



Submittal

Trane U.S. Inc.

Engineer: Allied Engineering

Date: July 26, 2013

Prepared For:
Riverside Mechanical Inc
27 Rebecca Way
Falmouth, ME 04105 U.S.A.

Job Name:
Casco Bay Terminal Building

Customer P.O. Number:
20155-4350-1

Trane Job Number:
A223251

Specification Section:
238126

Trane is pleased to provide the enclosed submittal for your review and approval.

Qty	Product	Tag(s)
1	LG Multi-Split Heat Pump System	CU-1 & HP-1 thru HP-3

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Trane U.S. Inc. dba Trane
860 Spring Street, Unit 1
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The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Table Of Contents

Product Summary.....1

VRV - LG (Item A1).....3

 Tag Data 3

 Product Data 3

Tag Data – LG Multi-Split Heat Pump System (Qty: 1)

Item	Tag(s)	Qty	Model Number
A1	CU-1	1	LMU247HV
A2	HP-1	1	LMDN095HVT
A3	HP-2	1	LMDN095HVT
A4	HP-3	1	LMDN125HV

Product Data - LG Multi-Split Heat Pump System**Item: A1, A2, A3, A4 Tag(s): CU-1/HP-1, HP-2, HP-3**

LG Multi-F Heat Pump Mini-split system

2 ton outdoor unit w/ 2 year parts warranty and 5 year compressor parts warranty

Indoor units are Multi-zone concealed ducted units w/ 2 year parts warranty

Wired programmable thermostat

Job Name/Location: Casco Bay Ferry Terminal

Tag #: CU-1

Date: 07/26/2013

For: File Resubmit
 Approval Other _____

PO No.:

Architect:

GC:

Engr: Allied Engineering

Mech: Riverside Mechanical

Rep: Trane

(Company)

(Project Manager)

LMU247HV
Multi F Inverter Heat Pump Outdoor Unit



Performance:

Capacity (Btu/h)	24,000
Cooling Power Input (kW)	1.43
Heating Power Input (kW)	2.21

Cooling Nominal Test Conditions:

Indoor: 80°F DB/67°F WB
 Outdoor: 95°F DB/75°F WB

Heating Nominal Test Conditions:

Indoor: 70°F DB/60°F WB
 Outdoor: 47°F DB/43°F WB

Electrical:

Power Supply (V ¹ /Hz/Ø)	208-230/60/1
MOP (A)	25
MCA (A)	15.4
Cooling Rated Amps (A)	14.9
Heating Rated Amps (A)	14.9
Compressor (A)	11.6
Fan Motor (A)	0.40

MOP - Maximum Overcurrent Protection MCA - Minimum Circuit Ampacity

Piping:

Refrigerant Charge (lbs)	4.63
Liquid Line (in, OD)	1/4 (3 Each)
Vapor Line (in, OD)	3/8 (3 Each)
Max Total Piping (ft) ²	246.1
Max ODU to IDU Piping (ft)	82.0
Piping Length (no add'l refrigerant, ft)	73.8
Max Elevation between ODU and IDU (ft)	49.2
Max Elevation between IDU and IDU (ft)	24.6

ODU - Outdoor Unit IDU - Indoor Unit

Controls Features:

- Auto operation
- Auto restart operation
- Defrost/Deicing
- Inverter (variable speed compressor)
- Low ambient operation to 14F (cooling mode)
- Restart delay (3-minutes)
- Self diagnosis
- Soft start

Standard Features:

- Limited Five Year Compressor Warranty
- Limited Two Year Functional Parts Warranty

Optional Accessories:

- PI-485 Integration Board (PMNFP14A0)
- AC Smart II (PQCSW320A1E)
- AC Ez (PQCSZ250S0)

Operating Range:

Cooling (°F DB)	14-118
Heating (°F WB)	0-64

Unit Data:

