SERIES SD Controllers Provide Value and Accurate, Cost-Effective Temperature Control

The SERIES SD family of PID temperature controllers utilizes today's advanced technology to provide the value, benefits and accuracy you've come to expect from Watlow. The features and performance offered by SERIES SD controllers make them ideally suited for a broad range of applications in temperature and process control.

The SERIES SD single channel controllers include a universal sensor input with up to three outputs that can be programmed for heat or cool temperature control, or to operate as process or deviation alarms. Programming inverse scaling is also simplified with the user-friendly set-up menu, providing additional value without additional cost.

Advanced features of SERIES SD controllers include EIA 485 Modbus™ serial communications, Watlow's INFOSENSE™ sensor technology, infrared remote communications operation, Watlow's patented User Definable Menu System and a "Save and Restore" feature that allows the restoration of either factory or user-defined settings.

Available in 1/32, 1/16, 1/8 and 1/4 DIN panel mount sizes, Watlow's SERIES SD family is backed by an industry leading three-year warranty from Watlow Winona. The SERIES SD controllers are UL® and C-UL® listed, CSA and CE certified and include the NEMA 4X (IP65) seal. The controllers are also available in FM limit approved versions, and the ramping version will be available during the second quarter of 2003.

Features and Benefits

Watlow's INFOSENSE™ sensor technology
- Thermal sensing technology improves sensor accuracy by a minimum of 50 percent

Watlow's patented User Defined Menu System
- Allows the user to assign up to 20 parameters in the operations menu
- Improves operational efficiency

"Save and Restore" feature for user settings
- Allows the user to save individual or factory settings
- Eliminates the need to contact the OEM or factory to restore settings

WATVIEW™ HMI (Human Machine Interface)
- Permits operation, configuration and data logging via a standard Windows® PC

Infrared communications
- Facilitates recipe management and data logging
- Allows easier controller setup, operation and monitoring

Up to three outputs (two for 1/32 DIN)
- Results in application versatility

Dual display on all models except the SD31
- Provides better recognition of process changes

Ramp to set point
- Controls temperature rise

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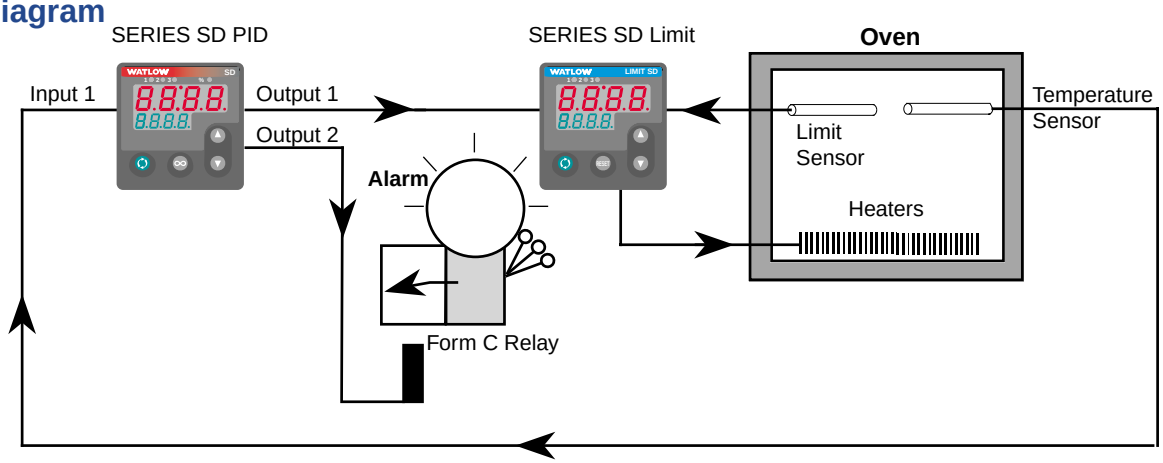
Registered Company
Winona, Minnesota USA

Printed in the USA on Recycled Paper, 15% Postconsumer Waste

Wiring Diagram



SERIES SD Limit Controllers

The SERIES SD family of limit controllers has been designed with the same microprocessor-based technology as the SERIES SD PID family of temperature controllers. The limits come with the FM (Factory Mutual) agency approval — the industry's most recognized designation for insurance concerns.

