

Linear Radiant Ceiling Panels

Catalog

always the best climate





When it comes to radiant heating and cooling systems, Zehnder is a trusted leader, providing innovative solutions that are as efficient as they are aesthetically pleasing. With over 65 years of experience in the radiant business globally, Zehnder has honed its expertise to deliver superior systems for a variety of applications.

PROVEN GLOBAL EXPERIENCE SINCE 1956

Zehnder has been at the forefront of radiant heating and cooling technology since 1956. With decades of experience, we bring unmatched industry knowledge and expertise to every project, ensuring reliability and top-tier performance for our clients.

SIGNATURE NORTH AMERICAN INSTALLATIONS

Our systems are trusted across North America in a range of industries, including healthcare, higher education, and Class A office spaces. Zehnder's radiant ceiling panels have been successfully integrated into diverse environments, offering effective and sustainable climate control.

DEDICATED DESIGN TEAM

From the start of your project, Zehnder's dedicated design team works closely with you to ensure the best possible solution. We collaborate with architects, engineers, and contractors to deliver a system tailored to your specific needs and goals, optimizing both performance and efficiency.

EXPERT ASSISTANCE WITH SIZING AND SELECTION

We provide comprehensive support with system sizing, panel selection, and a full shop drawing package. Whether you're building from the ground up or retrofitting an existing space, Zehnder ensures seamless integration and precise system design that maximizes energy efficiency and comfort.

CUSTOMIZATION & ARCHITECTURAL INTEGRATION

Zehnder understands that every project is unique. We offer a wide range of customizations to suit your project's specific needs and integrate perfectly with modern architectural aesthetics.

UNCOMPROMISING QUALITY & PRODUCTION STANDARDS

Quality is at the heart of everything we do. Zehnder maintains rigorous production standards to ensure that every radiant ceiling panel meets the highest levels of performance, durability, and reliability.

By choosing Zehnder, you're partnering with a company that has the experience, expertise, and dedication to help you achieve the most efficient and visually stunning radiant heating and cooling solutions. Let us bring your next project to life with the best in the industry.



Design considerations

System design

The design of a radiant ceiling perimeter system follows the usual design for re-circulating water systems which incorporate remote terminals for space heating.

Standard controls adjust the supply of heated water to the panels on demand from the room or zone thermostat. The aluminum panels respond instantaneously and the space quickly receives the desired heat. The piping and controls are similar to those used with conventional perimeter hot water systems but all pipes are in the ceiling plenum where they are readily accessible.

As the radiant panels raise the mean radiant temperature in the space they produce greater thermal comfort at ambient temperatures lower than those required with convective systems. An inside dry bulb design temperature 3 to 4°F below that normally used with convective systems is recommended.

Room loads should be calculated in a normal manner using the procedures set forth in the ASHRAE guide.

General design

The application, design and installation of Zehnder Rittling Radiant Ceiling Panel Systems have certain requirements and techniques that should be adhered to:

- As with any hydronic system, close attention should be paid to the piping system design. Piping should be designed to assure that water of the proper temperature and in sufficient quantity will be available to every grid or coil at all times.
- The cooling coils and air distribution should be carefully designed to

ensure proper performance. Most problems occur when air equipment is not capable of delivering air quantities at the specified rates.

