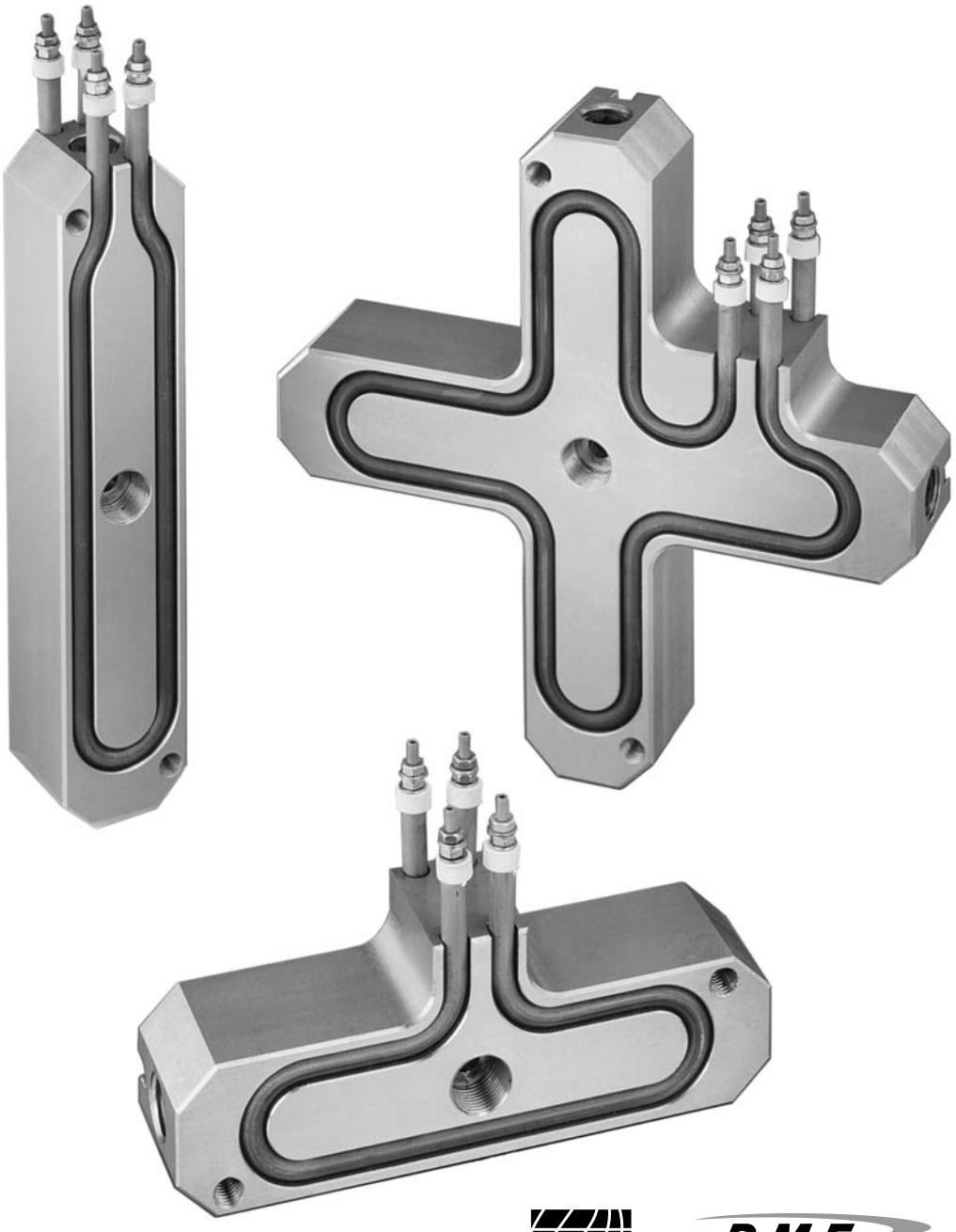
SYSTEM ASSEMBLY GUIDE

D-M-E Meteor™ Manifold



D-M-E Meteor™ Manifold

To our valued customers:

D-M-E created this assembly guide to assist you in the installation of the Meteor™ Manifold into your mold.

The machined Meteor Manifold with **9mm or 12mm** flow channel has been designed for use with Mini Gate-Mate, Gate-Mate 4, 250 Series and 375 Series Nozzles and for use with *most* thermoplastics. Contact D-M-E for assistance in nozzle selection.

The Meteor Manifold, when ordered using the provided part numbers, will include the manifold with the heaters installed. The following components must be fitted and installed by the customer: Manifold End Plugs and Set Screws.

NOTE:
All other components must be ordered separately. These components may include the following:

- **Center Support Pad**
- **Riser Pads**
- **Thermocouples**
- **Manifold Nozzle Seat**
- **Locating Ring**
- **Drool Ring**
- **Nozzles**
- **Nozzle Tips**
- **Dowel Pins**
- **Wiring Kit**

If, during setup and installation, you have questions that are not answered in the System Assembly Guide, please call 1-800-626-6653 or 1-248-398-6000.

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The Meteor™ Manifold System provides a versatile yet economical solution for many hot runner mold designs. Two-drop (in-line) and four-drop (X-style) manifolds are available in sizes to suit a variety of applications. Pre-engineered with accurately machined flow channels, nozzle ports can be freely located anywhere within each manifold's flow channel limits. Stocked for quick delivery, Meteor manifolds are supplied with replaceable, press-fit tubular heaters. A full complement of ancillary components are also available to complete the system design and construction. Nozzle selection can be made from a broad array of D-M-E nozzles, including the 250 and 375 Series, the popular Mini Gate-Mate™ and the Gate-Mate 4™ Series.

Inspection of the Meteor Manifold and Ordered Components

Prior to system assembly, D-M-E strongly suggests that you complete the following inspection and establish the procedures that will facilitate proper system assembly.

1. Ensure that all components provided are the correct part number and quantities.
2. Check all the supplied heaters for proper resistance in ohms (Ω) and for insufficient resistance to ground conditions by doing the following:

   ♦ Measure each corresponding heater's resistance and determine if they are equivalent. (Insufficient resistance to ground is defined as a reading to ground of 20,000 Ω or less.)

Modifications to the Meteor Manifold Before Use

The D-M-E Meteor manifold as supplied will require machining for the vertical flow channels (drops) that will allow the plastic to flow out of the manifold into the nozzle assemblies. The following will assist you in the machining process.

Operational Recommendation

All machining operations must be done without cutting fluids.

1. End Plug Machining Instructions (see Figs. 1-4, page 6)

- Determine the correct manifold end plug cutoff dimension. To do this add the 1/2 NL dimension to the correct "Y" dimension plus the correct "C" dimension together. Then subtract the 1/2 O.A.L. dimension from that number to give you the needed "W" dimension to remove from the manifold end plug.

  Formulas: $1/2\ NL = DL - DL \times 0.0000113 \times (T_{PR} - T_{AM})$ Metric Units

  $1/2\ NL = DL - DL \times 0.0000063 \times (T_{PR} - T_{AM})$ Imperial Units

  $W = (1/2\ NL + "Y" + "C") - 1/2\ O.A.L.$

  "W" is the amount of material to remove from end plug. If 1/2 NL minimum is used for vertical flow channel, no alteration to end plug is required.

- Cut end plug to length.

DL = Distance from centerline of mold to actual drop location in mold
T_{PR} = Processing temperature (°C/°F)
T_{AM} = Ambient temperature (20°C/68°F)
1/2 NL = Distance from centerline to vertical flow channel in manifold in cold condition
1/2 NL = DL – Thermal expansion

2. End Plug Installation

- After the manifold plug has been machined to the correct length install it into the manifold along with the retaining set screw. Each set screw should be torqued to a value of 200 ft-lbs.

3. Machine Vertical Flow Channels

- Using the existing dowel locations, set up the manifold block for the machining of the vertical flow channels. Pick up the location of the center dowel. Move to the correct 1/2 NL location then center drill, drill 1mm undersize to the center of the main horizontal flow channel for the 9mm or 12mm diameter vertical flow channel. Then, using a 9mm or 12mm diameter ball cutter, finish machining the full radius into the plug end. Depth for 9mm diameter flow channel is 27.5mm and depth for 12mm diameter flow channel is 29.0mm. Repeat these steps as necessary for each 1/2 NL location.

4. Clean and Prep

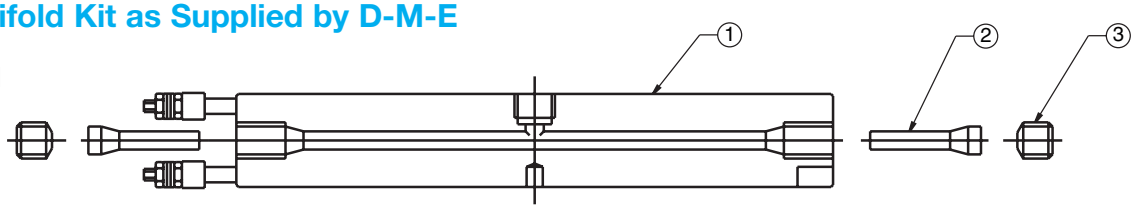
- Carefully clean out the manifold flow channels to be sure they are completely free from all machining debris.

5. Nozzle Seat Installation

- Apply anti-seize to the threads, then install the manifold nozzle seat and torque to 125 ft-lbs.

Manifold Kit as Supplied by D-M-E

Fig. 1



D-M-E METEOR MANIFOLDS ARE SUPPLIED WITH THE FOLLOWING COMPONENTS:
1. MANIFOLD WITH PRE-MACHINED FLOW CHANNEL AND (2) INSTALLED TUBULAR HEATERS
2. TAPERED END PLUGS
   (2) FOR IN-LINE CENTER EXIT
   (2) FOR IN-LINE END EXIT
   (4) FOR X-STYLE
3. END PLUG SET SCREWS
   (2) FOR IN-LINE CENTER EXIT
   (2) FOR IN-LINE END EXIT
   (4) FOR X-STYLE

Fig. 2

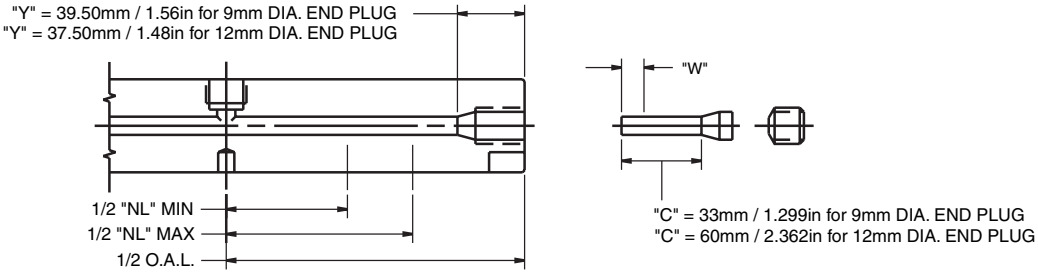


Fig. 3

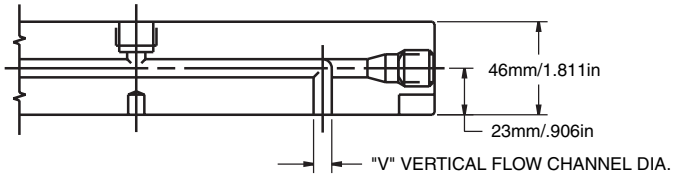
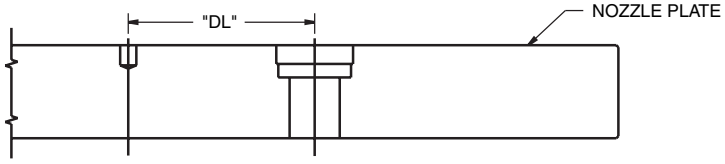


