Custom

![Athena temperature control products]

ATHENA®
The Temperature Control Company

CUSTOM TEMPERATURE CONTROL SOLUTIONS

Since 1965, Athena Controls, Inc. has been designing custom control solutions for a wide range of industries and applications. Today, we offer several alternatives designed to satisfy the varied needs of our customers.

If you're looking for a temperature or process controller with special input or output requirements, our Series C may be your solution. These controllers are available for quick delivery in sizes from 1/32 to 1/4-DIN, as well as a non-communicating model designed to be mounted on a DIN rail behind your control panel.

For fully custom-engineered control modules, our Technology Outsourcing Program (TOP) allows you to utilize our engineering skills and expertise with no out-of-pocket costs to you. It lets you concentrate your efforts on your core business and allows us to help you by doing what we do best -- design and manufacturing of reliable temperature and process controllers.

For a free, confidential discussion of your custom engineering requirements, contact your Athena Controls representative or call toll-free in the U.S. 1-800-782-6776. Outside the U.S., please call 610-828-2490.
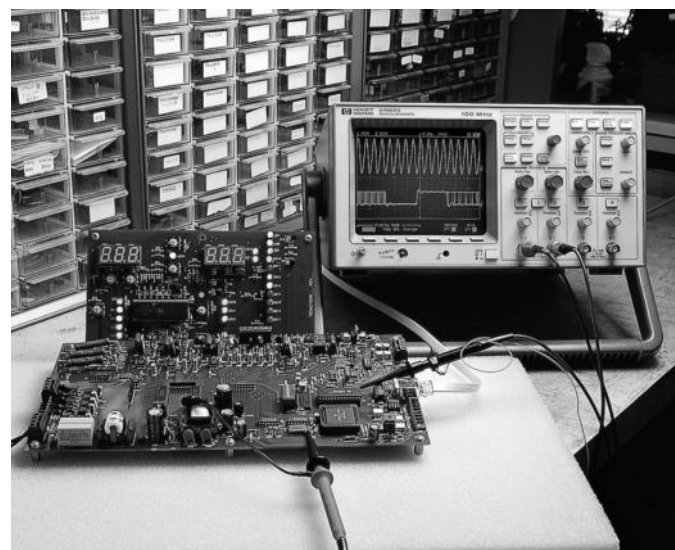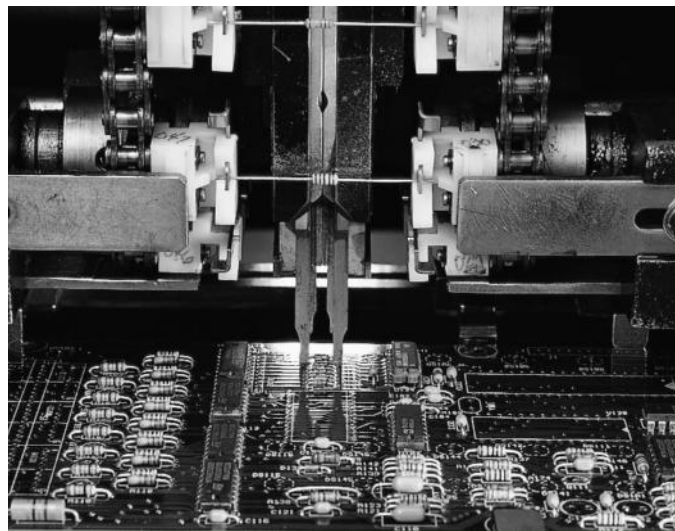
...With a Technology Outsourcing Program (TOP) from Athena Controls.

• NO upfront financial risk

• Solve key technology problems

• Reduce time to market for new products

• Free up your engineering resources for other projects

• Add improvements to existing designs

• Cut manufacturing costs

• Eliminate excess inventory

Industries Served

• Plastics
• Chemicals
• Instrumentation
• Scientific
• Medical
• Semiconductor
• Food
• Pharmaceutical
• Packaging

TOP Takes the Risk out of Outsourcing Your Custom Control Design and Manufacturing.

Athena's Technology Outsourcing Program (TOP) is designed to streamline the entire process of bringing your new products to market. It optimizes your technical resources and allows you to achieve your engineering and production objectives without making an upfront financial commitment.

In its simplest terms, TOP allows you to utilize Athena's engineering skills and expertise with no out-of-pocket costs to you. It lets you concentrate your efforts on your core business and allows us to help you by doing what we do best -- temperature control.

Athena's TOP is a 3-phase program that begins with a meeting to discuss your objectives and gather the information we need to assess your project's technical requirements and the estimated total investment required for final design and production.

Next, based on your authorization to proceed, we develop a comprehensive System Requirements Specification (SRS), along with an estimated cost and delivery date. Again, there is no financial commitment on your part.

Finally, if, and only if, you're fully satisfied that our SRS meets your requirements, you'll be asked to sign a letter of intent to issue a blanket purchase order. This letter includes final pricing and delivery schedules and authorizes us to build product for field-testing and proceed with final engineering documentation. Even now, you are only responsible for paying a "not to exceed" engineering cost should you decide to cancel the project.

Athena Controls, Inc.
Technology Outsourcing Program (TOP)
Overview of Elements

Phase I

Project Definition

- Mutual confidentiality agreement
- Information gathering
- Preliminary technical and cost analysis

The first step in the process, after signing a standard mutual confidentiality agreement, is to meet, discuss the project, and discern if there is a good probability that your product requirements can be met. If there is agreement, we move on to Phase II. You are under no financial obligation.

Phase II

Authorization to Proceed

- Authorization letter signed by company official
- System Requirements Specification (SRS) developed
- Estimated final cost and delivery schedule submitted

This phase ensures that there is a mutual understanding of all requirements, and requires participation of key personnel from both companies and a written commitment to proceed. However, the project may still be canceled at any time prior to Phase III without any financial obligation on your part.

