



TEMPERATURE CONTROL MODULE HOUSINGS

Models 1 & 2 Zone

Item #104199 / Item #104303

INSTRUCTION MANUAL



April 2010
IMS Company
10373 Stafford Road
Chagrin Falls, OH 44023-5296

Telephone: (440) 543-1615
Fax: (440) 543-1069
Email: sales@imscompany.com
Website: www.imscompany.com

INSTALLATION AND OPERATING

I N S T R U C T I O N S

IMS 1 & 2 ZONE TEMPERATURE CONTROL HOUSINGS

SECTION	TITLE	PAGE
I.	DESCRIPTION	
	General	1-2
	Housings	3-4
	Connectors	5-7
II.	INSTALLATION	
	Location	8
	Power Connection	8
	Mold Connections	9-10
	Modules	11
III.	OPERATION	11
	Power	12
	Temperature Control Modules	12

F I G U R E S

1.	COMPONENT CONFIGURATION	2
2.	HOUSINGS	4
3.	CABLE & CONNECTORS	7

I N S E R T S

1.	POWER WIRING DIAGRAM	13
2.	MOLD INTERFACE WIRING DIAGRAM	14
3.	EDGE CONNECTOR	15

IMS Company
10373 Stafford Rd.
Chagrin Falls, Ohio 44022
440/543-1615

I. DESCRIPTION

General

IMS Company has developed an innovative, inexpensive electronic temperature control unit to control heater band and mold probe temperatures. The controller works with Type "J" thermocouples in a feedback, closed-loop system and is interchangeable with the D-M-E "G-Series" and EMI "E-Series" temperature control housings.

The three basic components of the IMS Temperature Control System are:

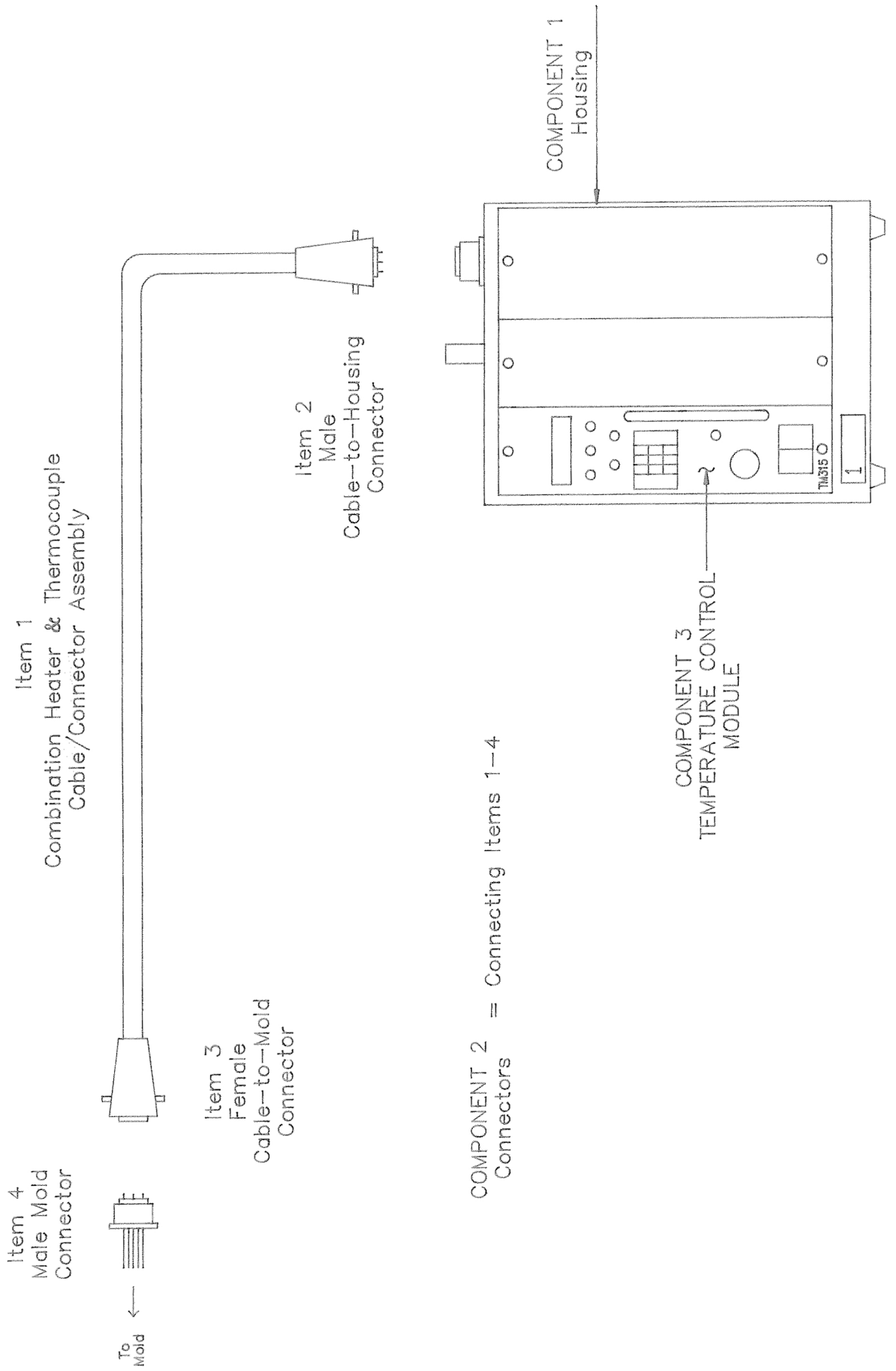
- 1) Housings
- 2) Connectors
- 3) Temperature Control Modules
(IMS Models TM315 and TM315D)