Fig. 4



MANIFOLD TYPE	MANIFOLD KIT ITEM NO.	NL MIN mm	NL MIN inch	NL MAX mm	NL MAX inch	O.A.L. mm	O.A.L. inch	"V" mm	"V" inch
IN-LINE END EXIT	MEM0100K	55	2.165	100	3.937	195	7.677	9.00	.354
	MEM0150K	100	3.937	150	5.906	245	9.646	9.00	.354
	MEM0200K	150	5.906	200	7.874	295	11.614	9.00	.354
	MEM0300K	200	7.874	300	11.811	395	15.551	12.00	.472
	MEM0400K	300	11.811	400	15.748	495	19.488	12.00	.472
	MEM0500K	400	15.748	500	19.685	595	23.425	12.00	.472
IN-LINE CENTER EXIT	MCM0100K	55	2.165	100	3.937	195	7.677	9.00	.354
	MCM0150K	100	3.937	150	5.906	245	9.646	9.00	.354
	MCM0200K	150	5.906	200	7.874	295	11.614	9.00	.354
	MCM0300K	200	7.874	300	11.811	395	15.551	12.00	.472
	MCM0400K	300	11.811	400	15.748	495	19.488	12.00	.472
	MCM0500K	400	15.748	500	19.685	595	23.425	12.00	.472
X-STYLE	MXM0100K	55	2.165	100	3.937	195	7.677	9.00	.354
	MXM0150K	100	3.937	150	5.906	245	9.646	9.00	.354
	MXM0200K	150	5.906	200	7.874	295	11.614	9.00	.354
	MXM0300K	200	7.874	300	11.811	395	15.551	12.00	.472

Meteor Manifold Standard Sizes

Fig. 5

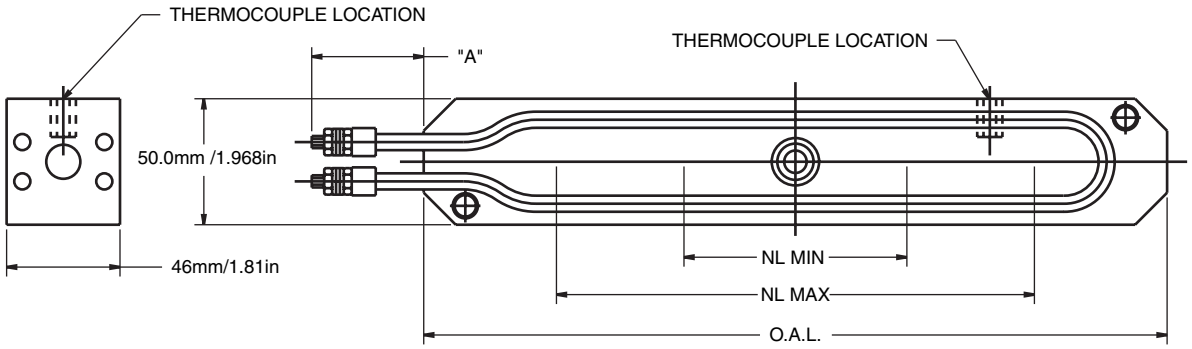


Fig. 6

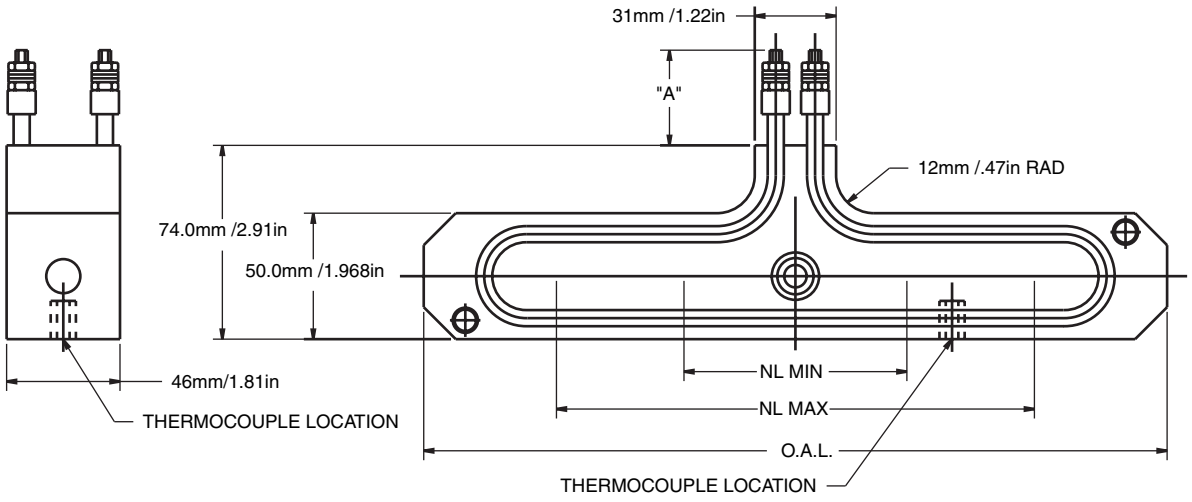
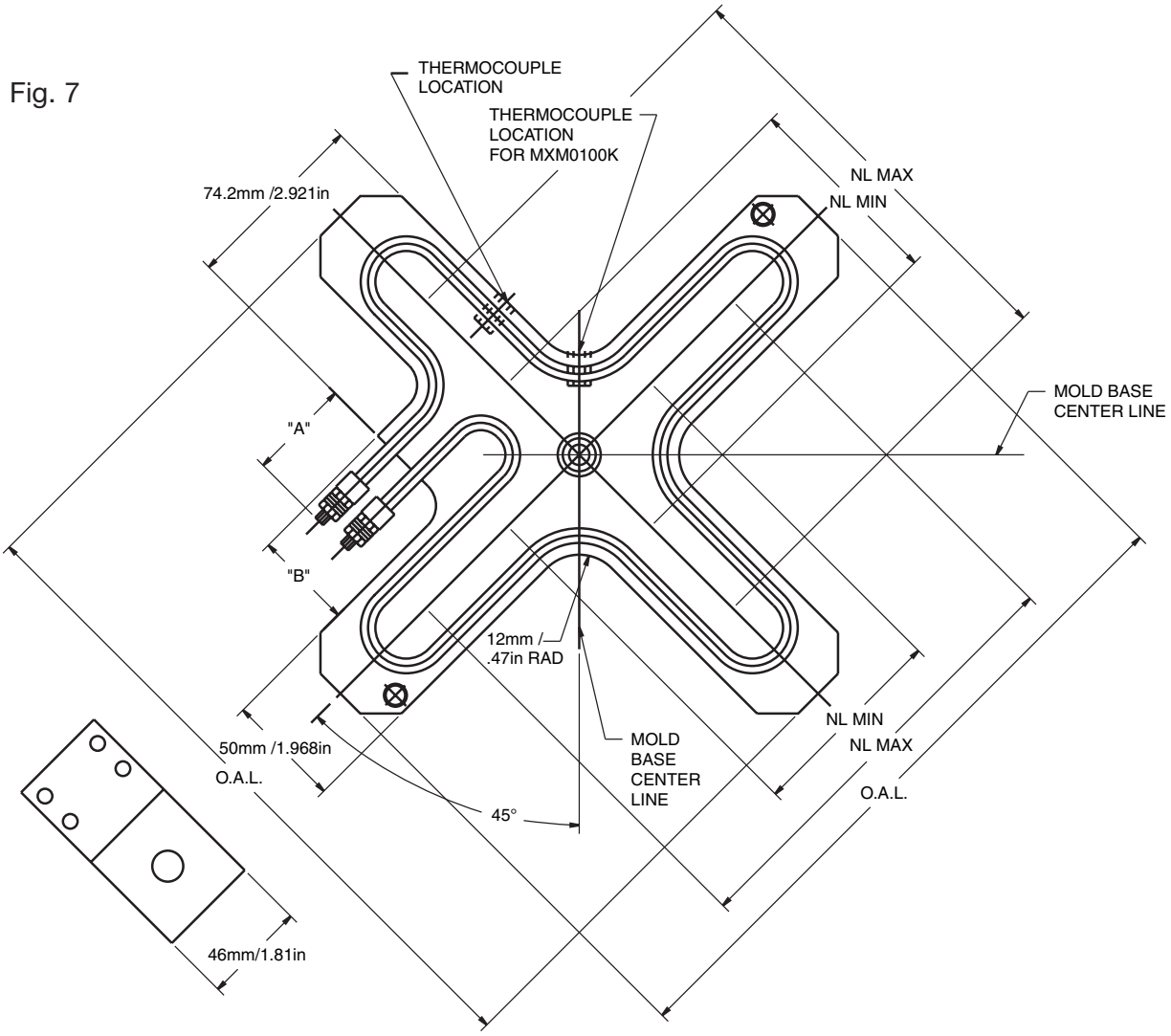


Fig. 7



Meteor Manifold Kit Item Numbers and Dimensions

MANIFOLD TYPE	MANIFOLD KIT ITEM NO.	NL MIN		NL MAX		O.A.L.		"A"		"B"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
IN-LINE END EXIT	MEM0100K	55	2.165	100	3.937	195	7.677	44.5	1.75	---	---
	MEM0150K	100	3.937	150	5.906	245	9.646	44.5	1.75	---	---
	MEM0200K	150	5.906	200	7.874	295	11.614	44.5	1.75	---	---
	MEM0300K	200	7.874	300	11.811	395	15.551	44.5	1.75	---	---
	MEM0400K	300	11.811	400	15.748	495	19.488	50.8	2.00	---	---
	MEM0500K	400	15.748	500	19.685	595	23.425	50.8	2.00	---	---
IN-LINE CENTER EXIT	MCM0100K	55	2.165	100	3.937	195	7.677	44.5	1.75	---	---
	MCM0150K	100	3.937	150	5.906	245	9.646	44.5	1.75	---	---
	MCM0200K	150	5.906	200	7.874	295	11.614	44.5	1.75	---	---
	MCM0300K	200	7.874	300	11.811	395	15.551	44.5	1.75	---	---
	MCM0400K	300	11.811	400	15.748	495	19.488	50.8	2.00	---	---
	MCM0500K	400	15.748	500	19.685	595	23.425	50.8	2.00	---	---
X-STYLE	MXM0100K	55	2.165	100	3.937	195	7.677	44.5	1.75	56.8	2.236
	MXM0150K	100	3.937	150	5.906	245	9.646	44.5	1.75	51.3	2.020
	MXM0200K	150	5.906	200	7.874	295	11.614	50.8	2.00	51.3	2.020
	MXM0300K	200	7.874	300	11.811	395	15.551	50.8	2.00	51.3	2.020