Limit controllers are typically added to thermal applications to monitor an over-temperature condition as a safety precaution. Limit controllers provide a redundant safety assurance to guard against instances where a high temperature runaway condition could result from a shorted input sensor, or from an output device that fails in a closed position.

Limits are recommended and are often required in applications where thermal runaway could result in costly operator safety concerns, product scrap, damage to capital equipment or a fire hazard.

INFOSENSE™ Sensor Technology

Watlow's INFOSENSE™ sensor technology improves temperature sensing accuracy by 50 percent.

Each INFOSENSE "smart" sensor contains four numeric values located on tags attached to each sensor that are programmed into the SD controller memory. These values characterize Watlow sensors and allow the controller to provide enhanced accuracy.

WATVIEW™ HMI

WATVIEW™, Watlow's Windows® based HMI (Human Machine Interface) software, supports the SERIES SD controllers. The software can be used to setup, monitor and edit the values of controller parameters, to monitor and manage alarms and to log and graph process data.

Infrared Communications

The Infrared Data Communications (IDC) option is available on all SERIES SD controller models except the 1/32 DIN and can support complete SERIES SD parameter configuration and operation. The IDC option supports wireless communications with PDAs (personal digital assistants) or other devices equipped with infrared communications that support the Infrared Data Association (IrDA) 1.0 Standard.

The actual user interface or configuration is dependent on the master device application software. A source for this software is Instant HMI from Software Horizons. For more information, visit www.instanthmi.com/watlow.

Advantages of IDC include automated logging of key process variables, increased accuracy and ease of use for recipe or configuration setups. Infrared data communications enhances controller data exchange in physically restricting environments (such as semiconductor clean rooms, governmental radio-active test labs or those hard to reach areas) and reduces the use of paper to record instrument information as well as human transposition errors.

Dimensions

DIN Size	Behind Panel (max.)	Width	Height
1/32 DIN	97.8 mm (3.85 in.)	52.6 mm (2.07 in.)	29.7 mm (1.17 in.)
1/16 DIN	97.8 mm (3.85 in.)	52.1 mm (2.05 in.)	52.1 mm (2.05 in.)
1/8 DIN Vertical	97.8 mm (3.85 in.)	52.8 mm (2.08 in.)	99.8 mm (3.93 in.)
1/8 DIN Horizontal	97.8 mm (3.85 in.)	99.8 mm (3.93 in.)	52.8 mm (2.08 in.)
1/4 DIN	101.1 mm (3.98 in.)	99.8 mm (3.93 in.)	99.8 mm (3.93 in.)

Specifications

Line Voltage/Power
- 100 to 240V~(ac), +10/-15 percent; (85-264V~[ac]) 50/60Hz, ±5 percent
- 24V≂(ac/dc), +10/-15 percent; 50/60Hz, ±5 percent
- 10VA maximum power consumption
- Data retention upon power failure via nonvolatile memory

Environment
- -18 to 65°C (0 to 149°F) operating temperature
- -40 to 85°C (-40 to 185°F) storage temperature
- 0 to 90 percent RH, non-condensing

Accuracy
- Calibration accuracy and sensor conformity: ±0.1 percent of span, ±1°C @ the calibrated ambient temperature and rated line voltage
- Calibration ambient temperature = 25°C ±3°C (77°F ±5°F)
- Accuracy span: 540°C (1000°F) minimum
- Temperature stability: ±0.1°C/°C (±0.2°F/°F) rise in ambient maximum

Agency Approvals
- UL® 3121, C-UL®, CSA, CE, NEMA 4X/IP65
- Limit version features FM approval

Controller
- Microprocessor based user-selectable control modes
- Single universal input, up to three outputs
- Control sampling rates: input = 6.5Hz, display = 10Hz, outputs = 6.5Hz

Operator Interface
- Dual 4 digit, 7 segment LED displays
- Advance, infinity and up down keys
- IRDA infrared port (not available on 1/32 DIN)
- Isolated EIA 485 Modbus™ serial communications

Wiring Termination -Touch Safe Terminals
- Input power and control outputs 12 to 22 AWG
- Sensor inputs and process outputs 20 to 28 AWG

