

Economical DIN Rail Signal Conditioners



CCT Series



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than actual size.

- ✓ Voltage, Current, Frequency, Resistance, Potentiometer, Thermocouple, RTD and Strain Gage Input Modules
- ✓ Integrator Modules Convert Voltage or Current to Frequency
- ✓ Loop Powered Galvanic Isolator Provides 2 kVeff Isolation Between Input and Output
- ✓ Compatible with Standard 35 mm DIN Rail

The CCT series DIN rail signal conditioners are designed to accept a broad range of input signals, such as ac and dc voltage and current, frequency, temperature (thermocouple and RTD), and process transducers, and provide standard process outputs of either 0/4 to 20 mA, or 0 to 10 Vdc. The CCT series features a modern housing design, that is easily mounted on standard DIN rails. Connections are safely and securely made, with input and output connections on the opposite sides of the module.

Internal Design

The CCT series is designed using an internal plug-in three module system that provides flexibility in selecting and changing the power supply, input signal and output signal. Available power supplies include 110 Vac, 220 Vac, and 24 Vdc.

Isolation

The three internal modules in each signal conditioner (signal input, signal output and power supply) are isolated up to 2 kVeff.

Outputs

Each CCT series signal conditioner is available with current and voltage output (only one may be used at a time). Available output types include 4 to 20 mA or 0 to 20 mA (jumper-selectable) and 0 to 10 Vdc.

Standard outputs are linear and proportional to the signal input. Thermocouple input modules feature special circuitry to linearize the output to the actual temperature, and not to the non-linear signal produced by thermocouple sensors.



Integrators

The CCT integrator signal conditioners accept either voltage or current signals, and provide a frequency pulse output. This pulse output can be used as input signals for PLCs or other industrial controls.

Additional Features

Additional models in the CCT series include the FAR power supplies, that can be used with the CCT-80 strain gage transmitter, to provide wheatstone bridge excitation. The loop-powered galvanic isolator model CCT-100 can be used in any application where input to output isolation is required. The CCT-100 provides up to 2 kVeff isolation between the input and output terminals.

Specifications

Power: 110 Vac (standard); 220 Vac or 24 Vdc (optional) ($\pm 10\%$ tolerance on all power supplies)

Output: 4 to 20 mA and 0 to 10 Vdc standard; 0 to 20 mA via jumper select

Accuracy: $\leq 0.2\%$ or $\leq 0.3\%$, depending on the model

Response Time: ≤ 250 ms

Isolation: 2 kVeff

Ripple: $\leq 0.5\%$

Bandpass: 1.5 Hz (-3 dB)

Operating Ambient: -10 to 60°C (14 to 140°F)

Storage Ambient: -30 to 80°C (-22 to 176°F)

Temperature Coefficient: $\leq 0.015\%/^{\circ}\text{C}$

Power Consumption: 1.5 VA max

Enclosure: Polycarbonate, RAL 7032; UL 94 V-1, IP40 protection

Terminal Housing: Polycarbonate, UL 94-2, IP20 protection

Max Wire Size: 4 mm² (14 AWG)

Dimensions: 75 H x 45 W x 110 mm D (2.95" x 1.77" x 4.33")

Weight: 270 g (0.6 lb)

Mounting: DIN rail 46277 and EN 50022 (35 x 7.5 mm)

ac/dc Voltage and Current Input Models



- ✓ ac/dc Voltage Input
Ranges from 100 mV to 650 V
- ✓ ac/dc Current Input
Models with 0 to 50 mA or 0 to 5 A

- ✓ Overvoltage Protection for Voltage Inputs
- ✓ High Impedance Voltage Inputs
- ✓ Low Impedance Current Inputs



The CCT series of ac and dc input signal conditioners accept analog signals and provide conditioned, isolated analog outputs of 0 to 10 V or 0/4 to 20 mA. The CCT-01 accepts dc voltages, the CCT-08 accepts ac voltages, while the CCT-04 and CCT-32 accept ac and

dc current signals, respectively. The CCT-32 also provides 24 Vdc excitation for powering transmitters. All models are powered by 110 Vac (220 Vac or 24 Vdc powered models also available), are mountable on standard 35 mm DIN rail, and are isolated to 2 kVeff.

