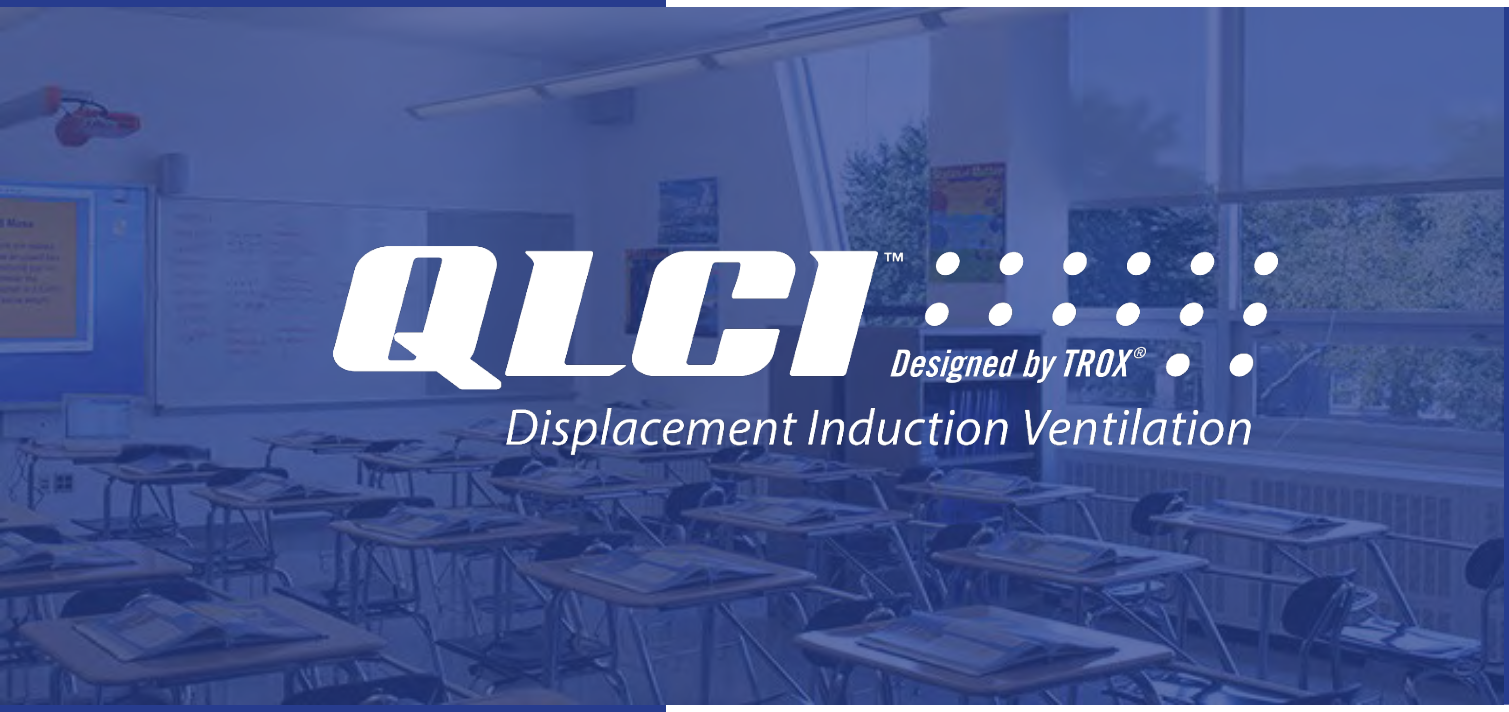
CARSON SOLUTIONS



QLCI™ Designed by TROX®

Displacement Induction Ventilation

Bookshelves and field modifiable sections among available accessories

Grill removes easily for maintenance

Threaded coil connections with flexible connectors for easy installation

Drain pan with piping connections

SOLUTION FOR CLASSROOM HVAC

The QLCI displacement induction ventilation diffuser is ideally suited to address the unique demands of a classroom environment and to provide optimum comfort and improved indoor air quality.

