

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

Please Read
Application And
Notes, If Any,
Attached

BUILDING INSPECTION

PERMIT

Permit Number: 070277

PERMIT ISSUED

APR - 9 2007

This is to certify that PRESUMPCOT STREET PROPERTIES LLC /Coastline Air Mec

has permission to HVAC install a rooftop unit

AT 425 PRESUMPCOT ST

425 A002001

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statutes of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of buildings and structures, and of the application on file in this department.

Apply to Public Works for street line and grade if nature of work requires such information.

Notification of inspection must be given and when permission procured before this building or part thereof is loaded or closed-in. 24 HOUR NOTICE IS REQUIRED.

A certificate of occupancy must be procured by owner before this building or part thereof is occupied.

OTHER REQUIRED APPROVALS

Fire Dept. Greg Cuzz

Health Dept. _____

Appeal Board _____

Other _____

Department Name

Deanne Bouke 4/6/07
Director - Building & Inspection Services

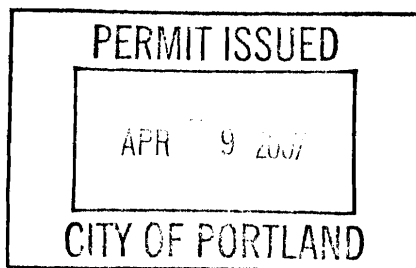
PENALTY FOR REMOVING THIS CARD

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 07-0277		Issue Date:		CBL: 425 A002001					
Location of Construction: 125 PRESUMPCOT ST		Owner Name: PRESUMPCOT STREET PROPE		Owner Address: PO BOX 403		Phone:			
Business Name:		Contractor Name: Coastline Air Mechanical Services /		Contractor Address: 40 Lori Lane Westbrook		Phone: 2072320113			
Lessee/Buyer's Name		Phone:		Permit Type: HVAC		Zone: I-M			
Past Use: Commercial/District Court Admin. Offices		Proposed Use: Commercial/District Court Admin. Offices HVAC install a rooftop unit		Permit Fee: \$570.00		Cost of Work: \$55,000.00		CEO District: 4	
Proposed Project Description: HVAC install a rooftop unit		FIRE DEPT: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied TO N FPA 90B		INSPECTION: Use Group: B Type: HVAC IMC 2003		Signature: Corea, C.A.S.		Signature: JMB 4/6/07	
		PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)		Action: <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied		Signature:		Date:	

Permit Taken By: dmartin		Date Applied For: 03/20/2007		Zoning Approval					
<ol style="list-style-type: none">This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.Building permits do not include plumbing, septic or electrical work.Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..				Special Zone or Reviews		Zoning Appeal		Historic Preservation	
				<input type="checkbox"/> Shoreland <input type="checkbox"/> Wetland <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan Maj <input type="checkbox"/> Minor <input type="checkbox"/> MM <input type="checkbox"/> Date: 3/20/07		<input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied Date:		<input checked="" type="checkbox"/> Not in District or Landmark <input type="checkbox"/> Does Not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Date:	

**CERTIFICATION**

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE

City of Portland, Maine - Building or Use Permit

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 07-0277	Date Applied For: 03/19/2007	CBL: 425 A002001
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Location of Construction: 125 PRESUMPSCOT ST	Owner Name: PRESUMPSCOT STREET PROPE	Owner Address: PO BOX 403	Phone:
Business Name:	Contractor Name: Coastline Air Mechanical Services /	Contractor Address: 40 Lori Lane Westbrook	Phone (207) 232-0113
Lessee/Buyer's Name	Phone:	Permit Type: HVAC	

Proposed Use: Commercial/District Court Admin. Offices HVAC install a rooftop unit	Proposed Project Description: HVAC install a rooftop unit
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Dept: Zoning **Status:** Approved **Reviewer:** Marge Schmuckal **Approval Date:** 03/20/2007
Note: **Ok to Issue:** ☒

Dept: Building **Status:** Approved with Conditions **Reviewer:** Jeanine Bourke **Approval Date:** 04/06/2007
Note: **Ok to Issue:** ☒

- 1) Installation shall comply with the requirements of the engineer for additional support where required.
- 2) Installation shall comply with 2003 International Mechanical Code
- 3) Equipment must be installed in compliance with the manufacturer's specifications

Dept: Fire **Status:** Approved with Conditions **Reviewer:** Cptn Greg Cass **Approval Date:** 03/20/2007
Note: **Ok to Issue:** ☒

- 1) Install shall comply with NFPA 90 B



General Building Permit Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

Location/Address of Construction: <u>125 Presumpscot</u>		
Total Square Footage of Proposed Structure		Square Footage of Lot
Tax Assessor's Chart, Block & Lot Chart# Block# Lot# <u>425</u> <u>A</u> <u>2</u>	Owner: <u>Jerry ADE</u>	Telephone:
Lessee/Buyer's Name (If Applicable)	Applicant name, address & telephone: <u>Coastline Air Mech LLC</u>	Cost Of Work: \$ <u>55,000</u> Fee: \$ _____ C of O Fee: \$ _____
Current legal use (i.e. single family) <u>Commercial</u> - If vacant, what was the previous use? _____ Proposed Specific use: _____ Is property part of a subdivision? _____ If yes, please name _____ Project description: <u>INSTALL HVAC ROOFTOPS & Premise</u> <u>Baseband Heat, Bath, Kitchen, Electrical Rm exhaust.</u>		
Contractor's name, address & telephone: <u>Thomas J. Smare</u> Who should we contact when the permit is ready: <u>40 Lori Ln Westbrook, ME</u> Mailing address: _____ Phone: <u>04098</u> <u>FAX 856-2959</u> <u>C.P. 233-0123</u> <u>PNT# 2671</u>		

Please submit all of the information outlined in the Commercial Application Checklist.
Failure to do so will result in the automatic denial of your permit.

In order to be sure the City fully understands the full scope of the project, the Planning and Development Department may request additional information prior to the issuance of a permit. For further information visit us on-line at www.portlandmaine.gov, stop by the Building Inspections office, room 315 City Hall or call 874-8703.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature of applicant: <u>Thomas J. Smare</u>	Date: <u>3-09-07</u>
DEPT. OF BUILDING INSPECTION CITY OF PORTLAND, ME	
MAR 12 2007 RECEIVED	

This is not a permit; you may not commence ANY work until the permit is issued.

**Coastline Air Mechanical Services
P.O. Box 125
Westbrook, Maine 04098-0125
Telephone No. (207) 232-0113
Facsimile No. (207) 856-2959**

March 15, 2007

Jerry Ade
P.O. Box 403
Portland, ME 04112

Re: Maine District Court HVAC Proposal

Provide and install (1) complete HVAC system for the newly renovated 7,200 square foot Presumpscot Street location – tenant, Maine District Court administrative offices. (2) 7 ½ York package electric ultra high efficiency rooftop units, (1) 5 ton York package electric ultra high efficiency rooftop unit, both complete with duct work and diffusion exposed. Install (1) 3-ton Dankin ceiling cassette heat pump for conference room install all necessary bathroom and electrical room exhaust, install (1) high efficiency gas wall hung boiler to provide perimeter baseboard heat, complete with commercial application baseboard, provide equipment submittal sheets for the City to review, provide confirmation of roof structural supports for the rooftop units to rest on, provide engineered and calculated heating and cooling load sheets, HVAC plan meets and exceeds ASHRAE standards for IAQ (Indoor Air Quality). Will also provide mechanical engineer stamp of approval (Allied Engineering). All air balance is performed by Yankee Air Balance, a certified air balance company, start and test all new HVAC systems.

Total estimated cost of HVAC project - **\$55,000.00.**

Please let me know if you have any questions. Thank you for your business.

Sincerely,

Thomas J. Smarc
Coastline Air Mechanical Services

Lincoln/Haney Engineering Associates, Inc.

Structural Engineering Consultants

Peter L. Lincoln, P.E.
William D. Haney, P.E.
Donald A. Bragdon (1945-93)

Project 2006.186

March 19, 2007

Mr. Tom Smarc
Coastline Air Mechanical
P.O. Box 125
Westbrook, ME 04098

Subject: Installation of three rooftop mechanical units at Roundhouse Building, Presumpscot Street,
Portland, ME

Dear Tom:

Last week we met at the original Roundhouse building on Presumpscot Street to discuss your desire to install three rooftop HVAC units. Specifically, you want to install a 45" x 82" York unit weighing 720 lbs. on a curb of the same size and two 59" x 89" York units weighing 1145 lbs. each on curbs measuring approximately 50" x 80". Your plan is to place the units at three separate locations in which case none of the existing roof beams will be required to support load from more than one unit.

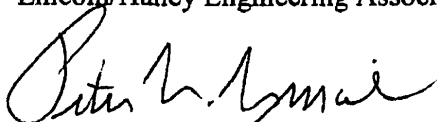
The roof structure, which has a low slope, consists of 5-3/4" x 13-1/2" wood beams supported by 11-1/2" x 17" wood beams. The 11-1/2" x 17" beams are supported within the space by timber columns and at the exterior of the building by brick walls. The roof deck consists of 2" thick tongue & groove wood plank. The roof has a single-ply, fully adhered EPDM membrane placed on top of an older built-up membrane.

Based on my calculations I have concluded that the roof structure has adequate capacity to support the three HVAC units and associated lightgauge metal ductwork. Individual curbs should be placed so that they are supported by at least two of the 5-3/4" x 13-1/2" roof beams. It is likely that new roof openings for ducts will result in the ends of the existing roof plank being unsupported. This will require that 2x10's be installed between the roof beams, at the sides of the duct openings. Additional 2x10's should then be installed in the opposite direction, at the other sides of the duct openings. The ends of all 2x10's should be supported by 8" tall Simpson joist hangers. The tops of the 2x10's should be secured by 16d nails at 8" on center driven through the roof plank.

If you have any questions please do not hesitate to let me know.

Sincerely,

Lincoln/Haney Engineering Associates, Inc.



Peter L. Lincoln, P.E.

cc Jerry Ade, Ade Property Management

7200 Sa



18-16

SYSTEM SIZING SUMMARY

System: CONFERENCE 104
Location: Portland, Maine
Prepared by: FWWEBB



COPY

Block Load 3.05
March 02, 2007
Page: 1

TABLE 1. SIZING DATA (COOLING)

Total Coil Load	30,627 BTU/hr	Load Occurs	July 15:00
Sensible Coil Load	23,133 BTU/hr	Outdoor Db/Wb	95.0/72.0 F
Total Zone Sensible	13,009 BTU/hr	Coil Conditions:	
Supply Temperature	55.0 F	Entering Db/Wb	86.7/68.9 F
Supply Air (Actual)	670 CFM	Leaving Db/Wb	54.7/53.9 F
Supply Air (Standard)	669 CFM	Apparatus Dewpoint	53.0 F
Ventilation Air	400 CFM	Bypass Factor	0.050
Direct Exhaust Air	0 CFM	Resulting Zone RH	59. %
Reheat Required	0 BTU/hr		
		Total Coil Load	2.55 Ton
Floor Area	468 sqft	Sensible Coil Load	1.93 Ton
Overall U-Value	0.286 BTU/hr/sqft/F	SQFT/Ton	183.37
Vent Air	0.85 CFM/sqft	Cooling	65.44 BTU/hr/sqft
Vent Air	20.00 CFM/Person	Cooling	1.43 CFM/sqft

TABLE 2. SIZING DATA (HEATING)

Heating Coil Load	54,039 BTU/hr	Heating	115.47 BTU/hr/sqft
Ventilation Load	33,644 BTU/hr	Heating	1.43 CFM/sqft
Total Zone Load	20,395 BTU/hr	Floor Area	468 sqft
Ventilation Airflow	400 CFM	Overall U-Value	0.286
Supply Airflow	670 CFM	Vent Air	0.85 CFM/sqft
		Vent Air	20.00 CFM/Person

TABLE 3. INPUT DATA (WEATHER)

Location	Portland, Maine		
Data Source	User Defined	Summer Dry-Bulb	95.0 F
Latitude	43.7 Degree	Coincident Wet-Bulb	72.0 F
Elevation	43.0 ft	Daily Range	22.0 F
Atmospheric Clearness #	1.05	Winter Dry-Bulb	-6.0 F

TABLE 4. INPUT (HVAC SYSTEM)

System Name	CONFERENCE 104	THERMOSTAT SETPOINTS	
System Type	Clg and Warm Air Ht	Cooling (Occ.)	73.0 F
System Start	6:00	Cooling (Unocc.)	75.0 F
Duration	24 hrs	Heating	72.0 F
SIZING SPECIFICATIONS		RETURN AIR PLENUM	Yes
Supply	55.0 F	Roof Load	70 %
Ventilation	20.00 CFM/person	Lighting Load	30 %
Exhaust	0.00 CFM	Wall Load	0 %
FACTORS		FAN	
Coil Bypass	0.050	Configuration	Draw Thru
Safety (Sens)	5 %	Static Pressure	0.50 in. wg.
Safety (Latent)	5 %		
Heating Safety	5 %		

TABLE 5. TOP TEN COOLING COIL LOADS

Time	Sensible Ton	Total Ton	Time	Sensible Ton	Total Ton
1) July 15:00	1.93	2.55	6) August 14:00	1.86	2.48
2) July 16:00	1.90	2.52	7) July 17:00	1.82	2.44
3) August 15:00	1.90	2.52	8) July 13:00	1.80	2.41
4) July 14:00	1.89	2.51	9) August 17:00	1.79	2.39
5) August 16:00	1.87	2.48	10) August 13:00	1.77	2.38

SYSTEM SIZING SUMMARY

System: CONFERENCE 104
Location: Portland, Maine
Prepared by: FWWEBB

Block Load 3.05
March 02, 2007
Page: 2

TABLE 6. ZONE SIZING DATA

Zone Name	Max. Cooling Sensible (BTU/hr)	Design Airflow Rate (CFM)	Design Time	Max. Heating Load (BTU/hr)	Design Flow Rate (CFM)
CONFERENCE 104	13,009	670	July 15:00	20,395	-
	Total:	670		Total:	,00

SYSTEM SIZING SUMMARY

System: VESTIBULE 101
Location: Portland, Maine
Prepared by: FWWEBB

Block Load 3.05
March 02, 2007
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TABLE 1. SIZING DATA (COOLING)

Total Coil Load	4,102 BTU/hr	Load Occurs	July 15:00
Sensible Coil Load	3,815 BTU/hr	Outdoor Db/Wb	95.0/72.0 F
Total Zone Sensible	3,587 BTU/hr	Coil Conditions:	
Supply Temperature	55.0 F	Entering Db/Wb	73.8/61.9 F
Supply Air (Actual)	185 CFM	Leaving Db/Wb	54.7/54.1 F
Supply Air (Standard)	185 CFM	Apparatus Dewpoint	53.6 F
Ventilation Air	0 CFM	Bypass Factor	0.050
Direct Exhaust Air	0 CFM	Resulting Zone RH	52.6 %
Reheat Required	0 BTU/hr		
		Total Coil Load	0.34 Ton
Floor Area	78 sqft	Sensible Coil Load	0.32 Ton
Overall U-Value	0.530 BTU/hr/sqft/F	SQFT/Ton	228.16
Vent Air	0.00 CFM/sqft	Cooling	52.60 BTU/hr/sqft
Vent Air	20.00 CFM/Person	Cooling	2.37 CFM/sqft

TABLE 2. SIZING DATA (HEATING)

Heating Coil Load	7,508 BTU/hr	Heating	96.25 BTU/hr/sqft
Ventilation Load	0 BTU/hr	Heating	2.37 CFM/sqft
Total Zone Load	7,508 BTU/hr	Floor Area	78 sqft
Ventilation Airflow	0 CFM	Overall U-Value	0.530
Supply Airflow	185 CFM	Vent Air	0.00 CFM/sqft
		Vent Air	20.00 CFM/Person

TABLE 3. INPUT DATA (WEATHER)

Location	Portland, Maine		
Data Source	User Defined	Summer Dry-Bulb	95.0 F
Latitude	43.7 Degree	Coincident Wet-Bulb	72.0 F
Elevation	43.0 ft	Daily Range	22.0 F
Atmospheric Clearness #	1.05	Winter Dry-Bulb	-6.0 F

TABLE 4. INPUT (HVAC SYSTEM)

System Name	VESTIBULE 101	THERMOSTAT SETPOINTS	
System Type	Ctg and Warm Air Ht	Cooling (Occ.)	73.0 F
System Start	6:00	Cooling (Unocc.)	75.0 F
Duration	24 hrs	Heating	72.0 F
SIZING SPECIFICATIONS		RETURN AIR PLENUM	Yes
Supply	55.0 F	Roof Load	70 %
Ventilation	20.00 CFM/person	Lighting Load	30 %
Exhaust	0.00 CFM	Wall Load	0 %
FACTORS		FAN	
Coil Bypass	0.050	Configuration	Draw-Thru
Safety (Sens)	5 %	Static Pressure	0.50 in. wg.
Safety (Latent)	5 %		
Heating Safety	5 %		

TABLE 5. TOP TEN COOLING COIL LOADS

Time	Sensible Ton	Total Ton	Time	Sensible Ton	Total Ton
1) July 15:00	0.32	0.34	6) June 15:00	0.31	0.32
2) July 16:00	0.31	0.34	7) July 13:00	0.30	0.32
3) July 14:00	0.31	0.34	8) June 18:00	0.30	0.32
4) July 17:00	0.31	0.33	9) June 16:00	0.30	0.32
5) July 18:00	0.31	0.33	10) August 15:00	0.30	0.32

SYSTEM SIZING SUMMARY

System: VESTIBULE 101
Location: Portland, Maine
Prepared by: FWWEBB

Block Load 3.05
March 02, 2007
Page: 2

TABLE 6. ZONE SIZING DATA

Zone Name	Max. Cooling	Design Airflow	Design Time	Max. Heating	Design Flow
	Sensible (BTU/hr)	Rate (CFM)		Load (BTU/hr)	Rate (CFM)
VESTIBULE 101	3,587	185	July 15:00	7,508	-
	Total:	185		Total:	.00

SYSTEM SIZING SUMMARY

System: MAINE DIST. CRT. GEN OFF

Location: Portland, Maine

Prepared by: FWWEBB

Block Load 3.05

March 02, 2007

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TABLE 1. SIZING DATA (COOLING)

Total Coil Load	179,909 BTU/hr	Load Occurs	July 15:00
Sensible Coil Load	150,230 BTU/hr	Outdoor Db/Wb	95.0/72.0 F
Total Zone Sensible	110,214 BTU/hr	Coil Conditions:	
Supply Temperature	55.0 F	Entering Db/Wb	79.2/64.8 F
Supply Air (Actual)	5,678 CFM	Leaving Db/Wb	54.7/54.0 F
Supply Air (Standard)	5,669 CFM	Apparatus Dewpoint	53.4 F
Ventilation Air	740 CFM	Bypass Factor	0.050
Direct Exhaust Air	300 CFM	Resulting Zone RH	55.3 %
Reheat Required	0 BTU/hr		
		Total Coil Load	14.99 Ton
Floor Area	7,596 sqft	Sensible Coil Load	12.52 Ton
Overall U-Value	0.071 BTU/hr/sqft/F	SQFT/Ton	506.66
Vent Air	0.10 CFM/sqft	Cooling	23.68 BTU/hr/sqft
Vent Air	20.00 CFM/Person	Cooling	0.75 CFM/sqft

TABLE 2. SIZING DATA (HEATING)

Heating Coil Load	327,427 BTU/hr	Heating	43.11 BTU/hr/sqft
Ventilation Load	62,241 BTU/hr	Heating	0.75 CFM/sqft
Total Zone Load	265,186 BTU/hr	Floor Area	7,596 sqft
Ventilation Airflow	740 CFM	Overall U-Value	0.071
Supply Airflow	5,678 CFM	Vent Air	0.10 CFM/sqft
		Vent Air	20.00 CFM/Person

