

# West *brand* **PRODUCT CATALOG**



# ABOUT WEST



Welcome to the WEST brand family of controller products, manufactured by Danaher Industrial Controls! For over 50 years, we have steadily increased our range of products and the level of technology inside. All of our product developments are customer focused, assuring outstanding performance, high reliability, reduced size and value added control options for all types of industries and applications. Commitment to our customer's quality process is reflected through our product certifications. The entire range of WEST brand products are UL, Canadian UL and CE approved. In addition, our limit controllers are Factory Mutual (FM) Approved.

We are a division of the Danaher Corporation, employing 19,000 associates, located in 25 countries around the world, Danaher has rapidly become distinguished for world-class standards of quality, customer service, and product value.

## DANAHER INDUSTRIAL CONTROLS CONTACTS

### Distributor Locations, Product Availability

Customer Service within U.S. & Canada . . . . . 800.866.6659  
Customer Service outside U.S. & Canada . . . . . 847.662.2666  
Customer Service Fax. . . . . 847.662.4150

### Technical Assistance

Applications Engineering within U.S. & Canada. . . . . 800.866.6659  
Applications Engineering outside U.S. & Canada. . . . . 847.662.2666  
Applications Engineering Fax. . . . . 847.782.5277  
General Information . . . . . 847.662.2666  
General Fax . . . . . 847.662.6633

### Email

Internet E-Mail . . . . . dancon@dancon.com

## CONVENIENT, HELPFUL DISTRIBUTORS

Each product in this catalog and local application assistance are readily available from an authorized distributor near you. For additional information or the name of your local Danaher Industrial Controls distributor, contact us at the telephone numbers listed above.

## DANAHER INDUSTRIAL CONTROLS

West brand products are manufactured by Danaher Industrial Controls, respected world-wide as a manufacturer of quality industrial automation products. Every Danaher Industrial Controls field salesman is an experienced application engineer able to provide sound technical guidance, and like all members of our team is committed to customer satisfaction.

*Customer visits are always welcome at . . .*



*our Gurnee, Illinois headquarters . . .*



*or our plant in Elizabethtown, North Carolina*

## DANAHER INDUSTRIAL CONTROLS

1675 Delany Road  
Gurnee, IL 60031  
Phone: 1.800.866.6659 or 847.662.2666  
Fax: 847.662.6633



**See us on the Web**  
[www.westinst.com](http://www.westinst.com)

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# ***WEST brand Products & Features:***

Welcome to the WEST brand family of controller products, manufactured by Danaher Industrial Controls! For over 50 years, we have steadily increased our range of products and the level of technology inside. All of our product developments are customer focused, assuring outstanding performance, high reliability, reduced size and value added control options for all types of industries and applications. Commitment to our customer's quality process is reflected through our product certifications. The entire range of WEST brand products are UL, Canadian UL and CE approved. In addition, our limit controllers are Factory Mutual (FM) Approved.

We are a division of the Danaher Corporation, employing 19,000 associates, located in 25 countries around the world, Danaher has rapidly become distinguished for world-class standards of quality, customer service, and product value.

## **The following features are found on most of our products:**

- **UL, Canadian UL, and CE approved; NEMA 4; FM Approved Limit Control.**
- **Multiple setpoint display strategies:** Allows the selection of various ways information can be presented on the controller.
- **Universal Input:** Accommodates Thermocouple , RTD, DCmV and mA Inputs
- **Universal Power Supply:** Allows the controller to accept 95 - 265V AC 50 & 60Hz.
- **Low Voltage Operation:** Allows the controller to accept 20-50V AC or 22-65V DC
- **Configuration port:** Designed to enable you to configure off-line directly from your own PC. Complete with dedicated software, this telecomm-type port makes configuration fast, accurate and reliable. All configuration parameters may be password protected and a comprehensive alarm strategy is available on most models.

# Features Continued:

- **Auto-tuning:** West Brand controllers are unique in that they utilize two tuning algorithms to provide you with optimal control. The first algorithm, **Pre-tune**, used during start-up is designed to bring you to setpoint faster. The second, **Self-tune**, is a continuous tuning algorithm, sometimes referred to as adaptive tune, monitors the process and provides optimal control at setpoint. These can be turned on and off individually.
- **Fuzzy Logic (RaPID®):** Selected models are available with this advanced tuning algorithm which dramatically reduces overshoot and time to control on start-up and process changes.
- **Valve Motor Drive:** Selected controllers directly interface to valve motor drives or electric actuators with or without slidewire feedback.
- **All of the WEST Brand products have a Three Year Warranty.**
- **Plug and Play:** Our *Plug and Play* Technology allows you the ability to easily add to the controller's features including communication by simply installing additional plug-in boards. Inputs, Outputs, Alarms, and Communications are all field upgradeable! This capability also allows the user to pay for only the options that are required on today's applications.



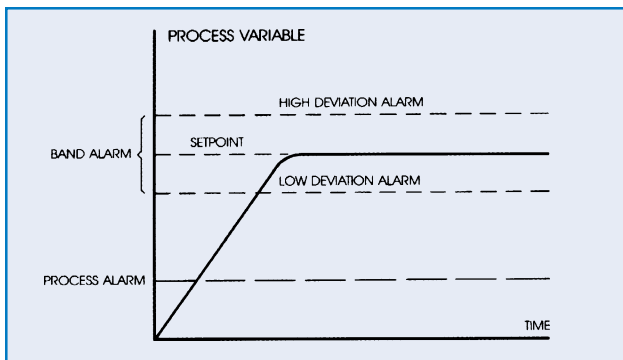
# Control Basics:

This section is intended to help you make a selection if you are uncertain which type of controller is most appropriate for your application.

## INPUT TYPE

An automatic process controller needs to measure the controlled variable continuously in order to take the appropriate action in controlling the process. In temperature applications, either a thermocouple or RTD can be used.

Considerations such as maximum temperature, and the harshness of the environment are important. For non temperature applications, the input signal is usually supplied by a signal conditioner, i.e.: flow/level; strain gauges; pressure transducers. It is vital to know the range and type of signal, i.e.: 4-20mA DC, 0-5V DC.



## CONTROL OUTPUTS

### Four Main Types Of Control Outputs-

#### Relay:

A relay is intended to drive a larger related contactor or solenoid valve. A relay is the standard output fitted to West products.

#### SSR (Solid State Relay) Drive:

SSR Drivers provide a logic signal that drives thyristors or solid state relays, where the fast switching of large currents is necessary.

#### Triac:

Triacs are another solid state device used commonly to replace relays. They switch 120/240V AC and can handle up to a 1 amp load. Extended life expectancy over that of a relay is the main reason for its popularity.

#### Analog/Linear:

DC Volts or mA are used to drive thyristors or other types of actuators.

### Other Control Outputs-

#### Valve Motor Drive:

Valve Motor Drives require either 2 Relays or 2 Triac Outputs to drive valve actuators open or close. In addition, these controllers may incorporate a slidewire feedback which provides positional information back to the controller.

#### Dual Output:

For some applications where the process itself generates heat, a secondary output may be required for "cooling". This is usually a relay output; however; SSR and DC Linear outputs may also be used.



# Control Basics:

NOTE: West Brand controllers are suitable for both, Reverse Acting applications (such as heating) or Direct Acting (such as cooling).

## Alarms:

Alarms can be configured for use in a variety of ways. When alarms have their own setpoints, they are process alarms and can operate over the entire range. Process alarms are independent of the setpoint and can operate at any position over the scale range of the instrument.

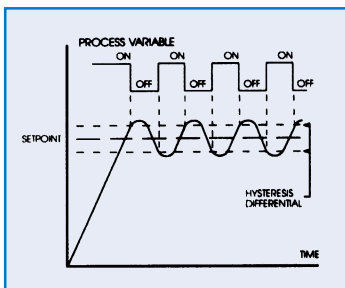
Deviation alarms are slaved to the main setpoints as a high, low or deviation alarm around the setpoint. High or Low deviation or band alarms are all dependent on, or *slaved* to, the controller setpoint. In other words, changes in control setpoint will automatically cause a change in alarm setpoints.

It is strongly recommended alarms are used as safety trips in control circuits to protect against damage arising from power failure or equipment damage.

## CONTROL MODES

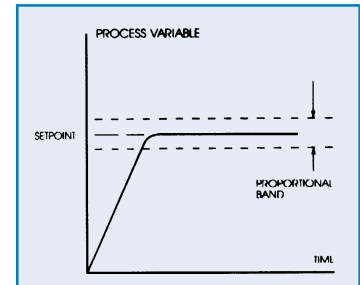
### On/Off Control Activity

This type of control is suitable for low accuracy applications. When driving contactors or solenoid valves, regard should be given to the possible wear effects that will result from this type of control action. Very simple On/Off controllers may cause the output to “chatter” as the process value crosses setpoint. To prevent this, an On/Off hysteresis is added to West Brand controllers. This requires that the process value exceeds the setpoint by a certain amount before the output will change state.



### Three Term Control Action (PID)

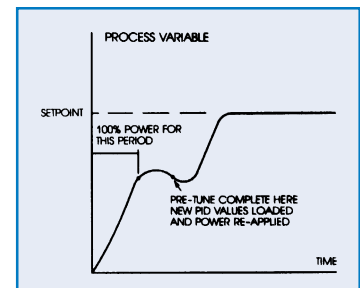
West Brand Three Term Controllers use proportional, integral, and derivative action. In a temperature control application the proportional action adjusts the heating point to be approximately equal to the process requirements to achieve a stable temperature. Proportional action compensates for some of the process lag and allows the use of a narrower proportional band with less offset. This type of control is ideal for small kilns, ovens and molding machines.



The limiting factor is that PID control action usually leaves an offset which can be removed using “Reset” or “integral” action. This can be adjusted manually or automatically in a PID controller.

### Self-Tuning

To tune a controller satisfactorily to match a particular set of load conditions is a time consuming process and requires expert knowledge for difficult processes. The use of West Brand *Self-tuning* allows optimum performance without the need to use a skilled engineer. West Brand controllers incorporate a *Pre-tune*, a one time tuning action which allows the controller to assess the nature of the process, setting suitable terms and *Self-tune*, sometimes referred to as *Adaptive-tune*, which remains active continuously, readjusting the terms as significant control conditions occur. Both *Self-tune* and *Pre-tune* can be selected or deselected on West Brand self-tuning controllers.



# Control Basics:

## Auto-Manual Control

Auto-Manual Control allows control of the process to be switched from automatic (or closed loop control), to manual (or open loop control). In Manual mode the operator is able to adjust the power to the load from zero to maximum, which is useful when first commissioning a system or troubleshooting. On switchback to Auto, the transfer is *bumpless*, the controller takes over control of the process without introducing a control disturbance.

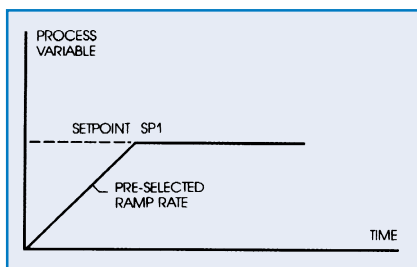
## ADDITIONAL FEATURES

### Remote Setpoint

This feature enables an externally generated analog signal (4-20mA DC, 1-5V DC, etc.) to be fed to a single or group of controllers as a setpoint. Applications include multi-zone programming, cascade control with ratio control, soft start etc.

### Initial Ramp Feature

The initial ramp on start-up feature causes the working setpoint of the controller to be driven to the required setpoint (SP1) at a user defined rate. Controllers fitted with this feature are particularly useful for applications requiring simple profiles or thermal shock protection.

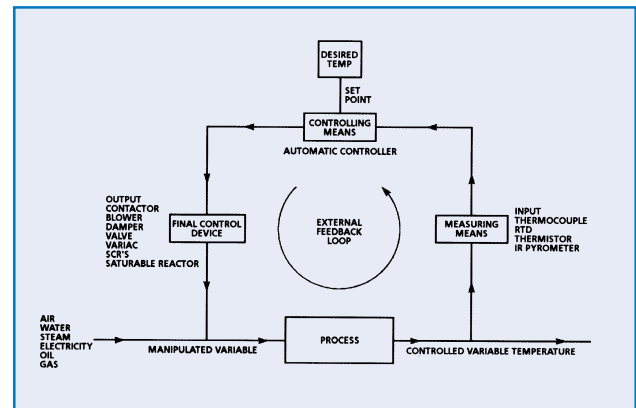


## Serial Communications

This option allows all the functions, parameters and values of a controller to be monitored and adjusted via a computer link using West ASCII or MODBUS protocol via a RS-485 connection.

## THE CONTROL LOOP

In the example loop the variable to be controlled is temperature and is usually referred to as the Process Variable (PV) or as the Measured Variable (MV). It is mea-



sured using a suitable sensor such as a thermocouple and the controller compares it to the desired value or Setpoint (SP) which is entered manually through the front panel push buttons on the controller. The controller compares the two values and takes action to equate them by changing the amount of heat being added to or taken from the process.

# Control Basics:

## TUNING THE CONTROLLER MANUALLY

### Controllers Fitted with Output 1 Only

Before starting to tune the Controller to the load, check that the Setpoint High and Low Limits (SPHi and SPLo) are set to safe levels.

The following simple technique may be used to determine values for proportional band (Pb1), derivative time constant (rAtE) and integral time constant (rSEt).

NOTE: This technique is suitable for use only with processes which are not harmed by large fluctuations in the process variable. It provides an acceptable basis from which to start fine tuning for a wide range of processes.

1. Set the setpoint to the normal operating process value (set it to a lower value if over shoot beyond the normal operating process value is likely to cause damage).
2. Select ON/OFF Control (i.e. set Pb1 = 0).
3. Switch on the process. Under these conditions, the process variable will oscillate about the setpoint and the following parameter values should be noted:

(a) The peak-to-peak variation (P) of the first cycle i.e. the difference between the highest value of the first overshoot and the lowest value of the first undershoot.

(b) The cycle time (T) of this oscillation in minutes.

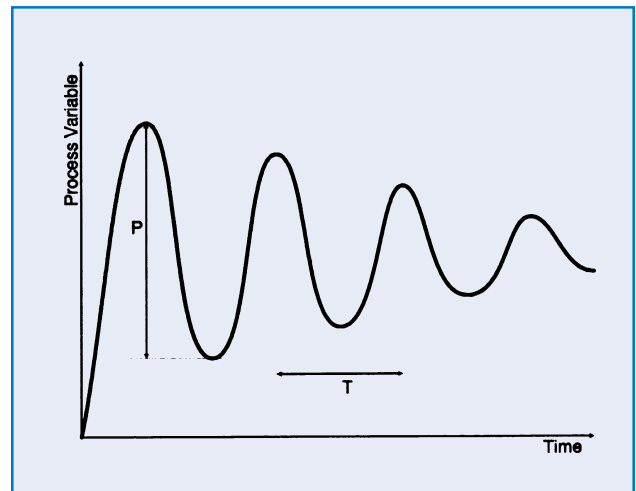
4. The control parameters should then be set as follows:

$$\text{Pb1: } \frac{P}{\text{Scale Range}} \times 100$$

$$\text{rSEt: } T \text{ Minutes}$$

$$\text{rAtE: } \frac{T}{6} \text{ Minutes}$$

NOTE: After setting up the parameters, set the Controller to Operator Mode to prevent unauthorized adjustment to the values.



# Control Basics:

## Controllers Fitted with Output 1 and Output 2

Before starting to tune the Controller to the load, check that the Setpoint High and Low Limits (SPHi and SPLo) are set to safe levels.

The following simple technique may be used to determine values for proportional band (Pb1), derivative time constant (rAtE) and integral time constant (rSEt).

NOTE: This technique is suitable for use only with processes which are not harmed by large fluctuations in the process variable. It provides an acceptable basis from which to start fine tuning for a wide range of processes.

1. Tune the Controller using Output 1 only as described.
2. Set Pb2 to the same value as Pb1 and monitor the operation of the Controller in dual output mode. If there is a tendency to oscillate as control passes into the Output 2 proportional band, increase the value of Pb2. If the process appears to be over-damped in the region of the Output 2 proportional band, decrease the value of Pb2.
3. When values of proportional bands, integral time constant and derivative time constant have been determined for tuning, if there is a “kick” as control passes from one output to the other, set OL to a positive value to introduce some overlap. Adjust the value of OL by trial and error until satisfied.

## Self-tune and Pre-tune Facilities

Once the Controller has been manually tuned, the Self-Tune and Pre-Tune facilities may be used in Operator Mode to enhance further the response of the Controller.

# ***3 Year Warranty and Return Statement:***

These products are sold by Danaher Industrial Controls under the warranties set forth in the following paragraphs. Such warranties are extended only with respect to a purchase of these products, as new merchandise, directly from Danaher Industrial Controls or from a West Brand product distributor, representative or reseller, and are extended only to the first buyer thereof who purchases them other than for the purpose of resale.

## ***3 Year Warranty***

These products are warranted to be free from functional defects in materials and workmanship at the time the products leave the factory and to conform at that time to the specifications set forth in the relevant instruction manual or manuals, sheet or sheets, for such products for a period of three years.

THERE ARE NO EXPRESSED OR IMPLIED WARRANTIES WHICH EXTEND BEYOND THE WARRANTIES HEREIN AND ABOVE SET FORTH. DANAHER INDUSTRIAL CONTROLS MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE PRODUCTS.

## ***Limitations***

Danaher Industrial Controls shall not be liable for any incidental damages, consequential damages, special damages, or any other damages, costs or expenses excepting only the cost or expense of repair or replacement as described above.

Products must be installed and maintained in accordance with the instructions. Users are responsible for the suitability of the products to their application. There is no warranty against damage resulting from corrosion, misapplication, improper specifications or other operating condition beyond our control. Claims against carriers for damage in transit must be filed by the buyer.

This warranty is void if the purchaser uses non-factory approved replacement parts and supplies or if the purchaser attempts to repair the product themselves or through a third party without Danaher Industrial Controls authorization.

## ***Returns***

Danaher Industrial Controls' sole and exclusive obligation and buyer's sole and exclusive remedy under the above warranty is limited to repairing or replacing (at Danaher Industrial Controls option) free of charge, the products which are reported in writing to Danaher Industrial Controls at its main office indicated below.

Danaher Industrial Controls is to be advised of return requests during normal business hours and the technical support department (phone number below) will issue a return authorization number at that time. Such returns are to include a statement of the observed deficiency. The buyer shall prepay shipping charges for products returned and Danaher Industrial Controls or its representative shall pay for the return of the products to the buyer.

Approved returns should be sent to:                   DANAHER INDUSTRIAL CONTROLS  
2100 West Broad Street  
Elizabethtown, NC 28337  
1-800-286-4890

# Notes


# Notes


# 2300 1/32 DIN Controller/Indicator

- Largest red or green digital display in a 1/32 DIN package.
- Three large multicolored LED's indicating process, alarms and configuration status.
- Three large tactile rubberized keys for a more practical human interface.
- Two outputs include both a relay and a solid state driver for primary control and alarming.
- Specially developed hands-free PID tuning algorithm. *Easy-Tune* continuously monitors and improves control.



The 2300 is a 1/32 DIN controller which has been designed to be our smallest control offering without sacrificing functionality.

Visually, the 2300 sets new standards with a large 4 digit display that can be specified in either red or green. The operator can easily view the actual temperature plus has 3 additional multi-color LED indicators for the process, alarm, and configuration status.

The three elastomeric push-buttons provide tactile feedback to your finger each time one of the switches is pressed. Entry is made easier by the large size of the push buttons plus the simplified operation of the control. The controller is provided with hands free PID (Auto Tuning) or can be manually fine tuned for a specific application.

Configuration can be achieved through the elastomeric push-buttons on the front of the control.

Functionality has not been compromised by size. It comes equipped with a full complement of thermocouples, RTDs, mVDCs, and mADCs for inputs. Outputs include a 5 amp relay and an SSR for primary control and alarming. An optional second alarm relay or a 2 wire RS485 MODBUS RTU communication is available.