Tubular Heater Information

Fig. 8

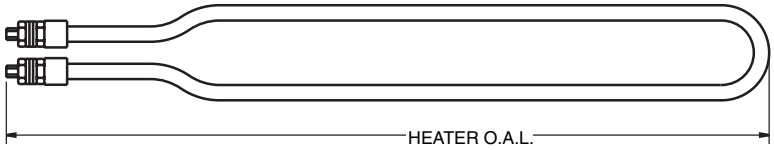


Fig. 9

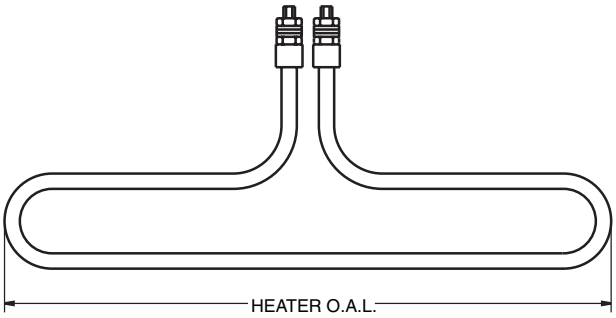
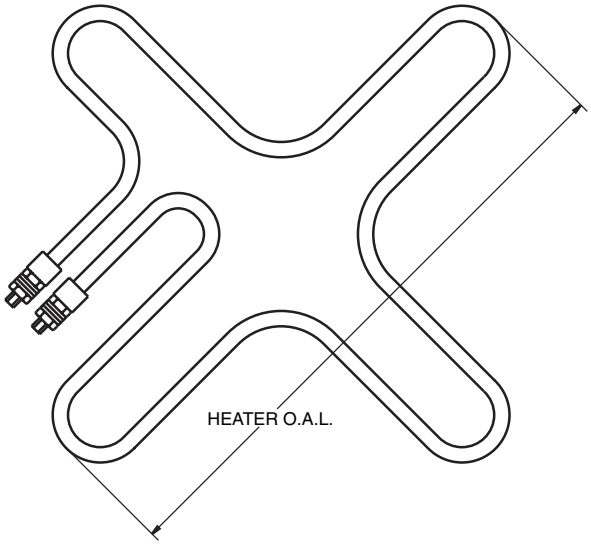


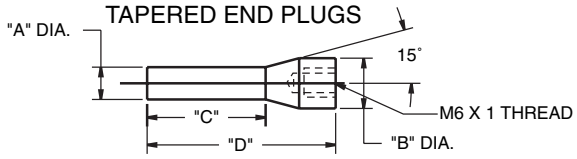
Fig. 10



MANIFOLD TYPE	MANIFOLD KIT ITEM NO.	TUBULAR HEATER ITEM NO.	HEATER O.A.L. mm	HEATER O.A.L. inch	HEATER WATTAGE	WIRING KIT ITEM NO.
IN-LINE END EXIT	MEM0100K	MEH0100	219	17.25	600	MWK1001
	MEM0150K	MEH0150	269	10.59	750	
	MEM0200K	MEH0200	319	12.56	900	
	MEM0300K	MEH0300	419	16.50	1225	
	MEM0400K	MEH0400	519	20.43	1550	
	MEM0500K	MEH0500	619	24.37	1850	MWK1002
IN-LINE CENTER EXIT	MCM0100K	MCH0100	155	6.10	600	MWK1001
	MCM0150K	MCH0150	205	8.07	750	
	MCM0200K	MCH0200	255	10.04	900	
	MCM0300K	MCH0300	355	13.98	1225	
	MCM0400K	MCH0400	455	17.91	1550	
	MCM0500K	MCH0500	555	21.85	1850	MWK1002
X-STYLE	MXM0100K	MXH0100	155	6.10	1050	MWK1001
	MXM0150K	MXH0150	205	8.07	1350	
	MXM0200K	MXH0200	255	10.04	1675	MWK1002
	MXM0300K	MXH0300	355	13.98	2150	

Replacement Components

TAPERED END PLUGS



ITEM NO.	"A"	"B"	"C"	"D"
MTP0009	9mm/.354in	14mm/.551in	33mm/1.299in	52.5mm/2.067in
MTP0012	12mm/.472in	16mm/.630in	60mm/2.362in	77.5mm/3.051in

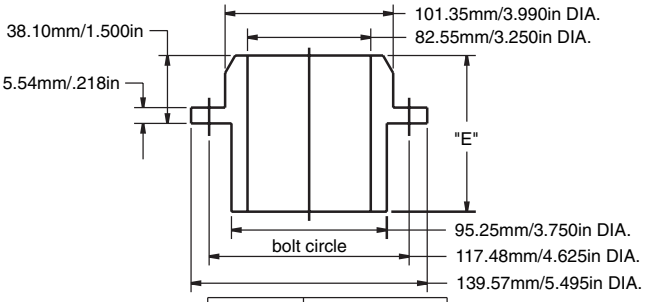
END PLUG SET SCREW

THREAD - M20 X 2.5
THICKNESS - 20mm /.787in
HEX FLAT - 10mm /.394in

ITEM NO.
MSS0001

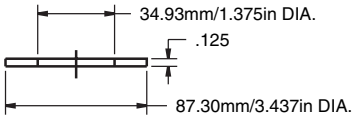
Ancillary Components

LOCATING RINGS



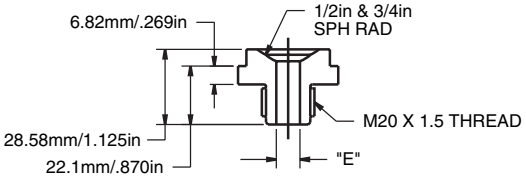
ITEM NO.	"E"
EHL0253	73.03mm/2.8754in
EHL0255	114.30mm/4.500in
EHL0256	81.00mm/3.189in

DROOL RING



ITEM NO.
EHL1003

NOZZLE SEAT



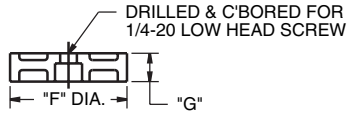
ITEM NO.	"E"
MNS0009	9mm/.354in
MNS0012	12mm/.472in

MANIFOLD THERMOCOUPLE

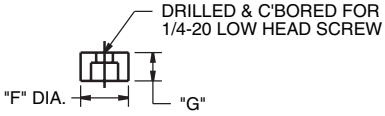
"J" TYPE
RED - NEGATIVE
WHITE - POSITIVE

ITEM NO.
ETC0252

RISER PADS

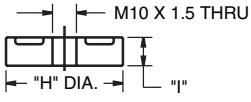


ITEM NO.	"F"	"G"
ERP1001	44.5mm/1.75in	12.70mm/.500in
ERP1002	44.5mm/1.75in	19.05mm/.750in



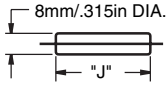
ITEM NO.	"F"	"G"
ERP1011	19.8mm/.78in	12.70mm/.500in
ERP1012	19.8mm/.78in	19.05mm/.750in

CENTER SUPPORT PADS



ITEM NO.	"H"	"I"
ECB0468	30.0mm/1.18in	20.0mm/.79in
ECB0469	30.0mm/1.18in	10.0mm/.39in
ECB0503	40.0mm/1.57in	10.0mm/.39in

CENTER SUPPORT & END DOWEL PINS



ITEM NO.	"J"
DP8-20	20.0mm/.787in
DP8-28	28.0mm/1.102in
DP8-32	32.0mm/1.260in

WIRING KITS

ITEM NO.	NO. OF MANIFOLD ZONES
MWK1001	1
MWK1002	2

MWK1001 CONSIST OF:
2 - JUMPER BARS
2 - 1220mm LONG POWER WIRES
2 - 1220mm LONG THERMOCOUPLE WIRES
3 - HEAT SHRINK TUBING
MWK1002 CONSIST OF:
4 - 1220mm LONG POWER WIRES
4 - 1220mm LONG THERMOCOUPLE WIRES
6 - HEAT SHRINK TUBING

Questions? Call D-M-E at 1-800-626-6653

Application Guidelines

To ensure success of each Meteor application, it is important that the mold designer take the following factors into consideration:

- Use the Meteor manifold to establish the shape of the manifold clearance pocket in the manifold retainer plate (see pages 12 and 13).
- Selection of proper mold steel for the gate area.
- Proper machining of the gate detail to the supplied drawing on the packing list supplied with each nozzle.
- Proper cooling of the gate area to ensure proper gate vestige and to minimize the drool or stringing of the material.
- Adequate cooling in the nozzle plate, manifold retainer plate (used to enclose the Meteor manifold) and the top clamp plate.
- Use of proper size and number of assembly screws to support the system (customer supplied).
- Allowance for adequate system cold clearance to permit later thermal expansion (refer to pages 23 and 24).

NOTE: Please treat these suggestions as guidelines only. Always follow standard mold making industry practices to ensure the proper function of the mold and manifold system.

Reference Drawing Showing Minimum Mold Plate Size and Suggested Pocket Machining Clearance Requirements