Phase III

Letter of Intent to Issue a Blanket Purchase Order

- Letter of Intent signed
- Includes final pricing and delivery schedules
- Authorizes building of functional prototype and completion of final engineering documentation
- Incurs a "not-to-exceed" charge for cancellation , but NO CHARGE if Athena fails to meet agreed-upon specifications

Assuming we meet all of your criteria in the final product, you agree to issue a blanket purchase order to Athena for production units. If you decide to cancel the project, you are only liable for a "not-to-exceed" engineering cost. If we don't meet your specifications, there is no charge whatsoever.

How Do You Know if TOP Is the Right Choice for You?

If you can answer "yes" to any of these situations, Athena's Technology Outsourcing Program may be just what you need to keep your new product plans on track:

- ❑ You need features and functions not found in a standard control product.
- ❑ You have some innovative ideas, which require new hardware and software.
- ❑ Your annual volume exceeds 100 units.
- ❑ You want to maintain control over your product and do not want to accept an off-the-shelf solution.
- ❑ You'd rather work with an expert in the field instead of committing in-house resources.

SAMPLE AUTHORIZATION TO PROCEED AGREEMENT

Phase II.
Authorization to Proceed
Technology Outsourcing Program (TOP)

Company: _____   Date: _____
Project Manager: _____
Address: _____
City: _____ State: _____Zip: _____

Thank you for your interest in the Athena Controls Technology Outsourcing Program (TOP). We have completed the Preliminary Definition of your project and have determined that it is feasible for us to provide you with a product that will meet your application requirements at an estimated price of $ per unit. This estimate is based on available information from _____ dated _____.

The prices stated above are only an estimate and final pricing will be given to _____ at the completion of Phase III.

The next step in our TOP program is to proceed to Phase III. In this Phase, there are no direct costs to you; however, it will require participation of key personnel from your company, i.e., engineering, production, and possibly marketing.

This letter authorizes Athena Controls to proceed to Phase III of the program, which involves the development of a comprehensive Systems Requirements Specification (SRS) document, as well as an estimated final cost and a timetable for delivery of a working prototype unit. It is understood, however, that in the event Athena is unable to develop a comprehensive systems requirements specification for this project, or does not feel that it is economical to do so, Athena will have no obligation or liability to _____.

For Athena Controls, Inc.:   For _____:

_____   _____
                                                              (Officer of Company and Title)

Date: _____   Date: _____

SAMPLE LETTER OF INTENT

Phase III.
Letter of Intent to Issue a Blanket Order

Technology Outsourcing Program (TOP)

Company: _____   Date: _____

Project Manager: _____

Address: _____

City: _____ State: _____Zip: _____

We are pleased to advise you that we have completed our final engineering specifications for the following project:

Project: _____.

Upon receipt of a signed copy of this Letter of Intent, Athena Controls agrees to develop and pro-vide _____ with a prototype product which shall fulfill the design

and functional requirements of the attached System Requirements Specification (SRS) document, and to offer this product in a full production version at a unit price of $_____ (± $_____), within a timeframe not to exceed _____ from the execution date of this document or purchase order.

After having a reasonable opportunity to evaluate the prototype product, _____ will agree to either:

    1) Enter into a Blanket Purchase Order Agreement with Athena Controls to supply this product for a period of at least __ year(s), and with a minimum required purchase of ___ units; or

    2) Terminate the project and reimburse Athena Controls for all engineering costs and administrative fees, related to the preliminary work performed by Athena, which sum shall not exceed $ _____. (If Athena Controls is unable to meet your company's conditions as described in the attached SRS, or if Athena is unable to meet your company's conditions at the above stated price, then _____ will have no financial obligation with regard to any preliminary work performed by Athena. Likewise, Athena will have absolutely no obligation or liability to _____ in the event Athena determines that it is not able to meet the conditions at the above quoted price.

The signatures below indicate the understanding and acceptance of the terms stated in this Letter of Intent by both parties.

For Athena Controls, Inc.:   For _____:

_____   _____
                                          (Officer of Company and Title)

Date: _____   Date: _____

SAMPLE TABLE OF CONTENTS
SYSTEM REQUIREMENTS SPECIFICATION (SRS)

1/32 DIN Universal Input Controller

- Thermocouple, RTD, Voltage or Current Input
- Auto-Tuning, Heat or Cool
- Field-Configurable – Heat or Cool Outputs
- Dual Output/Alarm Capabilities
- On/Off through Full PID Operation (P, PI, PD, PID)
- NEMA 4X (IP65) Dust and Splash-Proof Front Panel
- Bumpless Auto/Manual Transfer
- Field-Configurable Process and Deviation Alarms (Normal and Latching)
- Alarm Inhibit Mode
- DIN Standard Case Depth and Panel Cutout
- Special and Custom Options Available

Ordering Information

32C ☐ – ☐ – ☐ – ☐☐

Input Calibration

Code	Input	°F	°C
T*	= K "TC"	-220 to 2462°	-140 to 1350°
	J "TC"	-398 to 1400°	-100 to 760°
	T "TC"	-202 to 752°	-130 to 400°
R*	= 100 ohm RTD	-328 to 1562°	-200 to 850°
	100 ohm RTD (Decimal)	-199.0 to 392.0°	-128.8 to 200.0°
L*	= Linear Input 10 to 50 mV 4 to 20 mA 0 to 50 mV 0 to 20 mA	Scaleable	
U	= Universal		

*Factory set up. When changing input, re-calibration is required.

