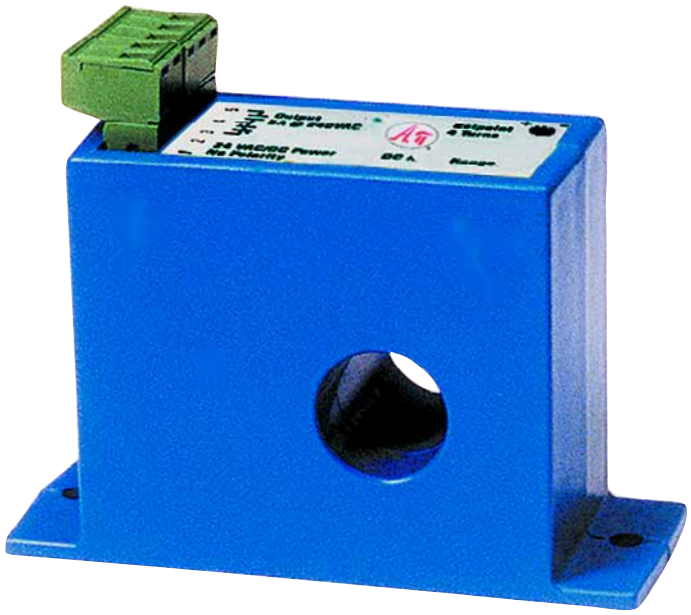
DC Current Switches
Solid Core

CS-DC-1S-12, CS-DC-2S-12
CS-DC-1S-24, CS-DC-2S-24

Input: ***5 to 300 Amps DC***

Output: ***SPDT Relay or Normally Open SSR, 5 to 100 A Setpoint***

- ***Low Voltage AC/DC Powered***
- ***0.3 A Solid State Switch or 5 A Relay***
- ***Adjustable 5 to 100 Amp Setpoint***
- ***LED Power and Status Indicators***



Models and Ranges

CS-DC-1S-12 Power: 12 VAC/VDC ±10%
Output: SPDT Relay, 5 A @ 240 VAC & 3 A @ 30 VDC

CS-DC-2S-12 Power: 12 VAC/VDC ±10%
Output: Normally Open, Solid State 0.3 A @ 135 VAC/VDC

CS-DC-1S-24 Power: 20 to 28 VAC/VDC
Output: SPDT Relay, 5 A @ 240 VAC & 3 A @ 30 VDC

CS-DC-2S-24 Power: 20 to 28 VAC/VDC
Output: Normally Open, Solid State 0.3 A @ 135 VAC/VDC

Specifications

Output

CS-DC-1S SPDT mechanical relay
5 A @ 240 VAC (3 A inductive, 1/8 HP @ 240 VAC), 3 A @ 30 VDC

CS-DC-2S Isolated solid state switch, Normally Open
0.3A@135 VAC/VDC
Not polarity sensitive. Off state leakage: none

Frequency Range

DC to 400 Hz

Setpoint Ranges

Jumper selectable
Low: 5 to 20 A Mid: 18 to 50 A Hi: 50 to 100 A

Setpoint Adjustment

9 turn potentiometer

Hysteresis

Approximately 5% of setpoint

Response Time

100 milliseconds (10% above setpoint)
20 milliseconds (100% above setpoint)

Overload

Low range	6 sec @ 500 A, 120 A continuous
Mid range	6 sec @ 600 A, 200 A continuous
Hi range	6 sec @ 800 A, 300 A continuous

Alarm Indication

Red LED turns on above trip point

Power

CS-DC-1S-12, CS-DC-2S-12 12 VAC/VDC ±10%, 10 VA

CS-DC-1S-24, CS-DC-2S-24 20 to 28 VAC/VDC, 10 VA

Power Indication

Green LED indicates when unit is on

Isolation Voltage

3000 Volts

Sensing Aperture

0.75" (19 mm) dia

Case

UL 94V-0 flammability rated

Environmental

CS-DC-1S –4 to 122°F (–20 to 50°C) 0-95% RH, non-condensing

CS-DC-2S –40 to 140°F (–40 to 60°C) 0-95% RH, non-condensing

Dimensions

Width:	1.5" (38.1 mm)
Length:	3.875" (98.4 mm)
Height:	3.0" (76.2 mm)

Features and Description

The CS-DC series current switches consist of a hall effect sensor, signal conditioner, and limit alarm in one compact package.

The field adjustable setpoint can be calibrated for any value between 5 Amps and 100 Amps, and when exceeded, will activate either a relay output or solid state output, depending on the model.

The CS-DC series current switches are available in a top terminal solid core case and are designed to withstand harsh industrial environments. They can be mounted in virtually any position and either panel mounted using the built-in mounting bracket or hung directly on the wire to be measured and secured with a wire tie.

The solid core design physically isolates the high DC current from the limit alarm circuitry making this product much safer to use than other products or methods. In addition, it eliminates the insertion loss that exists when DC shunts are used.

The CS-DC series current switches are user configurable by changing a jumper to a DC current range (5-20 A, 18-50 A, 50-100 A) that best fits the application. Once the overall range is configured, the setpoint is user adjustable by turning a potentiometer to any value within this range.

Two models are available, one with a SPDT relay and one with a normally open (NO) solid state relay (AC or DC). A green LED indicates "power on" and a red LED will activate when the alarm setpoint has been exceeded. A hysteresis of 5% of the setpoint is standard to prevent false trips or "chattering" of the output.

The switches are powered by either 12 VAC/DC or 24 VAC/DC depending on the model selected.

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CS-DC-1S-12, CS-DC-2S-12
CS-DC-1S-24, CS-DC-2S-24

Installation and Setup

DESCRIPTION
CS-DC series current switches are designed to monitor DC power. They operate (switch) when the current level through the opening exceeds the adjustable setpoint. The outputs are isolated from the input and the power supply.