Fig. 11

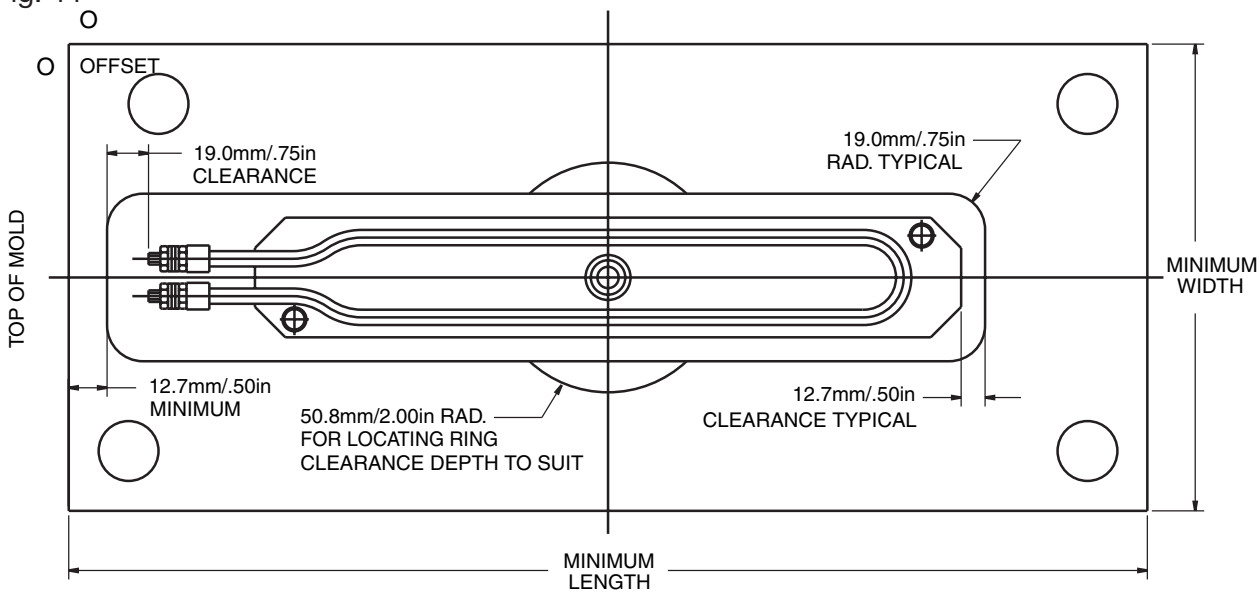
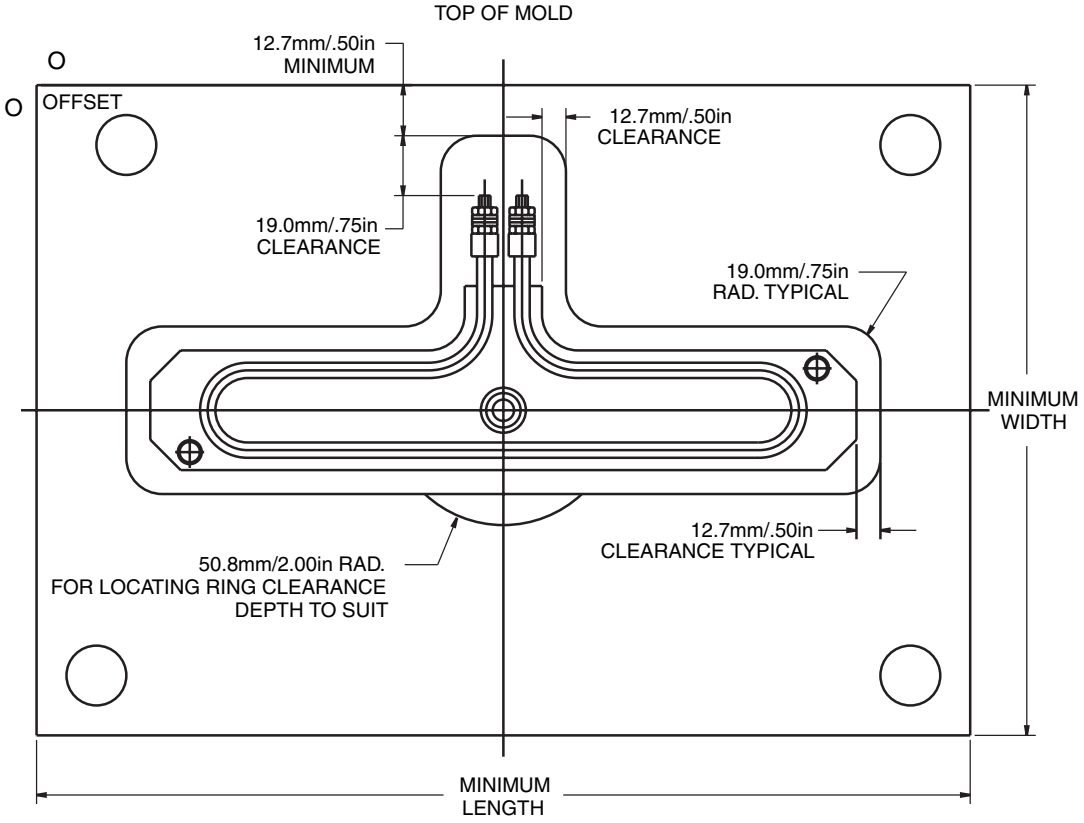


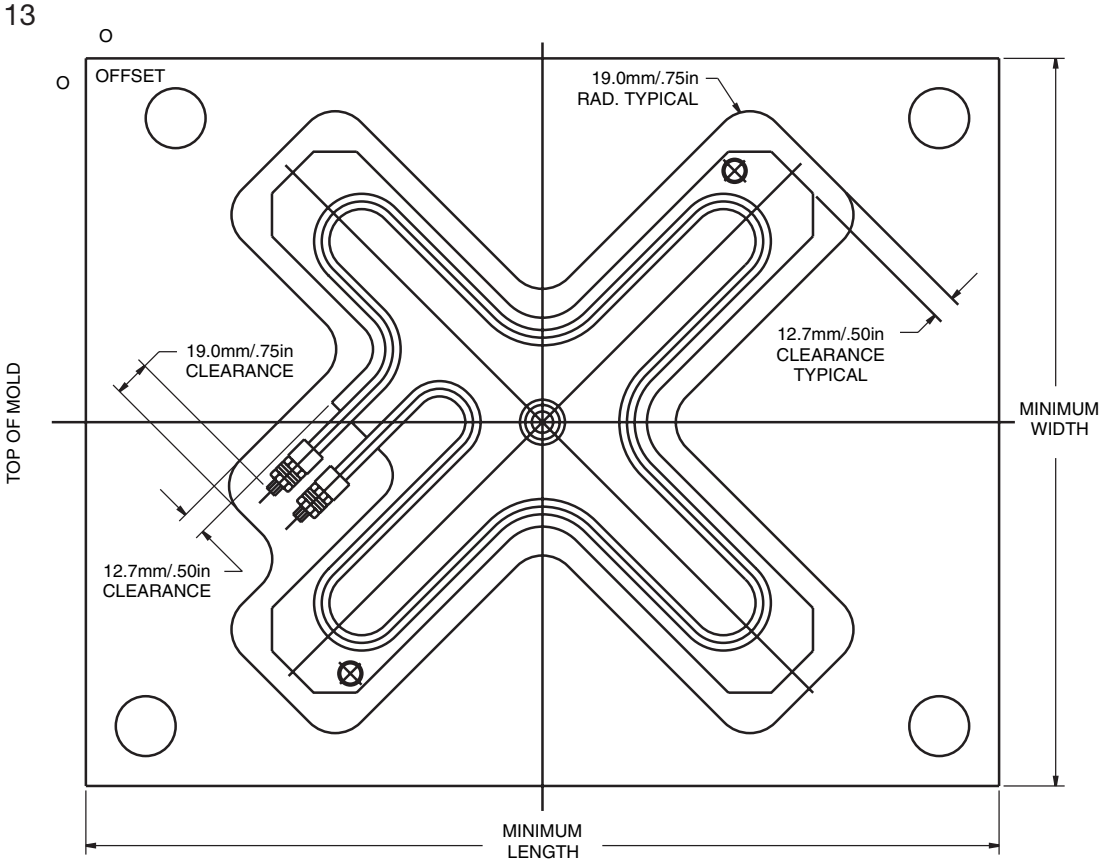
Fig. 12



VIEWS ARE FROM MOLD LOCATING RING / MACHINE NOZZLE

Reference Drawing Showing Minimum Mold Plate Size and Suggested Pocket Machining Clearance Requirements

Fig. 13



VIEW IS FROM MOLD LOCATING RING / MACHINE NOZZLE

MANIFOLD TYPE	MANIFOLD KIT ITEM NO.	MINIMUM WIDTH mm	MINIMUM WIDTH inch	MINIMUM LENGTH mm	MINIMUM LENGTH inch
IN-LINE END EXIT	MEM0100K	302	11-7/8	381	15
	MEM0150K	302	11-7/8	508	20
	MEM0200K	302	11-7/8	527	20-3/4
	MEM0300K	302	11-7/8	610	24
	MEM0400K	302	11-7/8	660	26
	MEM0500K	302	11-7/8	737	29
IN-LINE CENTER EXIT	MCM0100K	302	11-7/8	381	15
	MCM0150K	302	11-7/8	508	20
	MCM0200K	302	11-7/8	527	20-3/4
	MCM0300K	302	11-7/8	610	24
	MCM0400K	302	11-7/8	660	26
	MCM0500K	302	11-7/8	737	29
X-STYLE	MXM0100K	378	14-7/8	406	16
	MXM0150K	378	14-7/8	406	16
	MXM0200K	454	17-7/8	457	18
	MXM0300K	603	23-3/4	603	23-3/4

Machining Dimensions for Manifold Retaining Screws and Positioning Dowel Locations

