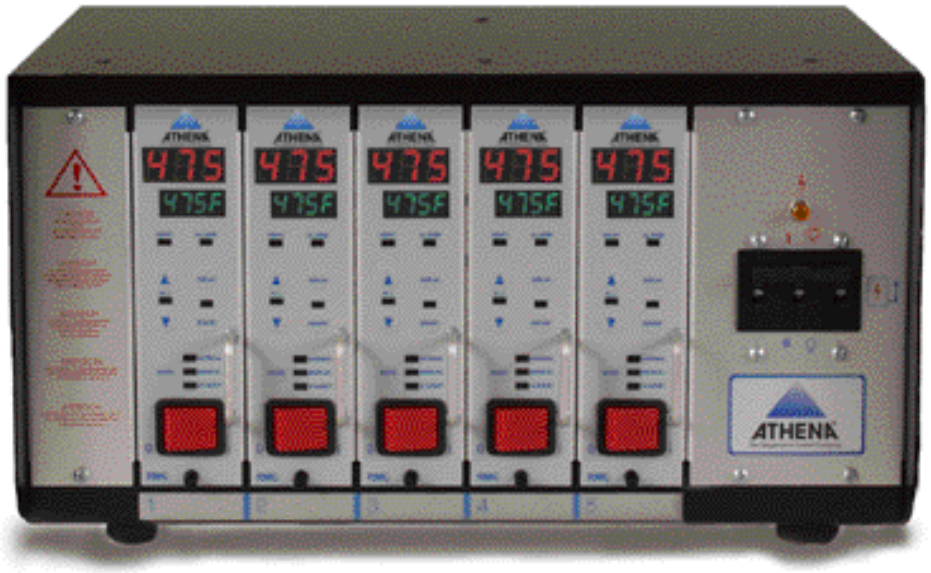
Modular

HOT RUNNER CONTROLS

athenacontrols.com



ATHENA

The Temperature Control Company

ATHENA CONTROLS, INC.
5145 Campus Drive
Plymouth Meeting, PA 19462-1129
U.S.A.

HOT RUNNER CONTROL SYSTEMS

Athena has achieved its reputation as the leader in the field of "hot runner" temperature control through a series of firsts in the plastics industry:

- Microprocessor-based self-tuning temperature controllers, from basic units to sophisticated modules featuring Modbus® communications and ZonePilot™ software for remote configuration via a Palm™ handheld device
- 1-, 2-, and 3-zone portable models and modular mainframe systems up to 48 zones
- Wide range of cables, connectors, and accessories, including cables compatible with Incoe® and Fast Heat® hot runner systems
- CompuStep® heater conditioning system
- CompuCycle® power control system
- Built-in diagnostics
- SafeChange™ "hot swap" feature provides safe disconnect in case of inadvertent removal of module from energized mainframe
- Automatic power hold if thermocouple breaks
- Self-regulating manual power controllers
- Mainframes field-convertible to global power supply voltages
- Series K control computers for hot runner control applications up to 264 zones

TABLE OF CONTENTS

Page

HOW TO ORDER A HOT RUNNER CONTROL SYSTEM

ORDERING SPECIFICATIONS

1. Specify type of controller required. — IMP, RMB, or RMC

2. Amperage required per zone? (heater wattage x voltage) — 15 or 30 amp

3. How many zones of control are required? — Up to 48 zones

4. Specify the mainframe cabinet. — See page 18
- Size frame required is the number of control modules plus any accessory modules.
- If 15 amp modules are used, specify MFL style frame.
- If 30 amp modules are used, specify MFH style frame.
- If an accessory module or Series RMC controller is used, specify an MFL-C or MFH-C style frame.
- If a current/voltage monitor is required, specify CV suffix in mainframe ordering code. (IMP only; not applicable to RMB or RMC)

Note: Contact factory for combination mainframes (15 A and 30 A together).

5. Specify Accessory Modules. — SAM
- IMP modules can be used with a Standby Alarm Module (SAM) (Refer to page 12.)

6. Specify cables, connectors, and terminal mounting boxes. — See pages 26 to 28

7. Choose optional mainframe accessories: — See page 29

Floor stands
Transformer kits
Closure (blanking) panels

Notes: Athena's mainframes are compatible with all D-M-E Company's G SERIES and SMART SERIES,® ITC, MCS, YUDO® and INCO® brand mainframes.
Use "D" ordering suffix for 60 Hz and °F
Use "X" ordering suffix for 50 Hz and °C
Use "E" ordering suffix for 50 Hz and °C, CE-compliant

HOT RUNNER CONTROLLER SELECTION GUIDE

Feature	Controller Series		
	IMP	RMB	RMC
CE-compliant			
UL/CSA/VDE-approved power switch			
Type J thermocouple			
Type K thermocouple			
Process display (LED)			
Fahrenheit/Celsius mode	Jumper	Jumper	Jumper
Setpoint display	Thumbwheel	LED	LED
Setpoint adjust	Thumbwheel	Pushbutton	Pushbutton
CompuStep® soft start			
Temperature alarms	Fixed	Fixed	Adjustable
Reverse thermocouple alarm			
Open thermocouple alarm			
Shorted thermcouple alarm			
External alarm (add'l module required)			
Auto/manual control			
Autotuning			
30 amp capability			
% output reading			
Horizontal single zone model	IMP/P	See RMC/P	RMC/P
Idle setpoint/setback			
SafeChange™ "hot-swap" feature			
Bumpless auto/manual transfer			
Front-panel lockout			
Switch to manual on open thermocouple			
Ground fault alarm			
Open heater alarm			
Loop break alarm			
Boost mode			
Current reading			
Adjustable control settings			
Shorted triac safety relay			
24 volt output (Series SY system)			
Thermocouple slaving			
Switch to manual %, OFF, or last % of output on open thermocouple			
Setpoint limits			
ALL command			
Modbus® communications			
Palm™ handheld interface			
Years under warranty	2	2	2

SERIES IMP

Athena's Series IMP Modules use microprocessor-based circuitry to perform all required control functions. Units have built-in diagnostics and are fully self-tuning—setpoint temperatures are maintained without the need to manually preset or adjust the control temperature.

- *Simultaneous digital setpoint and digital temperature indication*
- *Available in 15-amp modules as well as single-zone 15- and 30-amp portable temperature controllers*
- *Athena's mainframes are compatible with all D-M-E Company's G SERIES and SMART SERIES® ITC, MCS, YUDO® and INCO® brand mainframes.*
- *CompuStep® feature removes moisture from the heater before full power is applied*
- *CompuCycle® feature improves response time, reduces thermal fatigue and prolongs heater life by applying AC power smoothly and continuously*
- *Manual control for non-thermocouple applications, provides standby or "weekend" heat or to manually control temperature if a thermocouple fails*
- *Diagnostic and protection features include power "on," power to load, manual made, and over/under temperature, plus indicators and system protection for reversed and open thermocouples*
- *SafeChange™ "hot swap" feature allows safe removal and replacement of module*
- *Available standby heat and alarm accessory module (SAM) automatically sets all zones for standby, or "weekend" heat, and provides visual and audible alarms for over/under temperature (see page 12).*

Now...with SafeChange™ Hot Swap Feature!

Series IMP/P Portable Single-Zone Controller (page 16)

CE

Ordering Information

I M P — ☐ — ☐☐ — ☐☐☐

Or

I M P P — Single-Zone Portable

Market
D = Domestic
X = Export
E = CE

Current Rating
15 = 15 A
30 = 30 A (IMP only)

Special Options
000 = Consult factory

Note: The 30 amp Series IMPis twice as wide as the 15 amp model and has a circuit breaker instead of a power switch.

