Kohrs Lonnemann Heil Engineers, Inc.

Fort Thomas Office
1538 Alexandria Pike, Suite 11
Ft. Thomas, KY 41075
859-442-8050 telephone
859-442-8058 fax

Product Data

Project Name:	KLH Headquarters Renovation	**Submittal Code:**	233600.00-PD-01	**REV:** 00
Document Set:	Bid/Construction - Phase 2			
KLH Project #:	02024.00-BID2	**Received Date:**	01/28/2025	
Section Name:	Air Terminal Units			
Section Number:	233600.00			
Submitted By:	KLH Engineers			
Authored By:	Controlled Aire Inc			
Client Name:	Kohrs Lonnemann Heil Engineers, Inc.			

SUBMITTAL REVIEW

[X] **No Exceptions**

By: Christine E. Shea **Date:** 01/30/2025

ENGINEER'S REVIEW IS FOR GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. COMMENTS DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR REMAINS RESPONSIBLE FOR ACCURACY OF QUANTITIES, DIMENSIONS, DETAILS AND COORDINATION WITH OTHER TRADES.

General

1.1 No exceptions noted.

End of Submittal Review

V11-01 PAGE 7
V11-02,05,06,07,08,09,13,14 PAGE 11
V11-03, 04,10,11 PAGE 18
V11-12 PAGE 25

V13-06,07 PAGE 11
V13-02,03,05,08,04 PAGE 18
V13-09,10 PAGE 25
V13-11 PAGE 30
V13-12 PAGE 33

Note: Review is for general conformance only. Submittal reviews featuring the "No Exceptions" designation shall not be interpreted as permission to deviate from the contract. Modifications to the contract are based on express written request and approval and submittal reviews do not satisfy this requirement.

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Controlled Air Inc.
12009 Tramway Drive • Cincinnati, Ohio 45241

Project:	**KLH Engineers Inc Headquarters** **Phase 2 VAV Pre-Purchase** **PO-2024.00-002**
Location:	**Fort Thomas, KY**
Customer/Contractor:	**KLH Engineers, Chris Zurmehly**
Engineer:	**KLH Engineers, Christine Shea**
Equipment:	**Titus DESV, VAV boxes**

Submitted by: **Joe Zirkelbach**
Controlled Air Inc.
12009 Tramway Drive
Cincinnati, OH 45241
Phone: **513-981-2733**
Fax: **513-769-6633**
joe@controlled-air.com

Date: **1/22/2025**

Submittal Notes:

1. Submittal R-1, based on returned submittal 1/17/2025. This is for information only as boxes are released per this submittal.
2. V13-04 and V13-10 have been swapped per submittal note.
3. Handing is per returned submittal with piping matching control side.
4. All controls are provided and field installed by others.

Submittal Data

01/22/2025

Project Name: KLH HQ
Engineer: KLH Engineers
Architect:
Contractor:

Submitted By: Controlled Air
Joe Zirkelbach
12009 Tramway Dr
Cincinnati, OH 45241

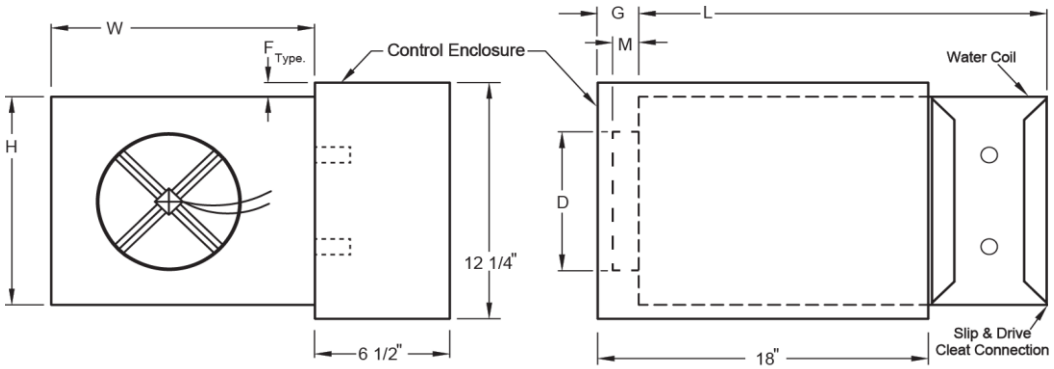
Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

DESV

Single Duct Terminal Unit, Direct Digital Control, Pressure Independent

Main Product **DESV-1**

DESV

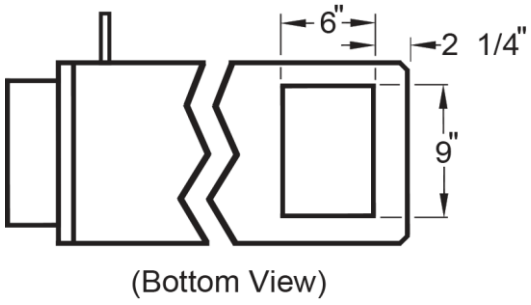


Right Hand Unit with Right Hand HWC Connections shown

Air Inlet (D) is 1/8" smaller than its Nom. Inlet.
All dimensions are in inches.

Unit-Size	CFM Range	Nom. Inlet	F	G	W	H	M	L
10	0 - 1400	10" Dia.	-	5 3/8"	14"	12 1/2"	3 3/8"	22 3/4"

Access Door Opening



(Bottom View)

Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

General Description — DESV-1

- Standard construction uses G40 22-gauge galvanized steel housing, and optional construction uses G40 20-gauge galvanized steel housing.
- Mechanically sealed and gasketed, leak resistant construction. Less than 2% of nominal CFM at 1.5" sp wg.
- Dual density internal insulation, treated to resist air erosion. Meets requirements of NFPA 90A and UL 181.
- Rectangular discharge opening is designed for slip and drive cleat duct connection.
- Multipoint center averaging inlet velocity sensor.
- Digital control packages can be factory mounted by Titus.
- Unit in accordance with UL-1996
- Model DESV can be installed horizontally, vertically, or at any angle. Operation is not affected by position.
- Gauge tees for CFM measurement.

Option Schedule — DESV-1

ID	Quantity	Tag	UNIT SIZE	MAX PRIMARY CFM	MIN PRIMARY CFM
1	1	V11-01	10	970	485

SENSOR CODE	3 - AEROCROSS	**UNIT ACC3**	0 -NONE
UNIT CONFIG	0 -BASIC	**UNIT ACC4**	0 -NONE
LINER OPTION	7 - ½" Fibre Free	**UNIT ACC5**	0 -NONE
CASING CONFIG	1R -22GA RH, Access Door	**WATER COIL**	W13 -3 ROW RH
DIGITAL CONTROLLER	0000 -NONE	**ELECTRIC HEAT TYPE**	000 -NONE
ACTUATOR TYPE	0000 -NONE	**KW**	0
CONTROL ACC1	00 -NONE	**ELEC COIL ACC1**	0 -NONE
CONTROL ACC2	00 -NONE	**ELEC COIL ACC2**	0 -NONE
CONTROL ACC3	00 -NONE	**ELEC COIL ACC3**	0 -NONE
UNIT ACC1	E -METAL CTRL ENCLOS	**ELEC COIL ACC4**	0 -NONE
UNIT ACC2	B -HANGER BRACKET		

Accessories	**DESV-1**

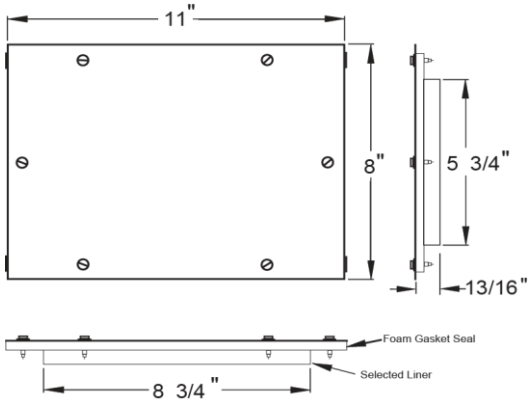
Selected Insulation: ½" Fibre Free

Insulation Characteristics:

Material: EPFI (EngineeredPolymer Foam Insulation)
Thickness: 1/2 inch
R-Value: 2.0 ft2 °F h/Btu @ 75°F
Density: 1.5 lbs/ft3
Flame Spread: less than 25
Smoke Density: less than 50
Mold Growth: None

