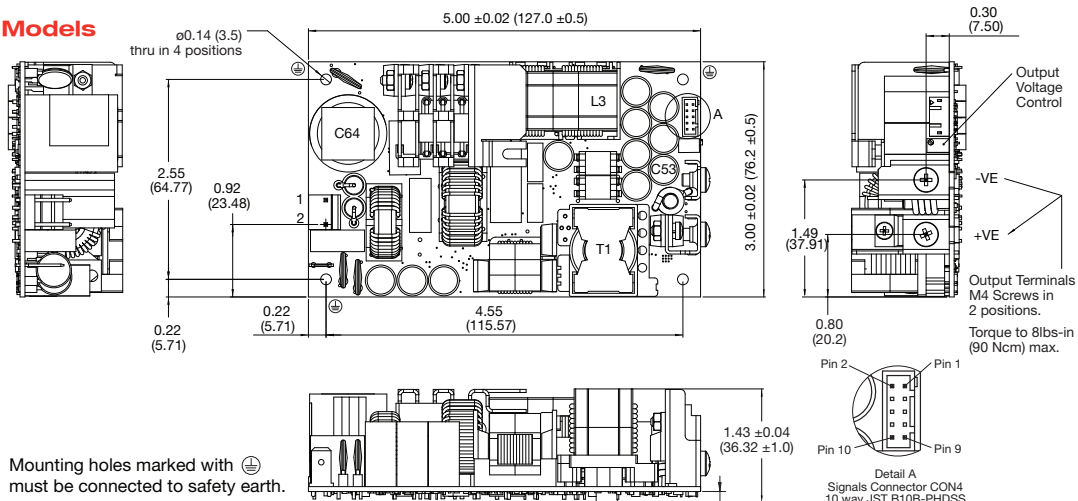
**Notes**

1. For covered version add suffix -C to model number e.g. CCB200PS12-C

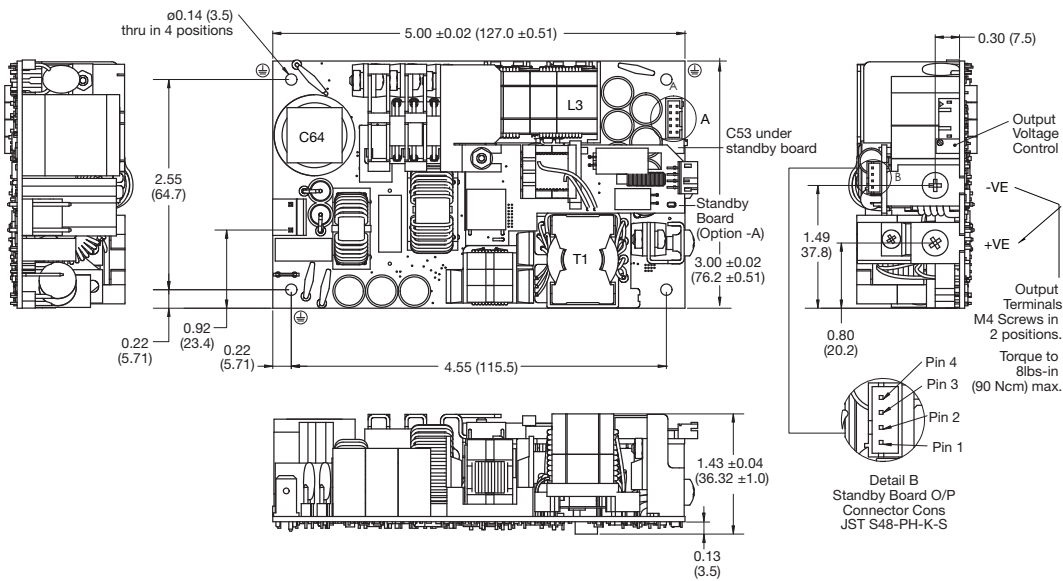
2. Add suffix -A for 5 V standby option, or -AC for standby and cover options combined.

