Compact Loop System, Providing Powerful Control in a ⅛ DIN Package

Features and Benefits

PID control of up to 16 heat and cool loops
- Minimizes panel space per loop
- Reduces installation time
- Increases reliability: fewer parts means fewer failures

Auto-tune
- Requires less time tuning
- Achieves excellent control with less expertise

Menu-guided operation with full text display
- Allows quick setup of the controller
- Simplifies operation

Eight jobs stored and recalled
- Changes quickly from one process to another

Multiple and mixed inputs
- Accepts combinations of thermocouples, RTDs, linear dc voltage and linear dc current sensors
- Reduces learning curve and inventory

Sensor failure detection
- Reduces time troubleshooting reversed, shorted and open sensors

High/low process and deviation alarms for each input
- Integrates as needed to integrate with PLC and other control elements

34 digital outputs
- Provides flexible configuration
- Allows use of outputs as needed for control and alarms

EIA/TIA-232 and 485 communications
- Connects to software for easy configuration and operation
- Allows integration with controllers and software

Watlow's SERIES CLS200 is a powerful line of controllers, combining performance and flexibility with compact design. The 4, 8 and 16 loop versions provide complete controller solutions for a broad range of applications. Support for multiple types of sensor inputs is available, including thermocouples, RTDs, linear voltage, current and frequency. Each controller can operate as a stand-alone system, and includes built-in serial communications for computer interface and data acquisition. Optional programmable ramp and soak features allow complex batch processing and sequencing. An enhanced feature option offers cascade control, ratio control, differential control, process variable retransmit and remote analog set point.

The SERIES CLS200 controllers are UL® and C-UL® listed and meet the requirements of the European Community EMC Directive and carry the CE mark.

WATLOW

Better Thermal Solutions…*Faster*

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WATVIEW Software

WATVIEW is an optional Windows®-based human machine interface (HMI) program that can be used as the primary interface to one or more Watlow controllers. WATVIEW provides channel setup and monitoring of up to 32 controllers at the same time. The easy-to-use graphical user interface (GUI) allows you to set control parameters, create user-defined recipes, view and manage alarms, set up and view trend plots and real-time data and export logged data to spreadsheet applications. Because it is designed specifically for Watlow controllers, WATVIEW requires less configuration time than other more expensive packages.

DAC and SDAC Modules

The optional DAC and SDAC modules are available for Watlow SERIES CLS200 controllers.

DAC
The DAC (digital to analog converter) converts one or two of the controller's distributed zero crossing (DZC) output signals to analog signals. Each output is field configurable for 4-20mA═(dc), 0-5V═(dc) or 0-10V═(dc).

SDAC
The SDAC (serial digital to analog converter) converts one controller output to a precise analog voltage or current signal. The unit is typically used for process variable retransmit, open-loop control, motor or belt speed control, or phase-angle fired SCR power controllers. The SDAC bears the CE mark and is UL® and C-UL® listed.

Firmware Options

Choose firmware with the features needed for the application:

- Standard—includes closed-loop PID control, auto-tune, alarms, job memory and failed sensor detection.
- Extruder— includes the standard firmware features, with PID control specifically adapted for plastic extruders.
- Ramp and soak—includes the standard firmware features with the addition of ramp and soak and process variable retransmit. Each channel can be configured for standard PID control or ramp and soak operation. Unused control outputs on any channel can be configured for retransmition.
- Enhanced features— includes the standard firmware features with the addition of process variable retransmit, remote analog set point, cascade control, ratio control and differential control algorithms. Each channel can be configured for standard PID controller or one of the other control algorithms. Each channel of cascade control or remote analog set point requires two controller channels. Unused control outputs on any channel can be configured for retransmit.