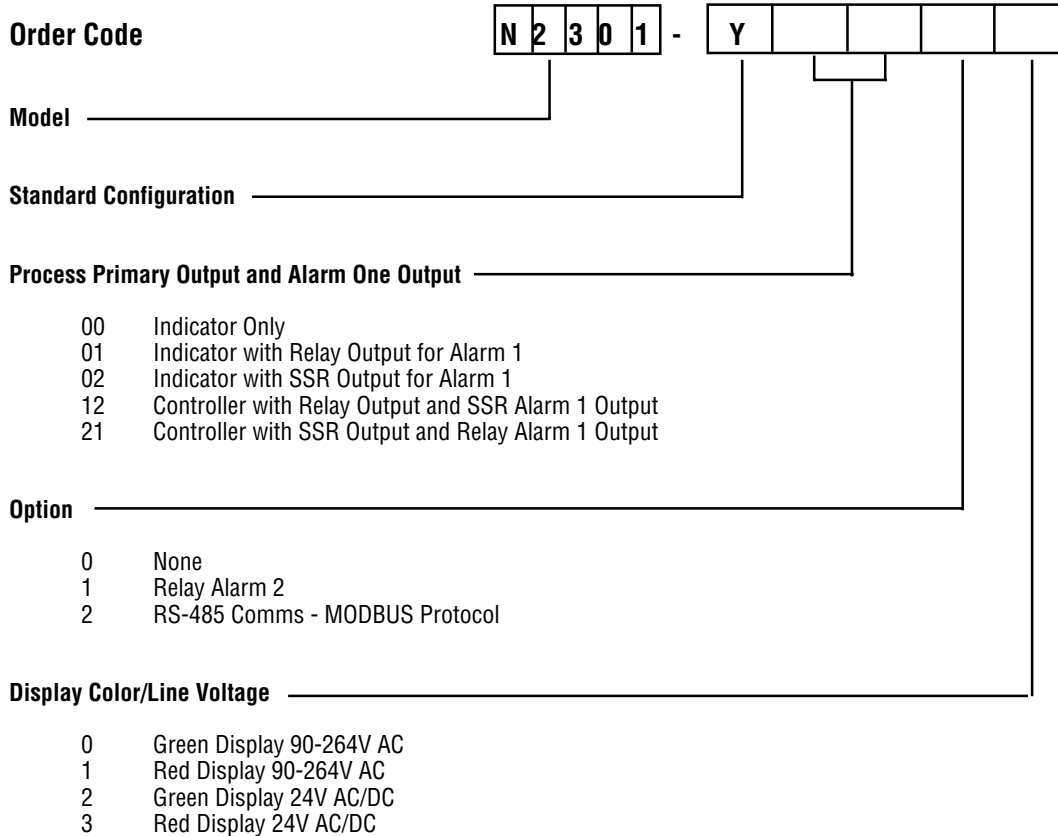


# 2300 Brief Specs:

## Brief Specs:

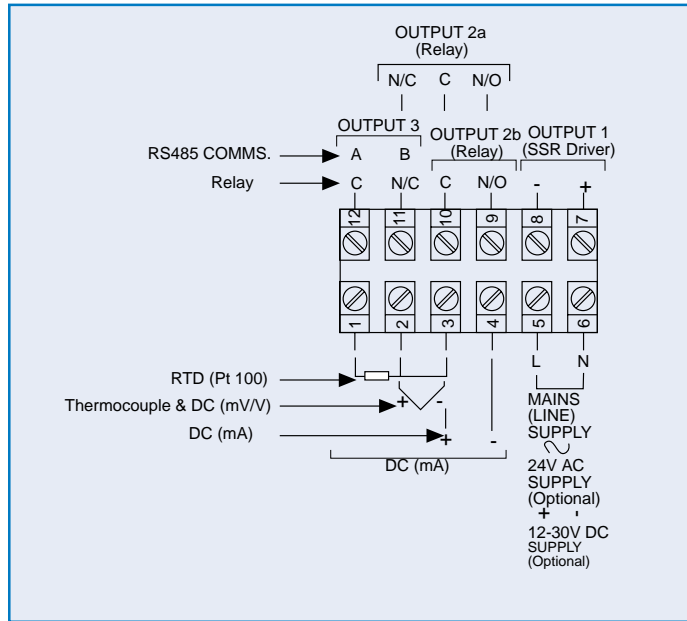
<b>Inputs:</b>	Thermocouple:	J, T, K, N, B, R, S
	RTD:	Pt 100
	DC Linear:	mA=0-20, 4-20 mV=0-50, 10-50
	Dual Setpoint:	Local Operator Interface; Lockable
<b>Output:</b>	Control Output:	Relay- SPST 2A at 120/240V AC SSR: >10V DC into 1 KOhm minimum
	Alarms Option:	2 alarms if two physical outputs are available 2A 120/240V AC (or SSR > 10V into 500 Ohm minimum)
	Communications: Option	RS-485 2 wire-MODBUS RTU
<b>Control and: Features</b>	Tuning:	Easy Tune or Manual Tuning with Pre-tune
	Proportional Band:	1.0% to 999.9% of input span
	Auto Reset:	1 second to 99 minutes 59 seconds and OFF
	Manual Reset (Bias): Rate:	0 to 100% 0 to 99 minutes 59 seconds
<b>Operating and: Environmental</b>	Accuracy:	±0.25% of input span ±1 LSD
	Ambient Temperature:	0°C to 55°C (Operating) -20°C to 80°C (Storage)
	Supply Voltage:	90 to 264V AC 50/60Hz
	Power Consumption:	4W Maximum
	Low Voltage Option:	12-30V DC, 12-24V AC 50/60 Hz
	EMI Immunity: EMI Emissions:	Complies with BS EN 50082 Parts 1 (1992) and 2 (1995) Complies with BS EN 50081 Parts 1 (1992) and 2 (1994)
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out:	1/32 DIN - 45mm X 22.5mm
	Unit Dimensions:	25mm High X 49mm Wide X 100mm Deep

# 2300 Order Matrix:



# 2300 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 6010 1/16 DIN Indicator

- Four digit display.
- Multiple alarm strategies.
- Plug and Play Technology allows for field upgrades.
- Retransmission output.
- Security via password protection and remote lock option.



The 6010 is a 1/16 Din Indicator that provides good visible indication, alarm capability and security for a variety of applications.

This unit has fast identification of alarms via separate LED indicators. Other options include a retransmission output, a 24V AC/DC input power supply, plus a remote input for a security lock.

Configuration can be easily setup through the front panel, plus, unauthorized user can be locked out of changing the alarm values and configuration parameters via a simple security code or by a remote.

# 6010 Brief Specs:

## **Brief Specs:**

<b>Inputs:</b>	Thermocouple:	J, T, K, N, B, R, S, L
	RTD:	Pt 100
	DC Linear:	mA=0-20, 4-20 mV=0-50, 10-50 V=0-5, 1-5, 0-10, 2-10
	Remote Lock:	Voltage Free Contact or TTL Lockable
<b>Output:</b>	Alarm Output:	Relay- SPST 2A at 120/240V AC
	Alarms Option:	2 alarms standard 2 alarms 2A 120/240V AC
	Communications: Option	RS-485 2 wire
<b>Operating and: Environmental</b>	Accuracy:	±0.25% of span ±1 LSD
	Ambient Temperature:	0°C to 55°C (Operating) -20°C to 80°C (Storage)
	Supply Voltage:	90 to 264V AC 50/60Hz
	Power Consumption:	4W Maximum
	Low Voltage Option:	20-50V AC, 22-65V DC
	EMI Immunity: EMI Emmissions:	Complies with BS EN 50082 Parts 1 (1992) and 2 (1995) Complies with BS EN 50081 Parts 1 (1992) and 2 (1994)
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out:	1/16 DIN - 45mm X 45mm
	Unit Dimensions:	49mm High X 49mm Wide X 110mm Deep

# 6010 Order Matrix:

**Order Code**



**Model**

**Standard Configuration**

**Input Type**

- 1 - 3 Wire RTD or DC mV
- 2 - Thermocouple
- 3 - DC mA
- 4 - DC Voltage

**Output 1 Type**

- 1 - Relay - Alarm output

**Output 2 Type**

- 0 - Not fitted
- 1 - Relay

**Recorder Output 3 Type**

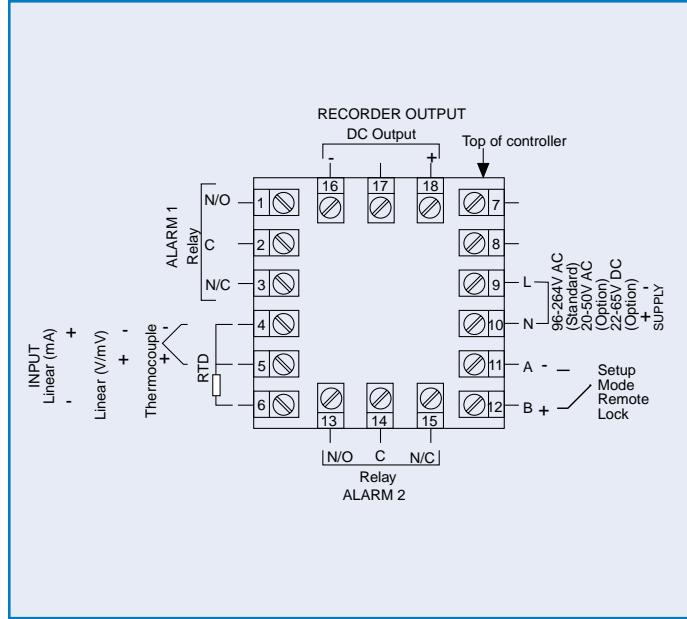
- 0 - Not fitted
- 3 - DC 0-10V
- 4 - DC 0-20mA
- 5 - DC 0-5V
- 7 - DC 4-20mA

**Options**

- 02 - 24VAC/DC Power Supply
- 30 - Remote Lock
- 32 - Remote Lock and 24VAC/DC Power Supply

# 6010 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 6100+ 1/16 DIN Controller

- Jumperless Configuration
- Auto Detected Hardware
- Process & Loop Alarms
- Auto or Manual Tuning
- Heat/Cool Operation
- Modbus & ASCII Communication
- Ramping Setpoint
- Remote/Dual Setpoint Options



The easy programming and operational simplicity of the entire range of West controllers is featured in the 6100+. Its adaptive-tune feature provides for better overall "quality control" with accurate "hands-free" tuning and faster, easier setup time.

The 6100+ offers a choice of full PID, Heat-Cool, or Dual Alarm features to handle virtually any application. Its unique loop break alarm saves money by providing process problem indication without the need for additional hardware required by heater break detection.

The 6100+ reduces controller inventory cost because one controller will handle RTD, T/C, and analog inputs. It features a recorder type analog retransmission feature that provides flexibility for external process monitoring and recording.

The 6100+'s universal power supply provides the flexibility for global power capability which eliminates the need for different boards and covers the 94-264 Volts AC, 50/60 Hz range. Its sealed front panel provides for reliable and accurate operation in harsh environments.



# 6100+ Brief Specs:

## **Features**

### **Control Types**

#### **Auto/Manual**

#### **Output Configuration**

#### **Alarm 1 & 2 Types**

Full PID with Pre-tune, Self-tune, manual tuning, or On-Off control. Heat only or heat & cool Selectable from front panel or via digital input, with bumpless transfer  
Up to 3 possible, for control, alarm, 24VDC transmitter power supply or retransmit of process value or setpoint  
Process high, process low, SP deviation, band, logical OR / AND. Also 1 loop alarm for process control security. Process alarms have adjustable hysteresis.

## **Human Interface**

4 button operation, dual 4 digit 10mm & 8mm high LED displays, optional choice of colors (Red/Red, Red/Green, Green/Red or Green/Green), plus 5 LED indicators

## **PC Configuration**

Off-line configuration from PC serial port to dedicated config socket (comms option not required). Configuration Software for Windows 98 or higher. West Part Number: PS1-CON

## **Inputs**

### **Thermocouple**

### **RTD**

### **DC Linear**

### **Impedance**

### **Accuracy**

### **Sampling**

### **Sensor Break Detection**

J, K, C, R, S, T, B, L, N & PtRh20%vsPtRh40%.  
3 Wire PT100, 50Ω per lead maximum (balanced)  
0 to 20mA, 4 to 20mA, 0 to 50mV, 10 to 50mV, 0 to 5V, 1 to 5V, 0 to 10V, 2 to 10V.  
Scalable -1999 to 9999, with adjustable decimal point  
>10MΩ for Thermocouple and mV ranges, 47KΩ for V ranges and 5Ω for mA ranges  
±0.1% of input range ±1 LSD (T/C CJC better than 1°C)  
4 per second, 14 bit resolution approximately  
<2 seconds (except zero based DC ranges), control O/P's turn off, high alarms activate for T/C and mV ranges, low alarms activate for RTD, mA or V ranges

## **Outputs & Options**

### **Control & Alarm Relays**

### **Control SSR Driver Outputs**

### **Triac Outputs**

### **DC Linear Outputs**

Contacts SPDT 2 Amp resistive at 240V AC, >500,000 operations  
Drive capability >10V DC in 500Ω minimum  
0.01 to 1 Amp AC, 20 to 280Vrms, 47 to 63Hz  
0 to 20mA, 4 to 20mA into 500Ω max, 0 to 10V, 2 to 10V, 0 to 5V, 1 to 5V into 500Ω min.  
Control outputs have 2% over/under drive applied. Accuracy ±0.25% at 250Ω (degrades linearly to 0.5% for increasing burden to specified limits)

### **Transmitter Power Supply**

### **Communications**

### **Digital Input**

### **Remote Setpoint Input**

Output 24VDC (nominal) into 910Ω minimum to power external devices  
2 Wire RS485, 1200 to 19200 Baud, Modbus and ASCII protocol (selectable)  
Selects between 2 setpoints or Auto/Manual control. Volt free or TTL input  
0 to 20mA, 4 to 20mA, 0 to 5V, 1 to 5V, 0 to 10V or 2 to 10V. Scalable -1999 to 9999. Local/Remote setpoint selected from front panel

## **Operating & Environmental**

### **Temperature & RH**

### **Power Supply**

### **Front Panel Protection**

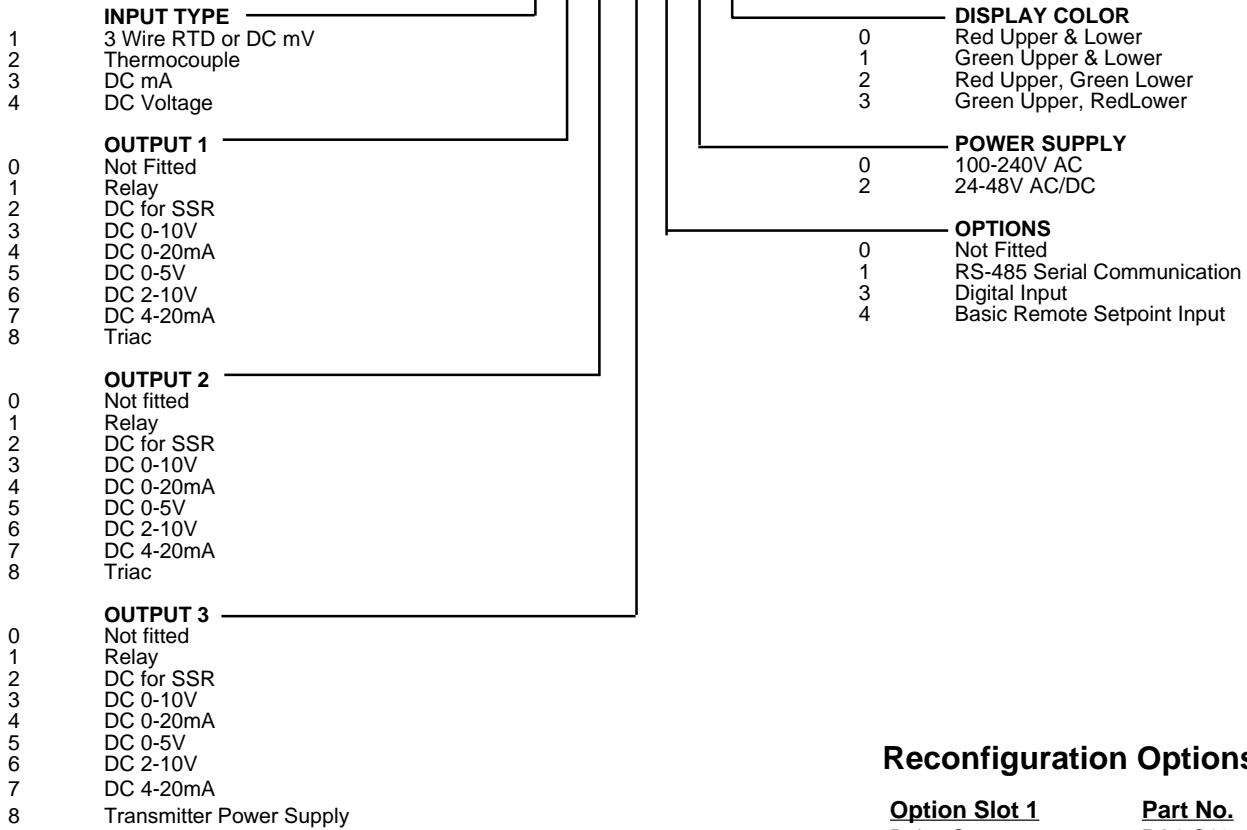
### **Standards**

0 to 55°C (-20 to 80°C storage), 20% to 95% RH non-condensing  
100 to 240V 50/60Hz 7.5VA (optional 20 to 48V AC 7.5VA/22 to 65V DC 5 watts)  
IEC IP66 (Behind panel protection is IP20)  
CE, UR & cUR recognized (file E208029)

# 6100+ Order Matrix:

## Order Code

P 6 1 0 1 Z

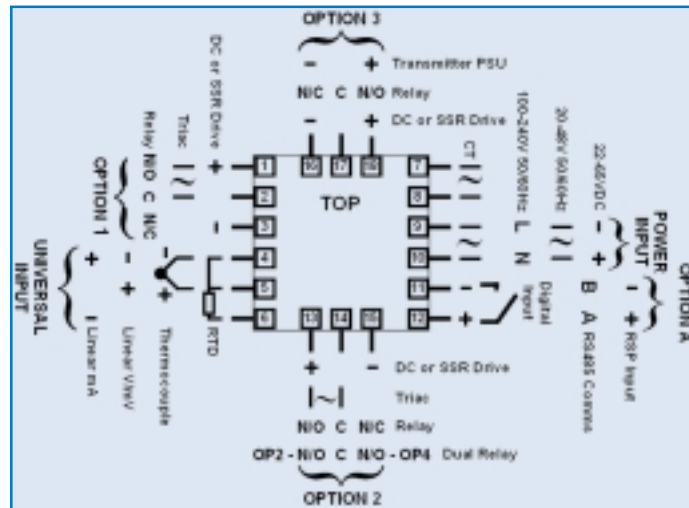


## Reconfiguration Options

<b>Option Slot 1</b>	<b>Part No.</b>
Relay Output	<b>PO1-C10</b>
SSR Driver Output	<b>PO1-C50</b>
Triac Output	<b>PO1-C80</b>
Linear mA/V DC Output	<b>PO1-C21</b>
<b>Option Slot 2 &amp; 3</b>	
Relay Output	<b>PO2-C10</b>
SSR Driver Output	<b>PO2-C50</b>
24VDC Transmitter PSU	<b>PO2-W08</b>
Linear mA/V DC Output	<b>PO2-C21</b>
<b>Option Slot A</b>	
RS485 Comms	<b>PA1-W06</b>
Digital Input	<b>PA1-W03</b>
Basic Remote Setpoint	<b>PA1-W04</b>
Configuration Software & Cable	<b>PS1-CON</b>

# 6100+ Wiring Diagram and Notes:

## Wiring Diagram:



Note: Not all Options shown above are available for every controller model

## Notes:

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# 6170 1/16 DIN Valve Motor Drive Controller

- **Open loop control eliminates the need for slidewire feedback.**
- **Plug and Play Technology allows for field upgrades.**
- **Dedicated configuration port allows configuration directly from PC for fast and repeatable configurations.**
- **Two Auto-tune algorithms: Pre-tune plus Self-tune.**
- **Third output for alarm or retransmission output.**



The 6170 is a 1/16 DIN controller with continuous on-line open loop control of valve motor drives or electric actuators. This feature allows for accurate control without the need for slidewire feedback. This lowers the cost of the motor and wiring, without sacrificing control.

The 6170 incorporates our advanced tuning algorithms, with selectable pre-tune and self-tuning for easier setup. The self-tune also reduces output activity to an absolute minimum without compromising control quality, thereby reducing wear and tear on mechanical components such as valves, contactors and relays. In test, these controls have cut down valve oscillation from 30 to 40 times a minute to just a few. Pre-tune plus self-tuning has also been shown to get on control up to 3 times faster.

Our *Plug and Play* Technology allows you the ability to easily add to the controller's features including communication by simply installing additional plug-in boards. Inputs, Outputs, Alarms, and Communications are all field upgradeable! This allows you to only pay for the options that are required on today's applications.