SERIES IMP TECHNICAL SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

Control Mode	CompuCycle® system
Temperature Range	Ambient to 999˚F, or ambient to 535˚C
Temperature Reset	Automatically corrects reset to within 2˚F (1˚C) at all settings
Control Accuracy	±1.0˚F (±0.5˚C) dependent on the total thermal system
Temperature Stability	±0.5% of full scale over the ambient range of 32 to 140˚F (0 to 60˚C)
Calibration Accuracy	Better than 0.2% of full scale
Power Response Time	Better than 0.13 seconds
Compensated Manual Mode	Maintains constant output power to within 1% of manually set power level with line voltage variation from 192 to 264 volts. Power control range is from 0 to 100%, using the CompuCycle system power drive.
Over Temperature Indicator	The upper segment of the leftmost display will be “on” and the whole display flashes at about 2 Hz when the temperature error exceeds +30˚F (+17˚C)
Under Temperature Indicator	The lower segment of the leftmost display will be “on” and the whole display flashes at about 2 Hz when the temperature error exceeds -30˚F (-17˚C)
TC Break Indication	Flashing “ ▭ ” on the leftmost display (in closed-loop and CompuStep)
TC Reverse Indication	Flashing “ ≡ ” on the leftmost display (in closed-loop and CompuStep)
No Heat/Open Heater Indication	Flashing “ — ” center segment only of the leftmost display (in closed-loop)
CompuStep® System Control Mode	Variable stepping voltage, phase fired
CompuStep System Duration	Approximately 5 minutes
CompuStep System Output Voltage	Steps approximately from 25 V_{RMS} to 170 V_{RMS} with 240 Vac line input
CompuStep System Holding Temperature	256˚F (125˚C)
CompuStep System Override Temperature	200˚F (93˚C)
Operational Mode Priority	a. TC break, TC reverse and No Heat override CompuStep System b. Manual mode overrides TC break, TC reverse and No Heat

INPUT SPECIFICATIONS

Thermocouple (T/C) Sensor	Type “J”, grounded or ungrounded
External (T/C) Resistance	Greater than 1000 ohms
T/C Isolation	Isolated from ground and supply voltages
Cold Junction Compensation	Automatic, better than 0.02˚F/F˚ (0.01˚C/˚C)
Input Type	Potentiometric
Input Impedance	22 megohms
Input Protection	Diode clamp, RC filter
Input Amplifier Stability	Better than 0.05˚F/˚F (0.03˚C/˚C)
Input Dynamic Range	Greater than 1000˚F (535˚C)
Common Mode Rejection Ratio	Greater than 100 dB
Power Supply Rejection Ratio	Greater than 90 dB

OUTPUT SPECIFICATIONS

Voltages	240 Vac nominal, single phase 120 Vac available
Power Capability	15 amperes, 3600 watts @ 240 Vac, 30 amperes, 7200 watts @ 240 Vac
Output Switch	Internal solid state triac, triggered by ac zero crossing pulses
Overload Protection	Triac and load use high speed fuses. Both sides of ac line are fused.
Power Line Isolation	Optically and transformer isolated from ac lines. Isolation voltage is greater than 2500 volts.

CONTROLS AND INDICATORS

Setpoint Control	Precision 3 digit pushbutton switch, direct reading; Range: 0 to 999˚F (535˚C); Resolution: 1˚F (1˚C); Accuracy: Better than 0.5˚F (0.3˚C)
Manual Power Control	Single turn potentiometer, calibrated scale; Range: 0-100%; Linearity: 10%
Mode Control	3-position sliding switch selects mode of operation 1. top position-Manual mode 2. middle position-Auto mode 3. bottom position-Auto mode with CompuStep system
Power ON/OFF	Rocker switch, UL, CSA, VDE approved

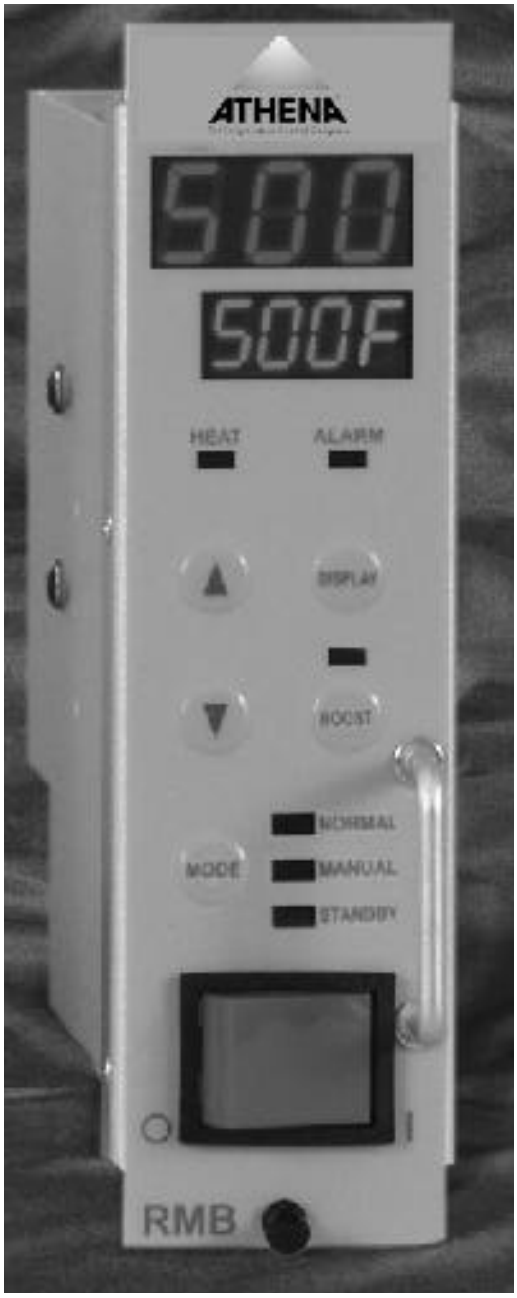
ELECTRICAL POWER SPECIFICATIONS

Input Voltage	240/120 Vac, + 10% - 20%
Frequency	50 Hz ± 3 Hz, 60 Hz ± 3 Hz
DC Power Supplies	Internal generated, regulated and temperature compensated
Module Power Usage	Less than 3 watts, excluding load

SERIES RMB

The Athena Series RMB is a microprocessor-based, single-zone temperature controller specifically designed for runnerless molding applications. It features an easy-to-use operator keypad, two LED displays, and three discrete indicators for heat-current, alarm and manual mode.

- *Athena's mainframes are compatible with all D-M-E Company's G SERIES and SMART SERIES,® ITC, MCS, YUDO® and INCO® brand mainframes.*
- *Accepts Type J or Type K thermocouple input (jumper selectable)*
- *Auto-tuning, with adjustable proportional band and rate*
- *Bumpless auto/manual transfer*
- *CompuStep® bake out feature prevents moisture at startup*
- *Built-in loop break, short, open, and reverse thermocouple protection*
- *Built-in triac safety protection*
- *Ground-fault protection*
- *Preset alarms at 30° F (17°C)*
- *Jumper-selectable soft-start mode*
- *Current monitor feature displays average current to load*
- *SafeChange™ "hot swap" feature allows safe removal and replacement of module*
- *CE compliant*



CE

Ordering Information

R M B – ☐ – ☐☐ – ☐☐☐

Market
D = Domestic
X = Export
E = CE

Current Rating
15 = 15 A
30 = 30 A

Special Options
000 = Consult factory

Note: The 30 amp Series RMB is twice as wide as the 15 amp model and has a circuit breaker instead of a power switch.