TABLE 3. INPUT DATA (WEATHER)

Location	Portland, Maine		
Data Source	User Defined	Summer Dry-Bulb	95.0 F
Latitude	43.7 Degree	Coincident Wet-Bulb	72.0 F
Elevation	43.0 ft	Daily Range	22.0 F
Atmospheric Clearness #	1.05	Winter Dry-Bulb	-6.0 F

TABLE 4. INPUT (HVAC SYSTEM)

System Name	MAINE DIST. CRT. GEN OFF	THERMOSTAT SETPOINTS	
System Type	Clg and Warm Air Ht	Cooling (Occ.)	73.0 F
System Start	6:00	Cooling (Unocc.)	75.0 F
Duration	24 hrs	Heating	72.0 F
SIZING SPECIFICATIONS		RETURN AIR PLENUM	Yes
Supply	55.0 F	Roof Load	70 %
Ventilation	20.00 CFM/person	Lighting Load	30 %
Exhaust	300.00 CFM	Wall Load	0 %
FACTORS		FAN	
Coil Bypass	0.050	Configuration	Draw Thru
Safety (Sens)	5 %	Static Pressure	0.50 in. wg.
Safety (Latent)	5 %		
Heating Safety	5 %		

TABLE 5. TOP TEN COOLING COIL LOADS

Time	Sensible Ton	Total Ton	Time	Sensible Ton	Total Ton
1) July 15:00	12.52	14.99	6) August 14:00	12.27	14.73
2) August 15:00	12.48	14.95	7) July 17:00	12.12	14.57
3) July 16:00	12.42	14.89	8) August 17:00	12.03	14.48
4) August 16:00	12.36	14.83	9) July 13:00	11.82	14.26
5) July 14:00	12.31	14.77	10) August 13:00	11.78	14.22

SYSTEM SIZING SUMMARY

System: MAINE DIST. CRT. GEN OFF

Location: Portland, Maine

Prepared by: FWWEBB

Block Load 3.05

March 02, 2007

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TABLE 6. ZONE SIZING DATA

Zone Name	Max. Cooling Sensible (BTU/hr)	Design Airflow Rate (CFM)	Design Time	Max. Heating Load (BTU/hr)	Design Flow Rate (CFM)
CONFERENCE 124	3,346	172	July 15:00	5,975	-
GENERAL OFF. CEILING	38,461	1,982	August 15:00	115,683	-
GENERAL OFFICE FLOOR	54,533	2,810	August 15:00	117,458	-
KITCHEN 106	2,183	112	January 23:00	228	-
MEN 107	1,031	53	January 23:00	171	-
OFFICE 125	3,415	176	July 15:00	8,061	-
STORAGE 105	609	31	January 23:00	190	-
STORAGE 111	2,357	121	July 15:00	6,500	-
VESTIBULE 101	3,587	185	July 15:00	7,508	-
WOMEN 108	1,266	65	July 15:00	3,413	-
Total:		5,707		Total:	.00

SYSTEM SIZING SUMMARY

System: MAINE DIST. CRT. SOUTH

Location: Portland, Maine

Prepared by: FWWEBB

Block Load 3.05

March 02, 2007

Page: 1

TABLE 1. SIZING DATA (COOLING)

Total Coil Load	41,905 BTU/hr	Load Occurs	August 15:00
Sensible Coil Load	35,088 BTU/hr	Outdoor Db/Wb	95.0/72.0 F
Total Zone Sensible	27,591 BTU/hr	Coil Conditions:	
Supply Temperature	55.0 F	Entering Db/Wb	77.5/64.2 F
Supply Air (Actual)	1,422 CFM	Leaving Db/Wb	54.7/54.1 F
Supply Air (Standard)	1,419 CFM	Apparatus Dewpoint	53.5 F
Ventilation Air	180 CFM	Bypass Factor	0.050
Direct Exhaust Air	0 CFM	Resulting Zone RH	54.9 %
Reheat Required	0 BTU/hr		
		Total Coil Load	3.49 Ton
Floor Area	1,510 sqft	Sensible Coil Load	2.92 Ton
Overall U-Value	0.102 BTU/hr/sqft/F	SQFT/Ton	432.40
Vent Air	0.12 CFM/sqft	Cooling	27.75 BTU/hr/sqft
Vent Air	20.00 CFM/Person	Cooling	0.94 CFM/sqft

TABLE 2. SIZING DATA (HEATING)

Heating Coil Load	72,052 BTU/hr	Heating	47.72 BTU/hr/sqft
Ventilation Load	15,140 BTU/hr	Heating	0.94 CFM/sqft
Total Zone Load	56,912 BTU/hr	Floor Area	1,510 sqft
Ventilation Airflow	180 CFM	Overall U-Value	0.102
Supply Airflow	1,422 CFM	Vent Air	0.12 CFM/sqft
		Vent Air	20.00 CFM/Person

TABLE 3. INPUT DATA (WEATHER)

Location	Portland, Maine		
Data Source	User Defined	Summer Dry-Bulb	95.0 F
Latitude	43.7 Degree	Coincident Wet-Bulb	72.0 F
Elevation	43.0 ft	Daily Range	22.0 F
Atmospheric Clearness #	1.05	Winter Dry-Bulb	-6.0 F

TABLE 4. INPUT (HVAC SYSTEM)

System Name	MAINE DIST. CRT. SOUTH	THERMOSTAT SETPOINTS	
System Type	Clg and Warm Air Ht	Cooling (Occ.)	73.0 F
System Start	6:00	Cooling (Unocc.)	75.0 F
Duration	24 hrs	Heating	72.0 F
SIZING SPECIFICATIONS		RETURN AIR PLENUM	Yes
Supply	55.0 F	Roof Load	70 %
Ventilation	20.00 CFM/person	Lighting Load	30 %
Exhaust	0.00 CFM	Wall Load	0 %
FACTORS		FAN	
Coil Bypass	0.050	Configuration	Draw Thru
Safety (Sens)	5 %	Static Pressure	0.50 in. wg.
Safety (Latent)	5 %		
Heating Safety	5 %		

TABLE 5. TOP TEN COOLING COIL LOADS

Time	Sensible Ton	Total Ton	Time	Sensible Ton	Total Ton
1) August 15:00	2.92	3.49	6) July 14:00	2.78	3.34
2) August 14:00	2.90	3.47	7) August 17:00	2.76	3.32
3) August 16:00	2.86	3.43	8) July 16:00	2.75	3.31
4) July 15:00	2.80	3.37	9) July 13:00	2.68	3.24
5) August 13:00	2.79	3.36	10) July 17:00	2.67	3.22

SYSTEM SIZING SUMMARY

System: MAINE DIST. CRT. SOUTH

Location: Portland, Maine

Prepared by: FWWEBB

Block Load 3.05

March 02, 2007

Page: 2

TABLE 6. ZONE SIZING DATA

Zone Name	Max. Cooling Sensible (BTU/hr)	Design Airflow Rate (CFM)	Design Time	Max. Heating Load (BTU/hr)	Design Flow Rate (CFM)
ELECTRICAL ROOM	2,217	114	August 15:00	5,915	-
OFFICE 113	3,426	177	August 15:00	6,462	-
OFFICE 114	3,045	157	August 15:00	5,941	-
OFFICE 115	3,175	164	August 15:00	6,355	-
OFFICE 116	2,581	133	September 15:00	4,634	-
OFFICE 117	2,637	136	September 15:00	4,816	-
OFFICE 118	3,192	164	August 15:00	6,397	-
OFFICE 119	3,195	165	August 15:00	6,410	-
OFFICE 120	4,171	215	August 15:00	9,984	-
Total:		1,425		Total:	00



 **COPY**

SUBMITTAL DATA

FOR: Approval

ORDER NO.:

DATE: 03/05/2007

PROJECT:

MAINE DISTRICT COURT

FACTORY INSTALLED OPTIONS

- | | |
|---|---|
| <input checked="" type="checkbox"/> ALUMINIZED STEEL GAS HEAT EXCHANGER | <input type="checkbox"/> NOVAR CONTROLS |
| <input type="checkbox"/> STAINLESS STEEL GAS HEAT EXCHANGER | <input type="checkbox"/> JOHNSON CONTROLS |
| <input checked="" type="checkbox"/> SINGLE ENTHALPY ECONOMIZER | <input type="checkbox"/> HONEYWELL CONTROLS |
| <input type="checkbox"/> SINGLE INPUT SLAB ECONOMIZER | <input type="checkbox"/> CPC CONTROLS |
| <input checked="" type="checkbox"/> POWER EXHAUST | <input type="checkbox"/> INTELLI-COMFORT CONTROLS |
| <input type="checkbox"/> BAS READY ECONOMIZER | <input type="checkbox"/> MODLING |
| <input type="checkbox"/> BAROMETRIC RELIEF DAMPER | <input checked="" type="checkbox"/> DIRTY FILTER SWITCH |
| <input checked="" type="checkbox"/> PHASE MONITOR | <input checked="" type="checkbox"/> SUPPLY AIR SMOKE DETECTOR |
| <input checked="" type="checkbox"/> DISCONNECT SWITCH | <input type="checkbox"/> RETURN AIR SMOKE DETECTOR |
| <input type="checkbox"/> CONVENIENCE OUTLET (Powered) | <input type="checkbox"/> TECHNICOAT CONDENSER COIL |
| <input checked="" type="checkbox"/> CONVENIENCE OUTLET (Non-Powered) | <input type="checkbox"/> TECHNICOAT EVAPORATOR COIL |
| <input checked="" type="checkbox"/> OVERSIZED BLOWER MOTOR | <input type="checkbox"/> OUTDOOR COIL GUARD |
| <input type="checkbox"/> HIGH SPEED STATIC DRIVE | <input type="checkbox"/> MOTORIZED OUTSIDE INTAKE AIR DAMPER (0-100%) |
| <input type="checkbox"/> REFRIGERANT REHEAT COIL | <input type="checkbox"/> STAINLESS STEEL DRAIN PAN |

FIELD INSTALLED ACCESSORIES

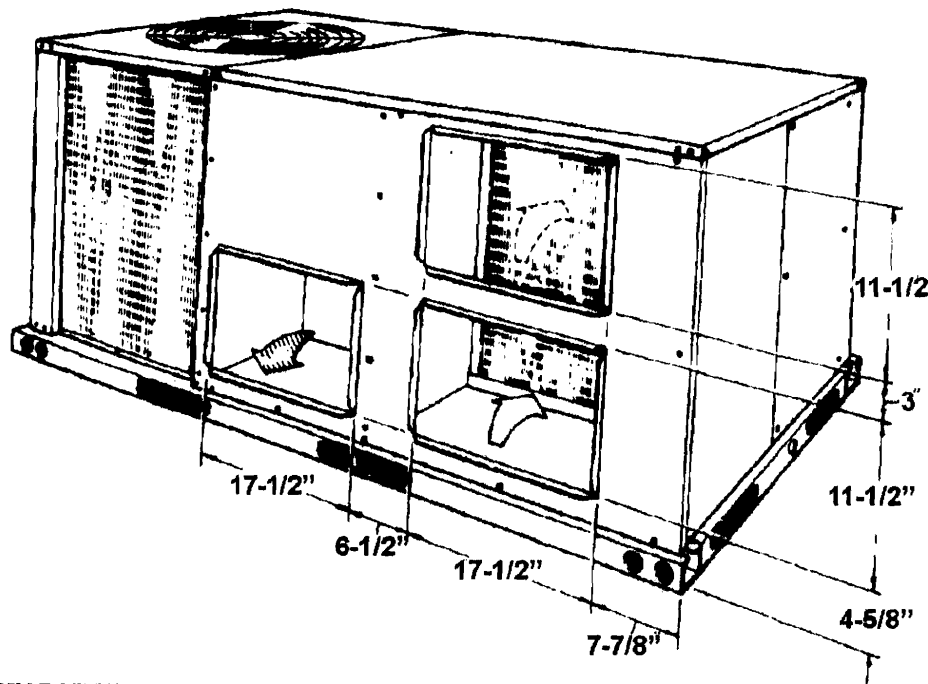
- | | |
|--|---|
| <input type="checkbox"/> 8" FULL PERIMETER ROOF CURB | <input type="checkbox"/> SIMPLICITY WIRELESS |
| <input checked="" type="checkbox"/> 14" FULL PERIMETER ROOF CURB | <input type="checkbox"/> SIMPLICITY REPEATER |
| <input type="checkbox"/> 24" FULL PERIMETER ROOF CURB | <input type="checkbox"/> SIMPLICITY TRANSPORTER |
| <input type="checkbox"/> ROOF CURB ADAPTER | <input type="checkbox"/> AIR PROVING SWITCH |
| <input type="checkbox"/> BURGLAR BARS | <input type="checkbox"/> RETURN AIR HUMIDITY SENSOR |
| <input type="checkbox"/> SINGLE INPUT ECONOMIZER | <input type="checkbox"/> FREEnet SERIAL ADAPTER |
| <input type="checkbox"/> SINGLE INPUT SLAB ECONOMIZER | <input type="checkbox"/> FREEnet USB ADAPTER |
| <input type="checkbox"/> DRY BULB SENSOR | <input type="checkbox"/> WALL SENSOR |
| <input type="checkbox"/> DUAL ENTHALPY SENSOR | <input type="checkbox"/> WALL SENSOR w/ Override |
| <input type="checkbox"/> POWER EXHAUST | <input type="checkbox"/> WALL SENSOR w/ Setpoint Adj. & Override |
| <input type="checkbox"/> BAROMETRIC RELIEF DAMPER | <input type="checkbox"/> DEHUMIDISTAT |
| <input checked="" type="checkbox"/> CO2 SENSOR | <input type="checkbox"/> DIRTY FILTER SWITCH |
| <input type="checkbox"/> NATURAL GAS HIGH ALTITUDE KIT | <input type="checkbox"/> MINUS 60 F HEAT KIT |
| <input type="checkbox"/> GAS PIPING KIT | <input type="checkbox"/> CONDENSER COIL GUARD |
| <input checked="" type="checkbox"/> PROPANE CONVERSION KIT | <input type="checkbox"/> HAIL GUARD KIT |
| <input type="checkbox"/> PROPANE HIGH ALTITUDE KIT | <input type="checkbox"/> SUPPLY AIR SMOKE DETECTOR |
| <input type="checkbox"/> EXHAUST EXTENSION KIT | <input type="checkbox"/> RETURN AIR SMOKE DETECTOR |
| <input type="checkbox"/> LOW LIMIT CONTROL | <input type="checkbox"/> MANUAL OUTSIDE AIR INTAKE DAMPER (35%) |
| <input type="checkbox"/> ENERGY RECOVERY VENTILATOR | <input type="checkbox"/> MANUAL OUTSIDE AIR INTAKE DAMPER (0-100%) |
| <input type="checkbox"/> ERV SUPPORT PIER | <input type="checkbox"/> MOTORIZED OUTSIDE AIR INTAKE DAMPER (0-100%) |
| <input type="checkbox"/> ERV BALANCING DAMPER | <input type="checkbox"/> ZONE CONTROLS |
| <input type="checkbox"/> PERMANENT FILTER KIT | <input type="checkbox"/> INDOOR THERMOSTAT |
| <input type="checkbox"/> ELECTRIC HEAT Model No. | |

DUCT CONNECTIONS: Bottom ☒ Side ☐

Refer to PRODUCT DATA on front side for electrical data.



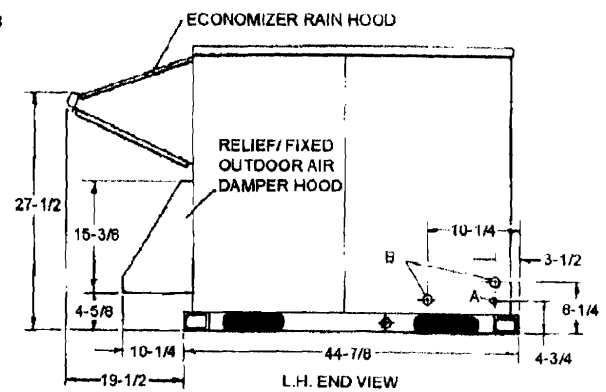
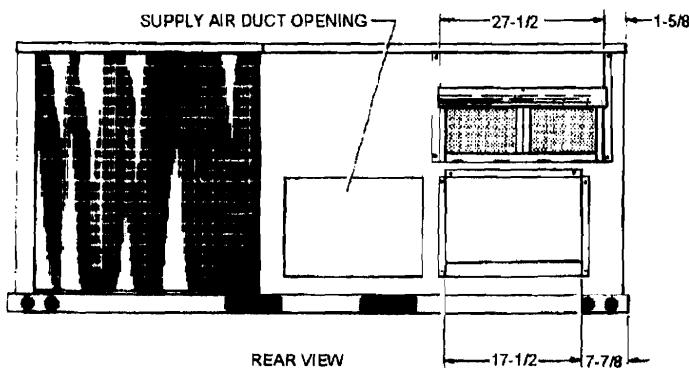
Notes:



RETURN AIR
SUPPLY AIR
CONDENSER AIR
OUTDOOR AIR
(Economizer)

REAR VIEW
SIDE SUPPLY AND
RETURN AIR DUCT
OPENINGS

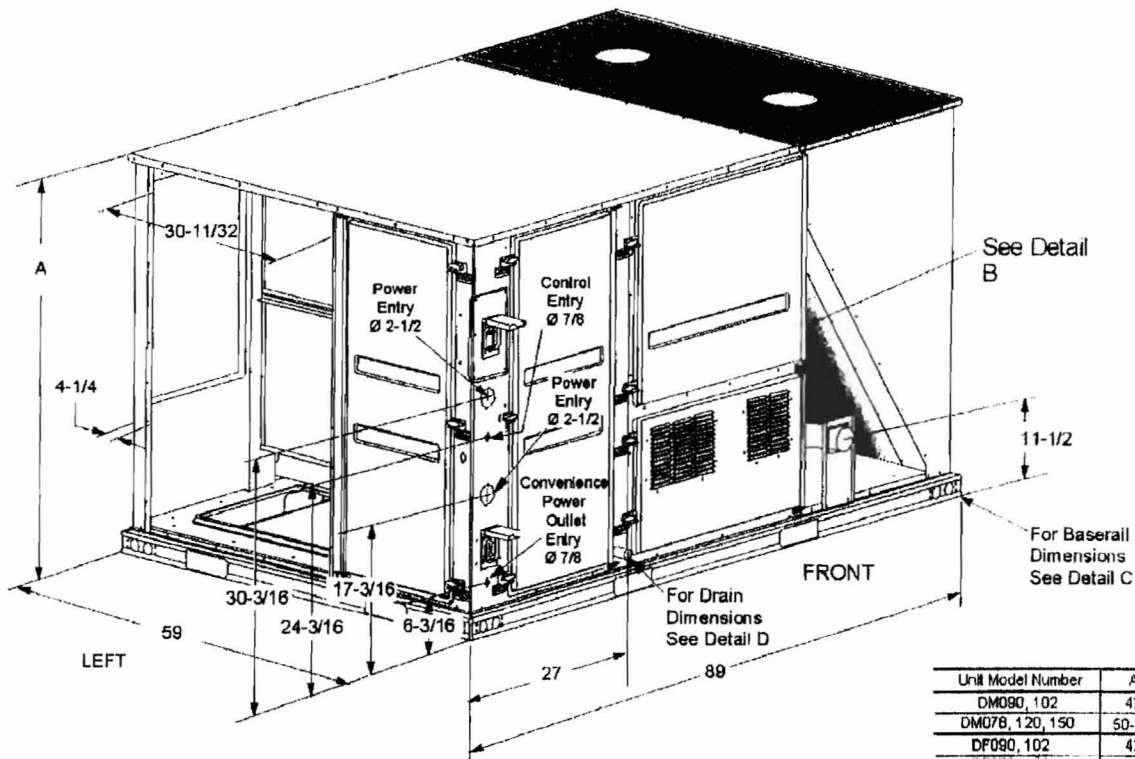
UNITS WITH ECONOMIZER RAIN HOOD & FIXED OUTDOOR DAMPER HOOD



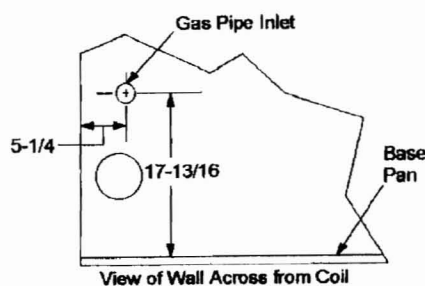
Notes:

