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LPIOM Linear Radiant Panel Installation, Operation & Maintenance Instructions
DESCRIPTION
Linear panels are an established approach to radiant heating. The linear panel is an extruded aluminum radiant heating strip that provides exceptionally high heat transfer. Linear panels are available in virtually any width and length up to a maximum of 16’. This product, while offering an up-to-date visual appearance, is suitable for both ceiling or wall mounting. Linear panels are also available with a range of mounting accessories providing flexible setup.

ADVANTAGES
The system, being flexible, is easily designed into any heating scheme with few dimensional constraints. Installation is straightforward and, as found through independent tests, the heat output of linear panels is equal to or better than other radiant heating products.

APPLICATIONS
Linear panels can be used in hospitals, nursing homes, daycares, commercial office developments, schools, museums, security facilities, airports, churches, banks, condominiums, laboratories, swimming pools, factories and workshops.
GENERAL SPECIFICATIONS

Material Specification
Linear panel extrusions combine outstanding aesthetic quality with excellent design flexibility as individual planks can be fastened together to form panels of virtually any width.

The aluminum planks incorporate a tube saddle channel as an integral part of the profile. The tubing is clipped into this channel and held in direct thermal contact with the extrusion. A non-hardening heat paste between the tubing and the aluminum face plate ensures even heat distribution to the active face, providing overall thermal efficiency.

Panel planks are tongue-and-grooved to provide a clean joint longitudinally. They are held together using a special clipping system.

Dimensions and Weight
Linear panels can be provided in a variety of lengths of up to 16’ and widths in multiples of 6”. An operating weight of 2 lb/ft² should be used when calculating the requirements for clipping and suspension components.

Materials of Construction
- Pipework: 5/8” O.D. copper tubing.
- Panels: Extruded aluminum planks.
- Panel joint clips: Cadmium or zinc-plated steel springs.
- Panel suspension clips: Cadmium or zinc-plated steel springs.
- Pipework clips: Cadmium or zinc-plated steel springs.
- Support channel: Extruded aluminum 1 1/2” x 3/4” x 1/8” thick.
- Paint finish: White polyester powder coating.
- Suspension system: Standard t-bar or drywall installation, the panels can be suspended with or without a frame for custom applications.
- Insulation: As per consultant’s specifications, usually a minimum of 1” thick foil backed batt insulation.
OPERATION AND MAINTENANCE

Linear panels are incorporated into a building's heating/cooling systems and will remain trouble free provided the following procedures are followed and inspections performed during start up and maintenance.

**Operation**
Heating mains should be flushed prior to connection to the radiant panels. After connection, the hydronic system should be flushed again and then dry pressure tested to isolate any leaks. Any remaining air should be vented from the system and boiler temperature should be brought up gradually.

**Maintenance**
Apart from cleaning any strainers, little maintenance should be required on the pipework system. Any descaling of pipework should be carried out in the same way as for other hydronic heating systems. The panels are robust and should resist damage. If for some reason a panel has been damaged, the pipework should be inspected to ensure that no clips have been displaced and that extruded planks are still securely fastened.

**Cleaning**
The surface of linear panels is best cleaned using an industrial vacuum cleaner to remove dust. However, if the panels become soiled they can be cleaned using a damp cloth and mild detergent.
SYSTEM DESIGN (IMPERIAL)

Radiant panel system design is fundamentally similar to that of other perimeter heating systems. The design procedure is as follows:

1. Perimeter heat losses for the space are calculated using standard ASHRAE methods and good engineering practice.
2. Water temperature drop across panel system (T) is chosen, usually 20°F.
3. Mean water temperature is determined by subtracting (T/2) from the entering water temperature.
4. Determine the linear output required for the space by dividing the total required output by the available panel length.
5. Determine the required panel width and number of passes by consulting the radiant panel linear output chart on L-5.
6. The required flow rate through the panel is based on the required panel output, the temperature drop across the system (T), and specific heat capacity of water. It can be calculated using the following formula:

\[
\text{FLOW RATE} = \frac{\text{PANEL OUTPUT}}{(T \times \text{HEAT CAPACITY})}
\]

(T) is in °F
Panel Output is in BTUH
Heat Capacity is Btu/lb x °F
Flow Rate is in gpm

7. The pressure drop across the panel system is dependent on the length of the panel circuit, the number of flexible interconnectors, and the flow rate of the water through the panel. A table of the pressure drops created by the copper tubing can be found on page L-16, and the pressure drops for the flexible interconnectors can be found on page L-17.

When designing a radiant panel heating job there are a few rules of thumb to keep in mind:
- try to supply 50% of the total perimeter heat required (as calculated in step 1) within 1m of the perimeter wall.
- design piping configuration such that the "hottest" water is always supplied closest to the perimeter wall.
- odd number of passes cannot be supplied and returned at the same end.
- even number of passes cannot be supplied and returned at opposite ends without the use of headers.

