Easy Operation and Numerous Uses Are Constants For This 1/8 DIN Ramping Controller

The Watlow SERIES 982 vertical ⅛ DIN-ramping controller and its companion, the horizontal SERIES 981, offer four-file / 24-step program capability, or easy-to-use non-ramping set point operation. The controller is designed with most typical programming needs in mind. The SERIES 981/982 is among the most easy-to-use ramping controllers.

Ramping operations include four files with six steps in each file. Programming options include ramp-rate or time-based profiles, guaranteed soak deviation, program looping and program status selection after power outage. The files may be linked to create a single 24-step program.

The primary analog input accepts 11 different thermocouple types, RTD or scalable process inputs. A second analog input can be factory configured for a slidewire feedback input common in gas valve control. With up to two event inputs, the SERIES 981/982 offers remote program start or hold capability and allows the operator to program a wait-for event.

The SERIES 981/982 is packaged with a NEMA 4X front panel to withstand harsh environments, four inch case depth and touch-safe wiring terminal.

The SERIES 981/982 features a three-year warranty and four day shipment, on all model, in limited quantities.

Features and Benefits

Four files / 24 steps
- Designed to meet the needs of most ramping applications

Auto-tuning
- One-step tuning of system parameters for easy operation

Optional dual auxiliary outputs
- Flexible time-based events or alarm outputs

Optional retransmit of set point or process variable
- For master programmer or chart recorder connection

Hardware and software parameter lockout options
- Provides several levels of operator security

NEMA 4X front panel
- Provides watertight corrosion resistance

10Hz sampling rate and burst-fire control
- Smooth, accurate control of the process

Slidewire feedback
- Interfaces with most slidewire input positioning devices

Your Authorized Watlow Distributor is:

WATLOW
1241 Bundy Boulevard
Winona, Minnesota 55987-5580 USA
Phone: +1 (507) 454-5300
Fax: +1 (507) 452-4507
Internet: www.watlow.com
e-mail: info@watlow.com

WIN-981-0903

ISO 9001
Registered Company
Winona, Minnesota USA

North American Sales Offices: **Atlanta**, (770)972-4948 • **Austin**, (512)249-1900 • **Birmingham**, (205)678-2358 • **Charlotte**, (704)573-8446 • **Chicago**, (847)458-1500 • **Cincinnati**, (513)398-5500 • **Cleveland**, (330)467-1423 • **Dallas**, (972)620-6030 • **Denver**, (303)798-7778 • **Detroit**, (248)651-0500 • **Eastern Canada**, (450)433-1309 • **Houston**, (281)440-3074 • **Indianapolis**, (317)575-8932 • **Kansas City**, (913)897-3973 • **Los Angeles**, (714)935-2999 • **Louisiana**, (318)864-2864 • **Maryland/Virginia**, (215)345-8130 • **Minneapolis/Manitoba**, (952)892-9222 • **Nashville**, (615)264-6148 • **New England**, (603)882-1330 • **New York/New Jersey/Philadelphia**, (215)345-8130 • **New York, Upstate**, (716)438-0454 • **Ontario**, (905)979-3507 • **Orlando**, (407)351-0737 • **Phoenix**, (602)795-7712 • **Pittsburgh**, (412)322-5004 • **Portland,** (360)254-1009 • **Raleigh/Greensboro**, (336)766-9659 • **St. Louis**, (314)878-4600 • **Sacramento**, (707)425-1155 • **San Diego**, (714)935-2999 • **San Francisco**, (408)434-1894 • **Seattle**, (425)222-4090 • **Tampa/St. Petersburg**, (407)647-9052 • **Tulsa**, (918)496-2826 • **Western Canada**, (604)444-4881 • **Wisconsin, North** (920)993-2161 • **Wisconsin, South** (262)723-5990
Asian Sales Offices: **Australia,** +61 (39) 335-6449 • **China,** +86 (21) 6277-2138 • **Japan,** +81 (03) 5403-4688 • **Korea,** +82 (02) 575-9804 • **Malaysia,** +60 (4) 641-5977 • **Singapore,** +65 6773-9488 • **Taiwan,** +886 (0) 7-288-5168 **European Sales Offices:** **France,** +33 (01) 3073-2425 • **Germany,** +49 (0) 7253-9400-0 • **Italy,** +39 (02) 458-8841 • **Sweden,** +46 31 7014959 • **United Kingdom,** +44 (0) 115-964-0777
Latin American Sales Office: **Mexico,** +52 (442) 217-6235

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

Specifications

Control Mode
- Single input, quad output, optional retransmit of set point or process variable.
- Programmable direct- and reverse-acting control outputs.
- 4-file, 6 steps per file, time/temperature profile or fixed-set-point control.
- Ramp-rate or time-based programming.
- Selectable control status following power loss.

Agency Approvals
- CE: 89/336/EEC Electromagnetic Compatibility Directive.
  EN 50081-2: 1994 Emissions.
  EN 50082-2: 1994 Immunity.
- 73/23/EEC Low Voltage Directive.
  EN 61010-1: 1993 Safety.
- UL® #873, C-UL® File #E43684
- NEMA 4X

Operator Interface
- Dual, four digit LED displays. Upper: 0.4 in. (10 mm). Lower: 0.3 in. (8 mm).
- Mode, Hold/Run, Display, Up and Down keys.

Sensors/Inputs
- Contact input for software function select (event input).
- Thermocouple Types B, C[2], D[2], E, J, K, N, R, S, T and Pt 2[2].
- RTD resolution in 1° or 0.1° RTD scales.
- Process variables: 0-20mA, 4-20mA, 0-5V⎓ (dc), 1-5V⎓ (dc), and 0-10V⎓ (dc).
- Slidewire or digital event input options.
- Sensor break protection de-energizes system for safety. Latching or non-latching.