Refrigerant Type	R410A
Refrigerant Control	EEV
Sound Pressure (±3 dB(A)) ³	51
Net Unit Weight (lbs)	130.1
Shipping Weight (lbs)	138.8
Heat Exchanger Coating	GoldFin™
Min Number of Indoor Units	2
Max Number of Indoor Units	3
Communication Cable (No. x AWG) ³	4 x 18

AWG - American Wire Gage

Compressor:

Quantity	1
Type	Twin-Rotary Inverter
Oil/Type	FVC68D

Fan:

Type	Propeller
Quantity	1
Fan Motor/Drive	Brushless Digitally Controlled/Direct
Airflow Rate (CFM)	2,119

Notes:

1. Acceptable operating voltage: 187V-253V.
2. Piping lengths are equivalent.
3. Sound Pressure levels are tested in an anechoic chamber under ISO Standard 1996.
4. All communication cable to be minimum 18 AWG, 2-conductor, stranded, shielded and must comply with applicable local and national code.
5. See Engineering Manual for sensible and latent capacities.
6. Power wiring cable size must comply with the applicable local and national code.
7. This data is rated 0 ft above sea level, with 24.6 ft of refrigerant line and a 0 ft level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95 - 105%.
8. Must follow installation instructions in the applicable LG installation manual.



System	Combined With	Nominal Cooling Capacity	EER	SEER	Nominal Heating Capacity	COP	HSPF	Low Heating Capacity	COP	Energy Star
LMU247HV	Non-Ducted Indoor Units	19,200	13.4	21.7	26,400	3.5	9.4	16,200	2.6	Yes
	Ducted Indoor Units	18,000	11.8	16.4	26,200	3.4	8.5	16,400	2.6	-
	Mixed Ducted & Non-Ducted	18,600	12.6	19.05	26,300	3.5	8.95	16,300	2.6	-

Job Name/Location: Casco Bay Ferry Terminal

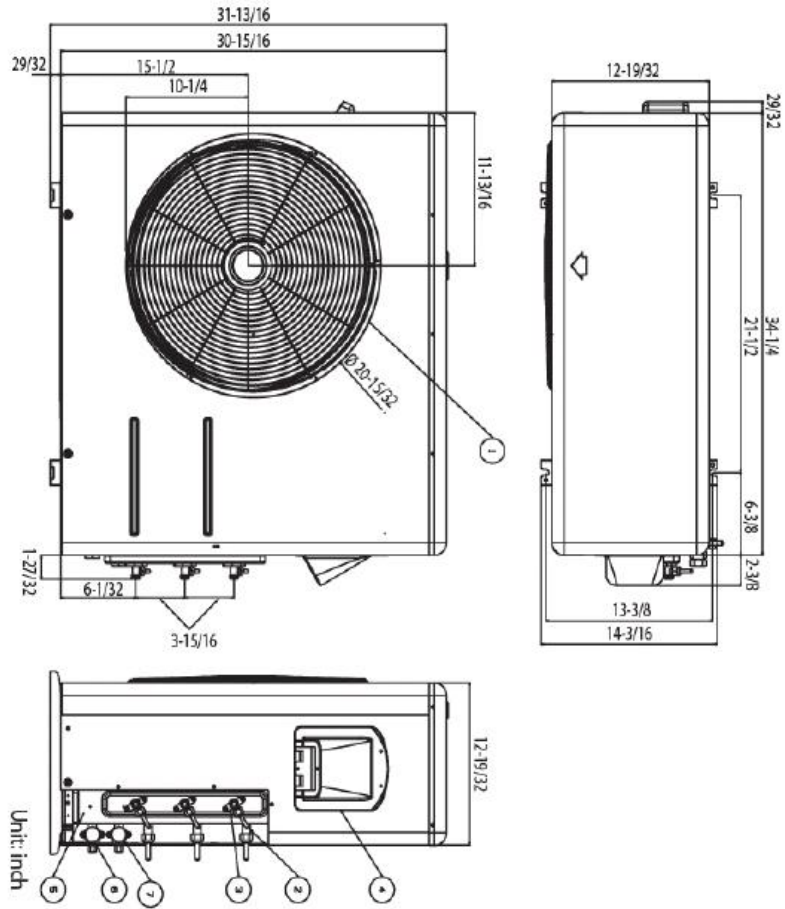
LMU247HV
Multi F Inverter Heat Pump Outdoor Unit