We provide a free design/consulting service. For assistance with complex applications or for in-depth information regarding radiant panel system design please contact our engineering department.
SYSTEM DESIGN (METRIC)

Radiant panel system design is fundamentally similar to that of other perimeter heating systems. The design procedure is as follows:
1. Perimeter heat losses for the space are calculated using standard ASHRAE methods and good engineering practice.
2. Water temperature drop across panel system (T) is chosen, usually 11°C.
3. Mean water temperature is determined by subtracting (T/2) from the entering water temperature.
4. Determine the linear output required for the space by dividing the total required output by the available panel length.
5. Determine the required panel width and number of passes by consulting the radiant panel linear output chart on L-5.
6. The required flow rate through the panel is based on the required panel output, the temperature drop across the system (T), and specific heat capacity of water. It can be calculated using the following formula:

\[
\text{FLOW RATE} = \frac{\text{PANEL OUTPUT}}{(T \times \text{HEAT CAPACITY})}
\]

- Panel Output is in Watts or (J/s)
- Heat Capacity is 4180 Watts/Litres x °C
- Flow Rate is in Litres/s

7. The pressure drop across the panel system is dependent on the length of the panel circuit, the number of flexible interconnectors, and the flow rate of the water through the panel. A table of the pressure drops created by the copper tubing can be found on page L-16, and the pressure drops for the flexible interconnectors can be found on page L-17.

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• try to supply 50% of the total perimeter heat required (as calculated in step 1) within 1m of the perimeter wall.
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• odd number of passes cannot be supplied and returned at the same end.
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LINEAR PANEL IMPERIAL OUTPUTS

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OUTPUTS EXPRESSED IN BTUH/LINEAL FOOT OF PANEL AND ARE BASED ON 70°F ROOM TEMPERATURE. FOR EVERY 1°F DECREASE IN ROOM TEMPERATURE BELOW 70°F, THE OUTPUT INCREASES BY 0.9%. FOR EVERY 1°F INCREASE IN ROOM TEMPERATURE ABOVE 70°F, THE OUTPUT DECREASES BY 0.9%.

ANY PANEL WIDTH CAN BE CONSTRUCTED BY COMBINING 4" AND 6" EXTRUSIONS AND INTERPOLATING THE APPROPRIATE OUTPUTS.

*REFER TO PAGE L-7 FOR ACTUAL PANEL WIDTHS & FINISHED OPENINGS

Note: Table for ethylene and propylene 50/50 glycol also available upon request.
### Linear Radiant Panel

#### Linear Panel Imperial Outputs Non Standard Passes

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### Notes
- Outputs expressed in BTU/h/lineal foot of panel and are based on 70°F room temperature.
- For every 1°F decrease in room temperature below 70°F, the output increases by 0.9%. For every 1°F increase in room temperature above 70°F, the output decreases by 0.9%.
## Linear Radiant Panel

### Linear Panel Imperial Outputs Non Standard Passes

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**Outputs expressed in BTU/h/Linear foot of panel and are based on 70°F room temperature.**

For every 1°F decrease in room temperature below 70°F, the output increases by 0.9%. For every 1°F increase in room temperature above 70°F, the output decreases by 0.9%.
### Linear Radiant Panel

**Outputs expressed in BTUH/lineal foot of panel and are based on 70°F room temperature.**

Every 1°F increase in room temperature above 70°F, the output decreases by 0.9%.

#### Linear Panel Imperial Outputs Non Standard Passes

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|        | 5 | 6 | 7 | 8 | 9 | 10 |
|--------|-------------------------|
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| 100    | 65 | 68 | 70 | 73 | 76 | 79 |
| 105    | 91 | 94 | 96 | 102 | 105 | 108 |
| 110    | 116 | 121 | 125 | 130 | 135 | 139 |
| 115    | 142 | 147 | 153 | 158 | 164 | 170 |
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| 145    | 294 | 306 | 318 | 329 | 341 | 353 |
| 150    | 319 | 332 | 344 | 357 | 370 | 383 |
| 155    | 345 | 359 | 373 | 386 | 400 | 414 |
| 160    | 371 | 385 | 400 | 415 | 430 | 445 |
| 165    | 396 | 412 | 428 | 444 | 460 | 475 |
| 170    | 421 | 438 | 454 | 471 | 488 | 505 |
| 175    | 446 | 464 | 482 | 500 | 518 | 536 |
| 180    | 472 | 491 | 509 | 528 | 547 | 566 |
| 185    | 498 | 518 | 538 | 558 | 578 | 598 |
| 190    | 523 | 544 | 565 | 585 | 606 | 627 |

|        | 5 | 6 | 7 | 8 | 9 | 10 |
|--------|-------------------------|
| 95     | 43 | 44 | 46 | 48 | 49 | 51 |
| 100    | 70 | 73 | 75 | 78 | 81 | 84 |
| 105    | 97 | 101 | 105 | 109 | 113 | 116 |
| 110    | 124 | 129 | 134 | 139 | 144 | 149 |
| 115    | 152 | 158 | 164 | 170 | 176 | 182 |
| 120    | 179 | 186 | 193 | 200 | 207 | 214 |
| 125    | 206 | 214 | 222 | 231 | 239 | 247 |
| 130    | 233 | 242 | 252 | 261 | 270 | 280 |
| 135    | 260 | 271 | 281 | 292 | 302 | 312 |
| 140    | 288 | 299 | 311 | 322 | 334 | 345 |
| 145    | 315 | 327 | 340 | 353 | 365 | 378 |
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| 155    | 369 | 384 | 399 | 414 | 428 | 443 |
| 160    | 397 | 413 | 429 | 444 | 460 | 476 |
| 165    | 424 | 441 | 458 | 475 | 492 | 509 |
| 170    | 450 | 468 | 486 | 505 | 523 | 541 |
| 175    | 478 | 497 | 516 | 535 | 554 | 573 |
| 180    | 505 | 525 | 545 | 566 | 586 | 606 |
| 185    | 533 | 555 | 576 | 597 | 619 | 640 |
| 190    | 560 | 582 | 604 | 627 | 649 | 672 |