See Figure 1 - Component Configuration - on the next page for an overall view of the system and how each component fits in.

These instructions apply specifically to the 1 and 2 zone IMS Temperature Control Housings (see separate instructions for the 5, 8 and 12 zone housings).

Following are detailed descriptions of each of the three components making up the system.

FIGURE 1 - COMPONENT CONFIGURATION



Housings

IMS Housings are designed to house any of several 10 or 15 amp temperature control modules that are intended to control power to mold heaters. IMS offers five different size housings - 1 zone, 2 zone, 5 zone, 8 zone and 12 zone (1 zone = 1 module). Again, these instructions pertain only to the 1 and 2 zone housings (1H and 2H).

A 1 zone unit controls 1 mold heater and a 2 zone unit from 1 to 2 heaters (however, some molders attempt to add more than one heater per zone and have met with mixed results). The maximum load for the 1 and 2 zone housings is 10 amps per zone, limited by the wire size and connector ratings.

The overall dimensions of both the 1 and 2 zone housings are 10 3/4"H x 7"W x 10"D.

Each housing is constructed from heavy-duty steel and includes the following features:

- steel handle for portability
- air vents in bottom and sides for cooling
- in line module circuit board connectors with large contact area for extra reliability (see Insert 3 - Edge Connector - on page 15)
- top and bottom module insertion guides
- pre-mounted, 5-pin female connector with latch
- external, 3-prong main AC power input plug (3-pin main AC power input socket supplied)
- optional wiring for communications with computers (Models 1HB, 2HB)

Standard housings are wired to accept 110-120 VAC or 208-240 VAC, single phase, 3 wire (2 AC power leads plus a ground lead), 50-60 Hz power. Note that standard TM315 modules are wired for 208-240 VAC and will work only with a 208-240 VAC input. The TM315 must be specially wired to run on 110-120 VAC input.

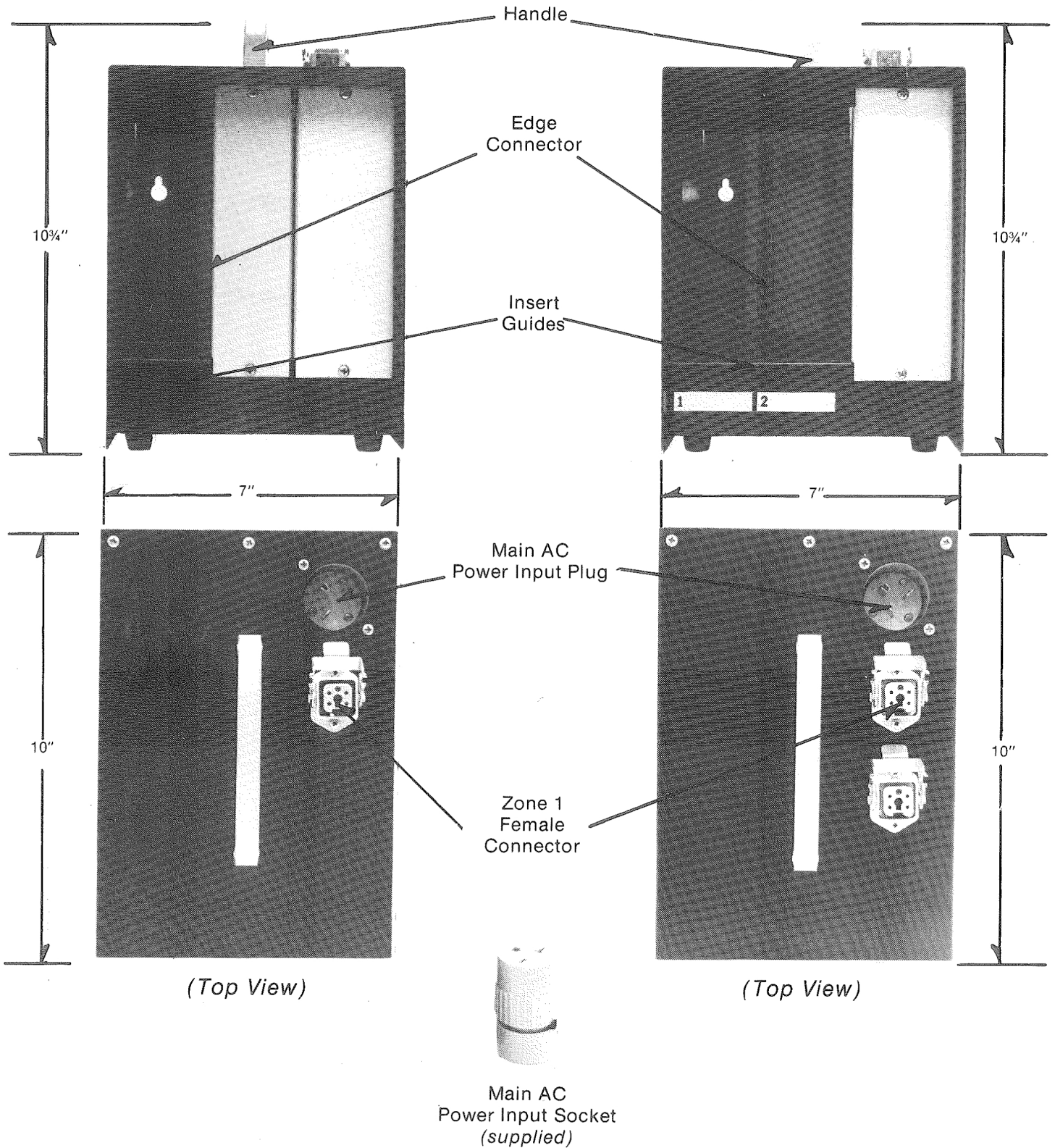
Five-pin, combination heater and thermocouple connectors are built-in to interface with your mold. Interfacing is basically accomplished through a single, 5-wire cable consisting of two heater leads, two thermocouple leads and a ground lead for each zone. Refer to Insert 2 - Mold Interface Wiring Diagram - on page 14 for the complete mold interfacing scheme.