Tag #: CU-1

Date: 07/26/2013

PO No.:



No.	Part Name	Remarks
1	Air discharge grille	
2	Gas pipe connection	
3	Liquid pipe connection	
4	Power & transmission connection	
5	Earth screw	
6	Main service valve (Liquid)	
7	Main service valve (Gas)	

Job Name/Location: Casco Bay Ferry Terminal

LMU247HV
Flex Multi Inverter Heat Pump Outdoor Unit



Tag #: CU-1

Date: 07/26/2013

PO No.:

Non-Ducted Indoor Units

Cooling

Active IDUs	Combination of Indoor Units (kBtu/h Class)				Room Capacity				Total Capacity				Input (W)			EER	SEER			
									Min		Rated									
UNIT	UNIT A	UNIT B	UNIT C	UNIT D	Total	UNIT-A (Btu/h)	UNIT-B (Btu/h)	UNIT-C (Btu/h)	UNIT-D (Btu/h)	Btu/h	kW	Btu/h	kW	Btu/h	kW	Min	Rated	Max		
2 Units	9	9	-	-	18	8,500	8,500	-	-	10,798	3.16	17,000	4.98	19,800	5.80	1,002	1,349	2,560	12.6	19.0
	9	12	-	-	21	7,586	10,114	-	-	11,100	3.25	17,700	5.19	23,100	6.77	1,044	1,383	2,830	12.8	19.0
	12	12	-	-	24	9,600	9,600	-	-	11,400	3.34	19,200	5.63	25,500	7.47	1,194	1,469	3,090	13.1	19.0
	9	18	-	-	27	6,400	12,800	-	-	11,400	3.34	19,200	5.63	27,500	8.06	1,284	1,469	3,090	13.1	19.0
	12	18	-	-	30	7,680	11,520	-	-	11,400	3.34	19,200	5.63	27,500	8.06	1,284	1,469	3,090	13.1	19.0
3 Units	9	9	9	-	27	6,400	6,400	6,400	6,400	11,700	3.43	19,200	5.63	28,800	8.44	1,200	1,431	3,050	13.4	21.7
	9	9	9	-	30	5,760	5,760	7,680	7,680	11,700	3.43	19,200	5.63	28,800	8.44	1,200	1,431	3,050	13.4	21.7
	9	12	12	-	33	5,236	6,982	6,982	6,982	11,700	3.43	19,200	5.63	28,800	8.44	1,200	1,431	3,050	13.4	21.7

Heating

Active IDUs	Combination of Indoor Units (kBtu/h Class)				Room Capacity				Total Capacity				Input (W)			COP	HSPF			
									Min		Rated									
UNIT	UNIT A	UNIT B	UNIT C	UNIT D	Total	UNIT-A (Btu/h)	UNIT-B (Btu/h)	UNIT-C (Btu/h)	UNIT-D (Btu/h)	Btu/h	kW	Btu/h	kW	Btu/h	kW	Min	Rated	Max		
2 Units	9	9	-	-	18	10,120	10,120	-	-	12,418	3.64	20,240	5.93	23,700	6.95	1,200	1,951	2,660	3.0	7.7
	9	12	-	-	21	9,857	13,143	-	-	12,765	3.74	23,000	6.74	27,700	8.12	1,260	2,174	3,010	3.1	7.7
	12	12	-	-	24	13,200	13,200	-	-	16,200	4.75	26,400	7.74	29,040	8.51	1,368	2,320	3,100	3.3	8.2
	9	18	-	-	27	8,800	17,600	-	-	16,200	4.75	26,400	7.74	31,500	9.23	1,428	3,320	3,100	3.3	8.2
	12	18	-	-	30	10,560	15,840	-	-	16,200	4.75	26,400	7.74	31,500	9.23	1,428	3,320	3,100	3.3	8.2
3 Units	9	9	9	-	27	8,800	8,800	8,800	-	16,200	4.75	26,400	7.74	32,000	9.38	1,308	2,207	3,090	3.5	9.4
	9	9	9	-	30	7,920	7,920	10,560	-	16,200	4.75	26,400	7.74	32,000	9.38	1,308	2,207	3,090	3.5	9.4
	9	12	12	-	33	7,200	9,600	9,600	-	16,200	4.74	26,400	7.74	32,000	9.38	1,308	2,207	3,090	3.5	9.4