CCT-01 dc Voltage Input CCT-08 ac Voltage Input

Range	0 to 100 mV	0 to 1 V	0 to 10 V	0 to 100 V	0 to 650 V
Impedance	100 k Ω	100 k Ω	1 M Ω		
Overvoltage	25 V	75 V	1000 Vdc/750 Vac		

To Order

Model No.†	Input Range	Output
CCT-01-0/100MV	0 to 100 mV dc	0 to 10 V or 0/4 to 20 mA
CCT-01-0/1V	0 to 1 V dc	0 to 10 V or 0/4 to 20 mA
CCT-01-0/10V	0 to 10 V dc	0 to 10 V or 0/4 to 20 mA
CCT-01-0/100V	0 to 100 V dc	0 to 10 V or 0/4 to 20 mA
CCT-01-0/650V	0 to 650 V dc	0 to 10 V or 0/4 to 20 mA
CCT-08-0/100MV	0 to 100 mV ac	0 to 10 V or 0/4 to 20 mA
CCT-08-0/1V	0 to 1 V ac*	0 to 10 V or 0/4 to 20 mA
CCT-08-0/10V	0 to 10 V ac*	0 to 10 V or 0/4 to 20 mA
CCT-08-0/100V	0 to 100 V ac*	0 to 10 V or 0/4 to 20 mA
CCT-08-0/650V	0 to 650 V ac*	0 to 10 V or 0/4 to 20 mA

† 110 Vac powered units supplied standard. To order 220 Vac or 24 Vdc powered models add “-220VAC” or “-24VDC” to the model number. No additional charge for 220 Vac, add additional cost for 24 Vdc. *The CCT-08 signal frequency range is 20 Hz to 6KHz.

Ordering Example: CCT-01-0/100 mV dc input signal conditioner with 0 to 100 mVdc range.

CCT-04 ac Current Input

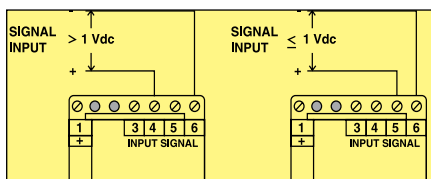
Range	0 to 50 mA ac	0 to 5 A ac
Impedance	20 Ω	0.02 Ω
Overload	100 mA ac	7.5 A ac

To Order

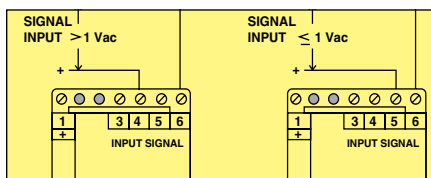
Model No.†	Input Range	Output
CCT-04-0/50MA	0 to 50 mA ac	0 to 10 V or 0/4 to 20 mA
CCT-04-0/5A	0 to 5 A ac	0 to 10 V or 0/4 to 20 mA

† 110 Vac powered units supplied standard. To order 220 Vac or 24 Vdc powered models add “-220VAC” or “-24VDC” to the model number. No charge for 220 Vac, add additional cost to price for 24 Vdc.

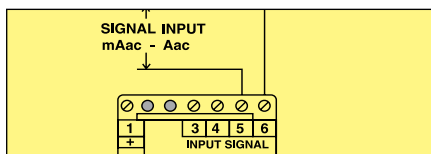
Ordering Example: CCT-04-0/5A ac current input signal conditioner with 0 to 5 A ac range.



CCT-01 Input Connections



CCT-08 Input Connections

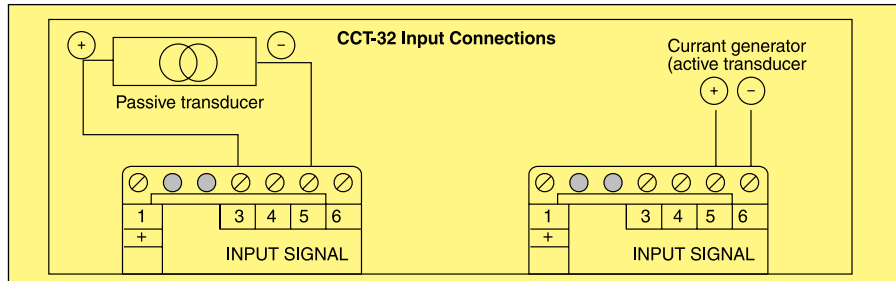


CCT-04 Input Connections



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dc Current Input Models



To Order

Model No. [†]	Input Range	Output
CCT-32-0/50MA	0 to 50 mA dc	0 to 10 V or 0/4 to 20 mA
CCT-32-0/5MA	0 to 5 mA dc	0 to 10 V or 0/4 to 20 mA

[†] 110 Vac powered units supplied standard. To order 220 Vac or 24 Vdc powered models add "-220VAC" or "-24VDC" to the model number. No additional charge for 220 Vac, add additional cost to price for 24 Vdc.