Outputs expressed in BTUH/lineal foot of panel and are based on 70°F room temperature. For every 1°F decrease in room temperature below 70°F, the output increases by 0.9%. For every 1°F increase in room temperature above 70°F, the output decreases by 0.9%.
**Linear Radiant Panel**

**Linear Panel Imperial Outputs Non Standard Passes**

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**Outputs Expressed in BTUH/Lineal Foot of Panel and are based on 70°F Room Temperature. For every 1°F decrease in room temperature below 70°F, the output increases by 0.9%. For every 1°F increase in room temperature above 70°F, the output decreases by 0.9%**

L-5i4
## LINEAR PANEL METRIC OUTPUTS

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**Outputs expressed in watts/lineal metre of panel and are based on 21°C room temperature. For every 1°C decrease in room temperature below 21°C, the output increases by 2%. For every 1°C increase in room temperature above 21°C, the output decreases by 2%.**

Any panel width can be constructed by combining 100mm and 150mm extrusions and interpolating the appropriate outputs.

*Refer to page L-7 for actual panel widths & finished openings*
## PANEL OUTPUTS - 50/50 ETHYLENE - (IMPERIAL)

**LINEAR PANEL IMPERIAL OUTPUTS - 50/50 ETHYLENE**

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Outputs expressed in BTUH/Lineal foot of panel and are based on 70°F room temperature. Any panel width can be constructed by combining 4", 6" and 8" extrusions.
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<td>436</td>
<td>485</td>
<td>587</td>
<td>703</td>
<td>804</td>
</tr>
</tbody>
</table>

Outputs expressed in BTUH/Linear foot of panel and are based on 70°F room temperature. Any panel width can be constructed by combining 4", 6" and 8" extrusions.
**Linear Radiant Panel**

**RADIANT PANEL WIDTHS & FINISHED OPENINGS**

<table>
<thead>
<tr>
<th>PANEL WIDTH (IMPERIAL-INCHES)</th>
<th>FINISHED OPENING (IMPERIAL-INCHES)</th>
<th>PANEL WIDTH (METRIC - mm)</th>
<th>FINISHED OPENING (METRIC - mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6-1/4</td>
<td>154</td>
<td>160</td>
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<tr>
<td>8-1/4</td>
<td>8-1/2</td>
<td>208</td>
<td>214</td>
</tr>
<tr>
<td>10</td>
<td>10-1/4</td>
<td>256</td>
<td>262</td>
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<td>12</td>
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<td>15-1/4</td>
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<td>389</td>
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<td>416</td>
</tr>
<tr>
<td>17-3/4</td>
<td>18-1/8</td>
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<td>19-7/8</td>
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<td>23-3/4</td>
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<td>610</td>
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<tr>
<td>29-5/8</td>
<td>29-7/8</td>
<td>754</td>
<td>760</td>
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<tr>
<td>35-1/2</td>
<td>35-3/4</td>
<td>902</td>
<td>908</td>
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**Note:** Finished openings do not include support angle thickness.
8" WALL MOUNT PANEL

OUTPUT/MWT SCHEDULE FOR 2-PASS 200mm (8") PANEL

<table>
<thead>
<tr>
<th>MWT (°F)</th>
<th>OUTPUT (Btu/h ft)</th>
<th>MWT (°C)</th>
<th>OUTPUT (W/m)</th>
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</thead>
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<tr>
<td>160</td>
<td>300</td>
<td>71.1</td>
<td>289</td>
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<td>165</td>
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<td>93.3</td>
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<tr>
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<td>498</td>
<td>96.1</td>
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SKY LIGHT

END CAP BY THE MANUFACTURER

RADIANT PANEL

WALL MOUNT PANEL

OUTSIDE WALL

CLIP SUPPLIED BY THE MANUFACTURER

MOUNTING SCREWS BY OTHERS

5/8" COPPER COIL

NON-HARDENING HEAT PASTE BETWEEN TUBING AND ALUMINUM

COIL CLIP

5/8" COPPER COIL

1/8" COPPER COIL

5/8" COPPER COIL
8" LOWER WALL MOUNT PANEL

TYPICAL INSTALLATION

NOT TO SCALE

OUTPUT/MWT SCHEDULE FOR 2-PASS 8" PANEL

<table>
<thead>
<tr>
<th>MWT (°F)</th>
<th>OUTPUT (Btu/h)</th>
<th>MWT (°F)</th>
<th>OUTPUT (Btu/h)</th>
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</thead>
<tbody>
<tr>
<td>120</td>
<td>124</td>
<td>165</td>
<td>321</td>
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<tr>
<td>160</td>
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<td>205</td>
<td>498</td>
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</table>