Ducted Indoor Units

Cooling

Active IDUs	Combination of Indoor Units (kBtu/h Class)				Room Capacity				Total Capacity				Input (W)			EER	SEER			
									Min		Rated									
UNIT	UNIT A	UNIT B	UNIT C	UNIT D	Total	UNIT-A (Btu/h)	UNIT-B (Btu/h)	UNIT-C (Btu/h)	UNIT-D (Btu/h)	Btu/h	kW	Btu/h	kW	Btu/h	kW	Min	Rated	Max		
2 Units	9	9	-	-	18	8,300	8,300	-	-	10,798	3.16	16,600	4.87	19,800	5.80	1,042	1,495	2,560	11.1	14.4
	9	12	-	-	21	7,286	9,714	-	-	12,000	3.52	17,000	4.98	23,100	6.77	1,084	1,504	2,830	11.3	14.4
	12	12	-	-	24	9,000	9,000	-	-	12,300	3.60	18,000	5.28	25,500	7.47	1,234	1,565	3,090	11.5	14.4
	9	18	-	-	27	6,000	12,000	-	-	12,300	3.60	18,000	5.28	27,500	8.06	1,324	1,565	3,090	11.5	14.4
	12	18	-	-	30	7,200	10,800	-	-	12,300	3.60	18,000	5.28	27,500	8.06	1,324	1,565	3,090	11.5	14.4
3 Units	9	9	9	-	27	6,000	6,000	6,000	-	12,300	3.60	18,000	5.28	28,800	8.44	1,260	1,525	3,050	11.8	16.4
	9	9	9	-	30	5,400	5,400	7,200	-	12,300	3.60	18,000	5.28	28,800	8.44	1,260	1,525	3,050	11.8	16.4
	9	12	12	-	33	4,910	6,545	6,545	-	12,300	3.60	18,000	5.28	28,800	8.44	1,260	1,525	3,050	11.8	16.4

Heating

Active IDUs	Combination of Indoor Units (kBtu/h Class)				Room Capacity				Total Capacity				Input (W)			COP	HSPF			
									Min		Rated									
UNIT	UNIT A	UNIT B	UNIT C	UNIT D	Total	UNIT-A (Btu/h)	UNIT-B (Btu/h)	UNIT-C (Btu/h)	UNIT-D (Btu/h)	Btu/h	kW	Btu/h	kW	Btu/h	kW	Min	Rated	Max		
2 Units	9	9	-	-	18	10,000	10,000	-	-	12,418	3.64	20,000	5.86	23,700	6.95	1,240	1,967	2,660	3.0	7.9
	9	12	-	-	21	9,771	13,029	-	-	13,800	4.04	22,800	6.68	27,700	8.12	1,300	2,227	3,010	3.0	7.9
	12	12	-	-	24	13,100	13,100	-	-	16,500	4.84	26,200	7.68	29,040	8.51	1,408	2,360	3,100	3.3	8.1
	9	18	-	-	27	8,733	17,467	-	-	16,500	4.84	26,200	7.68	31,500	9.23	1,468	2,360	3,100	3.3	8.1
	12	18	-	-	30	10,480	15,720	-	-	16,500	4.84	26,200	7.68	31,500	9.23	1,468	2,360	3,100	3.3	8.1
3 Units	9	9	9	-	27	8,733	8,733	8,733	-	16,500	4.84	26,200	7.68	32,000	9.38	1,368	2,226	3,090	3.4	8.5
	9	9	9	-	30	7,860	7,860	10,480	-	16,500	4.84	26,200	7.68	32,000	9.38	1,368	2,226	3,090	3.4	8.5
	9	12	12	-	33	7,145	9,527	9,527	-	16,500	4.84	26,200	7.68	32,000	9.38	1,368	2,226	3,090	3.4	8.5