Fig. 14

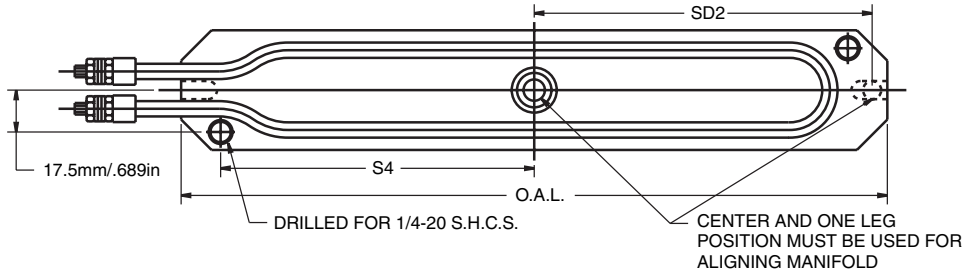


Fig. 15

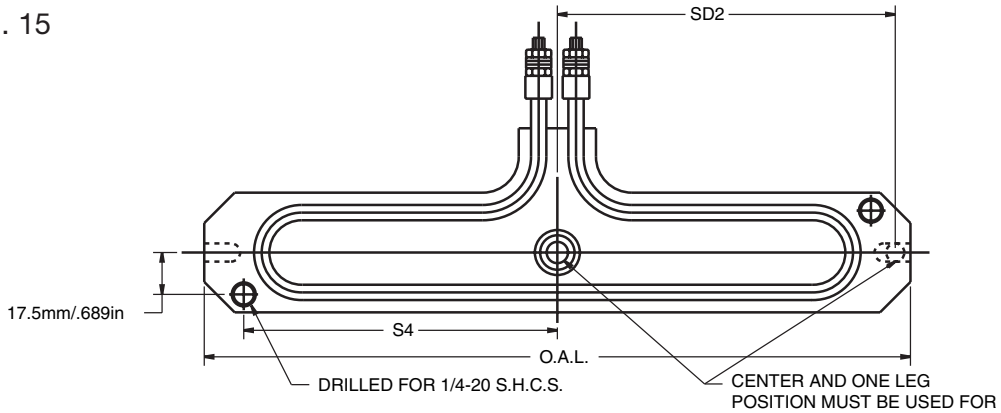
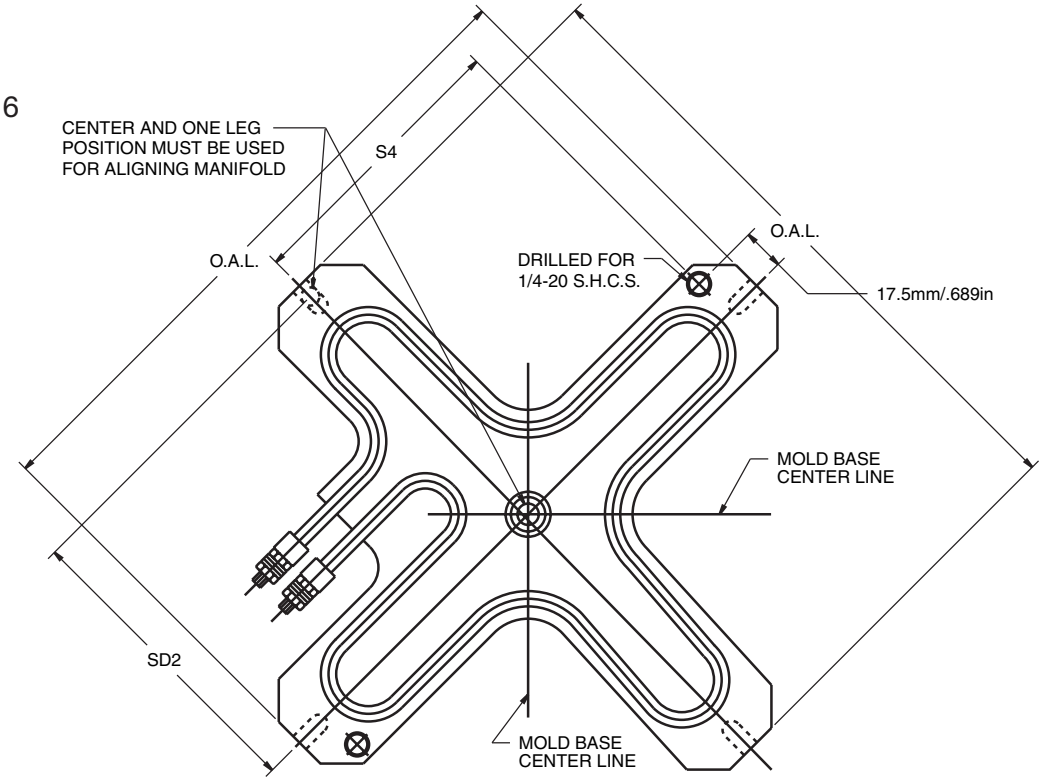


Fig. 16



MANIFOLD TYPE	MANIFOLD KIT ITEM NO.	"SD2" mm	"SD2" inch	"S4" mm	"S4" inch	O.A.L. mm	O.A.L. inch
IN-LINE END EXIT	MEM0100K	90	3.543	81	3.189	195	7.677
	MEM0150K	115	4.528	106	4.173	245	9.646
	MEM0200K	140	5.512	131	5.157	295	11.614
	MEM0300K	190	7.480	181	7.126	395	15.551
	MEM0400K	240	9.449	231	9.094	495	19.488
	MEM0500K	290	11.417	281	11.063	595	23.425
IN-LINE CENTER EXIT	MCM0100K	90	3.543	81	3.189	195	7.677
	MCM0150K	115	4.528	106	4.173	245	9.646
	MCM0200K	140	5.512	131	5.157	295	11.614
	MCM0300K	190	7.480	181	7.126	395	15.551
	MCM0400K	240	9.449	231	9.094	495	19.488
	MCM0500K	290	11.417	281	11.063	595	23.425
X-STYLE	MXM0100K	90	3.543	81	3.189	195	7.677
	MXM0150K	115	4.528	106	4.173	245	9.646
	MXM0200K	140	5.512	131	5.157	295	11.614
	MXM0300K	190	7.480	181	7.126	395	15.551

Tubular Heater

Installation and Replacement

NOTE: The proper protective clothing, gloves, and safety glasses should be worn when removing and installing heaters.

Removal of tubular heater from manifold

STEPS

1. Lift heater out of the groove.
2. Clean plastic, dirt and grease from heater groove.

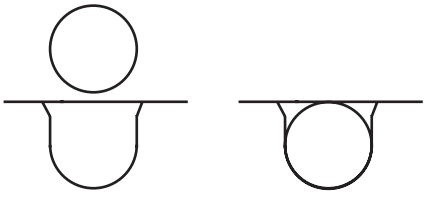
Heater installation in manifold (see Fig. 17)

STEPS

1. Place correct heater into the manifold heater groove.
2. Press heater down to the bottom of the heater groove using an arbor press or a soft metal block and hammer.
3. Heater must be below the manifold surface and elongated into the heater slot.
4. Check all the supplied heaters for proper resistance in ohms (Ω) and for insufficient resistance to ground conditions by doing the following:
   - ♦ Measure each corresponding heater's resistance and determine if they are equivalent. (Insufficient resistance to ground is defined as a reading to ground of 20,000 Ω or less.)

Manifold Tubular Heater Installation

Fig. 17



Step #1 Step #2

Top Clamp Plate
(customer to supply)

- The top clamp plate will have the upper support pad mounted to the underside of it. Transfer these locations from the nozzle locations in the nozzle plate. Provide adequate number and size of water lines over the manifold shape. See pages 24 and 25 of this assembly guide for installation and machining dimensions for the locating ring and drool ring.
- The top clamp plate should be machined from D-M-E #2 steel or equivalent.
- A pocket may be required above the manifold heater leads to provide adequate clearance. See page 19 for clearance requirements.

The following guidelines are to be used with D-M-E Nozzles and Components.

Follow the steps and procedures outlined on the following pages to ensure proper system assembly. All dimensional checks should be made and recorded on the Master Inspection Sheet (page 30) to assist documentation for quality control and quality assurance programs.

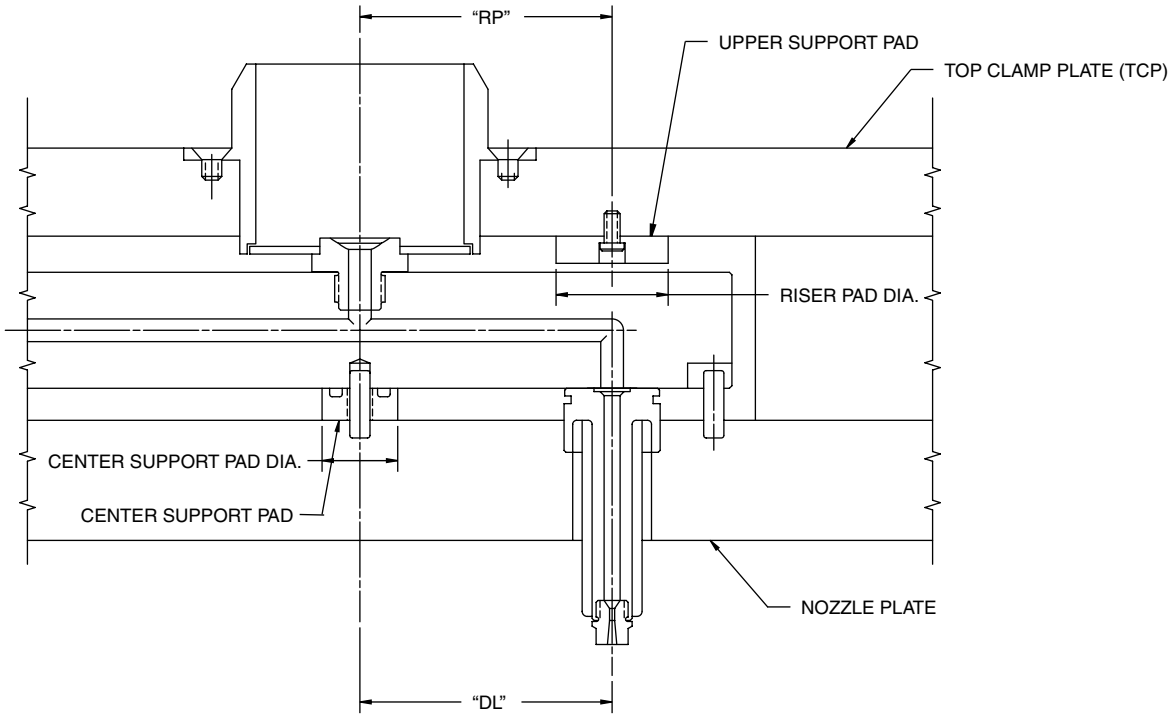
This information will help facilitate final assembly and future questions regarding your system. Use the charts on the following pages to record the system dimensions as assembled.

Manifold Retainer Plate
(customer to supply)

- The manifold retainer plate must be pocketed to surround the entire manifold. Provide an adequate number of cooling lines around the manifold pocket. See pages 12 and 13 for proper pocket sizes. *THIS CLEARANCE IS CRITICAL TO THE PERFORMANCE OF THE SYSTEM.*
- The location for the terminal mounting box should be selected. The top of the mold is the preferred location. (See D-M-E Mold Tooling Technologies catalog for terminal box selection and dimensions.)
- A slot should be cut into the manifold retainer plate at the bottom of the mold to provide a drain for the enclosed manifold pocket. Recommended size for this slot should be 1.5mm deep x 25mm wide.
- It may be necessary to slot the underside of the manifold retainer plate to clear the nozzle heater leads. A minimum clearance is required around nozzle heater leads. See page 19 for clearance requirements.
- The manifold retainer plate should be machined from D-M-E #2 steel or equivalent.

Manifold Retainer Section View

Fig. 17.1



ITEM NO.	"RP" MIN	RISER PAD DIA.
ERP1011	60.0mm/2.36in	19.8mm/.78in
ERP1012		
ERP2001	75.0mm/2.95in	47.6mm/1.88in
ERP2002		

For optimal performance, the riser pads are to be positioned directly above the nozzle locations "DL." The chart above shows the minimum distances from center of mold to riser pad locations to avoid interference with the locating ring. These minimum distances only apply to the meteor 100 and 150 series. The 200, 300, 400 and 500 series manifolds should have riser pads located directly above the nozzle positions "DL." For maximum support, use riser pads ERP2001 or ERP2002 whenever possible. Only use riser pads ERP1011 or ERP1012 when there are space constraints.