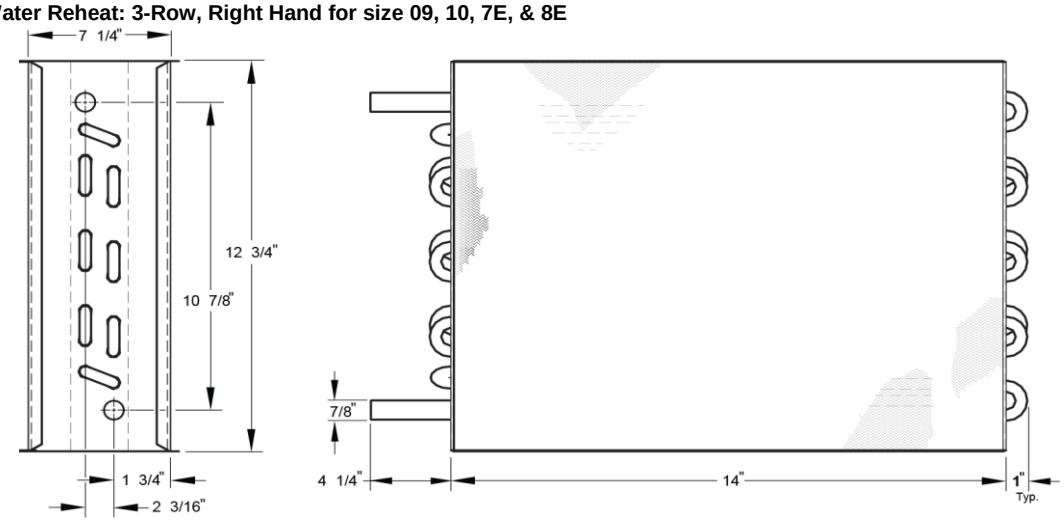
Code Compliances:
NFPA 90A & 90B - Appliances
NFPA 255 - Flame / Smoke Spread (25/50)
UL 181 - Air Erosion
UL 181 - Mold Growth and Humidity
UL 723 - Flame / Smoke Spread (25/50)
ASTM E96 – Water Vapor Transmission
ASTM E84 - Flame / Smoke Spread (25/50)
Factory Mutual Listed

Standard Access Door



Accessories (continued) **DESV-1**

ESV Hot Water Reheat: 3-Row, Right Hand for size 09, 10, 7E, & 8E



- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
3.47	0.42

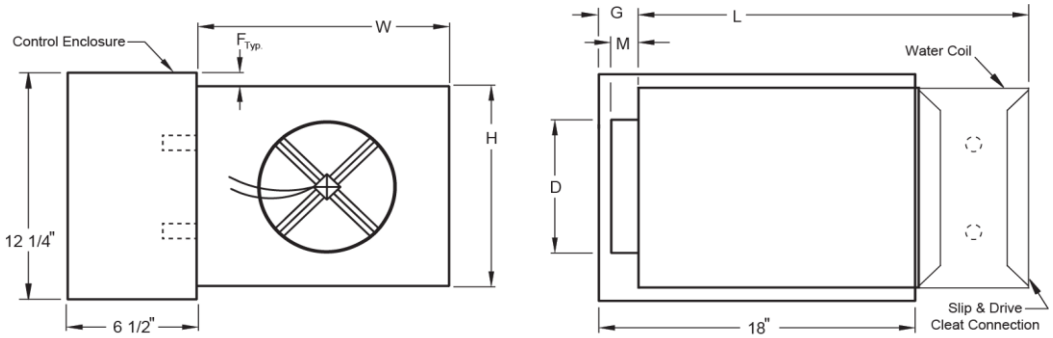
Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

DESV

Single Duct Terminal Unit, Direct Digital Control, Pressure Independent

Main Product **DESV-1 (2)**

DESV

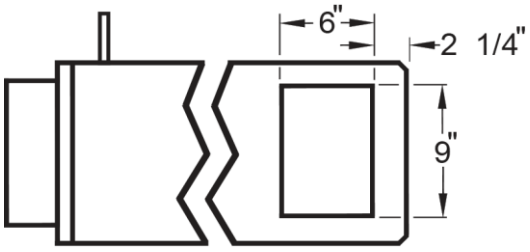


Left hand case with Left hand HWC connections shown.

Air Inlet (D) is 1/8" smaller than its Nom. Inlet.
All dimensions are in inches.

Unit-Size	Nom. Inlet	F	G	W	H	M	L
06	6" Dia.	2 1/8"	7 3/8"	12"	8"	3 3/8"	20 1/2"
12	12" Dia.	-	5 3/8"	16"	15"	3 3/8"	20 1/2"
14	14" Dia.	-	3 3/8"	20"	17 1/2"	3 3/8"	23"
10	10" Dia.	-	5 3/8"	14"	12 1/2"	3 3/8"	20 1/2"

Access Door Opening (Door details in Accessory section):



(Bottom View)

Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

Titus
Redefine your comfort zone.™

General Description — DESV-1 (2)

- Standard construction uses G40 22-gauge galvanized steel housing, and optional construction uses G40 20-gauge galvanized steel housing.
- Mechanically sealed and gasketed, leak resistant construction. Less than 2% of nominal CFM at 1.5" sp wg.
- Dual density internal insulation, treated to resist air erosion. Meets requirements of NFPA 90A and UL 181.
- Rectangular discharge opening is designed for slip and drive cleat duct connection.
- Multipoint center averaging inlet velocity sensor.
- Digital control packages can be factory mounted by Titus.
- Unit in accordance with UL-1996
- Model DESV can be installed horizontally, vertically, or at any angle. Operation is not affected by position.
- Gauge tees for CFM measurement.

Option Schedule — DESV-1 (2)

ID	Quantity	Tag	UNIT SIZE	MAX PRIMARY CFM	MIN PRIMARY CFM
2	1	V11-02	06	335	170
5	1	V11-05	12	1050	525
6	1	V11-06	12	1200	600
7	1	V11-07	14	1345	673
8	1	V11-08	14	1440	720
9	1	V11-09	12	975	488
13	1	V11-13	06	195	98
20	1	V13-06	14	1650	825
21	1	V13-07	10	945	472

SENSOR CODE	3 - AEROCROSS	**UNIT ACC3**	0 -NONE
UNIT CONFIG	0 -BASIC	**UNIT ACC4**	0 -NONE
LINER OPTION	7 - ½" Fibre Free	**UNIT ACC5**	0 -NONE
CASING CONFIG	1L -22GA LH, Access Door	**WATER COIL**	W22 -2 ROW LH
DIGITAL CONTROLLER	0000 -NONE	**ELECTRIC HEAT TYPE**	000 -NONE
ACTUATOR TYPE	0000 -NONE	**KW**	0
CONTROL ACC1	00 -NONE	**ELEC COIL ACC1**	0 -NONE
CONTROL ACC2	00 -NONE	**ELEC COIL ACC2**	0 -NONE
CONTROL ACC3	00 -NONE	**ELEC COIL ACC3**	0 -NONE
UNIT ACC1	E -METAL CTRL ENCLOS	**ELEC COIL ACC4**	0 -NONE
UNIT ACC2	B -HANGER BRACKET		

ID	Quantity	Tag	UNIT SIZE	MAX PRIMARY CFM	MIN PRIMARY CFM
14	1	V11-14	06	265	132

Option Schedule (continued) — **DESV-1 (2)**

SENSOR CODE	3 - AEROCROSS	**UNIT ACC3**	0 -NONE
UNIT CONFIG	0 -BASIC	**UNIT ACC4**	0 -NONE
LINER OPTION	7 - ½" Fibre Free	**UNIT ACC5**	0 -NONE
CASING CONFIG	1L -22GA LH, Access Door	**WATER COIL**	W21 -1 ROW LH
DIGITAL CONTROLLER	0000 -NONE	**ELECTRIC HEAT TYPE**	000 -NONE
ACTUATOR TYPE	0000 -NONE	**KW**	0
CONTROL ACC1	00 -NONE	**ELEC COIL ACC1**	0 -NONE
CONTROL ACC2	00 -NONE	**ELEC COIL ACC2**	0 -NONE
CONTROL ACC3	00 -NONE	**ELEC COIL ACC3**	0 -NONE
UNIT ACC1	E -METAL CTRL ENCLOS	**ELEC COIL ACC4**	0 -NONE
UNIT ACC2	B -HANGER BRACKET		

Accessories — **DESV-1 (2)**

Selected Insulation: ½" Fibre Free

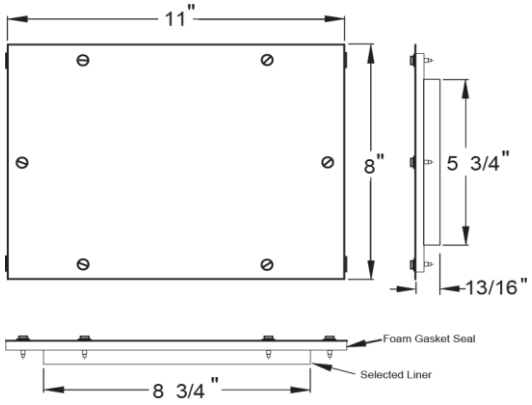
Insulation Characteristics:

Material: EPFI (EngineeredPolymer Foam Insulation)
Thickness: 1/2 inch
R-Value: 2.0 ft2 °F h/Btu @ 75°F
Density: 1.5 lbs/ft3
Flame Spread: less than 25
Smoke Density: less than 50
Mold Growth: None