**Mechanical Details**

**CCB200PSxx Models**



**CCB200PSxx-A Models**



| Input Connector CON 1 |         |
|-----------------------|---------|
| 1                     | Line    |
| 2                     | Neutral |

Mates with Molex housing 09-50-1031 and Molex series 5194 crimp terminals.

| Output Connector CON 3 |     |
|------------------------|-----|
| 1                      | +VE |
| 2                      | -VE |

| Signals Connector CON 4 |                        |
|-------------------------|------------------------|
| 1                       | Power Fail (Emitter)   |
| 2                       | Power Fail (Collector) |
| 3                       | Inhibit (Cathode)      |
| 4                       | Inhibit (Anode)        |
| 5                       | N/C                    |
| 6                       | N/C                    |
| 7                       | -VE Sense              |
| 8                       | -VE Sense              |
| 9                       | +VE Sense              |
| 10                      | +VE Sense              |

Mates with JST PHDR-10VS housing and JST SPHD-001T-P0.5 crimp terminals

| Standby Output (Option -A) |     |
|----------------------------|-----|
| 1                          | +5V |
| 2                          | +5V |
| 3                          | 0V  |
| 4                          | 0V  |

Mates with JST PHR-4 housing and JST SPH-002T-P0.5L crimp terminals

**Notes**

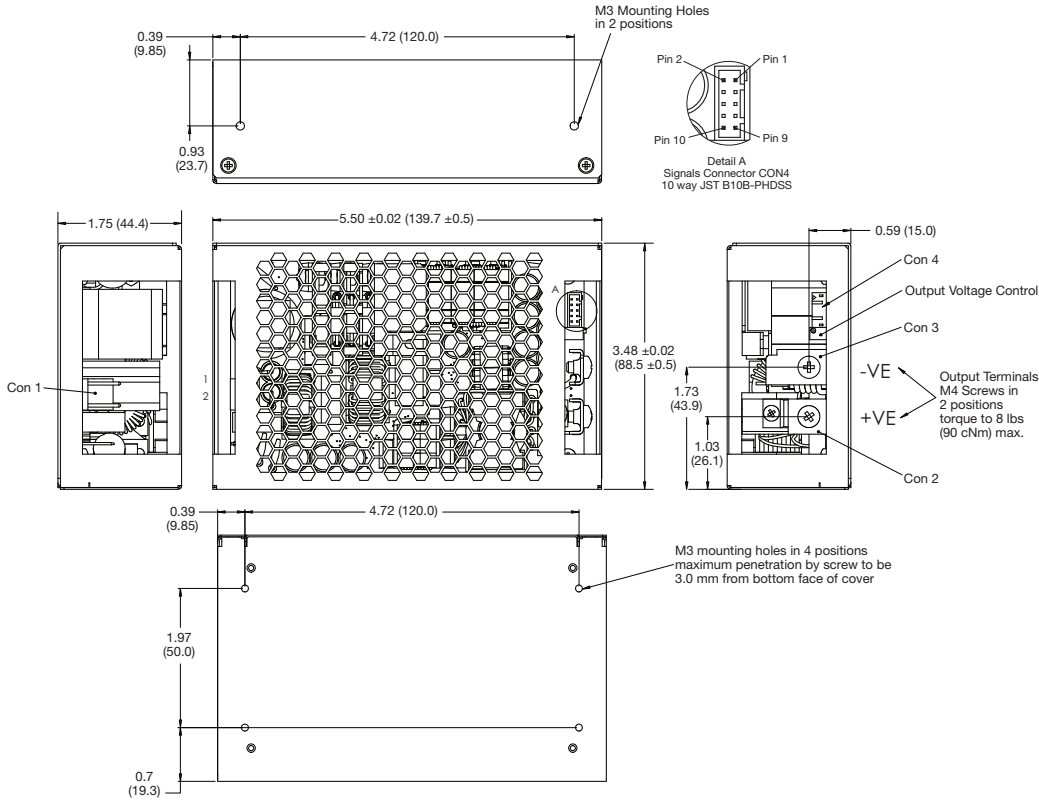
1. All dimensions in inches (mm).

2. Tolerance .xx = ±0.02 (0.50); .xxx = ±0.01 (0.25)

3. Weight: 0.88 lb (400 g) approx

Mechanical Details

CCB200PSxx-C Models



Input Connector CON 1

|   |         |
|---|---------|
| 1 | Line    |
| 2 | Neutral |

Mates with Molex housing 09-50-1031 and Molex series 5194 crimp terminals.

Output Connector

|            |
|------------|
| Con 2, +VE |
| Con 3, -VE |

Signals Connector CON 4

|    |                        |
|----|------------------------|
| 1  | Power Fail (Emitter)   |
| 2  | Power Fail (Collector) |
| 3  | Inhibit (Cathode)      |
| 4  | Inhibit (Anode)        |
| 5  | N/C                    |
| 6  | N/C                    |
| 7  | -VE Sense              |
| 8  | -VE Sense              |
| 9  | +VE Sense              |
| 10 | +VE Sense              |