Input Range

Specified temperature ranges represent the controller's operational span.

Thermocouple

Available with basic or universal signal conditioner

Type C②	0	to	2316°C	(32	to	4200°F)
Type D②	0	to	2316°C	(32	to	4200°F)
Type E	-200	to	799°C	(-328	to	1470°F)
Type J	0	to	816°C	(32	to	1500°F)
Type K	-200	to	1371°C	(-328	to	2500°F)
Type N	0	to	1300°C	(32	to	2372°F)
Type T	-200	to	399°C	(-328	to	750°F)
Pt 2②	0	to	1395°C	(32	to	2543°F)

Available with universal signal conditioner

Type B	870	to	1816°C	(1598	to	3300°F)
Type R	0	to	1760°C	(32	to	3200°F)
Type S	0	to	1760°C	(32	to	3200°F)

RTD Resolution (DIN or JIS)

1° (DIN)	-200	to	800°C	(-328	to	1472°F)
1° (JIS)	-200	to	630°C	(-328	to	1166°F)
0.1° (DIN and JIS)						
	-73.3	to	537.7°C	(-99.9	to	999.9°F)

Process

-999 to 9999 units for all: 0-5V⎓(dc); 1-5V⎓(dc); 0-10V⎓(dc); 0-20mA; and 4-20mA.

Input 2 slidewire feedback

100 to 1200Ω.

Line Voltage/Power
- 100-240V≂(ac/dc) +10 percent, -15 percent; 50/60Hz, ±5 percent.
- 24 to 28V≂(ac/dc) +10 percent, -15 percent; 50/60Hz, ±5 percent.
- Fused internally (factory replaceable only) Slo-Blo® type (time-lag): 2A, 250V for high voltage versions; 5A, 250V for low voltage versions.
- Power consumption 16VA maximum.
- Non-volatile memory retains data if power fails.

Operating Environment
- 0 to 55°C (32 to 130°F), 0 to 90 percent RH, non-condensing.

Storage Temperature
- -40 to 85°C (-40 to 185°F).

Terminals
- #6 compression universal head screws, accepts 28-14 gauge wire.

Shipping Weight
- .35 kg lbs (3.01 lbs).

Sample/Update Rates
- 1 input, PID and control outputs: 10Hz.
- 2 inputs: 5Hz.
- Display: 2Hz.
- Retransmit, remote set point and alarm outputs: 1Hz.

① Electromechanical relays warranted for 100,000 closures only. Solid-state switching devices recommended for applications requiring fast cycle times or extended service life.

② Not an ANSI/ASTM symbol.

Ordering Information

To order, complete the code number with the information below:

SERIES 981/982 — **98 C - - -**

Single chanel ⅛ DIN ramping controller, vertical or horizontal mount

Power Supply & Mounting
1 = 100 to 240V≂(ac/dc) nominal, horizontal mounting
2 = 100 to 240V≂(ac/dc) nominal, vertical mounting
3 = 24 to 28V≂(ac/dc) nominal, horizontal mounting
4 = 24 to 28V≂(ac/dc) nominal, vertical mounting

Software
C = Standard (4-file, 6 step per file, program capability)

Input 1
1 = Basic thermocouple signal conditioner (excluding Type B, R, and S)
2 = Universal signal conditioner (see range information)

Input 2
0 = None
3 = Slidewire feedback (see range information)
5 = Second digital event (one digital event is standard on all units)

Output 1
B = Solid-state relay, Form A, 0.5A, with RC suppression
C = Switched dc or open collector, isolated
D = Electromechanical relay①, Form C, 5A with RC suppression
E = Electromechanical relay①, Form C, 5A without RC suppression
F = Universal process, 0-5V⎓(dc), 1-5V⎓(dc), 0-10V⎓(dc), 0-20mA, 4-20mA, isolated
K = Solid-state relay, Form A, 0.5A, without RC suppression

Output 2
A = None
B = Solid-state relay, Form A, 0.5A, with RC suppression
C = Switched dc or open collector, isolated
D = Electromechanical relay①, Form C, 5A with RC suppression
E = Electromechanical relay①, Form C, 5A without RC suppression
F = Universal process 0-5V⎓(dc), 1-5V⎓(dc), 0-10V⎓(dc), 0-20mA, 4-20mA, isolated
K = Solid-state relay, Form A, 0.5A, without RC suppression
T = External signal conditioner power supply, 5, 12 or 20V⎓(dc) @ 30mA

Output 3
A = None
B = Solid-state relay, Form A, 0.5A, with RC suppression
C = Switched dc, isolated
J = Electromechanical relay①, Form A or B, 5A without RC suppression
K = Solid-state relay, Form A, 0.5A, without RC suppression
M = Retransmit, 0-20mA⎓(dc), 4-20mA⎓(dc)
N = Retransmit, 0-5V⎓(dc), 1-5V⎓(dc), 0-10V⎓(dc)
T = External signal conditioner power supply, 5, 12 or 20V⎓(dc) @ 30mA

Output 4
A = None
B = Solid-state relay, Form A, 0.5A, with RC suppression
C = Switched dc or open collector, isolated
D = Electromechanical relay①, Form C, 5A with RC suppression
E = Electromechanical relay①, Form C, 5A without RC suppression
K = Solid-state relay, Form A, 0.5A, without RC suppression
R = EIA/TIA-232 communications, opto-isolated
U = EIA/TIA-232, EIA/TIA-485 communications, opto-isolated
S = EIA/TIA-485, EIA/TIA-422 communications, opto-isolated
T = External signal conditioner power supply, 5, 12 or 20V⎓(dc) @ 30mA

Display Color (Upper/Lower)
GG = Green/Green RG = Red/Green
GR = Green/Red RR = Red/Red