Ordering Example: CCT32-0/5MA dc current input signal conditioner with 0 to 5 mA range.

Range	0 to 50 mA dc	0 to 5 A dc
Impedance	20 Ω	20 Ω
Overload	100 mA dc	100 mA dc

Voltage Excitation for Current Loop: 24 V dc @ 25 mA, supplied by converter

Thermocouple Input Models

- ✓ Available with J, K, T, E, R and S Thermocouple Types
- ✓ Jumper-Selectable Up or Downscale Break Protection
- ✓ 0.3% Accuracy
- ✓ Linearized

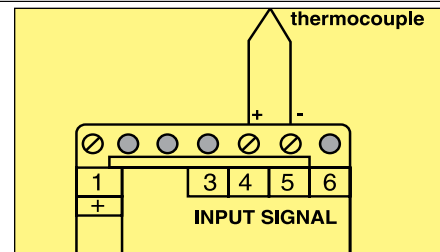
The CCT series of thermocouple input signal conditioners accept J, K, T, E, R or S type thermocouples, and provide conditioned, isolated analog outputs of 0 to 10 V or 0/4 to 20 mA. All models are powered by 110 Vac (220 Vac or 24 Vdc powered models also available), are mountable on standard 35 mm DIN rail, and are isolated to 2 kVeff.

Specifications

Cold Junction Compensation Error: 0.05°C/°C for J, K, T, E and R calibrations; 0.1°C/°C for type S; at 25°C ambient typical

Max Overvoltage: 75 Vdc

Break Protection: Jumper selectable, upscale (>20 mA) or downscale (<4 mA)



Input Connections

Range Table

Range Code	Range	J	K	T	E	S	R
0/200C	0 to 200°C			X			
0/300C	0 to 300°C		X	X			
0/400C	0 to 400°C	X	X	X			
0/500C	0 to 500°C	X	X				
0/600C	0 to 600°C	X	X				
0/700C	0 to 700°C	X	X				
0/800C	0 to 800°C		X		X		
0/900C	0 to 900°C		X				
0/1000C	0 to 1000°C		X				
0/1200C	0 to 1200°C		X				
600/1600C	600 to 1600°C					X	
850/1700C	850 to 1700°C						X

To Order

Input Model Number [†]	Type
CCT-22-(*)	J
CCT-23-(*)	K
CCT-24-(*)	T
CCT-25-0/800C	E
CCT-26-600/1600C	S
CCT-27-850/1700C	R

*Specify range code from range table. CCT-25 is only available with 0 to 800°C range, CCT-26 is only available with 600 to 1600°C range

[†] 110 Vac powered units supplied standard. To order 220 Vac or 24 Vdc powered unit models add "-220VAC" or "-24VDC" to the model number. No additional charge for 220 Vac, add additional cost to price for 24 Vdc.

Ordering Example: CCT-23-0/1200C, signal conditioner for type K thermocouple input, with 0 to 1200°C range.

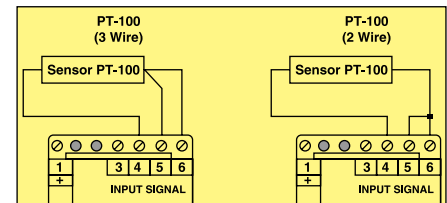
CCT-20 RTD Input Models



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- ✓ 100Ω Pt RTD Element, 0.00385 Curve
- ✓ 2 or 3 Wire Configuration
- ✓ 0.2% Accuracy
- ✓ Downscale Break Protection
- ✓ 1 mA Max Excitation Current

The CCT-20 signal conditioners accept 100Ω Pt RTD signals, and provide conditioned, isolated outputs of 0 to 10 V or 0/4 to 20 mA. Units are 110 Vac powered (220 Vac or 24 Vdc power also available). Modules are mountable on standard 35 mm DIN rail, and are isolated to 2 kVeff.