SERIES RMB TECHNICAL SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

Auto Control Mode	CompuCycle® system
Control Accuracy	±0.1˚F (±0.1˚C) dependent on the total thermal system
Temperature Range	32 to 999˚F (0 to 537˚C)
Temperature Stability	±0.5% of full scale over the ambient range of 32 to 131˚F (0 to 55˚C)
Calibration Accuracy	Better than 0.2% of full scale
Power Response Time	Better than 300 milliseconds
Process Sampling	100 milliseconds (nominal)
˚F/˚C	Jumper-selectable
CompuStep® System Control Mode	Variable stepping voltage, phase fired
CompuStep System Duration	Approximately 5 minutes
CompuStep System Output Voltage	Steps approximately from 25 V_{RMS} with 240 Vac line output, phase-fired
CompuStep System Override Temp	200˚F (93˚C)
Operational Mode Priority	a. T/C open, T/C reverse, Shutdown and Open heater override Compu Step system b. Manual mode overrides T/C open, T/C reverse

INPUT SPECIFICATIONS

Thermocouple (T/C) Sensor	Type “J” or Type “K”, grounded or ungrounded (switch-selectable)
External T/C Resistance	Maximum 100 ohms for rated accuracy
T/C Isolation	Isolated from ground and supply voltages
Cold Junction Compensation	Automatic, better than 0.02˚F/˚F (0.01˚C/˚C)
Input Type	Potentiometric
Input Impedance	10 megohms
Input Protection	Diode clamp, RC filter
Input Amplifier Stability	Better than 0.05 ˚F/˚F (0.03˚C/˚C)
Input Dynamic Range	Greater than 999˚F (537˚C)
Common Mode Rejection Ratio	Greater than 100 dB
Power Supply Rejection Ratio	Greater than 70 dB

OUTPUT SPECIFICATIONS

Voltages	240 Vac nominal, single phase 120 Vac available
Power Capability	15 amperes, 3600 watts @ 240 Vac; 30 amperes, 7200 watts @ 240 Vac
Overload Protection	Triac and load use high speed fuses. Both sides are fused (GBB)
Power Line Isolation	Optically and transformer isolated from ac lines. Isolation voltage is greater than 2500 volts.
Output Drive	Internal solid state triac, triggered by ac zero crossing pulses

CONTROLS AND INDICATORS

Setpoint Control	Two buttons up or down. Resolution: 1˚F (1˚C)
% Power Control	Two buttons up or down
Mode Control	Push button switch with LED indicator for manual mode
Display	Top: 3-digit filtered LED Bottom: 4-digit filtered LED
Status Indicators	Heat-current output. Alarm
Power On-Off	Rocker Switch, UL, CSA, and VDE approved

ELECTRICAL POWER SPECIFICATIONS

Input Voltage	240/120 Vac, + 10% -20%
Frequency	50 Hz ± 3 Hz, 60 Hz ± 3 Hz
DC Power Supplies	Internal generated, regulated and temperature compensated
Module Power Usage	Less than 3 watts, excluding load

SERIES RMC

The Athena Series RMC brings new and highly productive benefits to injection molders looking for a modular hot runner controller that's flexible, easy to set up, and simple to operate.

Using the popular Modbus® communications protocol, the next-generation RMC gives users the ability to set or change all zones, either remotely from a desktop computer, from a Palm® handheld device, or (with the ALL command) from any other individual RMC module in the mainframe.

- *Choice of three default modes for open thermocouple condition*
- *Built-in triac safety protection*
- *Accepts J or K thermocouple input (jumper selectable)*
- *SafeChange™ "hot swap" feature allows safe removal and replacement of module*
- *CompuStep® bake out feature prevents moisture at startup*
- *Built-in loop break, short, open, and reverse thermocouple protection*
- *"Boost" mode for temporary % of power output increase*
- *Ground-fault protection*
- *Adjustable setpoint limits*
- *Stores highest temperature detected*
- *Current monitor feature displays average current to load*
- *CE compliant*

Palm® handheld with ZonePilot™ software

)

CE

Ordering Information

R M C — ☐ — ☐☐ — ☐☐☐

Or

R M C P

Single-Zone Portable

Market
D = Domestic
X = Export
E = CE

Current Rating
15 = 15 A

Special Options
000 = Consult factory

SERIES RMC TECHNICAL SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

Auto Control Mode	CompuCycle® system
Control Accuracy	±0.1˚F (±0.1˚C) dependent on the total thermal system
Temperature Range	32 to 999˚F (0 to 537˚C)
Temperature Stability	±0.5% of full scale over the ambient range of 32 to 131˚F (0 to 55˚C)
Calibration Accuracy	Better than 0.2% of full scale
Power Response Time	Better than 300 milliseconds
Process Sampling	100 milliseconds (nominal)
˚F/˚C	Jumper-selectable
CompuStep® System Control Mode	Variable stepping voltage, phase fired
CompuStep System Duration	Approximately 5 minutes
CompuStep System Output Voltage	Steps approximately from 25 V_{RMS} with 240 Vac line output, phase-fired
CompuStep System Override Temp	200˚F (93˚C)
Operational Mode Priority	a. T/C open, T/C reverse, Shutdown and Open heater override CompuStep system b. Manual mode overrides T/C open, T/C reverse

INPUT SPECIFICATIONS

Thermocouple (T/C) Sensor	Type “J” or Type “K”, grounded or ungrounded (switch-selectable)
External T/C Resistance	Maximum 100 ohms for rated accuracy
T/C Isolation	Isolated from ground and supply voltages
Cold Junction Compensation	Automatic, better than 0.02˚F/˚F (0.01˚C/˚C)
Input Type	Potentiometric
Input Impedance	10 megohms
Input Protection	Diode clamp, RC filter
Input Amplifier Stability	Better than 0.05 ˚F/˚F (0.03˚C/˚C)
Input Dynamic Range	Greater than 999˚F (537˚C)
Common Mode Rejection Ratio	Greater than 100 dB
Power Supply Rejection Ratio	Greater than 70 dB

OUTPUT SPECIFICATIONS

Voltages	240 Vac nominal, single phase 120 Vac available
Power Capability	15 amperes, 3600 watts @ 240 Vac
Overload Protection	Triac and load use high speed fuses. Both sides are fused (GBB)
Power Line Isolation	Optically and transformer isolated from ac lines. Isolation voltage is greater than 2500 volts.
Output Drive	Internal solid state triac, triggered by ac zero crossing pulses

CONTROLS AND INDICATORS

Setpoint Control	Two buttons up or down. Resolution: 1˚F (1˚C)
% Power Control	Two buttons up or down
Mode Control	Push-button switch with LED indicator for manual mode
Display	Top: 3-digit filtered LED Bottom: 4-digit filtered LED
Status Indicators	Heat-current output Alarm
Power On-Off	Rocker Switch, UL, CSA, and VDE approved

ELECTRICAL POWER SPECIFICATIONS

Input Voltage	115 to 230 Vac, ± 10%
Frequency	50-60 Hz
DC Power Supplies	Internally generated, regulated and temperature compensated
Module Power Usage	Less than 6 watts, excluding load

SAM SERIES

Over/under temperature alarm. Built in standby/night heat. Audio and relay output. For use with IMP only.

SPECIFICATIONS

Standby Temperature	200° F (93° C)	
AC Input Requirements	240 Vac + 10% -20%, 48-63 Hz (standard) 120 Vac (Available)	
Alarm Limits	+/- 30° F (17° C) when used with an IMP	
Alarm Output (Audible)	Over Temperature:	2 KHz tone at 2 Hz interval
	Under Temperature:	1 Hz flashing interval
Alarm Output (Visual)	Over Temperature:	2 Hz flashing rate
	Under Temperature:	1 Hz flashing rate
Output Connector	AMP MIL-style connector (4 Pin) providing Normally Closed and Normally Opened relay contacts. (5 amp maximum)	
Communication Capacity	50 zones maximum	

Ordering Information

S A M – [ ] – [ ][ ][ ]

Market
D = Domestic
X = Export

Special Options
000 = Consult factory

NOTES

SERIES SY

Athena's low-voltage hot runner temperature control systems combine 240 Vac and 24 Vac into one unit and are available in either Series RMB or Series RMC control module configurations. A special safety interlock prevents insertion of a 24 Vac control module into a 240 Vac mainframe. Both controllers share these advanced features:

- *Dual digital displays*
- *Auto-tuning, with adjustable proportional band and rate*
- *Advanced diagnostics automatically inform the user of fault conditions, including open thermocouple, shorted thermocouple, reversed thermocouple, open heater, and high and low process temperature.*
- *CompuStep® provides gradual phase angle-fired voltage during warmup.*
- *CompuCycle® utilizes zero crossover power to improve response time, reduce thermal fatigue, and prolong heater life.*
- *Bumpless auto/manual transfer*
- *Wide range of accessories and control modules available to customize system*

System Configuration

Athena® low-voltage hot runner control systems include the mainframe cabinet with fused circuit breaker/disconnect, stepdown transformer, and floorstand. Controller modules, mold connectors, terminal boxes, and combination cables must be ordered separately (see ordering information below).