See Figure 2 - Housings - on the next page for a pictorial layout and explanation of the housings and their parts.

Figure 2 — HOUSINGS

Model 1H
(Front View)

Model 2H
(Front View)



NOTE: The mounted Female Connector shown above is NOT the same as the Female Cable-to-Mold Connector (*Item 3*) on page 7.

Connectors

The IMS Mold Temperature Control housing is connected to the injection molding machine through four connecting items (see Figure 1 - Component Configuration - on page 2 for interconnections between items). All four items shown below provide for both heater and thermocouple connections, so "Combination Heater & Thermocouple" is mentioned twice here for Item 1 and not mentioned again.

1. Combination Heater & Thermocouple Cable/Connector Assembly
- *2. Male Cable-to-Housing Connector
- *3. Female Cable-to-Mold Connector
4. Male Mold Connector

1. Combination Heater & Thermocouple Cable/Connector Assembly

The Cable/Connector Assembly (Item 1) connects the Male Cable-to-Housing Connector (Item 2) and the Female Cable-to-Mold Connector (Item 3). It is used with both the 1 and 2 zone housings. IMS stocks the Cable/Connector Assembly (with Items 2 and 3 already attached) in lengths of 10 and 20 feet. Special lengths can be supplied. The Cable/Connector Assembly is a 5-wire cable consisting of two heater power wires (L1, L2), two iron-constantan thermocouple wires (white=iron, red=constantan) and a mold ground wire, all shielded in a flexible, stainless steel sheath. Connected at one end of the cable is Item 2 and at the other end Item 3. One Cable/Connector Assembly is used for each zone.

You can make your own Cable/Connector Assembly, with the proper supplies, by connecting Items 2 and 3 as shown in Insert 2 - Mold Interface Wiring Diagram - on page 14.

You may omit Items 1, 3 and 4 by connecting the five wires from the mold directly to the Male Cable-to-Housing Connector (Item 2), also shown in Insert 2 - Mold Interface Wiring Diagram - on page 14.

2. Male Cable-to-Housing Connector

The Male Cable-to-Housing Connector (Item 2) connects the Cable/Connector Assembly above (Item 1) with the housing. This 5-prong male connector located on the end of Item 1 fits the 5-pin female connectors located on top of both the 1 and 2 zone housings. The Male Cable-to-Housing Connector's plastic hood has side notches over which the the latch on the housing's female connector snaps to insure a secure connection.

The Male Cable-to-Housing Connector may be used by itself to directly connect the mold wires to the housing as shown in Insert 2 - Mold Interface Wiring Diagram - on page 14.

*Items 2 and 3 are part of Item 1 when supplied by IMS.