- Displacement induction ventilation enhances the removal of space contaminants
- Terminals are designed to allow the supply of 100% outside air at (or near) the minimum ventilation rate for the room per ASHRAE 62.1
- Engineered design integrates induction nozzles to enable the delivery of primary air at conventional (50°F to 55° F) AHU supply temperatures
- Compliant with ANSI S12.60 sound requirement (<35dBA)
- Energy efficient
- Robust cabinet design
- Competitive first cost
- Low cost of operation
- Ideal for new and retrofit construction
- Applicable towards LEED credits

v2.0 – Issue Date: 11/2022

DESCRIPTION

APPLICATION
- Displacement induction ventilation (DIV) enhances the removal of space respiratory containments
- Quiet operation making it an ideal classroom and patient room solution
- Designed to provide exceptional air quality and acoustical performance

NOMINAL SIZES
- 6 cabinet lengths and 2 depths available

SPECIAL FEATURES
- Engineered design integrates nozzles to enable the delivery of primary air at conventional (50° to 55°F) AHU supply temperatures making the QLCI an ideal solution for humid climates
- Designed to allow supply of 100% outside air at (or near) the minimum ventilation rate for a classroom
- Primary air inlets allow connections of up to three terminals in a series

PARTS & CHARACTERISTICS
- QLCI air conditioning terminal housed in appropriate architectural cabinet
- Optional duct connection sizes
- A series of induction nozzles
- Integral heat transfer coil
- Perforated or louvered face panel options
- Integral sloped condensate tray with drain connection

CONSTRUCTION FEATURES
- Robust cabinet design
- Front panels can be removed for maintenance using an Allen wrench to loosen tamper resistant screws
- Drain pan with piping connections for removal of condensate if necessary
- Threaded coil fittings for easy installation with flexible connector
- Face panels shall be pencil-proof and at least 45% free area
- Top of cabinet is flat and is ideal for use as bookshelf or other storage

MATERIALS & SURFACES
- Cabinets constructed of 16-gauge steel
- Unit painted with textured powder coat finish in (standard) color as selected by architect
- All internal sheet metal components are galvanized

INSTALLATION & COMMISSIONING
- Easy installation
- Threaded coil fittings for easy installation with flexible connectors
- Front panels easily removable for maintenance

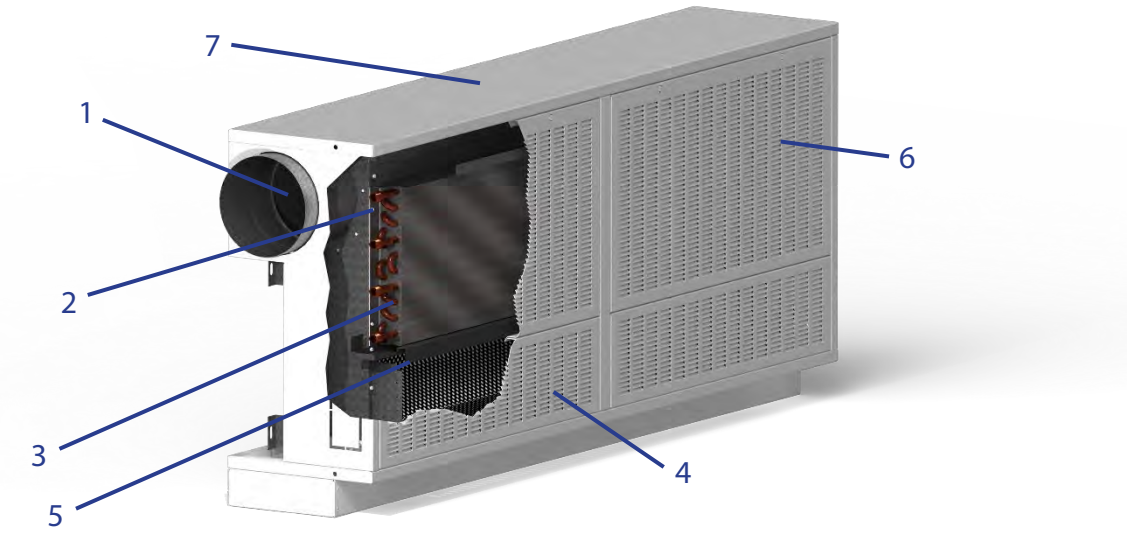
STANDARDS & GUIDELINES
- Low noise levels conform to ANSI Standard S12.60
- Qualify for LEED credits
- ASHRAE Standard 62.1 "Ventilation for Acceptable Air Quality" mandates classrooms be supplied a minimum outdoor airflow during all occupied hours

MAINTENANCE
- There are no moving parts within the terminals
- Space temperature control is accomplished by the thermostatic sequencing and modulation of associated water valves
- The simple air handling unit configuration makes the system nearly maintenance free
- Occasional vacuuming of the coil may be required in some applications
- On rare occasion the condensate tray may require cleaning