Output 1 (Heat/Cool)

Code
0 = None
B = Relay
S = Pulsed (Logic)
T = SS Relay, 1 A

Output 2 (Heat/Cool)

Code
0 = None
S = Pulsed (Logic)
T = SS Relay, 1 A

Options

Consult Factory

SERIES 32C TEMPERATURE/PROCESS CONTROLLER

OPERATING LIMITS

Line Voltage	85 to 265 V, 50/60 Hz 120 to 375 Vdc, (auto polarity)
Power Consumption	Less than 6 VA (instrument)
Operating Temperature	32 to 140˚F (0 to 60˚C)
Humidity Tolerance	90% R.H. maximum, non-condensing

PERFORMANCE

Accuracy	± 0.2% of FS, ± one digit
Setpoint Resolution	1 count/0.1 count
Repeatability	± 1.0 count
Temperature Stability	5 µV/˚C maximum
TC Cold End Tracking	0.05˚C /˚C ambient
Noise Rejection	Common mode > 100 dB Series mode > 70 dB
Process Sampling	3.5 Hz (270 ms)

CONTROL CHARACTERISTICS

Setpoint Limits	User Configurable
Alarms	Adjustable for high/low; process or deviation
Rate (Derivative)	0 to 2400 sec
Reset (Integral)	0 to 9600 sec
Cycle Time	0.3 to 120 sec
Proportional Band	1 to FS
Deadband	1 to FS
Control Hysteresis	1 to FS
Autotune	Operator-initiated from front panel
Manual Control	Operator-initiated from front panel

INPUTS

Thermocouple	J, K, T Maximum lead resistance, 100 ohms for rated accuracy
RTD	2-wire platinum, 100 ohms at 0˚C, DIN curve standard (0.00385)
Linear	Current and voltage
Engineering Units	Scaleable: -1999 to 9999
Decimal Position	Selectable: none, 1/10, 1/100

OUTPUTS

B	Relay 5 A @ 120 Vac; 5 A @ 240 Vac
S	5 Vdc pulsed
T	Solid-state relay, 1 A

MECHANICAL CHARACTERISTICS

Display	LED, 4-digit, 10 mm
Front Panel Rating	NEMA 4X (IP65)
Connections	Input and output via removable barrier strip
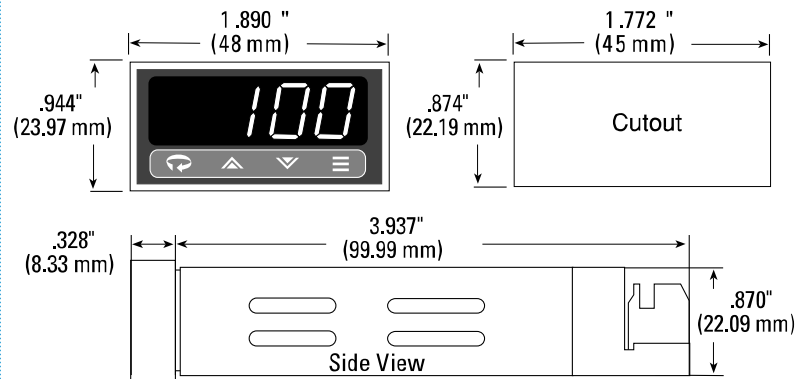
Output Indicator
Used to indicate activation of Output 1.

Four-Digit LED Display
Displays measured process value, setpoint, or parameter labels and settings.

Output Indicator
Used to indicate activation of Output 2.

Mode/Enter Key
Used to enter Parameter selections, access operating modes, silence latched alarms, and index through menu items.

Lower Key
Used to decrease values. (Hold for fast-step progression)

Raise Key
Used to increase values. (Hold for fast-step progression)

Menu Access Key
Used to enter or exit the menu system, index to the next menu, and enter the Security Level menu.

1/16 DIN Temperature/ Process Controller

- *Field-Configurable Universal Inputs*
- *User-Selectable Ramp to Setpoint*
- *8-Level Ramp/Soak Control*
- *Bumpless Auto/Manual Transfer*
- *NEMA 4X (IP65) Dust and Splash-Proof Front Panel*
- *Decimal Display in 0.1° for Measured Temperatures Under 1000° F or C*
- *On/Off through Full PID Operation (P, PI, PD, PID)*
- *Auto-Tuning, Direct or Reverse Acting (Field-Configurable)*
- *Adjustable Hysteresis and Deadband*
- *Outputs Configurable as Alarms*
- *Field-Configurable Process or Deviation Alarms; Latching or Non-Latching; Band and Inverse Band*
- *Dual Output/Dual Alarm Capabilities*
- *UL, cUL, and CE Approvals*
- *Options Include Serial Communications (RS-232, RS-485), Remote Analog Set-point, Multi-Function Contact/Digital Input, Transducer Excitation, and Auxiliary Output.*
- *Special and Custom Options Available*

Ordering Information

16C ☐ — ☐ — ☐ — ☐☐ — ☐☐

Input Calibration

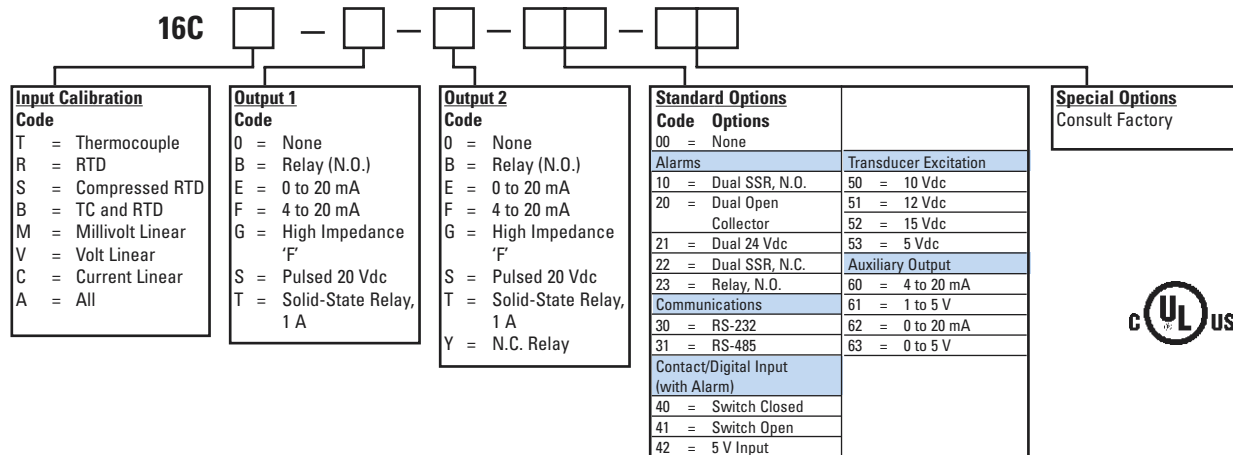| Code	
T	= Thermocouple
R	= RTD
S	= Compressed RTD
B	= TC and RTD
M	= Millivolt Linear
V	= Volt Linear
C	= Current Linear
A	= All