3. Female Cable-to-Mold Connector

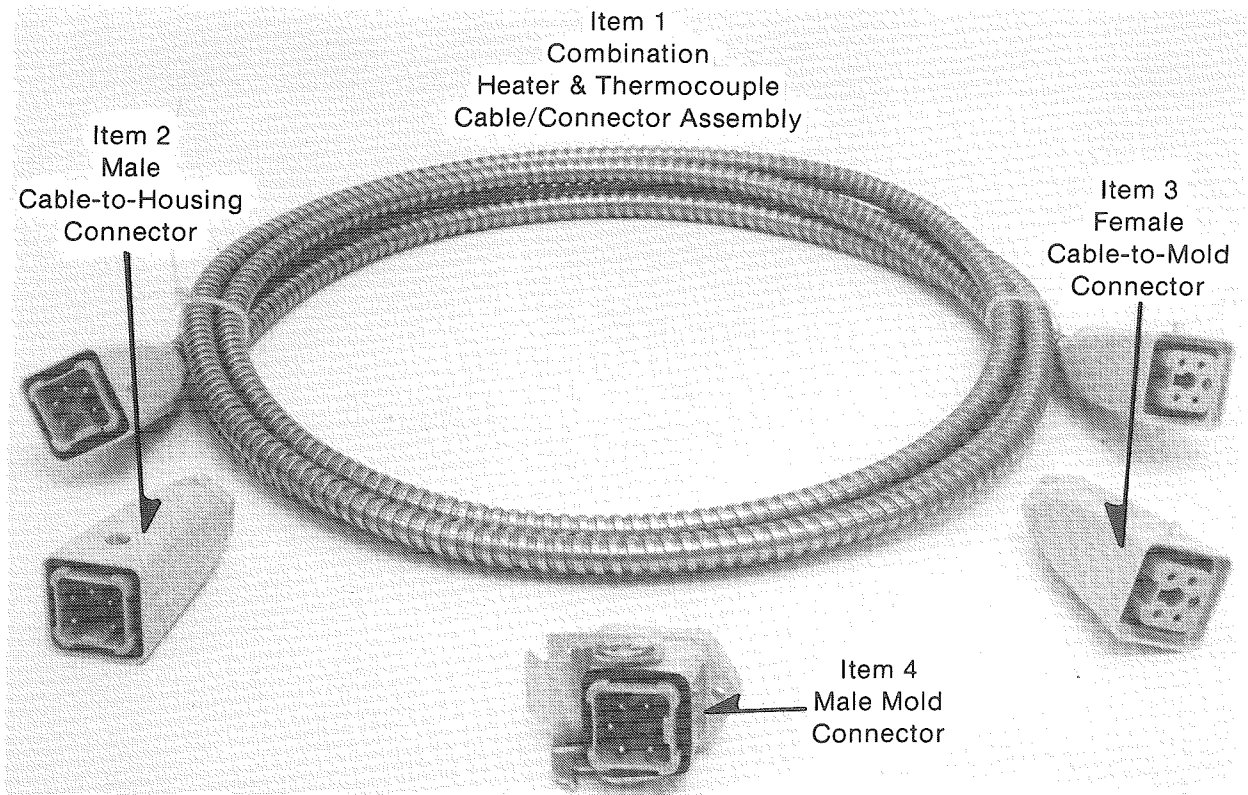
The Female Cable-to-Mold Connector (Item 3) connects the Cable/Connector Assembly (Item 1) with the Male Mold Connector below (Item 4). This 5-pin female connector located on the end of Item 1 accepts the 5-prong Item 4 from the mold. The Female Cable-to-Mold Connector's hood also has side notches over which Item 4's latch snaps to insure a secure connection.

4. Male Mold Connector

The Male Mold Connector (Item 4) connects the Female Cable-to-Mold Connector above (Item 3) on the end of the Cable/Connector Assembly (Item 1) to the mold. Heater wires and iron-constantan thermocouple wires are extended from a mold cavity and connected to the Male Mold Connector as shown in Insert 2 - Mold Interface Wiring Diagram - on page 14. This 5-prong male connector fits into the 5-pin Item 3. The Male Mold Connector also has a retaining latch to insure a secure connection.