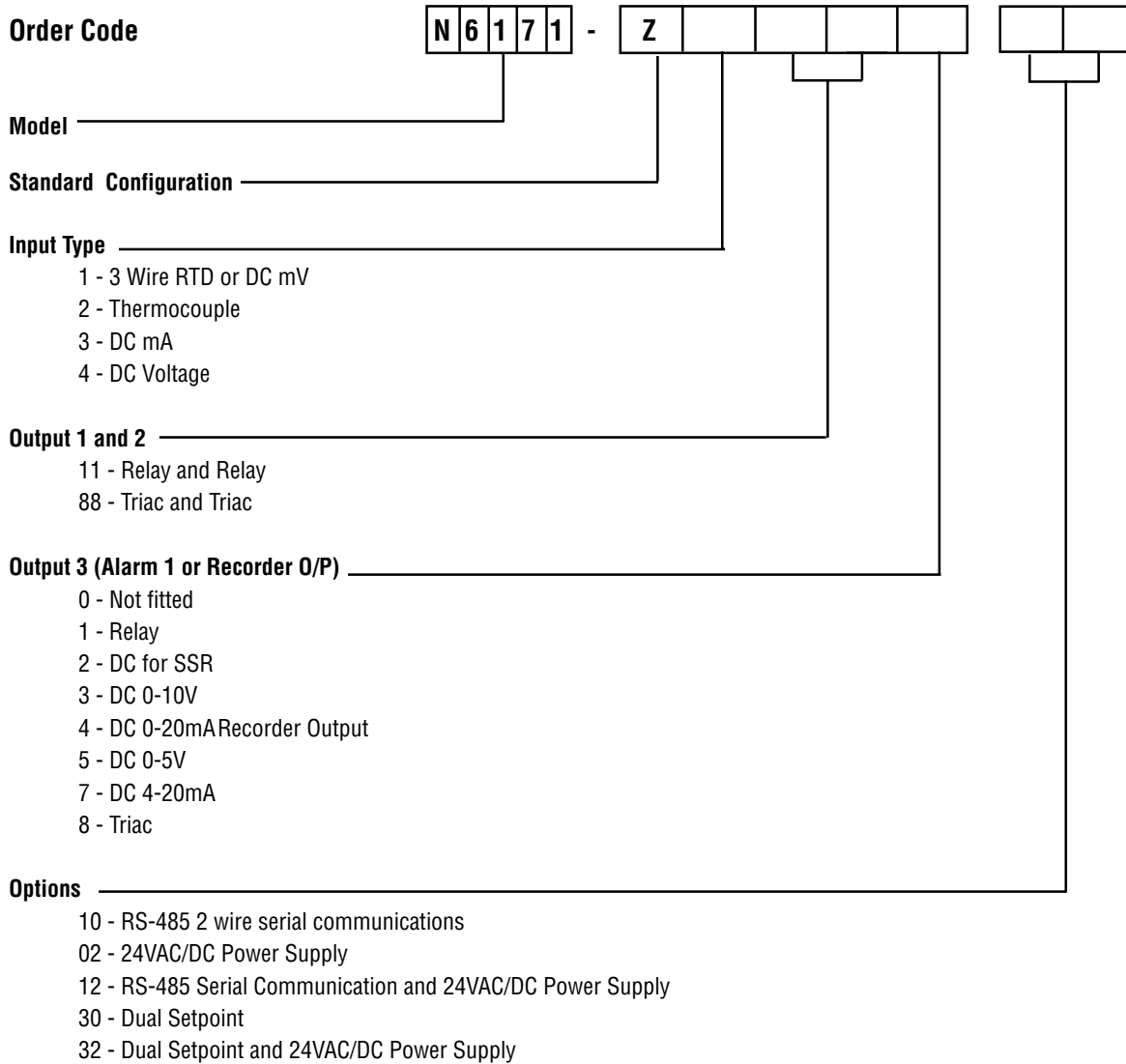
The controller is also easy to setup, with an innovative configuration port for off line programming directly from a PC or through a simplified operator's front panel. Access can also be limited by either a security code or by setpoint options.

# 6170 Brief Specs:

## **Brief Specs:**

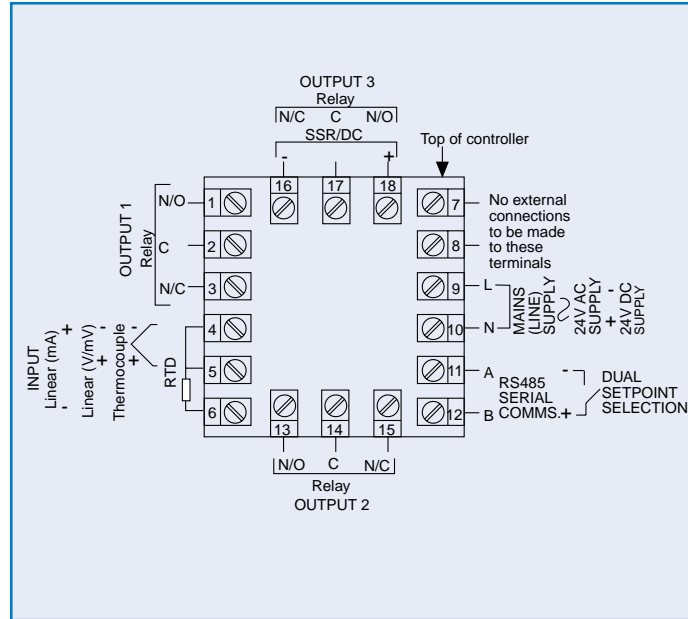
<b>Inputs:</b>	Thermocouple:	J, K, R, S, T, B, L, N
	RTD:	Pt 100
	DC Linear:	0-20mA, 4-20mA 0-50mV, 10-50mV 0-5V, 1-5V, 0-10V, 2-10V
	Dual Setpoint:	Voltage free contact or TTL compatible
<b>Output:</b>	VMD Control Outputs:	2 Relays- SPDT 2A at 120V AC (motor drive), 2A at 240V AC (resistive) 2 Triacs- 1amp @ 40°C, Derate to 1/2amp @ 80°C
	Alarm Output:	1 Relay- 2A at 240V AC or 1 SSR >4.2V DC
	Recorder Output:	0-5V and 0-10V SP PV 500 ohm min. 0-20mA and 4-20mA 500 ohm min.
	Communications:	RS-485 2 wire
<b>Control and: Features</b>	Tuning:	VMD, Pre-Tune and Self Tune Manual Adjustment Facility
	Proportional Band:	0.5% to 999.9% of input span
	Auto Reset:	1 second to 99 minutes 59 seconds
	Manual Reset (Bias): Rate:	0 to 100% 0 to 99 minutes 59 seconds
<b>Operating and: Environmental</b>	Accuracy:	±0.25% of input span ±1 LSD
	Ambient Temperature:	0°C to 55°C (Operating) -20°C to 80°C (Storage)
	Supply Voltage:	90 to 264V AC 50/60Hz
	Power Consumption:	4W Maximum
	Low Voltage Option:	20-50V AC, 22-65V DC
	EMI Immunity: EMI Emissions:	Meets with BS EN 50082-2 (1995) Meets with BS EN 50081-2 (1994)
<b>Dimensions: and Panel Cut Out</b>	Panel Cut-Out:	1/16 DIN - 45mm X 45mm
	Unit Dimensions:	48mm High X 48mm Wide X 110mm Deep

# 6170 Order Matrix:



# 6170 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 6400 1/16 DIN Profile Controller

- **RaPID®: Response Assisted PID (Fuzzy Logic)** minimizes overshoot and improves control.
- **Two Auto-tune Algorithms: Pre-tune plus Self-tune**
- **Four programs, of sixteen free format segments.**
- **Programs can be linked for up to 63 segments.**
- **Plug and Play Technology** allows for field upgrades.
- **Dedicated configuration port** allows configuration directly from a PC plus the development, transfer and storage of programs by dedicated software.



The 6400 is a 1/16 DIN profile controller. This control has RaPID, a fuzzy logic algorithm developed by West Instruments, plus their pre-tune and self-tune algorithms that when they are all combined provide shorter start-up times and improved overshoot control.

This profiler may seem small, but it packs a punch with holding up to 4 programs of 16 free-format segments each. These programs can be configured from the front of the instrument or directly by a PC through a configuration port. This configuration port has a dual purpose; first it can be used to configure the controller and secondly, it can be used to transfer programs.

The 6400 contains many of the features of the more expensive profilers such as guaranteed soak, delayed start, profile recovery features, profile cycling, plus optional digital inputs and outputs.



# 6400 Brief Specs:

## Brief Specs:

<b>Inputs:</b>	Thermocouple: RTD: DC Linear:	J, T, K, N, B, R, S Pt 100 mA=0-20, 4-20 mV=0-50, 10-50
<b>Output:</b>	Control Output:  Alarms Option:  Communications:	Relay- SPsT 2A at 120/240V AC for time proportioning operation. 5A at 120/240V AC for static operation. SSR: >10V DC into 1 KOhm minimum Triac- 1amp @ 40°C, Derate to 1/2amp @ 80°C 2 alarms if two physical outputs are available 2A 120/240V AC (or SSR > 10V into 500 Ohm minimum) RS-485 2 wire-MODBUS RTU
<b>Control and: Features</b>	Tuning: Proportional Band: Auto Reset: Manual Reset (Bias): Rate:	Easy Tune or Manual Tuning with Pre-tune 1.0% to 999.9% of input span 1 second to 99 minutes 59 seconds and OFF 0 to 100% 0 to 9 minutes 59 seconds
<b>Operating and: Environmental</b>	Accuracy: Ambient Temperature:  Supply Voltage: Power Consumption: EMI Immunity: EMI Emmissions:	±0.1% of input span ±1 LSD 0°C to 55°C (Operating) -20°C to 80°C (Storage) 90 to 264V AC 50/60Hz 4W Maximum Complies with BS EN 50082 Parts 1 (1992) and 2 (1995) Complies with BS EN 50081 Parts 1 (1992) and 2 (1994)
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out: Unit Dimensions:	1/16 DIN - 45mm X 22.5mm 25mm High X 49mm Wide X 100mm Deep

# 6400 Order Matrix:

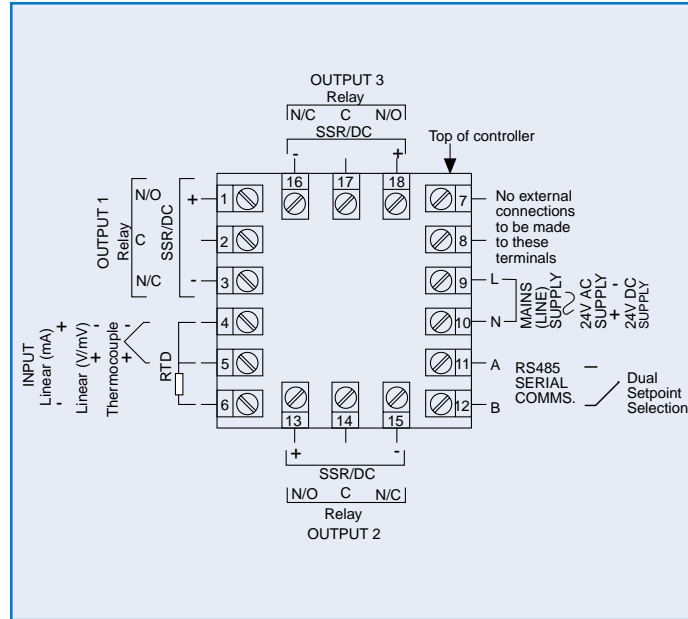
<b>Order Code</b>	N	6	4	0	1	Z							
<b>Model</b>	_____					_____					_____		
<b>Standard Configuration</b>	_____					_____					_____		
<b>Input Type</b>	_____					_____					_____		
	<ul style="list-style-type: none"> <li>1 - RTD or DC mV</li> <li>2 - Thermocouple</li> <li>3 - DC mA</li> <li>4 - DC V</li> </ul>												
<b>Output 1</b>	_____					_____					_____		
	<ul style="list-style-type: none"> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Triac</li> </ul>												
<b>Output 2</b>	_____					_____					_____		
	<ul style="list-style-type: none"> <li>0 - Not Fitted</li> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Triac</li> </ul>												
<b>Output 3</b>	_____					_____					_____		
	<ul style="list-style-type: none"> <li>0 - Not Fitted</li> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Triac</li> </ul>												
<b>Output 4</b>	_____					_____					_____		
	<ul style="list-style-type: none"> <li>10 - RS-485 2 Wire Serial Comms</li> <li>02 - Line voltage 24V AC/DC</li> <li>12 - RS-485 2 Wire Serial Comms and Line Voltage 24V AC/DC</li> <li>30 - Remote run/hold (digital input)</li> <li>32 - Remote run/hold (digital input) and Line Voltage 24V AC/DC</li> </ul>												

**NOTES:**

- 1. The RTD 0.0 range will always be 0.0 - 99.9, whatever the Range Maximum setting may be.
- 2. Absolute range maximum = 400°C (700°F).

# 6400 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 6500 1/16 DIN Controller

- Large Three Digit Single Display.
- A special tuning algorithm developed for electric heater applications, which combines West's Pre-tune and Self-tune algorithms.
- Continuous indication of both process and alarm status via LEDs.
- Security via a setpoint lock.
- Optional alarm output.
- Supplied pre-configured from factory.



The 6500 was designed for basic electric heater applications and uses the latest proven technology from the process industry to get on control quicker and stay there. It has a simplified operator interface which make it easy to use, setup and support, providing quality control at an affordable price.

The 6500 has a single 3 digit display which is designed for maximum visibility. The operator can easily view the actual temperature, setpoint and alarm value. A green LED indicates that the control is either below, above, or right on setpoint. A red LED indicates the alarm status.

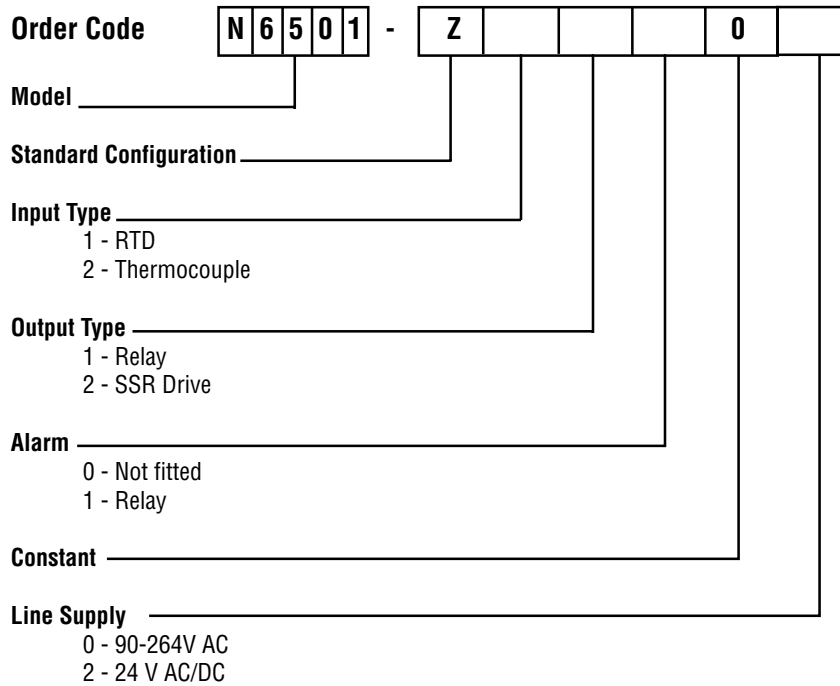
The controller comes with a specifically developed tuning algorithm for electric heater applications. This control requires no further tuning in most applications.

# 6500 Brief Specs:

## **Brief Specs:**

<b>Inputs:</b>	Thermocouple: RTD:	J/L, T, K, N Pt 100
<b>Output:</b>	Control Output:  Alarms Option: Communications:	Relay- SPDT 2A at 120/240V AC for time proportioning operation. SSR: >10V DC into 1 KOhm minimum 1 Alarm- 1 Relay 2A at 120/240V AC None
<b>Control and: Features</b>	Tuning: Proportional Band: Auto Reset: Manual Reset (Bias): Rate:	Easy Tune or Manual Tuning 1.0% to 999.9% of input span 1 second to 99 minutes 59 seconds and OFF 0 to 100% 0 to 9 minutes 59 seconds
<b>Operating and: Environmental</b>	Accuracy: Ambient Temperature:  Supply Voltage:  Power Consumption:	$\pm 0.25\%$ of span $\pm 1$ LSD 0°C to 55°C (Operating) -20°C to 80°C (Storage) 90 to 264V AC 50/60Hz Optional 20-50V AC, 50/60Hz, 22-65V DC 4W Maximum
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out: Unit Dimensions:	1/16 DIN - 45mm X 45mm 48mm High X 48mm Wide X 110mm Deep

# 6500 Order Matrix:

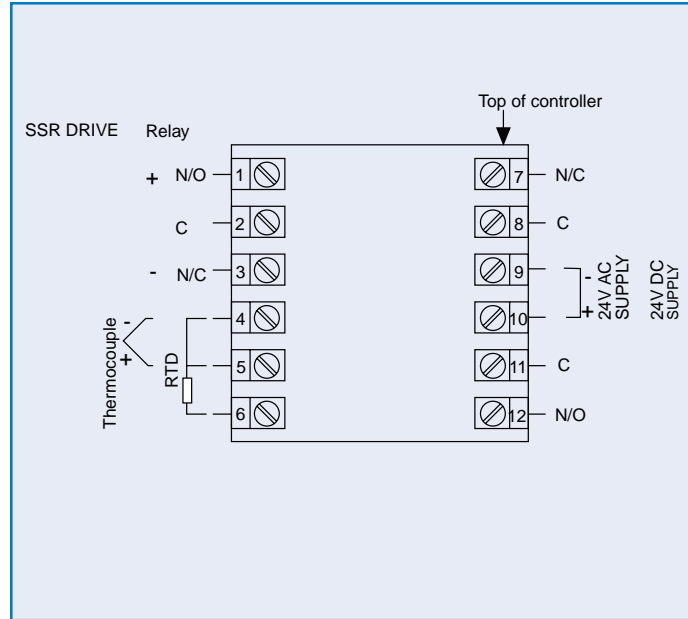


**NOTES:**

1. The RTD 0.0 range will always be 0.0 - 99.9, whatever the Range Maximum setting may be.
2. Absolute range maximum = 400°C (700°F).
3. Input Sensor Type is defaulted to Thermocouple, Type J/L, °F, and the Input Range Maximum is defaulted to 100.

# 6500 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 6600 1/16 DIN Controller with Heater Break Alarm

- **Heater Break Alarms** reduces scrap and improves quality. Detection of heater loss prior to production problems.
- **Quick Transfer** allows for ultra-easy setup of Heater Break Alarms.
- **Plug and Play Technology** allows field upgrades.
- **Configuration directly from PC** for fast and repeatable configurations.
- **Two Auto-tune algorithms: Pre-tune plus Self-tune.**
- **Four Outputs** available.



The 6600 is a 1/16 DIN controller that has been designed specifically to provide quality process control for the Plastics Extrusion Market.

This control features a special Heater Break Alarm Function which works similar to an amp meter, but alerts the operator to heater failures when they occur and prior to production problems. Quick Transfer is a one shot operation which automatically sets the alarm condition for the heater break and is based on the nominal current value. Quick Transfer allows for the automatic entry of setpoints for the heater break alarm. In addition, the Auto/Manual key can be configured for fast access to display amps or process temperature by a single key stroke.

Soft Start prevents premature heater failure due to high levels of moisture in heaters at start-up. Soft Start is included on this control, and is used to dry heaters out prior to production. Soft-start is used in injection molding hot runner and other cartridge heater applications. The 6600 controller incorporates our advanced tuning algorithms, with selectable pre-tune and self-tuning. The pre-tune is used on start-up and is a one-step tuning algorithm designed to get you to setpoint fast with self-tuning being enabled near setpoint and normal operating conditions to control overshoot. The self-tune is a continuous tuning algorithm or sometimes referred to as *adaptive tuning*. This control can also be manual fine tuned for specific applications.

This controller loaded up can have 4 outputs, 1 sensor input, 1 current transformer input, and RS-485 Communication. Combining all these features makes the West 6600 one of the most powerful controllers in its class.