MANUFACTURER END CAP BY THE RADIANT PANEL SKY LIGHT

WELDED CORNER RADIANT PANEL

WALL MOUNT PANEL OUTSIDE WALL

CLIP SUPPLIED BY THE MANUFACTURER MOUNTING SCREWS BY OTHERS

5/8" COPPER COIL

NON-HARDENING HEAT PASTE BETWEEN TUBING AND ALUMINUM

COIL CLIP
STANDARD CASTELLATED LINEAR EXTRUSIONS

4" (102mm) 1 PASS

6" (154mm) 1 PASS

6" (154mm) 2 PASS
LINEAR CURTAIN TRACK

152mm (6") 1-PASS CURTAIN TRACK
MISCELLANEOUS LINEAR EXTRUSIONS

- 2" BULLNOSE - 1 PASS - LEFT
- 2" BULLNOSE - 1 PASS - RIGHT
- LEFT-HAND INDUSTRIAL - 2 PASS
- RIGHT-HAND INDUSTRIAL - 2 PASS
- 4" 1-PASS C-SECTION
- 6" 1-PASS C-SECTION
- 2" J-SECTION
- 1" CORNER
- Extruded Aluminum T-ANGLE
- Extruded Aluminum L-ANGLE
- 4" 1-PASS BULLNOSE
COPPER CONNECTION DETAILS

5/16" O.D. COPPER TUBE BY MECHANICAL CONTRACTOR

Panel tubing flared by the manufacturer to allow for insertion of 5/16" copper. No coupling required.

5/16" O.D. TUBING BY THE MANUFACTURER

TYPICAL SUPPLY, RETURN CONNECTION.
BY MECHANICAL CONTRACTOR

T-BAR BY DIVISION 9

INTERCONNECTORS
SUPPLIED BY THE MANUFACTURER WHEN PANELS ARE INSTALLED IN SERIES IN THE SAME ROOM

16"

63/4"

16 1/2"

1/2' FOR EXPANSION
GENERAL NOTES

1. SHOP DRAWINGS MUST BE AVAILABLE TO THE INSTALLERS PRIOR TO THE START OF PIPING ROUGH IN. PIPING FOR RADIANT PANEL MUST NOT CHANGE FROM THE MECHANICAL DRAWINGS FOR PROJECT.

2. RADIANT PANEL DRAWING, ARCHITECTURAL DRAWING AND MECHANICAL DRAWINGS MUST BE CONSULTED BEFORE INSTALLATION BEGINS. REFER TO MECHANICAL DRAWINGS FOR PIPE SIZES AND VALVE LOCATIONS. ANY PANEL INSTALLED AGAINST EXTERIOR WALLS SHOULD HAVE THE FIRST TUBE SUPPLIED NEAREST THE WALL.

3. INSTALL RADIANT PANELS WITH FEMALE EDGE TOWARD EXTERIOR WALL. PLEASE NOTE THAT ALL PANELS ARE MADE WITH A RED LABEL INDICATING FEMALE EDGE.

4. ALL RADIANT PANELS MUST HAVE AT LEAST ONE TIE WIRE ON EACH CROSS BRACE.

5. BRACING ON RADIANT PANELS:
   - 2 BRACES - UP TO 5 feet
   - 3 BRACES - 5 feet TO 10 feet
   - 4 BRACES - 10 feet TO 14 feet
   - 5 BRACES - 14 feet TO 16 feet

6. FOR CUTTING OF RADIANT PANELS USE A CIRCULAR SAW WITH A CARBIDE TIPPED BLADE. CUT WITH THE FINISH SURFACE FACING THE SAW. ENSURE YOU PROTECT THE FINISH SURFACE BEFORE CUTTING BEGINS.

7. WHEN PANELS REQUIRE SITE CUTTING, FOLLOW THESE STEPS:
   1. Install all but the last panel, measure length required,
   2. Cut last panel to required length using procedure listed in part 6 above,
   3. Install final panel in ceiling.

8. VULCAN IS RESPONSIBLE ONLY FOR THE SUPPLY OF RADIANT PANELS. OTHERS ARE TO SUPPLY AND INSTALL THE FOLLOWING:
   1. Necessary piping between panels (other than interconnectors, as indicated on plan)
   2. Piping from panels to supply and return mains.
   3. Specified insulation and hanger wires.
   4. Suspended ceiling grids and panel support moldings.
CUTTING INSTRUCTIONS

MULTI-PANEL INSTALLATION

CUT PANEL HERE AS NEEDED
INTERCONNECTORS SUPPLIED BY THE MANUFACTURER
CUT PANEL HERE AS NEEDED

FACTORY INSTALLED KICK-UPS AND RETURN BEND KEPT BACK APPROXIMATELY 6" FROM EDGE OF PANEL
FACTORY INSTALLED RETURN BENDS KEPT BACK APPROXIMATELY 6" FROM EDGE OF PANEL

SINGLE PANEL INSTALLATION

CUT PANEL HERE AS NEEDED

FACTORY INSTALLED KICK-UPS FOR SUPPLY/RETURN CONNECTION
FACTORY INSTALLED RETURN BENDS KEPT BACK APPROXIMATELY 6" FROM EDGE OF PANEL
LINEAR PANEL EXPANSION DETAILS

EXPANSION GAP FOR RADIANT PANEL

INSTALLATION OF CROSS TEE BETWEEN PANEL ENDS

- T-BAR BY OTHERS
- ALUMINUM CROSSBRACE
- 5/8" O.D. TUBING
- 1/2" FOR EXPANSION
- WALL ANGLE
- OPENING REQUIRED VARIES DUE TO DESIGN
- CROSS TEE
- FIX CROSS TEE TO WALL ANGLE AND T-BAR
- WALL MOULDING BY RESPONSIBLE TRADE
- RADIANT PANEL
- PANEL LENGTH 1/2" SHORTER THAN CEILING OPENING
- CEILING OPENING (LENGTHWISE)
LINEAR CIRCUITRY AND PRESSURE DROPS