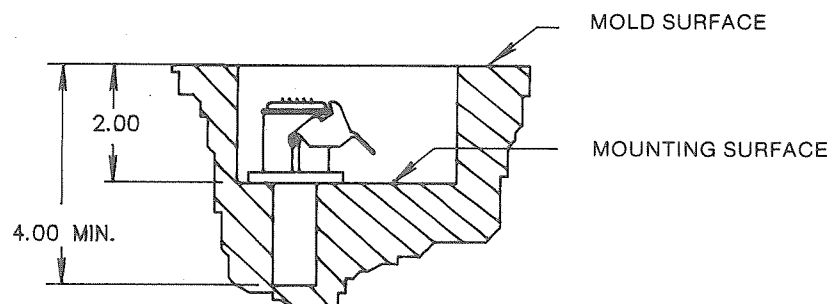
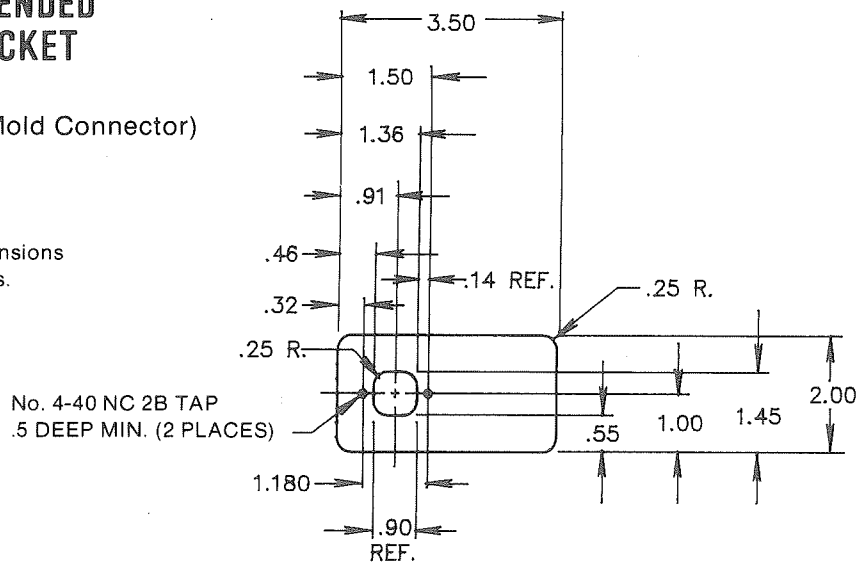
Refer to Figure 3 - Cable & Connectors - on the next page for pictures of connecting items described above and a recommended mold pocket layout for the Male Mold Connector.

Figure 3 — CABLE & CONNECTORS



RECOMMENDED MOLD POCKET LAYOUT (For Male Mold Connector)

Note: All dimensions
in inches.



II. INSTALLATION

Location

The IMS Temperature Control System should be located such that air can move freely in and out of the housing or mainframe. It should not be exposed to excessive heat (maximum operating ambient 100°F), dust, dirt, moisture or vibration. It must also be close enough to the mold to make all connections. The front panel should be easily accessible for setup, adjustment and service purposes.

Power Connections

Refer to Insert 1 - Power Wiring Diagram - on page 13.

1. Be sure your power line cord meets load requirements and electrical standards (see Power Line Cord Selector Table on Insert 1). BE SURE POWER IS OFF if line cord is already connected to a power circuit disconnect switch.
2. Separate the supplied main AC power input socket into two parts - front socket (with 3 screw-down terminals) and body assembly (with adjustable cable clamp chuck).
3. Prepare the power line cord by removing 1-1/8" of the outer jacket and stripping 5/8" insulation from each of the three leads.
4. Pass the power line cord through the back (rounded end) of the body assembly so that the cord is sticking out the front.
5. Connect each of the three power line cord leads to the three unscrewed terminals on the front socket by pushing down on the screw, inserting the wire, releasing and tightening the screw (see Insert 1 - Power Wiring Diagram - on page 13 for correct wire terminations). MAKE SURE GROUND IS SECURED UNDER THE GREEN HEX SCREW AND THAT THE SAME COLOR WIRE, USUALLY GREEN, TERMINATES TO EARTH GROUND AT THE OTHER END! Wiring errors at either end of the cable may make the housing electrically "hot" and extremely hazardous.
6. Line up the keyway notch and snap the wired socket back into the body assembly. Tighten down the adjustable chuck.
7. If the power line cord is not already attached to a power circuit disconnect switch, with the power OFF attach the leads to the protected side of the switch. Make sure the green ground lead is properly grounded.
8. Fully push the assembled main AC power input socket onto the 3-prong main AC power input plug in the back right-hand corner on the top of the housing. It will only fit one way due to the odd shape of the ground prong.

Mold Connections

Combination Heater & Thermocouple Cable/Connector Assembly:
Refer to Insert 2 - Mold Interface Wiring Diagram - on page 14.

1. If you are NOT making your own Cable/Connector Assembly (Item 1) go to step 12.

2. Gather the following parts needed to make a Cable/Connector Assembly (Item 1):

Item 2) 1 Male Cable-to-Housing Connector

Item 3) 1 Female Cable-to-Mold Connector

Part A) 2 insulated, stranded iron(+) constantan(-) thermocouple wires (i.e. one white iron wire and one red constantan wire)

Part B) 2 insulated, stranded, 16 gauge machine tool heater wires

Part C) 1 insulated, stranded, 16 gauge machine tool ground wire (preferably green)

Part D) 1 stainless steel sheath (or equivalent) no more than 5/16" in outside diameter

Note: Parts A-C must all be the same length. Part D should be 2" shorter in length than parts A-C (1" on each end).

3. Twist the white(+) iron and red(-) constantan thermocouple wires (part A) together over their entire length.

4. Insert the two thermocouple wires (part A), the two heater wires (part B) and the ground wire (part C) into the sheath (part D) so that they extend 1" beyond the sheath on each end.

