ISE, Inc.

2810 and 3810 UNIVERSAL I/O PROCESS CONTROLLERS IN 1/8 &1/4 DIN CONFIGURATIONS

West 2810 and 3810 controllers are compact, reliable and simple to set-up and use. T/C, RTD, and linear dc inputs are available. Outputs include relay, logic to drive a 3-30 VDC solid-state relay, and linear dc. Both units include West's one-shot pre-tune and adaptive self-tuning algorithms. Both output 1 and output 2 are full PID, and are also automatically tuned.

Options include all alarm types as well as RS-485 serial digital communication.

The 2810 and 3810 are manufactured in the U.S.A.

- **Front panel configurability**
- **Truly universal I/O**
- **All options on plug-in boards**
- **Dual LED displays**

2810/3810 1/4 DIN & 1/8 DIN Process Controllers

- **Input types and ranges selectable from front panel**
- **Relay or logic main output is jumper selectable**
- **PV offset and ramp to setpoint standard**
- **Optional output 2 selectable to be PID control output or alarm***
- **Remote setpoint and retransmission of PV optional**
- **Optional open loop valve motor drive**
- **Any configuration can be assembled from basic controller and appropriate option card.**
- **Auto/manual station with bumpless transfer**
- **Full PID on heat/cool**
- **Linear input/linear output capability with engineenng unit scaling**

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Specifications

INPUT
Input Types: T/C, RTD and linear
Common Mode Rejection: Negligible to 264 V, 50/60 Hz
Series Mode Rejection: 1000% of span (at 50/60 Hz) causes negligible effect
TIC Break Protection: Upscale (downscale optional) T/C
Calibration: Complies with BS4937, NBS125 & 1EC584 standards
RID (Pt100) Calibration: Complies with BS1904 & DIN 43760 standards

OUTPUT 1 (HEAT)
Relay: SPDT contact rating 2 A resistive @ 120/240 Vac Relay life > 10 °
SSR Drive: 0 &12 V output impedance 1 K ohm nominal
DC: Isolated up to 240 Vac
0-20 mA max RL — 500 ohms
4-20 mA max RL —500 ohms
1-5 V mm RL — 50K ohm
0-5 V mm RL 50 K ohm

OUTPUT 2 (COOL)
Relay: SPOT contact rating **2** A resistive at 120/240 Vac Relay life >10 operations
SSR Drive: 0-12 V output impedance 1 K ohm nominal
DC: Isolated up to 240 Vac
0-20 mA max RL = 500 ohms
4-20 mA max RL = 500 ohms
1-5V min RL=50Kohm
0-5V min RL=50Kohm

ALARM (OPTIONAL)
The following alarm configurations are available:

Product Code	Alarm Type	Range of Adjustment
C0046	Band Alarm inside band	0 to ± span
C0047	Band Alarm-outside band	0 to ± span
C0050	Hi & Lo Deviation-direct acting	0 to ±span
C0051	Hi & Lo Deviation-reverse acting	0 to ±span
C0048	Process Alarm-direct acting	Inst range
C0049	Process Alarm-reverse acting	Inst range

CONTROL
Proportional Band: = 1-1000% at 1% resolution and ON/OFF
Cycle Time: Output 1 (heat) .5, 1,2,4,8,16,32 & 64 seconds
Cycle Time: Output 2 (cool) .5, 1,2,4,8,16,32,64,128, 256 & 512 seconds
Integral Time: 10 sec to 30 min 00 sec and OFF (1 sec. increments)
Derivative Time: 0 sec to 10 min 00 sec and OFF (1 sec. increments)
Hysteresis in ON/OFF Mode: 0.1%-10% of span

SERIAL COMMUNICATIONS
RS485 is available using the following character transmission: data characters transmitted consist of one start bit, seven data bits, one parity bit (even) an a stop bit. The link is asynchronous and operates at 4800 baud.

DISPLAYS
Model 3810: Dual LED display of eight, seven segment displays, each 8 mm high arranged in two lines of 4 digits, seven discrete LED showing system status information.

Model 2810: Dual LED display of eight seven segment displays, each 14 mm high arranged in two lines of four digits, seven discrete LED showing system status information, °C and °F indication.