Because the SERIES CLS200 has no onboard analog outputs, applications that use process variable retransmit typically require one SDAC module per retransmitted signal.
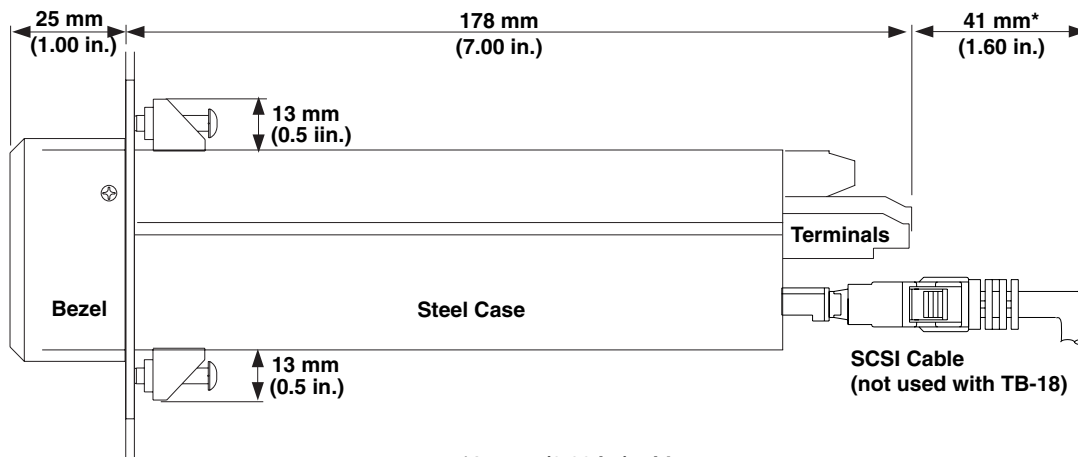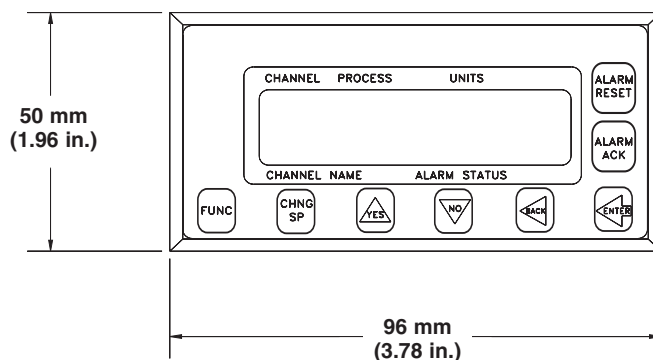
*15 mm (0.60 in.) with
Right Angle SCSI Connector

CLS200 Specifications

Operator Interface
- 32-character vacuum fluorescent display
- 8-key keypad to access guided menus and prompts, enter passkey sequence, set values, switch between single channel and multiple channel displays
- Controller configuration can be loaded through the standard serial port

Analog Inputs
- CLS204   4 differential
- CLS208   8 differential
- CLS216   16 single-ended

Noise Rejection
- 120dB at 60Hz

Temperature Coefficient
- 40ppm/˚C

Sensors/Inputs
- Thermocouples: user-selectable type, direct connection, linearization, reference junction compensation, reversed and shorted thermocouple detection and upscale break protection with output averaging
- RTD: (CLS204 and CLS208 only) 2- or 3-wire, platinum, 100Ω @ 0˚C, DIN 0.003850Ω/Ω/˚C curve, user-selectable range. Two user-selectable ranges offer different resolutions. Requires scaling resistors. See special/linear inputs in ordering information.
- Linear: current and voltage signals from linear transmitters
- Pulse input

Input Range and Accuracy

Sensor	Range (°C)	Range (°F)	Accuracy
Type B	66 to 1760°C	150 to 3200°F	±4.0°C
Type E	-200 to 787°C	-328 to 1448°F	±1.0°C
Type J	-212 to 760°C	-350 to 1400°F	±1.2°C
Type K	-268 to 1371°C	-450 to 2500°F	±1.3°C
Type R	-18 to 1766°C	0 to 3210°F	±2.8°C
Type S	-18 to 1760°C	0 to 3200°F	±2.8°C
Type T	-268 to 399°C	-450 to 750°F	±1.6°C

RTDs available on CLS204 and CLS208 only.