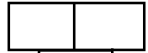
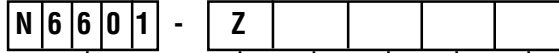
# 6600 Brief Specs:

## **Brief Specs:**

<b>Inputs:</b>	Thermocouple: RTD: Dual Setpoint:	J, T, K, N, L, R, S, B Pt 100 Voltage free contact or TTL
<b>Output:</b>	Control Output:  Alarms Option:  Recorder Output:  Communications:	Relay- SPDT 2A at 120/240V AC SSR: >10V DC into 1 KOhm minimum Triac- 1amp @ 40°C, Derate to 1/2amp @ 80°C 1 or 2 alarms plus Heater Break Alarm 2A 120/240V AC or SSR > 10V into 500 Ohm minimum 0-5V and 0-10V Retransmission SP/PV 500 ohm min 0-20mA and 4-20mA 500 ohm min. RS-485 2 wire-MODBUS or West ASCII
<b>Control and: Features</b>	Tuning:  Proportional Band: Auto Reset: Manual Reset (Bias): Rate:	Pre-Tune and Self Tune Auto/Manual with “bumpless” transfer .5% to 999.9% of input span 1 second to 99 minutes 59 seconds and OFF 0 to 100% 0 to 99 minutes 59 seconds
<b>Operating and: Environmental</b>	Accuracy: Ambient Temperature:  Supply Voltage:  Power Consumption:	±0.25% of span ±1 LSD 0°C to 55°C (Operating) -20°C to 80°C (Storage) 90 to 264V AC 50/60Hz Optional 20-50V AC, 22-65V DC 4W Maximum
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out: Unit Dimensions:	1/16 DIN - 45mm X 45mm 48mm High X 48mm Wide X 110mm Deep

# 6600 Order Matrix:

**Order Matrix:**



**Model** \_\_\_\_\_

**Standard Configuration** \_\_\_\_\_

**Input Type** \_\_\_\_\_

- 1 - 3 Wire RTD
- 2 - Thermocouple

**Output 1 (Heat Output)** \_\_\_\_\_

- 1 - Relay
- 2 - DC for SSR
- 8 - Triac

**Output 2 (Cool Output/alarms and/or Heater Break)** \_\_\_\_\_

- 0 - Not fitted
- 1 - Relay
- 2 - DC for SSR
- 8 - Triac
- 9 - Dual Relay

**Output 3 (Alarm 1 or Recorder O/P)** \_\_\_\_\_

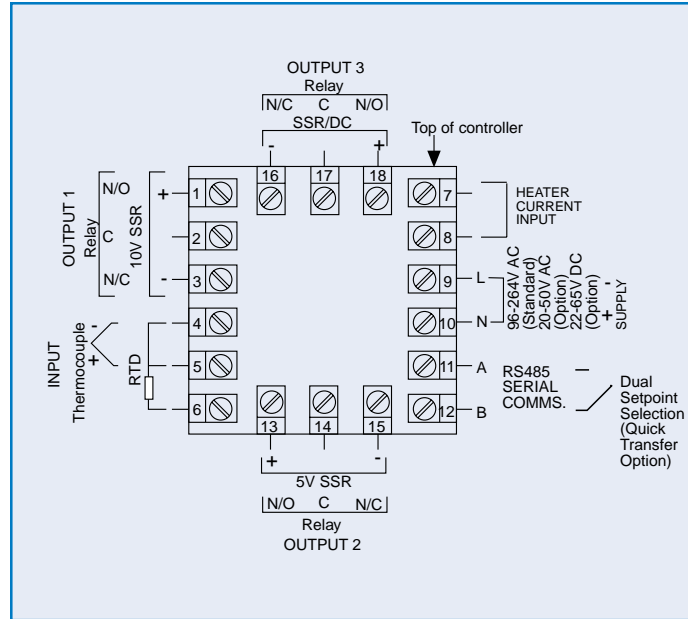
- 0 - Not fitted
- 1 - Relay
- 3 - DC 0-10V
- 4 - DC 0-20mA
- 5 - DC 0-5V
- 7 - DC 4-20mA
- 8 - Triac

**Options** \_\_\_\_\_

- 10 - RS-485 Serial Communication
- 02 - 24VAC/DC Power Supply
- 12 - RS-485 Serial Communication and 24VAC/DC Power Supply
- 30 - Dual Setpoint
- 32 - Dual Setpoint and 24VAC/DC Power Supply

# 6600 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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Approved

# 6700 1/16 DIN FM Approved Limit Controller

- High or low limit control.
- Storage of peak temperature plus duration of alarm condition.
- Plug and Play Technology allows field upgrades.
- Dedicated configuration port allows configuration directly from PC for fast and repeatable configurations.
- Password protection limiting operator access and providing process security.
- Display process value, setpoint or both.



The 6700 is a 1/16 DIN limit controller designed to provide a safety cutout and optional alarm contacts for use in a wide variety of applications.

The 6700 provides a latched relay output which is activated when process parameters either exceed or fall below the desired value, providing a fail safe cutoff which has to be manually reset once the process returns to a safe condition. This limit controller is FM approved.

The 6700 can be either a High Limit or a Low Limit controller. In either case, the relay contact will open and remain open until the process value returns to a safe condition and the reset button is depressed.

LED indicators are used to indicate when the limit has been exceeded and also when an operator has acknowledged the condition. Another LED will show the latch relay state, on or off.

The 6700 has a unique feature that shows both the peak temperature exceeded and the duration time that the setpoint was exceeded. This information can be valuable in determining the damage done to the load/products and equipment/furnace or oven.

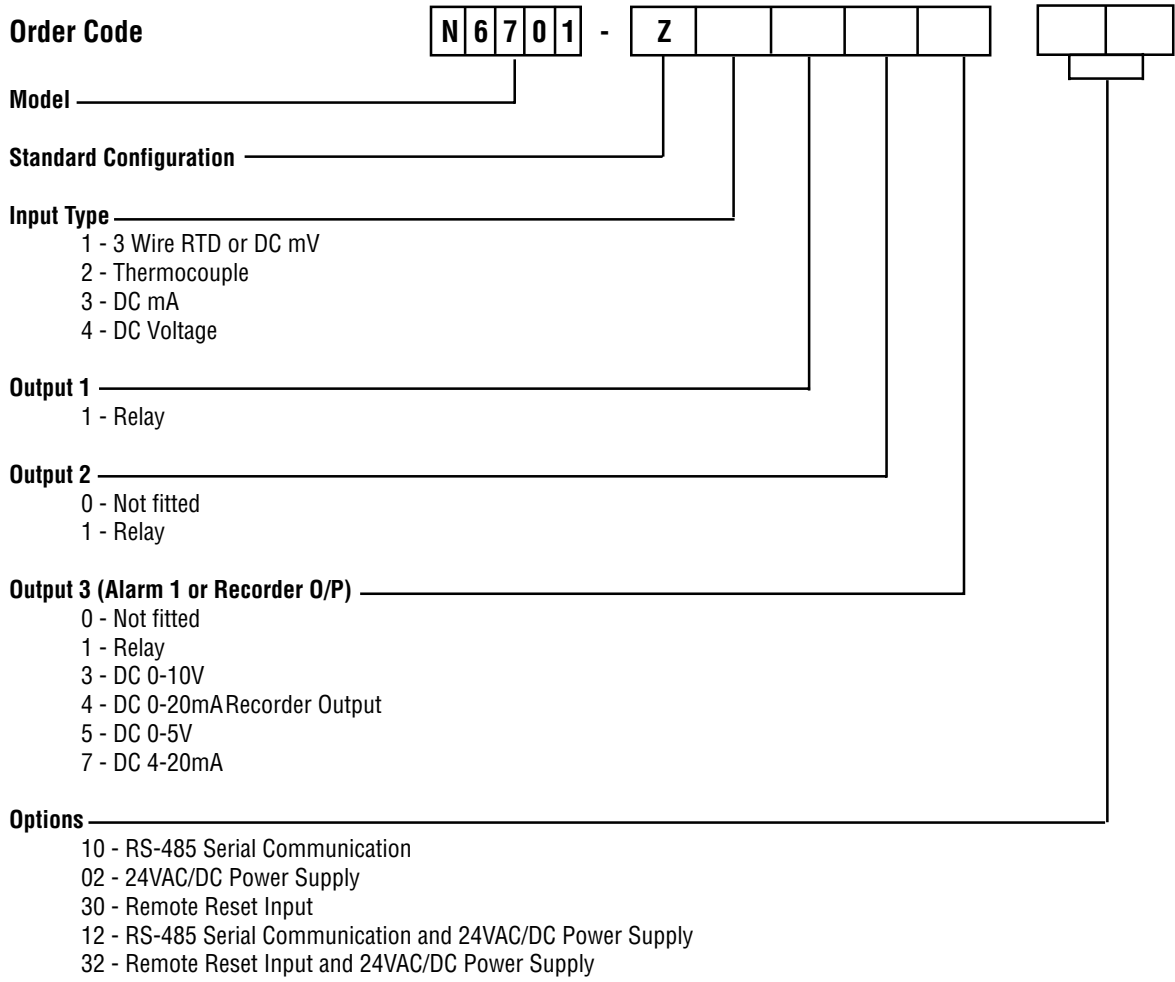
# 6700 Brief Specs:

## **Brief Specs:**

<b>Inputs:</b>	Thermocouple:	J, K, R, S, T, B, L, N
	RTD:	Pt 100
	DC Linear:	0-20mA, 4-20mA 0-50mV, 10-50mV 0-5V, 1-5V, 0-10V, 2-10V
	Remote Reset:	Voltage free contact or TTL compatible
<b>Output:</b>	Limit Outputs:	Relay- SPDT 5A at 240V AC
	Alarm Outputs:	2 Alarms as standard Relay- SPDT 2A at 120/240V AC
	Recorder Output:	0-5V and 0-10V Retransmission SP/PV 500 ohm min 0-20mA and 4-20mA 500 ohm min.
	Communications:	RS-485 2 wire
<b>Control:</b>	On Off Control:	Manual Reset
<b>Operating and: Environmental</b>	Accuracy:	$\pm 0.25\%$ of span $\pm 1$ LSD
	Ambient Temperature:	0°C to 55°C (Operating) -20°C to 80°C (Storage)
	Supply Voltage:	90 to 264V AC 50/60Hz
	Power Consumption:	4W Maximum
	Low Voltage Option:	20-50V AC, 22-65V DC
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out:	1/16 DIN - 45mm X 45mm
	Unit Dimensions:	48mm High X 48mm Wide X 110mm Deep

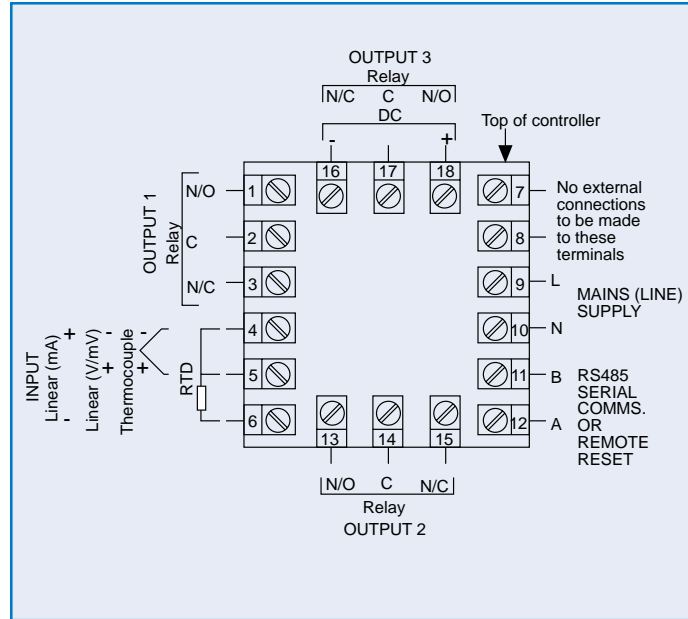
# 6700 Order Matrix:

# Order Matrix:



# 6700 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 8010 1/8 DIN Indicator

- Large four digit display available in green or red.
- Alarms can be latching or non latching.
- Two or three alarms available.
- Plug and Play Technology allows field upgrades.
- Dedicated configuration port allows configuration directly from PC for fast and repeatable configurations.



The 8010 is an 1/8 Din Indicator that provides good visible indication for almost all applications, and is available in either red or green.

This indicator also comes with several alarm strategies including latching and non-latching outputs. Relay output is standard with a second and third alarm possible. Each alarm has its own LED indicator for fast identification of alarms.

Configuration is simple, either through manual setup from the front panel or directly via a configuration port from a PC using dedicated West software. Unauthorized user can also be locked out of changing the alarm values and configuration parameters by a simple security code.

Our *Plug and Play* Technology allows you the ability to easily add to the indicators features including communication by simply installing additional plug-in boards. Inputs, Outputs, Alarms, and Communications are all field upgradeable! This capability also allows the user to pay for only the options that are required on today's applications.

This indicator can also be fitted for retransmission output, a transmitter power supply, 24V AC/DC input power, remote reset, and RS485 MODBUS communications making it one of the most flexible and powerful indicators available today.



# 8010 Brief Specs:

## **Brief Specs:**

<b>Inputs:</b>	Thermocouple:	J, T, K, N, B, R, S, L
	RTD:	Pt 100 3 Wire
	DC Linear:	mA=0-20, 4-20 mV=0-50, 10-50
<b>Output:</b>	Alarm Output:	Relay- SPDT 2A at 120/240V AC
	Alarms Option:	2 alarms if two physical outputs are available 2A 120/240V AC
	Communications: Option	RS-485 2 wire-MODBUS RTU Baud Rate- 9600, 4800, 2400, 1200
<b>Operating and: Environmental</b>	Accuracy:	±0.25% of input span ±1 LSD
	Ambient Temperature:	0°C to 55°C (Operating) -20°C to 80°C (Storage)
	Supply Voltage:	90 to 264V AC 50/60Hz (Optional 20-50V AC 50/60 Hz, 22-65V DC)
	Power Consumption:	4W Maximum
	EMI Immunity: EMI Emmissions:	Complies with BS EN 50082 Parts 1 (1992) and 2 (1995) Complies with BS EN 50081 Parts 1 (1992) and 2 (1994)
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out:	1/8 DIN - 45mm X 92mm
	Unit Dimensions:	48mm High X 96mm Wide X 100mm Deep

# 8010 Order Matrix:

**Order Code**



**Model**

**Standard Configuration**

**Input Type**

- 1 - 3 Wire RTD or DC mV
- 2 - Thermocouple
- 3 - DC mA
- 4 - DC Voltage

**Relay Output 1**

- 1 - Relay - Alarm output

**Output 2 Type**

- 0 - Not fitted
- 1 - Relay
- 3 - DC 0-10V
- 4 - DC 0-20mA
- 5 - DC 0-5V
- 7 - DC 4-20mA

**Output 3 Type**

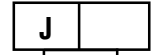
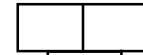
- 0 - Not fitted
- 1 - Relay
- 8 - Transmitter Power Supply

**Options**

- 10 - RS-485 Serial Communication
- 02 - 24VAC/DC Power Supply
- 30 - Remote Reset
- 12 - RS-485 Serial Communication and 24VAC/DC Power Supply
- 32 - Remote Reset and 24VAC/DC Power Supply

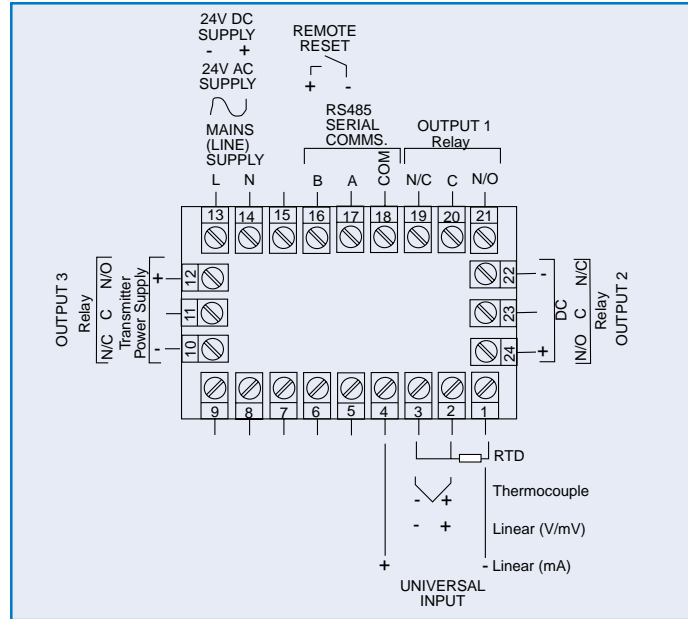
**LED Color**

- Blank - Red LEDs
- 1 - Green LEDs



# 8010 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 8080 & 8081 Panel Meters 1/8 DIN Panel Meters

- AWESOME 0.71" high digit LED display (27% larger than other 1/8 DIN units)
- Programmable color change display based on an event
- Programmable help function and secondary legend display
- Digital counter and rate indicator models
- Analog input models for Temperature, Process, Volts/Amps
- Front panel reset enable and preset lockout
- Optional RS-485 plug in card
- CE approved, UL, CUL recognized



The WEST brand Series 8080/8081 is a family of 1/8 DIN instruments which offer breakthrough display technology as well as easy-to-program user setup. Its large LED display features the ability to change color based on process status such as exceeding the count preset. Therefore, when monitoring critical values, the AWESOME panel meter provides operators with an instant visual alert to changes in the application's status.

Digital input models such as rate meters, indicators, counters, and timers as well as analog input models for temperature, flow, pressure, and level are available. These intelligent units offer multiple control & alarm outputs, optional serial communication, and specialized functions on analog input units. The front panel is rated NEMA 4X/IEC IP65 for use in washdown or dusty environments.

# 8080 & 8081 Panel Meters Brief Specs and Ordering:

## Common Specifications

### Control Inputs:

**Type:** Sinking, Edge Sensitive  
**Logic:** Low  $\leq$  2.0 VDC, High  $\geq$  3.0  
**Response Time:** 25 ms  
**Impedance:** 4.7 k $\Omega$  to +Voltage  
**Function:** DIGITAL INPUT MODELS: Input 1: Remote Reset (Display Hold on Rate Meter Model) Input 2: Security Lockout;  
 ANALOG INPUT MODELS: Programmable

### Outputs:

**Solid State:** NPN open collector, 30 VDC max., 100 mA max.  
**Relay:** SPDT, 5A resistive @110 VAC  
**Latency:** 75  $\mu$  seconds, plus 8 ms for relay pull-in  
**Linear Outputs:** (N/A for Totalizer or Counters) 0-20mA, 4-20mA, 0-10V, 2-10V, 0-5V, 1-5V (field selectable)

### Electrical:

**Supply Voltage:** 90-264 VAC, 50/60 Hz, or 20-50 VAC/VDC  
**Power Consumption:** 4 Watts  
**Access. Power Supply:** 9-15 (unregulated VDC), 125 mA max.

### Display:

**Type:** Red/Green, 7 segment LED,  
 5 digit primary display, single digit secondary display  
**Height:** 0.71" (18mm) primary display, 0.3" (7mm) secondary display  
**Annunciators:** Output 1 & 2 status

### Physical:

**Dimensions:** 48mm x 96mm, 110mm deep  
**Mounting:** Panel mount (bracket supplied), 45mm x 92mm cutout  
**Terminals:** Screw type - combination head  
**Front Panel Rating:** NEMA 4X / IEC IP65  
**Weight:** 0.56 lbs.