REFERENCE CONDITIONS
Ambient temperature: 20 ±2°C
Supply voltage: 120 or 240 V ±1% 50/60 Hz ±1%
Thermocouple source resistance: <10 ohms
Relative Humidity: 60 to 70%
RID (Pt100): <0.1 ohm per lead, all leads equal

OPERATING CONDITIONS
Ambient temperature: 0 to +50°C operating, -20 to +60°C storage
Supply Voltage: 193 to 264 V 50/60 Hz, 100 to 132 V 50/60 Hz
Power Consumption approx. 5 VA
Maximum Source Resistance: Thermocouple <1000 ohms
RTD (PT1 00) <5 ohms per lead (equal resistance in each lead)

PERFORMANCE
Reference Accuracy: Typically ±0.5% ±1 LSD typ.
Temperature Stability: <0.015% of span for 1°C change in ambient temperature
Effect of thermocouple resistance: <0.1% of span error for lead resistance 0-100 ohms
Effect of RID resistance: <0.1% of span error for 3 ohm lead resistance
Supply voltage influence on accuracy: +/-0.1% of span error for supply voltage within specified limits

Ordering Information

1/8 DIN MODEL
3810 Configurable Self-tuning Controller M3810
1/4 DIN MODEL
2810 Configurable Self-tuning Controller M2810
SUPPLY VOLTAGE 50/60HZ

220V or 240 Vac	L01
110V or l20Vac	L02
24 Vac	L04

INPUT (TIC, RTD OR LINEAR)
Thermocouple Range.

R Pt13%/Rh 0-1650°C	T1127
R Pt13%/Rh 32-3002°F	T1128
S Pt10%/Rh 0-1650°C	T1227
S Pt10%/Rh 32-3002°F	T1228
J I/C 0-205°C	T1415
J I/C 32-401°F	T1416
J I/C 0-450°C	T1417
J I/C 32-842°F	T1418
J I/C 0-760°C	T1419
J I/C 32-1400°F	T1420
T Cu /Con -200 to +260°C	T1525
T Cu/Con -328 to +500°F	T1526
I Cu/Con 0-260°C	T1541
T Cu/Con 32-500°F	T1542
K C/A 0-760°C	T1719
K C/A 32-1400°F	T1720
K C/A 0-1371 °C	T1723
K C/A 32-2500°F	T1724
L I/C (DIN std) 0-205°C	T1815
L I/C (DIN std) 0-450°C	T1817
L I/C (DIN std) 0-760°C	T1819
B Pt30%/Rh 100-1820°C	T1983
B Pt30%/Rh 212-3308°F	T1984

Upscale 1/C Break Protection STD

Downscale T/C Break Protection	T----21
No T/C Break Protection	T----22

DC LInear Range

0-20 mA 100 Ohm	T3413
4-20 mA 100 Ohm	T3414
0.2-1 V 1M Ohm	T4415
1-5V 1M Ohm	T4434
0-50mV 1M Ohm	T4443
0-1V 1M Ohm	T4444
0-5V 1M Ohm	T4445
10-50mV 1M Ohm	T4499

3 Wire RTD (Ptl00) Range

-101° to +100.0°C	T2230
-150° to +212.0°F	T2231
-101° to +300.0°C	T7201
-150° to +572.0°F	T7202
-200° to +205.0°C	T2297
-328° to +401.0°F	T2298
0 to 100.0°C	T2295
32.0 to 212.0°F	T2296
0 to 300°C	T2251
32-572°F	T2229
0 to 600°C	T2221
32to1112°F	T2222

OUTPUT 1 (EG HEAT)

Relay (5A-240 Vac)	H10
SSR Drive (0 &12 Vdc)	H50
DC Current 4-20 mA (max RL = 500 ohm)	H21
DC Current 0-20 mA (max RL = 500 ohm)	H24
DC Voltage 1-5 V (min RL =50 K ohm)	H61
DC Voltage 0-5 V (min RL- 50K ohm)	H64
Valve Motor Drive (open loop)°	H70
Output 1 direct acting	H--31

* Restrictions on VMD (H70) output:
1) Output 2 (cool) not available.
2) Alarm not available if either remote S.P.or recorder output is selected.
3) Cannot be reconfigured for any other type of output.
4) Self-tune is inoperative.

OUTPUT 2 (EG COOL)

Not Installed	C00
Relay (2 A-240 Vac)	C10
SSR Drive (0 &12 Vdc)	C50
DC Current 4-20 mA (max RL =500 ohm)	C21
DC Current 0-20 mA(max RL = 500 ohm)	C24
DC Voltage 1-5 V(min RL = 50 K ohm)	C61
DC Voltage 0-5 V(min RL= 50 K ohm)	C64

Note: Only 1 dc output may be selected, eg. either H21 C_ — or H__ C21.