Capacity data is based on the following conditions –
 Cooling Nominal Test Conditions: Indoor: 80°F DB/67°F WB Outdoor: 5°F DB/75°F WB
 Heating Nominal Test Conditions: Indoor: 70°F DB/60°F WB Outdoor: 47°F DB/43°F WB
 Refer to the EPDB Capacity Tables for capacities at other temperatures.

Job Name/Location: Casco Bay Ferry Terminal

Tag #: HP-1, HP-2

Date: 07/26/2013

For: File Resubmit
 Approval Other

PO No.:

Architect:

GC:

Engr: Allied Engineering

Mech: Riverside Mechanical

Rep: Trane

(Company)

(Project Manager)



PQRVCLOQW

LMDN095HV
 Flex Multi Ceiling Concealed Duct
 9,000 Btu/h Indoor Unit



Performance:

Nominal Capacity (Btu/h)	9,000
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Cooling Nominal Test Conditions: Indoor: 80°F DB/67°F WB Outdoor: 95°F DB/75°F WB
 Heating Nominal Test Conditions: Indoor: 70°F DB/60°F WB Outdoor: 47°F DB/43°F WB

Electrical:

Power Supply (V ¹ /Hz/Ø)	208-230/60/1
Rated Amps (A)	0.25

Piping:

Liquid Line (in, OD)	1/4
Vapor Line (in, OD)	3/8
Drain OD, ID (in)	1-1/4, 1
Temperature Sensor	Thermistor
Max Length Each Pipe (ft)	82
Max Elevation between ODU and IDU (ft)	49.2
Max Elevation between IDU and IDU (ft)	24.6

Features:

- 2 Thermistor control
- Auto operation
- Auto restart
- Control lock function
- Internal Condensate Pump
- Inverter (variable speed fan)

Included Accessories:

- Simple Controller with Mode (White) - PQRVCLOQW

Optional Accessories (sold separately)

- 7-Day Programmable Controller (Black) - PQRVSL0
- 7-Day Programmable Controller (White) - PQRVSL0QW
- Simple Controller with Mode (Black) - PQRVCLOQ
- Simple Controller without Mode (Black) PQRCHCA0Q
- Simple Controller without Mode (White) - PQRCHCA0QW
- AC Smart II - PQCSW320A1E
- ACP without Digital I/O - PQCPA11A03
- ACP with Digital I/O - PQCPB11A0E
- LonWorks Gateway - PQNFB16A1
- BACnet Gateway - PQNFB17B0
- AC Ez - PQCSZ250S0
- Dry Contact Unit Dry Contact Unit (1 contact, 24 VAC external power) - PQDSB1
- Dry Contact Unit Dry Contact Unit (2 input, power from indoor unit) - PQDSBC
- Dry Contact for third party thermostat - PQDSBNGCM1

Operating Range:

Cooling Max (°F WB)	76
Heating Min (°F DB)	59

Unit Data:

Refrigerant Type	R410A
Refrigerant Control	EEV
Sound Pressure H/M/L (±3 dB(A))	32/26/25
Primary Filter	Washable Pre-filter
Net Unit Weight (lbs)	46
Shipping Weight (lbs)	50
Communication Cable (No x AWG)	4 x 18

Fan:

Type	Sirocco
Quantity	3
Motor/Drive	Brushless Digitally Controlled/Direct
Airflow Rate H/M/L (CFM)	300/265/229
Max External Static Pressure (in wg)	0.157
Dehumidification Rate (pts/h)	2.1

Standard Features:

- Limited Warranty with LG Certified Installation
- Limited Two Year Functional Parts Warranty