Output 1

Code	
0	= None
B	= Relay (N.O.)
E	= 0 to 20 mA
F	= 4 to 20 mA
G	= High Impedance 'F'
S	= Pulsed 20 Vdc
T	= Solid-State Relay, 1 A

Output 2

Code	
0	= None
B	= Relay (N.O.)
E	= 0 to 20 mA
F	= 4 to 20 mA
G	= High Impedance 'F'
S	= Pulsed 20 Vdc
T	= Solid-State Relay, 1 A
Y	= N.C. Relay

Standard Options

Code	Options		
00	= None		
Alarms		**Transducer Excitation**	
10	= Dual SSR, N.O.	50	= 10 Vdc
20	= Dual Open Collector	51	= 12 Vdc
		52	= 15 Vdc
21	= Dual 24 Vdc	53	= 5 Vdc
22	= Dual SSR, N.C.	**Auxiliary Output**	
23	= Relay, N.O.	60	= 4 to 20 mA
Communications		61	= 1 to 5 V
30	= RS-232	62	= 0 to 20 mA
31	= RS-485	63	= 0 to 5 V
Contact/Digital Input (with Alarm)			
40	= Switch Closed		
41	= Switch Open		
42	= 5 V Input		

Special Options

Consult Factory

Note: The remote analog setpoint exists in larger units: 18C, 19C, 25C.

cULus CE

Range Information				
Input	**Range**		**Input**	**Range**
"B"	32 to 3308°F (0 to 1820°C)		"R"	-58 to 3214°F (-50 to 1768°C)
"C"	32 to 4199°F (0 to 2315°C)		"S"	-58 to 3214°F (-50 to 1768°C)
"E"	-238 to 1832°F (-150 to 1000°C)		"T"	-454 to 752°F (-270 to 400°C)
"J"	-328 to 1400°F (-200 to 760°C)		Platinel® II	-148 to 2250°F (-100 to 1232°C)
"K"	-454 to 2462°F (-270 to 1354°C)		100 ohm RTD	-328 to 1562°F (-200 to 850°C)
"N"	-450 to 2372°F (-268 to 1300°C)		100 ohm RTD (Decimal)	-328.0 to 707.0°F (-200.0 to 375.0°C)
"NNM"	32 to 2570°F (0 to 1410°C)			

SERIES 16C TEMPERATURE/PROCESS CONTROLLER

ATHENA
The Temperature Control Company

OPERATING LIMITS

Ambient Temperature	32˚ F to 131˚ F (0˚ C to 55˚ C)
Relative Humidity Tolerance	90%, non-condensing
Power	100-250 V 125 to 300 Vdc 24 Vac/Vdc optional
Power Consumption	Less than 6 VA

PERFORMANCE

Accuracy	±0.20% of full scale (±0.10% typical), ±1 digit
Setpoint Resolution	1 count / 0.1 count
Repeatability	±1 count
Temperature Stability	5 µV/˚C (maximum)
TC Cold-End Tracking	0.05˚C/˚C ambient
Noise Rejection	100 dB common mode
Process Sampling	10 Hz (100 ms)

CONTROL CHARACTERISTICS

Alarms	Adjustable for high/low; selectable process, or deviation
Proportional Band	2 to span of sensor
Integral	0 to 9600 seconds
Derivative	0 to 2400 seconds
Cycle Time	0 = 200 ms; 1 to 120 seconds
Control Hysteresis	1 to span of sensor
Autotune	Operator initiated from front panel
Manual Control	Operator initiated from front panel

INPUTS

Thermocouple	B, C, E, J, K, N, NNM, R, S, T, Platinel® II Maximum lead resistance 100 ohms for rated accuracy
RTD	Platinum 2- and 3-wire, 100 ohms at 0˚C, DIN curve standard (0.00385)
Linear	0-50 mV/10-50 mV, 0-20 mA/4-20 mA, 0-10 mV/0-50 mV, 0-100 mV, 0-1 V/0-5 V, 0-10 V, 1-5 V

OUTPUTS

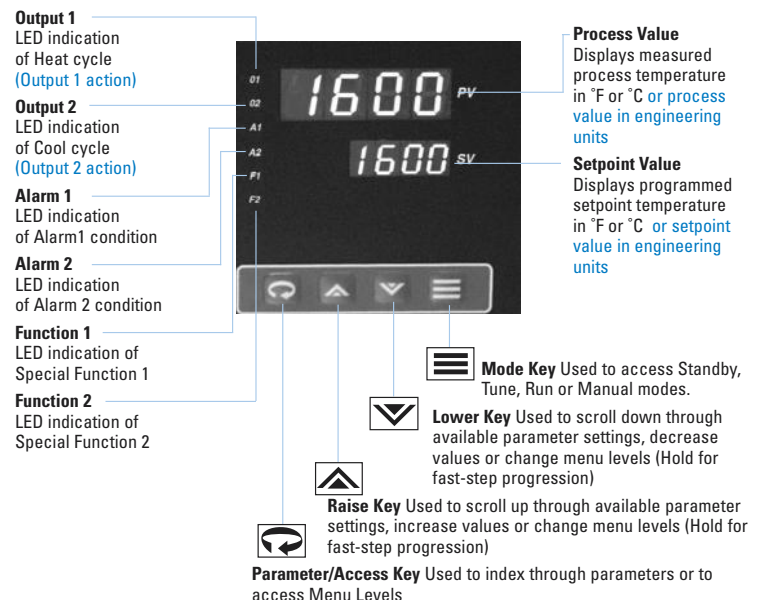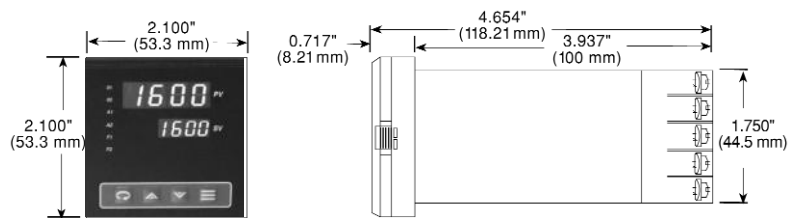|	
B	5A/3A (120/240 Vac) relay, normally open
E	0-20 mA
F	4-20 mA, full output to load with 500 ohm impedance, max.
G	High impedance 'F'
S	20 Vdc pulsed output
T	Solid-state relay, 1A
Y	5A/3A (120/240 Vac) relay, but normally closed (output 2 only).