TECHNICAL DATA

Nominal Width	13 ½" or 16 5/8"
Nominal Length	48", 60", 67 3/4", 72", 87 7/16", 96"
Primary Ventilation Air	60 - 210 CFM
Cooling Capacity	Up to 8500 btu/h
Heating Capacity	Up to 4500 btu/h
Primary Air Temperature	50°F to 65°F
Typical Room Setpoint Temperatures	73°F to 77°F

Schematic illustration of the QLCI displacement induction ventilation diffuser



1 Primary air inlet
2 Threaded coil fitting
3 Water coil
4 Perforated airflow distribution plate
5 Condensate tray with piping connections
6 Removable face panels
7 Robust cabinet

FUNCTION

Functional description

QLCI DIV terminals are designed to provide improved air quality and acoustical performance in occupied spaces. The units are fitted with a series of air induction nozzles which allow the supply of primary air to the terminals at conventional temperatures (50° to 55°F). The nozzles induce room air through a heat transfer (cooling and/or heating) coil to recondition the air prior to mixing with primary nozzles. The result is a constant volume (variable temperature) displacement supply of air to the classroom.

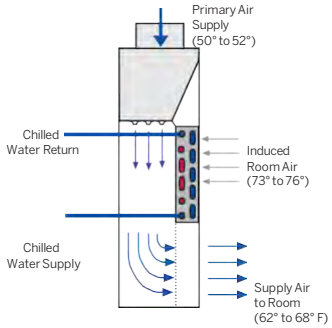
Benefits of displacement induction ventilation

Displacement conditioning provides several advantages over mixed air systems in classroom applications:

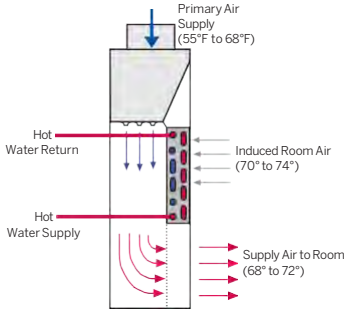
- Enhanced ventilation effectiveness
- More efficient removal of respiratory contaminants
- Reduced space noise levels
- Lower fan operation costs due to reduced outlet pressure and airflow requirements
- Increased economizer operation and chiller efficiencies

PRINCIPLE OF OPERATION

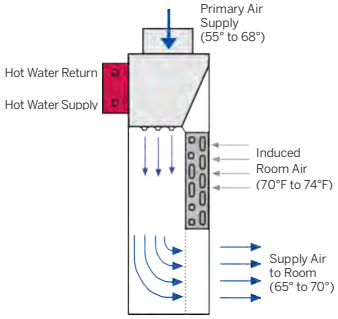
Cooling mode



Heating mode



Optional heating mode
Separate fin tube elements



INSTALLATION

QLCI DIV terminals are designed for easy installation and easy access for maintenance. Most classroom installations will require QLCI DIV terminals be installed along 75-80% of their external exposure to provide adequate space.

conditioning and ventilation at noise levels compliant with ANSI S12.60.

See Installation, Operation & Maintenance (IOM) Manual for complete installation instructions.

SAMPLED AIR-SIDE PERFORMANCE DATA

Many configurations available, see Carson Solutions for a complete list.

Size 1500 with 6" inlet and connections		Number of units per primary air connection							
		1		1.5		2		3	
Primary air flow rate	Supply air flow rate	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level
80	240	0.15	<15	0.17	<15	0.20	<15	0.29	19
100	300	0.23	<15	0.26	17	0.31	21	0.46	25
120	360	0.33	20	0.38	22	0.45	27	0.66	31
140	420	0.45	24	0.51	27	0.61	31	0.89	35
160	480	0.58	28	0.67	30	0.80	35	1.17	39

Size 1500 with 8" inlet and connections		Number of units per primary air connection							
		1		1.5		2		3	
Primary air flow rate	Supply air flow rate	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level
80	240	0.13	<15	0.14	<15	0.15	<15	0.18	19
100	300	0.21	<15	0.22	17	0.23	21	0.28	25
120	360	0.30	20	0.32	22	0.34	27	0.40	31
140	420	0.41	24	0.43	27	0.46	31	0.55	35
160	480	0.53	28	0.56	30	0.60	35	0.72	39

Size 2000 with 6" inlet and connections		Number of units per primary air connection							
		1		1.5		2		3	
Primary air flow rate	Supply air flow rate	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level
100	300	0.14	<15	0.17	16	0.22	20	0.37	24
120	360	0.20	18	0.25	21	0.32	25	0.53	29
140	420	0.27	23	0.34	25	0.43	30	0.72	34
160	480	0.35	27	0.44	29	0.56	34	0.94	38
180	540	0.44	30	0.56	33	0.71	37	1.18	41