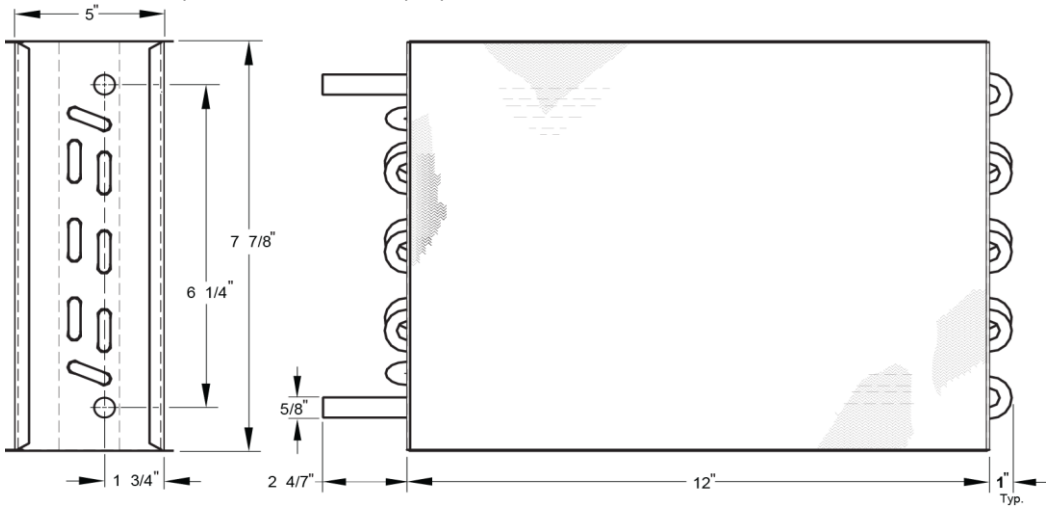
Code Compliances:
NFPA 90A & 90B - Appliances
NFPA 255 - Flame / Smoke Spread (25/50)
UL 181 - Air Erosion
UL 181 - Mold Growth and Humidity
UL 723 - Flame / Smoke Spread (25/50)
ASTM E96 – Water Vapor Transmission
ASTM E84 - Flame / Smoke Spread (25/50)
Factory Mutual Listed

Accessories (continued) **DESV-1 (2)**

Standard Access Door



ESV Hot Water Reheat: 2-Row, Left Hand for size 04, 05, & 06

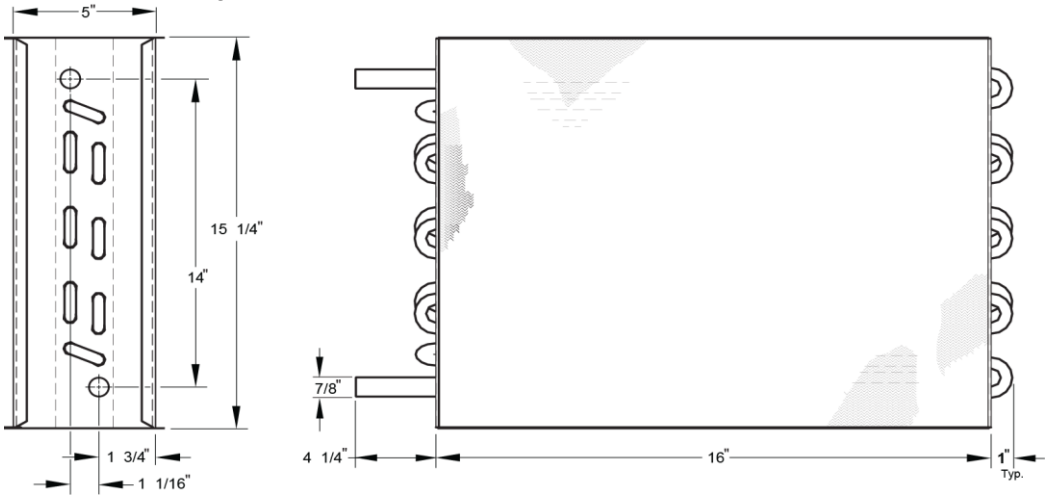


- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs)	Water Volume (gal)
1.26	0.15

Accessories (continued) **DESV-1 (2)**

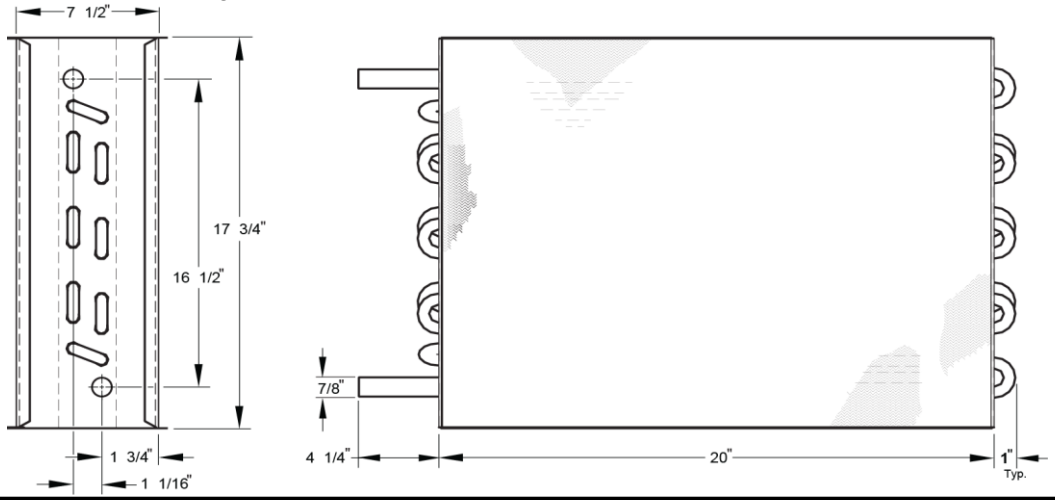
ESV Hot Water Reheat: 2-Row, Right Hand for size 12 & 1E



- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
3.45	0.41

ESV Hot Water Reheat: 2-Row, Right Hand for size 14 & 2E

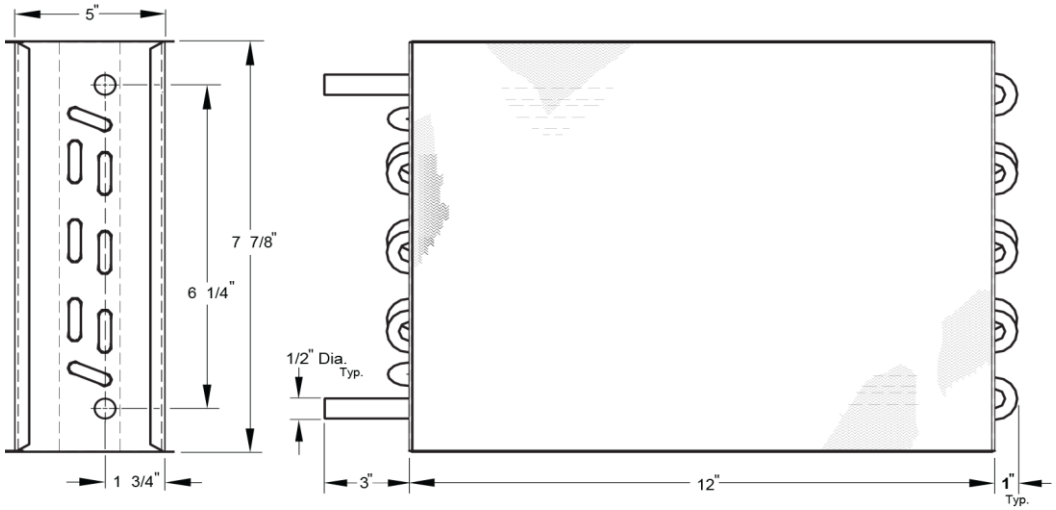


Accessories (continued) **DESV-1 (2)**

- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
4.08	0.49

ESV Hot Water Reheat: 1-Row, Left Hand for size 04, 05, & 06

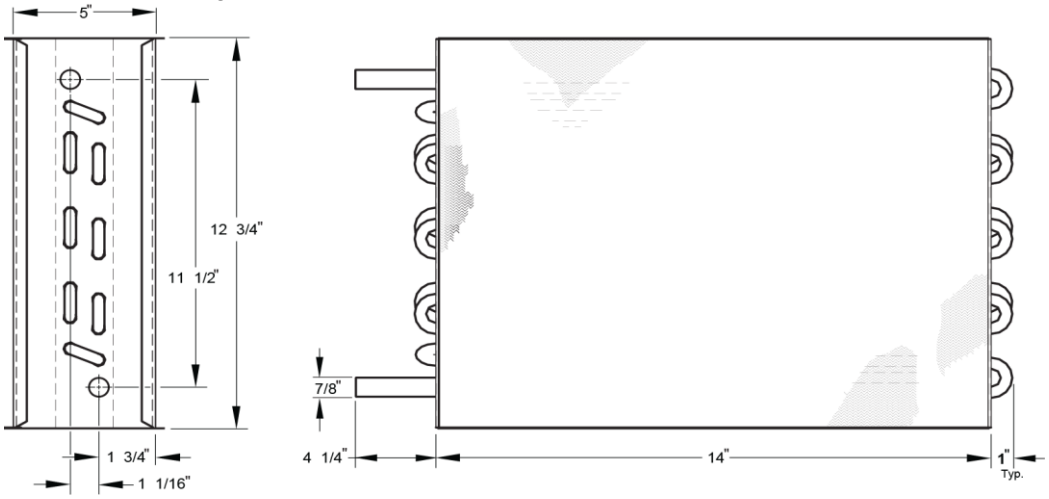


- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs)	Water Volume (gal)
0.59	0.07