Project Name **MAINE DISTRICT COURT**
Architect
Engineer
Purchaser
Submitted By

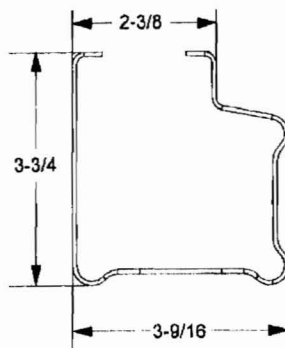
QUANTITY: 2 **UNITS DESIGNATION:** Schedule No: Model No: **DH090N15Q2JAF5**



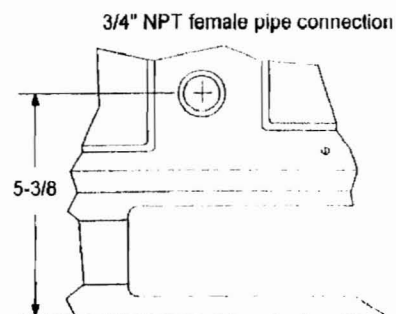
Unit Model Number	A
DM090, 102	42
DM078, 120, 150	50-3/4
DF090, 102	42
DF078, 120	50-3/4
DH078, 090, 102	42
DH120, 150	50-3/4
DR090 - 120	50-3/4
ZH078, 090	42
ZH102, 120	50-3/4
BP080	42
BP078, 102, 120, 150	50-3/4



Detail B



Detail C - Base Rail Dimensions



Detail D - Drain Dimensions

Project Name **MAINE DISTRICT COURT**

Architect

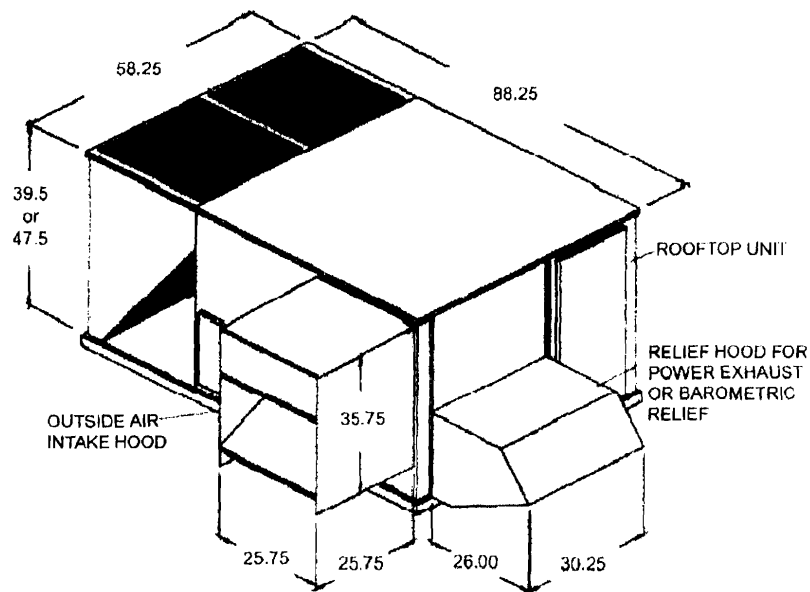
Engineer

Purchaser

Submitted By

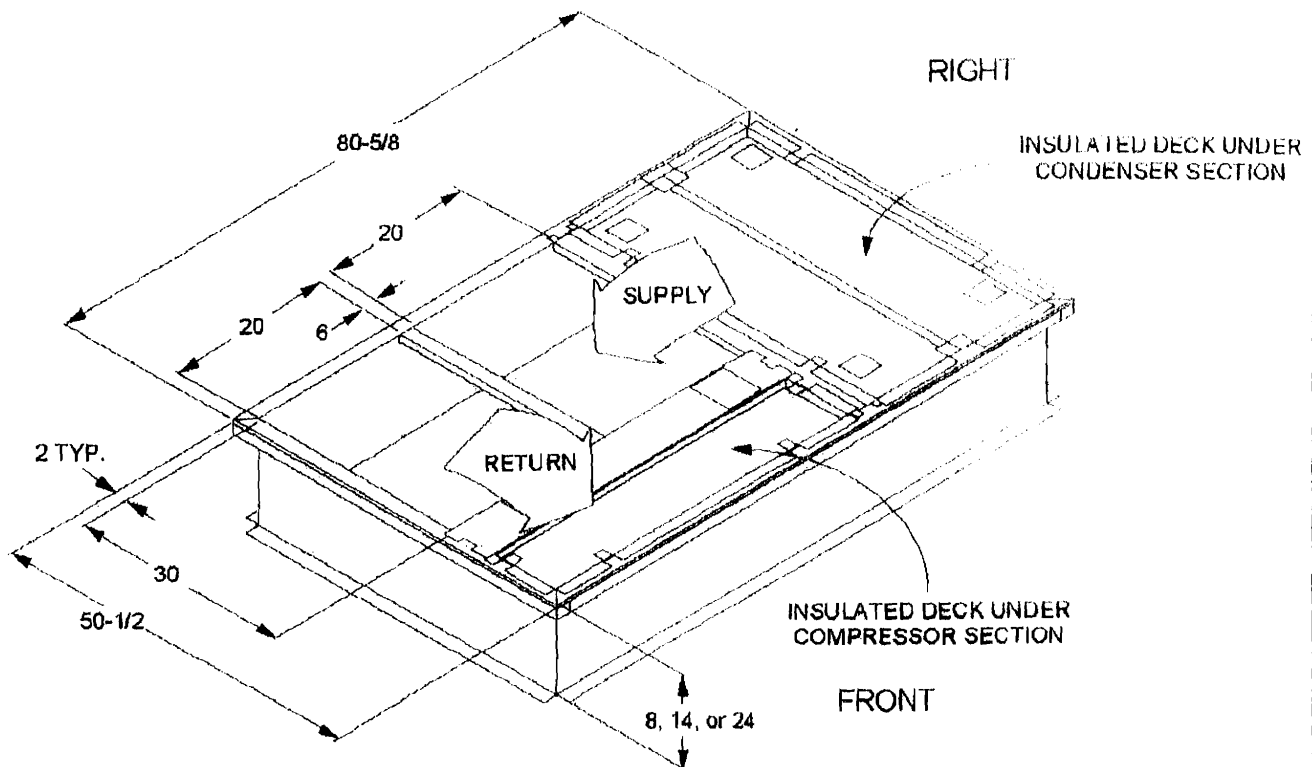
QUANTITY: 2 **UNITS DESIGNATION:** Schedule No:

Model No: **DH090N15Q2JAF5**



Roof Curb Details
Project Name: **MAINE DISTRICT COURT**

ROOF CURB DETAILS FOR THE FOLLOWING:
DH090N15Q2JAF5

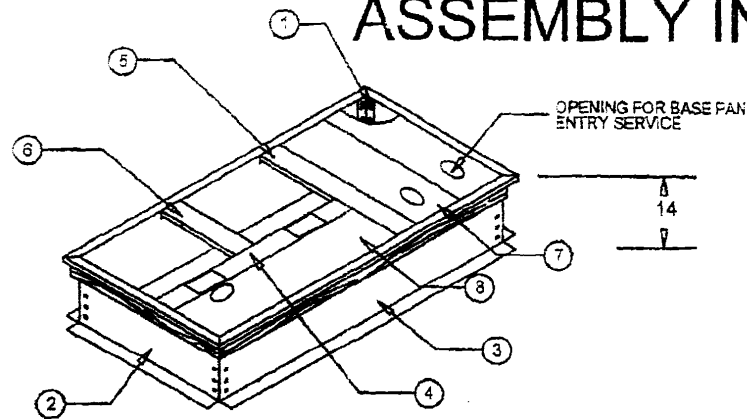


NOTE:
Ducts can be installed onto the curb from the roof.
All electrical and gas line connections can be made inside the curb.



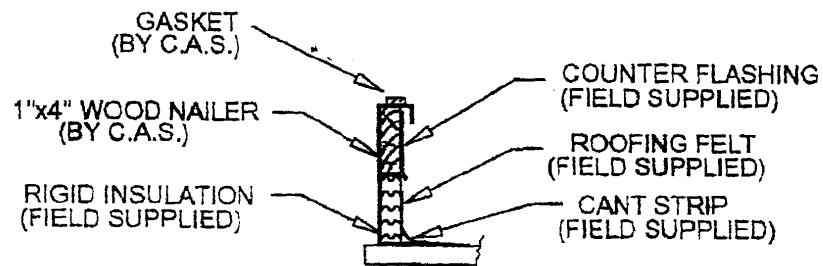
9600384

SURE LOCK ROOF CURB ASSEMBLY INSTRUCTIONS



PARTS LIST

- | | |
|---------------------------|-------------------------------|
| ① CORNER BRACKET (QTY. 4) | ⑦ PANEL, INSULATED (QTY. 2) |
| ② END RAILS (QTY. 2) | ⑧ PANEL, INSULATED (QTY. 1) |
| ③ SIDE RAILS (QTY. 2) | ⑨ HARDWARE BAG (QTY. 1) |
| ④ DUCT SUPPORT (QTY. 1) | (12) 10-16 x 3/4" TEK. SCREWS |
| INSULATED | 25' GASKET 1/4" x 1 1/4" |
| ⑤ DUCT SUPPORT (QTY. 1) | 10' GASKET 3/4" x 1 1/4" |
| INSULATED | (1) INSTRUCTION SHEET |
| ⑥ DUCT SUPPORT (QTY. 1) | |



TYPICAL INSTALLED CURB SECTION

PART# 9600966

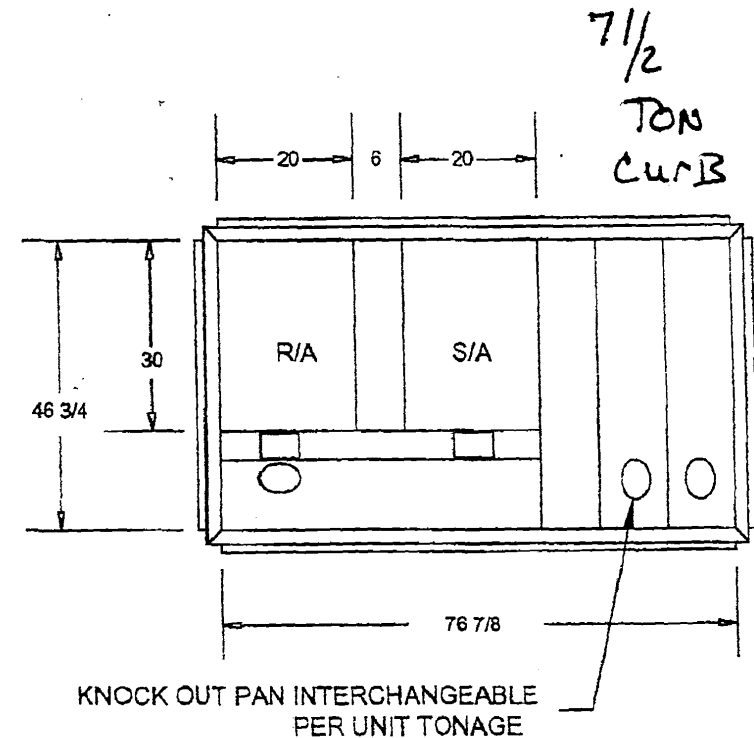
DATE: 08-19-03 REV: 09

SEE REVERSE SIDE FOR
STEP-BY-STEP ASSEMBLY
INSTRUCTIONS.

YORK UNITS
DH, DM 078-150
DP 090-150 (PREDATOR)

PART NUMBER

YORK	CAMBRIDGEPORT
1RCO-471	1001586



CAMBRIDGEPORT AIR SYSTEMS, INC.
SALISBURY, MA 01952
PHONE 1-800-648-2872 FAX 978-462-9189



SkyAir Submittal Data:

FHQ30MVJU Indoor Unit
RZQ30MVJU Outdoor Unit

Job Name:	Location:
Purchaser:	
Engineer:	
Submitted To:	For: <input type="checkbox"/> Reference <input type="checkbox"/> Approval <input type="checkbox"/> Construction
Submitted By:	Date:
Unit Designation: Schedule #:	Model No.:

Capacities & Efficiencies:

Cooling Capacity	30,000 Btu/h
Seasonal Energy Efficiency Ratio	13 SEER
Heating Rated Capacity	34,000 Btu/h
Heating Seasonal Performance Factor	7.7 HSPF
Cooling Mode Nominal Conditions:	Heating Mode Nominal Conditions:
Indoor: 80°F DB / 67°F WB	Indoor: 70°F DB / 60°F WB
Outdoor: 95°F DB / 75°F WB	Outdoor: 47°F DB / 43°F WB
Pipe Length: 25 ft	Pipe Length: 25 ft

Indoor Unit:

Power Supply (V/PH/Hz)	208-230/1/60
Airflow Rate (H/L)	790/670 cfm
Running Current (Rated)	1.0 A
Weight	90 lbs
Sound Pressure Level at 3.3 ft (H/M/L)	45 dB(A)

Outdoor Unit:

Power Supply (V/PH/Hz)	208-230/1/60
Cooling Operating Range (standard)	14°F – 115°F DB
Cooling Operating Range (with optional wind baffle - 2 required)	0°F – 115°F DB
Heating Operating Range (standard)	0°F – 64°F DB
Minimum Circuit Amps (MCA)	27 Amps
Maximum Fuse Amps (MFA)	30 Amps
Starting Current	19.9 Amps
Running Current (Cooling/Heating)	22.5 A
Weight	310 lbs
Sound Pressure Level at 3.3 ft	58 dB(A)

Piping:

Maximum Height Difference	164 ft
Maximum Length	230 ft
Liquid Piping Connection (OD)	3/8"
Gas Piping Connection (OD)	5/8"
Condensate Drain Piping Connection (OD)	1" (hole)

Standard Features:

Compressor Warranty	6 years
Parts Warranty	1 year
Limited Labor Warranty	1 year
7 Day Programmable Controller	

Options:

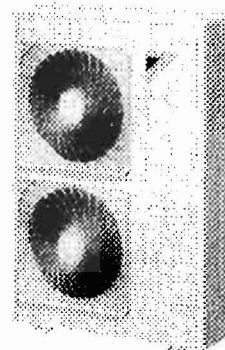
Replacement Long Life Filter	
Wireless Remote Controller	
Unified On/Off Controller	
Centralized Controller	
Simplified Wired Remote Controller	



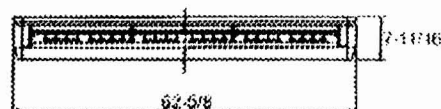
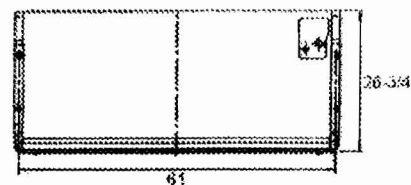
SkyAir

R-410A

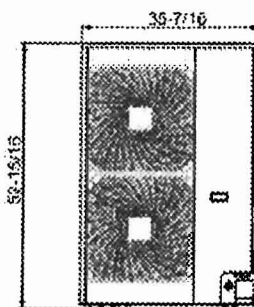
INVERTER



FHQ30MVJU



RZQ30MVJU



Daikin AC (Americas), Inc. ♦ 1645 Wallace Drive – Suite 110 ♦ Carrollton, TX 75006

SDS FHQ30MVJU_RZQ30MVJU 07-06

www.daikinac.com

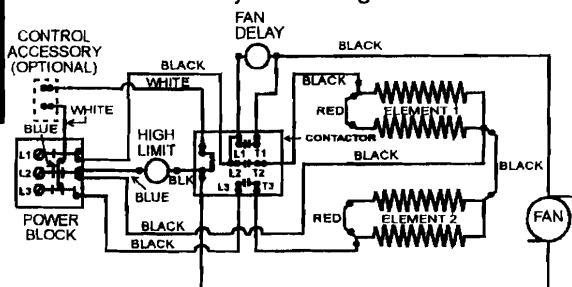
(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)



470 Beauty Spot Rd. E, Bennettsville SC 29512

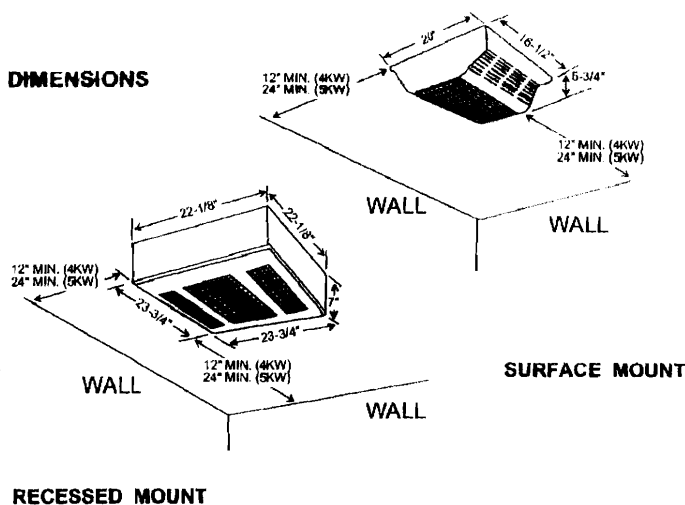
ELECTRICAL WIRING

Standard Factory Wired Diagram



CAUTION: Field wiring must be #10 AWG. min.
rated 90°C. min.

DIMENSIONS



ARCHITECT'S AND ENGINEER'S SPECIFICATIONS*

The heating equipment shall include an electric, ceiling-mounted type CDF Series 500 fan-forced air heater suitable for large area heating as manufactured by QMark, a Division of Marley Engineered Products, Bennettsville, SC. Heater shall be UL listed.

The heater shall be designed for surface, recess, or T-Bar mounting. For surface mounting, a QMark CDF-SE surface enclosure shall be used. For T-Bar mounting, a QMark CDF-RE recess enclosure shall be used. For recessed mounting in a permanent ceiling, a QMark CDF-RE recess enclosure and CDF-TK trim kit shall be used.

The heaters shall be factory wired for single-phase operation and field convertible to three-phase operation by removing one jumper wire.

The heaters should be factory wired for full wattage and field convertible to 75% or 50% wattage by the removal of one or two wires respectively.

HEATER SECTION - The heater section shall consist of a 20 gauge steel chassis on which are mounted the heating elements, fan motor and blade, fan control, thermal cutout, and 3-pole contactor. Heater section shall be completely prewired.

HEATER ELEMENTS - The heating elements shall be guaranteed for five years and shall be of non-glowing design consisting of 80/20 NiCh resistance wire, enclosed in a steel sheath, to which steel plate fins are brazed. The elements shall cover the entire air intake area to ensure uniform heating of all discharged air.