5. Strip 1/4" insulation from both ends of the five wires (parts A-C).

6. Remove the plastic hood from Item 2 by removing the screw in the top of the hood.

7. Feed the five wires (parts A-C) at one end of the sheath (part D) through the back of the removed hood so that the wires are sticking out the front.

8. Wire Item 2 as follows by unscrewing the appropriate numbered screw on the back, inserting the appropriate wire, and tightening the screw to secure the wire in place:

<u>screw #</u>	<u>wire</u>
1	heater wire (B)
2	white(+) iron T/C wire (A)
3	red(-) constantan T/C wire (A)
4	heater wire (B)
5	green ground wire (C)

9. Push the wired plug back into its plastic hood and tighten down the screw on the top of the hood.

10. Repeat steps 6-9 with the Female Cable-to-Mold Connector (Item 3) at the other end of the Cable/Connector Assembly (i.e. replace references to "Item 2" in steps 6-9 with "Item 3").

11. If you are making a second Cable/Connector Assembly for the two zone system, repeat steps 2-10.

Mold Heater Power & Thermocouple Wires:

Refer to Insert 2 - Mold Interface Wiring Diagram - on page 14.

12. If you are NOT using the Cable/Connector Assembly (i.e. omitting Items 1, 3, 4 and connecting the five loose mold wires directly to the housing via Item 2), perform steps 13-16 below with the Male Cable-to-Housing Connector (Item 2). That is, replace references to "Item 4" in steps 13-16 with "Item 2".

13. Extend the heater and thermocouple leads from cavity #1 to reach a comfortable area for connecting the Male Mold Connector (Item 4).

14. Repeat steps 6-9 with Item 4 to connect cavity #1's five mold wires to it (i.e. replace references to "Item 2" in steps 6-9 with "Item 4").

15. If you are wiring cavity #2 to zone 2, repeat steps 13-14 with cavity #2's five mold wires.

16. When all mold wires are attached, SECURE THE GREEN GROUND WIRE TO A GROUND ON THE MOLD.

Housing:

Refer to Insert 2 - Mold Interface Wiring Diagram - on page 14.

17. If you are NOT using the Cable/Connector Assembly (Item 1) then perform steps 18-19 below, disregarding the reference to it.

18. Fully insert the Male Cable-to-Housing Connector (Item 2) attached to the Cable/Connector Assembly (Item 1) in zone 1's 5-pin female socket on the top of the housing (on the 2 zone housing, zone 1 is the socket closest to the main AC power input plug). The connector will only fit one way due to the orientation of the pins. Firmly pull retaining latch up over the side notches until it snaps into place.

19. If you are wiring two zones, repeat step 18 for zone 2 (on the 2 zone housing, zone 2 is the frontmost socket).

Mold:

Refer to Figure 1 - Component Configuration - on page 2.

20. If you are NOT using the Cable/Connector Assembly (Item 1) go to step 23.
21. Extend zone 1's Cable/Connector Assembly (Item 1) from the housing to the mold and fully insert cavity #1's Male Mold Connector (Item 4) in the Female Cable-to-Mold Connector (Item 3) on the end of Item 1. Rotate the retaining latch on Item 4 until it snaps over the side notches on Item 3.
22. If you are wiring 2 zones, repeat step 21 with zone 2's Cable/Connector Assembly (Item 1) and cavity #2's Male Mold Connector (Item 4).

Modules

NOTE: Make sure the main disconnect switch connected to the housing is OFF or the power line cord is unplugged when inserting or removing control modules. Also, be sure you are using the correct voltage module for the housing. A 120 VAC module cannot be used in a housing wired for 240 VAC and vice versa.

23. Slide a control module (e.g. IMS TM315) in zone #1 of the housing between the top and bottom insert guides.
24. Push the module firmly until the card is properly seated in the edge connector at the back of the zone.
25. For a two zone controller, insert the other control module in zone 2. If you have followed the wiring instructions above, zone #1 will control cavity #1 and zone #2 will control cavity #2.
26. Install a blank cover plate over any remaining zone slots which do not contain a control module.

III. OPERATION

Power

Turn ON external power circuit disconnect switch to apply power to the IMS Mold Temperature Control System.

Temperature Control Module

Operate temperature control module according to module maker's instructions.

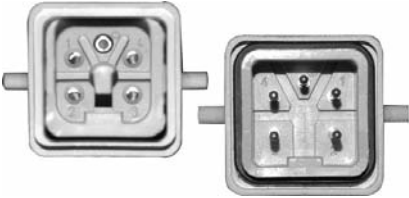
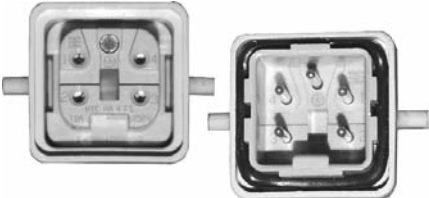
**BE SURE TO TURN MODULE POWER SWITCH OFF
(And better yet, also turn main disconnect off)
BEFORE REMOVING OR INSERTING MODULES.**