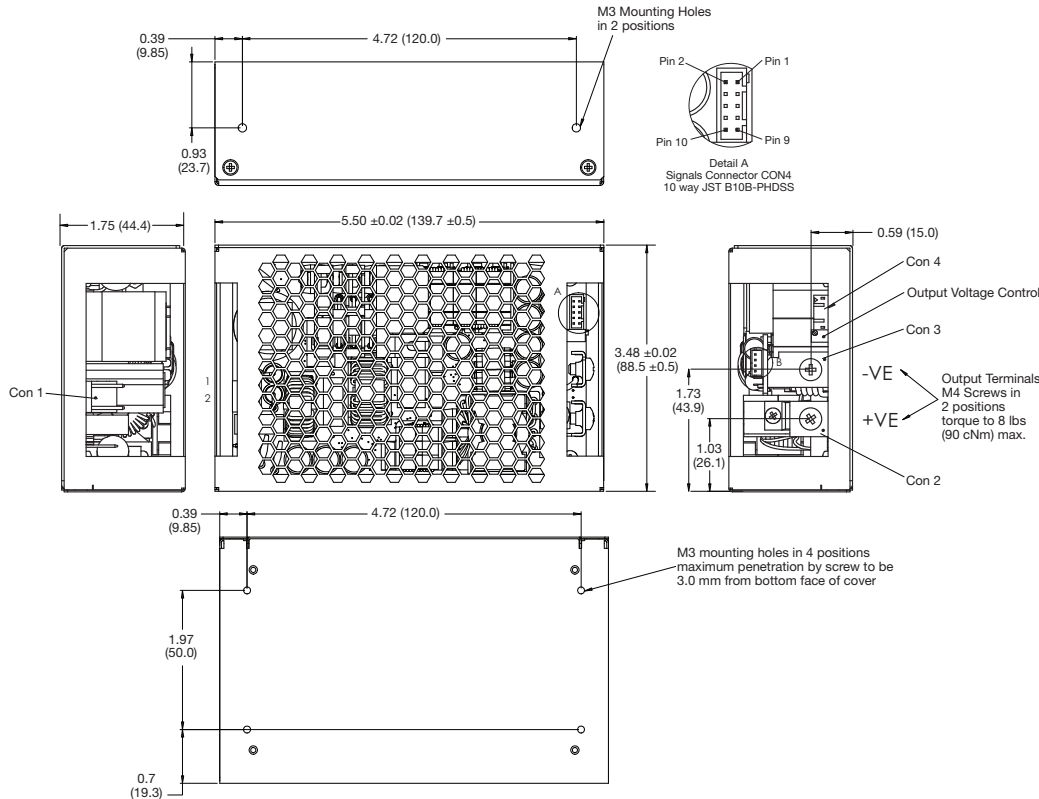
Mates with JST PHDR-10VS housing and JST SPHD-001T-P0.5 crimp terminals

Standby Output (Option -A)