Size 2000 with 8" inlet and connections		Number of units per primary air connection							
		1		1.5		2		3	
Primary air flow rate	Supply air flow rate	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level	Airside pressure drop	Space NC level
100	300	0.12	<15	0.13	16	0.14	20	0.19	24
120	360	0.17	18	0.19	21	0.21	25	0.27	29
140	420	0.23	23	0.25	25	0.28	30	0.37	34
160	480	0.27	27	0.33	29	0.37	34	0.48	38
180	540	0.30	30	0.42	33	0.47	37	0.61	41

SAMPLE THERMAL PERFORMANCE DATA

Many configurations available, see Carson Solutions for a complete list.

Reference values - Cooling

t_R	75°F
t_{Pr}	55°F
t_{CWS}	57°F

Reference values - Heating

t_R	70°F
t_{HWS}	120°F

Size	Primary Air Flow Rate	Water Flow Rate	Cooling Four-pipe or Two-pipe system			Heating Four-pipe System		Heating Two-pipe System	
	CFM	GPM	$\dot{Q}_{tot}$[1] (Btu/h)	$\dot{Q}_{cw}$[2] (Btu/h)	Δp_w[3] (ft. H_2O)	$\dot{Q}_{HW}$[4] (Btu/h)	Δp_w (ft. H_2O)	$\dot{Q}_{HW}$[4] (Btu/h)	Δp_w (ft. H_2O)
1500	80	0.50	2928	1187	0.9	2495	0.3	3132	0.9
		0.75	3081	1340	2.1	2659	0.7	3361	2.1
		1.00	3171	1429	3.7	2741	1.2	3472	3.7
		1.50	3268	1526	8.4	2820	2.8	3579	8.4
	100	0.50	3655	1478	0.9	3000	0.3	3890	0.9
		0.75	3861	1684	2.1	3218	0.7	4216	2.1
		1.00	3984	1807	3.7	3329	1.2	4380	3.7
		1.50	4119	1942	8.4	3439	2.8	4542	8.4
	120	0.50	4313	1700	0.9	3396	0.3	4472	0.9
		0.75	4564	1951	2.1	3661	0.7	4884	2.1
		1.00	4715	2103	3.7	3799	1.2	5096	3.7
		1.50	4884	2272	8.4	3937	2.8	5311	8.4
	140	0.50	4926	1878	0.9	3720	0.3	4939	0.9
		0.75	5216	2168	2.1	4028	0.7	5428	2.1
		1.00	5393	2345	3.7	4189	1.2	5684	3.7
		1.50	5592	2544	8.4	4353	2.8	5947	8.4
	160	0.50	5509	2026	0.9	3993	0.3	5327	0.9
		0.75	5832	2349	2.1	4338	0.7	5885	2.1
		1.00	6032	2549	3.7	4521	1.2	6181	3.7
		1.50	6258	2775	8.4	4709	2.8	6490	8.4
2000	100	0.50	3389	1212	1.2	2608	0.4	3207	1.2
		0.75	3546	1369	2.7	2783	0.9	3445	2.7
		1.00	3639	1462	4.8	2871	1.6	3560	4.8
		1.50	3738	1561	10.8	2957	3.6	3672	10.8
	120	0.50	4096	1483	1.2	3076	0.4	3913	1.2
		0.75	4303	1690	2.7	3303	0.9	4242	2.7
		1.00	4426	1814	4.8	3419	1.6	4407	4.8
		1.50	4562	1950	10.8	3534	3.6	4572	10.8
	140	0.50	4746	1698	1.2	3457	0.4	4475	1.2
		0.75	4997	1949	2.7	3730	0.9	4887	2.7
		1.00	5148	2100	4.8	3872	1.6	5100	4.8
		1.50	5317	2269	10.8	4014	3.6	5315	10.8
	160	0.50	5358	1875	1.2	3777	0.4	4938	1.2
		0.75	5647	2164	2.7	4092	0.9	5426	2.7
		1.00	5823	2340	4.8	4257	1.6	5683	4.8
		1.50	6022	2539	10.8	4426	3.6	5946	10.8
	180	0.50	5942	2024	1.2	4051	0.4	530	1.2
		0.75	6265	2347	2.7	4404	0.9	5887	2.7
		1.00	6465	2546	4.8	4592	1.6	6185	4.8
		1.50	6691	2772	10.8	4784	3.6	6493	10.8

PERFORMANCE NOTES

1 $\dot{Q}_{tot}$ includes $\dot{Q}_{CW}$ plus sensible cooling provided by primary air 20°F below room temperature at the flow rate indicated.