- Individual ceiling panel coils may be connected for parallel flow using headers or for series flow.
- Design piping configurations such that the highest temperature water is always supplied closest to the perimeter wall.
- Attention must be given to avoid noise from entrained air, high velocity or high pressure drop devices or from pump or pipe vibrations. Water velocities should be high enough to prevent air from accumulating and causing air binding. Air venting devices should be manual or automatic and, where possible, should not be located over the ceiling of occupied spaces.
- Piping systems must be designed to adequately accept thermal expansion. Forces from pipe expansion must not be transmitted to ceiling panels. Attention must be given to the thermal expansion of the ceiling panels.
- Interconnecting piping between panels should be of soft drawn copper and sufficiently looped to provide access to the panel from below if necessary. All piping should be tested to at least three times working pressure, but not less than 150 psi.
- Radiant ceiling panels should be located adjacent to the outside wall and in as close proximity as possible to the areas of maximum load. The panel area within three feet of the outside wall should have a heating capacity equal to or greater than 50% of the wall transmission load.
- Sufficient space above the ceiling must be allowed for installing and connecting the radiant ceiling panel piping.
- Room thermostat should be located on a side wall where it can "see" the outside wall and not the warm ceiling. The normal thermostat cover reacts to the warm ceiling panel and the radiant effect of the ceiling on the cover tends to alter the control point so that the thermostat controls two to three degrees lower when the outdoor temperature is at a minimum and the ceiling temperature is at a maximum.
- When the panel area for cooling is greater than the area for heating, two panel arrangement may be used. One panel, or grid of panels, is supplied with hot or chilled water year round. The other panel, or grid of panels, is supplied with chilled water only during the cooling season.
- To prevent condensation on the cooling panels, the panel water supply temperature should be maintained at least 1°F above the dew point temperature of the air in contact with the panel.
- Proper design of a variable volume system for use with a radiant panel cooling system requires that the latent load be based on the minimum air volume capacity. This is possible only if the room thermostat is staged with the radiant cooling valve port and the variable volume control operator. However, the system cannot be properly balanced if the exhaust air system is not controlled in conjunction with the supply air variations.
- Control zones are similar to those used in conventional systems. A multi-story commercial building will typically have nine zones: four corner zones, four exterior zones and one interior zone. Since interior zones require cooling year round, radiant panel cooling can be used in the interior zone in conjunction with

Design considerations

a heat pump cycle. This can reduce total operating cost particularly in an all electrical building.

- Radiant heating and cooling panel systems usually allow utilization of constant air volume and constant ventilation air temperature. However, during freezing weather the owner may wish to set the ventilation air temperature higher. In this situation, it is recommended that the ventilation air temperature be maintained at least 3 to 5°F below the space design temperature since ventilation air should handle the latent loads and not the sensible loads.
- During the winter, radiant panel heating of perimeter zones can be scheduled according to the outdoor temperature and/or solar sensors. Modulating control valves will function properly if water temperature is increased as outdoor temperatures drop. Temperature control of the interior zone and the radiant panel cooling system should not be a function of outdoor weather.
- As with all radiant ceiling panel systems, the supply air dew point should be reduced during extremely cold weather in accordance with the type of glazing installed to prevent condensation on window surfaces.

Selection procedure

The design of an extruded radiant panel system should follow all the usual design considerations for a closed water system. There are a number of basic design criteria that need to be obtained in order to properly design the system. They include the following:

- Determine the room design temperature.
- Determine the heat loss for the room.
- Determine the design hot water entering and leaving temperatures. Mean water temperature is determined by subtracting half of the water temperature difference from entering water temperature.
- Determine the panel layout (i.e. continuous perimeter strip, between columns only, etc.)
- Determine the capacity of the radiant panels.
- Calculate the area, width, and length of the panels.
- Calculate the water flow rate.
- Determine piping arrangement and water pressure drop per circuit.

The following standard formulas can be used to determine the necessary design criteria:

Heat Loss:

$$\frac{\text{Total BTU/hr}}{\text{Lineal ft. of panel}} = \text{BTU/hr required per linear ft.}$$

Panel Width:

$$\frac{\text{Required BTU/hr per lineal ft.}}{\text{Panel performance BTU/hr}} = \text{Panel width in ft.}$$

Flow Rate in GPM:

$$\frac{\text{Total BTU/hr}}{*500 \times \text{Water temperature drop (}^\circ\text{F)}} = \text{GPM}$$