Single panel length to a maximum of 16 feet
Pressure drop for 5/8" O.D. tubing:

- at 0.5 GPM is 0.5 foot drop per 100 feet (Flow rate US gal/min)
- at 1 GPM is 2 feet drop per 100 feet
- at 2 GPM is 7 feet drop per 100 feet
- at 2.5 GPM is 10 feet drop per 100 feet
- at 3 GPM is 14 feet drop per 100 feet

Refer to L-17 for additional pressure drop info.
INTERCONNECTOR PRESSURE DROPS

HEADER CIRCUITRY

INTERCONNECTORS
SUPPLIED BY THE MANUFACTURER

HEADER SYSTEM BY MECHANICAL CONTRACTOR

MULTIPLE PANEL CIRCUITRY FOR LONGER ZONES

<table>
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<tr>
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<td>0.559</td>
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<td>0.823</td>
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<tr>
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</table>
LINEAR PANELS IN T-BAR CEILING

ODD NUMBER OF PASSES SINGLE PANEL, LENGTH UP TO 16 FEET

TWO ODD NUMBER PASS PANELS PIPED AROUND COLUMN
PERIMETER PANELS WITH COLUMN INTERFERENCE

RADIANT PANELS POSITIONED CLEAR OF PERIMETER COLUMNS. EVEN PASS COILING SHOWN

RADIANT PANELS NOTCHED AROUND PERIMETER COLUMNS. EVEN PASS COILING SHOWN
PIPING DETAIL FOR ODD AND EVEN PASS LINEAR PANELS

H.W.R.
H.W.S.

ODD PASS RADIANT PANEL

۵/۶” O.D. SOFT COPPER FOR CONNECTING PANELS BY MECHANICAL CONTRACTOR

T-BAR CEILING AND WALL MOULDINGS BY OTHERS

INTERCONNECTORS

EVEN PASS PANEL

RETURN BENDS
ACCESS PANELS WHERE ACCESSIBILITY IS REQUIRED

TWO PANEL EVEN PASS CONFIGURATION

SINGLE PANEL EVEN PASS CONFIGURATION
Linear Radiant Panel

ACCESS PANELS WHERE ACCESSIBILITY IS REQUIRED

ACCESS PANEL BY THE MANUFACTURER

ACCESS PANEL BY OTHERS

ACCESS PANEL BY RESPONSIBLE TRADE

INACTIVE EXTRUDED ALUMINUM ACCESS PANEL BY THE MANUFACTURER TO ALLOW SUPPLY/RETURN CONNECTION

ACCESS PANEL BY THE MANUFACTURER
CORNER DETAILS

5/8" O.D. SOFT COPPER FOR CONNECTING PANELS BY MECHANICAL CONTRACTOR

CROSS TEE
Linear Radiant Panel

SERPENTINE CIRCUITING AROUND COLUMN

- Wire Hanger
- Supply
- Column
- Perimeter Wall
- Aluminum Crossbrace
- 5/8" O.D. Soft Copper for Connecting Panel Tubing by Mechanical Contractor
- Return
- Supplied Return Bends by the Manufacturer
- Angles by Others

Note: Panel width varies due to design.
INSTALLED IN PERIMETER T-BAR CEILING

NOTE: OPENING FOR RADIANT PANEL OBTAINED FROM L-7.
INSTALLED IN INTERIOR T-BAR CEILING

NOTE: OPENING FOR RADIANT PANEL OBTAINED FROM L-7.
SLOPED LINEAR PANEL IN T-BAR CEILING

- Minimum of 1 wire hanger, supplied by others, on each crossbrace.
- Non-hardening heat paste between tubing & aluminum.
- Wall angle custom made to required angle by others.
- Insulation by mechanical contractor.
- Angle custom made by others to be fastened to T-bar.

Note: Opening for radiant panel obtained from L-7.
SLOPED LINEAR PANEL IN T-BAR CEILING WITH CORNER

- MITERED CORNER
- PERIMETER WALL
- T-BAR CEILING
- RADIANT PANEL
- MINIMUM OF 1 WIRE HANGER, SUPPLIED BY OTHERS, ON EACH CROSSBRACE
- WALL ANGLE CUSTOM MADE TO REQUIRED ANGLE BY OTHERS
- INSULATION BY MECHANICAL CONTRACTOR
- NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM
- ANGLE CUSTOM MADE BY OTHERS TO BE FASTENED TO T-BAR
LINEAR PANELS AT PERIMETER WALL IN GYPROC CEILING

- PERIMETER WALL
- GYPROC CEILING
- USE 2 WIRE HANGERS IF PANEL IS OVER 24"
- MINIMUM OF 1 WIRE HANGER, SUPPLIED BY OTHERS, ON EACH CROSSBRACE
- ALUMINUM CROSSBRACE
- ANGLES BY OTHERS
- INSULATION BY MECHANICAL CONTRACTOR
- T-BAR BY OTHERS
- NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM

NOTE: OPENING FOR RADIANT PANEL OBTAINED FROM L-7. ACCESS TO SUPPLY, RETURN AND INTERCONNECTION BETWEEN PANELS WILL BE REQUIRED.
NOTE: OPENING FOR RADIANT PANEL OBTAINED FROM L-7. ACCESS TO SUPPLY, RETURN AND INTERCONNECTION BETWEEN PANELS WILL BE REQUIRED.
LINEAR PANELS AT PERIMETER WALL IN GYPROC CEILING