ALARM TYPE

With dual alarm option: See ordering code.

MECHANICAL CHARACTERISTICS

Display	Dual, 4-digit 0.36" (9.2 mm) LED display Process Value: orange Setpoint Value: green
Numeric Range	-1999 to 9999
Front-Panel Cutout	1.771" x 1.771" (45 mm x 45 mm)
Depth Behind Panel	3.937" (100 mm)
Front-Panel Rating	NEMA 4X (IP65)
Connections	Screw terminals

Specifications subject to change without notice.

Output 1
LED indication
of Heat cycle
(Output 1 action)

Output 2
LED indication
of Cool cycle
(Output 2 action)

Alarm 1
LED indication
of Alarm1 condition

Alarm 2
LED indication
of Alarm 2 condition

Function 1
LED indication of
Special Function 1

Function 2
LED indication of
Special Function 2

Process Value
Displays measured process temperature in ˚F or ˚C or process value in engineering units

Setpoint Value
Displays programmed setpoint temperature in ˚F or ˚C or setpoint value in engineering units

Mode Key Used to access Standby, Tune, Run or Manual modes.

Lower Key Used to scroll down through available parameter settings, decrease values or change menu levels (Hold for fast-step progression)

Raise Key Used to scroll up through available parameter settings, increase values or change menu levels (Hold for fast-step progression)

Parameter/Access Key Used to index through parameters or to access Menu Levels
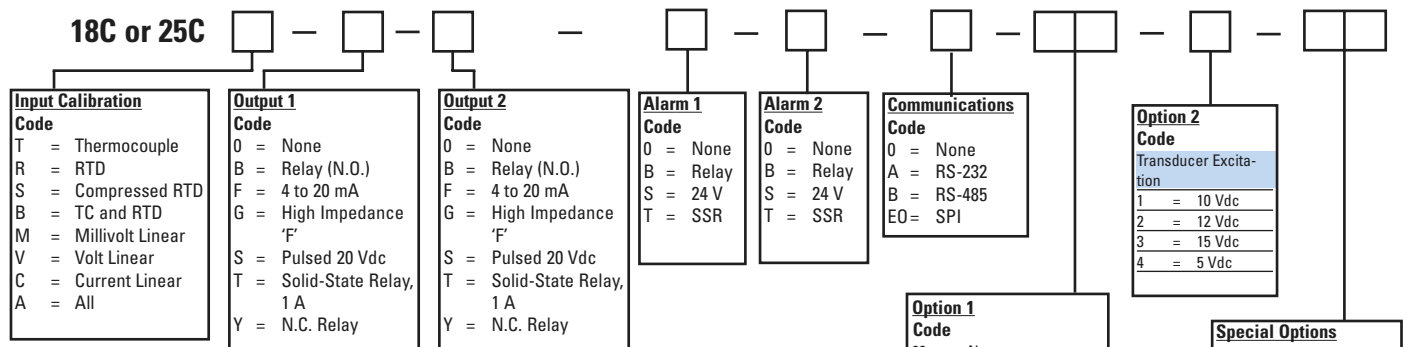
SERIES 18C and 25C

Temperature/Process Controllers

- 1/8-DIN (18C) or 1/4-DIN (25C) Models
- Field-Configurable Universal Inputs
- User-Selectable Ramp to Setpoint
- 8-Level Ramp/Soak Control
- Bumpless Auto/Manual Transfer
- NEMA 4X (IP65) Dust and Splash-Proof Front Panel
- Decimal Display in 0.1° for Measured Temperatures Under 1000° F or C
- On/Off through Full PID Operation (P, PI, PD, PID)
- Auto-Tuning, Direct or Reverse Acting (Field-Configurable)
- Adjustable Hysteresis and Deadband
- Outputs Configurable as Alarms
- Field-Configurable Process or Deviation Alarms; Latching or Non-Latching; Band and Inverse Band
- Dual Output/Dual Alarm Capabilities
- Options Include Serial Communications (RS-232, RS-485), Remote Analog Set-point, Multi-Function Contact/Digital Input, Transducer Excitation, and Auxiliary Output.
- Athena + (Standard), SPI, Engel/Arburg Communications Protocols
- Special and Custom Options Available

Ordering Information

18C or 25C — ☐ ☐ — ☐ — ☐ — ☐ — ☐ — ☐☐ — ☐ — ☐☐

Input Calibration
Code
T = Thermocouple
R = RTD
S = Compressed RTD
B = TC and RTD
M = Millivolt Linear
V = Volt Linear
C = Current Linear
A = All

Output 1
Code
0 = None
B = Relay (N.O.)
F = 4 to 20 mA
G = High Impedance 'F'
S = Pulsed 20 Vdc
T = Solid-State Relay, 1 A
Y = N.C. Relay

Output 2
Code
0 = None
B = Relay (N.O.)
F = 4 to 20 mA
G = High Impedance 'F'
S = Pulsed 20 Vdc
T = Solid-State Relay, 1 A
Y = N.C. Relay

Alarm 1
Code
0 = None
B = Relay
S = 24 V
T = SSR

Alarm 2
Code
0 = None
B = Relay
S = 24 V
T = SSR

Communications
Code
0 = None
A = RS-232
B = RS-485
EO = SPI

Option 1
Code
00 = None
Auxiliary Output
PA = 4 to 20 mA
PB = 1 to 5 V
PC = 0 to 20 mA
PD = 0 to 5 V
Remote Analog Setpoint
SA = 0 to 5 V w/ switch
SB = 1 to 5 V w/ switch
SC = 0 to 20 mA w/ switch
SD = 4 to 20 mA w/ switch
SE = Switch only
SF = 1 to 10 Vdc w/ switch