*constant

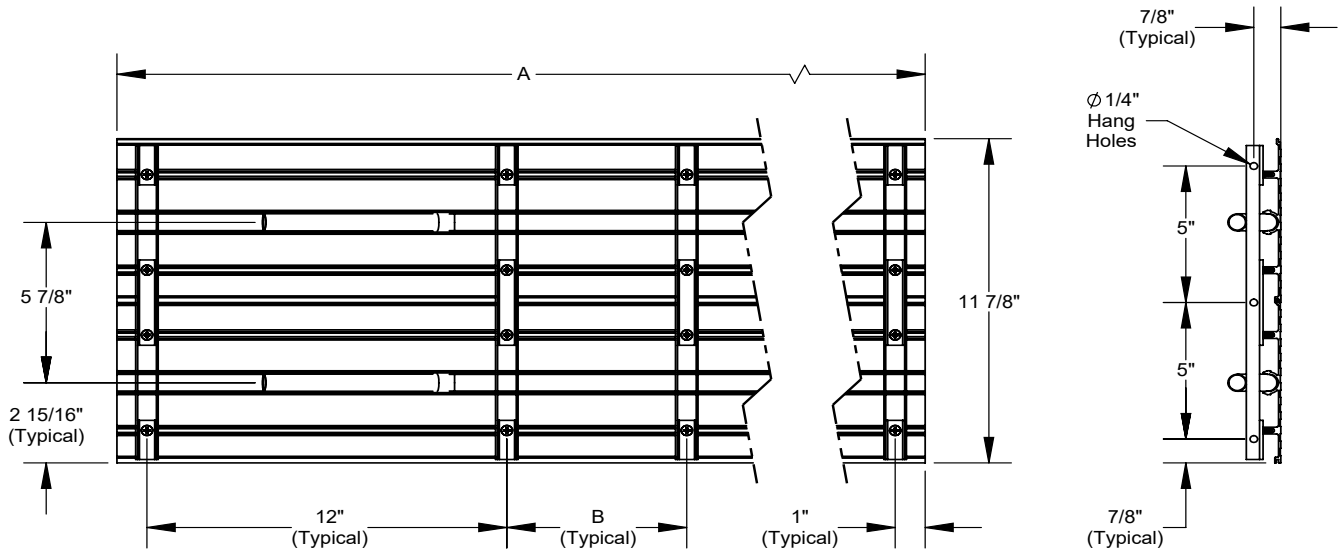
Heating Performance

Panel Width - BTUH per Linear Foot														
Mean Water Temperature (°F)		6" 1 Pass	6" 2 Pass	12" 2 Pass	12" 4 Pass	18" 3 Pass	18" 4 Pass	18" 6 Pass	24" 4 Pass	24" 8 Pass	30" 5 Pass	30" 10 Pass	36" 6 Pass	36" 12 Pass
	100	20	21	28	29	38	39	39	69	77	91	93	103	105
	105	29	33	40	45	54	58	63	91	108	115	129	131	145
	110	38	46	51	61	71	77	86	115	136	141	165	161	187
	115	46	55	65	78	89	97	108	139	168	169	201	192	227
	120	55	66	79	95	109	118	132	165	197	198	237	226	269
	125	63	75	94	111	128	139	154	190	226	228	273	259	309
	130	72	86	107	128	149	161	178	215	259	257	308	294	350
	135	80	96	123	145	167	180	200	239	288	286	344	328	393
	140	88	106	135	162	187	201	223	264	315	317	379	361	433
	145	97	116	150	179	206	223	247	288	347	347	415	395	475
	150	105	125	163	196	225	243	271	314	377	376	451	429	515
	155	113	136	178	214	247	266	296	338	406	407	487	464	556
	160	121	145	191	230	264	285	316	364	438	436	525	498	597
	165	129	155	206	245	283	305	338	389	466	467	559	532	637
	170	137	163	218	261	302	326	362	414	495	495	593	565	678
	175	145	174	233	279	320	345	383	438	525	525	630	600	717
	180	153	184	246	294	340	367	407	463	558	554	666	633	758
	185	161	193	261	312	358	387	430	488	560	585	703	668	801
	190	170	204	275	329	378	408	454	512	614	614	737	701	841
195	178	214	289	346	395	428	478	538	669	644	771	734	881	
200	186	225	302	363	416	450	502	562	724	675	805	770	922	
205	193	235	317	380	435	471	526	587	779	704	839	804	962	
210	203	246	329	397	455	493	549	613	834	735	874	839	1002	
215	211	256	344	415	473	513	573	637	888	763	908	873	1043	
220	220	267	359	432	491	533	597	653	943	793	942	908	1083	

- 70 °F air temperature
- Heating performance values in BTUH per linear foot of panel
- 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%. For specific outputs with varying conditions utilize our selection software at e-zselect.com