CCT-20 Input Connections

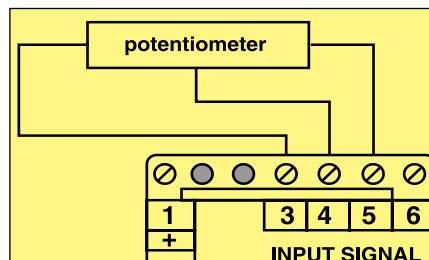
To Order

Model No. [†]	Input Range	Output
CCT-20-0/100C	0 to 100°C	0 to 10 V or 0/4 to 20 mA
CCT-20-0/200C	0 to 200°C	0 to 10 V or 0/4 to 20 mA
CCT-20-0/300C	0 to 300°C	0 to 10 V or 0/4 to 20 mA
CCT-20-0/400C	0 to 400°C	0 to 10 V or 0/4 to 20 mA
CCT-20-0/500C	0 to 500°C	0 to 10 V or 0/4 to 20 mA
CCT-20-0/600C	0 to 600°C	0 to 10 V or 0/4 to 20 mA

Ordering Example: CCT-20-0/200C RTD input signal conditioner with 0 to 200°C range.

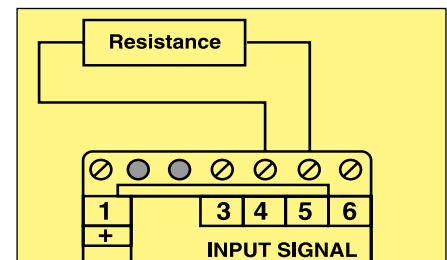
CCT-90 Potentiometer Models

- ✓ 100 Ω Min/1 MΩ Max Input
- ✓ Excitation Reference Voltage Between 1 and 2 V



CCT-90 Input Connections

The CCT-90 potentiometer input modules accept 3-wire potentiometers (such as position sensors) and CCT-95 models accept resistance signals, providing isolated 0 to 10 V or 0/4 to 20 mA



CCT-95 Input Connections

output. Each model is 110 Vac powered (220 Vac or 24 Vdc also available). Models are mountable on standard 35 mm DIN rail, and are isolated to 2 kVeff.

CCT-95 Resistance Input Models

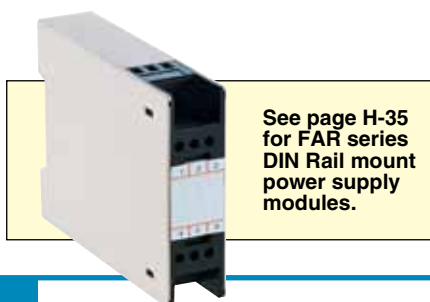
- ✓ 0.2% Accuracy
- ✓ Upscale Break Protection (>20 mA)
- ✓ 10%FS Min Input Span

[†] 110 Vac powered units supplied standard. To order 220 Vac or 24 Vdc powered models add “-220VAC” or “-24VDC” to the model number. No additional charge for 220 Vac, add additional cost to price for 24 Vdc.

To Order

Model Number [†]	Input Range	Output
CCT-90	Potentiometer	0 to 10 V or 0/4 to 20 mA
CCT-95-0/200	0 to 200 Ω	0 to 10 V or 0/4 to 20 mA
CCT-95-0/2K	0 to 2K Ω	0 to 10 V or 0/4 to 20 mA
CCT-95-0/20K	0 to 20 kΩ	0 to 10 V or 0/4 to 20 mA
CCT-95-0/200K	0 to 200 kΩ	0 to 10 V or 0/4 to 20 mA

Ordering Example: CCT-90 potentiometer input signal conditioner.



See page H-35 for FAR series DIN Rail mount power supply modules.