- Use 2 wire hangers on each cross brace if panel is over 610mm wide or as per seismic engineer's requirements.
- Access panel by the manufacturer typical 470mm unless otherwise noted.
- Make opening in drywall 5mm larger than clear opening for panel to allow for thickness of T and/or L angles.
- Wall angle by Division 9. Do not over torque mounting screws as this will distort moulding.
- Use a minimum of 1 wire hanger per cross brace.
- Insulation by others.
- Non-hardening heat paste between tubing and aluminum.
- T-bar by others.
Linear Radiant Panel

RECESSED LINEAR PANEL IN GYPROC CEILING

NOTE:
ACCESS TO SUPPLY, RETURN AND INTERCONNECTION BETWEEN PANELS WILL BE REQUIRED. OPENING FOR RADIANT PANEL OBTAINED FROM L-7.
LINEAR PANEL BEHIND BULKHEAD

USE 2 WIRE HANGERS IF PANEL IS OVER 24"

HEIGHT OF CEILING MAY VARY

NOTE:
OPENING FOR RADIANT PANEL OBTAINED FROM L-7. ACCESS THROUGH BULKHEAD REQUIRED FOR CONNECTION
SLOT DIFFUSER IN LINEAR PANEL BEHIND BULKHEAD

- **USE 2 WIRE HANGERS IF PANEL IS OVER 24"**
- **ANGLES BY OTHERS**
- **HEIGHT OF CEILING MAY VARY**
- **MINIMUM OF 1 WIRE HANGER ON EACH CROSSBRACE SUPPLIED BY OTHERS**
- **ACCESS REQUIRED FOR CONNECTING PANELS**
- **PERIMETER WALL**
- **ALUMINUM CROSSBRACE**
- **INSULATION BY MECHANICAL CONTRACTOR**
- **NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM**
- **DROP BULKHEAD**
- **LINEAR SLOT DIFFUSER BY OTHERS**
LINEAR RADIANT PANEL

SLOT DIFFUSER IN LINEAR PANEL IN T-BAR

USE 2 WIRE HANGERS IF PANEL IS OVER 24".

MINIMUM OF 1 WIRE HANGER ON EACH CROSSBRACE, SUPPLIED BY OTHERS.

PERIMETER WALL

DIFFUSER CLIPS INTO PANEL

ALUMINUM CROSSBRACE

INSULATION BY MECHANICAL CONTRACTOR

NON-HARDENING HEAT PASTE BETWEEN TUBING AND ALUMINUM

LINEAR SLOT DIFFUSER SUPPLIED UNPAINTED TO PANEL MANUFACTURER TO PAINT WITH PANEL AS A SINGLE UNIT.
SLOT DIFFUSER IN LINEAR PANEL

- Use 2 wire hangers if panel is over 24" (600mm)
- Angles by others
- Radiant panel
- Perimeter wall
- Aluminum crossbrace
- Minimum of 1 wire hanger per crossbrace
- Linear slot diffuser by others
- Non-hardening heat paste between tubing and aluminum
- Insulation by mechanical contractor
FRAMED PANEL WITH ACCESS PANEL IN GYPROC CEILING

NOTE:
CONNECTIONS TO VALVES DONE ABOVE ACTIVE PANEL TO ALLOW FOR ACCESS PANEL PLACEMENT. OPENING FOR RADIANT PANEL OBTAINED FROM L-7.
Linear Radiant Panel

FRAMED LINEAR PANEL IN GYPROC CEILING

USE 2 WIRE HANGERS IF PANEL IS OVER 600mm OR 24"

NOTE: MAKE OPENING IN DRYWALL 5mm LARGER THAN CLEAR OPENING FOR PANEL TO ALLOW FOR THICKNESS OF T ANGLES.

ACCESS PANEL BY THE MANUFACTURER. TYPICAL 450mm UNLESS OTHERWISE NOTED.

EXTRUDED ALUMINUM T-SECTION FRAME WITH WELDED CORNERS BY THE MANUFACTURER

ALUMINUM CROSS BRACE

TO MAIN SUPPLY TO MAIN RETURN

USE A MINIMUM OF 1 WIRE HANGER PER CROSS BRACE

ALUMINUM CROSS BRACE

INSULATION BY OTHERS

EXTRUDED T-FRAME BY THE MANUFACTURER

NON-HARDENING HEAT PASTE BETWEEN TUBING AND ALUMINUM

CLEAR OPENING WIDTH 610mm

L-31-A
FRAMED LINEAR SECURITY PANEL WITH ACCESS PANEL IN GYPROC CEILING

MAIN PANEL IS PERMANENTLY FIXED, BUT HAS A REMOVABLE LOCKING ACCESS PANEL

Panel length/Total number of hold down clips per frame:
- up to 6½’ = 4
- up to 9 ¾’ = 6
- up to 13’ = 8
- up to 16’ = 10

NOTE: OPENING FOR RADIANT PANEL OBTAINED FROM L-7. CONNECTIONS TO VALVES DONE ABOVE ACTIVE PANEL TO ALLOW FOR ACCESS PANEL PLACEMENT
Linear Radiant Panel

REMOVABLE LOCKING LINEAR PANEL IN GYPROC CEILING

NOTE:

- Use 2 wire hangers if panel is over 24".
- Access panel by the manufacturer. Typical 18" unless otherwise noted.
- Hold-down clip by the manufacturer.
- Aluminum cross brace.
- Non-hardening heat paste between tubing and aluminum.
- Extruded T-frame by the manufacturer.
- Use a minimum of 1 wire hanger per cross brace.
- Insulation by others.
- Insert this end of the panel first.
- Loosen screw to secure panel in place.