Option 2
Code
Transducer Excitation
1 = 10 Vdc
2 = 12 Vdc
3 = 15 Vdc
4 = 5 Vdc

Special Options
Consult Factory

Range Information

Input	Range	Input	Range
"B"	32 to 3308°F (0 to 1820°C)	"R"	-58 to 3214°F (-50 to 1768°C)
"C"	32 to 4199°F (0 to 2315°C)	"S"	-58 to 3214°F (-50 to 1768°C)
"E"	-238 to 1832°F (-150 to 1000°C)	"T"	-454 to 752°F (-270 to 400°C)
"J"	-328 to 1400°F (-200 to 760°C)	Platinel® II	-148 to 2250°F (-100 to 1232°C)
"K"	-454 to 2462°F (-270 to 1354°C)	100 ohm RTD	-328 to 1562°F (-200 to 850°C)
"N"	-450 to 2372°F (-268 to 1300°C)	100 ohm RTD (Decimal)	-328.0 to 707.0°F (-200.0 to 375.0°C)
"NNM"	32 to 2570°F (0 to 1410°C)		

c(UL)us CE

SERIES 18C & 25C TEMPERATURE/PROCESS CONTROLLERS

OPERATING LIMITS

Temperature	32° F to 131° F (0° C to 55° C)
Humidity	90%, non-condensing
Power	100-250 V 50/60 Hz
	125 to 300 Vdc
	24 Vac/24 Vdc optional
Power Consumption	Less than 6 VA

PERFORMANCE

Accuracy	±0.20% of full scale (±0.10% typical), ±1 digit
Setpoint Resolution	1 count / 0.1 count
Repeatability	±1 count
Temperature Stability	5 µV/°C (maximum)
TC Cold-End Tracking	0.05°C/°C ambient
Noise Rejection	100 dB common mode
Process Sampling	10 Hz (100 ms)

CONTROL CHARACTERISTICS

Alarms	Adjustable for high/low; selectable process, or deviation
Proportional Band	2 to span of sensor
Integral	0 to 9600 seconds
Derivative	0 to 2400 seconds
Cycle Time	0 = 200 ms; 1 to 120 seconds
Control Hysteresis	1 to span of sensor
Autotune	Operator initiated from front panel
Manual Control	Operator initiated from front panel

INPUTS

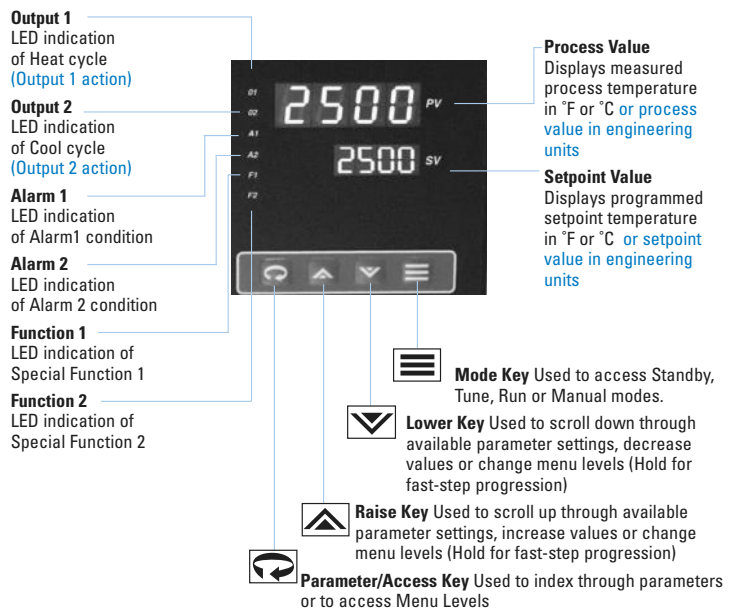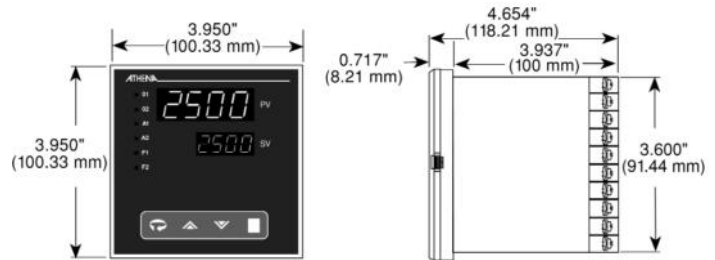|	
Thermocouple	B, C, E, J, K, N, NNM, R, S, T, Platinel® II Maximum lead resistance 100 ohms for rated accuracy
RTD	Platinum 2- and 3-wire, 100 ohms at 0°C, DIN curve standard (0.00385)
Linear	0-50 mV/10-50 mV, 0-20 mA/4-20 mA, 0-10 mV/0-50 mV, 0-100 mV, 0-1 V/0-5 V, 0-10 V, 1-5 V

OUTPUTS

B	5A/3A (120/240 Vac) relay, normally open
F	4-20 mA, full output to load with 500 ohm impedance, max.
G	High impedance 'F'
S	20 Vdc pulsed output
T	Solid-state relay, 1 A
Y	5A/3A (120/240 Vac) relay, but normally closed (output 2 only)