Sensor	Range (°C)	Range (°F)	Accuracy
RTD1	-100 to 275˚C	-148 to 527˚F	±1.1˚C
RTD2	-120 to 840˚C	-184 to 1544˚F	±1.6˚C

Note: Accuracy @ 25˚C ambient. Valid for 10 to 100 percent of span except Type B, which is specified for 800˚F to 3200˚F. RTD is for 100 percent of span.

Linear Voltage and Current Inputs
Requires scaling resistors. See special inputs in ordering information.
- 0-10mA⎓(dc)
- 0-20mA⎓(dc)/4-20mA⎓(dc)
- 0-100mV⎓(dc)
- 0-500mV⎓(dc)
- 0-1V⎓(dc)
- 0-5V⎓(dc)
- 0-10V⎓(dc)
- 0-12V⎓(dc)

Other ranges available. Consult factory.

Pulse Input
- One TTL-level square wave input up to 2kHz

Input Sampling Rate at 60Hz
Each channel has the following scans per second:
- CLS204: 6 samples per second (update time: 0.167 sec.)
- CLS208: 3 samples per second, (update time: 0.333 sec.)
- CLS216: 1.5 samples per second, (update time: 0.667 sec.)

Internal Measurement Resolution
- 0.006 percent, greater than 14 bits

Calibration
- Automatic zero and full scale

Digital Inputs
- TTL-level used for selecting recipes or jobs, or R/S triggers
- 8 inputs and 1 pulse input with 50-pin terminal board option
- 2 inputs and pulse input or 3 inputs with 18-pin terminal block option

Digital Outputs
- 34 digital outputs are available with 50-pin terminal board option
- 10 control outputs with 18-pin terminal block option
- 1 or 2 control outputs are user assigned for each loop
- Each control output can be configured for on-off time proportioning, or distributed zero crossing
- Outputs sink up to 60mA each at 5V⎓(dc)
- 350mA at 5V⎓(dc) available from on-board supply

Alarm Outputs
- Independent process and deviation alarms for each channel
- Alarms can operate any output not used for control
- User-programmable deadband, delay and startup suppression
- Global alarm output activates when any alarm occurs
- Watchdog output indicates controller is functioning correctly

Serial Interface
- EIA/TIA-232 or EIA/TIA-485

Baud Rate
- 2400, 9600 or 19200, user-selectable

Communications Protocols
- Form of ANSI X3.28-1976, (D1, F1) compatible with Allen-Bradley PLC/2
- Modbus® RTU

Line Voltage/Power
- 15 to 24V⎓(dc) ± 3V⎓(dc) @ 1A (maximum), 300mA (no load)

Agency Approvals
- UL®, C-UL® listed: UL® 61010-1 safety requirements for measurement, control and laboratory equipment
- CE Mark: See Declaration of Conformity for details

Modbus® is a registered trademark of AEG Schneider Automation.

Ordering Information

SERIES CLS200
Code Number　　　　　　　　　　　　　　　　**2** ☐ ☐ **-** ☐ ☐ ☐ ☐ ☐ ☐ ☐

Number of Channels
04 = 4 channel
08 = 8 channel
16 = 16 channel

Controller Type
1 = Standard EPROM
2 = Extruder
3 = Ramp and soak
4 = Enhanced features

Terminal Board
0 = SCSI connector only, user supplies cable and terminal board
1 = 18-pin terminal block (CLS204 and CLS208 only)
2 = 50-pin terminal block (includes 3 foot SCSI cable)

Power Supply
0 = No power supply
3 = 120/240V~(ac), 50/60Hz power supply adapter
　　(15V⎓[dc] @ 1.2A) (CE, UL® Class 2 approved)

SCSI Cables
0 = 3 foot SCSI cable with terminal board option 2 (no cable with
　　options 0 or 1)
1 = 6 foot SCSI cable
2 = 3 foot right angle SCSI cable
3 = 6 foot right angle SCSI cable

Serial Communication Cables
0 = No serial communication cable
1 = 10 foot serial communication cable (DB-9 female/bare wire)
2 = 25 foot serial communication cable (DB-9 female/bare wire)
3 = 50 foot serial communication cable (DB-9 female/bare wire)