General Dimensions and Data

Single Pass

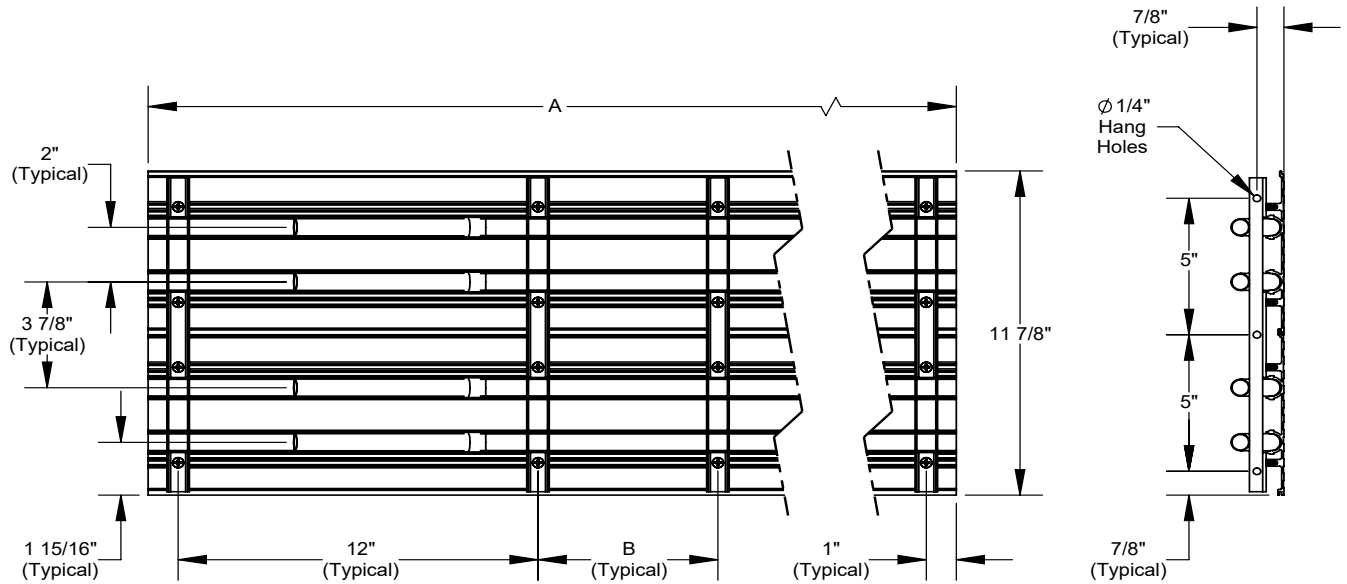


Nominal Length	A	B	# of cross channels
2'	1' 11-5/8"	N/A	3
3'	2' 11-5/8"	N/A	3
4'	3' 11-5/8"	21.6"	4
5'	4' 11-5/8"	16.8"	5
6'	5' 11-5/8"	22.8"	5
7'	6' 11-5/8"	28.8"	5
8'	7' 11-5/8"	23.2"	6
9'	8' 11-5/8"	27.2"	6
10'	9' 11-5/8"	31.2"	6
11'	10' 11-5/8"	26.4"	7
12'	11' 11-5/8"	29.4"	7
13'	12' 11-5/8"	25.9"	8
14'	13' 11-5/8"	28.3"	8
15'	14' 11-5/8"	25.6"	9
16'	25' 11-5/8"	27.6"	9

Nominal Width	Actual Width	Number of Passes	Dry Weight (lb/ft)	Fluid Weight (lb/ft)	Total Weight (lb/ft)
6"	6"	1	1.3	0.1	1.4
12"	11-7/8"	2	2.6	0.2	2.8
18"	17-3/4"	3	3.9	0.3	4.2
24"	23-5/8"	4	5.2	0.4	5.6
30"	29-1/2"	5	6.5	0.5	7.0
36"	35-3/8"	6	7.8	0.6	8.4