MECHANICAL CHARACTERISTICS

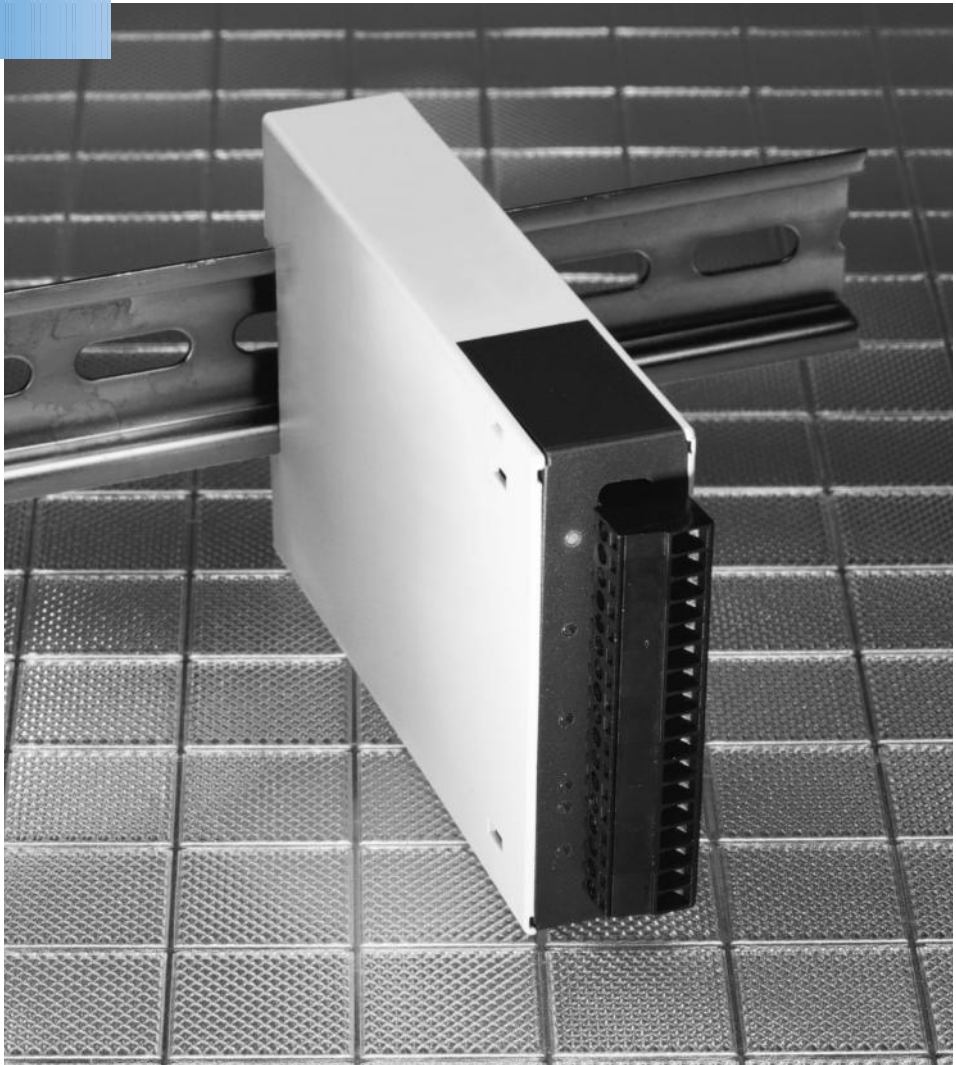|	
Display	Dual, 4-digit 0.36" (9.2 mm) LED display Process Value: orange Setpoint Value: green
Numeric Range	-1999 to 9999
Front-Panel Cutout	1.771" x 1.771" (45 mm x 45 mm)
Depth Behind Panel	3.937" (100 mm)
Front-Panel Rating	NEMA 4X (IP65)
Connections	Screw terminals
Contacts	Twin bifurcated (gold optional)

Specifications subject to change without notice.

Output 1 LED indication of Heat cycle (Output 1 action)

Output 2 LED indication of Cool cycle (Output 2 action)

Alarm 1 LED indication of Alarm1 condition

Alarm 2 LED indication of Alarm 2 condition

Function 1 LED indication of Special Function 1

Function 2 LED indication of Special Function 2

Process Value Displays measured process temperature in °F or °C or process value in engineering units

Setpoint Value Displays programmed setpoint temperature in °F or °C or setpoint value in engineering units

Mode Key Used to access Standby, Tune, Run or Manual modes.

Lower Key Used to scroll down through available parameter settings, decrease values or change menu levels (Hold for fast-step progression)

Raise Key Used to scroll up through available parameter settings, increase values or change menu levels (Hold for fast-step progression)

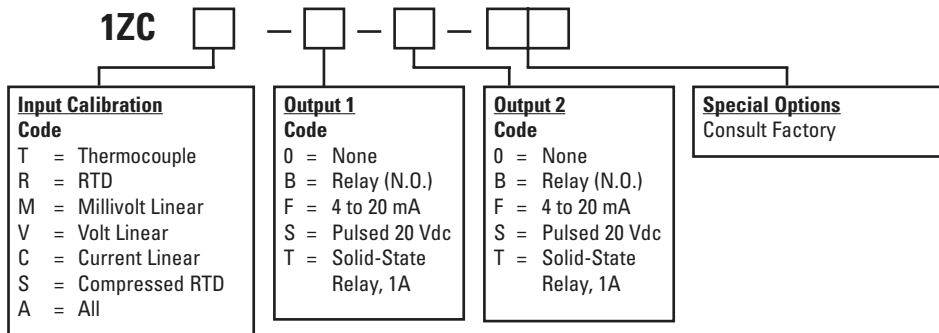**Parameter/Access Key** Used to index through parameters or to access Menu Levels

DIN Rail Type Temperature/Process Controller

- *Miniature DIN Rail Mountable Enclosure Stackable to Required Number of Zones*
- *Each Zone Independently Powered 100-250 V 50/60 Hz (24 Vac/dc available)*
- *RS-485 Serial Communications Using Athena + Protocol*
- *Easy Communications Bus Wiring*
- *Auto Tune*
- *Each Output Universally Configurable as Heat/Cool or Alarm*
- *Accepts RTD (2 and 3 Wire), Thermocouple, and Linear Inputs*
- *Loop Break Alarm*
- *Pluggable Terminal Block for Easy Wiring and Controller Replacement*
- *Optically Isolated Inputs and Outputs*

Ordering Information

1ZC ☐ — ☐ — ☐ — ☐☐

Input Calibration Code
T = Thermocouple
R = RTD
M = Millivolt Linear
V = Volt Linear
C = Current Linear
S = Compressed RTD
A = All

Output 1 Code
0 = None
B = Relay (N.O.)
F = 4 to 20 mA
S = Pulsed 20 Vdc
T = Solid-State Relay, 1A

Output 2 Code
0 = None
B = Relay (N.O.)
F = 4 to 20 mA
S = Pulsed 20 Vdc
T = Solid-State Relay, 1A