SIGNAL CONDITIONERS

CCT-05 Frequency Input Models



D/I



A/OUT

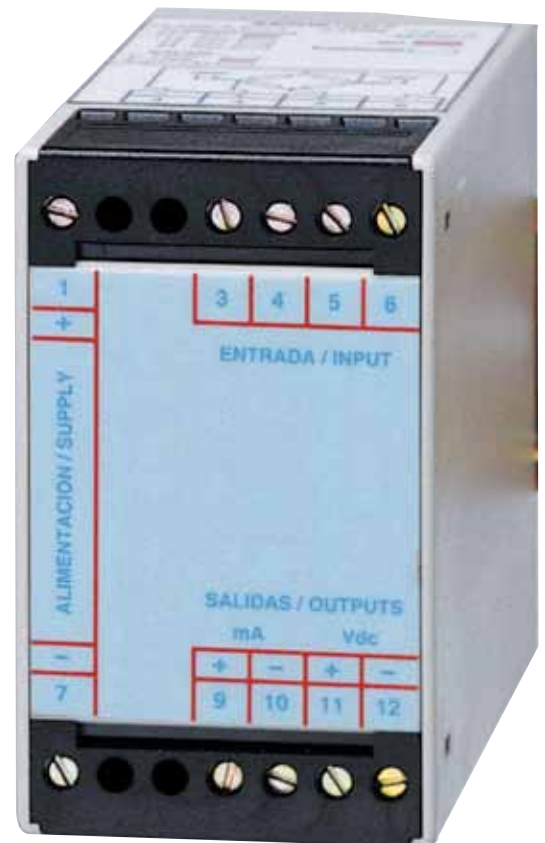


- ✓ NPN, PNP, NAMUR, Open Collector, Contact, or TTL Inputs or AC Voltage (100 mV to 400 Vac)
- ✓ Signal Input Range from 40 Hz to 40 kHz
- ✓ Excitation for NPN, PNP and NAMUR Inputs

The CCT-05 signal conditioners accept inputs from a variety of frequency transducers, including NPN, PNP, NAMUR, open collector,

contact or TTL pulse or AC voltage (100 mV to 400 Vac). Modules are supplied scalable for a minimum and maximum frequency range. The actual range is set by the user via multiturn trimmers, a frequency generator is also required. All units are 110 Vac powered (220 Vac or 24 Vdc power also available), and may be mounted on standard 35 mm DIN rail.

Each unit is isolated to 2 kVeff.

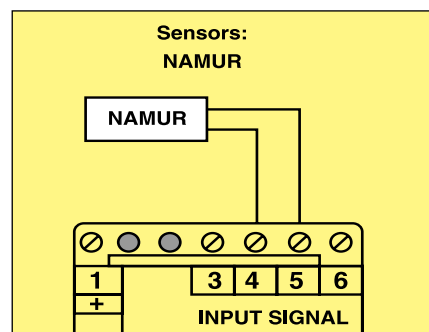
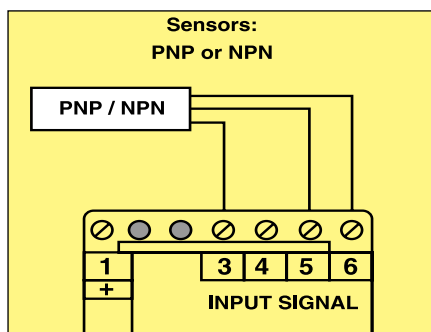


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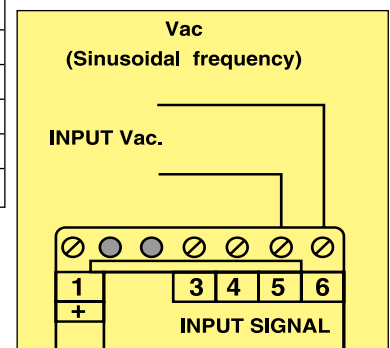
To Order

Model No.†	Min* Range	Max* Range	Output
CCT-05-40/70	0 to 40 Hz	0 to 70 Hz	0 to 10 V or 0/4 to 20 mA
CCT-05-70/125	0 to 70 Hz	0 to 125 Hz	0 to 10 V or 0/4 to 20 mA
CCT-05-125/225	0 to 125 Hz	0 to 225 Hz	0 to 10 V or 0/4 to 20 mA
CCT-05-225/400	0 to 225 Hz	0 to 400 Hz	0 to 10 V or 0/4 to 20 mA
CCT-05-400/700	0 to 400 Hz	0 to 700 Hz	0 to 10 V or 0/4 to 20 mA
CCT-05-700/1250	0 to 700 Hz	0 to 1250 Hz	0 to 10 V or 0/4 to 20 mA
CCT-05-1250/2250	0 to 1250 Hz	0 to 2250 Hz	0 to 10 V or 0/4 to 20 mA
CCT-05-2250/4K	0 to 2250 Hz	0 to 4 kHz	0 to 10 V or 0/4 to 20 mA
CCT-05-4K/7K	0 to 4 kHz	0 to 7 kHz	0 to 10 V or 0/4 to 20 mA
CCT-05-7K/12.5K	0 to 7 kHz	0 to 12.5 kHz	0 to 10 V or 0/4 to 20 mA
CCT-05-12.5K/22.5K	0 to 12.5 kHz	0 to 22.5 kHz	0 to 10 V or 0/4 to 20 mA
CCT-05-22.5K/40K	0 to 22.5 kHz	0 to 40 kHz	0 to 10 V or 0/4 to 20 mA