CE

Ordering Information

Low-Voltage System

SY - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

Communications
0 = No
C = Yes (RMC only)

Market
D = Domestic
X = Export
E = CE

240 Vac Zones
04 = 4 Zones

24 Vac Zones
04 = 4 Zones
08 = 8 Zones

CV Monitor
00 = No
CV = Yes

Special Options
(Consult Factory)

Control Module

[ ] - [ ] - [ ] - 024

Controller
RMC = Series RMC
RMB = Series RMB

Market
D = Domestic
X = Export
E = CE

Current Rating
15 = 15 amp

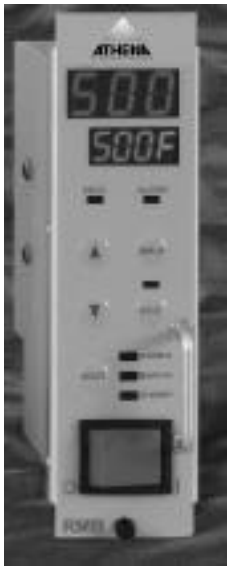
24 Vac Option

Mold Connectors:	TPC-00-01
Terminal Boxes:	PTC-00-TB-12
Combination Cables:	CPT-10 (10') CPT-20 (20')

SERIES SY DUAL-VOLTAGE HOT RUNNER SYSTEM

The Athena Series RMB controller features an easy-to-use operator keypad, two LED displays, and three discrete indicators for heat-current, alarm and manual mode.

- Accepts Type J or Type K thermocouple input (jumper selectable)
- Built-in loop break, short, open, and reverse thermocouple protection
- Built-in triac safety protection
- Ground-fault protection
- Preset alarms at 30° F (17° C)
- Jumper-selectable soft-start mode
- Current monitor feature displays average current to load



See page 8 for more information.

See page 10 for more information.

The Athena Series RMC controller offers the same features as the Series RMB, plus:

- Built-in current monitoring
- Front-panel boost function
- ALL command
- Remote communications via Modbus® or Palm™ handheld device
- Choice of three default modes for open thermocouple protection
- Boost mode for temporary % of power output increase

SERIES IMP/P AND RMC/P PORTABLE CONTROLLERS

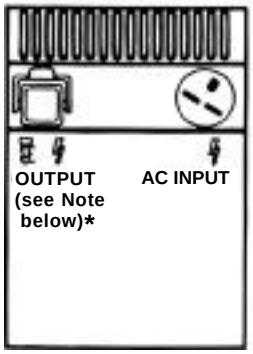
SERIES IMP/P SINGLE-ZONE CONTROLLER

Note: For features and technical specifications of the Series IMP/P, refer to the Series IMP description on page 6.

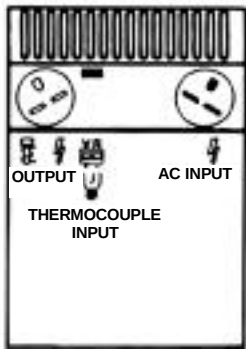
SERIES RMC/P SINGLE-ZONE CONTROLLER

Note: For features and technical specifications of the Series RMC/P, refer to the Series RMC description on page 10.

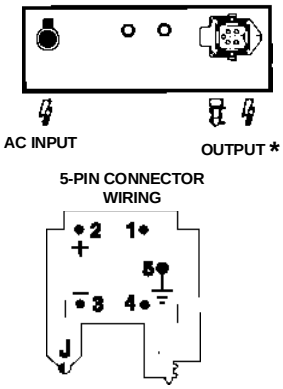
IMP/P15B
NEMA in,
5-Pin out



IMP/P15A
NEMA in,
NEMA out



IMP/P10B
Line in,
5-Pin out



*Note: Mating connector CKPTM1 supplied.

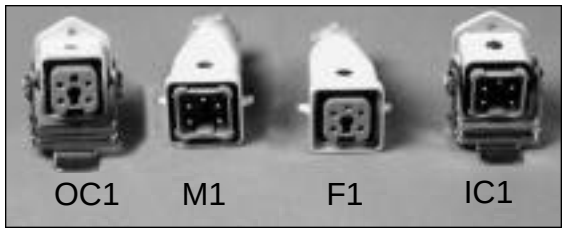
Ordering Information

Controller	Connector Style	Market	Special Options
IMP/P = IMPP RMC/P = RMCP	10A = NEMA/NEMA 10B = Line In/5-Pin 15A = NEMA/NEMA 15B = NEMA /5-Pin	D = Domestic X = Export E** = CE	000 = Consult factory

** 10 amp only

CONNECTORS AND CABLE FOR PORTABLE CONTROLLERS

5-Pin Combination Power and Thermocouple Connnectors for Portable Controllers (one per zone required)

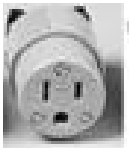


C K P T – ☐ ☐ ☐

Individual-Zone Combo Connectors
CKPT = 5-Pin Combo Mold Power/ Thermocouple Connectors for Portable Main-frames

Type
OC1 = Frame
M1 = Cable, Frame-End
F1 = Cable, Mold-End
IC1 = Mold

NEMA Connectors for Portable Controllers



215K005U01 (AC1512F)
Cord connector, female
15 A, 125 V
Power out

215K006U01 (AC1512M)
Cord connector, male
15 A, 125 V
Power in

215K004U01 (AC1524F)
Cord connector, female
15 A, 250 V
Power out

215K003U01 (AC1524M)
Cord connector, male
15 A, 250 V
Power in

215K002U01 (AC2024F)
Connector chassis, female
20 A, 250 V
Power out

215K001U01 (AC2024M)
Connector chassis, male
20 A, 250 V
Power in

TCS1
TC Socket, mold side

215P001U01 (M2MJ)
TC mini-plug

Individual 5-Pin Cable for Portable Controllers (one per zone required)

M P T C – ☐ ☐

Individual-Zone, 5-Pin
MPTC = 5-Pin Cable

Length
10 = 10'
20 = 20'

MAINFRAME CONFIGURATIONS

MAINFRAMES FOR 15-AMP MODULES*

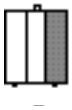
The configurations illustrated below provide a wide selection of zone capacities to suit almost any control application. The 5, 8 and 12 zone frames use individual frame sections. The 16 thru 48 zone frames use 2, 3 or 4 frame sections rigidly fastened together into one prewired integral unit which requires only one main AC power input connection. The Current/ Voltage Monitor option will be factory installed and must be ordered at same time as mainframe.

Dimensions*

MFL Mainframe	Height	Depth	Width	MFH Mainframe
1- & 2-zone	9-1/4”	10”	7”	1-zone
3-zone	9-1/4”	12-3/4”	7”	
5-zone	8-7/8”	11-1/2”	16-1/8”	2-zone
8-zone	8-7/8”	11-1/2”	22-1/8”	3-zone
12-zone	8-7/8”	11-1/2”	30-1/4”	5- & 6-zone

*For mainframes over 12 zones, add dimensions of stacked cabinets.