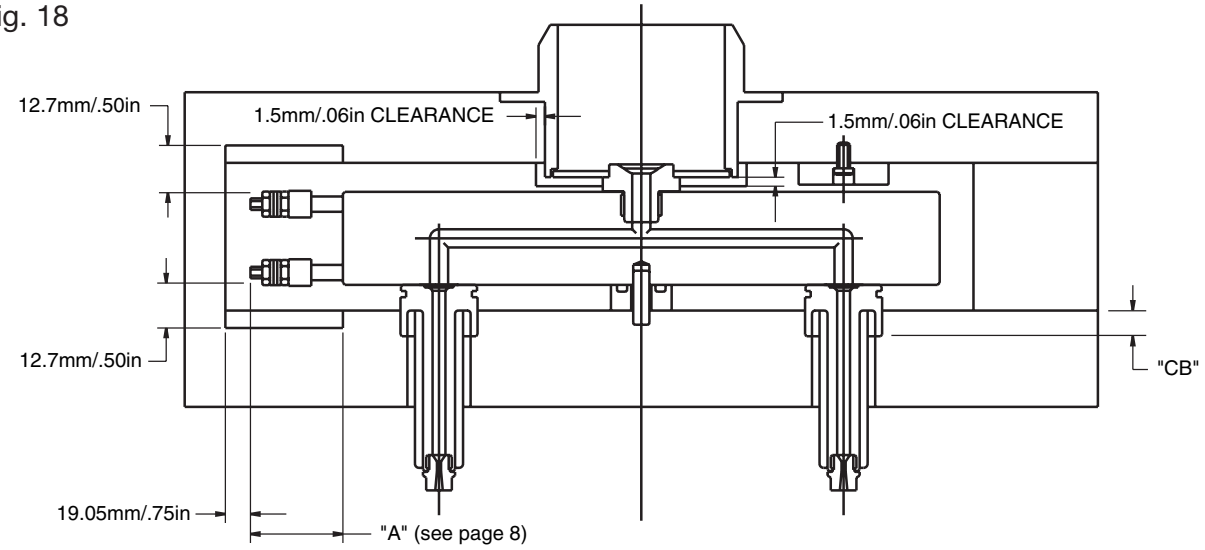
ITEM NO.	"DL" MIN	CENTER SUPPORT PAD DIA.
ECB0468	35.0mm/1.38in	30.0mm/1.18in
ECB0469		
ECB0503	40.0mm/1.57in	40.0mm/1.57in

If "DL" falls below the minimums shown in the chart above, the center support pad can be eliminated, but the locating dowel must always be used.

Required Manifold Heater Lead Clearances

If clearance between manifold and clamp plate and/or between manifold and nozzle plate is less than 12.7mm/0.5 inches, clearance pocket(s) are required for the manifold heater leads.

Fig. 18

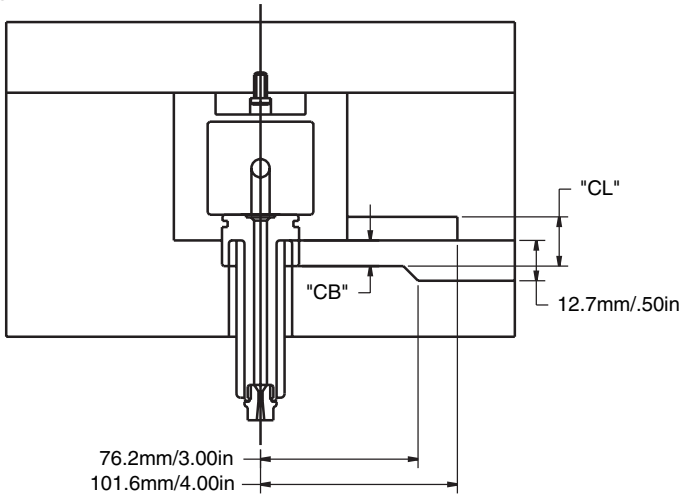


Manifold Heater Lead Clearance Pocket:
Length = A + 19.0mm/.75in
Width = 75mm/2.95in
If CB is 12.7mm/.50in, Depth = CB - 12.7mm/.50in.
If CB < 12.7mm/.50in, no depth machining is required.
Pocket width is symmetric with respect to center of heater exit.

Required Nozzle Heater Lead Clearances

If nozzle counterbore depth “CB” is less than “CL” a clearance slot must be machined off the bottom side of the manifold retainer plate to provide clearance around the nozzle heater lead. Depth of slot equals CL-CB. Minimum slot length must be 102mm/4 inches.

Fig. 19



NOZZLE SERIES	"CL" mm	inch
250	12.7	.500
375	15.9	.625
* GATE-MATE 4	12.7	.500
MINI GATE-MATE	12.7	.500

* FOR GATE-MATE 4 FRONT-LOAD HEATER APPLICATIONS, SEE D-M-E CATALOG SECTION "P" MINI-PRINT #1800.

Nozzle Plate
(customer to supply)

- Note the dowel pin locations on your Meteor manifold block and machine SD2 dowel location into the nozzle plate (see Figs. 14-16, page 14, and table on page 15).
- Provide adequate cooling lines around the nozzle locations and under the manifold.
- The nozzle plate should be machined from D-M-E #2 steel or equivalent strength mold steel.
- Wire channels should be provided to route and protect the wires. These wire channels should not be positioned under the manifold. High temperatures in these areas may cause damage to the system wiring. A pocket may be required under the manifold heater leads to provide adequate clearance. See page 20 for clearance requirements.

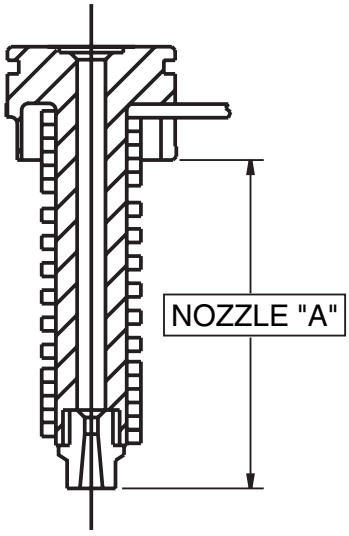
Operational Recommendation

The nozzles should be keyed in the nozzle plate to prevent rotation. This will facilitate the tip removal for replacement or cleaning of foreign material from the nozzle tips if necessary. The preferred method for keying the nozzle is on page 21.

1. Nozzle Measurements

For Gate-Mate 4 front-load heater applications, refer to D-M-E Mold Tooling Technologies catalog Section P mini print 1800 for machining and wiring specifications. Check the “A” dimension of the nozzle assemblies to ensure this dimension is within specification and to establish a base for all other dimensions. Record the value on the Master Inspection Sheet (page 30).

Fig. 20



2. Counterbore Depth Measurements

Inspect the nozzle plate that will house the nozzle for flatness. Ensure the wire channels are free of any sharp corners or burrs. All directional changes should incorporate generous radii. All of the nozzle head counterbore depths are to be +.001/-.000 inch to the designed dimension. Measure the counterbore in three locations to ensure flatness. Record this number as “B” dimension on the Master Inspection Sheet.

Machining Dimensions for Keyed Nozzle Bodies

Fig. 21

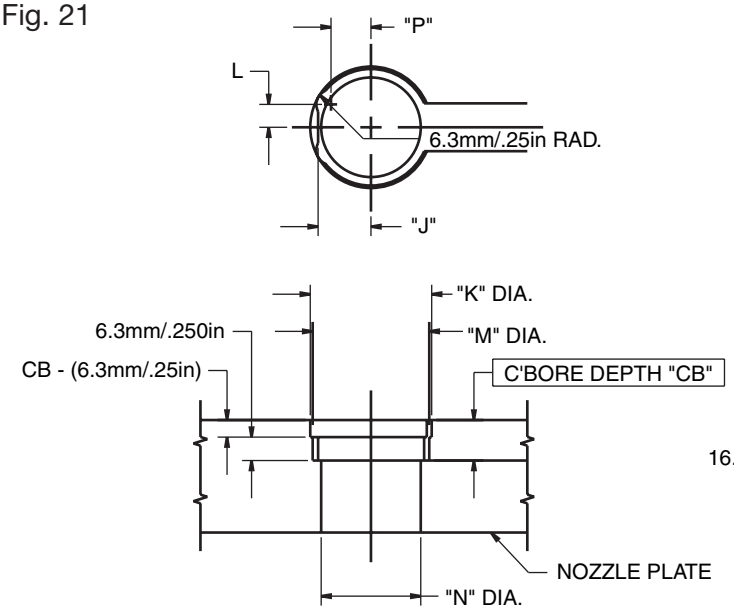
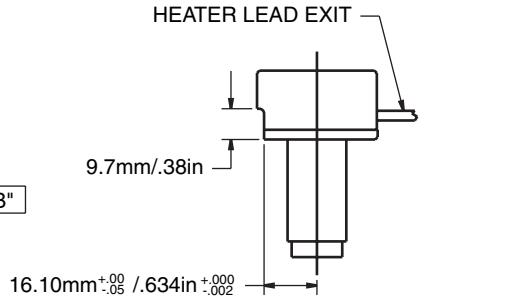


Fig. 22

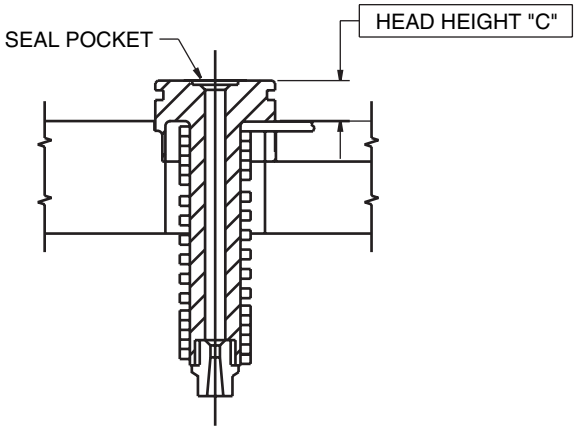


MINI GATE-MATE NOZZLE MUST BE MODIFIED TO THESE DIMENSIONS TO FIT INTO KEYED NOZZLE PLATE

NOZZLE SERIES	"M" DIA.		"K" DIA.		"N" DIA. MAX. SQ.COIL or CAST-IN		"N" DIA. MIN. SQ.COIL or CAST-IN	
	mm +.03 -.00	inch +.001 -.000	mm	inch	mm	inch	mm	inch
250	38.12	1.501	39.6	1.56	31.75	1.250	30.15	1.187
GATE MATE 4	38.12	1.501	39.6	1.56	31.75	1.250	28.58	1.125
375	50.82	2.001	52.3	2.06	41.28	1.625	36.50	1.437
MINI GATE MATE	38.12	1.501	39.6	1.56	31.75	1.250	30.15	1.187

NOZZLE SERIES	"J"		"L"		"P"		"CB" MIN.		"CB" MAX.	
	mm +.03 -.00	inch +.001 -.000	mm	inch	mm	inch	mm	inch	mm	inch
250	16.13	.635	8.71	.343	10.11	.398	6.35	.250	19.05	.750
GATE MATE 4	16.13	.635	8.71	.343	10.11	.398	6.35	.250	19.05	.750
375	22.48	.885	11.00	.433	16.33	.643	6.35	.250	19.05	.750
MINI GATE MATE	16.13	.635	8.71	.343	10.11	.398	6.35	.250	12.70	.500

Fig. 23



3. Head Height

Install the nozzles into their respective counterbores. DO NOT INSTALL THE SEAL RING AT THIS TIME. Check the height of the nozzle head to the plate in which the nozzles are installed. Record these dimensions as "C" on the Master Inspection Sheet (page 30).

Operational Recommendation

Mark the nozzle bodies on their outer diameter with the location in which they will be installed. Pay particular attention to systems that use different length nozzles. On multi-cavity molds, the marked number will normally reflect the cavity number, which in turn will match the temperature control zone number. Each nozzle counterbore location should be numbered with its appropriate location. Use the mold "O" (OFFSET) corner as a location reference.