ALARM OPTIONS (Relay SPDT 2A. 240 Vac)- See Notes 1 & 2

Alarm 1

Limit Comparator	C--46
BandAlarm	C--47
Process Alarm (direct)	C--48
Process Alarm (reverse)	C--49
High/Low Alarm (direct)	C--50
High/Low Alarm (reverse)	C--51

Alarm 2

Limit Comparator	C--46
Band Alarm	C--47
Process Alarm (direct)	C--48
Process Alarm (reverse)	C--49
High/Low Alarm (direct)	C--50
High/Low Alarm (reverse)	C--51

1: Alarm 2 not available it Output 2 has been selected or if Alarm I has not been selected.
2: Alarm I and Alarm 2 available if output 2 has not been selected.

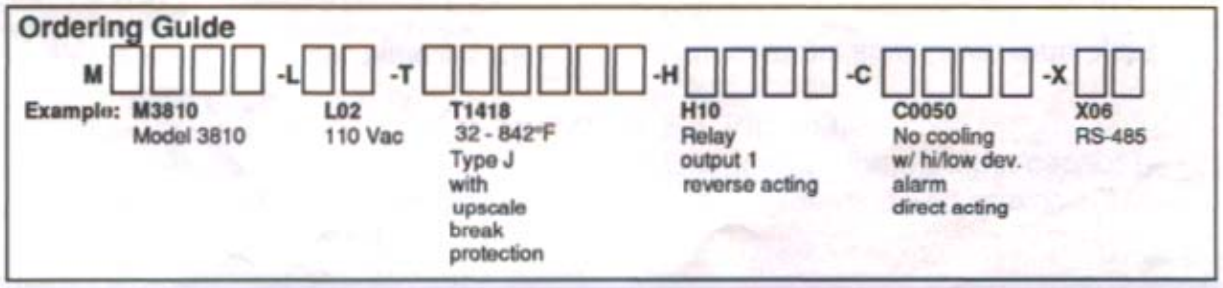
OPTIONS

None Installed	X00
RS485 Serial Comms°	X06
Recorder Output:	
O-5V(25ohm source)	X12
0-20mA(500Ohm load max)	X18
4.-2OmA(500Ohm load max)	X19
1-5 V (250ohm source)	X20
Remote setpoint input:	
0-5 V (into 200 K ohm)	X04
0-20mA(into 100 ohm)	X37
4-20mA(into 100 ohm)	X05
1-5 V (into 200 K ohm)	X38

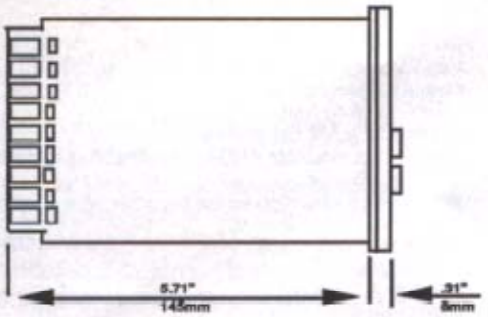
INDEPENDENT OPTiONS

Push-on blade terminals	X69
Remote front panel w/ 1.6' cable	X79** 3810 only
Remote front panel w/ 6' cable	X74** 3810 only
Remote front panel w/ 15' cable	X75** 3810 only

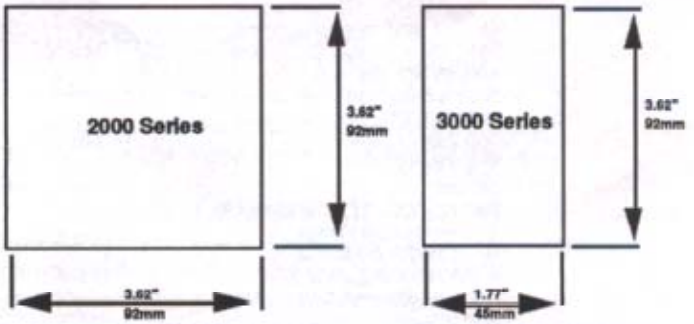
If recorder output or remote selpoint options are selected, only one add'l option is available, i.e. output 2 or alarm 1.
°RS-4.85 comms option (X06) is not available with the following I/O options:
Recorder output (Codes X12, X18, X19 or X20) Remote setpoint (Codes X04. X05. X37 or x38)