MOTOR AND CONTROLS - The fan motor shall be impedance-protected, permanently lubricated, and with totally-enclosed rotor. Fan control shall be bi-metallic, snap-action type and shall activate the fan immediately and continue to operate the fan after the thermostat is

SPECIFICATIONS:

CAT. NO.	MOUNTING	KW ¹	BTU/HR (000)	VOLTS	PHASE ²	AMPS ³	CFM	F T
CDF-548	HEATER	4/3/2	13.7/10.2/6.8	208	1 - 3	19.2/14.4/9.6	283	51
CDF-542	SECTION			240	1 - 3	16.7/12.5/8.3		
CDF-547	ONLY			277	1	14.4/10.8/7.2		
CDF-558	HEATER	5/3.8/2.5	17.1/13.0/8.5	208	1 - 3	24.0/18.3/12.9	396	45
CDF-552	SECTION			240	1 - 3	20.8/15.8/10.4		
CDF-557	ONLY			277	1	18.1/13.7/9.0		
CDF-SE	Surface Mounting Enclosure only - To be used with above heater sections. Dimensions: 20" L x 16-1/2" W x 5-3/4" D							
CDF-RE	Recess Mounting Enclosure only - To be used with above heater sections. Dimensions: 23-3/4" L x 23-3/4" W x 7" D							
OPTIONAL ACCESSORIES				FIELD INSTALLED KITS				
CDF-T ⁴	Thermostat SPST. Range 45 to 95 Degrees F.							
CDF-24R	Relay (Time Delay 45 - 60 sec. to close when energized) requires 24 volt supply from remote source.							
CDF-R12	Relay (Time Delay 45 - 60 sec. to close when energized) requires 120 volt supply from remote source.							
CDF-DS	Power Disconnect Switch (3-Pole) 30 amps, 600 volts, 3 phase, 60 Hz.							
CDF-TK	Trim Ring for mounting on permanent ceiling (cannot be factory installed).							
CDF-TR4	208 240 Primary Transformer/24V sec. and 24V holding coil control relay.							
CDF-TR7	277V Primary Transformer/24V sec. and 24V holding coil control relay.							

¹Factory wired for highest wattage, field convertible to lower wattages.

²Factory wired 1 Phase, field convertible to 3 Phase.

³On dual-phase units, maximum amp draw is listed.

⁴CDF-T, CDF-PE mount in same location - only one can be used for any application.

satisfied and until all heated air has been discharged. Thermal cutout shall be bi-metallic snap-action type designed to automatically shut off the heater in the event of overheating and reactivate the heater when temperature returns to normal.

OPERATIONAL CONTROLS - Thermostat, disconnect switch, and all interlock relays shall be installed within the heater enclosure.

RECESS ENCLOSURE - The back box shall be designed for duty as a recessed rough-in box in masonry, T-Bar, or frame ceiling construction. The back box shall be 20 gauge galvanized steel and shall contain knockouts through which field wiring leads are brought. Enclosures to recess into a maximum 7 inches of ceiling space.

The louvered recess faceplate shall be of 20 gauge cold rolled steel, phosphatized, then electrostatically painted Navajo white by a baked enamel process.

SURFACE ENCLOSURE - The surface mounting plate shall be designed for duty as a rough-in box on masonry, T-Bar, or frame ceiling construction. The surface mounting plate shall be 20 gauge galvanized steel and shall contain knockouts through which field wiring leads are brought. Enclosure to extend a maximum of 6 inches into the heated space.

The louvered surface wrapper shall be contoured aluminum extrusion and 20 gauge sheet metal combination with rounded corners. The surface wrapper shall be electrostatically painted Navajo white by a baked enamel process.

*QMark reserves the right to change specifications without prior notice.



FILE #E21609



CAPACITIES

4KW
Field Convertible to 3KW or 2KW
208V, 1Ø or 3Ø, 240V, 1Ø or 3Ø
277V, 1Ø

5KW
Field convertible to 3.8KW or 2.5KW
208V, 1Ø or 3Ø; 240V, 1Ø or 3Ø;
277V, 1Ø

CDF 500 SERIES - CEILING MOUNTED HEATER

[illegible][illegible]

ACCESSORIES AND CONTROLS

SUBMITTED BY:	DATE:

APPROVED BY:	DATE:

ZSS-QCDFO

(03-02)

Project Name **MAINE DISTRICT COURT**
Architect
Engineer
Purchaser
Submitted By

QUANTITY: 2 UNITS DESIGNATION: Schedule No:

Model No: **DH090N16Q2JAF5**

COOLING PERFORMANCE

Total Capacity	91.5	MBH
Sensible Capacity	67.7	MBH
Efficiency (at ARI)	11.50	EER
Part Load Efficiency	12.00	IPLV
Ambient DB Temp	95.0	F
Entering DB Temp	80.0	F
Entering WB Temp	67.0	F
Leaving DB Temp	59.1	F
Leaving WB Temp	57.4	F
Power Input (w/o blower)	6.70	KW
Elevation	0	Ft
Sound Power	84	Dbels

HEATING PERFORMANCE

Gas Fired Input @ Sea Level	180	MBH
Gas Fired Output @ Sea Level	144	MBH

Steady State Efficiency	80.0	%
Entering DB Temp	60.0	F
Leaving DB Temp	104.4	F

SUPPLY AIR BLOWER PERFORMANCE

Supply Air	3000	CFM
Outside Air	0	CFM
External Static Pressure	0.60	IWG
Duct Connection Location	Bottom	
Blower Speed	1250	RPM
Motor Rating	3.0	HP
Brake Horsepower	2.02	BHP
Power Input	1.89	KW

ELECTRICAL DATA

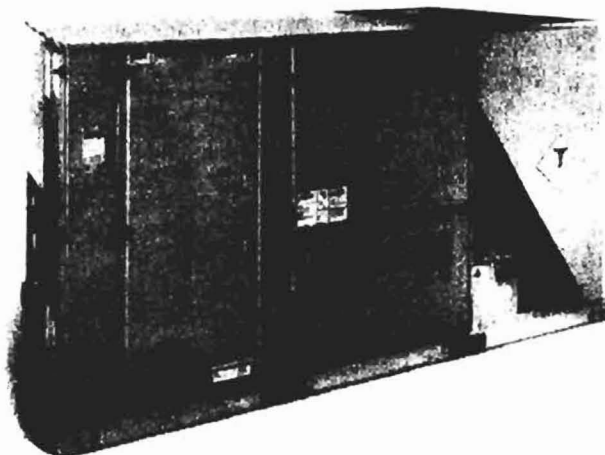
Power Supply	208-3-60	
Total Unit Ampacity	51.1	Amps
Maximum Overcurrent Device		
Fuse Size	60	Amps
HACR Circuit Breaker	60	Amps

DIMENSIONS & WEIGHT

Height 42 in Width 89 in Depth 59 in	
Total Weight (incl factory options)	1145 Lbs

CLEARANCES

Front 36 in	Back 36 in
Bottom ¹ 0 in	Top ² 72 in
Left Side	36 in
Right Side (condenser end)	12 in



GENERAL FEATURES

- Complete Factory Package - Tested, Charged, Wired
- Two-Stage Cooling with Independent Circuits and Face-Split Evaporator Coil
- Hermetically Sealed Compressors
- Simplicity™ Controls
- Adjustable Belt Drive Blower
- Solid State Control Board with Flash Code to Monitor System Operation
- Two-Stage Heating with Spark Ignition
- Induced Draft with Post Purge Logic on Gas Fired Units
- Bottom or Side Duct Connections
- Low Voltage Relay Board With Terminal Strip
- Crankcase Heaters
- Solid Core Liquid Line Filter Driers
- Slide-out Condensate Drain Pan
- Hinged Access Panels
- Slide-out Blower/ Motor Assembly
- Low Ambient to Zero Degrees
- Compressor Anti-Recycle Protection
- Plug-Type Wiring Harness Connectors for Economizers
- Permanently Lubricated Motors
- 24 Volt Control Circuit with Compressor Lock Out Protection
- High Pressure, Low Pressure and Freezstat Controls
- Copper Tube/Aluminum Fin Coils
- Easy Access to all Electrical Components
- Rigging Holes and Forklift Slots in Base Rails for Lifting
- Single Point Power Connection
- Powder Paint Finish That Meets ASTM-B117, 1000 hr. Salt Spray Test Standards
- CSA Agency Approval on all Units
- Factory Warranty
 - One Year on the Complete Unit
 - Four Additional Years on the Compressors
 - Nine Additional Years on the Gas Fired Heat Exchanger

1. Units may be installed on combustible floors made from wood or class A, B or C roof covering materials.
2. Units must be installed out doors. Overhanging structures or shrubs should not obstruct condenser air discharge outlet



Project Name **MAINE DISTRICT COURT**

Architect

Engineer

Purchaser

Submitted By

QUANTITY: 1 UNITS DESIGNATION: Schedule No:

Model No: **DH060N10N2KAA1**

COOLING PERFORMANCE

Total Capacity	60.0	MBH
Sensible Capacity	45.0	MBH
Efficiency (at ARI)	12.2	SEER

Ambient DB Temp	95.0	F
Entering DB Temp	80.0	F
Entering WB Temp	67.0	F
Leaving DB Temp	59.1	F
Leaving WB Temp	57.5	F
Power Input (w/o blower)	4.50	KW
Elevation	0	Ft
Sound Power	86	Dbels

HEATING PERFORMANCE

Gas Fired Input @ Sea Level	125	MBH
Gas Fired Output @ Sea Level	99	MBH

AFUE	80.3	%
Entering DB Temp	60.0	F
Leaving DB Temp	105.8	F

SUPPLY AIR BLOWER PERFORMANCE

Supply Air	2000	CFM
Outside Air	0	CFM
External Static Pressure	0.60	IWG
Duct Connection Location	Bottom	
Blower Speed	1043	RPM
Motor Rating	1.5	HP
Power Input	1.11	KW

ELECTRICAL DATA

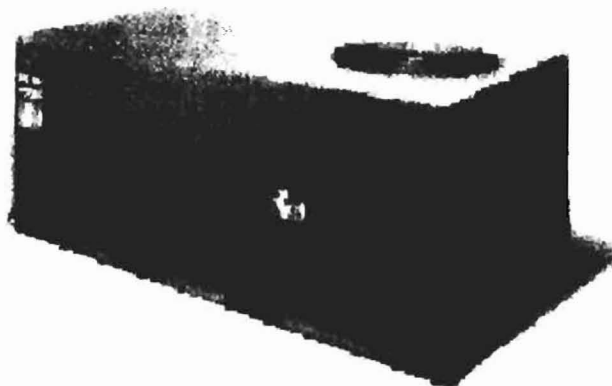
Power Supply	208-3-60	
Total Unit Ampacity	27.5	Amps
Maximum Overcurrent Device		
Fuse Size	35	Amps
HACR Circuit Breaker	35	Amps

DIMENSIONS & WEIGHT

Height	33 in	Width	82 in	Depth	45 in
Total Weight (incl factory options)	720	Lbs			

CLEARANCES

Front	32 in	Back	12 in
Bottom ¹	0 in	Top ²	72 in
Left Side (filter access)	24 in		
Right Side (outdoor coil)	24 in		



GENERAL FEATURES

- Simplicity™ Controls
- Solid State Control Board with Flash Code to Monitor System Operation
- Low Ambient to Zero Degrees
- Complete Factory Package - Tested, Charged, Wired
- Hermetically Sealed Compressor
- Unit Underside Insulated
- Spark Ignition - Induced Draft with Post Purge Logic on Gas Fired Units
- Ambient Modified - Time/Temperature Defrost Logic on Heat Pumps
- Bottom or Side Duct Configuration Capability
- Low Voltage Relay Board With Terminal Strip
- PTC Type Crankcase Heater
- Liquid Line Filter Drier
- Plug-Type Wiring Harness Connectors for Economizers
- Permanently Lubricated Motors
- 24 Volt Control Circuit with compressor lock out protection
- Copper Tube/Aluminum Fin Coils
- 2" Filter Rack with 1" T/A Filters
- High & Low Pressure / Loss of Charge and Freezstat Protection Switches
- Easy Access to all Electrical Components
- Rigging Holes and Forklift Slots in Base Rails for Lifting
- Single Point Power Connection
- Powder Paint Finish That Meets ASTM-B117, 1000 hr. Salt Spray Test Standards
- CSA Agency Approval on all Units
- Factory Warranty
 - One Year on the Complete Unit
 - Four Additional Years on the Compressor
 - Nine Additional Years on the Gas Fired Heat Exchanger

1. Units may be installed on combustible floors made from wood or class A, B or C roof covering materials.
2. Units must be installed out doors. Overhanging structures or shrubs should not obstruct condenser air discharge outlet. Locate the unit so that the vent hood outlet is at least:
- 3 feet above any forced air inlet located within 10 horizontal feet (excluding those integral to the unit).
- 4 feet below, 4 horizontal feet from, or 1 foot above any door or gravity air inlet to the building.
- 4 feet from electric meters, gas meters, regulators and relief equipment.

A 1 in. clearance must be provided between any combustible material and the supply air ductwork for a distance of 3 feet from the unit. The products of combustion must not be allowed to accumulate within a confined space and recirculate.

FACTORY INSTALLED OPTIONS

- | | |
|---|--|
| <input checked="" type="checkbox"/> ALUMINIZED STEEL GAS HEAT EXCHANGER | <input type="checkbox"/> REFRIGERANT REHEAT COIL |
| <input type="checkbox"/> STAINLESS STEEL GAS HEAT EXCHANGER | <input type="checkbox"/> NOVAR CONTROLS |
| <input type="checkbox"/> TWO-STAGE GAS HEAT | <input type="checkbox"/> JOHNSON CONTROLS |
| <input type="checkbox"/> SINGLE ENTHALPY ECONOMIZER | <input type="checkbox"/> HONEYWELL CONTROLS |
| <input type="checkbox"/> BAS READY ECONOMIZER | <input type="checkbox"/> CPC CONTROLS |
| <input type="checkbox"/> POWER EXHAUST | <input type="checkbox"/> INTELLI-COMFORT CONTROLS |
| <input type="checkbox"/> BAROMETRIC RELIEF DAMPER | <input type="checkbox"/> MODLIN |
| <input type="checkbox"/> PHASE MONITOR | <input type="checkbox"/> 2" PLEATED FILTERS |
| <input checked="" type="checkbox"/> DISCONNECT SWITCH | <input type="checkbox"/> HINGED FILTER DOOR & TOOL-LESS ACCESS |
| <input type="checkbox"/> CONVENIENCE OUTLET (Powered) | <input type="checkbox"/> SUPPLY AIR SMOKE DETECTOR |
| <input checked="" type="checkbox"/> CONVENIENCE OUTLET (Non-Powered) | <input checked="" type="checkbox"/> RETURN AIR SMOKE DETECTOR |
| <input type="checkbox"/> OVERSIZED BLOWER MOTOR | <input type="checkbox"/> AIR PROVING SWITCH |
| <input type="checkbox"/> MOTORIZED OUTSIDE INTAKE AIR DAMPER (0-100%) | <input type="checkbox"/> TECHNICOAT CONDENSER COIL |
| <input checked="" type="checkbox"/> BELT DRIVE | <input type="checkbox"/> TECHNICOAT EVAPORATOR COIL |
| <input type="checkbox"/> OUTDOOR COIL GUARD | <input type="checkbox"/> STAINLESS STEEL DRAIN PAN |
| <input type="checkbox"/> DIRTY FILTER SWITCH | |

FIELD INSTALLED ACCESSORIES

- | | |
|--|---|
| <input checked="" type="checkbox"/> 14" FULL PERIMETER ROOF CURB | <input type="checkbox"/> SIMPLICITY WIRELESS |
| <input type="checkbox"/> 8" FULL PERIMETER ROOF CURB | <input type="checkbox"/> AIR PROVING SWITCH |
| <input type="checkbox"/> ROOF CURB ADAPTER | <input type="checkbox"/> SIMPLICITY RETROFIT BOX |
| <input type="checkbox"/> BURGLAR BARS | <input type="checkbox"/> SIMPLICITY REPEATER |
| <input type="checkbox"/> SINGLE INPUT ECONOMIZER | <input type="checkbox"/> SIMPLICITY TRANSPORTER |
| <input type="checkbox"/> DRY BULB SENSOR | <input type="checkbox"/> RETURN AIR HUMIDITY SENSOR |
| <input type="checkbox"/> DUAL ENTHALPY SENSOR | <input type="checkbox"/> FREEnet SERIAL ADAPTER |
| <input type="checkbox"/> POWER EXHAUST | <input type="checkbox"/> FREEnet USB ADAPTER |
| <input type="checkbox"/> BAROMETRIC RELIEF DAMPER | <input type="checkbox"/> WALL SENSOR |
| <input type="checkbox"/> CO2 SENSOR | <input type="checkbox"/> WALL SENSOR w/ Override |
| <input type="checkbox"/> NATURAL GAS HIGH ALTITUDE KIT | <input type="checkbox"/> WALL SENSOR w/ Setpoint Adj. & Override |
| <input type="checkbox"/> GAS PIPING KIT | <input type="checkbox"/> DEHUMIDISTAT |
| <input checked="" type="checkbox"/> PROPANE CONVERSION KIT | <input type="checkbox"/> DIRTY FILTER SWITCH |
| <input type="checkbox"/> PROPANE HIGH ALTITUDE KIT | <input type="checkbox"/> MINUS 60 F HEAT KIT |
| <input type="checkbox"/> LOW NOX KIT | <input type="checkbox"/> CONDENSER COIL GUARD |
| <input type="checkbox"/> LOW AMBIENT KIT | <input type="checkbox"/> HAIL GUARD KIT |
| <input type="checkbox"/> ANTI-RECYCLE TIMER | <input type="checkbox"/> SUPPLY AIR SMOKE DETECTOR |
| <input type="checkbox"/> EXHAUST EXTENSION KIT | <input type="checkbox"/> RETURN AIR SMOKE DETECTOR |
| <input type="checkbox"/> LOW LIMIT CONTROL | <input type="checkbox"/> MANUAL OUTSIDE AIR INTAKE DAMPER (35%) |
| <input type="checkbox"/> PERMANENT FILTER KIT | <input type="checkbox"/> MANUAL OUTSIDE AIR INTAKE DAMPER (0-100%) |
| <input type="checkbox"/> ENERGY RECOVERY VENTILATOR | <input type="checkbox"/> MOTORIZED OUTSIDE AIR INTAKE DAMPER (0-100%) |
| <input type="checkbox"/> ERV SUPPORT PIER | <input type="checkbox"/> ZONE CONTROLS |
| <input type="checkbox"/> ERV BALANCING DAMPER | <input type="checkbox"/> START ASSIST KIT |
| <input type="checkbox"/> ELECTRIC HEAT Model No. | <input type="checkbox"/> INDOOR THERMOSTAT |

DUCT CONNECTIONS: Bottom ☒ Side ☐



Refer to PRODUCT DATA on front side for electrical data.
Notes:

Date

03/05/2007

Project Name

MAINE DISTRICT COURT

Client / Purchaser

Order No

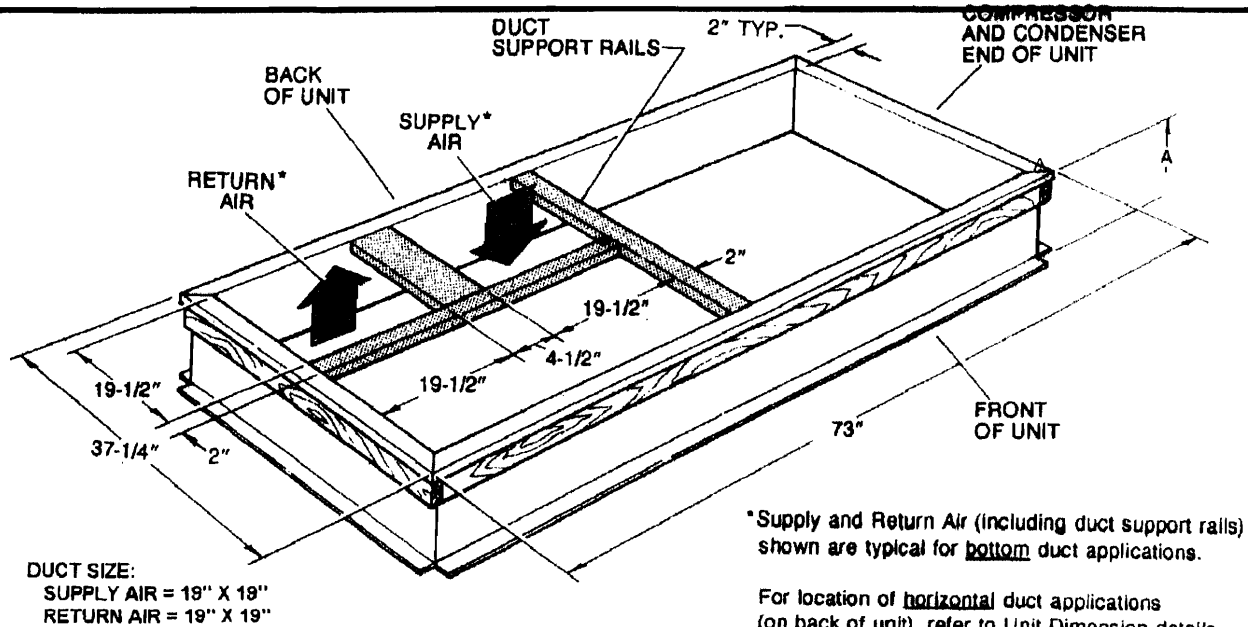
Submittal Summary Page

(Equipment only. Refer to Quotation page or Schedules for selected accessories.)