### Environmental:

**Operating Temp.:** 0° to 55° Celcius, 32° to 131° Fahrenheit  
**Storage Temp.:** -20° to 80° Celsius, -4° to 176° Fahrenheit  
**Relative Humidity:** 20% to 95% non-condensing  
**Approvals:** UL, CUL, CE

## Unique Model Specifications

### DIGITAL INPUT MODELS

#### Count/Time Inputs:

**Type:** Sinking/Sourcing or Contact Closure (Quadrature for Counters)  
**Frequency:** 10 kHz max. (5 kHz max. for Position Indicator)  
**Magnetic Input:** 0.5 to 30V peak (Only for Rate & Rate w/ Total)

### ANALOG INPUT MODELS

#### Sensor/Process Inputs:

**Type:** Temp. Ind.: B, J, K, N, S, & T thermocouples, 3 & 4 wire RTDs

DC Process: to 50 mA,  $\pm$ 10Volts DC,  $\pm$ 100 mV

AC Volts/Amps: from 0-1 VAC to 0-600 VAC, 0-1 mA to 0-1 amp

DC Volts/Amps: from 0-100 mV to 0-600 VDC, 0-1 mA to 0-2 amps

Strain Gauge: 0-100 mVDC

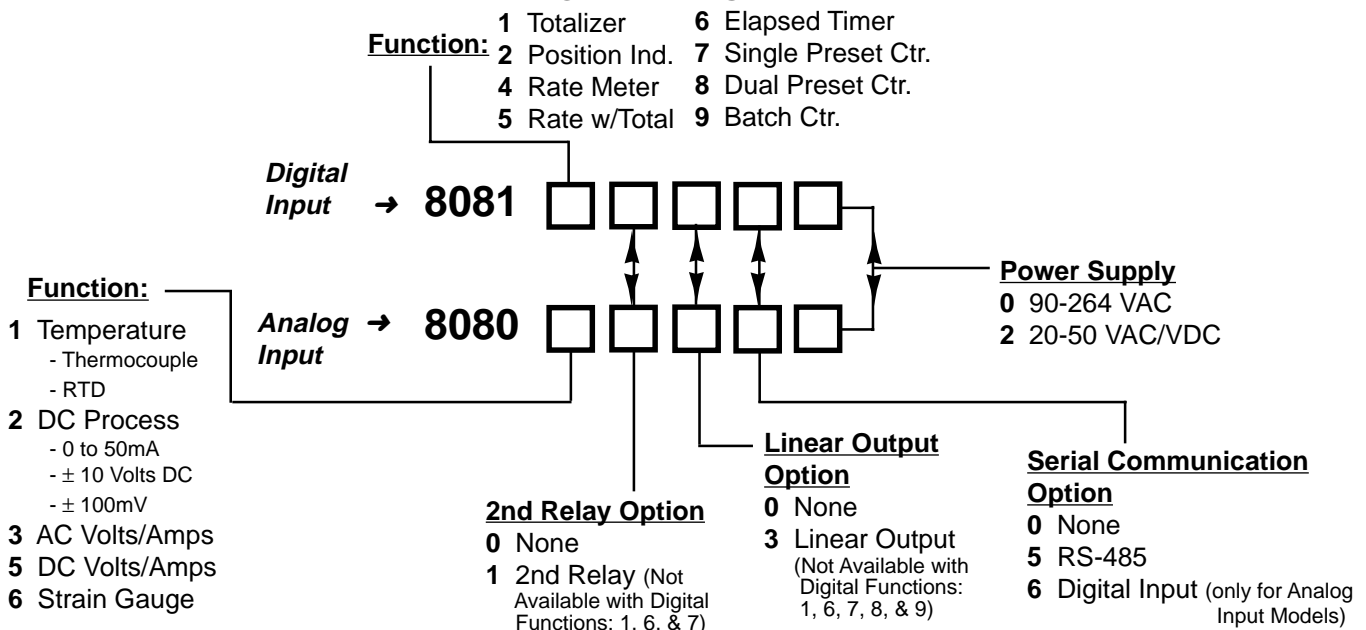
**Accuracy:**  $\pm$ 0.1% of span ( $\pm$ 0.01% of span for DC Process;  $\pm$ 0.03% of span for Strain Gauge)

**Sample Rate:** 250 ms (100 ms for DC Process & Strain Gauge)

**Resolution:** 14 bits

**Sensor Break:** detected within 2 secs. (N/A to AC & DC Volts/ Amps)

## ORDERING



# 8100+ 1/8 DIN Controller

- Jumperless Configuration
- Auto or Manual Tuning
- Plug and Play Technology allows field upgrades
- Heat/Cool Operation
- Process & Loop Alarms
- Ramping Setpoint
- Modbus & ASCII Comms
- Remote/Dual Setpoint Options



The 8100+ is a 1/8 DIN controller which combines sophisticated functionality and built-in versatility with ease of use.

The 8100+ incorporates our advanced tuning algorithms, with selectable pre-tune and self-tuning. Pre-tune is used on startup and is a one step tuning algorithm designed to get you to setpoint fast with self-tuning being enabled near setpoint and normal operating conditions to control overshoot. The self-tune is a continuous tuning algorithm sometimes referred to as *adaptive tuning*. This control can also be manual fine tuned for specific applications.

Our *Plug and Play* Technology allows you the ability to easily add to the controller's features including communication by simply installing additional plug-in boards. Inputs, Outputs, Alarms, and Communications

are all field upgradeable! This capability also allows the user to pay for only the options that are required on today's applications.

The controller is also easy to setup, with an innovative configuration port for off line programming directly from a PC or through a simplified operator's front panel, which also makes accessing information quick and easy. Access can also be limited by either a security code or by setpoint options.

# 8100+ Brief Specs:

## **Brief Specs:**

### **Features**

#### **Control Types**

Full PID with Pre-tune, Self-tune, manual tuning, or On-Off control. Heat only or heat & cool

#### **Auto/Manual**

Selectable from front panel or via digital input, with bumpless transfer

#### **Output Configuration**

Up to 3 possible, for control, alarm, 24VDC transmitter power supply or retransmit of process value or setpoint

#### **Alarm 1 & 2 Types**

Process high, process low, SP deviation, band, logical OR / AND. Also 1 loop alarm for process control security. Process alarms have adjustable hysteresis.

#### **Human Interface**

4 button operation, dual 4 digit 10mm & 8mm high LED displays, optional choice of colors (Red/Red, Red/Green, Green/Red or Green/Green), plus 5 LED indicators

#### **PC Configuration**

Off-line configuration from PC serial port to dedicated config socket (comms option not required). Configuration Software for Windows 98 or higher. West Part Number: PS1-CON

### **Inputs**

#### **Thermocouple**

J, K, C, R, S, T, B, L, N & PtRh20%vsPtRh40%.

#### **RTD**

3 Wire PT100, 50 $\Omega$  per lead maximum (balanced)

#### **DC Linear**

0 to 20mA, 4 to 20mA, 0 to 50mV, 10 to 50mV, 0 to 5V, 1 to 5V, 0 to 10V, 2 to 10V.

Scalable -1999 to 9999, with adjustable decimal point

#### **Impedance**

>10M $\Omega$  for Thermocouple and mV ranges, 47K $\Omega$  for V ranges and 5 $\Omega$  for mA ranges

#### **Accuracy**

$\pm 0.1\%$  of input range  $\pm 1$  LSD (T/C CJC better than 1°C)

#### **Sampling**

4 per second, 14 bit resolution approximately

#### **Sensor Break Detection**

<2 seconds (except zero based DC ranges), control O/P's turn off, high alarms activate for T/C and mV ranges, low alarms activate for RTD, mA or V ranges

### **Outputs & Options**

#### **Control & Alarm Relays**

Contacts SPDT 2 Amp resistive at 240V AC, >500,000 operations

#### **Control SSR Driver Outputs**

Drive capability >10V DC in 500W minimum

#### **Triac Outputs**

0.01 to 1 Amp AC, 20 to 280Vrms, 47 to 63Hz

#### **DC Linear Outputs**

0 to 20mA, 4 to 20mA into 500 $\Omega$  max, 0 to 10V, 2 to 10V, 0 to 5V into 500 $\Omega$  min.

Control outputs have 2% over/under drive applied. Accuracy  $\pm 0.25\%$  at 250 $\Omega$  (degrades linearly to 0.5% for increasing burden to specified limits)

#### **Transmitter Power Supply**

Output 24VDC (nominal) into 910 $\Omega$  minimum to power external devices

#### **Serial Communications**

2 Wire RS485, 1200 to 19200 Baud, Modbus and ASCII protocol (selectable)

#### **Digital Input**

Selects between 2 setpoints or Auto/Manual control. Volt free or TTL input

#### **Remote Setpoint Input**

0 to 20mA, 4 to 20mA, 0 to 100mV, 0 to 5V, 1 to 5V, 0 to 10V, 2 to 10V or Potentiometer (2K $\Omega$  maximum). Scalable -1999 to 9999. Local/Remote setpoint selected from digital input (supplied as part of Full RSP) or front panel

### **Operating & Environmental**

#### **Temperature & RH**

0 to 55°C (-20 to 80°C storage), 20% to 95% RH non-condensing

#### **Power Supply**

100 to 240V 50/60Hz 7.5VA (optional 20 to 48V AC 7.5VA/22 to 65V DC 5 watts)

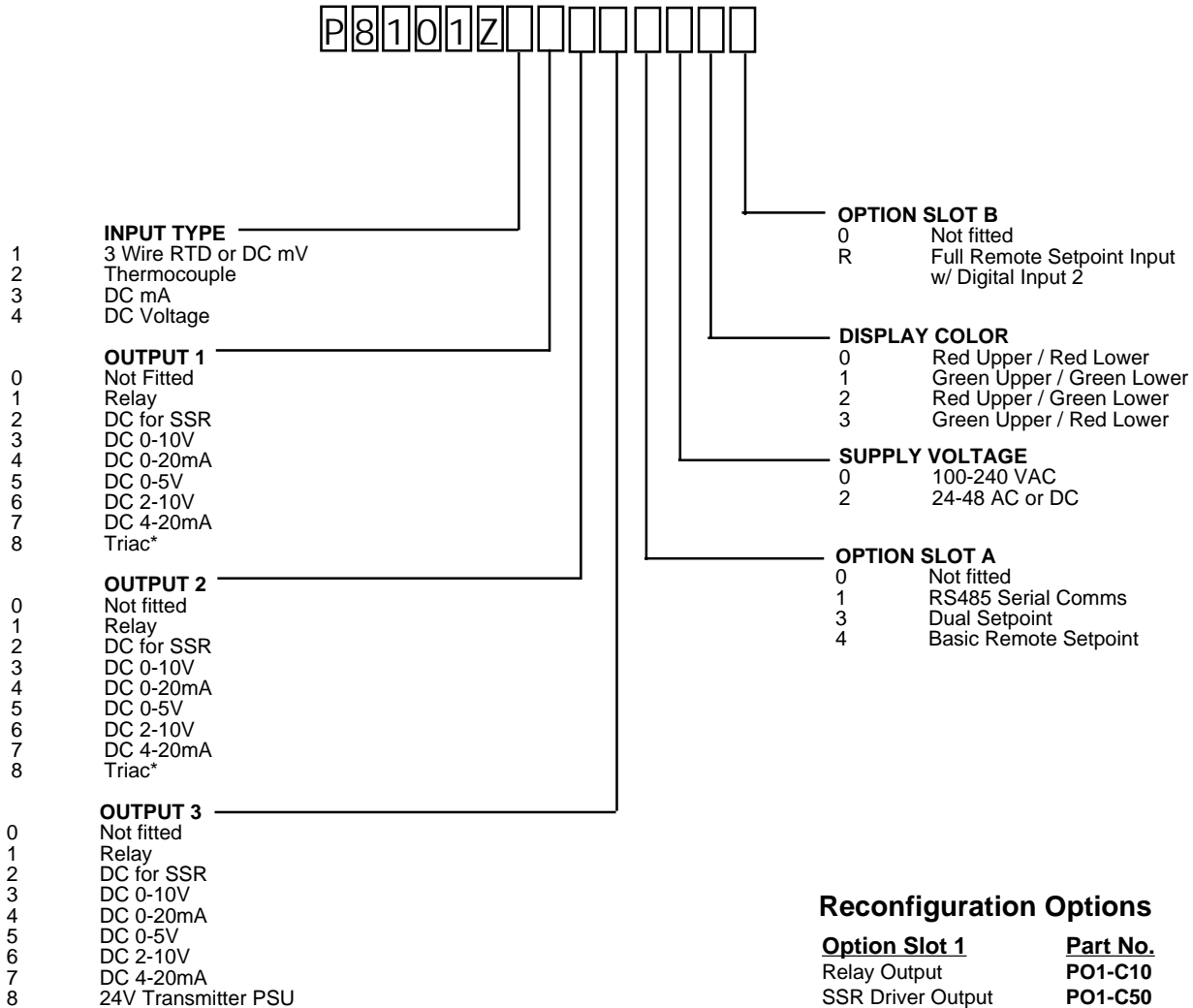
#### **Front Panel Protection**

IEC IP66 (Behind panel protection is IP20)

#### **Standards**

CE, UR & cUR recognized

# 8100+ Order Matrix:



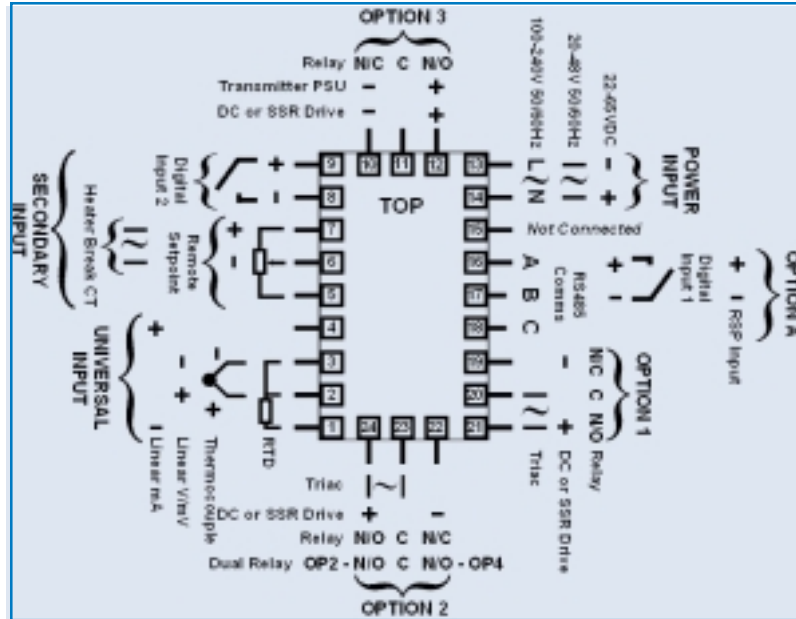
## Reconfiguration Options

<u>Option Slot 1</u>	<u>Part No.</u>
Relay Output	<b>PO1-C10</b>
SSR Driver Output	<b>PO1-C50</b>
Triac Output	<b>PO1-C80</b>
Linear mA/V DC Output	<b>PO1-C21</b>
<u>Option Slot 2 &amp; 3</u>	
Relay Output	<b>PO2-C10</b>
SSR Driver Output	<b>PO2-C50</b>
Triac Output	<b>PO2-C80</b>
Linear mA/V DC Output	<b>PO2-C21</b>
24VDC Transmitter PSU	<b>PO2-W08</b>
<u>Option Slot A</u>	
RS485 Comms	<b>PA1-W06</b>
Digital Input	<b>PA1-W03</b>
Basic Remote Setpoint	<b>PA1-W04</b>
<u>Option Slot B</u>	
Full Remote Setpoint	<b>PB1-W0R</b>
Configuration Software & Cable	<b>PS1-CON</b>



# 8100+ Wiring Diagram and Notes:

## Wiring Diagram:



Note: Not all Options shown above are available for every controller model

## Notes:

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# 8170 1/8 DIN Valve Motor Drive Controller

- **Open loop control eliminates the need for slidewire feedback.**
- **Plug and Play Technology allows for field upgrades.**
- **Dedicated configuration port allows configuration directly from PC for fast and repeatable configurations.**
- **Two Auto-tune algorithms: Pre-tune plus Self-tune.**
- **Third output for alarm or retransmission output.**



The 8170 is a 1/8 DIN controller with continuous on-line open loop control of valve motor drives or electric actuators. This feature allows for accurate control without the need for slidewire feedback. This lowers the cost of the motor and wiring, without sacrificing control.

The 8170 incorporates our advanced tuning algorithms, with selectable pre-tune and self-tuning for easier setup. The self-tune also reduces output activity to an absolute minimum without compromising control quality, thereby reducing wear and tear on mechanical components such as valves, contactors and relays. In test, these controls have cut down valve oscillation from 30 to 40 times a minute to just a few. Pre-tune plus self-tuning has also been shown to get on control up to 3 times faster.

Our *Plug and Play* Technology allows you the ability to easily add to the controller's features including communication by simply installing additional plug-in boards. Inputs, Outputs, Alarms, and Communications are all field upgradeable! This allows you to only pay for the options that are required on today's applications.

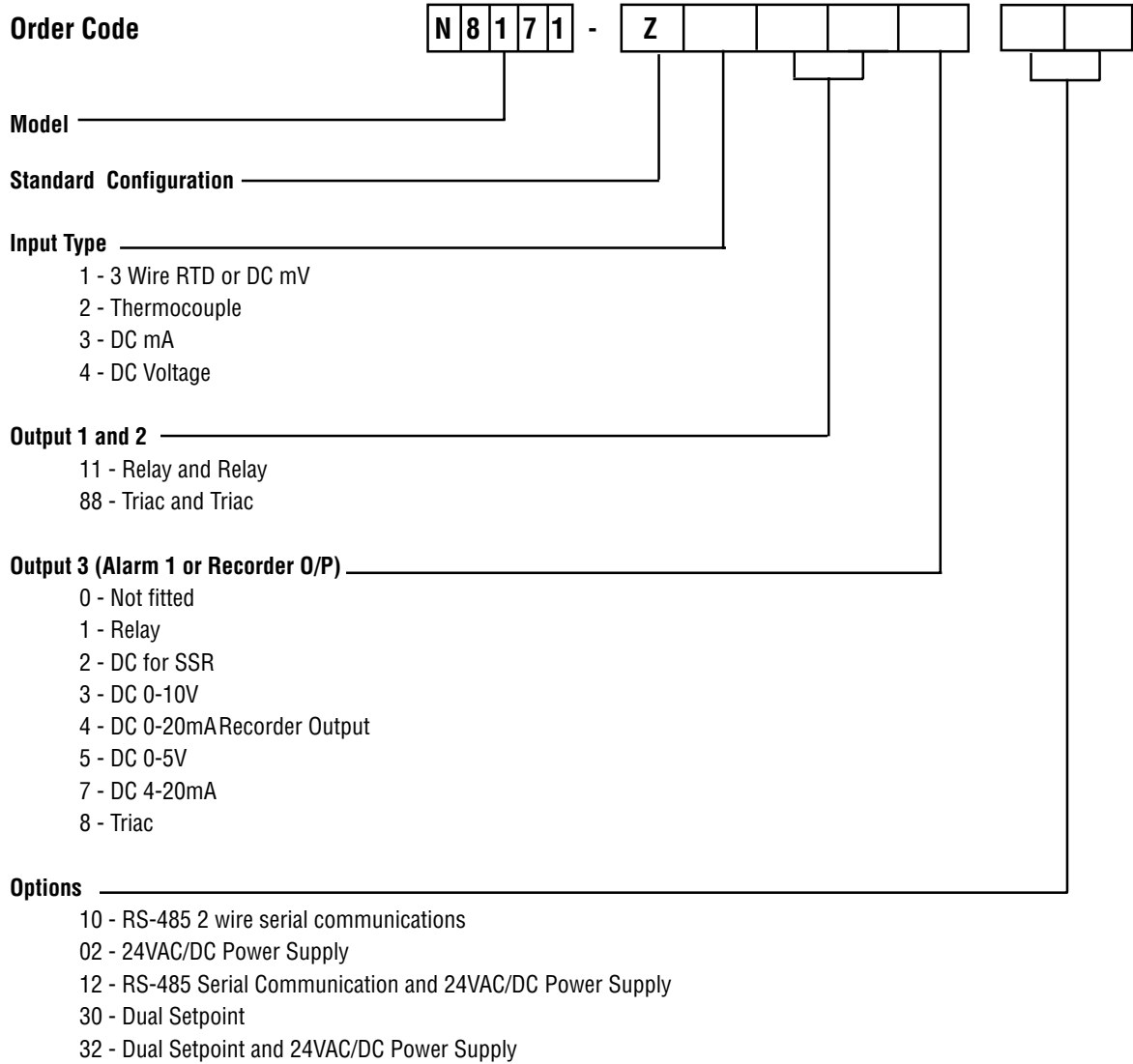
The controller is also easy to setup, with an innovative configuration port for off line programming directly from a PC or through a simplified operator's front panel. Access can also be limited by either a security code or by setpoint options.