Mounting/Wiring Information

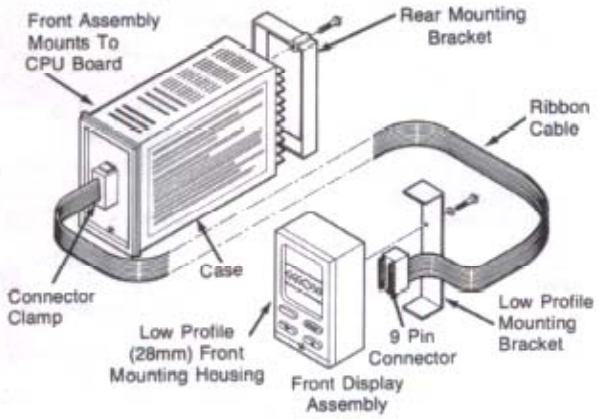


Cutout Dimensions

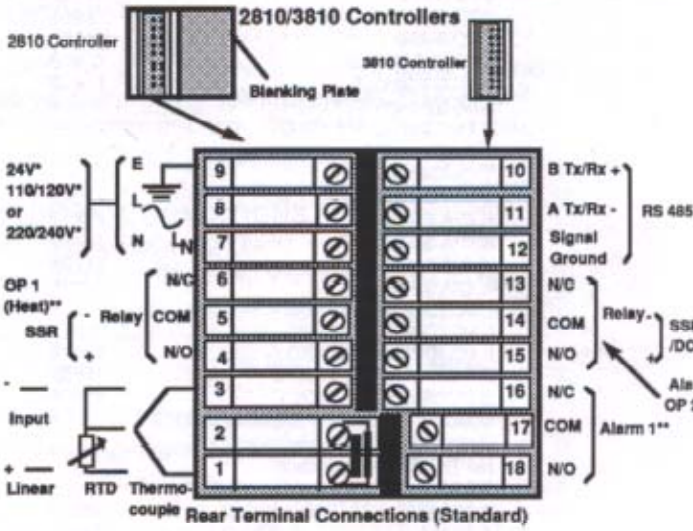


The controller is supplied for operation on 24 V, 193 V-246 V or 100V-132 V (50/60 Hz) as stated on the product code label. Check that the designated voltage is correct before applying power. Local requirements regarding electrical installation should be rigidly observed. Ground terminals must be connected separately and must not be made common to the neutral connection. Consideration should be given to the prevention of access by unauthorized personnel to the power terminations. The ground terminal (Terminal 9) should be connected to a protective ground conductor before any other connections are made; this should remain connected at all times. Power should be connected via a two-pole switch and a fuse (1A for 100 V -132 V and 190 V -2-4 V, 5 A for 24 V operation) as shown in the figure below.

3810 Only
Remote Front Panel Option

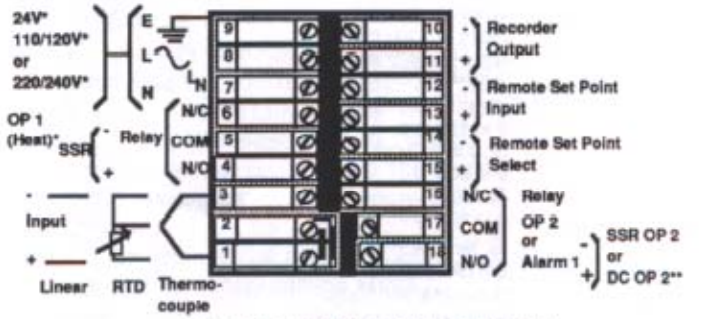


2810/3810 Controllers



Rear Terminal Connections (Standard)

*50/60Hz
**Where DC Output 1 is installed (product codes H21, H24, H61 and H64), this is connected to terminals 14 & 15 and Output 2 Relay (product code C10) or Alarm 2 (product code C00----) is connected to terminals 4,5 & 6. Output 2 SSR (product code C50) uses terminals 4 and 5. If DC Output 1, RS 485 communications and the Alarm 1 option are installed, the alarm output uses terminals 4, 5 & 6.



Connections (RSP and/or Recorder O/P)

*50/60Hz
**Where DC Output 1 is installed (product codes H21, H24, H61 and H64), this is connected to terminals 17 & 18; Output 2 Relay (product code C10) or Alarm 1 (product code C00xx) is connected to terminals 4, 5 & 6; Output 2 SSR (product code C50) uses terminals 4 & 5.

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