2 $\dot{Q}_{CW}$ is coil sensible cooling using chilled water supplied 18°F below the room temperature.

3 6-p_w is the water head loss at the referenced water supply flow rate.

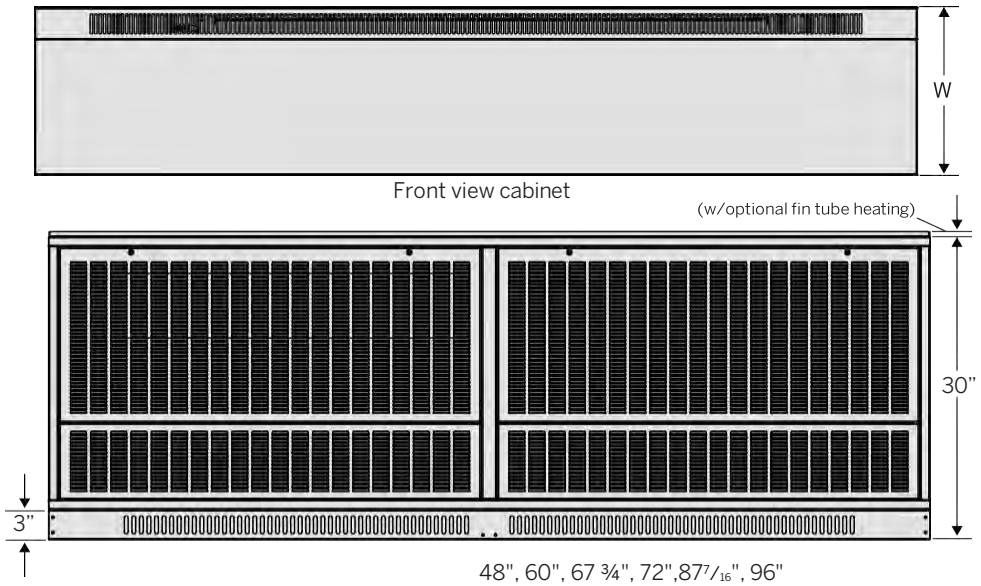
4 $\dot{Q}_{HW}$ is coil sensible heating using hot water supplied at 50°F above the room temperature.

OPTIONAL REAR FIN TUBE ELEMENTS HEATING CAPACITY

Top View Cabinet with fin tube element option
(see p7 for other views)

Fin Tube Elements BTUH/LF at 4.0 GPM						
Entering water temperature	Entering air temperature					
	55	60	65	70	75	80
100	275	233	194	156	121	89
110	363	318	275	233	194	156
120	459	410	363	318	275	233
130	560	508	459	410	363	318
140	666	612	560	508	459	410
150	778	721	666	612	560	508
160	894	835	778	721	666	612
170	1014	954	894	835	778	721
180	1139	1076	1014	954	894	835

QLCI DIMENSIONAL DATA



48", 60", 67 ¾", 72",87 7/16", 96"
48", 60", 67 ¾", 72", 87 7/16", 96"

Dimensions [in]

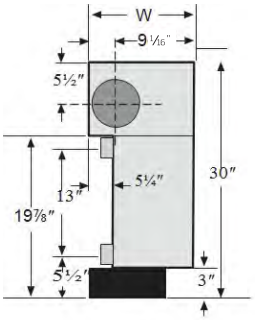
QLCI Standard Sizes	Length	Width w/o heater	Width w/ heater
4	48	13 ½" or 16 5/8"	16 5/8"
5	60		
1500	67 3/4		
6	72		
2000	87 7/16		
8	96		

STANDARD DIMENSIONS

Custom dimensions available

Contact Carson Solutions for more information

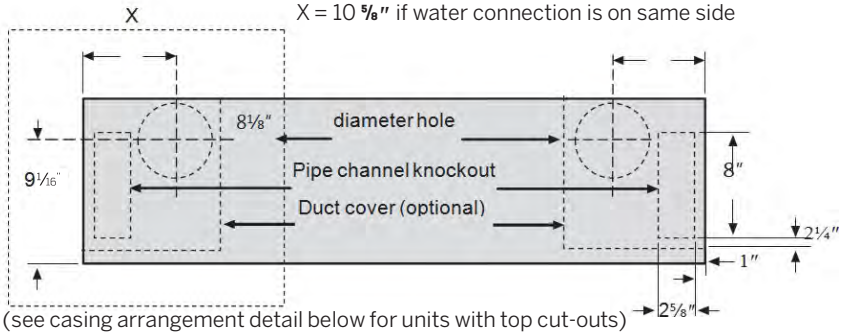
Side View



W = 13½" = Standard unit
W = 16⅝" = Unit with heater

Top View

X = 8 ⅜" if water connection is on opposite side
X = 10 ⅝" if water connection is on same side