† 110 Vac powered units supplied standard. To order 220 Vac or 24 Vdc powered models add "220VAC" or "24VDC" to the model number. No additional charge for 220 Vac, add additional cost to price for 24 Vdc. *The output signal is non-linear for input frequencies below 10 Hz.



Ordering Example: CCT-05-70/125 frequency input signal conditioner with 0 to 70 Hz minimum range and 0 to 125 Hz maximum range.



CCT-80 Strain Gage/Load Cell Input Models



- ✓ For Strain Gage Sensors with 20 mV Output and 10 V Excitation
- ✓ 4 and 6-Wire Bridge Sensors
- ✓ 350 Ω Sensor Impedance
- ✓ Companion FAR-1 Power Supply Module Provides Stabilized 10 Vdc Excitation for 4 Modules
- ✓ FAR Series Power Supplies Provide Bridge Excitation

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FAR-1 10 V, 250 mA power supply with excitation sense capability.

The CCT-80 strain gauge/load cell signal conditioners accept input from 350 Ω bridge circuits and provide isolated 0 to 10 V or 0/4 to 20 mA output. The FAR series power supplies can be used to provide signal isolation for bridge circuits and other transducers. The FAR-1 is specifically designed for use with strain gage circuits. All units are 110 Vac powered (220 Vac power also available), and are mounted on standard 35 mm DIN rails.

Power Supply Specifications

Power: 110 Vac, 50-60 Hz

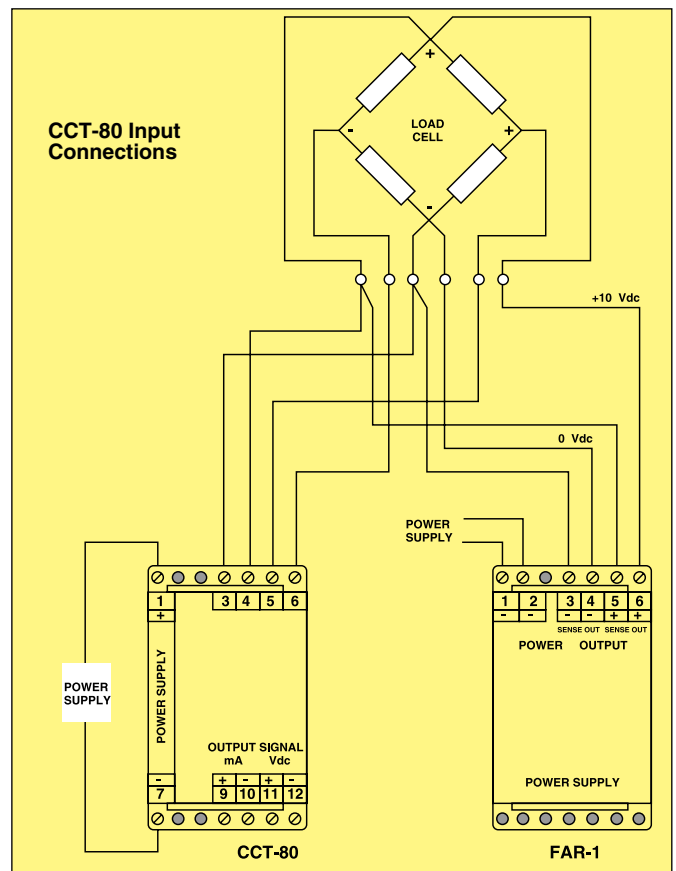
Output Adjust (FAR-1 only): $\pm 5\%$, internal potentiometer

† 110 Vac powered units supplied standard. To order 220 Vac or 24 Vdc powered models add “-220VAC” or “-24VDC” to the model number. No additional charge for 220 Vac, add additional cost to price for 24 Vdc.