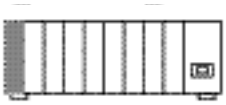
1-Zone



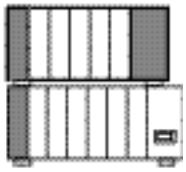
2-Zone

3-Zone

5-Zone

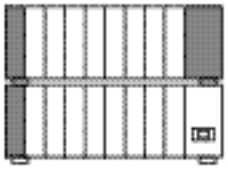


8-Zone

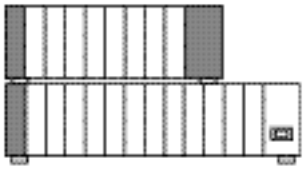


11-Zone

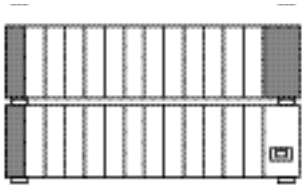
12-Zone



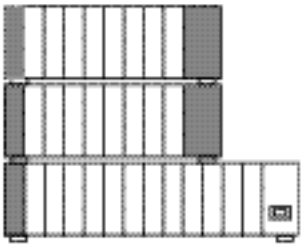
16-Zone



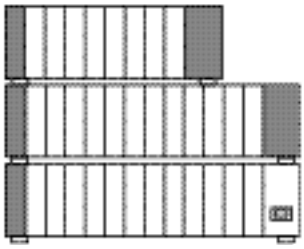
20-Zone



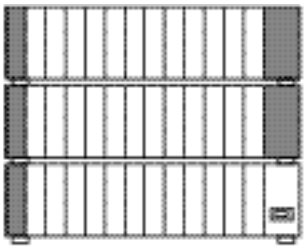
24-Zone



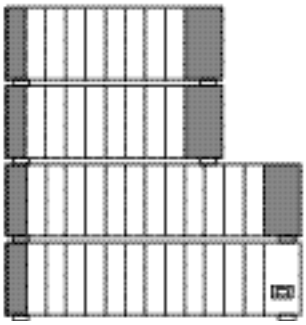
28-Zone



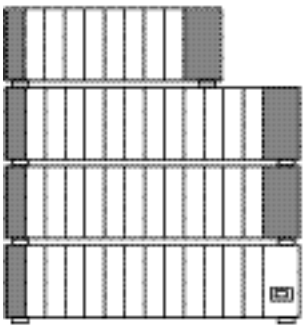
32-Zone



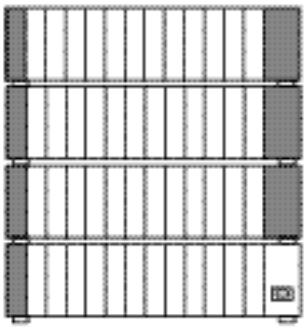
36-Zone



40-Zone



44-Zone



48-Zone

Notes on Mainframes

Mainframe cabinets may be stacked to form a permanent, integrated unit with a single ac power input and breaker. Up to 48 control modules (zones) may be accommodated.

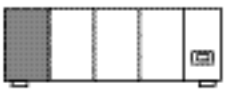
5-, 8-, and 12-zone mainframes have a breaker rating of 50 amps and a maximum total wattage of 20 kW (domestic and export) and 36 kW (CE). Mainframes for 16 zones and over have breaker ratings of 70 amps and 29 kW (domestic and export) and 50.4 kW (CE).

MAINFRAMES FOR 30-AMP MODULES**

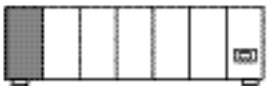
The 5 configurations illustrated below provide 1, 2, 3, 5 or 6 zones of 30 amp control for higher wattage heater applications. The Current/Voltage Monitor option will be factory installed and must be ordered at same time as mainframes.

1-Zone

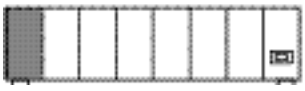
2-Zone



3-Zone



5-Zone



6-Zone

**NOTE: Blank panel(s) should be ordered to provide for heat dissipation and to cover unused zones in frames. Combination frames to accommodate both 15 and 30 amp modules are available on special order.

HOW TO SIZE CIRCUIT BREAKERS AND TRANSFORMER KITS

To Size Circuit Breakers, Follow These Guidelines:

5, 8, 12 zones = 50 A breaker rating @ 20 kW max.
>12 zones = 70 A breaker rating @ 29 kW max.

To Size a Transformer Kit, Follow These Steps:

1. Calculate total heater wattage
2. Divide result by 1000 (equals kVA)
3. Select transformer from table below

Transformer Part No.	Load Rating in kVA	3-Phase Amperage (per Phase)
TK09	9	21.7 A
TK15	15	36.1 A
TK30	30	72.3 A
TK45	45	108.4 A

Transformer kits are fully wired and include enclosed transformer (480 Vac 3Ø in, 240 Vac 3Ø out) with adjustable voltage taps, power cable to main frame, disconnect switch, extra fuses, and floor stand with all hardware. Other transformers are available for your particular power requirements.

For ordering information, see page 29.

MAINFRAMES FOR PORTABLE CONTROLLERS

Ordering Information

SINGLE / DUAL ZONE MAINFRAMES

M F L – ☐ – ☐ – ☐☐ – ☐☐ – ☐☐☐

Controller
MFL = 15 amp Zones

Market
D = Domestic
X = Export

Zone Count
1 = Single Zone
2 = Dual Zone

Input (Power)
NO = NEMA
CO = Clamp

Output (Power)
NF = NEMA / Fan
CO = Clamp
PO = 5-Pin
PS = 5-Pin / Switch
PF = 5-Pin / Fan

Special Options
000 = Consult factory

HIGH-POWER SINGLE ZONE MAINFRAMES

M F H – ☐ – ☐ – ☐☐ – ☐☐ – ☐☐☐

Controller
MFH = 30 amp Zones

Market
D = Domestic
X = Export

Zone Count
1 = Single Zone

Input (Power)
CO= Clamp

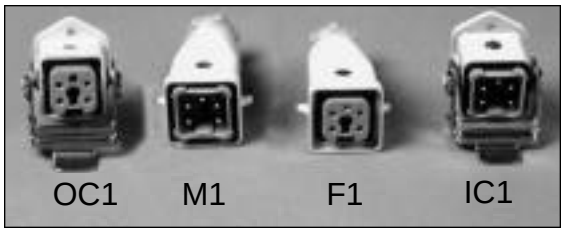
Output (Power)
CO= Clamp

Special Options
000 = Consult factory

Note: Controller modules not included; frame connections included.

CONNECTORS AND CABLE FOR PORTABLE CONTROLLERS

5-Pin Combination Power and Thermocouple Connnectors for Portable Controllers (one per zone required)

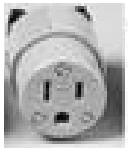


C K P T – ☐ ☐ ☐

Individual-Zone Combo Connectors
CKPT = 5-Pin Combo Mold Power/ Thermocouple Connectors for Portable Main-frames

Type
OC1 = Frame
M1 = Cable, Frame-End
F1 = Cable, Mold-End
IC1 = Mold

NEMA Connectors for Portable Controllers



215K005U01
(AC1512F)
Cord connector, female
15 A, 125 V
Power out

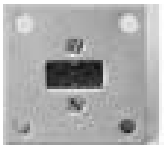
215K006U01
(AC1512M)
Cord connector, male
15 A, 125 V
Power in

215K004U01
(AC1524F)
Cord connector, female
15 A, 250 V
Power out

215K003U01
(AC1524M)
Cord connector, male
15 A, 250 V
Power in

215K002U01
(AC2024F)
Connector chassis, female
20 A, 250 V
Power out

215K001U01
(AC2024M)
Connector chassis, male
20 A, 250 V
Power in



TCS1
TC Socket, mold side

215P001U01
(M2MJ)
TC mini-plug

Individual 5-Pin Cable for Portable Controllers (one per zone required)

M P T C – ☐ ☐

Individual-Zone, 5-Pin
MPTC = 5-Pin Cable

Length
10 = 10′
20 = 20′

TRI-ZONE™ PORTABLE THREE-ZONE CONTROLLER

Ordering Information

Base	Communications	Market	Zones	Input	Output
MFL	0 = No 1 = Yes	D = Domestic X = Export	03	CO = Clamp NO = NEMA	PT = Combo PO = 5-Pin/Fan

Note: Controllers not included.

Combo Cable for Tri-Zone System

TPTC – ☐☐

Cable
TPTC = Output Cable for Tri-Zone System

Length
10 = 10′
20 = 20′

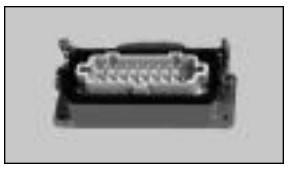
Individual Zone Cable (3 Required)

MPTC – ☐☐

Individual-Zone, 5-Pin
MPTC = 5-Pin Cable (3 required) for Tri-Zone System

Length
10 = 10′
20 = 20′

Combo Connector for Tri-Zone System



TPT03 – ☐

Connector
TPT03 = Output Connector for Tri-Zone System

Market
A = Domestic and Export
E = CE

MAINFRAME ORDERING INFORMATION

Ordering Information

STANDARD MAINFRAMES

Base	Communications	Market	Zone Count	CV Monitor	Special Options
MFL = 15 A zones	0 = No comms. C = Comms.	D = Domestic X = Export E = CE	05 = 5 08 = 8 11 = 11 12 = 12 16 = 16 20 = 20 24 = 24 28 = 28 32 = 32 36 = 36 40 = 40 44 = 44 48 = 48	00 = Not included CV = Included	000 = Consult factory