Section 4 of this assembly guide contains a typical wiring schematic for the Meteor system. If this schematic does not suit your application you should alter it or draw a new schematic to provide the end user (customer) with this needed information.

4. Grinding Support Pads

- If needed, size the manifold center support to a dimension of +.000/-.001 inch to the height of the nozzle head found in step #3. Grind both sides of the center support pads to ensure parallelism.

NOTE: The support pads are manufactured from a non-magnetic material. Fabricate a holding fixture to be used for the grinding of these supports. Record this dimension where indicated on the Master Inspection Sheet.

Operational Recommendation

In the center of the manifold, center dowel is always required. The center support is not required if the space between the nozzle heads is insufficient.

- Properly position the Meteor manifold onto the nozzle plate using the dowel pins. The dowel pin located in the center will also locate the center support pad. The second dowel should be positioned at the end of the manifold. The dowel location on each end of the Meteor manifold will be machined as a slot. This will allow for thermal expansion (growth), and will be on the bottom of the manifold. There should be clearance between the top of the dowel pin and the bottom of the slot in the manifold. This clearance should be at least .060 inch to ensure that the dowels do not hold the manifold above the nozzles. The use and proper location of these dowel pins is important to ensure the nozzle drop locations are aligned with the nozzle flow channels. Install the dowel pins and check that the height meets the above criteria.

- Check the Meteor manifold thickness and record this dimension as “H-1” on the Master Inspection Sheet on page 30. Next, test fit the Meteor manifold block over the nozzles (with seal rings removed) and dowel pins. Making sure that the Meteor manifold lies flat across the nozzles and center support without any rocking motion.
- Establish the “D” dimension by adding the average “C” dimension to the “H-1” manifold thickness. Record this dimension on the Master Inspection Sheet.
- Before installing the manifold retainer plate, check and record the thickness of the retainer plate. Record this dimension as “E” on the Master Inspection Sheet.
- Carefully install the manifold retainer plate taking care not to pinch any wiring. Check for proper clearance around the manifold to the manifold retainer plate, and also around the manifold heater termination areas.

NOTE: It may be necessary to machine clearance slots in the manifold retainer plate to clear the nozzle heater leads.

5. Preparing for Final Assembly

- Size and install the upper support pads to the underside of the top clamp plate. This dimension will be the difference between the “E” dimension minus the “D” dimension minus the cold clearance (see formula immediately following below). Record this as dimension “SP” on the Master Inspection Sheet.
  SP=E-D-total cold clearance.

  NOTE: Note the upper supports are manufactured from non-magnetic material. Fabricate a holding fixture to be used for the grinding of these supports.

  FORMULA FOR FIGURING THE AMOUNT OF THERMAL EXPANSION
  (Determining the cold clearance value)

  “H-1” x .0000113 x (process temp. - 20°C) - .0762 = total cold clearance Metric Units

  “H-1” x .0000063 x (process temp. - 68°F) - .003 = total cold clearance Imperial Units

  “H-1”= The manifold thickness

- Test fit the top clamp plate to check interference between upper support pads and any manifold components or wiring. Check and record the nozzle “Z” dimension on the Master Inspection Sheet. THIS DIMENSION SHOULD FALL WITHIN 0.001 in. OF EACH OTHER. Remove the top clamp plate and inspect the manifold area. Remove the retainer plate and set it aside temporarily.
- Remove the manifold, taking care to protect wiring, and prepare to install seal rings into the heads of the nozzles. Check to see that all nozzles and their locations are properly marked. Mark all nozzles, manifold power and thermocouple leads to ensure proper connection into the system terminal box. At this time, it is possible to wire the nozzle assemblies to the power and thermocouple connectors. Refer to the Wiring Guidelines provided in this assembly guide (beginning on page 26) for further assistance.

6. Final Assembly

- Clean seal ring counterbores, INSTALL SEAL RINGS, and then carefully install the manifold into position without displacing the seal rings from their locations. It is now time to wire-up the power and thermocouple leads to the proper connectors. Clean and install the manifold retainer plates. DO NOT PINCH WIRING. Clean and install the top clamp plate. Then torque down the bolts that tie the top clamp plate to the nozzle plate using the torque values specified on the system design drawing.
- Determine the locating ring cutoff dimension “G.” Measure from the surface of the locating ring flange to the nozzle seat flange on which the drool ring rests. Subtract 0.010 in. and record this dimension as “G” on the Master Inspection Sheet on page 30. Machine the locating ring skirt length to this dimension and counterbore for the drool ring 87.88mm/3.46 in. dia. x .006mm/.15 in. deep. Finally, install the drool ring and locating ring onto the top clamp plate.

  NOTE: If E-D=14.2mm/.56 in. (refer to Figs. 24 and 25 on page 25) then use D-M-E Locating Ring item #EHL-0256 (no alteration required). Otherwise, use EHL-0255 and alter as specified to “G” and counterbore.
- Carefully assemble the top clamp plate to the remainder of the mold.
- USE CAUTION to avoid pinching any of the system wiring.
- Install all assembly screws and torque down as required.
- Recheck all wiring for continuity.
- Bench test the unit.

Fig. 24

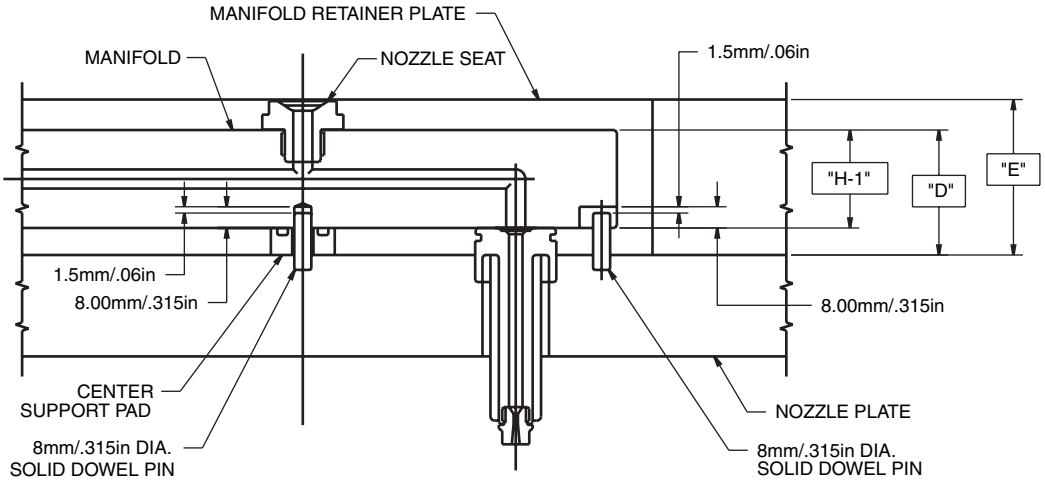
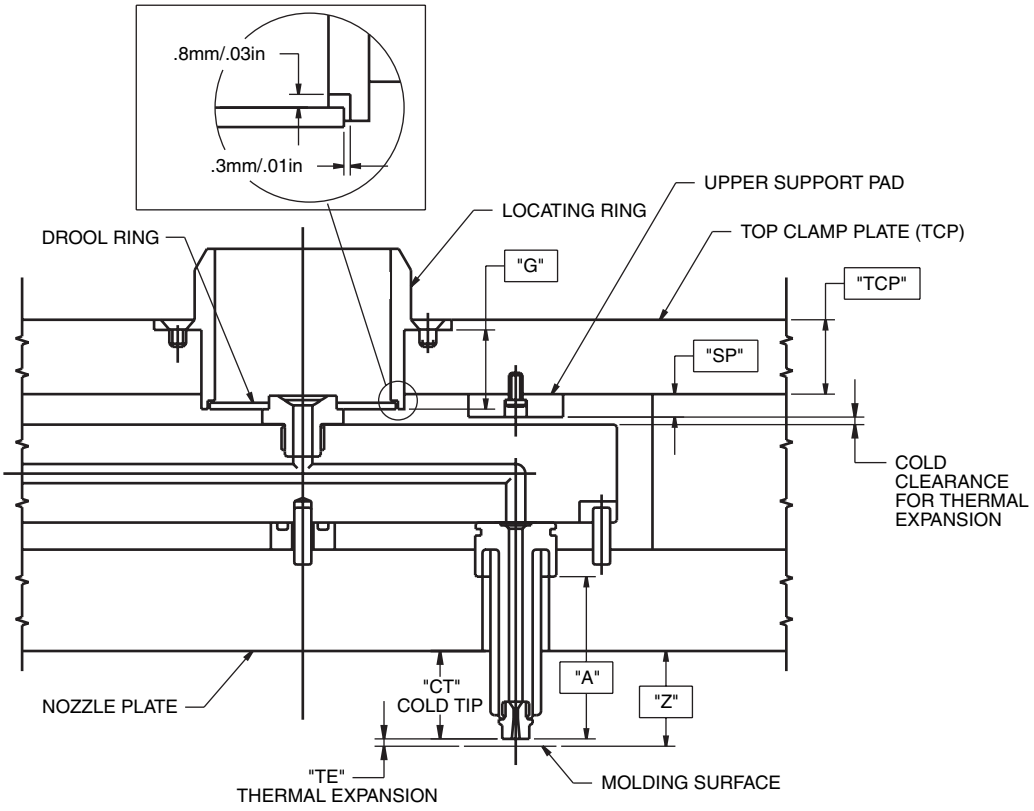


Fig. 25



FORMULA FOR DETERMINING NOZZLE THERMAL EXPANSION FACTOR IS AS FOLLOWS:
TE(mm) = "A" DIMENSION(mm) X .0000113 X (NOZZLE SET POINT TEMP °C - 20°C)
TE(inch) = "A" DIMENSION(inch) X .0000063 X (NOZZLE SET POINT TEMP °F - 68°F)

CT = Z - TE

Operational Recommendation

In the event that multiple zones are ganged together to minimize the required number of control zones, it will be necessary to use one pair of thermocouple wires per ganged set of nozzles. Run other thermocouple leads into the terminal box, insulating and identifying each for use as spares if required at a later date.

- **Ground Connection:** A ground connection must exist between the Hot Runner system (mold base) and the temperature control system. This is accomplished via the D-M-E mold power cable, which contains a ground wire (green) provided on the connector.

  TO PREVENT ELECTRICAL SHOCK AND ENSURE PERSONAL SAFETY, THE GROUNDING WIRE SHOULD BE CONNECTED TO THE MOLD BASE OR THE TERMINAL BOX ITSELF.