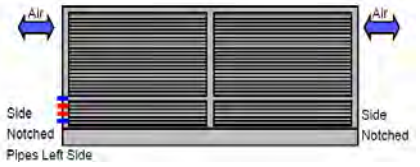


(see casing arrangement detail below for units with top cut-outs)

AIR AND WATER CONNECTIONS CONFIGURATIONS

Arrangement of heat exchanger and water connections

QLCI-CS



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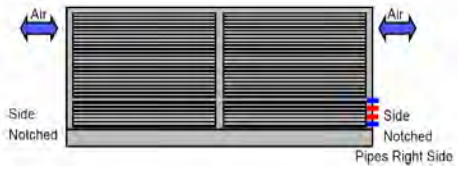
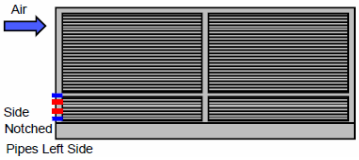


QLCI-RT



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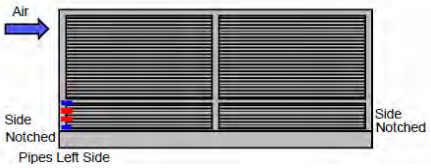

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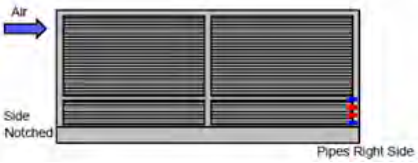

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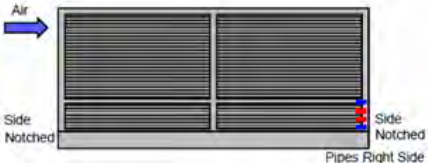
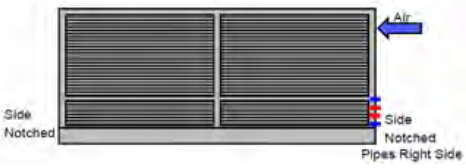


QLCI-LT

QLCI-LTN



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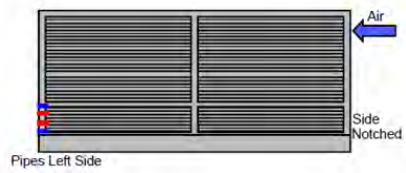

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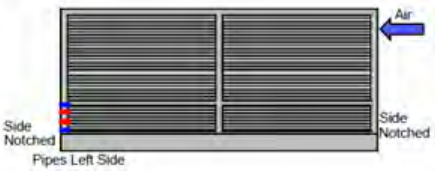
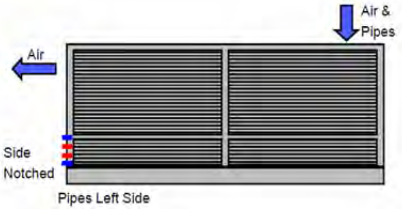


AIR AND WATER CONNECTIONS CONFIGURATIONS

Arrangement of heat exchanger and water connections

QLCI-RE



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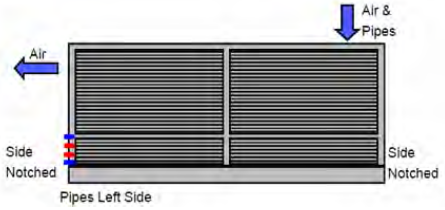

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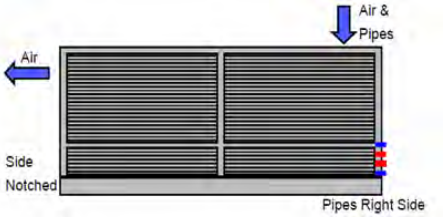

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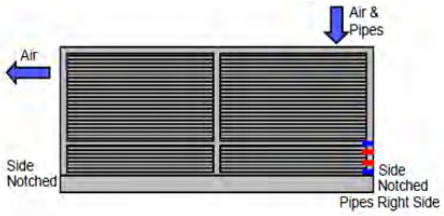
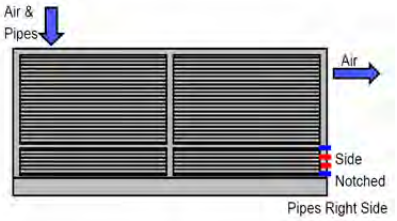