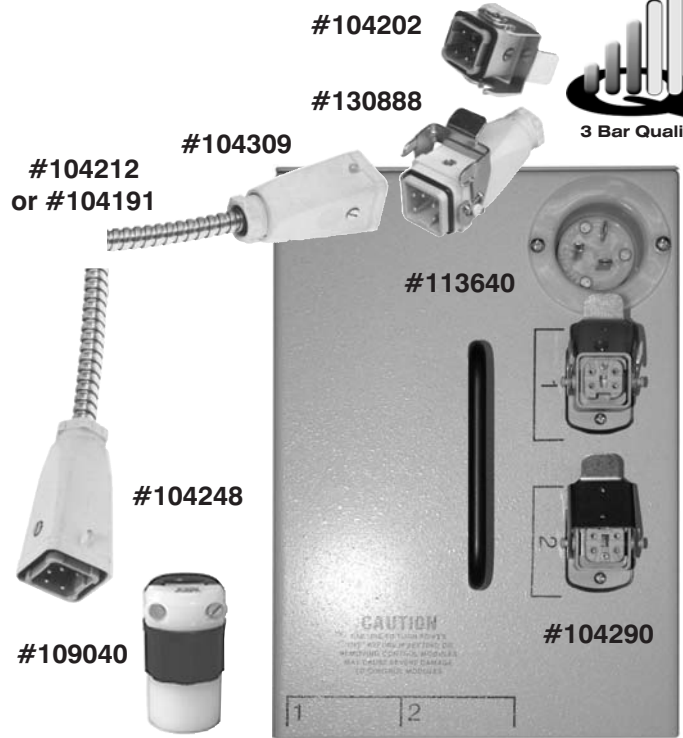
Failure to switch power off usually results in a destroyed module and edge connector, involving downtime and high repair costs.





IMS Cable Connector Sets

For 1 and 2 Zone Controllers



1 & 2 Zone Cables	
Heater and Thermocouple Combination Cables	
	10' #104212 \$112.50
	20' #104191 \$143.15



1 & 2 Zone Connectors	
<p>Male Mold Mountable Heater & TC</p> <p>#104202 \$13.30</p> 	<p>Female Cable to Mold Connector</p> <p>#104309 \$13.30</p> 
<p>Stand Alone Male Mold Connector</p> <p>#130888 \$13.30</p> 	<p>Male Cable to Housing Connector</p> <p>#104248 \$13.30</p> 

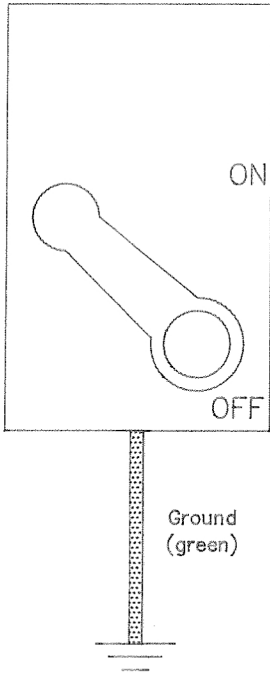
1 & 2 Zone Housing Replacement Parts		
 <p>Female Power Input Jack</p> <p>#104290 \$12.80</p>	 <p>Flange Male Power Plug</p> <p>#113640 \$28.10</p>	 <p>Mountable Female Connector</p> <p>#109040 \$25.95</p>



Using spare temperature controls will eliminate wasting time having to wait for a mold to come to temperature. It can be brought to temperature before it is hung.

INSERT 1 – POWER WIRING DIAGRAM

Power Circuit
Disconnect Switch



Line 1 (black)

Ground (green)

Line 2 (white)

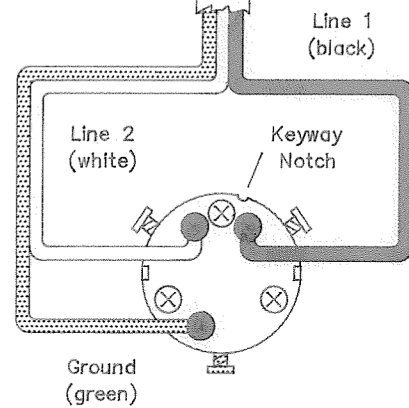
Power Line Cord

Body
Assembly
(side view)

Adjustable
Chuck

Main AC
Power Input
Socket

Front
Socket
(back view)



Line 1
(black)

Line 2
(white)