Universal Input
- Thermocouple, grounded or ungrounded sensors
- RTD 2- or 3-wire, platinum, 100Ω @ 0°C calibration to DIN curve (0.00385 Ω/Ω/°C)
- Process, 0-20mA @ 100Ω, or 0-10V⎓(dc) @ 20kΩ input impedance; Scalable
- Inverse scaling
- >20MΩ input impedance
- Maximum of 20Ω source resistance

Specifications (con't)

Allowable Operating Range

Type J:	0	to	815°C	or	32	to	1500°F
Type K:	-200	to	1370°C	or	-328	to	2500°F
Type T:	-200	to	400°C	or	-328	to	750°F
Type N:	0	to	1300°C	or	32	to	2372°F
Type E:	-200	to	800°C	or	-328	to	1470°F
Type C:	0	to	2315°C	or	32	to	4200°F
Type D:	0	to	2315°C	or	32	to	4200°F
Type PTII:	0	to	1395°C	or	32	to	2543°F
Type R:	0	to	1760°C	or	32	to	3200°F
Type S:	0	to	1760°C	or	32	to	3200°F
Type B:	0	to	1816°C	or	32	to	3300°F
RTD (DIN):	-200	to	800°C	or	-328	to	1472°F

Process: -1999 to 9999 units

Control Outputs

Outputs 1, 2 , 3 (Output 3 not available on ⅛ DIN)

- User selectable for heat/cool as on-off, P, PI, PD, PID, or Alarm action. Not valid for limit controls
- Electromechanical relay. Form A, rated 2A @ 120V~(ac), 2A @ 240V~(ac) or 2A @ 30V⎓(dc)
- Switched dc non-isolated minimum turn on voltage of 6V⎓(dc) into a minimum 500Ω load with a maximum on voltage of not greater than 12V⎓(dc) into an infinite load. Maximum switched dc power supply current available for up to two outputs is 60mA
- Solid-state relay, Form A, 0.5A @ 24V~(ac) minimum, 264V~(ac) maximum, opto-isolated, without contact suppression
- Process output (Non Isolated) User-selectable 0-10V⎓(dc), 0-5V⎓(dc), 1-5V⎓(dc) @ 1KΩ minimum, 0-20mA, 4-20mA @ 800Ω maximum
- Electromechanical relay. Form C, rated 5A @ 120V~(ac), 5A @ 240V~(ac) or 5A @ 30V⎓(dc)
- Open collector 42V⎓(dc) @ 250mA maximum
- EIA 485 serial communications with Modbus™ protocol

Your Authorized Watlow Distributor Is:

Ordering Information

To order, complete the model number on the right with the information below.

S D - - A

DIN Sizes
3 = ⅓₂ DIN
6 = ⅛ DIN
8 = ⅛ DIN Vertical
9 = ⅛ DIN Horizontal
4 = ¼ DIN

Control Type
1 = ⅓₂ DIN Single Display PID Control ①
C = PID Control Dual Display
L = Limit Control Dual Display ②
R = Ramping Dual Display ③

Power Supply
H = 100 to 240V≂(ac/dc)
L = 24 to 28V≂(ac/dc)

Output 1
C = Switched dc
K = SSR, Form A, 0.5A
F = Universal process
J = Mechanical relay, Form A, 2A

Output 2
A = None
C = Switched dc
K = SSR, Form A, 0.5A
J = Mechanical relay, Form A, 2A
U = EIA 485 Modbus™ communications

Output 3 (Not available on ⅓₂ DIN)
A = None
C = Switched dc/open collector
K = SSR, Form A, 0.5A
F = Universal process
E = Mechanical relay, Form C, 5A

Infrared Comms Options (IRDA)
A = None (Default selection on ⅓₂ DIN)
R = IRDA ready (Not available on ⅓₂ DIN)

Display Colors and Custom Options
R1 = Red (Single display units)
G1 = Green (Single display units)
RG = Red Green (Dual display units)
RR = Red Red (Not available on ⅓₂ DIN Dual Display)
XX = Custom options, special overlays, etc.

① Red or green available on single display.

② Not all options above are available on the SD limit controllers. Consult factory for proper configurations.

③ Available approximately 6/15/03.

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