General Dimensions and Data

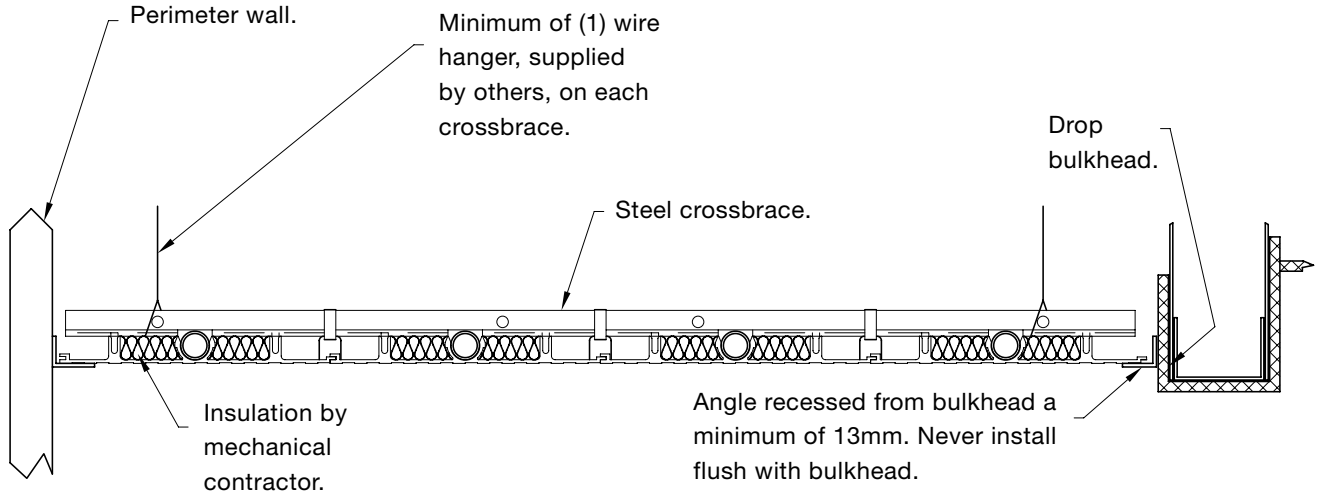
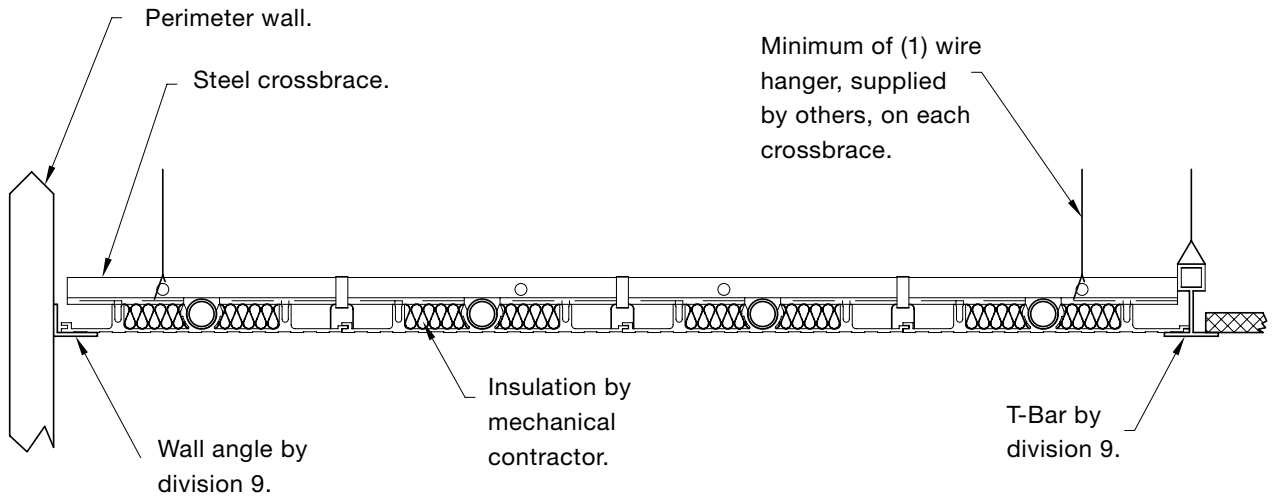
Double Pass



Nominal Length	A	B	# of cross channels
2'	1' 11-5/8"	N/A	3
3'	2' 11-5/8"	N/A	3
4'	3' 11-5/8"	21.6"	4
5'	4' 11-5/8"	16.8"	5
6'	5' 11-5/8"	22.8"	5
7'	6' 11-5/8"	28.8"	5
8'	7' 11-5/8"	23.2"	6
9'	8' 11-5/8"	27.2"	6
10'	9' 11-5/8"	31.2"	6
11'	10' 11-5/8"	26.4"	7
12'	11' 11-5/8"	29.4"	7
13'	12' 11-5/8"	25.9"	8
14'	13' 11-5/8"	28.3"	8
15'	14' 11-5/8"	25.6"	9
16'	25' 11-5/8"	27.6"	9