Keyway
Notch

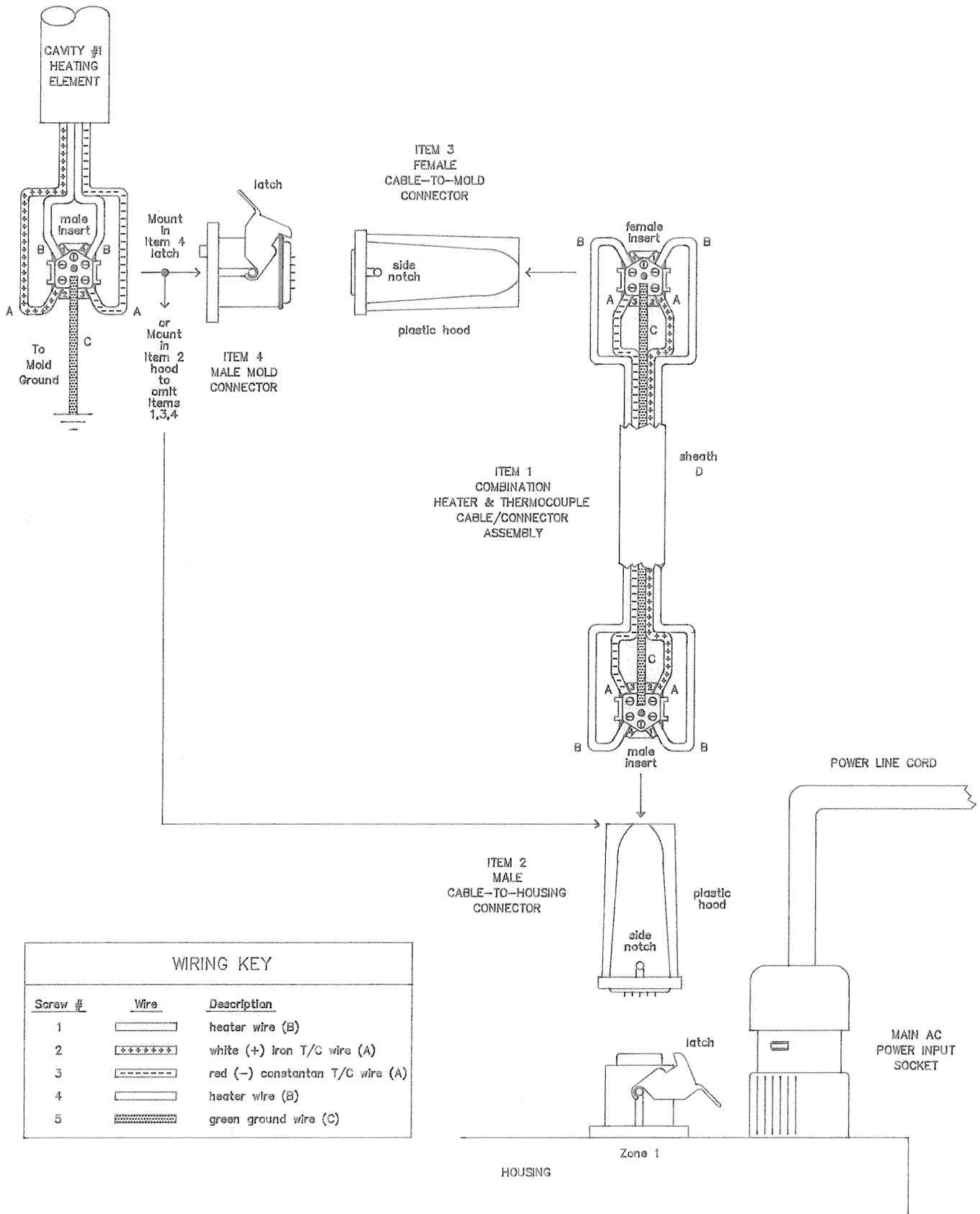
Ground
(green)

POWER LINE CORD SELECTOR TABLE

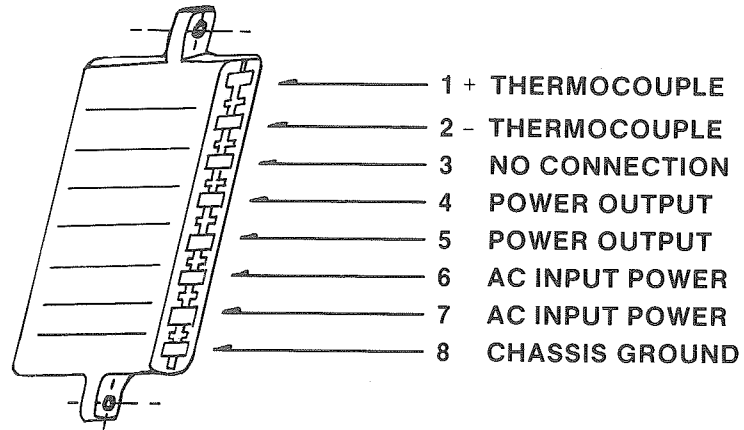
Zones	Amps/Zone	Line Current	AWG
1	5	5	16
1	10	10	16
2	5	10	16
2	10	20	14

NOTE: For circuits not using a neutral conductor, the black and white wire terminals may be switched.

INSERT 2 - MOLD INTERFACE WIRING DIAGRAM



INSERT 3 — Edge Connector



MAINTENANCE RECORD
AND NOTES