HIGH-POWER MAINFRAMES

Base	Communications	Market	Zone Count	CV Monitor	Special Options
MFH =30 A zones	0 = No comms. C = Comms.	D = Domestic X = Export E = CE	02 = 2 03 = 3 05 = 5 06 = 6	00 = Not included CV = Included	000 = Consult factory

Available in place of the standard breaker/disconnect panel, the CV monitor provides the operator with:

- *voltage information from each phase*
- *the ability to select an individual zone to monitor current*

HOT RUNNER CONTROLS, SYSTEM COMPONENTS
DOMESTIC AND EXPORT

#Zones	CABLES		CONNECTORS		TERMINAL BOXES **		
	Mold Power (C10=10 Ft) (C20=20 Ft)	Thermocouple (C10=10 Ft) (C20=20 Ft)	Mold Power Input*	Thermocouple	Power Input	Thermocouple	Combination
STANDARD MAINFRAME ("A" SUFFIX = DOMESTIC OR EXPORT)							
5	1-MPCL05CxxA	1-TC05CxxA	1-PICL05A	1-MTC05A	1-PICL512TBA	1-MTC005TBA	1-PTCL005TBA
8	1-MPCL08CxxA	1-TC08CxxA	1-PICL08A	1-MTC08A	1-PICL512TBA	1-MTC008TBA	1-PTCL008TBA
11/12	1-MPCL12CxxA	1-TC12Cxx A	1-PICL12A	1-MTC12A	1-PICL512TBA	1-MTC012TBA	1-PTCL012TBA
16	2-MPCL08CxxA	2-TC08CxxA	2-PICL08A	2-MTC08A	2-PICL512TBA	2-MTC008TBA	1-PTCL016TBA
20	1-MPCL08CxxA	1-TC08CxxA	1-PICL08A	1-MTC08A	2-PICL512TBA	1-MTC008TBA	1-PTCL008TBA
	1-MPCL12CxxA	1-TC12CxxA	1-PICL12A	1-MTC12A		1-MTC012TBA	1-PTCL012TBA
24	2-MPCL12CxxA	2-TC12CxxA	2-PICL12A	2-MTC12A	2-PICL512TBA	2-MTC012TBA	1-PTCL024TBA
28	2-MPCL08CxxA	2-TC08CxxA	2-PICL08A	2-MTC08A	3-PICL512TBA	2-MTC008TBA	1-PTCL016TBA
	1-MPCL12CxxA	1-TC12CxxA	1-PICL12A	1-MTC12A		1-MTC012TBA	1-PTCL012TBA
32	1-MPCL08CxxA	1- TC08CxxA	1-PICL08A	1-MTC08A	3-PICL512TBA	1-MTC008TBA	1-PTCL008TBA
	2-MPCL12CxxA	2-TC12CxxA	2-PICL12A	2-MTC12A		2-MTC012TBA	1-PTCL024TBA
36	3-MPCL12CxxA	3-TC12CxxA	3-PICL12A	3-MTC12A	3-PICL512TBA	3-MTC012TBA	3-PTCL012TBA
40	2-MPCL08CxxA	2-TC08CxxA	2-PICL08A	2-MTC08A	4-PICL512TBA	2-MTC008TBA	1-PTCL016TBA
	2-MPCL12CxxA	2-TC12CxxA	2-PICL12A	2-MTC12A		2-MTC012TBA	1-PTCL024TBA
44	1-MPCL08CxxA	1-TC08CxxA	1-PICL08A	1-MTC08A	4-PICL512TBA	1-MTC008TBA	1-PTCL008TBA
	3-MPCL12CxxA	3-TC12CxxA	3-PICL12A	3-MTC12A		3-MTC012TBA	3-PTCL012TBA
48	4-MPCL12CxxA	4-TC12CxxA	4-PICL12A	4-MTC12A	4-PICL512TBA	4-MTC012TBA	2-PTCL024TBA
HIGH-POWER MAINFRAME ("A" SUFFIX = DOMESTIC OR EXPORT)							
2	1-MPCH23CxxA	1-TC05CxxA	1-PICH23A	1-MTC05A	1-PICH023TBA	1-MTC005TBA	1-PTCH023TBA
3	1-MPCH23CxxA	1-TC05CxxA	1-PICH23A	1-MTC05A	1-PICH023TBA	1-MTC005TBA	1-PTCH023TBA
5	1-MPCH05CxxA	1-TC05CxxA	1-PICH05A	1-MTC05A	1-PICH005TBA	1-MTC005TBA	1-PTCH005TBA
6	1-MPCH06CxxA	1-TC08CxxA	1-PICH06A	1-MTC08A	1-PICH006TBA	1-MTC008TBA	1-PTCH006TBA

* Includes Crimp Connectors

**Order Power Input and Thermocouple or Combination

HOT RUNNER CONTROLS, SYSTEM COMPONENTS
CE COMPLIANT

#Zones	CABLES		CONNECTORS		TERMINAL BOXES **		
	Mold Power (C10=10 Ft) (C20=20 Ft)	Thermocouple (C10=10 Ft) (C20=20 Ft)	Mold Power Input*	Thermocouple	Power Input	Thermocouple	Combination
STANDARD MAINFRAME ("E" SUFFIX = CE COMPLIANT)							
5	1-MPCL05CxxE	1-TC05CxxE	1-PICL05E	1-MTC05E	1-PICL005TBE	1-MTC005TBE	1-PTCL005TBE
8	1-MPCL08CxxE	1-TC08CxxE	1-PICL08E	1-MTC08E	1-PICL008TBE	1-MTC008TBE	1-PTCL008TBE
11/12	1-MPCL12CxxE	1-TC12CxxE	1-PICL12E	1-MTC12E	1-PICL012TBE	1-MTC012TBE	1-PTCL012TBE
16	2-MPCL08CxxE	2-TC08CxxE	2-PICL08E	2-MTC08E	2-PICL008TBE	2-MTC008TBE	1-PTCL016TBE
20	1-MPCL08CxxE	1-TC08CxxE	1-PICL08E	1-MTC08E	2-PICL008TBE	1-MTC008TBE	1-PTCL008TBE
	1-MPCL12CxxE	1-TC12CxxE	1-PICL12E	1-MTC12E		1-MTC012TBE	1-PTCL012TBE
24	2-MPCL12CxxE	2-TC12CxxE	2-PICL12E	2-MTC12E	2-PICL012TBE	2-MTC012TBE	1-PTCL024TBE
28	2-MPCL08CxxE	2-TC08CxxE	2-PICL08E	2-MTC08E	3-PICL008TBE	2-MTC008TBE	1-PTCL016TBE
	1-MPCL12CxxE	1-TC12CxxE	1-PICL12E	1-MTC12E		1-MTC012TBE	1-PTCL012TBE
32	1-MPCL08CxxE	1- TC08CxxE	1-PICL08E	1-MTC08E	3-PICL008TBE	1-MTC008TBE	1-PTCL008TBE
	2-MPCL12CxxE	2-TC12CxxE	2-PICL12E	2-MTC12E		2-MTC012TBE	1-PTCL024TBE
36	3-MPCL12CxxE	3-TC12CxxE	3-PICL12E	3-MTC12E	3-PICL012TBE	3-MTC012TBE	3-PTCL012TBE
40	2-MPCL08CxxE	2-TC08CxxE	2-PICL08E	2-MTC08E	4-PICL008TBE	2-MTC008TBE	1-PTCL016TBE
	2-MPCL12CxxE	2-TC12CxxE	2-PICL12E	2-MTC12E		2-MTC012TBE	1-PTCL024TBE
44	1-MPCL08CxxE	1-TC08CxxE	1-PICL08E	1-MTC08E	4-PICL008TBE	1-MTC008TBE	1-PTCL008TBE
	3-MPCL12CxxE	3-TC12CxxE	3-PICL12E	3-MTC12E		3-MTC012TBE	3-TCL012TBE
48	4-MPCL12CxxE	4-TC12CxxE	4-PICL12E	4-MTC12E	4-PICL012TBE	4-MTC012TBE	2-PTCL024TBE
IGH-POWER MAINFRAME ("E" SUFFIX = CE COMPLIANT)							
2	1-MPCH23CxxE	1-TC05CxxE	1-PICH23E	1-MTC05E	1-PICH023TBE	1-MTC005TBE	1-PTCH023TBE
3	1-MPCH23CxxE	1-TC05CxxE	1-PICH23E	1-MTC05E	1-PICH023TBE	1-MTC005TBE	1-PTCH023TBE
5	1-MPCH05CxxE	1-TC05CxxE	1-PICH05E	1-MTC05E	1-PICH005TBE	1-MTC005TBE	1-PTCH005TBE
6	1-MPCH06CxxE	1-TC08CxxE	1-PICH06E	1-MTC08E	1-PICH006TBE	1-MTC008TBE	1-PTCH006TBE