# 8170 Brief Specs:

## **Brief Specs:**

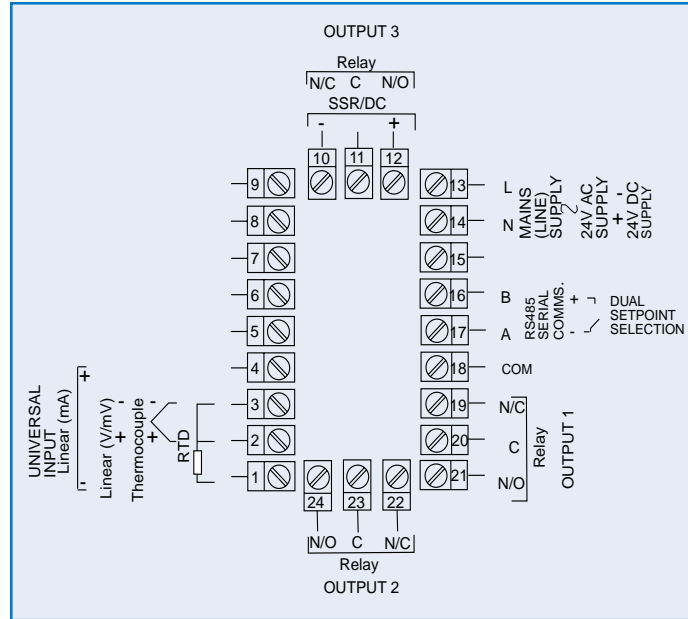
<b>Inputs:</b>	Thermocouple:	J, K, R, S, T, B, L, N
	RTD:	Pt 100
	DC Linear:	0-20mA, 4-20mA 0-50mV, 10-50mV 0-5V, 1-5V, 0-10V, 2-10V
	Dual Setpoint:	Voltage free contact or TTL compatible
<b>Output:</b>	VMD Control Outputs:	2 Relays- SPDT 2A at 240V AC >5 X 10 <sup>5</sup> operations (resistive) 2 Triacs- 1amp @ 40°C, Derate to 1/2amp @ 80°C
	Alarm Output:	1 Relay- 2A at 240V AC or 1 SSR >4.2V DC
	Recorder Output:	0-5V and 0-10V SP PV 500 ohm min. 0-20mA and 4-20mA 500 ohm min.
	Communications:	RS-485 2 wire
<b>Control and: Features</b>	Tuning:	VMD, Pre-Tune and Self Tune Manual Adjustment Facility
	Proportional Band:	0.5% to 999.9% of input span
	Auto Reset:	1 second to 99 minutes 59 seconds
	Manual Reset (Bias): Rate:	0 to 100% 0 to 99 minutes 59 seconds
<b>Operating and: Environmental</b>	Accuracy:	±0.25% of input span ±1 LSD
	Ambient Temperature:	0°C to 55°C (Operating) -20°C to 80°C (Storage)
	Supply Voltage:	90 to 264V AC 50/60Hz
	Power Consumption:	4W Maximum
	Low Voltage Option:	20-50V AC, 22-65V DC
	EMI Immunity: EMI Emissions:	Meets with BS EN 50082-2 (1995) Meets with BS EN 50081-2 (1994)
<b>Dimensions: and Panel Cut Out</b>	Panel Cut-Out:	1/8 DIN - 92mm X 45mm
	Unit Dimensions:	96mm High X 48mm Wide X 100mm Deep

# 8170 Order Matrix:



# 8170 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 8200 1/8 DIN Controller With RaPID® (Fuzzy Logic)

- **RaPID®: Response Assisted PID (Fuzzy Logic)** minimizes overshoot and improves control.
- **Two Auto-tune Algorithms: Pre-tune plus Self-tune**
- **Plug and Play Technology** allows field upgrades.
- **Dedicated configuration port** allows configuration directly from PC for fast and repeatable configurations.
- **Password protection** limiting operator access and providing process security.
- **Optional Remote Setpoint.**



The 8200 is a 1/8 DIN controller which incorporates our advanced tuning algorithms, pre-tune, self-tune plus RaPID, to dramatically reduce overshoot and improve time to control on start-up, setpoint changes, and load disturbances. Rapid is easily turned on from the front panel.

RaPID stands for *Response assisted PID*, and is a unique fuzzy logic based algorithm which enhances the traditional PID function set manually or by auto-tuned algorithms. RaPID re-blends the PID control on-line and instead of learning from an event and reacting after it has happened, RaPID reacts as an event occurs, thereby improving the quality of control and speed of response.

Our *Plug and Play* Technology allows you to choose from 5 input/output boards, and a RS-485 communications board, to be assembled precisely to your application requirements. Since each option is self contained on its own plug-in board, it makes field upgrading simple and cost-effective. A remote setpoint option is also available on this control.

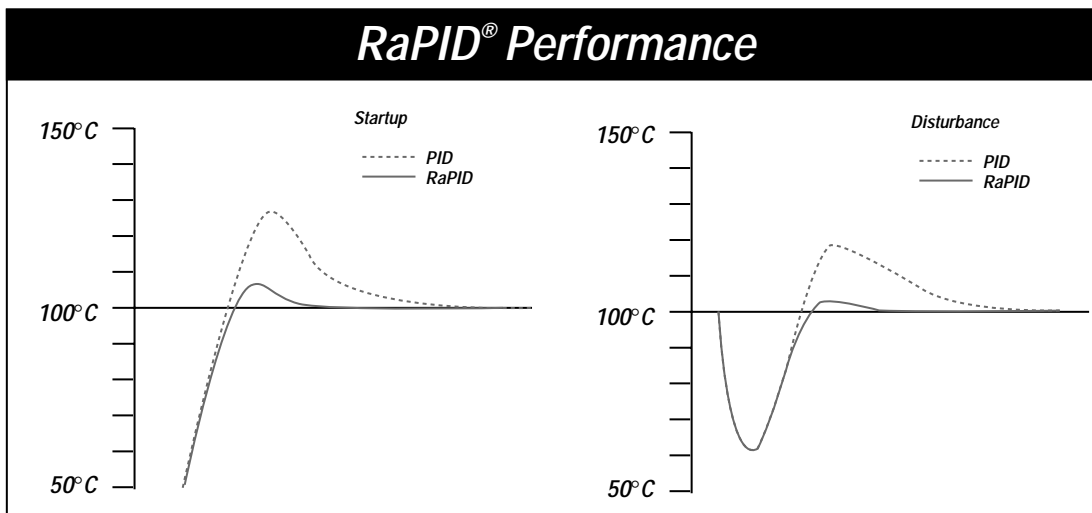
The controller is also easy to setup, with an innovative configuration port for off line programming directly from a PC or through a simplified operator's front panel. Access can also be limited by either a security code or by setpoint options.

# 8200 Brief Specs and RaPID<sup>®</sup> Performance:

## Brief Specs:

<b>Inputs:</b>	Thermocouple: J, K, R, S, T, B, L, N RTD: Pt 100 3 Wire DC Linear: mA, mV, or V Dual Setpoint: Voltage free contact or TTL compatible
<b>Output:</b>	Control and Alarm Outputs: Relay- SPDT 2A at 240V AC > 5 X 10 <sup>5</sup> operations Control Outputs: SSR >4.0V DC into 1 K ohm minimum Triac- 1amp @ 40°C, Derate to 1/2amp @ 80°C Communications: RS-485 2 wire
<b>Control and Features</b>	Tuning: RaPID <sup>®</sup> , PID, PID/ON-Off 2, On-Off, Pre-Tune and Self Tune Proportional Band: 0.5% to 999.9% of input span and ON-OFF Auto Reset: 1 second to 99 minutes 59 seconds and OFF Manual Reset (Bias): 0 to 100% Rate: 0 to 99 minutes 59 seconds
<b>Operating and Environmental</b>	Accuracy: ±0.25% of input span ±1 LSD Ambient Temperature: 0°C to 55°C (Operating) -20°C to 80°C (Storage) Supply Voltage: 90 to 264V AC 50/60Hz (Optional 20-50V AC 50/60Hz, 22-65V DC) Power Consumption: 4W Maximum EMI Immunity: Meets with BS EN 50082-2 (1995) EMI Emmissions: Meets with BS EN 50081-2 (1994)
<b>Dimensions and Panel Cut Out</b>	Panel Cut-Out: 1/8 DIN - 92mm X 45mm Unit Dimensions: 96mm High X 48mm Wide X 100mm Deep

## RaPID<sup>®</sup> Performance:



Results achieved against competitor PID and fuzzy logic controllers on a simulated load with two first order time constants of 80 and 30 seconds each, and a dead time of seven seconds.

# 8200 Order Matrix:

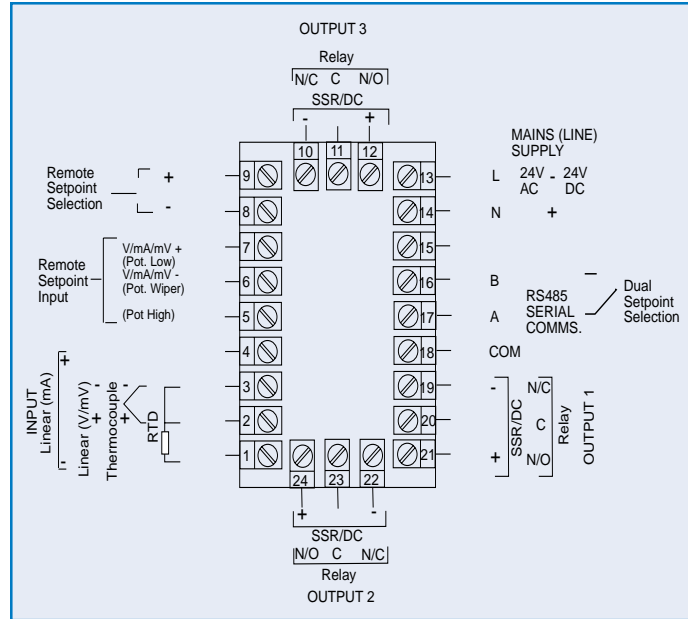
<b>Order Code</b>	N	8	2	0	1	-	Z										
<b>Model</b>	_____																
<b>Standard Configuration</b>	_____																
<b>Input Type</b>	_____																
	<ul style="list-style-type: none"> <li>1 - 3 Wire RTD or DC mV</li> <li>2 - Thermocouple</li> <li>3 - DC mA</li> <li>4 - DC Voltage</li> </ul>																
<b>Output 1</b>	_____																
	<ul style="list-style-type: none"> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Triac (Consult Factory)</li> </ul>																
<b>Output 2 (Alarm 2 or Control Output 2)</b>	_____																
	<ul style="list-style-type: none"> <li>0 - Not fitted</li> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Triac</li> </ul>																
<b>Output 3 (Alarm 1 or Recorder O/P)</b>	_____																
	<ul style="list-style-type: none"> <li>0 - Not fitted</li> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Triac</li> </ul>																
<b>Options</b>	_____																
	<ul style="list-style-type: none"> <li>10 - RS-485 Serial Communication</li> <li>02 - 24VAC/DC Power Supply</li> <li>30 - Dual Setpoint Switching</li> <li>12 - RS-485 Serial Communication and 24VAC/DC Power Supply</li> <li>32 - Dual Setpoint Switching and 24V AC/DC Power Supply</li> </ul>																
<b>Second Analog Input Type Option (R)*</b>	_____																
	<ul style="list-style-type: none"> <li>R1 - Remote Setpoint Linear DC mV</li> <li>R3 - Remote Setpoint Linear DC mA</li> <li>R4 - Remote Setpoint Linear DC V</li> <li>R8 - Dual Setpoint Switching</li> <li>R9 - Potentiometer</li> </ul>																

\*Note Second Analog Input Type must be specified at time of purchase; cannot be added at a later time.



# 8200 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 8600 1/8 DIN Controller with Heater Break Alarm

- **Heater Break Alarms** reduces scrap and improves quality. Detection of heater loss prior to production problems.
- **Quick Transfer** allows for ultra-easy setup of Heater Break Alarms.
- **Plug and Play Technology** allows field upgrades.
- **Configuration directly from PC** for fast and repeatable configurations.
- **Two Auto-tune algorithms: Pre-tune plus Self-tune.**
- **Four Outputs** available.



The 8600 is a 1/8 DIN controller that has been designed specifically to provide quality process control for the Plastics Extrusion Market.

This control features a special Heater Break Alarm Function which works similar to an amp meter, but alerts the operator to heater failures when they occur and prior to production problems. Quick Transfer is a one shot operation which automatically sets the alarm condition for the heater break and is based on the nominal current value. Quick Transfer allows for the automatic entry of setpoints for the heater break alarm. In addition, the Auto/Manual key can be configured for fast access to display amps or process temperature by a single key stroke.

Soft Start prevents premature heater failure due to high levels of moisture in heaters at start-up. Soft Start is included on this control, and is used to dry heaters out prior to production. Soft-start is used in injection molding hot runner and other cartridge heater applications. The 8600 controller incorporates our advanced tuning algorithms, with selectable pre-tune and self-tuning. The pre-tune is used on start-up and is a one-step tuning algorithm designed to get you to setpoint fast with self-tuning being enabled near setpoint and normal operating conditions to control overshoot. The self-tune is a continuous tuning algorithm or sometimes referred to as *adaptive tuning*. This control can also be manual fine tuned for specific applications.

This controller loaded up can have 4 outputs, 1 sensor input, 1 current transformer input, and RS-485 Communication. Combining all these features makes the West 8600 one of the most powerful controllers in its class.

# 8600 Brief Specs:

## **Brief Specs:**

<b>Inputs:</b>	Thermocouple:	J, T, K, N, L, R, S, B
	RTD:	Pt 100
	Dual Setpoint:	Voltage free contact or TTL
<b>Output:</b>	Control Output:	Relay- SPDT 2A at 120/240V AC SSR: >10V DC into 1 KOhm minimum Triac- 1amp @ 40°C, Derate to 1/2amp @ 80°C
	Alarms Option:	1 or 2 alarms plus Heater Break Alarm
	Recorder Output:	2A 120/240V AC or SSR > 10V into 500 Ohm minimum 0-5V and 0-10V Retransmission SP/PV 500 ohm min 0-20mA and 4-20mA 500 ohm min.
	Communications:	RS-485 2 wire-MODBUS or West ASCII
<b>Control and: Features</b>	Tuning:	Pre-Tune and Self Tune Auto/Manual with “bumpless” transfer
	Proportional Band:	.5% to 999.9% of input span
	Auto Reset:	1 second to 99 minutes 59 seconds and OFF
	Manual Reset (Bias): Rate:	0 to 100% 0 to 99 minutes 59 seconds
<b>Operating and: Environmental</b>	Accuracy:	±0.25% of span ±1 LSD
	Ambient Temperature:	0°C to 55°C (Operating) -20°C to 80°C (Storage)
	Supply Voltage:	90 to 264V AC 50/60Hz Optional 20-50V AC, 22-65V DC
	Power Consumption:	4W Maximum
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out:	1/8 DIN - 92mm X 45mm
	Unit Dimensions:	96mm High X 48mm Wide X 100mm Deep

# 8600 Order Matrix:

**Order Matrix:**



**Model** \_\_\_\_\_

**Standard Configuration** \_\_\_\_\_

**Input Type** \_\_\_\_\_

- 1 - 3 Wire RTD
- 2 - Thermocouple

**Output 1 (Heat Output)** \_\_\_\_\_

- 1 - Relay
- 2 - DC for SSR
- 8 - Triac

**Output 2 (Cool Output/alarms and/or Heater Break)** \_\_\_\_\_

- 0 - Not fitted
- 1 - Relay
- 2 - DC for SSR
- 8 - Triac
- 9 - Dual Relay

**Output 3 (Alarm 1 or Recorder O/P)** \_\_\_\_\_

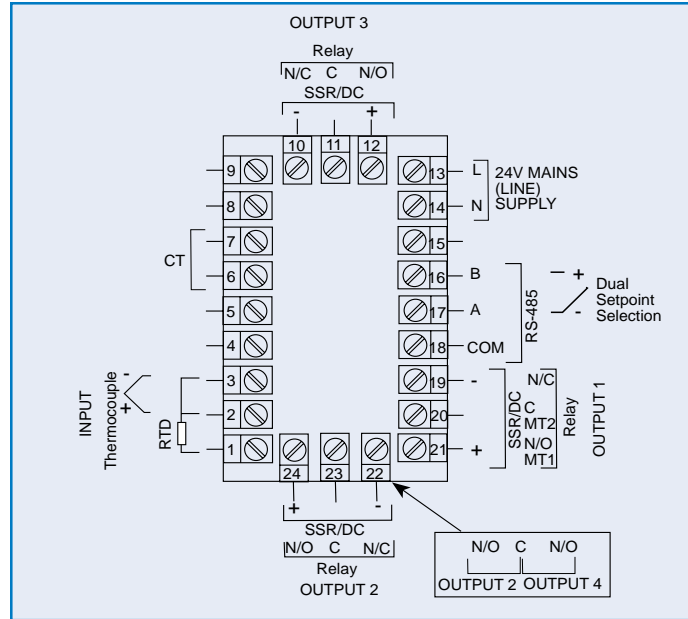
- 0 - Not fitted
- 1 - Relay
- 3 - DC 0-10V
- 4 - DC 0-20mA
- 5 - DC 0-5V
- 7 - DC 4-20mA
- 8 - Triac

**Options** \_\_\_\_\_

- 10 - RS-485 Serial Communication
- 02 - 24VAC/DC Power Supply
- 12 - RS-485 Serial Communication and 24VAC/DC Power Supply
- 30 - Dual Setpoint
- 32 - Dual Setpoint and 24VAC/DC Power Supply\*

# 8600 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 4100+ 1/4 DIN Controller

- Jumperless Configuration
- Auto or Manual Tuning
- Plug and Play Technology allows field upgrades
- Heat/Cool Operation
- Process & Loop Alarms
- Ramping Setpoint
- Modbus & ASCII Comms
- Remote/Dual Setpoint Options



The 4100+ is a 1/4 DIN controller which combines sophisticated functionality and built-in versatility with ease of use.

The 4100+ incorporates our advanced tuning algorithms, with selectable pre-tune and self-tuning. Pre-tune is used on start-up and is a one step tuning algorithm designed to get you to setpoint fast with self-tuning being enabled near setpoint and normal operating conditions to control overshoot. The self-tune is a continuous tuning algorithm sometimes referred to as *adaptive tuning*. This control can also be manual fine tuned for specific applications.

Our *Plug and Play* Technology allows you the ability to easily add to the controller's features including communication by simply installing additional plug-in boards. Inputs, Outputs, Alarms, and Communications

are all field upgradeable! This capability also allows the user to pay for only the options that are required on today's applications.

The controller is also easy to setup, with an innovative configuration port for off line programming directly from a PC or through a simplified operator's front panel, which also makes accessing information quick and easy. Access can also be limited by either a security code or by setpoint options.

# 4100+ Brief Specs:

## **Brief Specs:**

### **Features**

#### **Control Types**

Full PID with Pre-tune, Self-tune, manual tuning, or On-Off control. Heat only or heat & cool

#### **Auto/Manual**

Selectable from front panel or via digital input, with bumpless transfer

#### **Output Configuration**

Up to 3 possible, for control, alarm, 24VDC transmitter power supply or retransmit of process value or setpoint

#### **Alarm 1 & 2 Types**

Process high, process low, SP deviation, band, logical OR / AND. Also 1 loop alarm for process control security. Process alarms have adjustable hysteresis.

### **Human Interface**

4 button operation, dual 4 digit 13mm & 10mm high LED displays, optional choice of colors (Red/Red, Red/Green, Green/Red or Green/Green), plus 5 LED indicators

### **PC Configuration**

Off-line configuration from PC serial port to dedicated config socket (comms option not required). Configuration Software for Windows 98 or higher. West Part Number: PS1-CON

### **Inputs**

#### **Thermocouple**

J, K, C, R, S, T, B, L, N & PtRh20%vsPtRh40%.

#### **RTD**

3 Wire PT100, 50 $\Omega$  per lead maximum (balanced)

#### **DC Linear**

0 to 20mA, 4 to 20mA, 0 to 50mV, 10 to 50mV, 0 to 5V, 1 to 5V, 0 to 10V, 2 to 10V.

Scalable -1999 to 9999, with adjustable decimal point

#### **Impedance**

>10M $\Omega$  for Thermocouple and mV ranges, 47K $\Omega$  for V ranges and 5 $\Omega$  for mA ranges

#### **Accuracy**

$\pm 0.1\%$  of input range  $\pm 1$  LSD (T/C CJC better than 1°C)

#### **Sampling**

4 per second, 14 bit resolution approximately

#### **Sensor Break Detection**

<2 seconds (except zero based DC ranges), control O/P's turn off, high alarms activate for T/C and mV ranges, low alarms activate for RTD, mA or V ranges

### **Outputs & Options**

#### **Control & Alarm Relays**

Contacts SPDT 2 Amp resistive at 240V AC, >500,000 operations

#### **Control SSR Driver Outputs**

Drive capability >10V DC in 500W minimum

#### **Triac Outputs**

0.01 to 1 Amp AC, 20 to 280Vrms, 47 to 63Hz

#### **DC Linear Outputs**

0 to 20mA, 4 to 20mA into 500 $\Omega$  max, 0 to 10V, 2 to 10V, 0 to 5V into 500 $\Omega$  min.