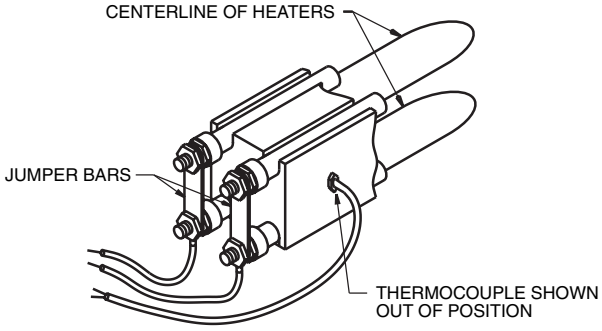
- **Power and Thermocouple Connector Placement:** Do not place the mold's power or thermocouple plugs in any area where they will be exposed to extreme temperature or humidity.
- Confirm zone numbering with respect to cavity numbers.
- **Wire Channels:** Use wire channels to ensure that wiring for nozzle and manifold (including thermocouples) is routed away from the manifold. Use retainer clips to hold the wiring in the channels to prevent wires from being cut or pinched during final assembly.
- Recheck resistances of heaters and thermocouples. Compare to previous results. If values are different, troubleshoot the system. Record these values on the Master Inspection Sheet provided.
- **Adding Wire to Nozzle Heater Leads:** If additional lead length is required, use the same type of wire. Where the connection is made, a non-insulated butt connector should be used and taped over with a high-temperature insulating tape. Be sure to test all connections before final assembly.
- **Adding Wire to Thermocouple Leads:** If additional lead length is required, use only type "J" thermocouple wire [positive (+) white, negative (-) red]. The wire should be double-length stripped, folded for proper silver-brazed connection, and taped over with a high-temperature insulating tape.

NOTE: Wiring kits are available from D-M-E.

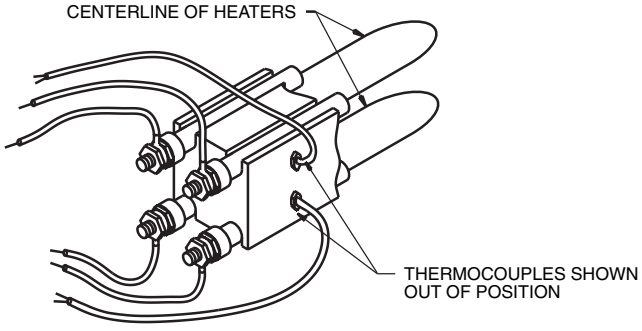
Wiring Diagrams for the Meteor Manifold & Smart Series® / G-Series Mold Connectors

MANIFOLD TYPE	MANIFOLD KIT ITEM NO.	WATTAGE PER MANIFOLD HEATER	AMPERAGE PER MANIFOLD HEATER	D-M-E CONTROLLER	WIRING LOCATION FOR NOZZLES AND MANIFOLD					
					ZONE #1	ZONE #2	ZONE #3	ZONE #4	ZONE #5	ZONE #6
IN-LINE END EXIT	MEM0100K	600	2.50	5 ZONE	NOZZLE #1	NOZZLE #2	MANIFOLD			
	MEM0150K	750	3.13		NOZZLE #1	NOZZLE #2	MANIFOLD			
	MEM0200K	900	3.75		NOZZLE #1	NOZZLE #2	MANIFOLD			
	MEM0300K	1225	5.10		NOZZLE #1	NOZZLE #2	MANIFOLD			
	MEM0400K	1550	6.46		NOZZLE #1	NOZZLE #2	MANIFOLD			
	MEM0500K	1850	7.71		NOZZLE #1	NOZZLE #2	MANIFOLD	MANIFOLD		
IN-LINE CENTER EXIT	MCM0100K	600	2.50	5 ZONE	NOZZLE #1	NOZZLE #2	MANIFOLD			
	MCM0150K	750	3.13		NOZZLE #1	NOZZLE #2	MANIFOLD			
	MCM0200K	900	3.75		NOZZLE #1	NOZZLE #2	MANIFOLD			
	MCM0300K	1225	5.10		NOZZLE #1	NOZZLE #2	MANIFOLD			
	MCM0400K	1550	6.46		NOZZLE #1	NOZZLE #2	MANIFOLD			
	MCM0500K	1850	7.71		NOZZLE #1	NOZZLE #2	MANIFOLD	MANIFOLD		
X-STYLE	MXM0100K	1050	4.38	5 ZONE	NOZZLE #1	NOZZLE #2	NOZZLE #3	NOZZLE #4	MANIFOLD	
	MXM0150K	1350	5.63		NOZZLE #1	NOZZLE #2	NOZZLE #3	NOZZLE #4	MANIFOLD	
	MXM0200K	1675	6.98	8 ZONE	NOZZLE #1	NOZZLE #2	NOZZLE #3	NOZZLE #4	MANIFOLD	MANIFOLD
	MXM0300K	2150	8.96		NOZZLE #1	NOZZLE #2	NOZZLE #3	NOZZLE #4	MANIFOLD	MANIFOLD

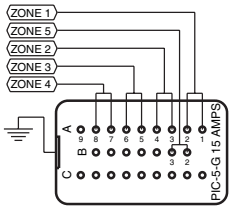
*Use wiring kit item no. MWK1002 with these 4 manifolds, all other manifolds will use wiring kit item no. MWK1001



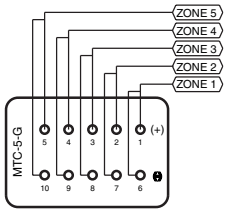
INSTALLATION OF WIRING KIT ITEM NO. MWK1001
JUMPER BARS INSTALLED AS SHOWN TO CONNECT TOP AND BOTTOM HEATERS TOGETHER TO MAKE UP ONE ZONE OF CONTROL.



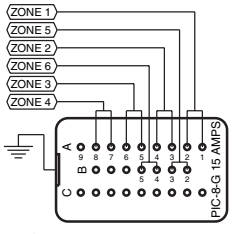
INSTALLATION OF WIRING KIT ITEM NO. MWK1002
TOP AND BOTTOM HEATERS ARE WIRED SEPARATELY TO MAKE UP TWO ZONES OF CONTROL.



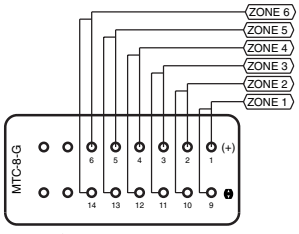
5 ZONE
MOLD POWER INPUT CONNECTOR
(MALE FRONT)



5 ZONE
MOLD THERMOCOUPLE CONNECTOR
(MALE FRONT)



8 ZONE
MOLD POWER INPUT CONNECTOR
(MALE FRONT)



8 ZONE
MOLD THERMOCOUPLE CONNECTOR
(MALE FRONT)

Instructions Prior to Installation of the Meteor Manifold System

Perform the following checks before installing the Hot Runner System into the press.

1. With the system properly grounded, execute an electrical check of each control zone for both power and thermocouple connections. Check the heater leads for continuity. The resistance checked to ground of all heater leads must be greater than 20,000 ohms (20 KW).
2. Check each thermocouple circuit for continuity. It is also important to check for continuity between thermocouples and heater elements. There should be no circuit between the heater element and the thermocouple.
3. Bench test the unit with the temperature controller set at 149˚C/300˚F. Ensure all heaters come up to the desired set point. If desired set point is not reached, troubleshoot the system.
4. When the mold is installed in the press and all water connections are made, plug the power and thermocouple cables into the mold terminal box.
5. Set the temperature controller to the correct processing temperature for the material being molded. This value is usually about 10˚C/50˚F higher than front machine barrel temperature setting.

   NOTE: Allow all heaters to go through a moisture dryout process (soft start).
6. Bring the system up to the correct processing temperature. Turn on mold water (cooling) and close the mold. Extremely cold water is not necessary. Water temperature of 38˚C/100˚F should keep the “A” side of mold from expanding at a different rate than the “B” side of the mold.
7. When the Hot Runner System has reached set point and is normalized, the D-M-E temperature controllers will show a green light in the center of the deviation light display.
8. Make sure that the machine nozzle orifice is as large as, but not larger than, the nozzle seat flow channel. This will allow maximum throughput to the Hot Runner System and the mold cavities.
9. Be certain that the nozzle radius on the machine barrel matches the nozzle seat radius on the manifold to prevent drooling. This should ensure a leak-proof seal.
10. Purge the barrel to ensure stable material enters the manifold.
11. Move the machine nozzle into position against the manifold nozzle seat.

Meteor Manifold Start-Up Procedures

1. Ensure that the machine's nozzle tip is properly seated on the manifold nozzle seat.
2. Set machine back pressure to 300-500 psi.
3. Run the extruder until material flows through all nozzle orifices (gates). Run for an additional 5-15 seconds. Then clear gates and all mold surfaces of material. If the material nozzle will not stay against the tool, see Notes and General Comments (below).
4. Move the sled back and decrease back pressure to normal setting.
5. Set decompression/suck back at a minimum 0.500 in. to control drool.
6. Set molding parameters.
7. Move sled forward.
8. Start the molding process.
9. Check the system for leaks.

Notes and General Comments

If the system will not start up, throttle down or shut off water to the "A" plate. Water to the nozzle plate should remain on.

If the machine will not extrude with the tool open, close the tool, jog the screw forward, open the tool, close the tool, and jog the screw forward again.

If the machine nozzle will not stay against nozzle seat, PROCEED WITH CAUTION. Set injection forward pressure to 200 psi. Set injection speed to slow, making sure the system is up to temperature. Move the sled into the tool and cautiously jog injection forward until material flows through gates. If necessary, raise the injection pressure in steps up to, but not exceeding, 500 psi. Clear gates and all mold surfaces of material. Finally, start the molding process.

NOTE: NEVER inject plastic through the hot runner system with the mold open.

CAUTIONS

- Make sure you wear proper safety equipment such as gloves and face shield at all times.
- Never use a torch to open frozen-off gates. This may damage tips, gate detail, or the mold itself.
- If you insert anything into the gate or tip to clear it, you must first back the machine nozzle away from the tool. Check for drool out the back of the manifold before you start. Drool here will indicate little or no pressure in the manifold.
- Never inject any Hot Runner System with high injection pressure when the mold is open.
- During the first 15 minutes of operation, check system for leaks. Loss of shot size could be an indication of leakage.
- Check to see that all cooling fans are operating in temperature-control main frames.
- Input voltage to the main frame system must not be less than 208 VAC.
- Voltages less than 240 VAC will require an extended time to bring the system up to its proper operating temperature. Lower voltages decrease effective wattage. For example: at 208 VAC, the effective wattage is 28% less than that at 240 VAC.

Company Name _____

Contact Name _____

Phone _____ **Fax** _____

If you have any questions, please call D-M-E at 1-800-626-6653.

DROPS	NOZZLE DIMENSIONS					HEATER & THERMOCOUPLE (T/C) OHM MEASUREMENT:	
	A	B	C*	D**	X	Heater	T/C
Nozzle #1							
Nozzle #2							
Nozzle #3							
Nozzle #4							

* *Head Height* ** *Average "C" plus "H-1" dimension*

MANIFOLD "H-1" HEIGHT:

CENTER SUPPORT HEIGHT:

MANIFOLD PLATE THICKNESS "E":

DIMENSION "SP":

LOCATING RING CUTOFF DIMENSION "G":

ONCE THIS FORM IS COMPLETED, PLEASE FAX TO D-M-E At 1-248-544-5707.

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