Nominal Width	Actual Width	Number of Passes	Dry Weight (lb/ft)	Fluid Weight (lb/ft)	Total Weight (lb/ft)
6"	6"	2	1.6	0.2	1.8
12"	11-7/8"	4	3.2	0.4	3.6
18"	17-3/4"	4	4.2	0.4	4.6
		6	4.8	0.6	5.4
24"	23-5/8"	8	6.4	0.7	7.1
30"	29-1/2"	10	8.0	0.9	8.9
36"	35-3/8"	12	9.5	1.1	10.7

Suspension details

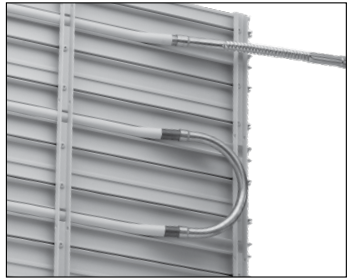


Notes:

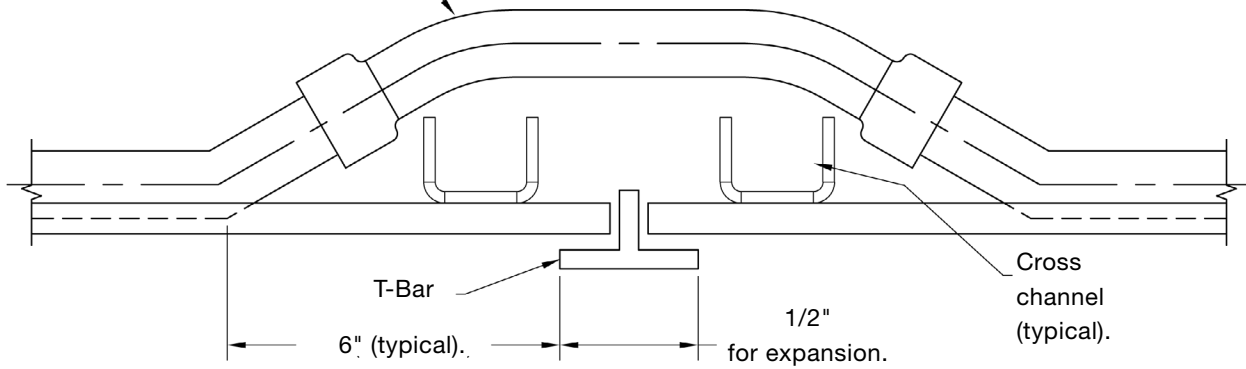
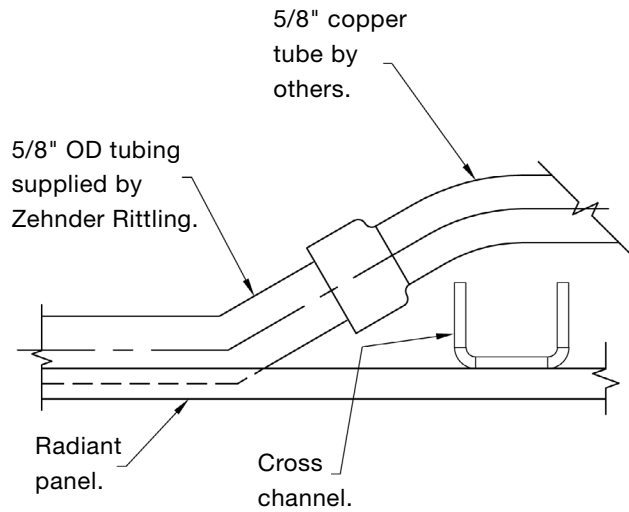
- Access through bulkhead required for connection.
- Typical window pocket installation where panel is higher than ceiling.
- Wall angle molding on both sides.
- Similarly, this detail may be used for a drop soffit where panel is lower than the balance of ceiling.