* Includes Crimp Connectors

**Order Power Input and Thermocouple or Combination

POWER AND THERMOCOUPLE CABLE ORDERING INFORMATION

Mold Thermocouple Cable - MFL and MFH Mainframes

Cable
TC = Mold thermocouple cable

 # Zones
05 = 5 Zones
08 = 8 Zones
12 = 12 Zones

Length*
C10 = 10′
C20 = 20′

Market
A = Domestic and Export
E = CE

Special Options
000 = Consult factory

Mold Power Cable (15 amp) - Used with MFL Mainframe

Cable
MPCL = Mold power cable

 # Zones
05 = 5 Zones
08 = 8 Zones
12 = 12 Zones

Length*
C10 = 10′
C20 = 20′

Market
A = Domestic and Export
E = CE

Special Options
000 = Consult factory

High-Power Mold Power Cable (30 amp) - Used with MFH Mainframe

Cable
MPCH = High power mold power cable

 # Zones
23 = 2 or 3 Zones
05 = 5 Zones
06 = 6 Zones

Length*
C10 = 10′
C20 = 20′

Market
A = Domestic and Export
E = CE

Special Options
000 = Consult factory

*Consult factory for special lengths.

THERMOCOUPLE AND MOLD POWER CONNECTORS

THERMOCOUPLE CONNECTORS

[ ][ ][ ] – [ ][ ] – [ ]

Connector
MTC = Mold Thermocouple Connector

 # Zones
05= 5 Zones
08= 8 Zones
12 = 12 Zones

Market
A = Domestic and Export
E = CE

MOLD POWER/INPUT CONNECTORS

[ ][ ][ ][ ] – [ ][ ] – [ ]

Connector
PICL = Mold Power Connector

 # Zones
05 = 5 Zones
08 = 8 Zones
12 = 12 Zones

Market
A = Domestic and Export
E = CE

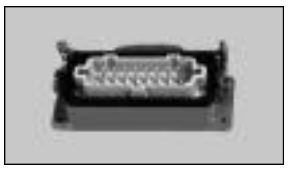
[ ][ ][ ][ ] – [ ][ ] – [ ]

Connector
PICH = High-Power Mold Power Connector

 # Zones
23 = 2 or 3 Zones
05 = 5 Zones
06 = 6 Zones

Market
A = Domestic and Export
E = CE

COMBO CONNECTORS FOR TRI-ZONE™ SYSTEM



[T][P][T][0][3] – [ ]

Connector
TPT03 = Output Connector for Tri-Zone System

Market
A = Domestic and Export
E = CE

TERMINAL MOUNTING BOXES ORDERING INFORMATION

MTC Terminal Mounting Boxes for Thermocouple Connectors

PICL and PICH Terminal Mounting Boxes for Mold Power Input Connectors (15 amps)

PTCH and PTCL Combination Terminal Mounting Boxes (30 amps)

BOXES FOR PORTABLE SYSTEMS

Model No.	Used With
PTCL-001-TB-A	IMP/P, RMC/Pand MFL mainframes with one 5-pin connector
PTCL-002-TB-A	MFL mainframes with two 5-pin connectors
PTCH-001-TB-A	MFH mainframes with one 30-amp NEMA plug and one thermocouple plug

Box
MTC = Thermocouple Box

 # Zones
005 = 5 Zones
008 = 8 Zones
012 = 12 Zones

Kit
TB = Terminal Box

Market
A = Domestic or Export
E = CE

Box
PICL = Power Box (Domestic and Export)

 # Zones
512 = 5 Zones
512 = 8 Zones
512 = 12 Zones

Kit
TB = Terminal Box

Market
A = Domestic or Export
E = CE

Box
PICL = Power Box (CE only)

 # Zones
005 = 5 Zones
008 = 8 Zones
012 = 12 Zones

Kit
TB = Terminal Box

Market
E = CE

Box
PICH = High Power Box (30A)

 # Zones
023 = 2 or 3 Zones
005 = 5 Zones
006 = 6 Zones

Kit
TB = Terminal Box

Market
A = Domestic or Export
E = CE

Box
PTCH = High Power Combina tion Box (30A)

 # Zones
023 = 2 or 3 Zones
005 = 5 Zones
006 = 6 Zones

Kit
TB = Terminal Box

Market
A = Domestic or Export
E = CE

Box
PTCL = Combination Box (Domestic and Export)

 # Zones
005 = 5 Zones
008 = 8 Zones
012 = 12 Zones

Kit
TB = Terminal Box

Market
A = Domestic or Export
E = CE

HOT RUNNER CONTROL SYSTEM ACCESSORIES

TRANSFORMER KITS

Transformer kits are fully wired and include enclosed transformer (480 Vac 3Ø in, 240 Vac 3Ø out) with adjustable voltage taps, power cable to main frame, disconnect switch, extra fuses, and floor stand with all hardware. Other transformers are available for your particular power requirements.

Directions for sizing a transformer kit may be found on page 19.

Ordering Information

Transformer	Rating	Phases	Voltage
TK= TK	06 = 6 KVA 09 = 9 KVA 15 = 15 KVA 30 = 30 KVA 45 = 45 KVA	1 = Single Phase 3 = Three Phase	A= 480 B= 600

CLOSURE (BLANKING) PANELS

Must be used to cover unused zones in main frames for correct air circulation (cooling). MFB10 for use on single unused zones. MFB20 for use on two unused zones. Supplied with push-pull panel fasteners.

Panel	Zones	Market
MFB= Blank	10 =Single zone 20 =Dual Zone	A = Domestic and Export E = CE

UNIVERSAL FLOOR STAND

Panel	Zones	Special Options
MFS= Floorstand	5812 = Adjustable	Consult Factory

MODULE REPLACEMENT FUSES

Catalog No.	Description	Amps	Quantity
ABC15	15 amp, 240 V	15	5
A25X30	30 amp, 240 V	30	1

INSULATED CRIMP CONNECTORS

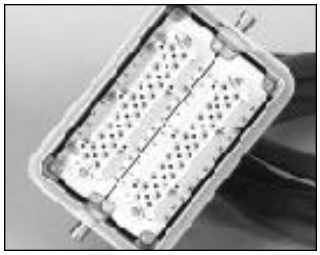
For easy splicing of mold power input connector leads to heater leads.

Catalog Number	Amps	Quantity
HWCC-1	15	36
HWCC-2	30	20

CUSTOM AND COMBINATION CABLES

Custom Cables for Incoe® and Fast Heat® Systems

For Incoe® Systems



Custom Cable
CC = Combination

 # Zones
04 = 4 Zones
08 = 8 Zones
12 = 12 Zones

Length
C10 = 10′
C20 = 20′

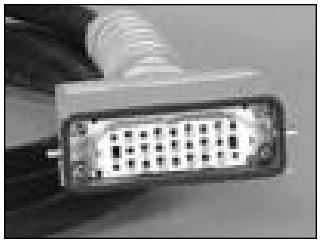
Market
A = Domestic and Export

Configuration
002

Note: Athena connectors are on mainframe side.
On mold side, cable connects to the following Incoe connector part number:
#1614 (4-zone system)
#3214 (8-zone system)
#4814 (12-zone system)

For Fast Heat® Systems

CM Mold Power Cable



CT Thermocouple Mold Power Cable

Custom Cable
CM = Mold Power
CT = Thermocouple

 # Zones
05 = 5 Zones
09 = 9 Zones
12 = 12 Zones

Length
C10 = 10′
C20 = 20′

Market
A = Domestic and Export

Configuration
012

Note: Connects to Fast Heat connectors on mold.