QLCI-LE



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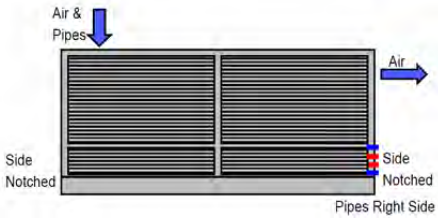

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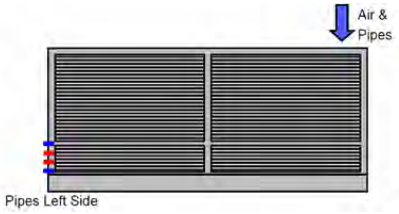

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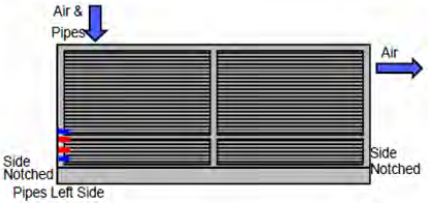

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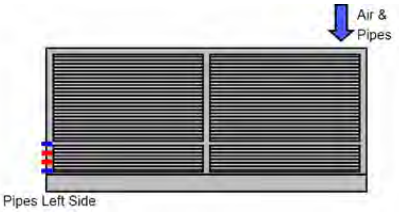

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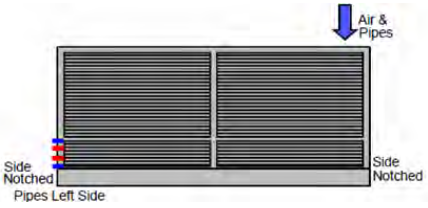

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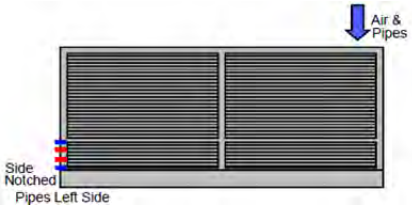
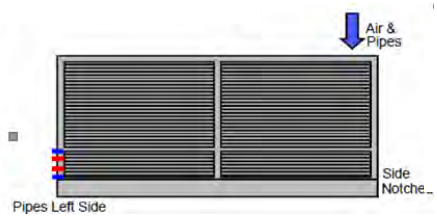


QLCI-RXR



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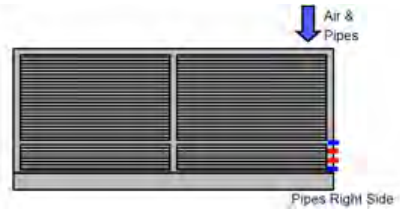

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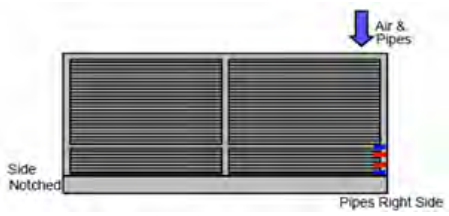
AIR AND WATER CONNECTIONS CONFIGURATIONS

Arrangement of heat exchanger and water connections

QLCI-RXXL



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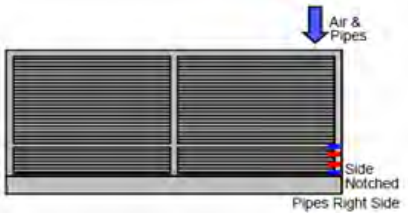

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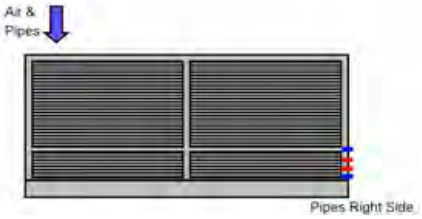

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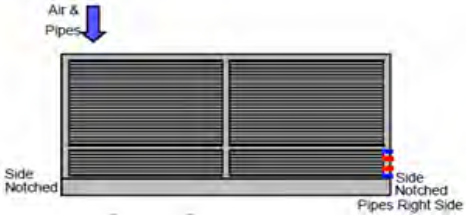

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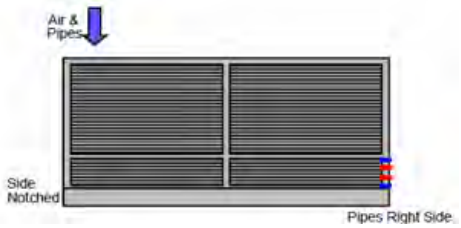