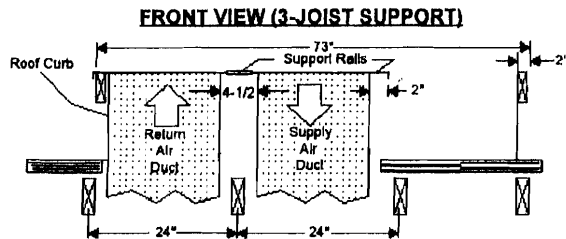
QTY	SCHEDULE NO	MODEL NO.	DESCRIPTION
2		DH090N15Q2JAF5	208-3-60 Ultra High Efficiency Gas/Electric Unit
1		DH060N10N2KAA1	208-3-60 Ultra High Efficiency Gas/Electric Unit

NOTES:

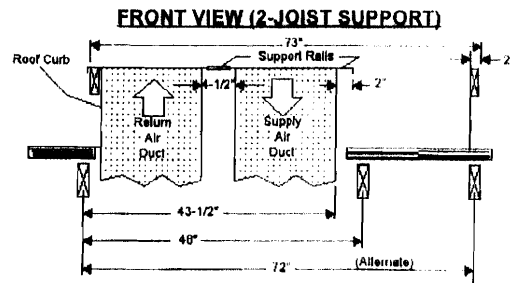
ROOF CURB DETAILS FOR THE FOLLOWING:
DH060N10N2KAA1



Model	Dimension "A"
1RC0465	8"
1RC0434	14"

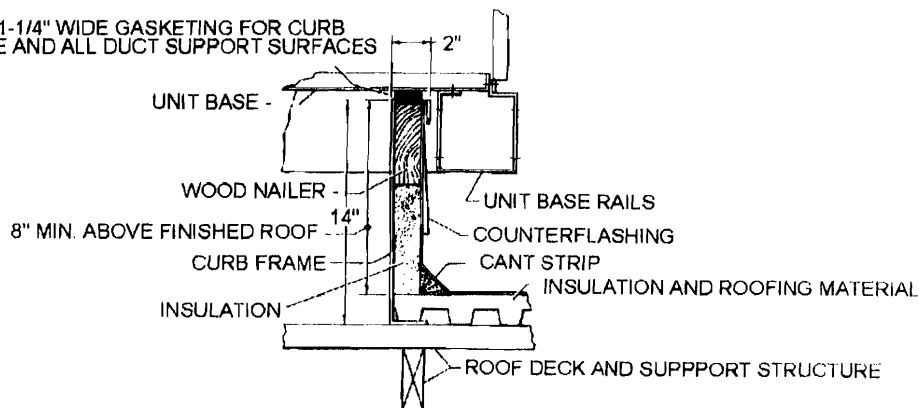


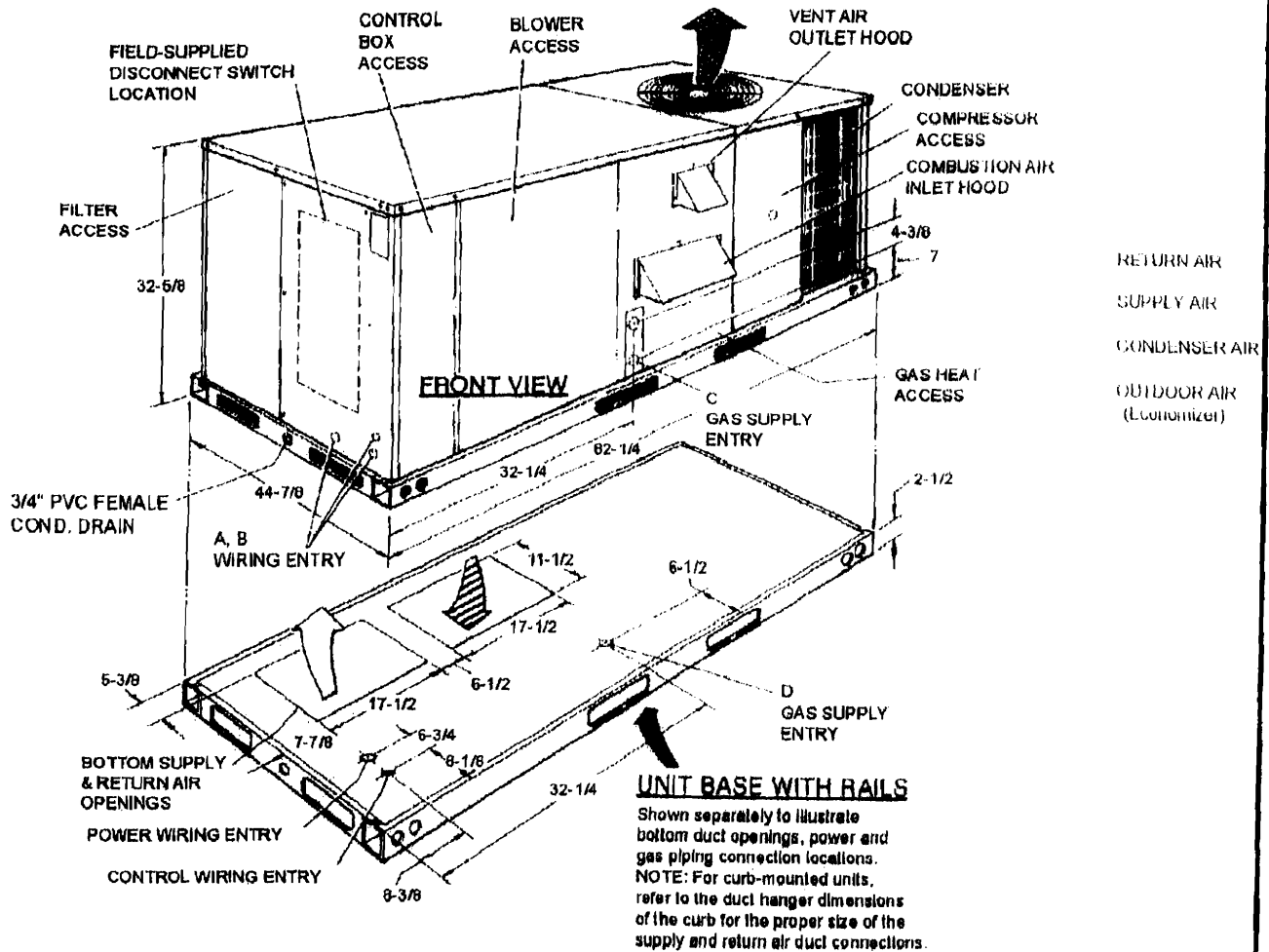
NOTE: Both supply and return air duct openings are square and the same size, providing easy duct installation. Ducts can be installed onto the curb from the roof. All electrical wiring connections can be made inside the curb.



The 43-1/2" overall duct dimension allows ductwork penetration between roof joists that are spaced on 48" centers.

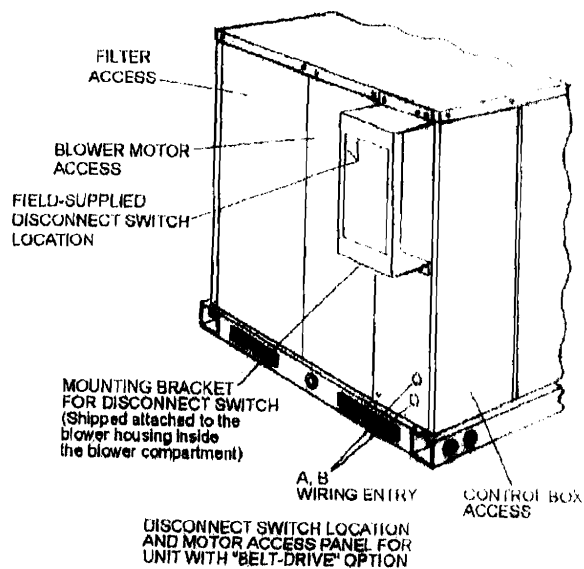
3/4" X 1-1/4" WIDE GASKETING FOR CURB FRAME AND ALL DUCT SUPPORT SURFACES





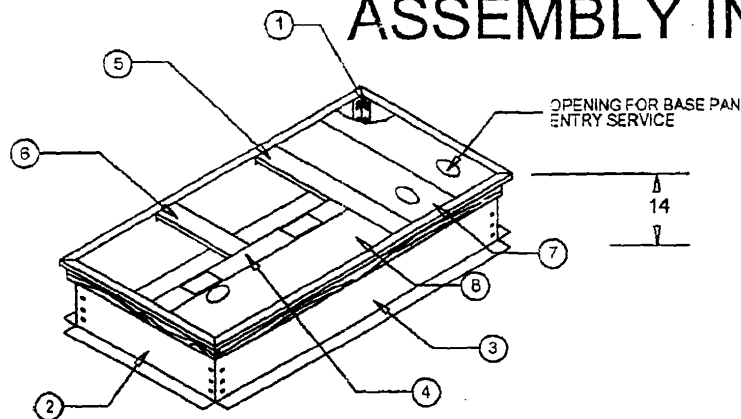
Utilities Entry Data

Hole	Opening Dia.	Use	
A	7/8" KO	Control	Side or Bottom
B	2" KO	Power	Side or Bottom
C	1-5/8" KO	Gas Piping	Front
D	1-1/2" KO		Bottom



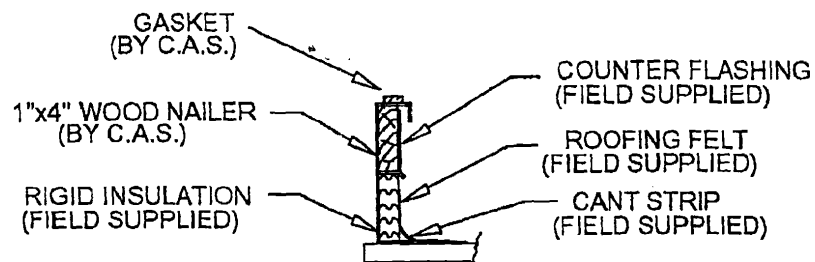
9600384

SURE LOCK ROOF CURB ASSEMBLY INSTRUCTIONS



PARTS LIST

- | | |
|--------------------------|------------------------------|
| ① CORNER BRACKET (QTY.4) | ⑦ PANEL, INSULATED (QTY.2) |
| ② END RAILS (QTY.2) | ⑧ PANEL, INSULATED (QTY.1) |
| ③ SIDE RAILS (QTY.2) | ⑨ HARDWARE BAG (QTY.1) |
| ④ DUCT SUPPORT (QTY.1) | (12) 10-16 x 3/4" TEK.SCREWS |
| INSULATED | 25' GASKET 1/4" x 1 1/4" |
| ⑤ DUCT SUPPORT (QTY.1) | 10' GASKET 3/4" x 1 1/4" |
| INSULATED | (1) INSTRUCTION SHEET |
| ⑥ DUCT SUPPORT (QTY.1) | |



TYPICAL INSTALLED CURB SECTION

PART# 9600966

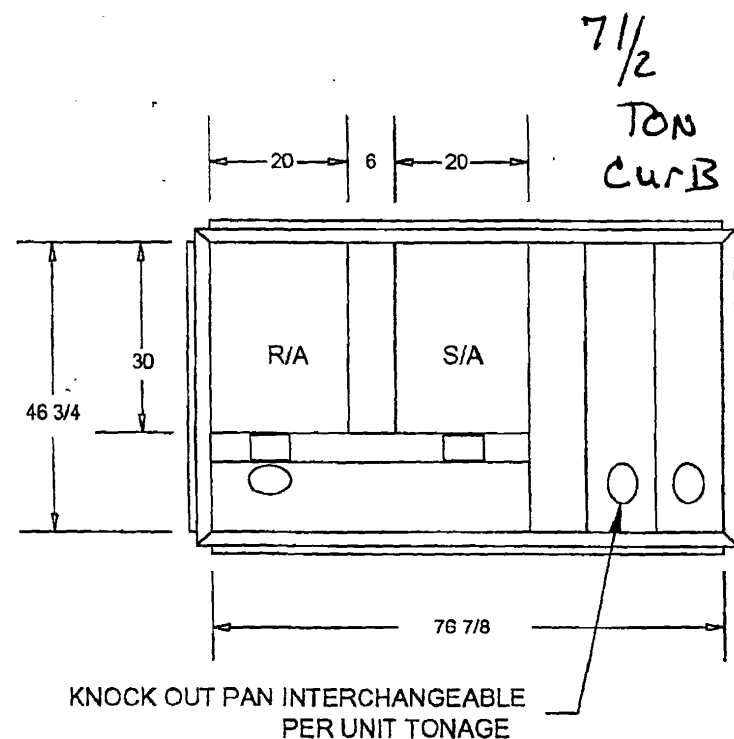
DATE:08-19-03 REV:09

SEE REVERSE SIDE FOR
STEP-BY-STEP ASSEMBLY
INSTRUCTIONS.

YORK UNITS
DH, DM 078-150
DP 090-150 (PREDATOR)

PART NUMBER

YORK	CAMBRIDGEPORT
1RCO-471	1001586



CAMBRIDGEPORT AIR SYSTEMS, INC.
SALISBURY, MA 01952
PHONE 1-800-648-2872 FAX 978-462-9189

MAINE DISTRICT COURT FIN TUB SCHEDULE

ROOM	ROOM MBH	ELEMENT LENGTH	FINNTUBE	ENCLOSURE	L. ENDCAP	R. ENDCAP	CAB HEATER	F.T. HWV VALVE	HWT ACTUATOR	GPM	VALVE CV CALC/ACT.
VESTIBULE 101	7.5						RC-1200-02	013G8044		1.54	0.9CV/2.7CV
CONFERENCE 104	20.3	16'	STC-3/4 435	2) 8'	2) TP14-EC8LA	2) TP14-EC3R		013G8044	013G8562	2	1.2CV/2.7CV
OFFICE 113	3.1	7'	STC-3/4 435	12'	TP14-WS8A	TP14-WS4		013G8044	013G8562	2	1.2CV/2.7CV
OFFICE 114	7.6	5'	STC-3/4 435	12'	TP14-WS8A	TP14-WS4		013G8044	013G8562	2	1.2CV/2.7CV
OFFICE 115	3.1	7'	STC-3/4 435	12'	TP14-WS8A	TP14-WS4		013G8044	013G8562	2	1.2CV/2.7CV
OFFICE 116	5.3	5'	STC-3/4 435	12'	TP14-WS8A	TP14-WS4		013G8044	013G8562	2	1.2CV/2.7CV
OFFICE 117	5.5	5'	STC-3/4 435	12'	TP14-WS8A	TP14-WS4		013G8044	013G8562	2	1.2CV/2.7CV
OFFICE 118	3.79	7'	STC-3/4 435	12'	TP14-WS8A	TP14-WS4		013G8044	013G8562	2	1.2CV/2.7CV
OFFICE 119	8.1	7'	STC-3/4 435	12'	TP14-WS8A	TP14-WS4		013G8044	013G8562	2	1.2CV/2.7CV
OFFICE 120	13.3	11'	STC-3/4 435	12'	TP14-WS8A	TP14-EC3R		013G8044	013G8562	2	1.2CV/2.7CV
CONF. 124	9.4	8'	STC-3/4 435	10'	TP14-WS8A	TP14-WS4		013G8044	013G8562	2	1.2CV/2.7CV
OFFICE 125	9.7	8'	STC-3/4 435	10'	TP14-WS8A	TP14-WS4		013G8044	013G8562	2	1.2CV/2.7CV
TOTAL	113.69									23.64	

RADIATOR 2GPM @3PSI DELTA=1.2CV

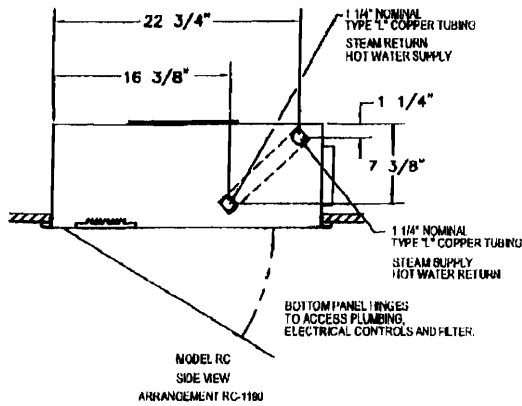
✓ 36[#]

CABINET UNIT HEATER SUBMITTAL DATA

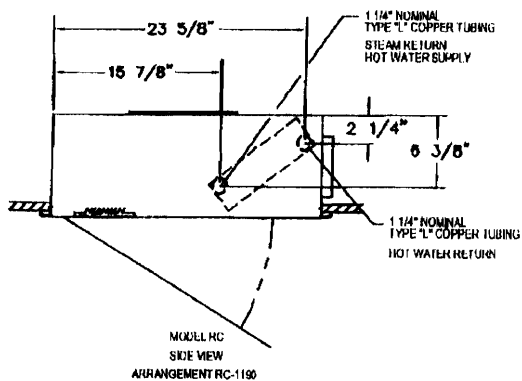
CBS-RC-02

Recessed Ceiling Units - Models RC

PIPING AND MOUNTING CONNECTIONS SHOWN ARE TYPICAL FOR ALL AIR FLOW ARRANGEMENTS SEE OTHER SIDE.