Notes:

1. Acceptable operating voltage: 187V-253V.
2. See Engineering Manual for sensible and latent capacities.
3. Sound Pressure levels are tested in an anechoic chamber under ISO Standard 1996.
4. All communication cable to be minimum 18 American wire gage (AWG), 2-conductor, stranded, shielded and must comply with applicable local and national code.
5. Power wiring cable size must comply with the applicable local and national code.
6. This unit comes with a dry helium charge.
7. This data is rated 0 ft above sea level, with 24.6 ft of refrigerant line per indoor unit and a 0 ft level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95 – 105%.
8. Must follow installation instructions in the applicable LG installation manual.



Job Name/Location: Casco Bay Ferry Terminal

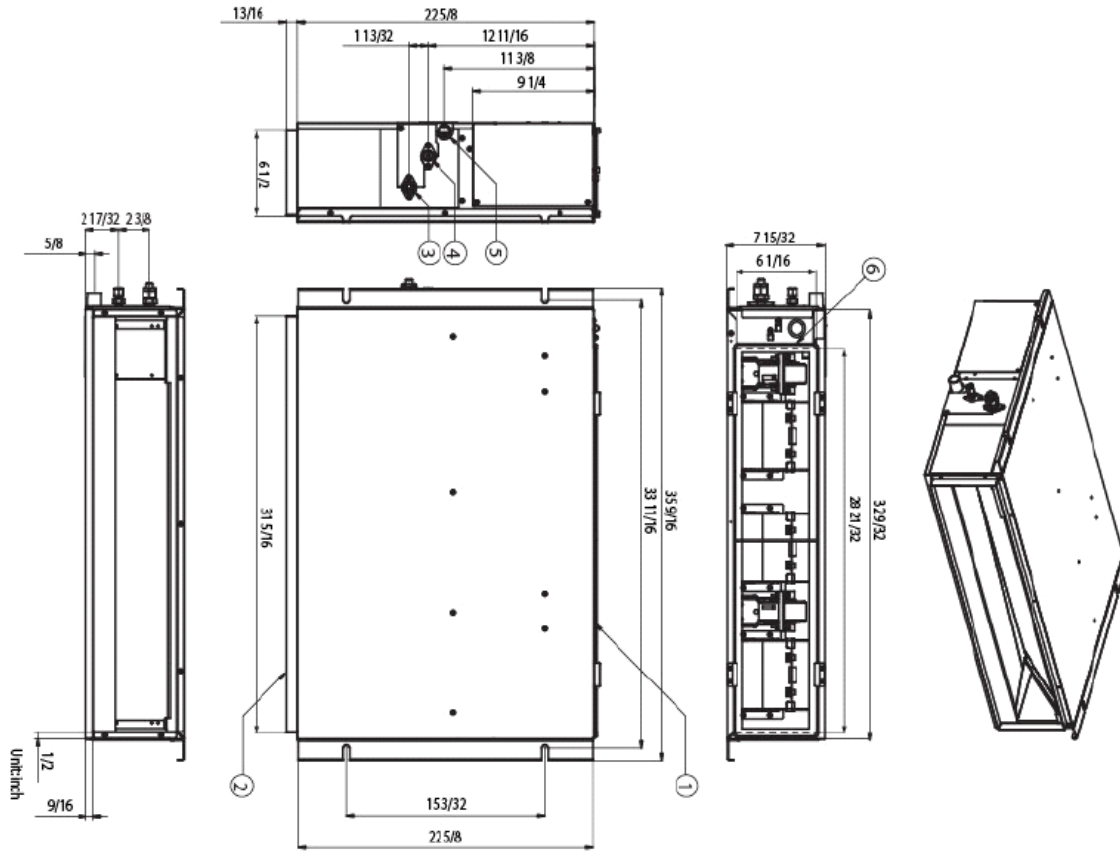
LMDN095HV
 Flex Multi Ceiling Concealed Duct
 9,000 Btu/h Indoor Unit