SCHEDULE
- Panel up to 6' require 2 locks.
- Panel up to 10' require 3 locks.
- Panel up to 13' require 4 locks.

PRE-DRILLED HOLES TO ACCESS SECURITY SCREWS

MAKE OPENING IN DRYWALL 1/2" LARGER THAN CLEAR OPENING FOR PANEL TO ALLOW FOR THICKNESS OF T ANGLES.
Linear Radiant Panel

SURFACE MOUNTED LINEAR PANEL

NOTE: PIPING CONNECTION ALSO POSSIBLE THROUGH SIDE OF PANEL

FASTENED TO STRUCTURE ABOVE BY MECHANICAL CONTRACTORS

ALUMINUM CROSSBRACE

FACTORY SUPPLIED PAINTED SCREW TO MATCH RADIANT PANEL

INSULATION BY MECHANICAL CONTRACTOR

EXTRUDED FRAMING MATERIAL BY THE MANUFACTURER

NON-HARDENING HEAT PASTE BETWEEN TUBING AND ALUMINUM

3.5"
VERTICAL LINEAR PANEL IN GYPROC WALL

NOTE:
ACCESS REQUIRED TO THE BACK OF RADIANT PANEL TO ALLOW FOR CONNECTION OF PIPING AND HOLDING BRACKET.

OPENING FOR RADIANT PANEL OBTAINED FROM L-7.
SURFACE WALL MOUNTED LINEAR PANEL

PERIMETER WALL

RADIANT PANEL

WINDOW

WALL MOUNTING CLIP
BY THE MANUFACTURER

INSULATION
BY MECHANICAL
CONTRACTOR

ALUMINUM CROSSBRACE

NON-HARDENING HEAT PASTE
BETWEEN TUBING & ALUMINUM
SURFACE WALL MOUNTED LINEAR PANEL

PERIMETER WALL

RADIANT PANEL

WINDOW

INSULATION BY MECHANICAL CONTRACTOR

ALUMINUM CROSSBRACE

NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM

WALL MOUNTING CLIP BY THE MANUFACTURER
SURFACE WALL MOUNTED LINEAR PANEL

PERIMETER WALL

RADIANT PANEL

WALL MOUNTING CLIP
BY THE MANUFACTURER

WINDOW

INSULATION BY OTHERS

ALUMINUM CROSSBRACE

NON-HARDENING HEAT PASTE
BETWEEN TUBING & ALUMINUM

6" INCREMENTS

1"
HANGING LINEAR PANEL IN EXPOSED AREA

NOTE:
PAINTED 0.040" ALUMINUM TOP OPTIONAL

ALUMINUM CROSSBRACE
INSULATION BY OTHERS
NON-HARDENING HEAT PASTE BETWEEN ALUMINUM & TUBING
HANGING INDUSTRIAL LINEAR PANEL

- CEILING ABOVE
- END CAP
- HANGING DEVICE BY OTHERS
- ALUMINUM CROSSBRACE
- NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM
HANGING LINEAR PANEL IN EXPOSED AREA

NOTE:
OPTIONAL 0.040” ALUMINUM TOP PAINTED TO MATCH RADIANT PANEL AVAILABLE

WALL CLIP SUPPLIED BY THE MANUFACTURER
ALUMINUM CROSSBRACE

3/8” THREADED ROD, NUT & HOLE BY OTHERS

NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM

L-ANGLE BY OTHERS, SCREWED TO WALL

END CAP

INSULATION BY OTHERS
HANGING LINEAR PANEL IN EXPOSED AREA

NOTE:
OPTIONAL 0.040" ALUMINUM TOP PAINTED TO MATCH RADIANT PANEL AVAILABLE

WALL CLIP SUPPLIED BY THE MANUFACTURER

3/8" THREADED ROD, NUT & HOLE BY OTHERS

ALUMINUM CROSSBRACE

NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM

L-ANGLE BY OTHERS, SCREWED TO WALL

INSULATION BY OTHERS
Linear Radiant Panel

HANGING LINEAR PANEL IN EXPOSED AREA

CEILING ABOVE

WALL

END CAP

WALL CLIP
SUPPLIED BY
THE MANUFACTURER

ALUMINUM
CROSSBRACE

NON-HARDENING HEAT
PASTE BETWEEN TUBING
& ALUMINUM

L-ANGLE BY THE MANUFACTURER

CHAIN BY OTHERS

INSULATION BY
OTHERS
ENCLOSED LINEAR PANEL IN EXPOSED AREA

- END CAP
- RADIANT PANEL
- 20 GAUGE SATIN COAT CUSTOM DESIGNED TO SUIT, PAINTED TO MATCH RADIANT PANEL
- \( \frac{3}{8} \)" THREADED ROD, NUT AND HOLES BY OTHERS
- ALUMINUM CROSSBRACE
- 180° CORNER SECTION
- INSULATION BY MECHANICAL CONTRACTOR
HANGING LINEAR PANEL IN EXPOSED AREA