|   |     |
|---|-----|
| 1 | +5V |
| 2 | +5V |
| 3 | 0V  |
| 4 | 0V  |

Mates with JST PHR-4 housing and JST SPH-002T-P0.5L crimp terminals

CCB200PSxx-AC Models



Notes

1. All dimensions in inches (mm).
2. Tolerance .xx = ±0.02 (0.50); .xxx = ±0.01 (0.25)

3. Weight: 1.36 lb (618 g) approx

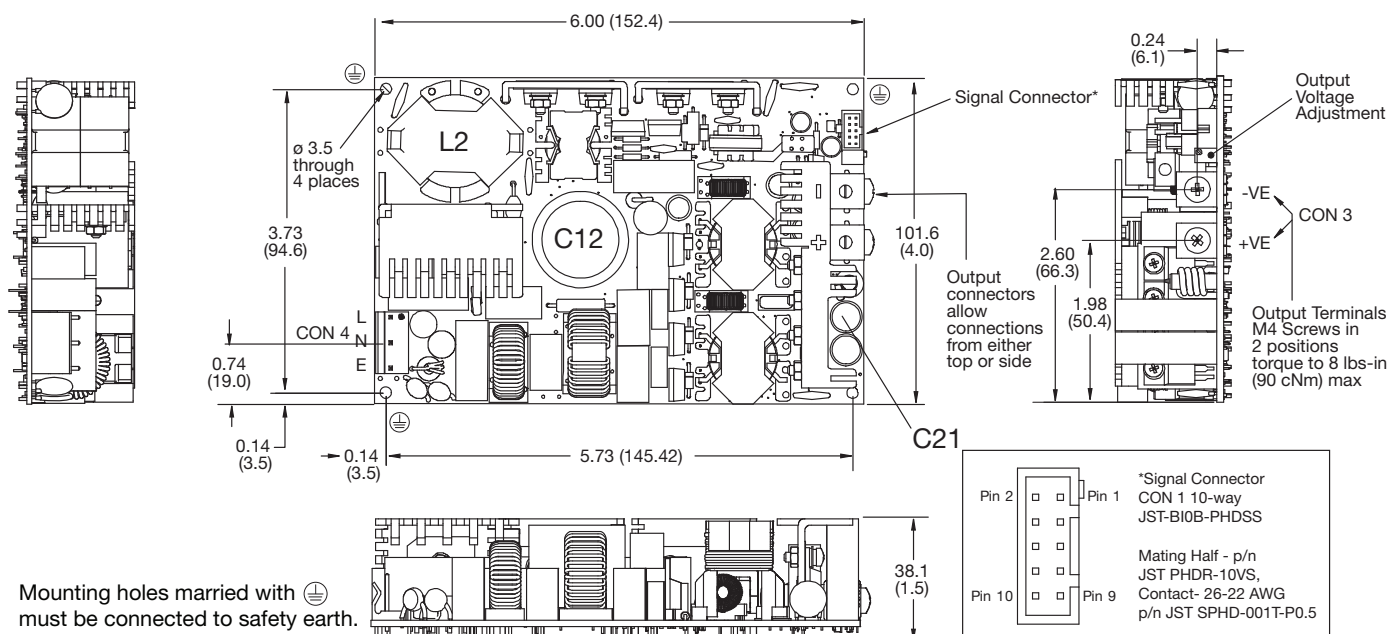
**Models and Ratings**

| Output Power |                     | Output Voltage V1 | Output Current V1 |                     | Standby Supply V2 | Model Number |
|--------------|---------------------|-------------------|-------------------|---------------------|-------------------|--------------|
| Nominal      | Peak <sup>(1)</sup> |                   | Nominal           | Peak <sup>(1)</sup> |                   |              |
| 250 W        | 300 W               | 12.0V             | 20.8 A            | 25.00 A             | 5.0 V/0.5 A       | CCB250PS12   |
| 250 W        | 300 W               | 15.0V             | 16.7 A            | 20.00 A             | 5.0 V/0.5 A       | CCB250PS15   |
| 250 W        | 300 W               | 24.0V             | 10.4 A            | 12.50 A             | 5.0 V/0.5 A       | CCB250PS24   |
| 250 W        | 300 W               | 28.0V             | 8.9 A             | 10.70 A             | 5.0 V/0.5 A       | CCB250PS28   |
| 250 W        | 300 W               | 36.0V             | 6.9 A             | 8.30 A              | 5.0 V/0.5 A       | CCB250PS36   |
| 250 W        | 300 W               | 48.0V             | 5.2 A             | 6.25 A              | 5.0 V/0.5 A       | CCB250PS48   |

**Notes**

1. Peak duration is 500ms max, average power must not exceed 250 W.

**Mechanical Details**



| Signals Connector CON 1 |                           |
|-------------------------|---------------------------|
| 1                       | 5 V Standby Return        |
| 2                       | 5 V Standby               |
| 3                       | 5 V Standby Return        |
| 4                       | 5 V Standby               |
| 5                       | 5 V Standby Return        |
| 6                       | 5 V Standby               |
| 7                       | Power Fail (Collector)    |
| 8                       | Power Fail (Emitter)      |
| 9                       | Remote On / Off (Cathode) |
| 10                      | Remote On / Off (Anode)   |

| Output Connector CON 3 |     |
|------------------------|-----|
| 1                      | +VE |
| 2                      | -VE |

| Input Connector CON 4 |         |
|-----------------------|---------|
| 1                     | Line    |
| 2                     | Neutral |
| 3                     | Earth   |

Mates with Molex housing 09-50-3051 and Molex series 2478 crimp terminals.

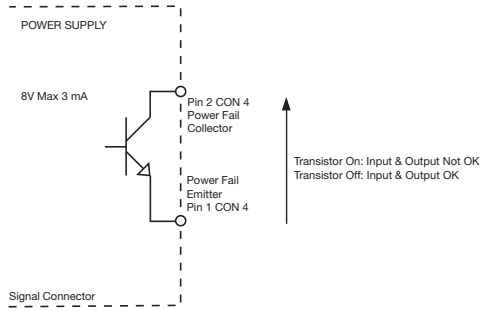
**Notes**

- All dimensions in inches (mm).
- Tolerance .xx =  $\pm 0.02$  (0.50); .xxx =  $\pm 0.01$  (0.25)
- Weight 1.7 lb (780 g) approx