Tag #: HP-1, HP-2

Date: 07/26/2013

PO No.:



No.	Part Name	Remarks
1	Air suction flange	
2	Air discharge flange	
3	Gas pipe connection	
4	Liquid pipe connection	
5	Drain pipe connection	
6	Power supply connection	

Job Name/Location: Casco Bay Ferry Terminal

Tag #: HP-3

Date: 07/26/2013

For: File Resubmit
 Approval Other

PO No.:

Architect:

GC:

Engr: Allied Engineering

Mech: Riverside Mechanical

Rep: Trane

(Company)

(Project Manager)



PQRVCLOQW

LMDN125HV
 Flex Multi Ceiling Concealed Duct
 12,000 Btu/h Indoor Unit



Performance:

Nominal Capacity (Btu/h)	12,000
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Cooling Nominal Test Conditions:
 Indoor: 80°F DB/67°F WB
 Outdoor: 95°F DB/75°F WB

Heating Nominal Test Conditions:
 Indoor: 70°F DB/60°F WB
 Outdoor: 47°F DB/43°F WB

Electrical:

Power Supply (V/Hz/Ø)	208-230/60/1
Rated Amps (A)	0.25

Piping:

Liquid Line (in, OD)	1/4
Vapor Line (in, OD)	3/8
Drain OD, ID (in)	1-1/4, 1
Temperature Sensor	Thermistor
Max Length Each Pipe (ft)	82
Max Elevation between ODU and IDU (ft)	49.2
Max Elevation between IDU and IDU (ft)	24.6

Features:

- 2 Thermistor control
- Auto operation
- Auto restart
- Control lock function
- Internal Condensate Pump
- Inverter (variable speed fan)

Included Accessories:

- Simple Controller with Mode (White) - PQRVCLOQW

Optional Accessories (sold separately)

- 7-Day Programmable Controller (Black) - PQRCSVLO
- 7-Day Programmable Controller (White) - PQRCSVLOQW
- Simple Controller with Mode (Black) - PQRVCLOQ
- Simple Controller without Mode (Black) PQRCHCAOQ
- Simple Controller without Mode (White) - PQRCHCAOQW
- AC Smart II - PQCSW320A1E
- ACP without Digital I/O - PQCPA11A03
- ACP with Digital I/O - PQCPB11A0E
- LonWorks Gateway - PQNFB16A1
- BACnet Gateway - PQNFB17B0
- AC Ez - PQCSZ250S0
- Dry Contact Unit Dry Contact Unit (1 contact, 24 VAC external power) - PQDSB1
- Dry Contact Unit Dry Contact Unit (2 input, power from indoor unit) - PQDSBC
- Dry Contact for third party thermostat - PQDSBNGCM1

Operating Range:

Cooling Max (*F WB)	76
Heating Min (*F DB)	59

Unit Data:

Refrigerant Type	R410A
Refrigerant Control	EEV
Sound Pressure H/M/L (±3 dB(A))	33/31/26
Primary Filter	Washable Pre-filter
Net Unit Weight (lbs)	46
Shipping Weight (lbs)	50
Communication Cable (No x AWG)	4 x 18

Fan:

Type	Sirocco
Quantity	3
Motor/Drive	Brushless Digitally Controlled/Direct
Airflow Rate H/M/L (CFM)	335/300/265
Max External Static Pressure (in wg)	0.157
Dehumidification Rate (pts/h)	2.5

Standard Features:

- Limited Warranty with LG Certified Installation
- Limited Two Year Functional Parts Warranty

Notes:

1. Acceptable operating voltage: 187V-253V.
2. See Engineering Manual for sensible and latent capacities.
3. Sound Pressure levels are tested in an anechoic chamber under ISO Standard 1996.
4. All communication cable to be minimum 18 American wire gage (AWG), 2-conductor, stranded, shielded and must comply with applicable local and national code.
5. Power wiring cable size must comply with the applicable local and national code.
6. This unit comes with a dry helium charge.
7. This data is rated 0 ft above sea level, with 24.6 ft of refrigerant line per indoor unit and a 0 ft level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95 – 105%.
8. Must follow installation instructions in the applicable LG installation manual.