To Order	
Model No.†	Description
CCT-80	Strain gage signal conditioner with 0-10 V or 0/4 to 20 mA output
FAR-1	10 V, 250 mA power supply with excitation sense capability, 110 Vac power*
FAR-2-5	5 V, 225 mA power supply
FAR-2-9	9 V, 225 mA power supply
FAR-2-12	12 V, 200 mA power supply
FAR-2-15	15 V, 100 mA power supply
FAR-2-18	18 V, 100 mA power supply
FAR-2-24	24 V, 150 mA power supply

* To order FAR-1 with 230 Vac power, add suffix “-230” to model number at no additional charge.

Ordering Example: CCT-80 strain gage signal conditioner with FAR-1 10AV, 250mA power supply.



CCT-55 Signal Integrators



- ✓ Convert Analog Voltage/Current to Frequency Output
- ✓ Source or Sink Output
- ✓ Output Ranges From 1 pulse/hour to 10,000 pulses/sec Full Scale

The CCT-55 signal integrators provide conditioned, isolated frequency outputs proportional to the analog input signal. The CCT-55-V accepts voltages from 0-100 mV to 0 to 650 V, while the CCT-55-I accepts from 0 to 5 mA to 0 to 50 mA input. Output ranges are field settable through jumper selection and multiturn trimmers. A calibrator and frequency meter is required for adjustment.

Specifications

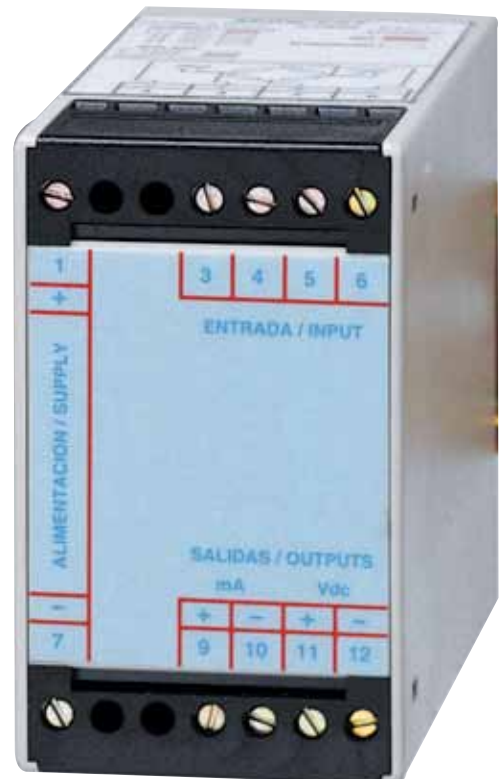
dc Voltage Input Ranges: 0 to 0.1 Vdc, 0 to 1 Vdc, 0 to 10 Vdc, 0 to 100 Vdc, 0 to 650 Vdc; jumper select

Current Input Ranges: 0 to 5 mA, 0 to 50 mA; jumper select

Output: 15 Vdc @ 5 mA source or 100 mA sink with 24 Vdc external supply

Output Ranges: 1 pulse/hr to 10,000 pulses/sec full scale; jumper select and potentiometer adjustment

Pulse Ratio: 50% or fixed 100 ms



CCT100 Galvanic Isolator

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Model CCT-100
Galvanic Isolator

- ✓ Provides 2 kV Input to Output Isolation
- ✓ 0 to 50 mA Input and Output Ranges
- ✓ Loop Powered

Specifications

INPUT

Input/Output Ratio: 1:1; signal output = signal input

Input Current: 0 to 50 mA dc

Input Voltage: 18 Vdc max

Voltage Drop: 3 Vdc max

Max Load: 50 mA dc

OUTPUT

Output Current: 0 to 50 mA dc

Ripple: 0.5% @ 3 kHz

To Order

Model No. [†]	Description
CCT-55-V	Voltage Input
CCT-55-I	Current Input

[†] 110 Vac powered units supplied standard. To order 220AVac or 24 Vdc powered models add "220VAC" or "24VDC" to the model number. No additional charge for 220 Vac, add additional cost to price for 24 Vdc.

Ordering Example: CCT-55-V voltage input.

Load: 0 to 750 Ω

Response Time: 50 ms

Accuracy: 0.1% at 25°C

Temperature Coefficient: 0.01% each 10°C from 10 to 60°C

Dimensions: 75 x 22.5 x 98.5 mm (2.95 x 0.89 x 3.88")

Weight: 100 g (0.2 lb)

To Order

Model No.	Description
CCT-100	Loop powered galvanic isolation module

Ordering Example: CCT-100 galvanic isolator.