Piping components

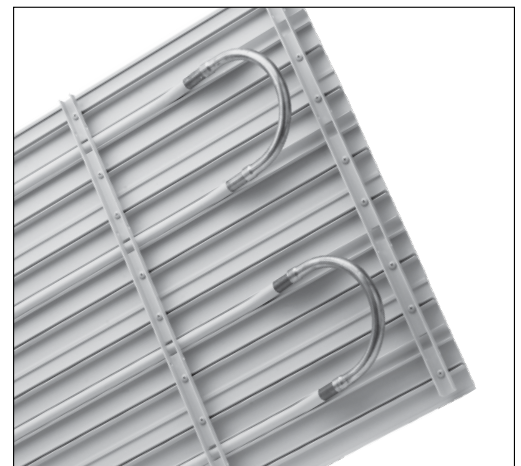
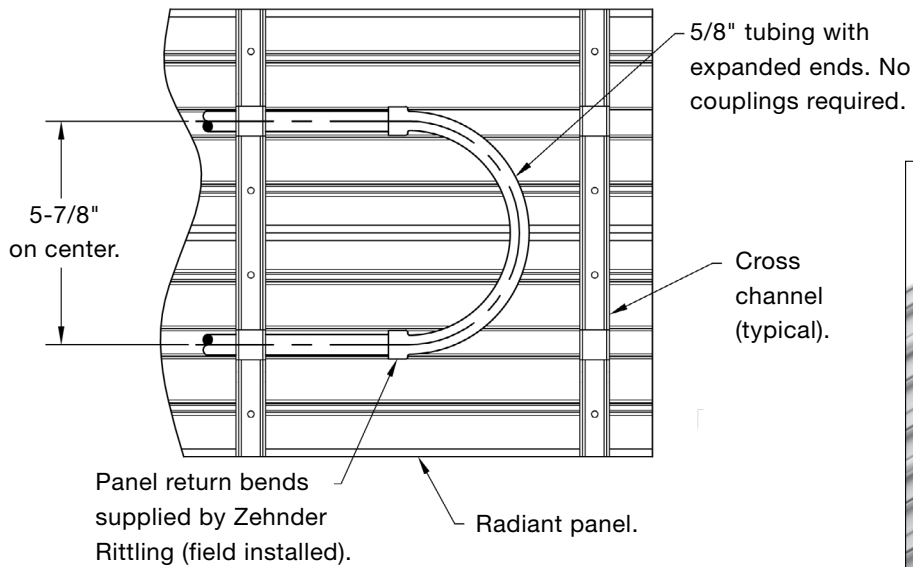
Typical connections for supply, return, and trimmed panels. Connect with 1/2" nominal soft copper tubing. Slip onto panel tubing (nominal 1/2", 5/8" OD). U-bends are shipped loose for field installation (factory mounting of u-bends available upon request)



12" flexible panel connector supplied by Zehnder Rittling (field installed).



Flexible connections are used between panels when they are installed in series in the same room.



Mechanical specifications

Part 1 - General

1.01 Related documents

A. Drawings and general provisions of the contract, including general and supplementary conditions and division 1 specification sections, apply to this section.

1.02 Summary

A. This section includes the following:

1. Hydronic radiant heating and cooling ceiling panels

1.03 Submittals

A. Product data: includes rated capacities, specialties and accessories for each product indicated.

B. Submit certification by independent agency of panel performance curves and capacity ratings.

C. Shop drawings to be completed prior to release. Include plans, elevations, sections, details and attachments to other work. Indicate dimensions, weights, loads, required clearances, method of field assembly, components and location and size of each field connection.

1. Include schedule showing panel circuiting, model designation, size, room location and accessories furnished.

2. IOM

1.04 System Description

A. Contractor shall provide complete radiant ceiling system including ceiling suspension system, mounting trims and non-radiant panels as required.

B. Contractor shall include mock up room for the architects and engineers approval prior to release of product. Mock up shall include devices such as lights, fire suppression and AV.

1.05 Quality

A. Manufacturer of the radiant heating and cooling ceiling system shall have a minimum of 5 years of similar installations.

B. Radiant ceiling manufacturer to supply 1 year warranty from date of shipment.

C. Panels to be manufactured US and in a certified ISO9001:2015 facility.

D. Radiant ceiling panels and accessories shall be rated and tested for pressures as shown on drawings and manufacturers technical documentation.