Accessories (continued) **DESV-1 (2)**

ESV Hot Water Reheat: 2-Row, Right Hand for size 09, 10, 7E, & 8E



- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
2.32	0.28

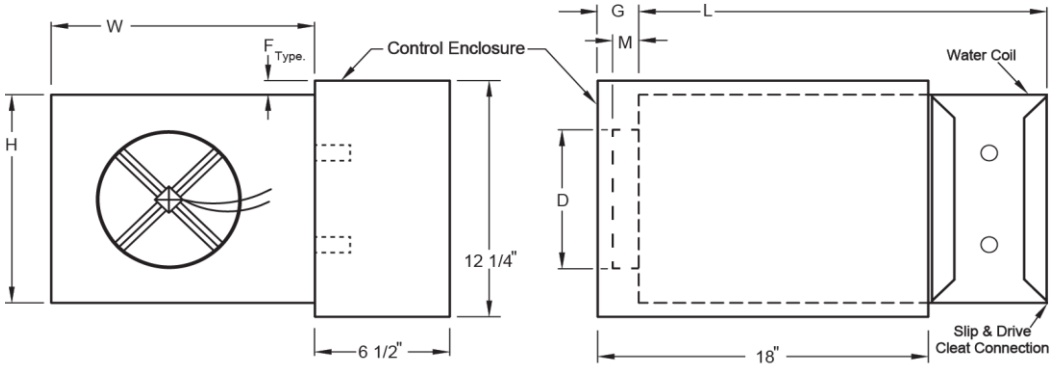
Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

DESV

Single Duct Terminal Unit, Direct Digital Control, Pressure Independent

Main Product **DESV-1 (3)**

DESV

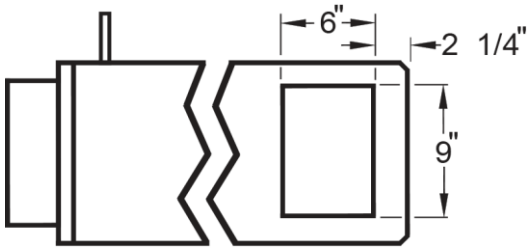


Right Hand Unit with Right Hand HWC Connections shown

Air Inlet (D) is 1/8" smaller than its Nom. Inlet.
All dimensions are in inches.

Unit-Size	CFM Range	Nom. Inlet	F	G	W	H	M	L
08	0 - 900	8" Dia.	1 1/8"	7 3/8"	12"	10"	3 3/8"	20 1/2"
07	0 - 650	7" Dia.	1 1/8"	7 3/8"	12"	10"	3 3/8"	20 1/2"
06	0 - 500	6" Dia.	2 1/8"	7 3/8"	12"	8"	3 3/8"	20 1/2"
10	0 - 1400	10" Dia.	-	5 3/8"	14"	12 1/2"	3 3/8"	20 1/2"
14	0 - 3000	14" Dia.	-	3 3/8"	20"	17 1/2"	3 3/8"	23"

Access Door Opening



(Bottom View)

Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

General Description — DESV-1 (3)

- Standard construction uses G40 22-gauge galvanized steel housing, and optional construction uses G40 20-gauge galvanized steel housing.
- Mechanically sealed and gasketed, leak resistant construction. Less than 2% of nominal CFM at 1.5" sp wg.
- Dual density internal insulation, treated to resist air erosion. Meets requirements of NFPA 90A and UL 181.
- Rectangular discharge opening is designed for slip and drive cleat duct connection.
- Multipoint center averaging inlet velocity sensor.
- Digital control packages can be factory mounted by Titus.
- Unit in accordance with UL-1996
- Model DESV can be installed horizontally, vertically, or at any angle. Operation is not affected by position.
- Gauge tees for CFM measurement.

Option Schedule — DESV-1 (3)

ID	Quantity	Tag	UNIT SIZE	MAX PRIMARY CFM	MIN PRIMARY CFM
3	1	V11-03	08	500	250
4	1	V11-04	07	405	202
11	1	V11-11	06	350	175
15	1	V13-01	10	895	448
17	1	V13-03	10	645	323
19	1	V13-05	08	685	342
22	1	V13-08	14	1520	760
24	1	V13-04	06	285	142

SENSOR CODE	3 - AEROCROSS	**UNIT ACC3**	0 -NONE
UNIT CONFIG	0 -BASIC	**UNIT ACC4**	0 -NONE
LINER OPTION	7 - ½" Fibre Free	**UNIT ACC5**	0 -NONE
CASING CONFIG	1R -22GA RH, Access Door	**WATER COIL**	W12 -2 ROW RH
DIGITAL CONTROLLER	0000 -NONE	**ELECTRIC HEAT TYPE**	000 -NONE
ACTUATOR TYPE	0000 -NONE	**KW**	0
CONTROL ACC1	00 -NONE	**ELEC COIL ACC1**	0 -NONE
CONTROL ACC2	00 -NONE	**ELEC COIL ACC2**	0 -NONE
CONTROL ACC3	00 -NONE	**ELEC COIL ACC3**	0 -NONE
UNIT ACC1	E -METAL CTRL ENCLOS	**ELEC COIL ACC4**	0 -NONE
UNIT ACC2	B -HANGER BRACKET		

ID	Quantity	Tag	UNIT SIZE	MAX PRIMARY CFM	MIN PRIMARY CFM
10	1	V11-10	06	185	82
16	1	V13-02	06	170	85

Option Schedule (continued) — **DESV-1 (3)**

SENSOR CODE	3 - AEROCROSS	**UNIT ACC3**	0 -NONE
UNIT CONFIG	0 -BASIC	**UNIT ACC4**	0 -NONE
LINER OPTION	7 - ½" Fibre Free	**UNIT ACC5**	0 -NONE
CASING CONFIG	1R -22GA RH, Access Door	**WATER COIL**	W11 -1 ROW RH
DIGITAL CONTROLLER	0000 -NONE	**ELECTRIC HEAT TYPE**	000 -NONE
ACTUATOR TYPE	0000 -NONE	**KW**	0
CONTROL ACC1	00 -NONE	**ELEC COIL ACC1**	0 -NONE
CONTROL ACC2	00 -NONE	**ELEC COIL ACC2**	0 -NONE
CONTROL ACC3	00 -NONE	**ELEC COIL ACC3**	0 -NONE
UNIT ACC1	E -METAL CTRL ENCLOS	**ELEC COIL ACC4**	0 -NONE
UNIT ACC2	B -HANGER BRACKET		

Accessories — **DESV-1 (3)**

Selected Insulation: ½" Fibre Free

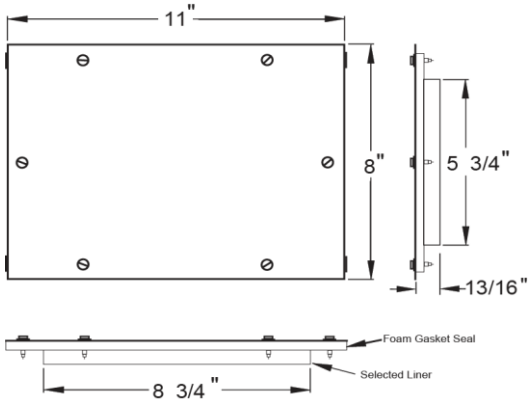
Insulation Characteristics:

Material: EPFI (EngineeredPolymer Foam Insulation)
Thickness: 1/2 inch
R-Value: 2.0 ft2 °F h/Btu @ 75°F
Density: 1.5 lbs/ft3
Flame Spread: less than 25
Smoke Density: less than 50
Mold Growth: None

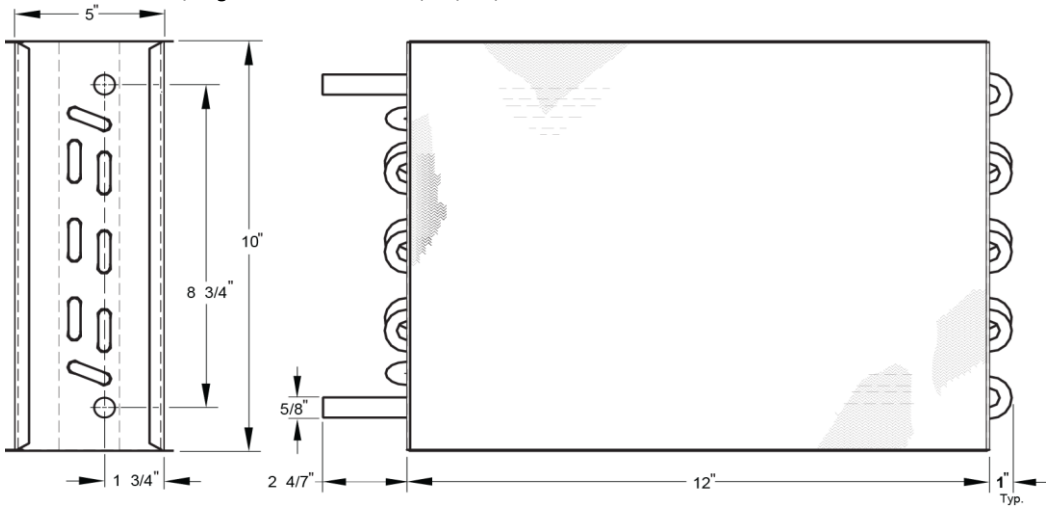
Code Compliances:
NFPA 90A & 90B - Appliances
NFPA 255 - Flame / Smoke Spread (25/50)
UL 181 - Air Erosion
UL 181 - Mold Growth and Humidity
UL 723 - Flame / Smoke Spread (25/50)
ASTM E96 – Water Vapor Transmission
ASTM E84 - Flame / Smoke Spread (25/50)
Factory Mutual Listed