Control outputs have 2% over/under drive applied. Accuracy  $\pm 0.25\%$  at 250 $\Omega$  (degrades linearly to 0.5% for increasing burden to specified limits)

#### **Transmitter Power Supply**

Output 24VDC (nominal) into 910 $\Omega$  minimum to power external devices

#### **Serial Communications**

2 Wire RS485, 1200 to 19200 Baud, Modbus and ASCII protocol (selectable)

#### **Digital Input**

Selects between 2 setpoints or Auto/Manual control. Volt free or TTL input

#### **Remote Setpoint Input**

0 to 20mA, 4 to 20mA, 0 to 100mV, 0 to 5V, 1 to 5V, 0 to 10V, 2 to 10V or Potentiometer (2K $\Omega$  maximum). Scalable -1999 to 9999. Local/Remote setpoint selected from digital input (supplied as part of Full RSP) or front panel

### **Operating & Environmental**

#### **Temperature & RH**

0 to 55°C (-20 to 80°C storage), 20% to 95% RH non-condensing

#### **Power Supply**

100 to 240V 50/60Hz 7.5VA (optional 20 to 48V AC 7.5VA/22 to 65V DC 5 watts)

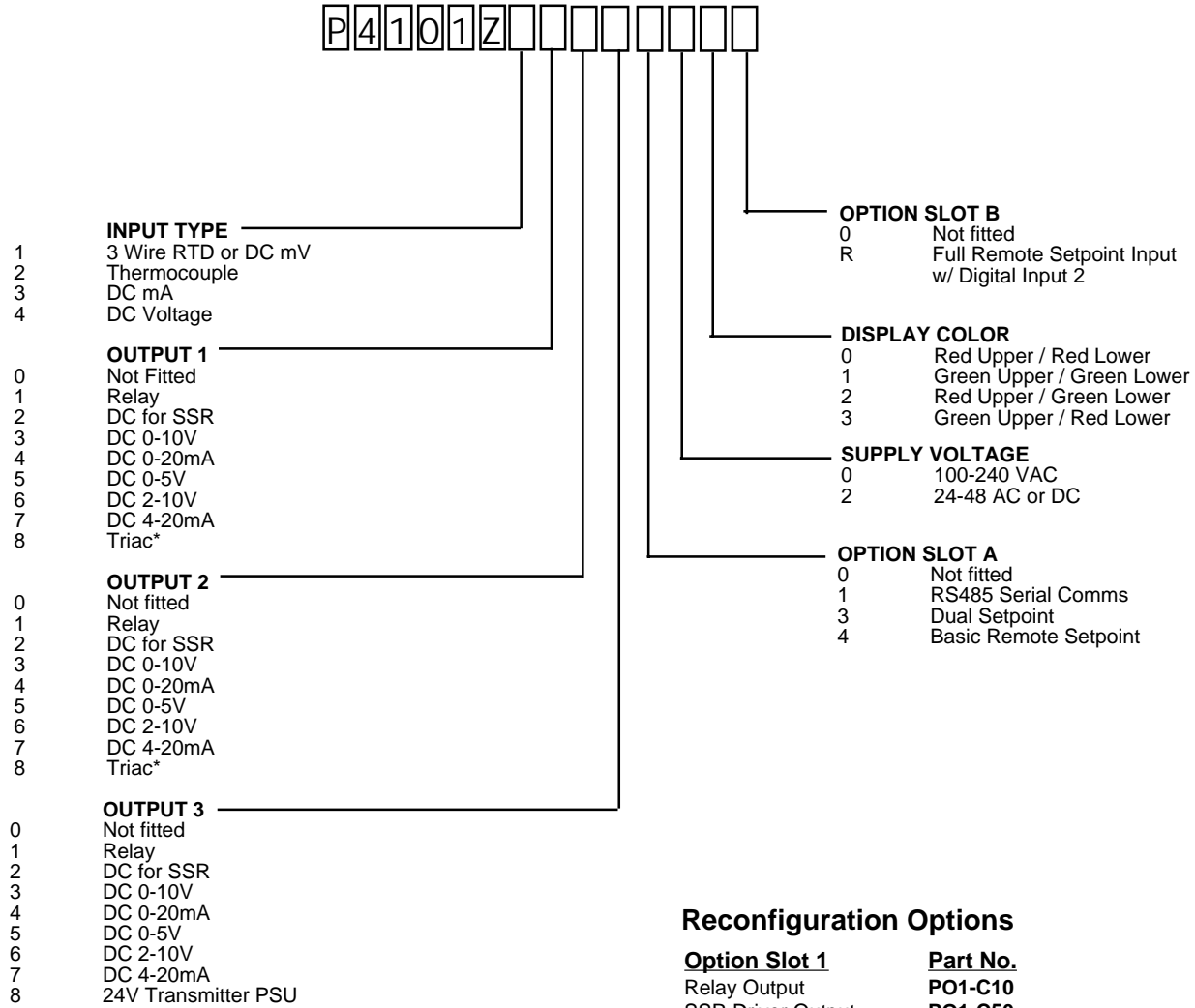
#### **Front Panel Protection**

IEC IP66 (Behind panel protection is IP20)

#### **Standards**

CE, UR & cUR recognized

# 4100+ Order Matrix:



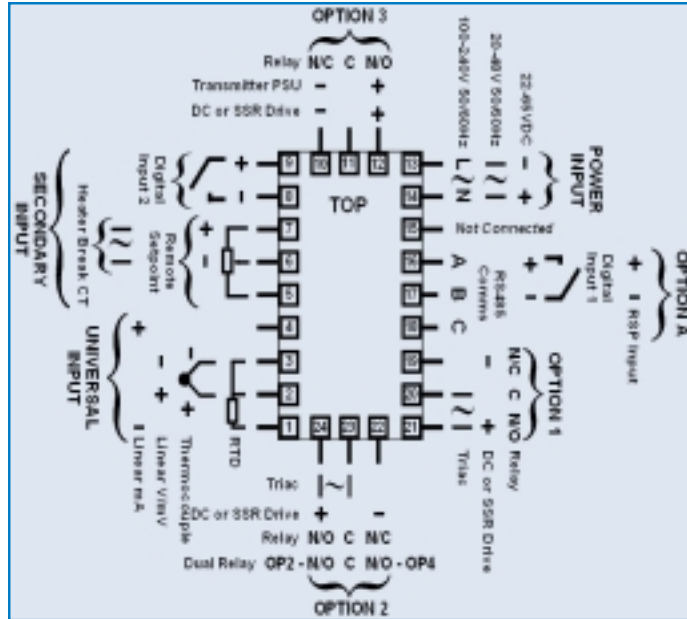
## Reconfiguration Options

<u>Option Slot 1</u>	<u>Part No.</u>
Relay Output	<b>PO1-C10</b>
SSR Driver Output	<b>PO1-C50</b>
Triac Output	<b>PO1-C80</b>
Linear mA/V DC Output	<b>PO1-C21</b>
<u>Option Slot 2 &amp; 3</u>	
Relay Output	<b>PO2-C10</b>
SSR Driver Output	<b>PO2-C50</b>
Triac Output	<b>PO2-C80</b>
Linear mA/V DC Output	<b>PO2-C21</b>
24VDC Transmitter PSU	<b>PO2-W08</b>
<u>Option Slot A</u>	
RS485 Comms	<b>PA1-W06</b>
Digital Input	<b>PA1-W03</b>
Basic Remote Setpoint	<b>PA1-W04</b>
<u>Option Slot B</u>	
Full Remote Setpoint	<b>PB1-W0R</b>
Configuration Software & Cable	<b>PS1-CON</b>



# 4100+ Wiring Diagram and Notes:

## Wiring Diagram:



Note: Not all Options shown above are available for every controller model

## Notes:

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# 4170 1/4 DIN Valve Motor Drive Controller

- **Open loop control eliminates the need for slidewire feedback.**
- **Plug and Play Technology allows for field upgrades.**
- **Dedicated configuration port allows configuration directly from PC for fast and repeatable configurations.**
- **Two Auto-tune algorithms: Pre-tune plus Self-tune.**
- **Third output for alarm or retransmission output.**



The 4170 is a 1/4 DIN controller with continuous on-line open loop control of valve motor drives or electric actuators. This feature allows for accurate control without the need for slidewire feedback. This lowers the cost of the motor and wiring, without sacrificing control.

The 4170 incorporates our advanced tuning algorithms, with selectable pre-tune and self-tuning for easier setup. The self-tune also reduces output activity to an absolute minimum without compromising control quality, thereby reducing wear and tear on mechanical components such as valves, contactors and relays. In test, these controls have cut down valve oscillation from 30 to 40 times a minute to just a few. Pre-tune plus self-tuning has also been shown to get on control up to 3 times faster.

Our *Plug and Play* Technology allows you the ability to easily add to the controller's features including communication by simply installing additional plug-in boards. Inputs, Outputs, Alarms, and Communications are all field upgradeable! This allows you to only pay for the options that are required on today's applications.

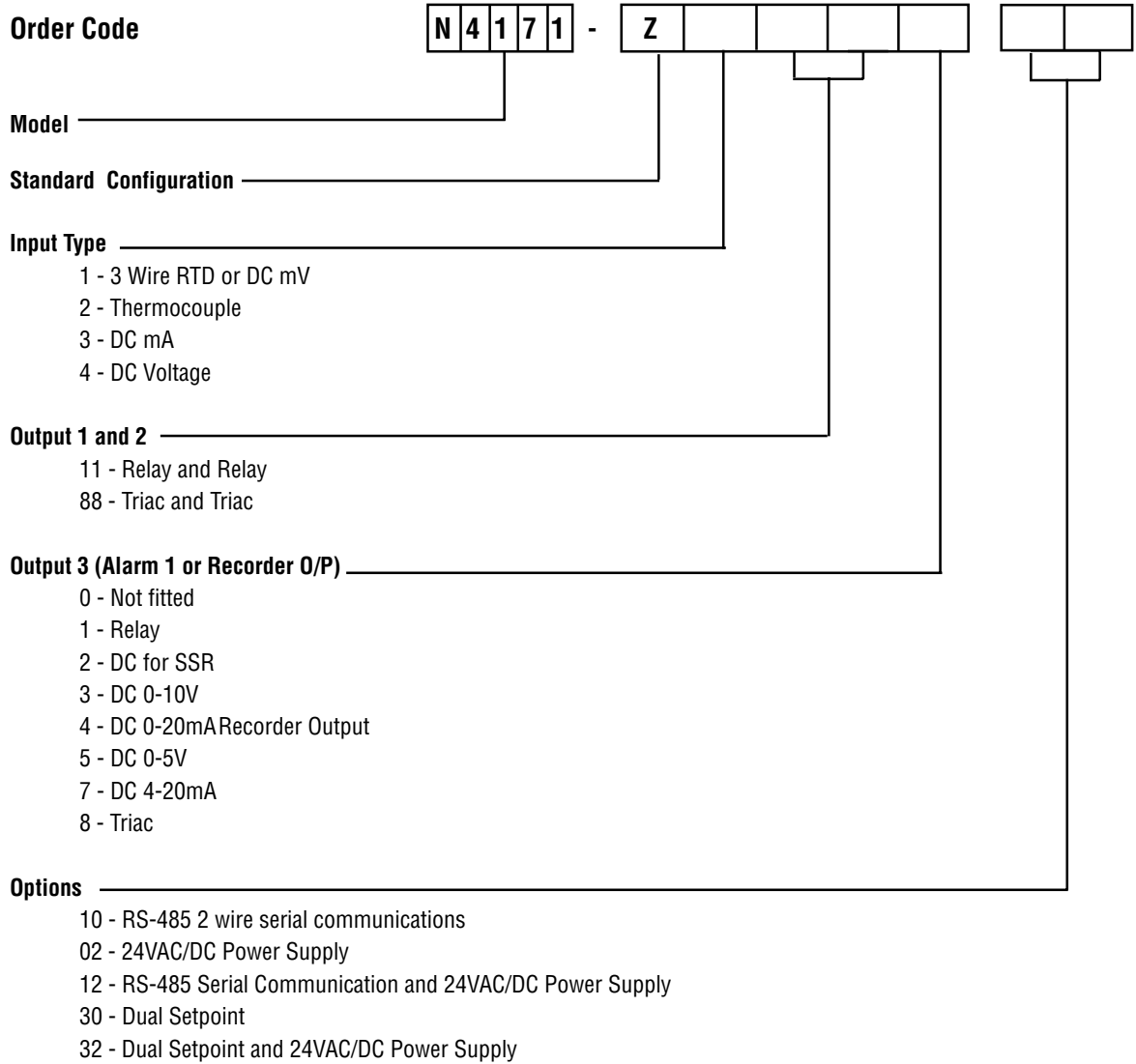
The controller is also easy to setup, with an innovative configuration port for off line programming directly from a PC or through a simplified operator's front panel. Access can also be limited by either a security code or by setpoint options.

# 4170 Brief Specs:

## **Brief Specs:**

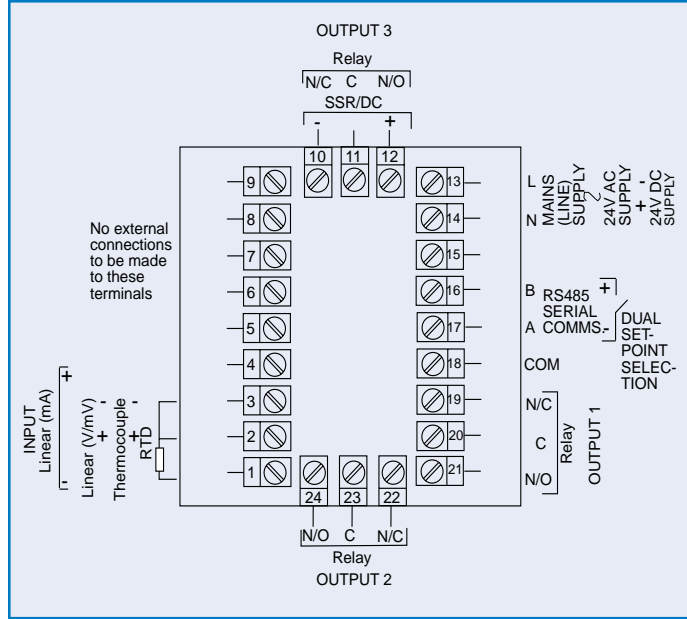
<b>Inputs:</b>	Thermocouple:	J, K, R, S, T, B, L, N
	RTD:	Pt 100
	DC Linear:	0-20mA, 4-20mA 0-50mV, 10-50mV 0-5V, 1-5V, 0-10V, 2-10V
	Dual Setpoint:	Voltage free contact or TTL compatible
<b>Output:</b>	VMD Control Outputs:	2 Relays- SPDT 2A at 240V AC >5 X 10 <sup>5</sup> operations (resistive) 2 Triacs- 1amp @ 40°C, Derate to 1/2amp @ 80°C
	Alarm Output:	1 Relay- 2A at 240V AC or 1 SSR >4.2V DC
	Recorder Output:	0-5V and 0-10V SP PV 500 ohm min. 0-20mA and 4-20mA 500 ohm min.
	Communications:	RS-485 2 wire
<b>Control and: Features</b>	Tuning:	VMD, Pre-Tune and Self Tune Manual Adjustment Facility
	Proportional Band:	0.5% to 999.9% of input span
	Auto Reset:	1 second to 99 minutes 59 seconds
	Manual Reset (Bias):	0 to 100%
	Rate:	0 to 99 minutes 59 seconds
<b>Operating and: Environmental</b>	Accuracy:	±0.25% of input span ±1 LSD
	Ambient Temperature:	0°C to 55°C (Operating) -20°C to 80°C (Storage)
	Supply Voltage:	90 to 264V AC 50/60Hz
	Power Consumption:	4W Maximum
	Low Voltage Option:	20-50V AC, 22-65V DC
	EMI Immunity:	Meets with BS EN 50082-2 (1995)
	EMI Emissions:	Meets with BS EN 50081-2 (1994)
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out:	1/4 DIN - 92mm X 92mm
	Unit Dimensions:	96mm High X 96mm Wide X 100mm Deep

# 4170 Order Matrix:



# 4170 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 4200 1/4 DIN Controller With RaPID®

- **RaPID®: Response Assisted PID (Fuzzy Logic)** minimizes overshoot and improves control.
- **Two Auto-tune Algorithms: Pre-tune plus Self-tune**
- **Plug and Play Technology** allows field upgrades.
- **Dedicated configuration port** allows configuration directly from PC for fast and repeatable configurations.
- **Password protection** limiting operator access and providing process security.
- **Optional Remote Setpoint.**



The 4200 is a 1/4 DIN controller which incorporates our advanced tuning algorithms, pre-tune, self-tune plus RaPID, to dramatically reduce overshoot and improve time to control on start-up, setpoint changes, and load disturbances. Rapid is easily turned on from the front panel.

RaPID stands for *Response assisted PID*, and is a unique fuzzy logic based algorithm which enhances the traditional PID function set manually or by auto-tuned algorithms. RaPID re-blends the PID control on-line and instead of learning from an event and reacting after it has happened, RaPID reacts as an event occurs, thereby improving the quality of control and speed of response.

Our *Plug and Play* Technology allows you to choose from 5 input/output boards, and a RS-485 communications board, to be assembled precisely to your application requirements. Since each option is self contained on its own plug-in board, it makes field upgrading simple and cost-effective. A remote setpoint option is also available on this control.

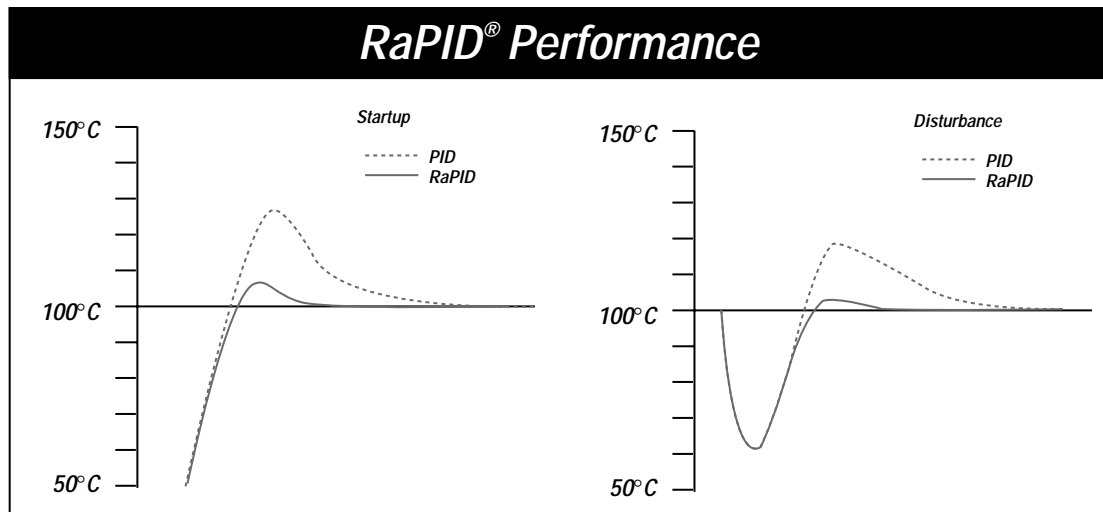
The controller is also easy to setup, with an innovative configuration port for off line programming directly from a PC or through a simplified operator's front panel. Access can also be limited by either a security code or by setpoint options.

# 4200 Brief Specs and RaPID<sup>®</sup> Performance:

## Brief Specs:

<b>Inputs:</b>	Thermocouple: RTD: DC Linear: Dual Setpoint:	J, K, R, S, T, B, L, N Pt 100 3 Wire mA, mV, or V Voltage free contact or TTL compatible
<b>Output:</b>	Control and Alarm Outputs: Control Outputs:  Communications:	Relay- SPDT 2A at 240V AC > 5 X 10 <sup>5</sup> operations SSR >4.0V DC into 1 K ohm minimum Triac- 1amp @ 40°C, Derate to 1/2amp @ 80°C RS-485 2 wire
<b>Control and Features</b>	Tuning:  Proportional Band: Auto Reset: Manual Reset (Bias): Rate:	RaPID <sup>®</sup> , PID, PID/ON-Off 2, On-Off, Pre-Tune and Self Tune  0.5% to 999.9% of input span and ON-OFF 1 second to 99 minutes 59 seconds and OFF 0 to 100% 0 to 99 minutes 59 seconds
<b>Operating and Environmental</b>	Accuracy: Ambient Temperature:  Supply Voltage: Power Consumption: EMI Immunity: EMI Emmissions:	±0.25% of input span ±1 LSD 0°C to 55°C (Operating) -20°C to 80°C (Storage) 90 to 264V AC 50/60Hz (Optional 20-50V AC 50/60Hz, 22-65V DC) 4W Maximum Meets with BS EN 50082-2 (1995) Meets with BS EN 50081-2 (1994)
<b>Dimensions and Panel Cut Out</b>	Panel Cut-Out: Unit Dimensions:	1/4 DIN - 92mm X 92mm 96mm High X 96mm Wide X 100mm Deep

## RaPID<sup>®</sup> Performance:



Results achieved against competitor PID and fuzzy logic controllers on a simulated load with two first order time constants of 80 and 30 seconds each, and a dead time of seven seconds.