CEILING ABOVE

END CAP

ALUMINUM CROSSBRACE

20 GAUGE SATIN COAT CUSTOM DESIGNED TO SUIT, PAINTED TO MATCH RADIANT PANEL

180° CORNER SECTION

NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM

INSULATION BY OTHERS

HANGING DEVICE BY OTHERS
HANGING LINEAR PANEL IN EXPOSED AREA

- Ceiling Above
- End Cap
- Hanging Device
- Aluminum Crossbrace
- 180° Corner Section
- Non-Hardening Heat Paste Between Tubing & Aluminum
- Insulation By Others
HANGING LINEAR PANEL IN EXPOSED AREA

- Ceiling above
- End cap
- Aluminum crossbrace
- Non-hardening heat paste between tubing & aluminum
- Insulation by others
- Hinging device by others
WALL MOUNTED LINEAR PANEL FOR GYMNASIUM

- ACCESS PANEL
- RADIANT PANEL
- END CAP BY THE MANUFACTURER
- WALL MOUNTING CLIP BY THE MANUFACTURER
- INSULATION BY OTHERS
- ALUMINUM CROSSBRACE
- HEATING LINES TO BE INSULATED WITHIN RADIANT PANEL
- NON-HARDENING HEAT PASTE BETWEEN TUBING AND ALUMINUM

NARROWER PROFILE AVAILABLE WHEN CLEARANCE FOR MAINS IS NOT REQUIRED

4" 6"
SURFACE MOUNTED LINEAR PANEL

- **End Cap**
- **WALL**
- **Joiner Strip by the Manufacturer**
- **Access Panel**
- **Radiant Panel**
- **3" Wide Hanging Bracket by the Manufacturer**
- **Aluminum Crossbrace**
- **Min 1 ½" Non-Hardening Heat Paste between Tubing & Aluminum**
- **Insulation by Others**

**Bracket**
- Bracket must be evenly spaced in between the access panel and the active panel (½" from edge of active panel to center of bracket)

**Access Panel**
- Soft Copper Connection by Others
- Copper Bends by the Manufacturer
- Welded Corner by the Manufacturer

**Bracket**
- 3" Wide Hanging Bracket evenly spaced at a maximum interval of 4'
Linear Radiant Panel

SURFACE MOUNTED LINEAR PANEL

- USE 2 HANGER WIRES FOR PANELS OVER 24"
- POP RIVETS BY MECHANICAL CONTRACTOR
- ALUMINUM CROSSBRACE
- NON-HARDENING HEAT PASTE
- PANEL COVER PAINTED TO MATCH RADIANT PANEL
SURFACE MOUNTED LINEAR PANEL

WALL

ACCESS PANEL

RADIANT PANEL

JOINER STRIP BY THE MANUFACTURER

3" WIDE HANGING BRACKET BY THE MANUFACTURER

MIN 1"

L-39-C
SURFACE MOUNTED LINEAR PANEL

- Linear Radiant Panel
- Non-hardening heat paste between tubing & aluminum
- 3" wide hanging bracket by the manufacturer
- ALUMINUM CROSSBRACE
- MIN 1½"
- NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM

12" ACCESS PANEL
JOINER STRIP BY THE MANUFACTURER
Linear Radiant Panel

SURFACE MOUNT WITH 4" BULLNOSE

JOINER STRIP BY THE MANUFACTURER

WALL

RADIANT PANEL

END CAP

ACCESS PANEL

ALUMINUM CROSSBRACE

NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM

INSULATION BY OTHERS

HANGING BRACKET BY THE MANUFACTURER

SURFACE CAN BE ACTIVATED IF OUTPUT REQUIRED
Linear Radiant Panel

SURFACE MOUNT WITH 4" CORNER

- RADIANT PANEL
- 12" ACCESS PANEL
- JOINER STRIP BY THE MANUFACTURER
- ALUMINUM CROSSBRACE
- NON-HARDENING HEAT PASTE BETWEEN TUBING & ALUMINUM
- INSULATION BY OTHERS
- HANGING BRACKET BY THE MANUFACTURER
- SURFACE CAN BE ACTIVATED IF OUTPUT REQUIRED
PERIMETER CHANNEL ANGLE

DO NOT OVER TORQUE MOUNTING SCREWS AS THIS WILL DISTORT MOULDING.
T-BAR CLIP

INSTALL MINIMUM OF 2 CLIPS PER PANEL - SPACING BETWEEN CLIPS NOT TO EXCEED 6"

EXTRUDED CLIP
(SUPPLIED BY THE MANUFACTURER)

CLIP USED TO HOLD PANEL TIGHT AGAINST T-BAR.
INSTALLATION INSTRUCTIONS

LINEAR RADIANT HEATING PANELS ARE FINISHED WITH STANDARD WHITE POLYESTER POWDER COATING. HOWEVER, THE PANEL SURFACE MUST NOT COME IN CONTACT WITH THE BARE SKIN. PERSPIRATION OR GREASE FROM AN UNGLOVED HAND CAN POTENTIALLY LEAVE A MARK ON THE PANEL.

INSTALLATION PERSONNEL MUST WEAR CLEAN WHITE GLOVES WHEN HANDLING THE RADIANT PANELS.

USE A HEAT PAD BETWEEN RADIANT PANEL AND COPPER PIPE WHEN MAKING SOLDER CONNECTION. EXCESSIVE HEAT CAN DAMAGE THE PAINT FINISH.