Accessories (continued) **DESV-1 (3)**

Standard Access Door



ESV Hot Water Reheat: 2-Row, Right Hand for size 07, 08, 5E, & 6E

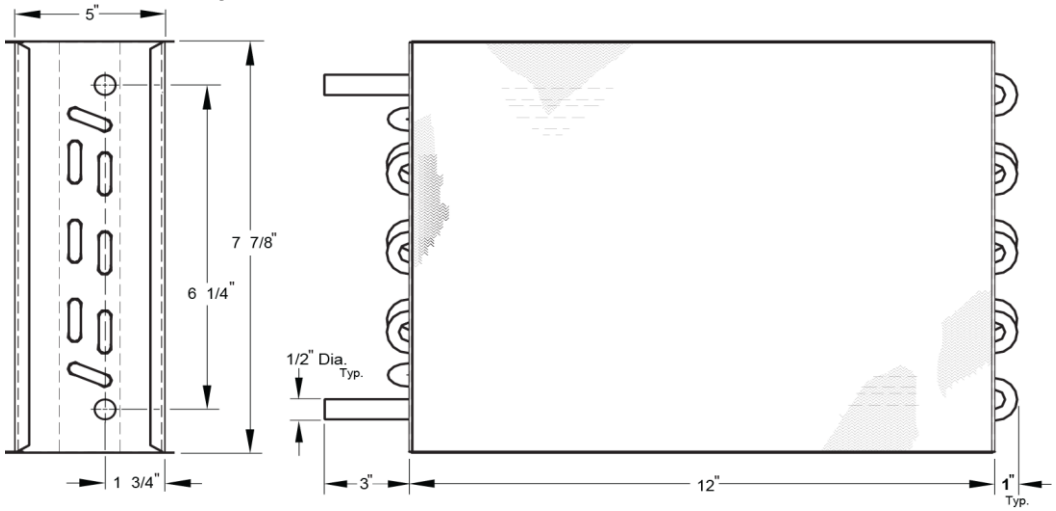


- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
1.82	0.22

Accessories (continued) **DESV-1 (3)**

ESV Hot Water Reheat: 1-Row, Right Hand for size 04, 05, & 06

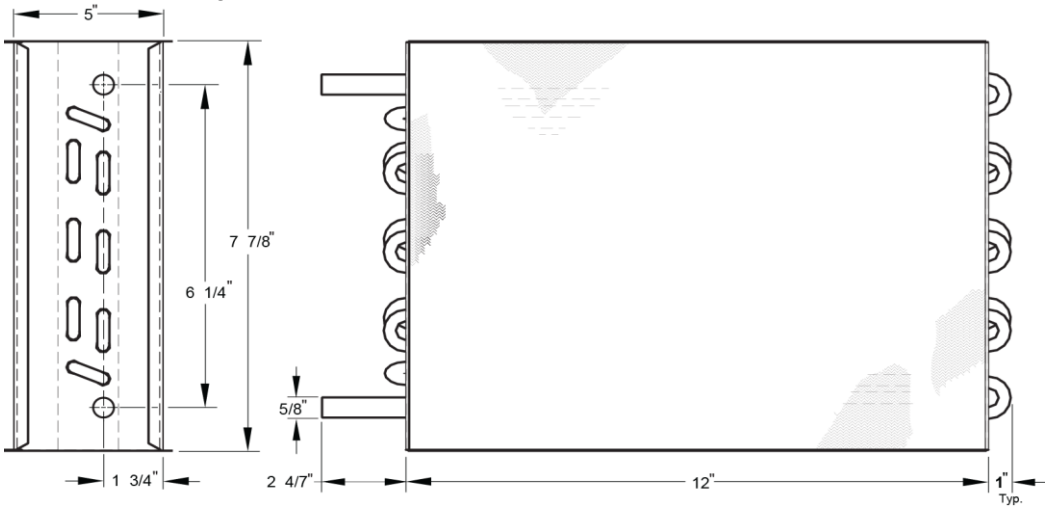


- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs)	Water Volume (gal)
0.59	0.07

Accessories (continued) **DESV-1 (3)**

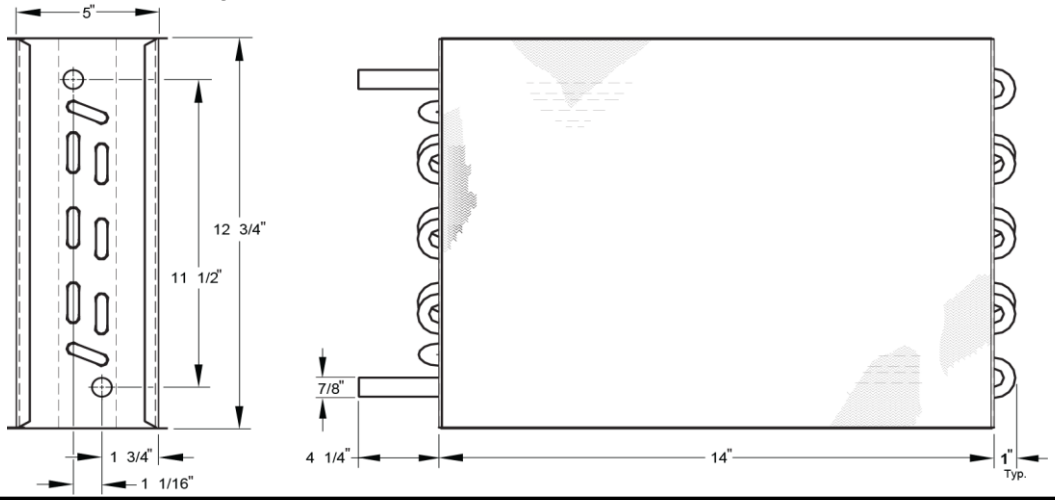
ESV Hot Water Reheat: 2-Row, Right Hand for size 04, 05, & 06



- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
1.26	0.15

ESV Hot Water Reheat: 2-Row, Right Hand for size 09 10, 7E, & 8E

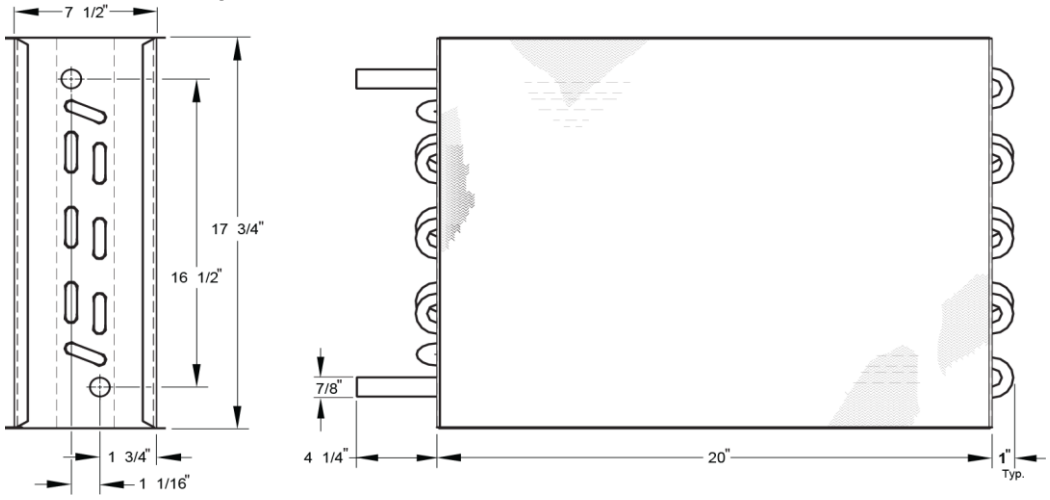


Accessories (continued) **DESV-1 (3)**

- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
2.32	0.28

ESV Hot Water Reheat: 2-Row, Right Hand for size 14 & 2E



- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
4.08	0.49

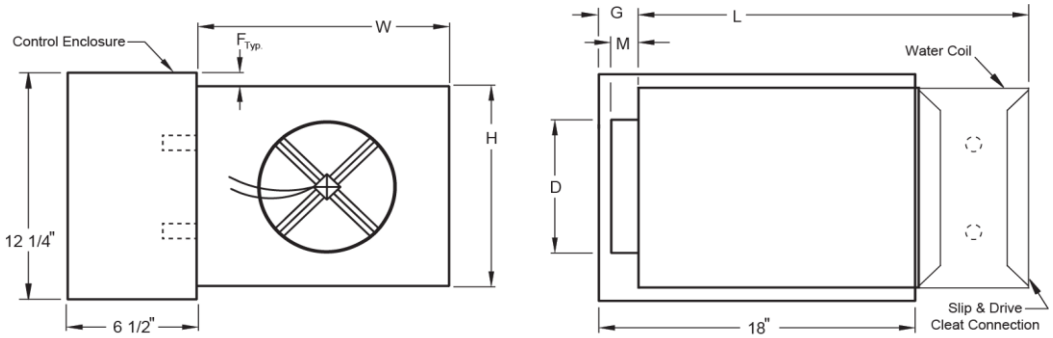
Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

DESV

Single Duct Terminal Unit, Direct Digital Control, Pressure Independent

Main Product **DESV-1 (4)**

DESV

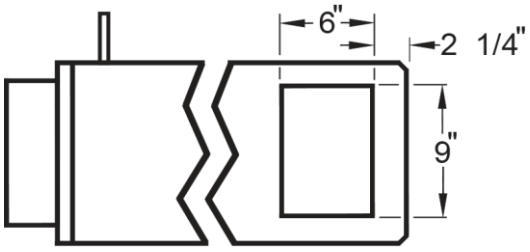


Left hand case with Left hand HWC connections shown.