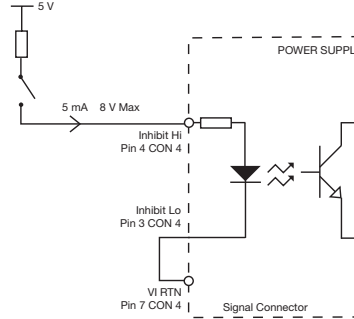
## Mechanical Details

### Signals - CCB200

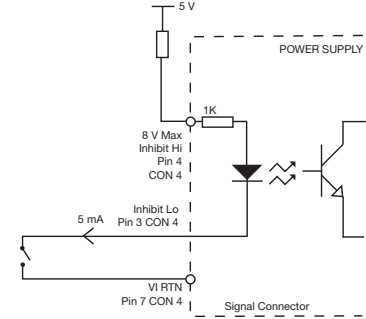
#### Power Fail



#### Inhibit (High)

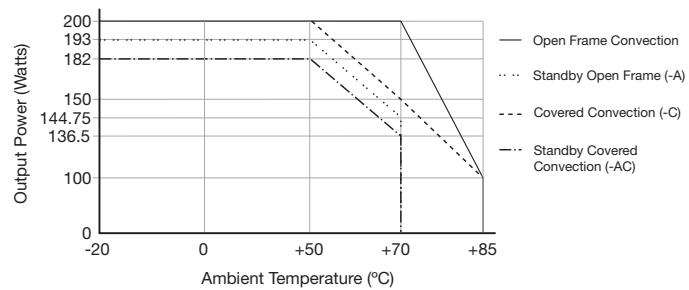
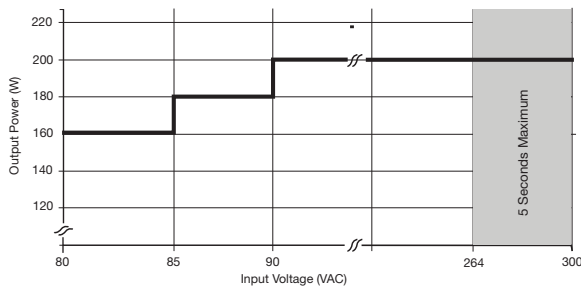


#### Inhibit (Low)



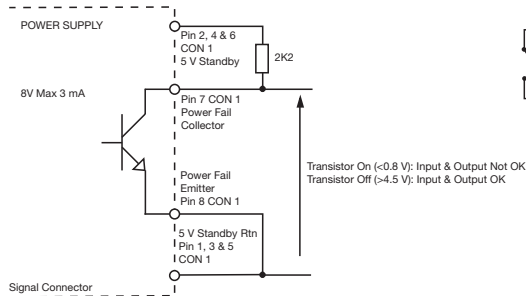
| Signals                        | Notes & Conditions  |
|--------------------------------|---|
| Power Fail                     | Uncommitted opto isolated transistor, normally off when AC is good (see fig.5)<br>Provides 5 - 15ms warning of loss of output from AC failure |
| Remote On/Off (Inhibit/Enable) | Uncommitted isolated optocoupler diode, powered diode inhibits the supply (see fig.6 & 7)   |
| 5V Standby (Optional -A)       | 5V/0.5 A Supply, always present when AC applied   |

### Input Voltage & Temperature Derating - CCB200

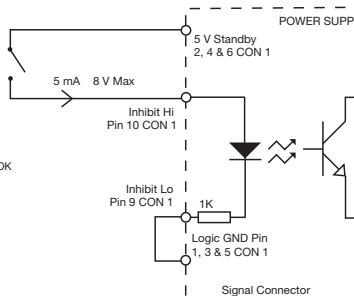


### Signals - CCB250

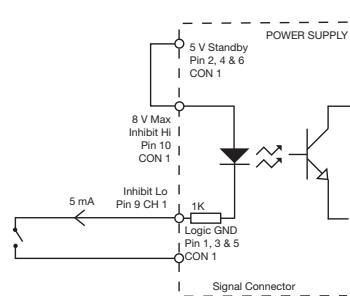
#### Power Fail



#### Inhibit (High)



#### Inhibit (Low)



| Signals                        | Notes & Conditions  |
|--------------------------------|---|
| Power Fail                     | Uncommitted opto isolated transistor, normally off when AC is good<br>Provides $\geq 5$ ms (typically 20-30 ms) warning of loss of output from AC failure |
| Remote On/Off (Inhibit/Enable) | Uncommitted isolated optocoupler diode, powered diode inhibits the supply   |
| Standby Supply V2              | Isolated 5V/0.5 A supply, always present when AC supplied.  |

### Input Voltage & Temperature Derating - CCB250