# 4200 Order Matrix:

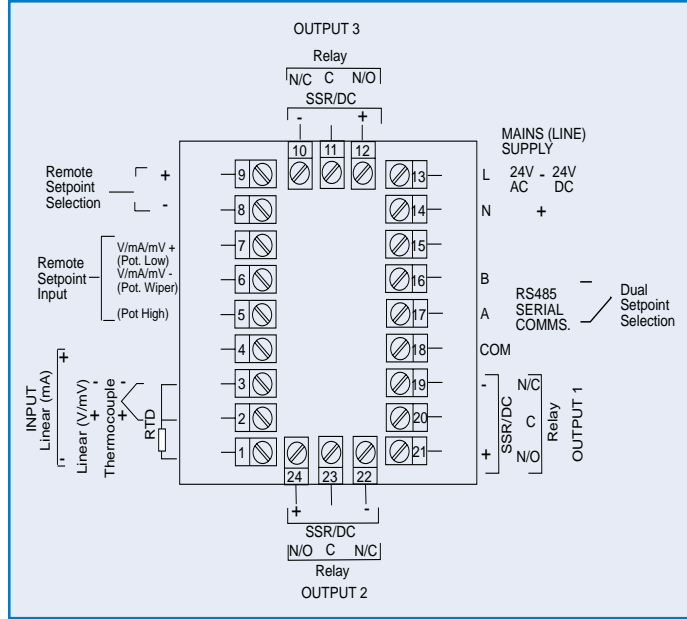
<b>Order Code</b>	N	4	2	0	1	-	Z											
<b>Model</b>																		
<b>Standard Configuration</b>																		
<b>Input Type</b>																		
	<ul style="list-style-type: none"> <li>1 - 3 Wire RTD or DC mV</li> <li>2 - Thermocouple</li> <li>3 - DC mA</li> <li>4 - DC Voltage</li> </ul>																	
<b>Output 1</b>																		
	<ul style="list-style-type: none"> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Traic (Consult Factory)</li> </ul>																	
<b>Output 2 (Alarm 2 or Control Output 2)</b>																		
	<ul style="list-style-type: none"> <li>0 - Not fitted</li> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Traic</li> </ul>																	
<b>Output 3 (Alarm 1 or Recorder O/P)</b>																		
	<ul style="list-style-type: none"> <li>0 - Not fitted</li> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Traic</li> </ul>																	
<b>Options</b>																		
	<ul style="list-style-type: none"> <li>10 - RS-485 Serial Communication</li> <li>02 - 24VAC/DC Power Supply</li> <li>30 - Dual Setpoint Switching</li> <li>12 - RS-485 Serial Communication and 24VAC/DC Power Supply</li> <li>32 - Dual Setpoint Switching and 24V AC/DC Power Supply</li> </ul>																	
<b>Second Analog Input Type Option (R)*</b>																		
	<ul style="list-style-type: none"> <li>R1 - Remote Setpoint Linear DC mV</li> <li>R3 - Remote Setpoint Linear DC mA</li> <li>R4 - Remote Setpoint Linear DC V</li> <li>R8 - Dual Setpoint Switching</li> <li>R9 - Potentiometer</li> </ul>																	

\*Note Second Analog Input Type must be specified at time of purchase; cannot be added at a later time.



# 4200 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# 4400 1/4 DIN Profile Controller

- **Informative Display provide maximum process information at a glance.**
- **Eight programs, of sixteen free format segments.**
- **Programs can be linked for up to 127 segments.**
- **Dedicated configuration port allows configuration directly from PC plus the development, transfer and storage of recipes by dedicated software.**
- **Power failure recovery strategies plus delayed start and real time clock.**
- **Optional four event outputs and six digital inputs.**



The 4400 is a powerful profile controller which will provide accurate programming control over complex processes. It is easy to program, setup and use, and is packed full of innovative features.

The 4400 has been designed to give the operator more immediate visibility than ever before. At a glance, the programmable displays will show you the measured variable, the setpoint and the parameter being edited, the number of cycles or time remaining, the recipe name and number, also whether the cycle is in a ramp or soak. In short, everything you need to know about your process is displayed.

The 4400 allows you to save up to 8 programs or recipes, with up to 16 segments each. You can join any number of these programs together allowing you to

build large complex profiles up to 127 segments. Unlike many other profilers, the 4400 offers you a free choice in programming each segment. ( Free Format ) For example, you can choose (ramp/ramp or soak/soak) sequences which are often needed for flexible triggering of events.

The 4400 has a special configuration port and dedicated software which enables you to configure directly from a PC, in addition, you can program recipes and store them by names. Any number of recipes can be stored on a PC and downloaded via the configuration port. At all times when a recipe is running, the name of the recipe will be shown in the alpha/numeric display.

The 4400 has the normal 3 outputs for control and alarming plus a slot for RS-485 communication. Optional features include a 4 event relay output card, a 6 digital input card, and a real time clock. Combining all these features makes the 4400 one of the most powerful profilers in its class.

# 4400 Brief Specs:

## Brief Specs:

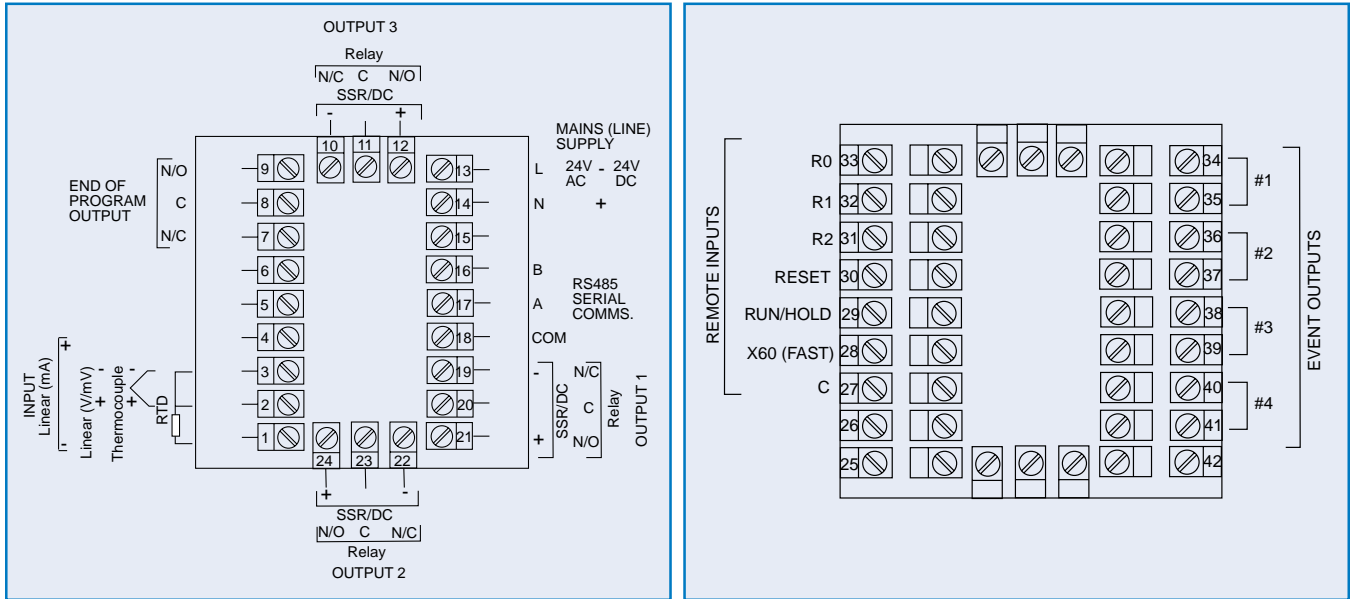
<b>Inputs:</b>	Thermocouple: RTD: DC Linear: Calibration	J, K, R, S, T, B, L, N Pt 100 3 Wire mA, mV or V Complies with BS4937, NBS125, IEC584
<b>Output:</b>	Control and Alarm Outputs: Control Outputs:  DC: Communications:	Relay- SPDT 2A at 240V AC > 5 X 10 <sup>5</sup> operations SSR >4.0V DC into 1 K ohm minimum Triac- 1amp @ 40°C, Derate to 1/2amp @ 80°C 8 bits in 250mS (10 bits in 1 sec. typical >10 bits in >1 sec typical) RS-485 2 wire
<b>Control and: Features</b>	Tuning:  Proportional Band: Auto Reset: Manual Reset (Bias): Rate:  Program Facilities: Length:  Segment Types: Cycling: Delay Start:	Pre-Tune and Self Tune Auto/Manual with <i>bumpless</i> transfer 0.5% to 999.9% of input span and ON-OFF 1 second to 99 minutes 59 seconds and OFF 0 to 100% 0 to 99 minutes 59 seconds  Programs: 8, each with free form segments Adjustable in the range 1 to 16 segments Programs cascadeable maximum length 121 segments Ramp, dwell, join, repeat or end 1 to 9999, infinite 0 - 99:59
<b>Operating and: Environmental</b>	Accuracy: Ambient Temperature:  Supply Voltage: Power Consumption: EMI Immunity: EMI Emmissions:	±0.25% of input span 0°C to 55°C (Operating) -20°C to 80°C (Storage)  90 to 264V AC 50/60Hz (Optional 20-50V AC 50/60Hz, 22-65V DC) 4W Maximum Meets with BS EN 50082-2 (1995) Meets with BS EN 50081-2 (1994)
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out: Unit Dimensions:	1/4 DIN - 92mm X 92mm 96mm High X 96mm Wide X 100mm Deep

# 4400 Order Matrix:

<b>Order Code</b>	<table border="1"><tr><td>N</td><td>4</td><td>4</td><td>0</td><td>1</td></tr></table> - <table border="1"><tr><td>Z</td><td></td><td></td><td></td><td></td></tr></table>	N	4	4	0	1	Z					<table border="1"><tr><td></td><td></td></tr></table> - <table border="1"><tr><td>G</td><td></td><td></td><td></td></tr></table>			G			
N	4	4	0	1														
Z																		
G																		
<b>Model</b>	_____																	
<b>Standard Configuration</b>	_____																	
<b>Input Type</b>	_____																	
	<ul style="list-style-type: none"> <li>1 - 3 Wire RTD or DC mV</li> <li>2 - Thermocouple</li> <li>3 - DC mA</li> <li>4 - DC Voltage</li> </ul>																	
<b>Output 1</b>	_____																	
	<ul style="list-style-type: none"> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Triac (Consult Factory)</li> </ul>																	
<b>Output 2 (Alarm 2 or Control Output 2)</b>	_____																	
	<ul style="list-style-type: none"> <li>0 - Not fitted</li> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Triac</li> </ul>																	
<b>Output 3 (Alarm 1 or Recorder O/P)</b>	_____																	
	<ul style="list-style-type: none"> <li>0 - Not fitted</li> <li>1 - Relay</li> <li>2 - DC for SSR</li> <li>3 - DC 0-10V</li> <li>4 - DC 0-20mA</li> <li>5 - DC 0-5V</li> <li>7 - DC 4-20mA</li> <li>8 - Triac</li> </ul>																	
<b>Options</b>	_____																	
	<ul style="list-style-type: none"> <li>10 - RS-485 Serial Communication</li> <li>02 - 24VAC/DC Power Supply</li> <li>12 - RS-485 Serial Communication and 24VAC/DC Power Supply</li> </ul>																	
<b>Advanced Options</b>	_____																	
	<ul style="list-style-type: none"> <li>100- Event Outputs</li> <li>010- Remote Program Control Inputs</li> <li>001- Real Time Clock</li> </ul>																	

# 4400 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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Approved

# 4700 1/4 DIN FM Approved Limit Controller

- High or low limit control.
- Storage of peak temperature plus duration of alarm condition.
- Plug and Play Technology allows field upgrades.
- Dedicated configuration port allows configuration directly from PC for fast and repeatable configurations.
- Password protection limiting operator access and providing process security.
- Display process value, setpoint or both.



NEMA 4

The 4700 is a 1/4 DIN limit controller designed to provide a safety cutout and optional alarm contacts for use in a wide variety of applications.

The 4700 provides a latched relay output which is activated when process parameters either exceed or fall below the desired value, providing a fail safe cutoff which has to be manually reset once the process returns to a safe condition. This limit controller is FM approved.

The 4700 can be either a High Limit or a Low Limit controller. In either case, the relay contact will open and remain open until the process value returns to a safe condition and the reset button is depressed.

LED indicators are used to indicate when the limit has been exceeded and also when an operator has acknowledged the condition. Another LED will show the latch relay state, on or off.

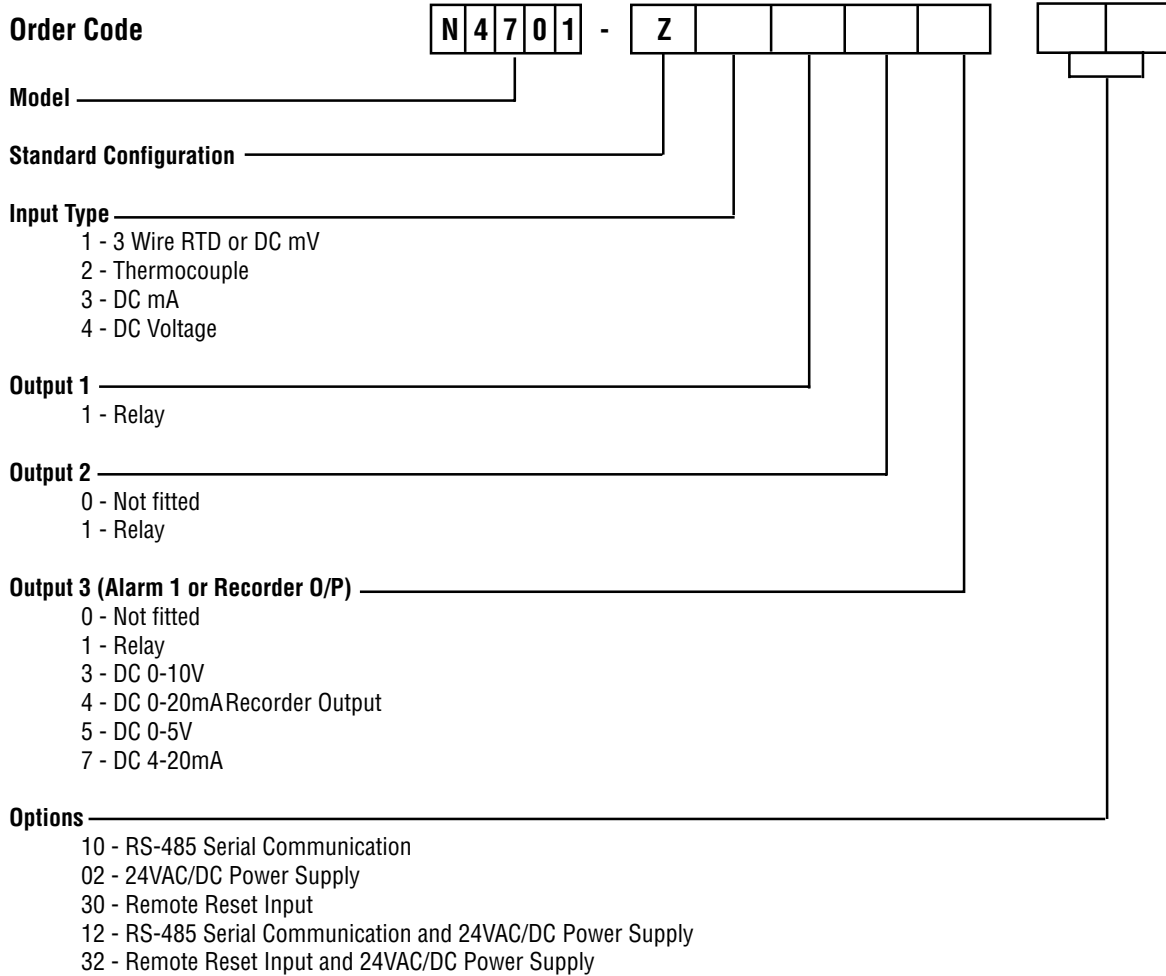
The 4700 has a unique feature that shows both the peak temperature exceeded and the duration time that the setpoint was exceeded. This information can be valuable in determining the damage done to the load/products and equipment/furnace or oven.

# 4700 Brief Specs:

## **Brief Specs:**

<b>Inputs:</b>	Thermocouple:	J, K, R, S, T, B, L, N
	RTD:	Pt 100
	DC Linear:	0-20mA, 4-20mA 0-50mV, 10-50mV 0-5V, 1-5V, 0-10V, 2-10V
	Remote Reset:	Voltage free contact or TTL compatible
<b>Output:</b>	Limit Outputs:	Relay- SPDT 5A at 240V AC
	Alarm Outputs:	2 Alarms as standard Relay- SPDT 2A at 120/240V AC
	Recorder Output:	0-5V and 0-10V Retransmission SP/PV 500 ohm min 0-20mA and 4-20mA 500 ohm min.
	Communications:	RS-485 2 wire
<b>Control:</b>	On Off Control:	Manual Reset
<b>Operating and: Environmental</b>	Accuracy:	$\pm 0.25\%$ of span $\pm 1$ LSD
	Ambient Temperature:	0°C to 55°C (Operating) -20°C to 80°C (Storage)
	Supply Voltage:	90 to 264V AC 50/60Hz
	Power Consumption:	4W Maximum
	Low Voltage Option:	20-50V AC, 22-65V DC
<b>Dimensions and: Panel Cut Out</b>	Panel Cut-Out:	1/4 DIN - 92mm X 92mm
	Unit Dimensions:	96mm High X 96mm Wide X 100mm Deep

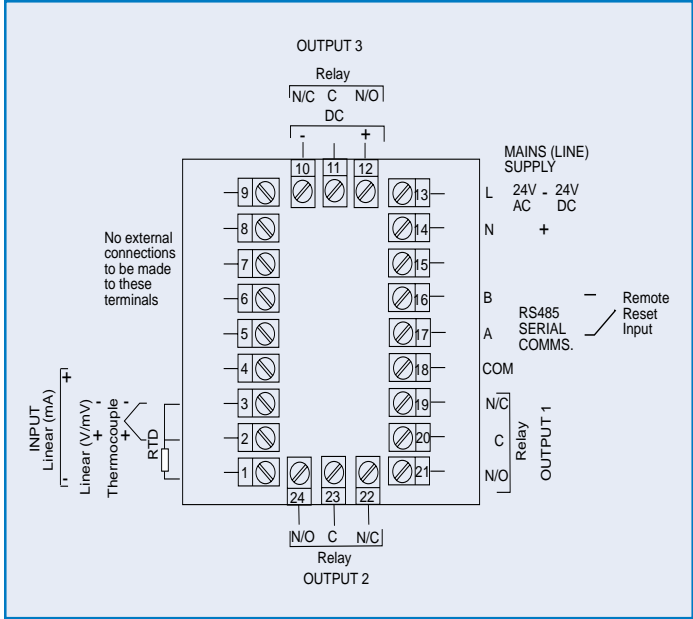
# 4700 Order Matrix:





# 4700 Wiring Diagram and Notes:

## Wiring Diagram:



## Notes:

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# Accessories:

The following accessories are available for our 4000, 6000 and 8000 Series products:

- **Plug-In Boards**

Relay	M9610-C10
Analog	M9610-C21
Logic	M9610-C50
Triac	M9610-C80
RS-485 Communications	M9610-X06
Digital Input	M9610-W03 (Dual Setpoint and Remote Reset)
Transmitter power Supply	M9610-W08
Dual Relay	M9610-W09
Program Control Inputs	N9440G010 (4400 Programmer)
Event Outputs	N9440G100 (4400 Programmer)

- **Current Transformers Series 6600 and 8600**

0-25 Amp	M9610-A25
0-50 Amp	M9610-A50
0-100 Amp	M9610-A100

- **Configuration Software**

Software for 4000, 6000, 8000 Series	M9997-A05011
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- **Configuration Software**

Software for 4400 Only	M9997-A05013
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- **1/16 DIN Configuration Kit**

1/16 DIN Configurator Kit	116ADAPT
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- **Adaptor Plates**

1/4 DIN -1/8 DIN	64422101
1/4 DIN -1/16 DIN	64422102
1/8 DIN -1/16 DIN	64422103