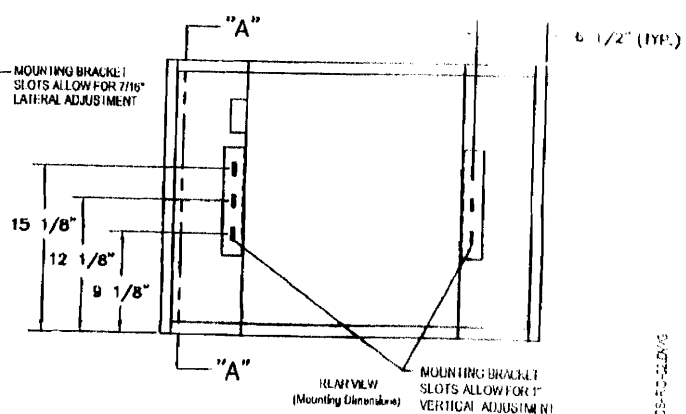


STANDARD ONE ROW COIL
PIPING DIMENSIONS.
(SHOWN ABOVE)



TWO ROW COIL PIPING DIMENSIONS
(SHOWN ABOVE)

SIZE	DIM "L"	DIM "W"
02	35"	18 1/8"
03	43"	26 1/8"
04	47"	30 1/8"
06	59"	42 1/8"
08	61"	44 1/8"
10	66"	49 1/8"
12	73"	56 1/8"
14	85"	68 1/8"



PROJECT:
LOCATION:
ARCHITECT:
ENGINEER:
CONTRACTOR:
PO NUMBER:
DATE:

bmm
Beacon/Morris

260 North Elm Street • Westfield, MA 01085
Tel: (413) 562-5423 • Fax: (413) 572-3764
www.beacon-morris.com

A MESTEK COMPANY

CABINET UNIT HEATERS RATINGS AND SPECIFICATIONS

TABLE I

UNIT SIZE	02	03	04	06	08	10	12	14
HEATING CAP. - HOT WATER MBH	16.4	22.8	29.8	48.0	54.5	62.0	75.6	78.5
20' WID. GPM	1.64	2.28	2.98	4.80	5.46	6.20	7.56	7.85
HIGH CAP. - COIL 2 ROW								
HEATING CAP. MBH	25.8	35.4	46.3	69.8	87.6	101.8	119.8	128.6
HOT WATER GPM	2.58	3.54	4.63	6.98	8.76	10.18	11.98	12.86
20' WID.								
HEATING CAP. - STEAM 2 PSIG MBH	22.6	31.4	41.0	66.1	75.1	85.4	104.1	108.2
STANDARD EDR	94	131	171	276	313	356	434	451
COIL COND. LB/HR	23.4	32.5	42.4	68.4	77.7	88.4	107.7	112
COIL								
NUMBER INS PER INCH	12	12	12	12	12	12	12	12
FACE AREA FT ²	.97	1.5	1.8	2.6	2.8	3.1	3.6	4.4
COIL CONNECTIONS	1-1/4CU	1-1/4CU	1-1/4CU	1-1/4CU	1-1/4CU	1-1/4CU	1-1/4CU	1-1/4CU
BLOWERS								
NUMBER	1	1	2	2	3	3	4	4
DIAMETER/WIDTH	5-3/4 / 1	5-3/4 / 1	5-3/4 / 1	5-3/4 / 1	5-3/4 / 1	5-3/4 / 1	5-3/4 / 1	5-3/4 / 1
DRIVE	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT
HPM	1050	1050	1050	1050	1050	1050	1050	1050
LOW	875	875	875	875	875	875	875	875
CFM								
HIGH	230	335	430	630	860	1060	1230	1410
LOW	185	270	345	505	685	845	985	1130
MOTOR								
H.P.	1/15	1/15	1/10	1/10	1 @ 1/10 1 @ 1/15	1 @ 1/10 1 @ 1/15	1/10	1/10
NUMBER	1	1	1	1	2	2	2	2
VOLTS/PHASE/HERTZ	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60
AMPERES	.8	.8	1.4	1.4	2.2	2.2	2.8	2.8
CONTROLS - STD.	VAR.	VAR.	VAR.	VAR.	VAR.	VAR.	VAR.	VAR.
FILTER								
NO. VIB	1	1	1	1	1	1	1	1
PERM.	PERM.	PERM.	PERM.	PERM.	PERM.	PERM.	PERM.	PERM.
LENGTH	19-3/4	27-3/4	31-3/4	43-3/4	45-3/4	50-3/4	57-3/4	69-3/4
WIDTH	8-11/16	8-11/16	8-11/16	8-11/16	8-11/16	8-11/16	8-11/16	8-11/16
THICKNESS	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
dB LEVEL 10' FROM UNIT								
50	52	53	54	55	55	56	56	
LENGTH	35	43	47	59	61	66	73	85
HEIGHT	25	25	25	25	25	25	25	25
DEPTH	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2

FILTER IDENTIFICATION AND DATA

SIZE	PART NO.	FILTER SIZE
02	PC1297-2	15/32" x 8 11/16" x 19 3/4"
03	PC1297-3	15/32" x 8 11/16" x 27 3/4"
04	PC1297-4	15/32" x 8 11/16" x 31 3/4"
06	PC1297-6	15/32" x 8 11/16" x 43 3/4"
08	PC1297-8	15/32" x 8 11/16" x 45 3/4"
10	PC1297-10	15/32" x 8 11/16" x 50 3/4"
12	PC1297-12	15/32" x 8 11/16" x 57 3/4"
14	PC1297-14	15/32" x 8 11/16" x 69 3/4"

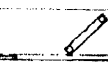
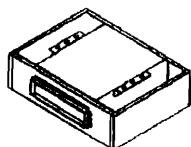
CABINET UNIT HEATERS

SHIPPING WEIGHT
(LBS)

	SIZE							
STYLE	02	03	04	06	08	10	12	14
RC	102	121	135	164	183	194	215	243

RECESSED
CEILING

RC



RC-1190*



RC-1200



RC-1210

*Arrangements are specifically designed for duct use.

CABINET UNIT HEATERS HEATING CAPACITIES

TABLE II — STANDARD COIL

ENTERING WATER 200°F
ENTERING AIR 60°F

UNIT SIZE	GPM	WATER P.D./FT.	HIGH FAN SPEED				LOW FAN SPEED			
			CFM	MBH	WTD	FAT	CFM	MBH	WTD	FAT
02	0.5	0.02		12.8	51.2	111		11.8	47.2	119
	1.0	0.06		15.1	30.2	120		13.8	27.6	129
	1.5	0.15	230	16.2	21.6	125	185	15.0	20.0	135
	2.0	0.24		17.4	17.4	130		16.1	16.1	140
	2.5	0.36		18.0	15.0	135		17.3	13.0	146
03	1.0	0.07		21.3	42.6	118		19.1	38.2	125
	1.5	0.16		22.0	26.6	120		19.8	26.4	130
	2.0	0.26	335	22.7	22.7	127	270	20.1	20.1	129
	2.5	0.39		23.5	18.8	125		20.7	16.6	131
	3.0	0.55		23.0	15.0	126		21.1	14.1	132
04	1.0	0.07		21.8	43.6	106		19.0	38.0	115
	2.0	0.27		26.6	26.6	117		23.9	23.9	124
	2.5	0.41	430	29.0	23.2	122	345	25.8	20.5	129
	4.0	1.00		30.9	15.4	126		27.4	13.7	133
	5.0	1.45		32.3	12.9	129		28.3	11.3	136
06	2.0	0.30		40.4	40.4	119		35.7	35.7	125
	3.0	0.63		44.8	29.8	125		39.0	26.5	133
	4.0	1.10	630	47.2	23.6	129	505	41.9	21.0	136
	5.0	1.60		49.4	19.8	132		43.6	17.5	140
	6.0	2.25		50.7	16.9	134		44.6	15.0	142
08	2.0	0.31		47.1	47.1	110		42.0	42.0	117
	3.0	0.64		52.2	34.8	115		46.5	31.0	123
	4.0	1.10	860	53.9	26.9	117	685	48.3	24.2	125
	6.0	2.25		56.0	18.6	120		49.1	16.4	126
	8.0	3.85		57.8	14.4	122		51.2	12.8	129
10	3.0	0.65		55.8	32.7	109		50.2	33.5	115
	4.0	1.15		60.4	30.2	112		53.5	26.0	118
	6.0	2.35	1060	62.2	20.7	114	845	54.7	18.2	120
	8.0	4.00		64.1	16.0	116		56.3	14.1	121
	10.0	6.00		66.0	13.2	117		58.0	11.8	124
12	4.0	1.20		71.5	35.7	113		65.1	32.6	121
	6.0	2.50		74.5	24.8	116		66.6	22.2	123
	8.0	4.20	1230	76.7	18.1	117	985	68.0	17.0	124
	10.0	6.30		77.7	15.5	118		69.0	13.8	125
	12.0	8.85		78.6	13.1	119		69.7	11.6	126
14	3.5	1.00		71.0	40.6	106		66.3	37.9	114
	4.0	1.30		74.1	37.0	108		68.4	34.2	116
	6.0	2.70	1410	77.6	25.9	111	1130	69.9	23.3	117
	10.0	6.80		80.9	16.2	113		72.5	14.5	119
	12.0	9.55		81.7	13.6	113		73.0	12.2	120

CABINET UNIT HEATERS HEATING CAPACITIES

TABLE III — HIGH CAPACITY — 2 ROW COIL

ENTERING WATER 200°F
ENTERING AIR 60°F

UNIT SIZE	GPM	WATER P.D./FT.	HIGH FAN SPEED				LOW FAN SPEED			
			CFM	MBH	WTD	FAT	CFM	MBH	WTD	FAT
02	0.5	0.03		17.9	71.6	133		16.5	68.0	144
	1.0	0.09		21.7	43.4	149		19.9	39.8	162
	1.5	0.22	225	23.3	31.1	155	180	21.4	28.5	170
	2.0	0.34		24.8	24.8	162		22.5	22.5	175
	2.5	0.50		25.7	20.6	165		23.5	18.8	180
03	1.0	0.10		30.1	60.2	144		28.3	56.6	158
	1.5	0.25		31.9	42.5	149		28.9	38.5	161
	2.0	0.38	330	33.1	33.1	152	265	29.7	29.7	163
	2.5	0.56		34.3	27.4	156		30.3	24.2	165
	3.0	0.77		34.9	23.3	157		30.8	20.5	167
04	1.0	0.11		31.5	63.0	129		29.5	59.0	141
	2.0	0.44		39.5	39.5	147		35.8	35.8	158
	2.5	0.59	420	42.4	33.9	153	335	37.8	30.2	164
	4.0	1.41		45.4	22.7	160		39.7	19.9	168
	5.0	2.04		46.8	18.7	163		40.8	16.3	172
06	2.0	0.45		57.6	57.6	146		52.7	52.7	158
	3.0	0.93		63.1	42.1	154		57.0	38.0	166
	4.0	1.60	620	66.0	33.0	158	495	59.7	29.9	171
	5.0	2.30		69.1	27.6	163		61.2	24.5	174
	6.0	3.30		69.5	23.2	164		62.0	20.7	175
08	2.0	0.46		67.1	67.1	133		58.1	58.1	139
	3.0	0.95		75.8	50.5	143		68.2	45.5	153
	4.0	1.65	845	79.3	39.7	146	675	71.6	35.8	158
	6.0	3.35		82.6	27.5	150		73.4	24.5	160
	8.0	5.60		86.5	21.6	154		75.8	19.0	163
10	3.0	1.00		84.6	56.4	135		75.9	50.6	144
	4.0	1.75		90.5	45.3	140		81.2	40.6	150
	6.0	3.50	1040	94.6	31.5	144	830	84.0	28.0	153
	8.0	5.90		98.6	24.7	147		86.3	21.8	156
	10.0	8.85		101.6	20.3	150		88.9	17.8	159
12	4.0	1.85		105.3	52.7	140		93.3	46.7	149
	6.0	3.75		111.6	37.2	145		100.4	33.5	155
	8.0	6.30	1210	115.3	28.8	148	970	102.8	25.7	158
	10.0	9.45		118.1	23.6	150		105.0	21.0	160
	12.0	13.20		119.8	20.0	151		106.7	17.8	161
14	4.0	2.05		109.8	54.9	133		100.2	50.1	143
	5.0	3.00		114.8	45.9	136		103.5	41.4	146
	6.0	4.15	1385	118.3	39.4	139	1170	106.6	35.5	149
	10.0	10.45		125.8	25.2	144		111.4	27.3	152
	12.0	14.55		127.9	21.3	145		112.2	18.7	153

SPECIFICATIONS & WARRANTY*

*STANDARD CABINET UNIT ONLY

The contractor shall furnish and install Beacon-Morris Cabinet Unit Heaters as selected to meet or exceed job requirements. The Cabinet Unit Heaters will conform to the items listed below and be certified under CSA guidelines.

CABINETS

All cabinets will be constructed with 18 gauge electro galvanized steel internal cabinets, side panels and top. The front panel shall be furnished in 16 gauge electro galvanized steel. Adequate work area for installation of control valves or electrical equipment shall be provided on both sides of the internal cabinet.

The cabinet shall be provided with a neutral eggshell baked enamel prime coat as standard. (Available if specified) Powder coated baked enamel, color selected from Beacon-Morris Color Chart.

All cabinets shall be supplied with adjustable rear mounting brackets which will provide adjustment to correct alignment of the unit at installation to non square or out of true walls, joists, studs or surfaces. Adjustable leveling legs (two each base leg) are available when specified.

RECESSED UNITS

All recessed units shall be supplied with a "Wall Seal" assembly. This assembly shall provide protection to the wall or ceiling construction material. The "Wall Seal" shall be supplied in an eggshell baked enamel prime coat as standard. (When specified) Baked enamel colors may be selected from Beacon-Morris Color Chart.

CEILING MOUNT OR RECESSED UNITS

All "RC" units shall be supplied with a continuous hinged front panel. The continuous hinge shall provide full swing through 90°. A safety chain shall be provided as standard to prevent the face panel from swinging fully open accidentally. This chain must be easily detached to allow full access for servicing. Speed control switch will be shipped with wiring diagram for installation where desired.

FILTERS

All filters supplied as standard shall be reusable aluminum media with a 69% arrestance level. Filters shall be slide in type which are locked into position with two cotter pins.

FANS

Fan wheels shall be centrifugal, forward curved, double width of electro galvanized steel. Fan housings shall be of formed, galvanized sheet metal.

MOTORS

All motors shall have integral thermal protection and start at 78 percent of rated voltage. All motors shall be of p.s.c. design and be capable of operating in high static conditions. All motors shall be factory run-tested and assembled in unit prior to shipping.

ELECTRICAL

All primary internal wiring shall be done at the factory and every unit shall be factory tested for reliability.

FRESH AIR DAMPERS

When desired specify either of the following:

1. Where noted 25% Manual Outside Air Dampers shall be provided. A manually operated damper quadrant shall provide from 0% to 25% outside air through the use of a single blade damper.
2. Where noted 25% Motorized Outside Air Dampers shall be provided. A synchronous motor (115/60/1) interlocked with the blower shall automatically open the outside air damper when blower starts. The single blade damper shall be adjustable from 0% to 25% outside air. When the blower stops or there is a loss of power, the damper shall return to the closed position. A damper override switch shall be provided to prevent damper operation when desired.

WARRANTY

The products in this catalog are warranted by Beacon-Morris, to be free from defects in material and workmanship for a period of one (1) year from the date of shipment from Beacon's plant. Beacon's liability under this warranty is limited to replacing or repairing at our option, F.O.B. our plant any defective component or assembly returned to our factory prepaid and with proper return authorization document. All repairs or replacements are made subject to factory inspection. In the interest of product improvement, Beacon-Morris reserves the right to make changes without notification.



260 North Elm Street • Westfield, MA 01085
Tel: (413) 562-5423 • Fax: (413) 572-3764
www.beacon-morris.com



A MESTEK COMPANY

Tag _____

TWIN-PAK

Submittal

Style "TP"
Slope Top Enclosures
Copper/Aluminum &
Steel Element Ratings

Specification

ENCLOSURE:

STYLE: "TP"
OUTLET: Slope Louvered
Two-Piece
LENGTHS: 2' thru 8' in 1' Increments
MATERIAL: ☐ 18 Ga. C.R.S. Std.
FINISH: ☐ Baked Primer

BACKPLATE:

TYPE: ☐ Partial Backplate
LENGTHS: 4' and 8' Only
MATERIAL: ☐ 20 Ga. Painted Std.

Note: Assembly includes all necessary components for complete assembly.
Element is shipped in separate carton.

ELEMENT:

TYPE: Cu/Al (Mechanically Expanded)
LENGTHS: 2' thru 6' in 1' Increments.
One End Flared, Std.
See Catalog for Working Pressures.

ELEMENT:

TYPE: Steel (Mechanically Expanded)
LENGTHS: 2' thru 6' in 1' Increments.
☐ NPT Threads Both Ends (standard)
☐ Beveled Ends for Field Weld

BRACKETS: ☐ Bracket w/Brkt Mtd B.B. Hanger

ACCESSORIES: All overlapping, engage between backplate and wall at top. Bottom returns to wall, holes provided for fasteners.

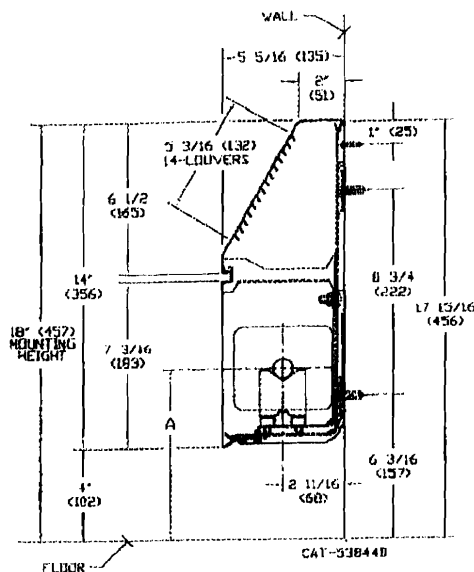
STEEL

ELEMENT DESIGNATION	NOMINAL PIPE SIZE	CRADLE	A MIN.	A MAX.
ST-144	1-1/4 (32)	2	7-7/8 (200)	8-15/16 (227)
ST-243	2" (50)	1	7-5/8 (194)	8-3/4 (222)

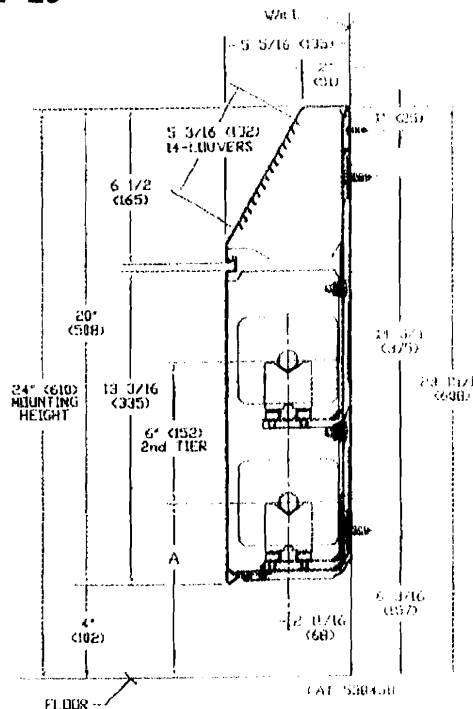
COPPER

ELEMENT DESIGNATION	NOMINAL PIPE SIZE	CRADLE	A MIN.	A MAX.
STC-3/4 435	3/4 (20)	2	7-3/8 (187)	8-1/2 (216)
STC-435	1" (25)	2	7-1/2 (191)	8-5/8 (219)
STC-1435	1-1/4 (32)	2	7-5/8 (194)	8-13/16 (224)

☒ TP-14



☐ TP-20



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PROJECT: _____ DATE: _____
LOCATION: _____
ARCHITECT: _____
ENGINEER: _____
CONTRACTOR: _____
PO NUMBER: _____

STYLE "TP"

COPPER/ALUMINUM ELEMENT RATINGS

COVER	TUBE SIZE	CATALOG DESIGNATION	FIN SIZE	FIN PER FT.	FIN THICKNESS	ENCL DEPTH AND HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)					
										200°	190°	180°	170°	160°	150°
										FACTOR					
									1.00	.86	.78	.69	.61	.53	.45
TP-14	3/4"	STC-3/4-435	4-1/4" x 3-5/8"	50	.020"	14B	1	18	1840	1580	1440	1270	1120	980	830
	1"	STC-435	4-1/4" x 3-5/8"	50	.020"	14B	1	18	1930	1660	1510	1330	1180	1020	870
	1-1/4"	STC-1435	4-1/4" x 3-5/8"	50	.020"	14B	1	18	1860	1600	1450	1280	1130	990	840
TP-20	3/4"	STC-3/4-435	4-1/4" x 3-5/8"	50	.020"	20B	1	24	2090	1800	1630	1440	1270	1110	940
	1"	STC-435	4-1/4" x 3-5/8"	50	.020"	20B	1	24	2180	1870	1700	1500	1330	1160	980
	1-1/4"	STC-1435	4-1/4" x 3-5/8"	50	.020"	20B	1	24	2130	1830	1660	1470	1300	1130	960
TP-20	3/4"	STC-3/4-435	4-1/4" x 3-5/8"	50	.020"	20B	2	24	2820	2430	2200	1950	1720	1490	1270
	1"	STC-435	4-1/4" x 3-5/8"	50	.020"	20B	2	24	2840	2270	2060	1820	1610	1400	1190
	1-1/4"	STC-1435	4-1/4" x 3-5/8"	50	.020"	20B	2	24	2510	2160	1960	1730	1530	1300	1130