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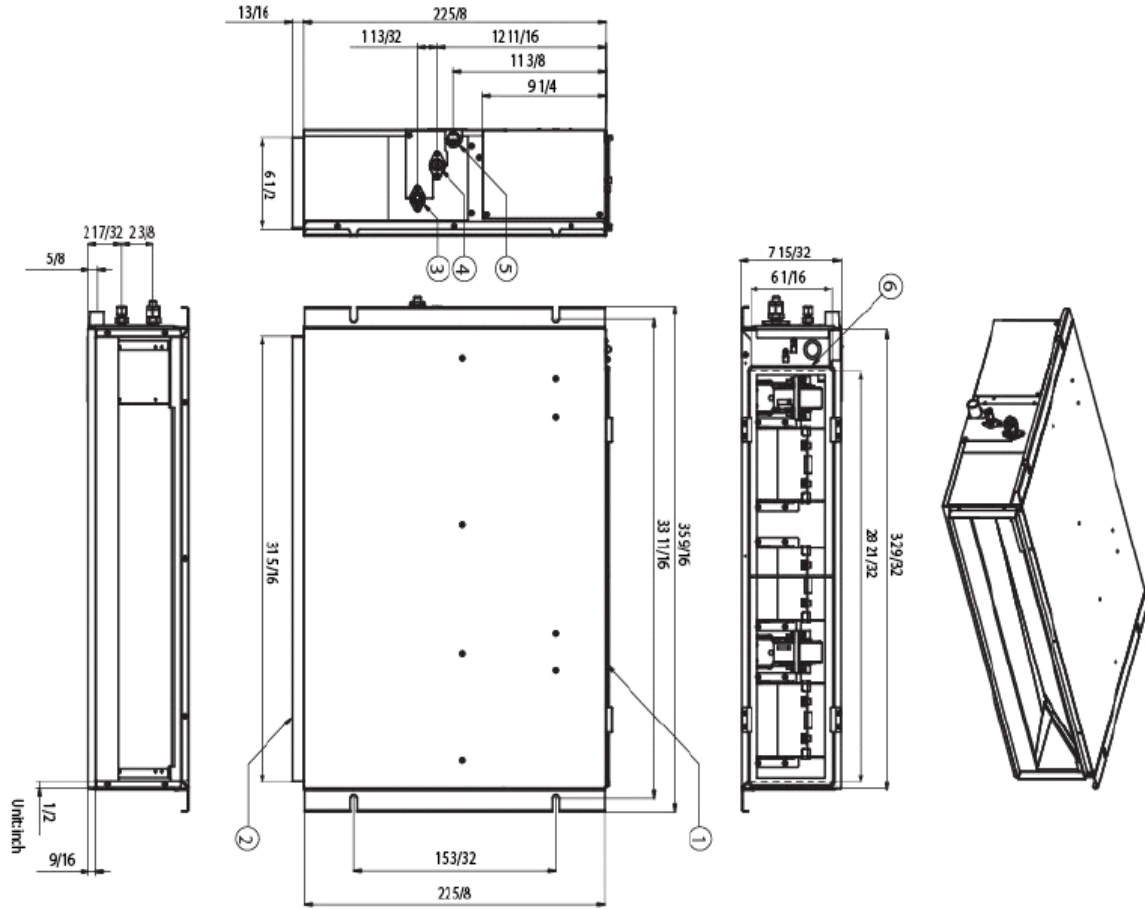
LMDN125HV
 Flex Multi Ceiling Concealed Duct
 12,000 Btu/h Indoor Unit



Tag #: HP-3

Date: 07/26/2013

PO No.:



No.	Part Name	Remarks
1	Air suction flange	
2	Air discharge flange	
3	Gas pipe connection	
4	Liquid pipe connection	
5	Drain pipe connection	
6	Power supply connection	