Air Inlet (D) is 1/8" smaller than its Nom. Inlet.
All dimensions are in inches.

Unit-Size	Nom. Inlet Size	F	G	W	H	M	L
10	10" Dia.	-	5 3/8"	14"	12 1/2"	3 3/8"	22 3/4"
14	14" Dia.	-	3 3/8"	20"	17 1/2"	3 3/8"	25 1/4"

Access Door Opening (Door details in Accessory section):



(Bottom View)

Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

General Description — DESV-1 (4)

- Standard construction uses G40 22-gauge galvanized steel housing, and optional construction uses G40 20-gauge galvanized steel housing.
- Mechanically sealed and gasketed, leak resistant construction. Less than 2% of nominal CFM at 1.5" sp wg.
- Dual density internal insulation, treated to resist air erosion. Meets requirements of NFPA 90A and UL 181.
- Rectangular discharge opening is designed for slip and drive cleat duct connection.
- Multipoint center averaging inlet velocity sensor.
- Digital control packages can be factory mounted by Titus.
- Unit in accordance with UL-1996
- Model DESV can be installed horizontally, vertically, or at any angle. Operation is not affected by position.
- Gauge tees for CFM measurement.

Option Schedule — DESV-1 (4)

ID	Quantity	Tag	UNIT SIZE	MAX PRIMARY CFM	MIN PRIMARY CFM
12	1	V11-12	10	750	375
18	1	V13-10	14	2000	1000
23	1	V13-09	14	2425	1212

SENSOR CODE	3 - AEROCROSS	**UNIT ACC3**	0 -NONE
UNIT CONFIG	0 -BASIC	**UNIT ACC4**	0 -NONE
LINER OPTION	7 - ½" Fibre Free	**UNIT ACC5**	0 -NONE
CASING CONFIG	1L -22GA LH, Access Door	**WATER COIL**	W23 -3 ROW LH
DIGITAL CONTROLLER	0000 -NONE	**ELECTRIC HEAT TYPE**	000 -NONE
ACTUATOR TYPE	0000 -NONE	**KW**	0
CONTROL ACC1	00 -NONE	**ELEC COIL ACC1**	0 -NONE
CONTROL ACC2	00 -NONE	**ELEC COIL ACC2**	0 -NONE
CONTROL ACC3	00 -NONE	**ELEC COIL ACC3**	0 -NONE
UNIT ACC1	E -METAL CTRL ENCLOS	**ELEC COIL ACC4**	0 -NONE
UNIT ACC2	B -HANGER BRACKET		

Accessories	**DESV-1 (4)**

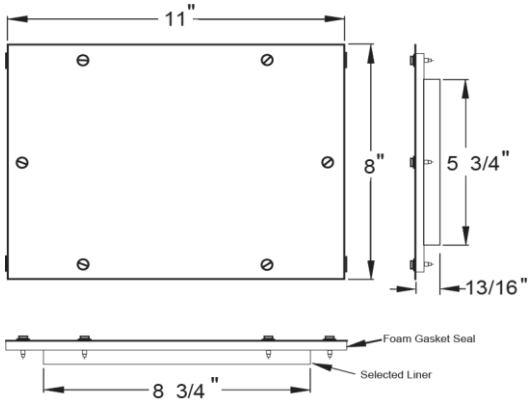
Selected Insulation: ½" Fibre Free

Insulation Characteristics:

Material: EPFI (EngineeredPolymer Foam Insulation)
Thickness: 1/2 inch
R-Value: 2.0 ft2 °F h/Btu @ 75°F
Density: 1.5 lbs/ft3
Flame Spread: less than 25
Smoke Density: less than 50
Mold Growth: None

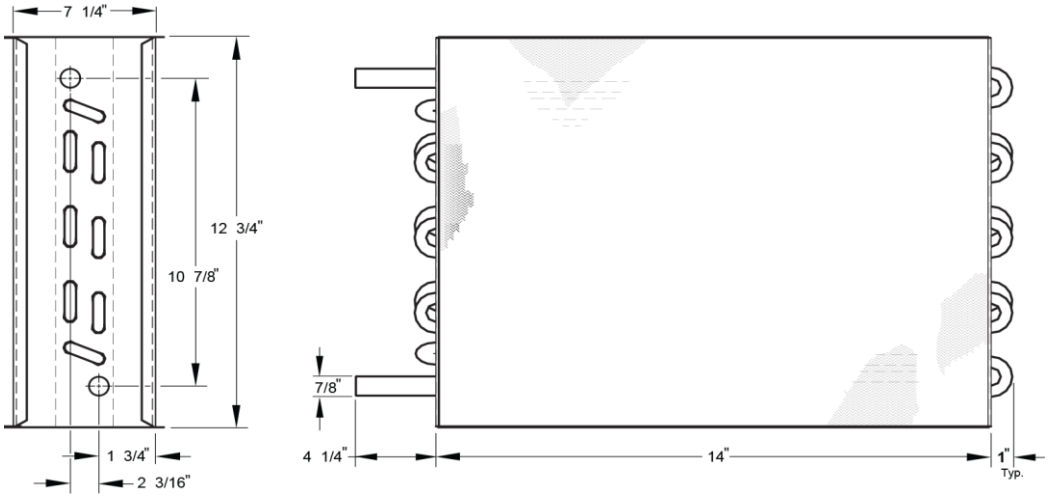
Code Compliances:
NFPA 90A & 90B - Appliances
NFPA 255 - Flame / Smoke Spread (25/50)
UL 181 - Air Erosion
UL 181 - Mold Growth and Humidity
UL 723 - Flame / Smoke Spread (25/50)
ASTM E96 – Water Vapor Transmission
ASTM E84 - Flame / Smoke Spread (25/50)
Factory Mutual Listed

Standard Access Door



Accessories (continued) **DESV-1 (4)**

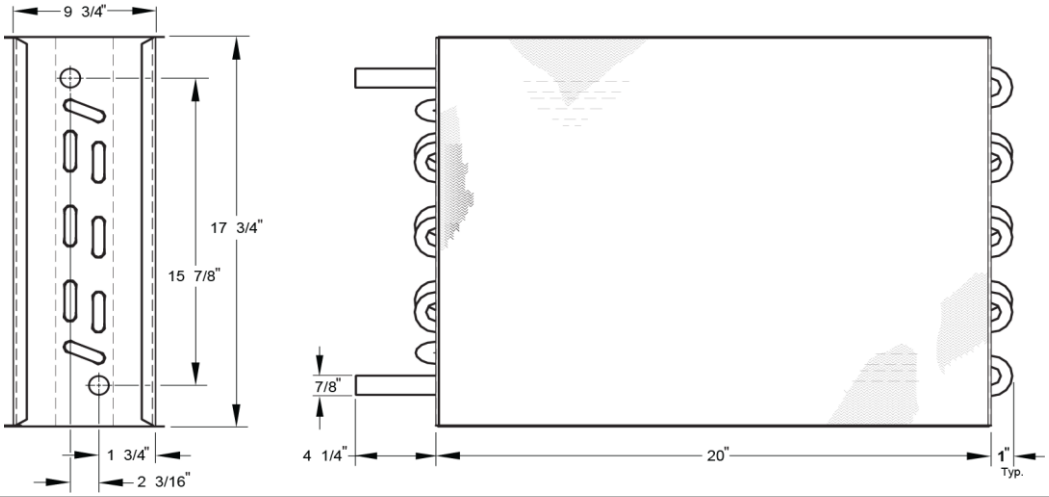
ESV Hot Water Reheat: 3-Row, Left Hand for size 09, 10, 7E, & 8E



- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
3.47	0.42

ESV Hot Water Reheat: 3-Row, Left Hand for size 14 & 2E



Accessories (continued) — **DESV-1 (4)**

- Coil tubing is 1/2" diameter 0.016" thick copper.
- Coil connection tubing is 0.032" thick copper.
- Aluminum plate fins, 10 per inch.
- Casing is 20 Gauge galvanized steel.
- Copper male solder connections.
- Connection is slip and drive to duct work down stream of terminal.
- Leak tested to 450 PSIG.
- Maximum working pressure, 360 PSIG
- Maximum 200 degree F water
- Coils rated and certified to AHRI Standard 410

Water Weight (lbs.)	Water Volume (gal)
5.87	0.71

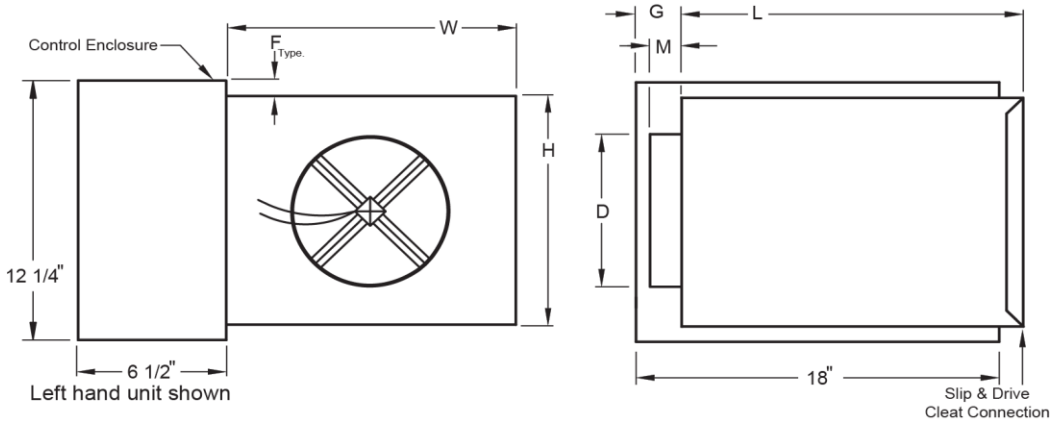
Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

DESV

Single Duct Terminal Unit, Direct Digital Control, Pressure Independent

Main Product **DESV-1 (5)**

DESV

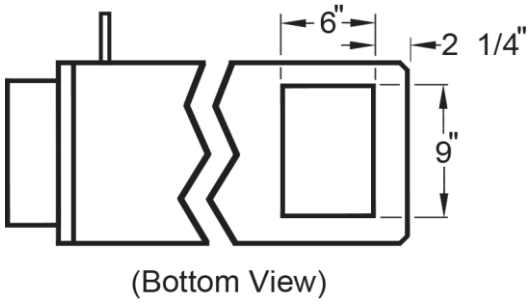


Air Inlet (D) is 1/8" smaller than its Nom. Inlet.

All dimensions are in inches.

Unit-Size	CFM Range	Nom. Inlet	F	G	W	H	M	L
16	0 - 4000	16" Dia.	-	3 3/8"	24"	18"	3 3/8"	15 1/2"

Access Door Opening (Door details in Accessory section):



Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

General Description — DESV-1 (5)

- Standard construction uses G40 22-gauge galvanized steel housing, and optional construction uses G40 20-gauge galvanized steel housing.
- Mechanically sealed and gasketed, leak resistant construction. Less than 2% of nominal CFM at 1.5" sp wg.
- Dual density internal insulation, treated to resist air erosion. Meets requirements of NFPA 90A and UL 181.
- Rectangular discharge opening is designed for slip and drive cleat duct connection.
- Multipoint center averaging inlet velocity sensor.
- Digital control packages can be factory mounted by Titus.
- Unit in accordance with UL-1996
- Model DESV can be installed horizontally, vertically, or at any angle. Operation is not affected by position.
- Gauge tees for CFM measurement.

Option Schedule — DESV-1 (5)

ID	Quantity	Tag	UNIT SIZE	MAX PRIMARY CFM	MIN PRIMARY CFM
25	1	V13-11	16	3000	0

SENSOR CODE	3 - AEROCROSS	**UNIT ACC3**	0 -NONE
UNIT CONFIG	0 -BASIC	**UNIT ACC4**	0 -NONE
LINER OPTION	7 - ½" Fibre Free	**UNIT ACC5**	0 -NONE
CASING CONFIG	1L -22GA LH, Access Door	**WATER COIL**	000 -NONE
DIGITAL CONTROLLER	0000 -NONE	**ELECTRIC HEAT TYPE**	000 -NONE
ACTUATOR TYPE	0000 -NONE	**KW**	0
CONTROL ACC1	00 -NONE	**ELEC COIL ACC1**	0 -NONE
CONTROL ACC2	00 -NONE	**ELEC COIL ACC2**	0 -NONE
CONTROL ACC3	00 -NONE	**ELEC COIL ACC3**	0 -NONE
UNIT ACC1	E -METAL CTRL ENCLOS	**ELEC COIL ACC4**	0 -NONE
UNIT ACC2	B -HANGER BRACKET		

Accessories	**DESV-1 (5)**

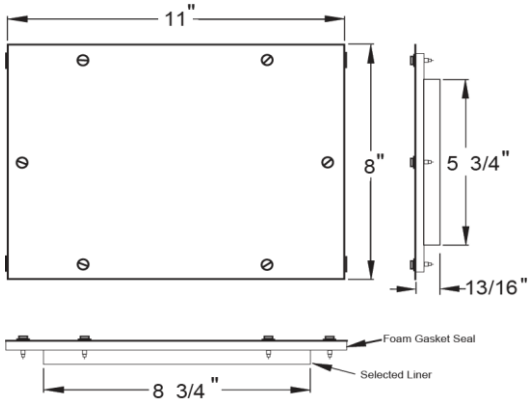
Selected Insulation: ½" Fibre Free

Insulation Characteristics:

Material: EPFI (EngineeredPolymer Foam Insulation)
Thickness: 1/2 inch
R-Value: 2.0 ft2 °F h/Btu @ 75°F
Density: 1.5 lbs/ft3
Flame Spread: less than 25
Smoke Density: less than 50
Mold Growth: None

Code Compliances:
NFPA 90A & 90B - Appliances
NFPA 255 - Flame / Smoke Spread (25/50)
UL 181 - Air Erosion
UL 181 - Mold Growth and Humidity
UL 723 - Flame / Smoke Spread (25/50)
ASTM E96 – Water Vapor Transmission
ASTM E84 - Flame / Smoke Spread (25/50)
Factory Mutual Listed

Standard Access Door



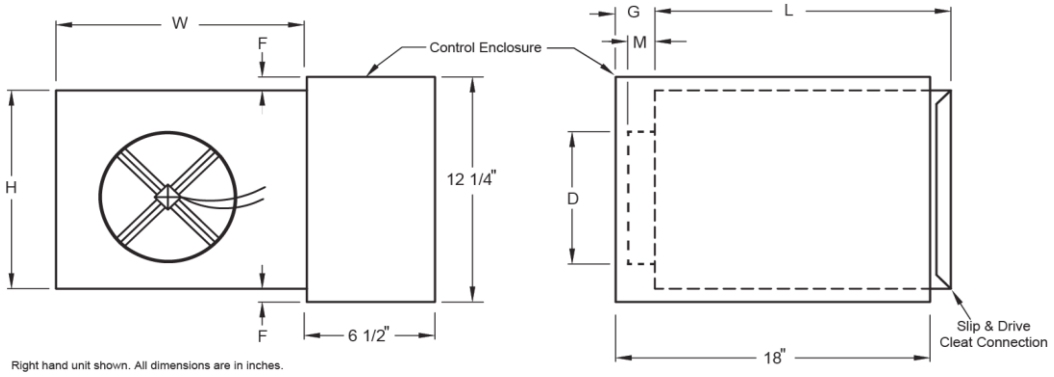
Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

DESV

Single Duct Terminal Unit, Direct Digital Control, Pressure Independent

Main Product **DESV-1 (6)**

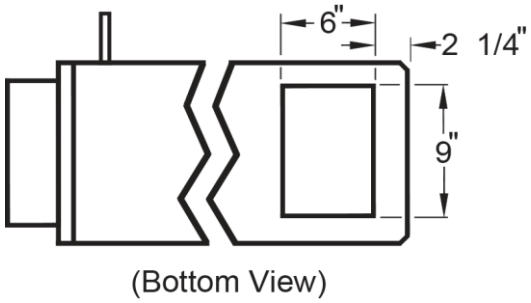
DESV



Air Inlet (D) is 1/8" smaller than its Nom. Inlet.
All dimensions are in inches.

Unit-Size	CFM Range	Nom. Inlet	F	G	W	H	M	L
16	0 - 4000	16" Dia.	-	3 3/8"	24"	18"	3 3/8"	15 1/2"

Access Door Opening



Project	KLH HQ	**Date**	01/22/2025
Architect		**Office**	Controlled Air
Engineer	KLH Engineers	**Preparer**	Joe Zirkelbach
Contractor		**Version**	2014.0.575
Designation			

General Description — DESV-1 (6)

- Standard construction uses G40 22-gauge galvanized steel housing, and optional construction uses G40 20-gauge galvanized steel housing.
- Mechanically sealed and gasketed, leak resistant construction. Less than 2% of nominal CFM at 1.5" sp wg.
- Dual density internal insulation, treated to resist air erosion. Meets requirements of NFPA 90A and UL 181.
- Rectangular discharge opening is designed for slip and drive cleat duct connection.
- Multipoint center averaging inlet velocity sensor.
- Digital control packages can be factory mounted by Titus.
- Unit in accordance with UL-1996
- Model DESV can be installed horizontally, vertically, or at any angle. Operation is not affected by position.
- Gauge tees for CFM measurement.