STYLE "TP"

STEEL ELEMENT RATINGS

COVER	TUBE SIZE	CATALOG DESIGNATION	FIN SIZE	FIN PER FT.	FIN THICKNESS	ENCL DEPTH AND HEIGHT IN INCHES	TIERS AND CENTERS IN INCHES	MTG. HEIGHT IN INCHES	STEAM 215° FACTOR	HOT WATER (AVG.)					
										200°	190°	180°	170°	160°	150°
										FACTOR					
									1.00	.86	.78	.69	.61	.53	.45
TP-14	1-1/4"	ST144	4-1/4" SQ.	40	.032" A	14B	1	18	1570	1350	1230	1080	960	830	710
	1-1/4"	ST243	4-1/4" SQ.	32	.032" A	14B	1	"	1400	1300	1080	970	850	740	630
TP-20	1-1/4"	ST144	4-1/4" SQ.	40	.032" A	20B	1	24	1670	1440	1300	1150	1020	890	750
	1-1/4"	ST243	4-1/4" SQ.	32	.032" A	20B	1	"	1450	1250	1130	1000	890	770	650
TP-20	1-1/4"	ST144	4-1/4" SQ.	40	.032" A	20B	2	"	2370	2040	1850	1640	1460	1280	1070
	1-1/4"	ST243	4-1/4" SQ.	32	.032" A	20B	2	"	2110	1820	1650	1460	1290	1120	950

Guaranteed Working Pressures (PSI)

1 1/4" IPS: 660 @ temps. up to 650°F

2" IPS: 405 @ temps. up to 650°F

1 1/4" CU: 194 @ temps. up to 300°F

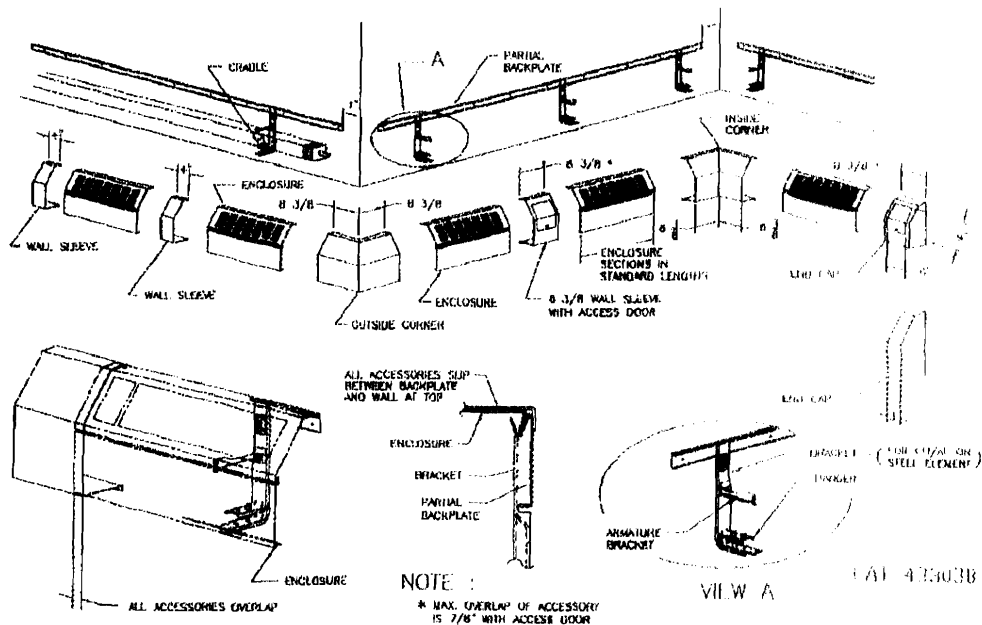
1" CU: 204 @ temps. up to 300°F

3/4" CU: 218 @ temps. up to 300°F

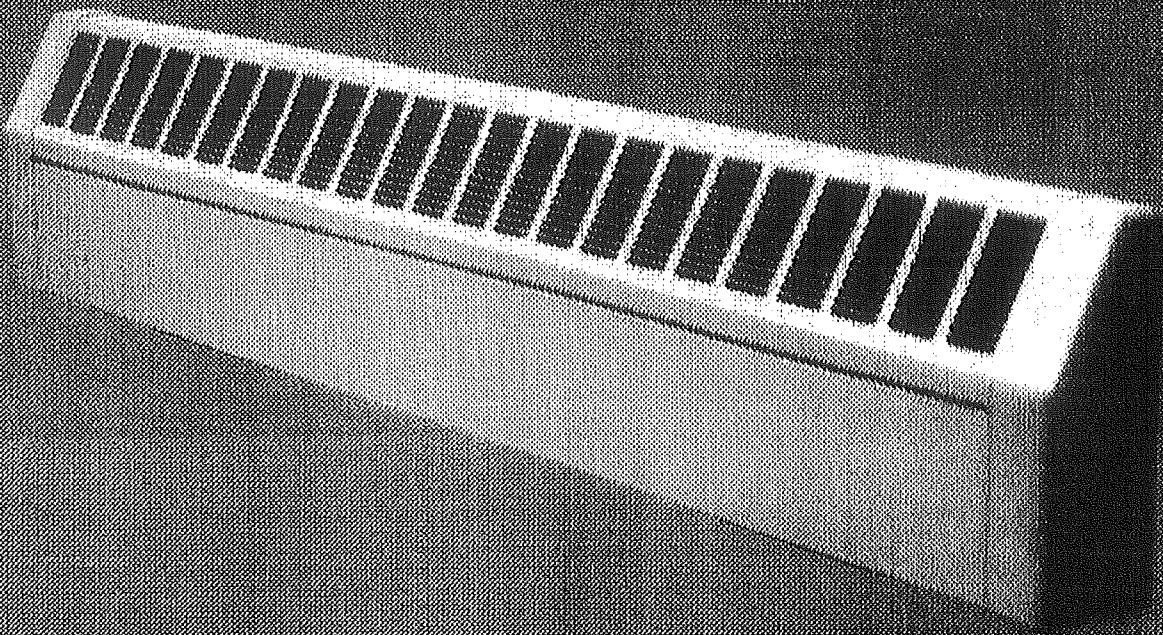
Maximum pressures at other temperatures are available upon request.

Installation Details

* Standard length: Available from 3' to 8' in 12" increments.



Two Piece Commercial Finned-Tube



bmm
Beacon/Morris

'TWIN'PAK

Features and Benefits

Easy to buy. Easy to handle. Easy to install.

Beacon/Morris' Twin Pak offers two sizes of enclosures, the TP-14, a 14" high two-piece enclosure, and the TP-20, a 20" high, two-piece enclosure which will accommodate two tiers of element. Twin Pak's functional slope top design has a pleasing look and enhances the appearance of medical buildings, conference rooms, dining rooms, lobbies, office suites—high traffic areas that demand good looks, durability and low price.

Those contractors familiar with Beacon/Morris products know us for our higher quality products. Twin Pak is no exception. Tough, durable 18 gauge covers come with an electrostatically applied, oven-baked prime finish. Partial back plates are rugged 20 gauge prepainted steel. Compare Twin Pak with the competition—the same quality just isn't there.

You'll like the wide selection of enclosure and element lengths, too. Standard 14" or 20" high enclosures are packaged in 3, 4, 5, 6, 7 and 8 foot lengths, elements in 2, 3, 4, 5 and 6 foot lengths to save time and keep the job moving. Choice of copper/aluminum or steel elements.

Ships like baseboard

Twin Pak's 2-piece design lets us conveniently package all the required components in a single carton. Each carton contains 2-piece enclosure, backplate, brackets, hangers and cradles. Simple installation instructions are printed right on the carton for ready reference. Element ships separately.

Stores like baseboard

Twin Pak's baseboard-like cartons stack one on top of the other. Saves storage space in a garage or warehouse and facilitates loading and unloading trucks and vans. Easy-to-handle cartons protect the enclosures from dents, dings and scratches.

Installs like baseboard

Draw one level chalk line on the installation wall and you're off to the races. Standard bracket is supplied with one or two adjustable element supports that allows a 1½" vertical movement.

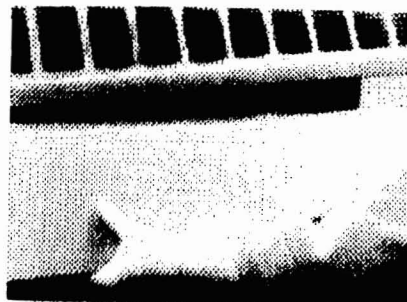
All elements are nested onto a slide cradle to support the element tube or pipe. Enclosure brackets, formed at the top, engage the top inside bend of the partial backplate. This exclusive automatic locating design really simplifies installation. The brackets, with push-lock enclosure locks, snap and secure the enclosure bottom. (See back cover for available accessories.)



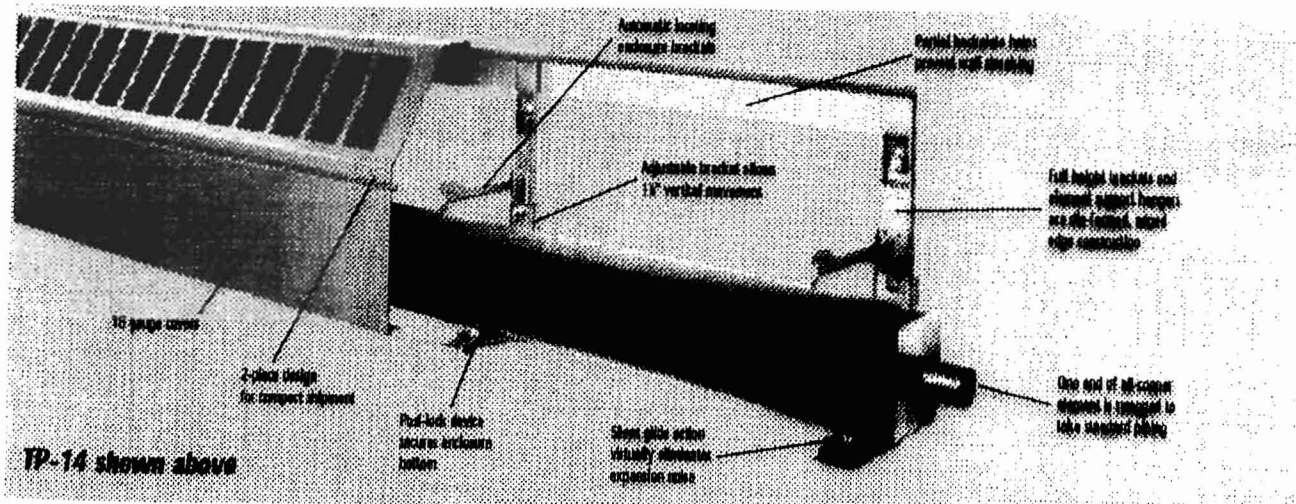
Ships like baseboard



Stores like baseboard



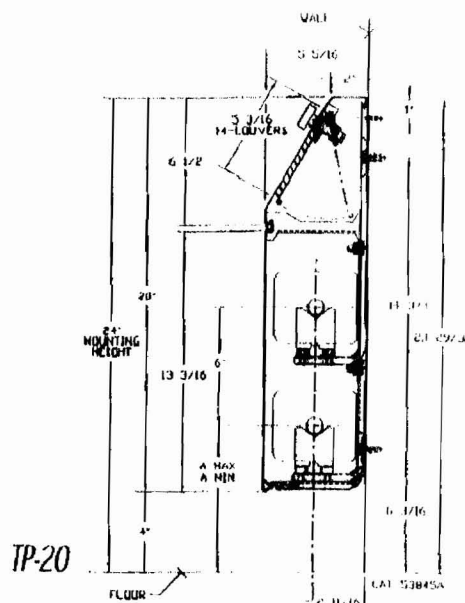
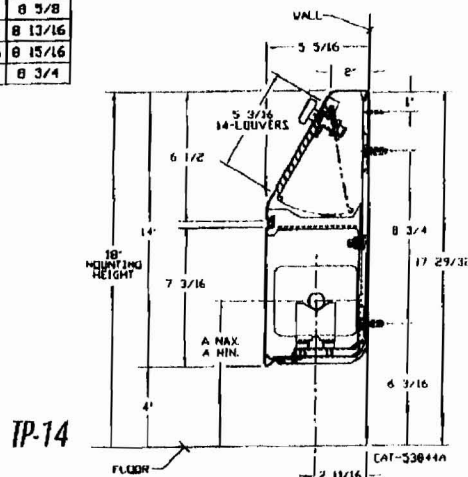
Installs like baseboard



Models TP-14 and TP-20

Dimensions and Ratings

ELEMENT DESIGNATION	CRADLE NCL	A MIN.	A MAX.
C3/4 435	2	7 3/8	8 1/2
C435	2	7 1/2	8 5/8
CL435	2	7 11/16	8 13/16
SL13, SL14	2	7 13/16	8 15/16
S243	1	7 5/8	8 3/4



Cover	Tube Size	Catalog Designation	Fin Size (Inches)	Fin Per Ft.	Fin Thickness	Enclosure Depth & Height	Fans & Centrif.	Mtg. Height	Crown 216° F Factor 1.00	Average Hot Water Temperature T					
										200°	180°	160°	140°	120°	100°
										0.88	0.78	0.68	0.58	0.48	0.38
TP-14	1 1/4" L.P.S.	ST-144	4" SQ.	40	.032" STL	14B	1	18	1570	1350	1230	1080	960	830	710
	2" L.P.S.	ST-243	4" SQ.	32	.032" STL	14B	1	18	1400	1300	1080	970	850	740	630
	3/4" CU.	STC-435	4" x 3"	50	.020" AL	14B	1	18	1840	1580	1440	1270	1120	980	830
	1" CU.	STC-435	4" x 3"	50	.020" AL	14B	1	18	1930	1660	1510	1330	1180	1020	870
	1 1/4" CU.	STC-1435	4" x 3"	50	.020" AL	14B	1	18	1860	1600	1450	1280	1130	990	840
TP-20	1 1/4" L.P.S.	ST-144	4" SQ.	40	.032" STL	20B	1	24	1670	1440	1300	1150	1020	890	750
	2" L.P.S.	ST-243	4" SQ.	32	.032" STL	20B	1	24	1450	1250	1130	1000	880	770	650
	3/4" CU.	STC-435	4" x 3"	50	.020" AL	20B	1	24	2090	1800	1630	1440	1270	1110	940
	1" CU.	STC-435	4" x 3"	50	.020" AL	20B	1	24	2180	1870	1700	1500	1330	1160	980
	1 1/4" CU.	STC-1435	4" x 3"	50	.020" AL	20B	1	24	2130	1830	1660	1470	1300	1130	960
IP-20	1 1/4" L.P.S.	ST-144	4" SQ.	40	.032" STL	20B	2	24	2370	2040	1850	1640	1450	1260	1070
	2" L.P.S.	ST-243	4" SQ.	32	.032" STL	20B	2	24	2110	1820	1650	1460	1290	1120	950
	3/4" CU.	STC-435	4" x 3"	50	.020" AL	20B	2	24	2820	2430	2200	1950	1720	1490	1270
	1" CU.	STC-435	4" x 3"	50	.020" AL	20B	2	24	2640	2270	2060	1820	1610	1400	1190
	1 1/4" CU.	STC-1435	4" x 3"	50	.020" AL	20B	2	24	2510	2160	1960	1730	1530	1330	1130

- The ratings above include factors shown below for recommended mounting height (recommended mounting height is 4" greater than enclosure height).
- Ratings are in BTU per hour per lineal foot of active length. Active length is catalog ordering length less 5" for steel, less 4" for copper.
- Water ratings applicable to water flow rates of three or more feet per second have been determined by applying factors to steam ratings.
- Steel fins are painted black. Copper is unpainted.
- NPT threads furnished on steel elements. Please use domestic fittings for proper installation.
- If the unit is to be installed at a different height than recommended, the rating must be adjusted as follows:

Rating multiplied by:
Factor from Table A for the Actual Mounting Height
Factor from Table B for the Recommended Mounting Height

Table A

Mounting Height (In.)	18 or less	19	20	21	22	23	24	25	26	27	28	29	30	32	34	36	38	40 or more
Factor 5 1/4" Offset	1.100	1.100	1.100	1.089	1.082	1.085	1.079	1.072	1.065	1.058	1.052	1.046	1.039	1.025	1.016	1.009	1.003	1.000

Guaranteed Working Pressures (PSI)

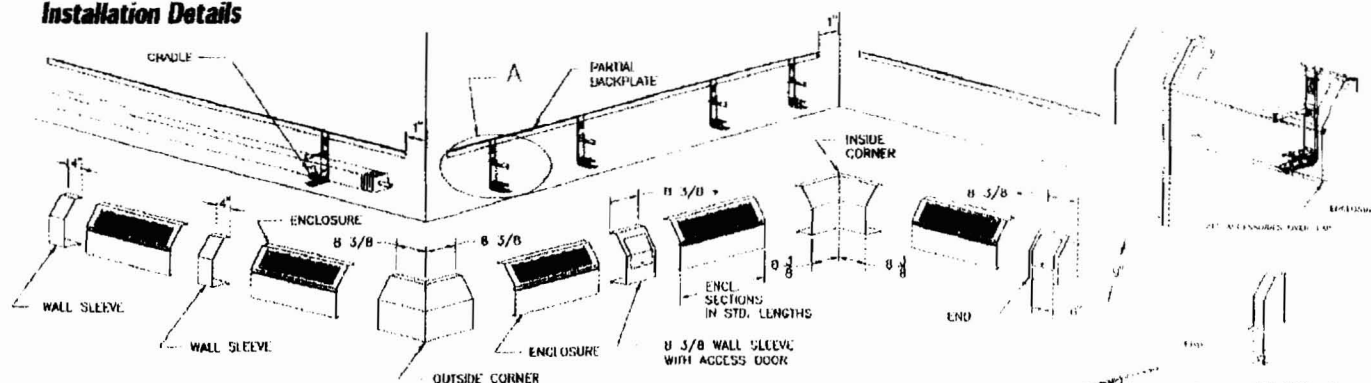
- 1 1/4" L.P.S.: 660 @ temps. up to 660°F
- 2" L.P.S.: 405 @ temps. up to 650°F
- 1 1/4" CU.: 194 @ temps. up to 300°F
- 1" CU.: 204 @ temps. up to 300°F
- 3/4" CU.: 218 @ temps. up to 300°F

Maximum pressures at other temperatures are available upon request.

Twin-Pak Accessories

Installation Details and Enclosure and Element Shipping Information

Installation Details



- Standard length: Available from 3' to 8' in 12" increments.
- When two or more covers occur in a run, a 4" wall sleeve is to be used at joints.