Special Options
Consult Factory

Range Information			
Input	**Range**	**Input**	**Range**
"B"	32 to 3308°F (0 to 1820°C)	"R"	-58 to 3214°F (-50 to 1768°C)
"C"	32 to 4199°F (0 to 2315°C)	"S"	-58 to 3214°F (-50 to 1768°C)
"E"	-238 to 1832°F (-150 to 1000°C)	"T"	-454 to 752°F (-270 to 400°C)
"J"	-328 to 1400°F (-200 to 760°C)	Platinel® II	-148 to 2250°F (-100 to 1232°C)
"K"	-454 to 2462°F (-270 to 1354°C)	100 ohm RTD	-328 to 1562°F (-200 to 850°C)
"N"	-450 to 2372°F (-268 to 1300°C)	100 ohm RTD (Decimal)	-328.0 to 707.0°F (-200.0 to 375.0°C)
"NNM"	32 to 2570°F (0 to 1410°C)		

SERIES 1ZC TEMPERATURE/PROCESS CONTROLLER

ATHENA
The Temperature Control Company

OPERATING LIMITS

Ambient Temperature	32˚ F to 131˚ F (0˚ C to 55˚ C)
Relative Humidity Tolerance	90%, non-condensing
Power	100-250 V 50/60 Hz (single-phase) 125 to 300 Vdc 24 Vac/Vdc (optional)
Power Consumption	Less than 6 VA

PERFORMANCE

Accuracy	±0.20% of full scale (±0.10% typical), ±1 digit
Setpoint Resolution	1 count / 0.1 count
Repeatability	±1 count
Temperature Stability	5 µV/˚C (maximum)
TC Cold-End Tracking	0.05˚C/˚C ambient
Noise Rejection	100 dB common mode
Process Sampling	10 Hz (100 ms)

CONTROL CHARACTERISTICS

Proportional Band	2 to span of sensor
Integral	0 to 9600 seconds
Derivative	0 to 2400 seconds
Cycle Time	0 = 200 ms; 1 to 120 seconds
Control Hysteresis	1 to span of sensor
Autotune	Operator initiated
Manual Control	Operator initiated

INPUTS

Thermocouple	B, C, E, J, K, N, NNM, R, S, T, Platinel® II Maximum lead resistance 100 ohms for rated accuracy
RTD	Platinum 2- and 3-wire, 100 ohms at 0˚C, DIN curve standard (0.00385)
Linear	0-50 mV/10-50 mV, 0-20 mA/4-20 mA, 0-10 mV/0-50 mV, 0-100 mV, 0-1 V/0-5 V, 0-10 V, 1-5 V

Specifications subject to change without notice.

OUTPUTS

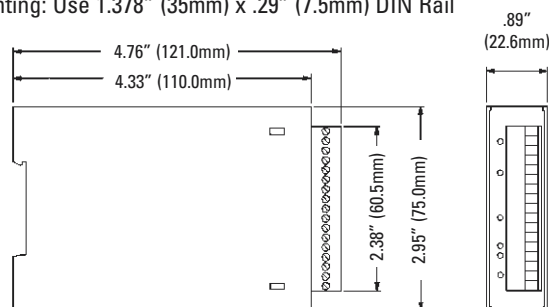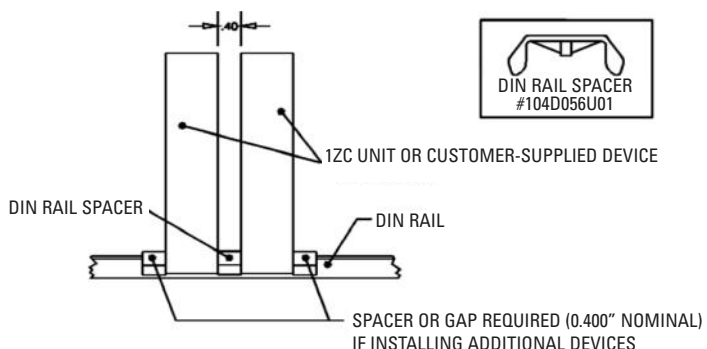|	
B	5A/3A (120/240 Vac) relay, normally open
F	4-20 mA, full output to load with 500 ohm impedance, max.
S	20 Vdc pulsed output
T	Solid-state relay, 1 A

COMMUNICATIONS TYPE

RS-485 Standard

MECHANICAL CHARACTERISTICS

Display	LED displays for Sensor Error, RXD, TXD, Output 1, Output 2, Power/Run
Connections	Screw terminals

Mounting: Use 1.378” (35mm) x .29” (7.5mm) DIN Rail

MOUNTING CLEARANCE REQUIREMENTS

DIN RAIL SPACER #104D056U01

1ZC UNIT OR CUSTOMER-SUPPLIED DEVICE

DIN RAIL SPACER

DIN RAIL

SPACER OR GAP REQUIRED (0.400” NOMINAL) IF INSTALLING ADDITIONAL DEVICES

1ZC CONTACT IDENTIFICATION

Contact #/Description

1	Sensor (-)	T/C, RTD, or Process
2	Sensor (+)	T/C, RTD, or Process
3	Sensor	Bias for RTD
4	Comms	RS485 + (“A”) I/O line bidirectional
5	Comms	RS485 - (“B”) I/O line bidirectional
6	Output 1	Relay, N.O., SS relay: Load; Process (+)
7	Output 1	Relay, common, SS relay: Load; Process: (-)
8	Output 2	Relay, N.O., SS relay: Load; Process (+)
9	Output 2	Relay, common, SS relay: Load; Process: (-)
10	Power	Input, L2 (reference only, no polarity required)
11	Power	Input, L1 (reference only, no polarity required)

NOTES

NOTES

Universal Digital Controllers

Power Controls

Vintage Controllers

Power Handlers

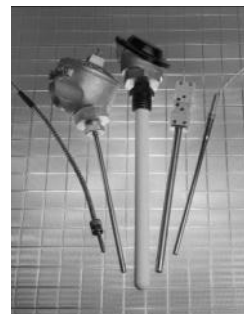Hot Runner Controllers

Analog Controllers

Tudor™ Temperature Sensors

ATHENA®
The Temperature Control Company