Option Schedule — DESV-1 (6)

ID	Quantity	Tag	UNIT SIZE	MAX PRIMARY CFM	MIN PRIMARY CFM
26	1	V13-12	16	3000	1275

SENSOR CODE	3 - AEROCROSS	**UNIT ACC3**	0 -NONE
UNIT CONFIG	0 -BASIC	**UNIT ACC4**	0 -NONE
LINER OPTION	7 - ½" Fibre Free	**UNIT ACC5**	0 -NONE
CASING CONFIG	1R -22GA RH, Access Door	**WATER COIL**	000 -NONE
DIGITAL CONTROLLER	0000 -NONE	**ELECTRIC HEAT TYPE**	000 -NONE
ACTUATOR TYPE	0000 -NONE	**KW**	0
CONTROL ACC1	00 -NONE	**ELEC COIL ACC1**	0 -NONE
CONTROL ACC2	00 -NONE	**ELEC COIL ACC2**	0 -NONE
CONTROL ACC3	00 -NONE	**ELEC COIL ACC3**	0 -NONE
UNIT ACC1	E -METAL CTRL ENCLOS	**ELEC COIL ACC4**	0 -NONE
UNIT ACC2	B -HANGER BRACKET		

Accessories	**DESV-1 (6)**

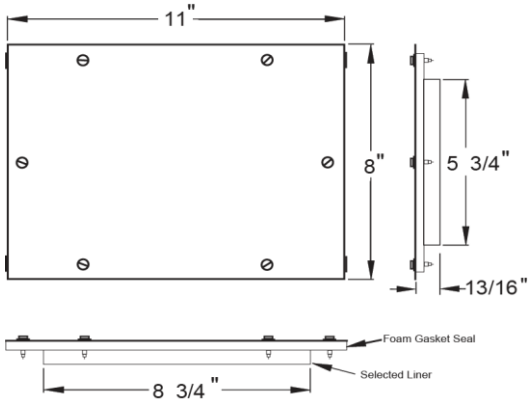
Selected Insulation: ½" Fibre Free

Insulation Characteristics:

Material: EPFI (EngineeredPolymer Foam Insulation)
Thickness: 1/2 inch
R-Value: 2.0 ft2 °F h/Btu @ 75°F
Density: 1.5 lbs/ft3
Flame Spread: less than 25
Smoke Density: less than 50
Mold Growth: None

Code Compliances:
NFPA 90A & 90B - Appliances
NFPA 255 - Flame / Smoke Spread (25/50)
UL 181 - Air Erosion
UL 181 - Mold Growth and Humidity
UL 723 - Flame / Smoke Spread (25/50)
ASTM E96 – Water Vapor Transmission
ASTM E84 - Flame / Smoke Spread (25/50)
Factory Mutual Listed

Standard Access Door



Single Duct Terminal Unit Schedule

KLH HQ

Tag	AHU Tag	Room	Model	Size		CFM		Static Pressure			NC Levels		Hot Water Heat Coil										Unit Information
				Unit	Outlet	Max	Min	Inlet	Down	Min	Rad	Dis	CFM	MBH	EAT	EWT	LAT	APd	GPM	LWT	WPd	Rows	FPI	Hand
V11-01	RTU-11		DESV	10	14x12.5	970	485	1.5	0.5	0.44	22	27	730	27.7	55	140	90	0.43	2.1	113.6	0.3	3-RH	10	RH
V11-02	RTU-11		DESV	06	12x8	335	170	1.5	0.5	0.24	20	25	205	8	55	140	91	0.15	1.1	125.7	0.21	2-LH	10	LH
V11-03	RTU-11		DESV	08	12x10	500	250	1.5	0.5	0.18	20	28	304	10.9	55	140	88	0.17	1.1	120.4	0.28	2-RH	10	RH
V11-04	RTU-11		DESV	07	12x10	405	202	1.5	0.5	0.18	20	25	255	10	55	140	91	0.12	1.1	121.8	0.27	2-RH	10	RH
V11-05	RTU-11		DESV	12	16x15	1050	525	1.5	0.5	0.2	20	25	585	22.2	55	140	90	0.19	2.2	119	0.41	2-LH	10	LH
V11-06	RTU-11		DESV	12	16x15	1200	600	1.5	0.5	0.24	22	27	664	25.2	55	140	90	0.23	2.9	122.6	0.68	2-LH	10	LH
V11-07	RTU-11		DESV	14	20x17.5	1345	673	1.5	0.5	0.17	18	22	673	24.8	55	140	89	0.15	1.9	112.9	0.22	2-LH	10	LH
V11-08	RTU-11		DESV	14	20x17.5	1440	720	1.5	0.5	0.19	18	22	720	25.8	55	140	88	0.17	1.9	112.4	0.23	2-LH	10	LH
V11-09	RTU-11		DESV	12	16x15	975	488	1.5	0.5	0.18	20	25	517	20.2	55	140	91	0.17	1.9	118.5	0.37	2-LH	10	LH
V11-10	RTU-11		DESV	06	12x8	185	82	1.5	0.5	0.06	14	23	82	2.7	55	140	84.8	0.03	0.4	127.1	0.14	1-RH	10	RH
V11-11	RTU-11		DESV	06	12x8	350	175	1.5	0.5	0.26	20	25	288	10.3	55	140	88	0.16	1.6	127.1	0.31	2-RH	10	RH
V11-12	RTU-11		DESV	10	14x12.5	750	375	1.5	0.5	0.29	20	25	750	30.1	55	140	92	0.28	2.6	116.2	0.37	3-LH	10	LH
V11-13	RTU-11		DESV	06	12x8	195	98	1.5	0.5	0.09	14	23	98	4.9	55	140	101.1	0.06	0.8	128.1	0.14	2-LH	10	LH
V11-14	RTU-11		DESV	06	12x8	265	132	1.5	0.5	0.11	18	27	132	4	55	140	83	0.05	1.2	133	0.59	1-LH	10	LH
V13-01	RTU-13		DESV	10	14x12.5	895	448	1.5	0.5	0.25	23	28	470	17.9	55	140	90	0.24	2.3	124.4	0.37	2-RH	10	RH
V13-02	RTU-13		DESV	06	12x8	170	85	1.5	0.5	0.05	13	22	85	2.8	55	140	85	0.03	0.5	127.8	0.16	1-RH	10	RH
V13-03	RTU-13		DESV	10	14x12.5	645	323	1.5	0.5	0.15	20	27	471	17.4	55	140	89	0.14	2	122.6	0.33	2-RH	10	RH
V13-04	RTU-10		DESV	06	12x8	285	142	1.5	0.5	0.18	18	28	219	10	55	140	97	0.11	4.8	135.8	2.39	2-RH	10	RH
V13-05	RTU-13		DESV	08	12x10	685	342	1.5	0.5	0.31	23	29	387	14.7	55	140	90	0.29	2.8	129.2	1.07	2-RH	10	RH
V13-06	RTU-13		DESV	14	20x17.5	1650	825	1.5	0.5	0.23	20	22	895	34	55	140	90	0.21	3.4	119.4	0.51	2-LH	10	LH
V13-07	RTU-13		DESV	10	14x12.5	945	472	1.5	0.5	0.28	23	28	472	15.9	55	140	86	0.27	1.5	119	0.25	2-LH	10	LH
V13-08	RTU-13		DESV	14	20x17.5	1520	760	1.5	0.5	0.21	19	22	812	30.8	55	140	90	0.19	2.7	116.9	0.38	2-RH	10	RH
V13-09	RTU-13		DESV	14	20x17.5	2425	1212	1.5	0.5	0.68	20	22	1445	54.9	55	140	90	0.63	3.2	105.6	0.42	3-LH	10	LH
V13-10	RTU-13		DESV	14	20x17.5	2000	1000	1.5	0.5	0.49	19	22	1351	64.5	55	140	99	0.45	6.3	119.2	1.24	3-RH	10	RH
V13-11	RTU-13		DESV	16	24x18	3000	0	1.5	0.5	0.03	25	28	0		0	0	0	0		0	0			LH
V13-12	RTU-13		DESV	16	24x18	3000	1275	1.5	0.5	0.03	25	28	0		0	0	0	0		0	0			RH

Notes:
1. Selections are based on Titus as Manufacturer.
2. All performance based on tests conducted in accordance with ASHRAE 130-2008 and AHRI 880-2011.
3. All NC levels determined using AHRI 885-2008 Appendix E.
4. All airflow, pressure losses and heating performance values have been corrected for altitude.
5. Units of measure: dimensions (in), airflow (cfm), water flow (gpm), air pressure (in wg), water head losses (ft) and temperatures (degF).
6. Water pressure drop (WPd) units is in ft. water.