Specifications

Power Supply	24U = 20-28 VAC/VDC (24 V nominal)
Power Consumption	< 2 VA
Setpoint Range	20-400 A (DC) 17-338 A (AC, typical at 60 Hz)
Setpoint Adjust	270° Turn potentiometer (coarse) 270° Turn potentiometer (fine)
Isolation Voltage	UL listed to 1250 VAC
Frequency Range	DC to 400 Hz
Repeatability	0.5%
Hysteresis	5% of setpoint
Sensing Aperture	1.30" (33.0 mm)

Output Rating & Environmental

SDTA	
(Automatic Reset)	SPDT (Form C) Relay 2 A @ 125 VAC Resistive 2 A @ 30 VDC Resistive
SDTL	
(Latching Reset)	SPDT (Form C) Relay 2 A @ 125 VAC Resistive 2 A @ 30 VDC Resistive
Environmental	20 to 50°C (-4 to 122°F) 0-95% RH, Non-condensing Pollution Degree 2 Altitude to 6561 ft (2000 meters)
Listings	UL/cUL

Model Number Key

DS1 - SDTA - 24U - FD

Case Style:
FD - Solid-Core, DIN or panel mtg.

Power Supply:
24U - 24 VAC/VDC

OUTPUT:
SDTA - Single Pole Double Throw (SPDT or Form C) relay, Auto Reset
SDTL - Single Pole Double Throw (SPDT or Form C) relay, Latching

SENSOR TYPE:
DS1 - DC current sensing switch with range 20-400 ADC and adjustable setpoint

Switching Response Time

ON Delay	
5% over Setpoint	80 ms max
50% over Setpoint	80 ms max
100% over Setpoint	80 ms max

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INSTRUCTIONS

DS1-FD SERIES

DC Current Operated Switch

Quick "How To" Guide

1. Mount the sensor by snapping onto a DIN rail or attaching to a panel using the mounting holes.

2. Run the wire you are monitoring through aperture.

3. Connect power & output wiring.
   A. Use 30-12 AWG 75°C minimum copper conductors only and tighten terminals to 5-7 lbs torque.
   B. Make sure power supply matches specifications.
   C. Make sure controlled load requires less than the sensor contact capacity.

4. Adjust Setpoint
   A. Turn the Coarse Adjustment fully clockwise.
   B. Turn the Fine Adjustment fully counter-clockwise.
   C. Energize the monitored load, and set the trip point by turning the Coarse Adjustment slowly counter-clockwise until the sensor trips.
   D. Leave the adjustment tripped to monitor for under current conditions, or use the Fine Adjustment to untrip the output to detect over current conditions.

393000107 Rev 2

Description

DS1-FD Series are DC current operated relays. They operate (relay contacts change state) when the current level through the hole exceeds the adjustable setpoint. They accept 24 VAC or 24 VDC power. The outputs are isolated from the input and the power supply. The sensor can be supplied with form C relay output (-SDT), either resetting when the monitored current falls below the setpoint, or latching in the tripped condition until an external button closes between the "reset" terminals.

Installation

Mount the sensor to a DIN rail or secure to a panel with screws through the mounting holes. Run wire to be monitored through opening in the sensor.

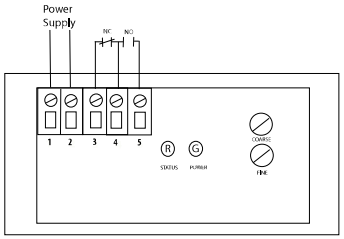
DS1-FD switches work in the same environment as motors, contactors, heaters, pull-boxes, and other electrical enclosures. They can be mounted in any position or hung directly on wires with a wire tie. Just leave at least one inch distance between sensor and other magnetic devices.

Power Wiring

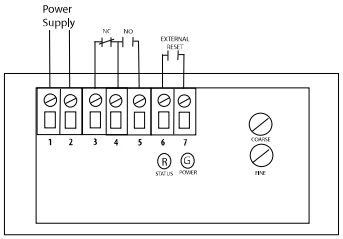
Connect 24 VAC or VDC power to terminals 1 and 2. Tighten to 5-7 in-lbs torque. The connection is not polarity sensitive. The Green LED will light when the sensor is energized.

Output Wiring

Connect control or monitoring wires to the sensor. Use 30-12 AWG copper wire and tighten terminals to 5-7 in-lbs torque. Be sure the output load does not exceed the relay contact rating. Note that the NO contact closes on current rise, and the NC contact opens on current rise.



Connection-Auto Reset



Connection-Latching

Note: reset is not isolated from sensor power. Do Not add voltage to the reset button, shorting action only.

Setpoint Adjustment

Setpoint Adjustment

DS1-FD switches have two setpoint adjustment mechanisms:

1. Turn the setpoint Coarse Adjustment (CA) fully CW to set the trip point at the maximum (400 ADC).
   DO NOT OVERTURN!
2. Turn the Fine Adjustment (FA) fully CCW .
3. Slowly turn the CA CCW until the sensor trips.
4. Slowly turn FA CW until the sensor untrips.
5. The adjustment can be left at this point and the output will **change on current increase.**
6. Turning the FA CCW will cause the sensor output to trip. This setting will **detect a current decrease** and the relay contacts will revert to original condition when current falls below the set point.
7. If turning FA CW in step 4 does not allow the output to untrip, return to step 1, and readjust using CA.

Adjustment Notes

1. Relay output contacts are mechanical, and can be tested with an ohmmeter if the controlled circuit is not energized.
2. If the controlled circuit is energized, testing can be done with a volt meter. A closed contact will show no potential and an open contact will show full controlled circuit voltage.
3. We recommend adjusting setpoint to allow for normal voltage variations.
5. Hysteresis (deadband) is 5% of the setpoint. During set point adjustment, the hysteresis will be tighter than in normal operation to make adjustment easier.
6. When adjusting the latching version models, remember to short between terminals 6 and 7 to allow the output to reset.

Contact and LED Action

MONITORED CIRCUIT AMPS	OUTPUT CONTACT		RED STATUS LED
	NO	NC	
None or < 20 ADC	OPEN	CLOSED	OFF
Lower Than Set Point	OPEN	CLOSED	OFF
Higher Than Set Point	CLOSED	OPEN	ON

Trouble Shooting

1. Sensor is always tripped

A. Current may be higher than 400 ADC.

B. The setpoint may be too low. *Turn Coarse Adjustment pot CW to increase setpoint.*

C. Sensor output has been overloaded and contacts are burned out. *Check the output load, remembering to include inrush on inductive loads (coils, motors, ballasts).*

2. Sensor will not trip

A. Unit is not powered. *Check power supply and power wiring, confirm Green LED is on.*

B. The current may be lower than the 20 amp minimum needed to operate the sensor output. *Loop the conductor through the sensing aperture twice or more to increase the current "seen" by the sensor.*

C. The setpoint may be too high. *Turn pot CCW to decrease setpoint.*

D. Switch has been overloaded and contacts are burned out. *Check the output load, remembering to include inrush on inductive loads (coils, motors, ballasts).*