The CS-DC-1S-24 and CS-DC-2S-24 operate on 24 Volts AC or DC. The CS-DC-1S-12 and CS-DC-2S-12 operate on 12 Volts AC or DC.

INSTALLATION
Run wire to be monitored through opening in the sensor.

CS-DC switches work in the same environment as motors, contactors, heaters, pull-boxes, and other electrical enclosures.

They can be mounted in any position or hung directly on wires with a wire tie. Just leave at least one inch distance between sensor and other magnetic devices.

POWER WIRING
See wiring diagram below.

Connect low voltage power to terminals 1 and 2. Tighten to 4.5 in-lb torque. The connection is not polarity sensitive.

Terminals are removable to make wiring easier. Be sure to seat the terminal properly in the location marked Power.

OUTPUT WIRING
See wiring diagram below.

Connect control or monitoring wires to the sensor. Use up to 12-22 AWG copper wire and tighten terminals to 4.5 In-Lb torque. Be sure the output load does not exceed the switch rating.

CAUTION Incandescent lamps can have “Cold Filament Inrush” current of up to 10 times their rated amperage. Use caution when switching lamps.

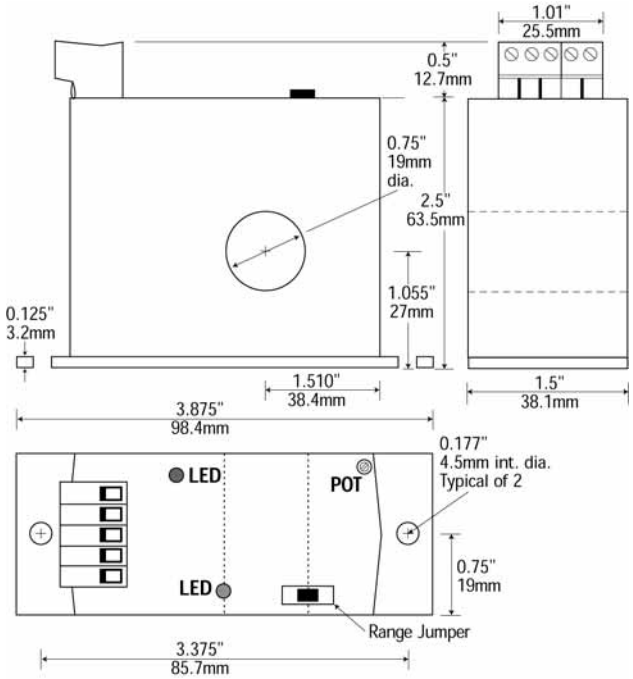
CAUTION! Do Not Disconnect Output Terminals Under Load!

SPDT relay

CS-DC-1S-24
Power: 20 to 28 VAC/DC
CS-DC-1S-12
Power: 12 VAC/DC ±10%

Normally Open solid state relay

CS-DC-2S-24
Power: 20 to 28 VAC/DC
CS-DC-2S-12
Power: 12 VAC/DC ±10%



API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.

SETPOINT ADJUSTMENT
CS-DC switches have two setpoint adjustment mechanisms.

1. Select the setpoint RANGE with the Range Jumper.
2. Fine tune the SETPOINT with the 9 turn potentiometer.

The 9-turn pot is shipped from the factory set fully counter-clockwise (CCW) to the lowest setpoint.

Turning the pot clockwise (CW) will increase the setpoint.

Turning the pot counter-clockwise (CCW) will decrease the setpoint.

The pot has a slip-clutch to prevent damage at either end of its rotation. To determine where the adjustment is, turn the pot all the way CCW. This will return it to the minimum setpoint.

We recommend adjusting setpoint to allow for possible voltage variations.

CS-DC-2S Solid State Switch Output Status
CS-DC-2S output contacts are solid-state. Check output status by applying voltage to the contacts and reading the voltage drop across the contacts. An Ohmmeter set on “Continuity” will give misleading results.

Typical Adjustment
1. Make sure all wiring is correct, all terminals are tight and that the green power LED is on.
2. Move the jumper to the desired range.
3. Turn the pot to minimum setpoint (9 turns CCW).
4. Have normal operating current running through sensor. The output should be tripped and the red LED should be ON.
5. Turn the pot CW until the unit untrips. This is indicated by the red LED turning off and by the changing of the output switch status.
6. Now turn the pot CCW slowly until the unit trips again. It now set at the current level being monitored.
   A. To set UNDERLOAD - Turn the pot about 1/8 turn further CCW.
   B. To set OVERLOAD - Turn the pot about 1/8 turn further CW.

MONITORED AMPS	OUTPUT CS-DC-2S (SS)	OUTPUT CS-DC-1S (SPDT)	RED LED
None or <Minimum	OPEN	3-4 closed 4-5 open	OFF
Below trip level	OPEN	3-4 closed 4-5 open	OFF
Above trip level	CLOSED	3-4 open 4-5 closed	ON

TROUBLESHOOTING
Sensor is always tripped
1. The jumper may be set in a range that is too low for current being monitored. Move jumper to the correct range.
2. The setpoint may be too low. Turn pot CW to increase setpoint.
3. Switch has been overloaded and contacts are burned out. Check the output load, remembering to include inrush on inductive loads (coils, motors, ballasts).

Sensor will not trip
1. Unit is not powered. Check power supply and power wiring.
2. The jumper may be set in a range that is too high for current being monitored. Move jumper to the correct range.
3. The setpoint may be too high. Turn pot CCW to decrease setpoint.
4. Switch has been overloaded and is burned out. Check output load, including inrush or inductive loads (coils, motors, ballasts).

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Current Sensors