E. Use same brand of Manufacturer throughout, unless otherwise specified.

1.06 Coordination

A. Coordinate layout and installation of radiant panels and suspension components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire suppression system and partition assemblies.

Part 2 – Products

2.01 Refer to architectural spec section 09 - Finishes for additional ceiling requirements.

2.02 Manufacturers

A. Manufacturers: subject to compliance with requirements, provide products by one of the following:

i. Zehnder

2.03 Hydronic Radiant Heating and Cooling Ceiling Panels

A. Material: Radiant ceiling panels to be constructed from 0.0725" aluminium with tube saddles integral to the extrusion. Number of tubes per equipment schedule.

B. Tubes: Water tubing shall be ½" nominal Type-M (5/8" OD) copper tubing.

C. Activation: Tubing shall be snapped into aluminium extrusion and mechanically fastened to the saddle. Extruded aluminium saddles shall interlock using tongue and groove connection held together with cross braces.

D. Insulation: Factory supplied and installed 1" insulation.

E. Connections: Factory supplied copper interconnects and U-bends.

Mechanical specifications continued

F. Panel Face: Panels to have castellated face.

G. Color: Radiant ceiling panel surface to be coated with textured white, low gloss white paint.

PART 3 – EXECUTION

3.01 Pre-Design Services

A. Bid shall include the costs to complete final selections and coordination with the Engineer at the Engineers office. Allow for a minimum of three (3) days.

3.02 Installation – General

A. Install radiant panel level and plumb. Maintain sufficient clearance for normal services, maintenance, or in accordance with construction drawings.

B. To ensure proper installation and handling of the radiant panels, a complete IOM shall be supplied and reviewed before installation has begun.

C. Complete installation and startup checks according to manufacturer’s written instructions and perform the following:

1. Verify that controls and control enclosure are accessible.
2. Verify that control connections are complete to control valves as needed.
3. Verify that any identification tags are visible.
4. Verify that controls respond to inputs as specified.
5. Removal of protective film coating before system startup.
6. Release of stabilization profiles on panel edges.

3.03 Connections

A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicated general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to radiant panels to allow for service and maintenance.

C. In addition to Division 23 Section “Hydronic Piping”, connect copper tubing to supply with shut-off valve, strainer, control valve, and union or flange, and to return with balancing valve and union or flange.

3.04 Field Quality Control

A. Perform the following field tests and inspections and prepare test reports:

1. Leak Test: After installation, fill water tubes and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, start units to conform to proper unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Remove and replace malfunctioning units and retest as specified above.

3.05 Cleaning and Protection

A. Remove protective film coating before startup of the system.

B. Clean all visible surfaces of equipment; touch up as required.

C. Protect all units before, during and after installation. Damaged materials due to improper

Warranty

Zehnder Rittling guarantees its products to be free from defects in material and workmanship for a period of one year from date of shipment from our factory.

Should there be any defects in the good(s), the purchaser should promptly notify Zehnder Rittling. Upon receipt of written consent from Zehnder Rittling, the purchaser shall return the defective good(s) to the factory for inspection with freight prepaid. If inspection shows the goods to be defective, Zehnder Rittling will at its discretion repair or replace the said item(s).

Defects arising from damage due to shipment, improper installation, negligence or misuse by others are not covered by this warranty.

This warranty is extended only to the original purchaser from Zehnder Rittling.

IMPORTANT: Approved submittal documentation, specific to each project, supersedes the general guidelines contained within this document.

always the best climate

Our mission is to provide a healthy indoor climate with top quality solutions. Living spaces are kept at a comfortable temperature by our radiators and heating & cooling ceilings whereas our ventilation solutions make sure that you can breathe fresh clean air 24/7.

zehnder

www.zehnder-rittling.com



global presence in over 70 countries

Your global partner for indoor climate

Trusted partner

We provide our customers with tailored services from planning to installation of excellent solutions for the best indoor climate since 1895.



Know what's next

Consistent focus on innovation has always been the motor for our business. We strive to provide intelligent solutions for ventilation, heating, and cooling.



Swiss quality and precision

Swiss quality and precision are reflected in all our products. Our design standards create timeless elegance in living spaces for yesterday, today, and tomorrow.



Know why, know how

It is our ongoing mission to share our expertise and know how with our customers by providing expert trainings. Our dedicated Zehnder academies bring indoor climate to life.