Serial Communication Jumper Settings
0 = EIA/TIA-232
1 = EIA/TIA-485
2 = EIA/TIA-485 terminated

Special Inputs
(Standard unit is configured for thermocouples and -10 to 60mV linear inputs.
For other sensors, order special inputs. See below for ordering instructions.
For CLS216 specify two digits, for CLS204 and CLS208 specify one digit.
0 or 00 = Thermocouples and -10 to 60mV inputs only
X or XX = Number of current, voltage or RTD inputs

　　　　　　　　　　　　　　　　　C L S S I ☐ ☐ **-** ☐ ☐ **-** ☐ ☐

Special Input Type
(Not required for thermocouple sensor inputs)
20 = RTD 1: 0.1˚, -148 to 527˚F (-100 to 275˚C)
　　Not available on CLS216
21 = RTD 2: 1˚, -184 to 1544˚F (-120 to 840˚C)
　　Not available on CLS216
43 = 0-10mA⎓(dc)
44 = 0-20mA⎓(dc)/4-20mA⎓(dc)
50 = 0-100mV⎓(dc)
52 = 0-500mV⎓(dc)
53 = 0-1V⎓(dc)
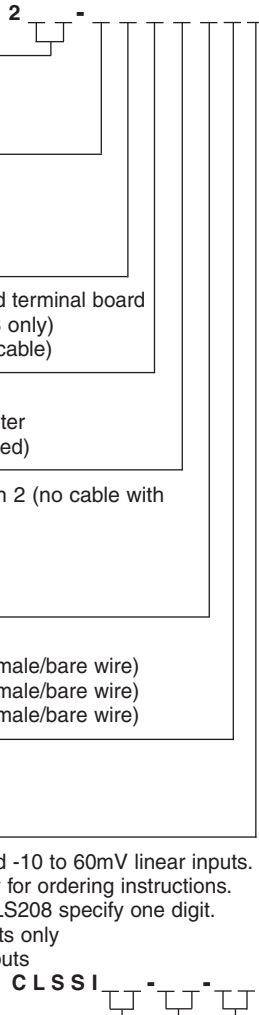55 = 0-5V⎓(dc)
56 = 0-10V⎓(dc)
57 = 0-12V⎓(dc)

Start Channel
XX = Channel Number XX

End Channel
XX = Channel Number XX

Availability
Up to four weeks, depending on complexity and order release quantity. Consult
factory for details.

Accessories

The following accessories are available for the CLS200.

Software Ordering Information

WATVIEW HMI Software
　Run-time Edition includes spreadsheet display, setup
　screens, recipe manager with calendar-start, alarm
　management, event log, data logging and trend graphing.
　WV00-R0U0-000 - (USB key)
　WV00-R0P0-000 - (Parallel key)

　Developer Edition includes all the features of the
　Run-time edition plus capability of developing custom
　screens.
　WV00-D0U0-000 - (USB key)
　WV00-D0P0-000 - (Parallel key)

Ordering Information

DAC/SDAC

Code Number　　　　　　　　　　**D A C -** ☐ ☐

DAC/SDAC Type
1 = DAC with 2 each 0 to 5V⎓(dc) outputs
2 = DAC with 2 each 0 to 10V⎓(dc) outputs
3 = DAC with 2 each 4 to 20mA⎓(dc) outputs
4 = Serial digital to analog converter (SDAC)

Power Supply
A = None
B = 16V⎓(dc), 300mA, 120V~(ac), 60Hz power
　　supply (supplies power for up to 10 dual
　　DAC modules)
H = 120/240V~(ac), 50/60Hz power supply adapter,
　　(15V⎓[dc] @ 1.2A) powers up to 12 dual DAC modules
L = 120/240V~(ac), 50/60Hz power supply adapter,
　　(5V⎓[dc] @ 3A) powers up to 10 SDAC modules

Your Authorized Watlow Distributor Is:

To be automatically connected to the nearest North American Technical and Sales Office call:

1-800-WATLOW2