Combination Power and Thermocouple Cable (One zone per cable)

Cable
MPTC = Combination power and thermocouple cable

Length*
C10 = 10′
C20 = 20′

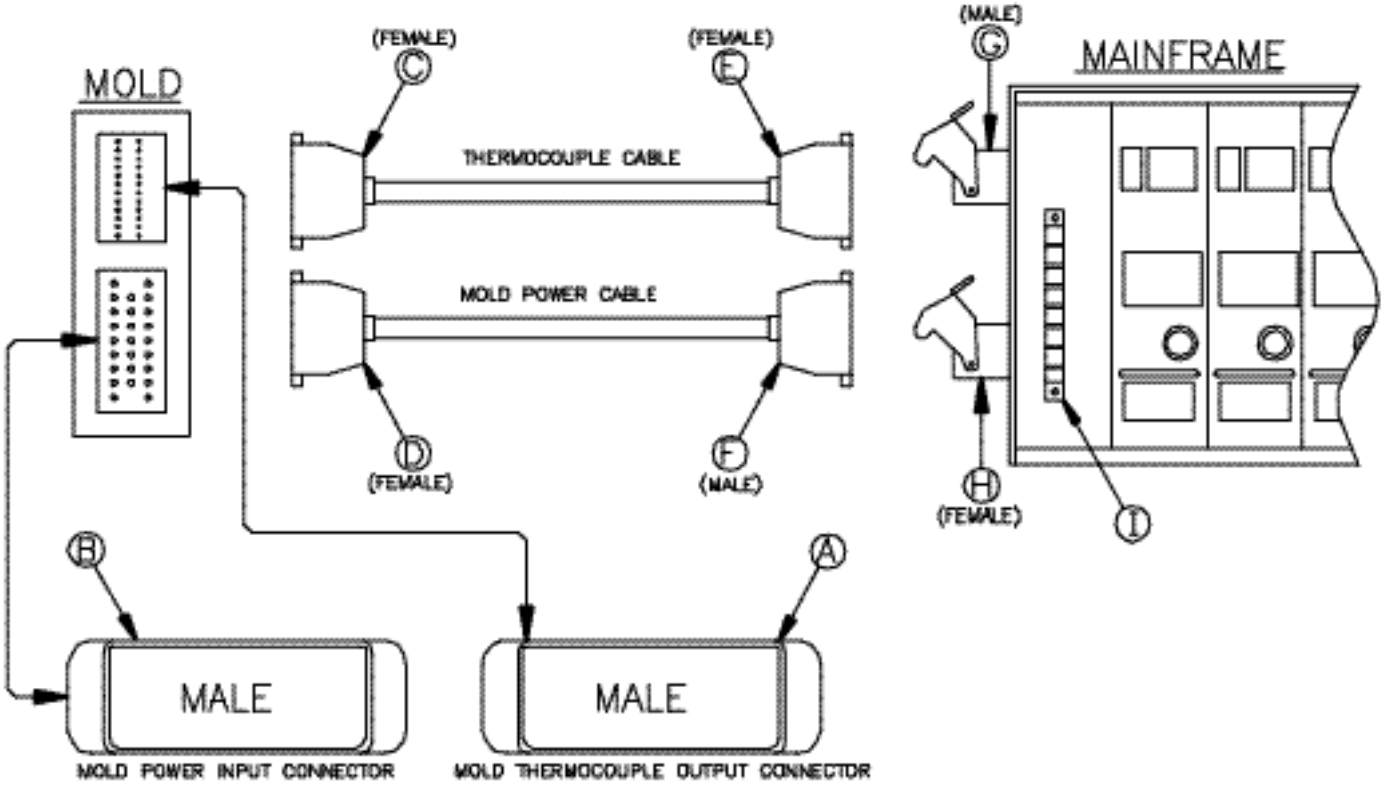
* Consult factory for special lengths.

Combo Output Cable for Tri-Zone™ System

Cable
TPTC = Combo Cable for Tri-Zone System

Length*
10 = 10′
20 = 20′

MAINFRAME CONNECTOR DIAGRAM



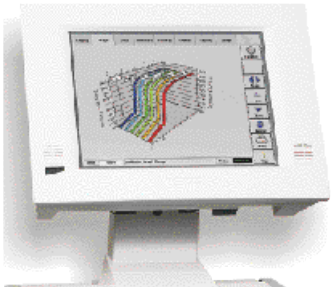
MOLD CONNECTORS			
REF	DOM/EXP	CE	DESCRIPTION
A	MTC05A	MTC05E	Mold Thermocouple Output Connector 5-Zone, and all 30 Amps
	MTC08A	MTC08E	Mold Thermocouple Output Connector 8-Zone
	MTC12A	MTC12E	Mold Thermocouple Output Connector 12-Zone
B	PICL05A	PICL05E	Mold Power Input Connector 5-Zone
	PICL08A	PICL08E	Mold Power Input Connector 8-Zone
	PICL12A	PICL12E	Mold Power Input Connector 12-Zone
	PICH23A	PICH23E	Mold-High Power Input Connector 2-3 Zone, 30 Amps
	PICH05A	PICH05E	Mold-High Power Input Connector 5-Zone (30 Amps)
	PICH08A	PICH08E	Mold-High Power Input Connector 8-Zone (30 Amps)

CABLE CONNECTORS			
REF	DOM/EXP	CE	DESCRIPTION
C	ACKTF15	ECKTF15	Mold End Kit/Thermocouple Cable 5-Zone (10, 15 or 30 Amps)
	ACKTF18	ECKTF18	Mold End Kit/Thermocouple Cable 8-Zone (10, 15 or 30 Amps)
	ACKTF112	ECKTF112	Mold End Kit/Thermocouple Cable 12-Zone (10, 15 or 30 Amps)
D	ACKPF112B	ECKPF112B	Mold End Kit for all 10 or 15 Amp Powtr Cables
	ACKPF13C	ECKPF13C	Mold End Kit for 2 or 3 Zone, 30Amp Power Cables
	ACKPF15C	ECKPF15C	Mold End Kit for 5-Zone, 30 Amp Power Cables
E	ACKTF112A	ECKTF112A	Frame End Kit for all Thermocouple Cables (10, 15 or 30 Amps)
F	ACKPM112B	ECKPM112B	Frame End Kit for all 10 or 15 Amp Power Cables
	ACKPM13C	ECKPM13C	Frame End Kit for 2 or 3 Zone, 30 Amp Power Cable
	ACKPM15C	ECKPM15C	Frame End Kit for 6-Zone, 30 Amp Power Cable

MAINFRAME CONNECTORS			
REF	DOM/EXP	CE	DESCRIPTION
G	ACKTM212A	ECKTM212A	Thermocouple Input Kit for all Mainframe (10, 15 or 30 Amps)
H	ACKPF212B	ECKPF212B	Power Output Kit for all 10 or 15 Amp Mainframes
	ACKPF23C	ECKPF23C	Power Output Kit for 2 or 3 Zone, 30 Amp Mainframes
	ACKPF25C	ECKPF25C	Power Output Kit for 6-Zone, 30 Amp Mainframes
I	215N003U01	215N003U01	PC Board Edge Connector for all Mainframes and Modules
	614AD11U01	614AD11U01	PC Board Edge Connector for all Mainframes and Modules W/Pins

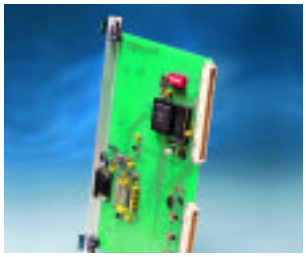
ALSO FROM ATHENA CONTROLS...

Series K Hot Runner Controls



Universal Digital Controllers

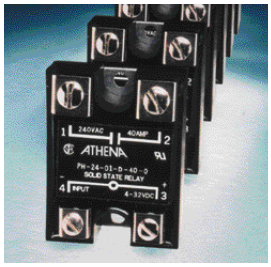
Custom Control Solutions



Analog Controllers

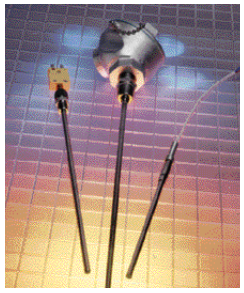
Power Controls

Power Handlers



Vintage Controllers

Tudor™ Temperature Sensors



ATHENA

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