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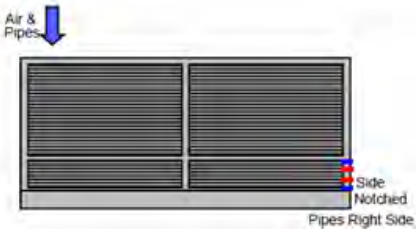

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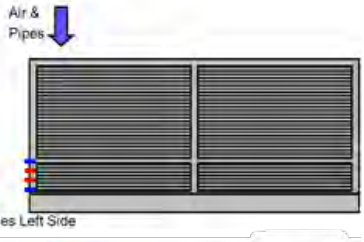

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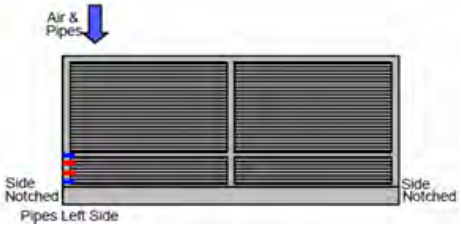

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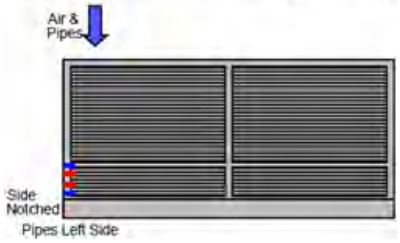

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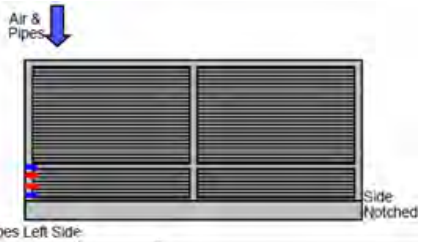

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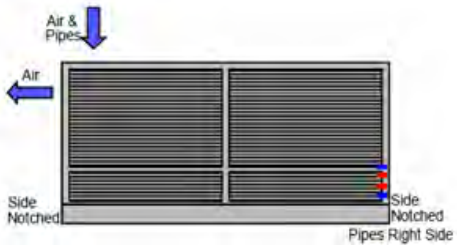

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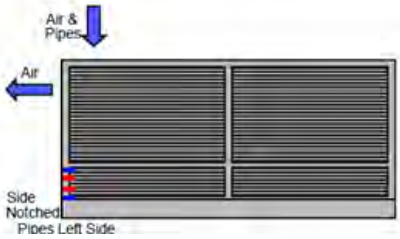

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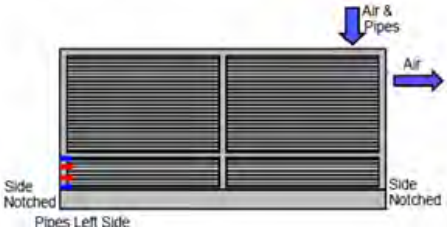

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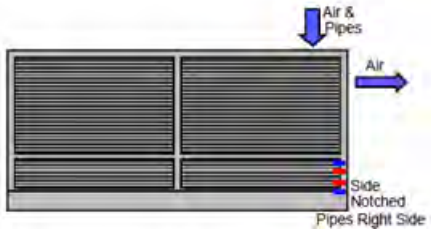

DESCRIPTION

Furnish and install QLCI, designed by TROX® displacement induction ventilation diffusers in the models, sizes and configurations on plans and schedules.

This specification text describes the general properties of the product. Contact Carson Solutions for texts for QLCI variants.

SPECIAL FEATURES

- System designed for mounting under window
- Guaranteed space ventilation
- Compliant with ANSI S12.60 requirements
- Integral cooling and heating coil
- Sloped condensate tray with drain connection
- Robust construction for K-12 applications
- Low cost of operation
- Ideal for new and retrofit construction

MATERIALS AND SURFACES

- Cabinet constructed of 16-gauge steel
- Internal components constructed of 20-gauge galvanized steel (unfinished)
- External surfaces finished in textured powder coat paint in one of four (4) standard RAL colors as selected by architect or a custom color (cost option)
- Finish is textured to hide small scratches and fingerprints
- Face panels shall be louvered (standard) or perforated

TECHNICAL DATA

Length: 48", 60", 67 3/4", 72", 87 7/16", 96"

- Width: 13 1/2 in, 16 5/8 in
- Height: 30 in
- Primary air volume flow rate: 60-210 CFM
- Cooling capacity: up to 8500 btu/h
- Heating capacity: up to 4500 btu/h

For full specifications, contact Carson Solutions.

ORDER CODE