NOTE:

- MAX. OVER-LAP OF ACCESSORY IS 2/8" WITH ACCESS DOOR

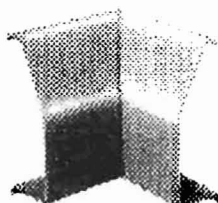
Accessories



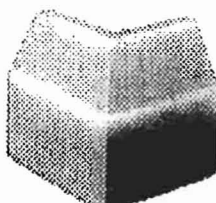
3" End Cover



8" End
with Access Door



Inside Corner



Outside Corner



4" Wall Sleeve



8" Wall Sleeve
with Access Door

Element and Enclosure Shipping Information

Units with damper assembly are special order. Consult factory for pricing and availability. Element is shipped in separate cartons.

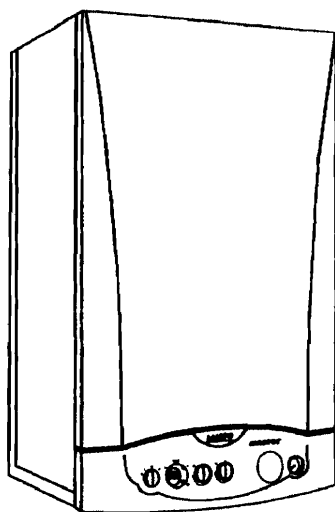
Unit	Catalog Number	Unit Length	Approx. Carton Weight (lbs.)	Package Contents
14" Enclosure Assembly	TP-14-8	8'	36.0	Contains one length each top panel, front panel, partial back plate. 3' through 6' units include 2 brackets, 2 adjustable hangers with hardware, and 2 slide cradles. 7' and 8' units include 3 brackets, 3 adjustable hangers with hardware, and 3 slide cradles.
	TP-14-7	7'	31.5	
	TP-14-6	6'	27.0	
	TP-14-5	5'	22.5	
	TP-14-4	4'	18.0	
	TP-14-3	3'	13.5	
20" Enclosure Assembly	TP-20-8	8'	44.0	Contains one length each top panel, front panel, partial back plate. 3' through 6' units include 2 brackets, 4 adjustable hangers with hardware, and 4 slide cradles. 7' and 8' units include 3 brackets, 6 adjustable hangers with hardware, and 6 slide cradles.
	TP-20-7	7'	39.3	
	TP-20-6	6'	30.8	
	TP-20-5	5'	26.1	
	TP-20-4	4'	21.4	
	TP-20-3	3'	16.7	

beacon/morris

BTP-6R

260 North Elm Street, Westfield, MA 01085 • Tel: (413) 562-5423 • Fax: (413) 572-3764
5211 Creekbank Road, Mississauga, Ontario L4W 1R3 Canada • Tel: (905) 625-2991 • Fax: (905) 625-6610
www.beacon-morris.com

◆ A MESITEK COMPANY

MASCOT

Condensing Boilers

HT 330	Combi Boiler / Water Heater
HT 1.330	Boiler
HT 1.450	Boiler
HT 1.650	Boiler

Submittal Data **LAARS**
Heating Systems Company

Standard Equipment

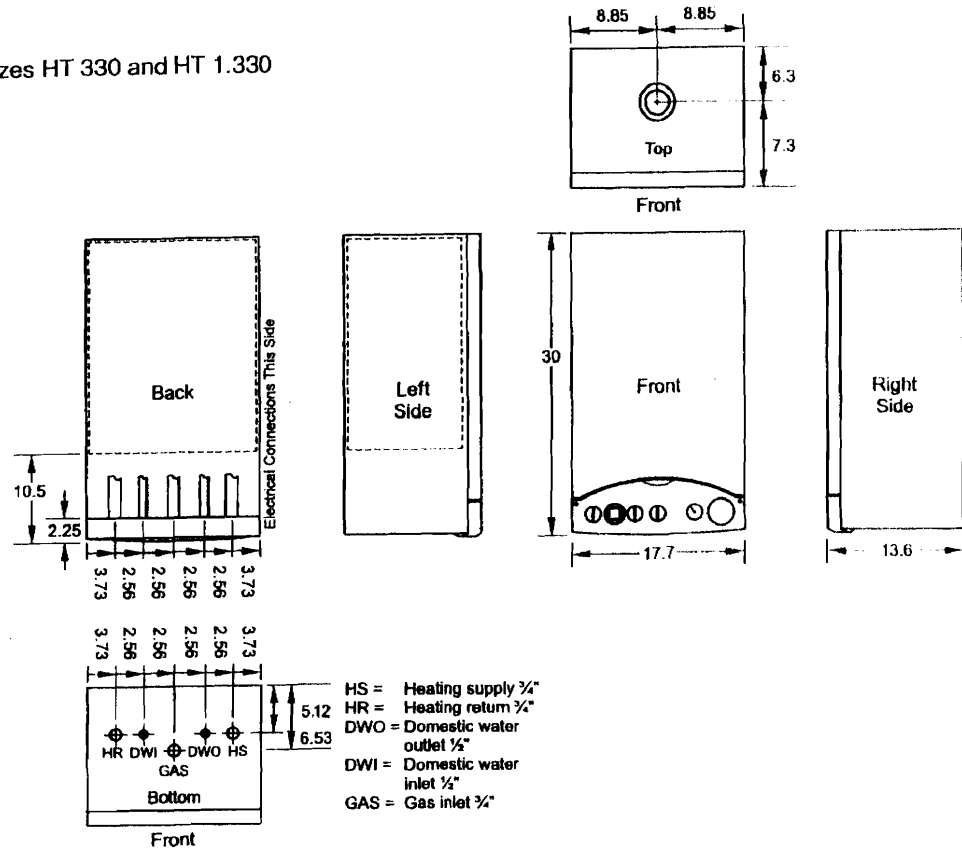
- Designed and constructed in accordance with the ASME Boiler & Pressure Vessel Code, Sections II, IV, and IX
- Design certified and tested to ANSI standard Z21.13
- Fully condensing (96% thermal efficiency at full input)
- Sealed stainless steel combustion chamber
- Welded stainless steel heat exchanger
- 2-character alphanumeric display of temperatures and fault codes
- Stainless steel burner
- Zero clearance from vent when concentric vent system is used
- Built-in back flow preventer (1.330 & 330)
- Supervised spark ignition
- Fully modulating gas valve
- Variable speed blower
- Diagnostic LEDs
- DHW priority (330)
- Wall-mounting template
- Freeze protection assistance - attempts to run boiler and boiler pump when water temperature goes below 41°F (5°C)
- Built-in circulating pump and bypass (1.330 & 330)
- Natural or propane gas (no parts changes needed for conversion)
- Stainless steel brazed plate DHW heat exchanger (330)
- Outdoor reset ready - just add outdoor air sensor
- Built-in air vent (1.330 & 330)
- Built-in relief valve
- Built-in boiler drain valve (1.330 & 330)
- Built-in manual system fill valve (1.330 & 330)
- Built-in low water cutoff
- Built-in pressure gauge
- Built-in low water cutoff
- Pump exerciser
- Pump time delay
- Connection valve kit (1.330 & 330)
- Built-in expansion tank (1.330 & 330)

Specifications

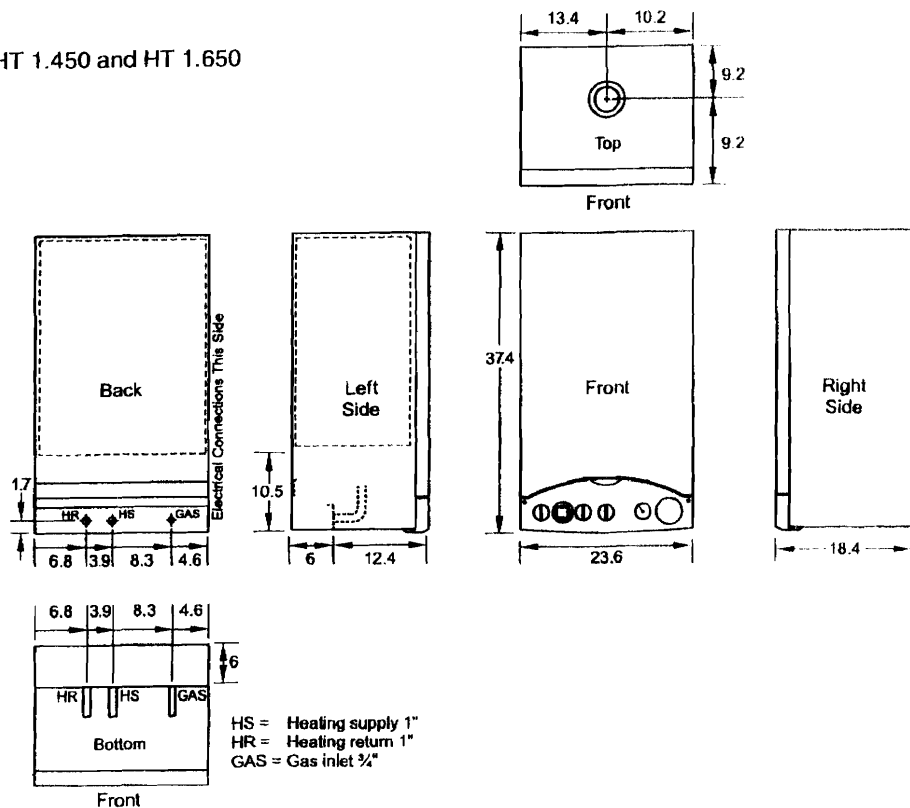
		HT 330		HT 1.330		HT 1.450		HT 1.650	
Input, max fire	BTU/h kW	126,376	37.0	126,376	37.0	167,262	49.0	241,600	70.8
Input, minimum fire	BTU/h kW	37,192	10.9	37,192	10.9	55,618	16.3	73,361	21.5
Output, maximum fire	BTU/h kW	112,601	33.0	112,601	33.0	153,618	45.0	221,789	65.0
Output, minimum fire	BTU/h kW	32,804	9.6	32,804	9.6	52,058	15.3	69,326	20.3
Max. DHW flow rate (dt@80°F)	gpm l/m	3.6	14	N/A		N/A		N/A	
Max. boiler pressure	psi kPa	30	207	30	207	30	207	30	207
Min. DHW pressure	psi kPa	2.9	20	N/A		N/A		N/A	
Max. DHW pressure	psi kPa	116	800	N/A		N/A		N/A	
Height	in cm	30.0	76	30.0	76	37.4	95	37.4	95
Width	in cm	17.7	45	17.7	45	23.6	60	23.6	60
Depth	in cm	13.6	35	13.6	35	18.4	44	18.4	44
Concentric vent-air	in cm	2.36-3.93	6-10	2.36-3.93	6-10	3.15-4.92	8-12	3.15-4.92	8-12
Weight	lbs kg	103	47	102	46	141	64	159	72
Voltage	V	120		120		120		120	
Frequency	Hz	60		60		60		60	
Service	Amos	15		15		15		15	

Dimensions

Sizes HT 330 and HT 1.330



Sizes HT 1.450 and HT 1.650



**Application**

RA-2000 Thermostatic Radiator Valves regulate the flow of hot water or steam through free-standing radiators, baseboards or convectors in hot water and two-pipe low pressure steam systems.

Operator Features

- Valve mounted operators provide fast acting modulating control of the space temperature through a patented vapor charge, ensuring the highest level of comfort control.
- Standard valve mounted operators are equipped with a theft protection device and a "snap-action" mechanism that allows for easy installation and removal without the use of tools.
- Tamper resistant versions of the valve mounted operators are available to discourage unauthorized adjustment, vandalism and theft.
- Conforms to ASHRAE / ANSI Standard 102-1983.

Valve Features

- RA-2000 valves are fitted with a packing gland assembly that is replaceable while the system is in operation. The packing gland is fitted with a grease cup to ensure the o-ring packing is lubricated for life.
- Sturdy EPDM rubber valve disc provides a positive seal against the valve seat at differential pressures of up to 20 PSI in Hydronic hot water heating systems.
- Plastic cap supplied to protect the valve pushpin can provide manual control of the valve during installation. If manual operation is required, a separate hand knob is available as an accessory.
- Conforms to ASHRAE / ANSI Standard 102-1983.

RA2000 Operators


Standard Valve Mounted
Dial and Sensor



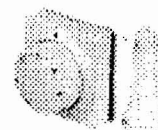
Standard Valve Mounted
Dial with Remote Sensor



Tamper Resist. Valve Mtd.
Dial and Sensor



Tamper Resist. Valve Mtd.
Dial w/ Remote Sensor



Combined Remote Mtd.
Dial and Sensor



Separate Remote Mtd.
Dial and Sensor

RA2000 Valve Bodies


Straight FPT x MPT
Union Tailpiece



Angle FPT x MPT
Union Tailpiece



Side Mount Angle
FPTxMPT Union Tailpiece



Straight Double
Solder Union

Technical Specifications

Hydronic Hot Water Systems

Maximum Temperature:	250°F
Maximum Static Pressure:	145 psi
Maximum Test Pressure:	232 psi
Max. Diff. Pressure (water):	20 psi
Max. Sensor Temperature:	140°F
Adjustable Temp. Range:	45-86°F (7-30°C)

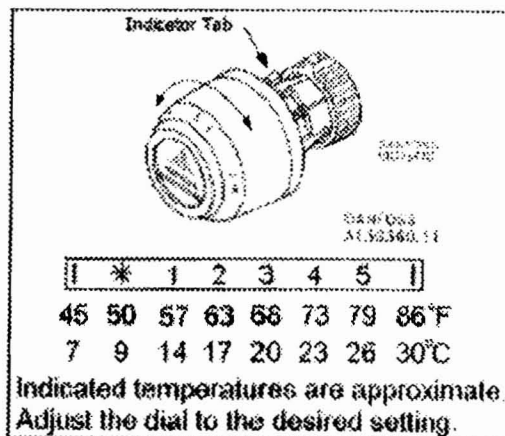
Two-Pipe Low-Pressure Steam Systems

Maximum Temperature:	250°F
Maximum Test Pressure:	232psig
Maximum Steam Pressure:	15psig
Max. Sensor Temperature:	140°F
Adjustable Temp. Range:	45-86°F (7-30°C)

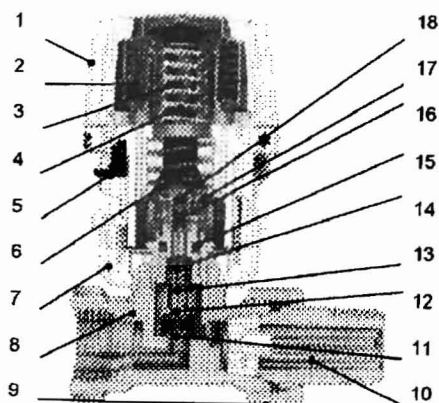
Comfort Control

Control of the space temperature at a comfortable level is easily accomplished by adjusting the dial clockwise or counter-clockwise. The dial has a numbered scale of 1 to 5 corresponding to temperatures of approximately 57°F to 79°F (14°C to 26°C).

Should the space be vacant for an extended period or if the room is to be aired, the dial can be set to the "*" symbol for freeze protection (50°F or 9°C) to save energy.



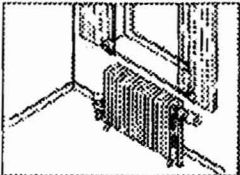




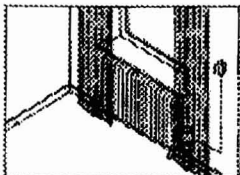




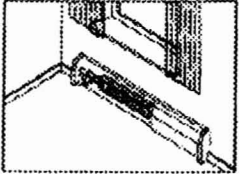




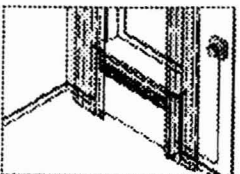




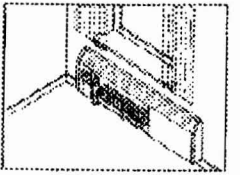




Design and Function



The RA 2000 thermostatic operator consists of a saturated vapor charged bellows and a setting dial. The dial is set to the position equal to the desired temperature. When the ambient temperature lowers, the pressure from the bellows will reduce, allowing the valve to open. A rise of temperature increases the pressure in the bellows closing the valve. The balanced pressures between the adjustment spring and the bellows ensure a smooth and modulating operation of the valve. Danfoss RA 2000 are manufactured to the highest quality standards in an ISO 9001 factory.

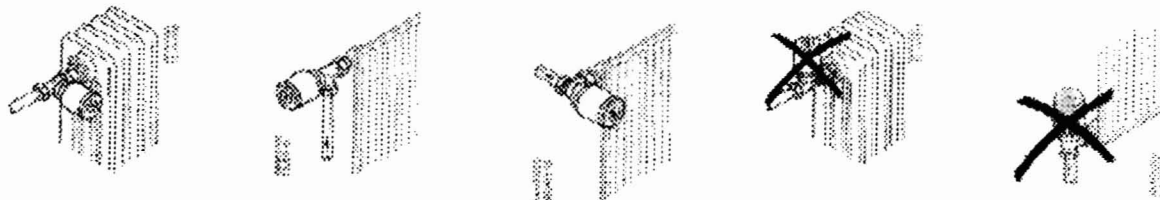
No.	Description
1	Operator setting dial (ABS)
2	Vapor charged bellows
3	Safety spring (steel)
4	Adjustment spring (steel)
5	Locking/limiting pin (steel)
6	Pressure spindle (plastic)
7	Snap-on mounting ring
8	Valve body (nickel plated brass)
9	Union nut (nickel plated brass)
10	Tailpiece (nickel plated brass)
11	Valve disc (EPDM)
12	Valve spindle (brass)
13	Valve spring (stainless steel)
14	Back seat washer (EPDM)
15	Valve bonnet (brass)
16	Pressure pin (stainless steel)
17	Packing o-ring (EPDM)
18	Packing gland (DRZ brass)

Application

Typical Installation Configuration	=	Operator Type	+	Valve Type
 <p>Free-Standing Radiators The freestanding hot water or low-pressure steam radiator is located where air circulation is unobstructed and passes freely over the operator.</p>	=	 <p>Valve-mounted dial and sensor, standard or tamper-resistant models. Always install these operators in a horizontal position.</p>	+	   <p>Straight, Side-Mount Angle or Double Solder Union</p>
 <p>Free-Standing Radiators Freestanding hot water or low-pressure steam radiator. Air circulation <i>does not</i> pass freely over the operator due to furniture, drapes, coverings, etc.</p>	=	 <p>Valve-mounted dial with remote sensor, standard or tamper-resistant models. The sensor can be mounted on a wall up to 6 feet away in a location free of drafts.</p>	+	   <p>Straight, Angle, Side-Mount Angle or Double Solder Union</p>
 <p>Baseboards/Convectors The hot water or low-pressure steam fin-tube baseboard or convactor is located where air circulation is unobstructed and passes freely over the operator.</p>	=	 <p>Valve-mounted dial and sensor, standard or tamper-resistant models. Always install these operators in a horizontal position.</p>	+	   <p>Straight, Side-Mount Angle or Double Solder Union</p>
 <p>Baseboards/Convectors Hot water or low-pressure steam fin-tube baseboard or convactor. Air circulation <i>does not</i> pass freely over the operator due to furniture, drapes, coverings, etc.</p>	=	 <p>Combined remote mounted dial and sensor. The dial operators are wall mounted and are available with 6', 16' or 26' long capillary tubes.</p>	+	   <p>Straight, Angle, Side-Mount Angle or Double Solder Union</p>
 <p>Baseboards/Convectors The hot water or low-pressure steam fin-tube baseboard or convactor arrangement requires the dial and sensor to be mounted separately, away from the valve.</p>	=	 <p>Separate remote mounted dial and sensor. The remote dial mounts on the wall or enclosure (max. 6' away). The sensor is mounted beneath the radiation or on a draft free wall 6' away from the dial.</p>	+	   <p>Straight, Angle, Side-Mount Angle or Double Solder Union</p>

IMPORTANT: Install operators with valve mounted sensors horizontally.

If mounted vertically, the operators will sense heat radiating upwards from the termination unit and make an inaccurate determination as to space temperature.



Ordering Information

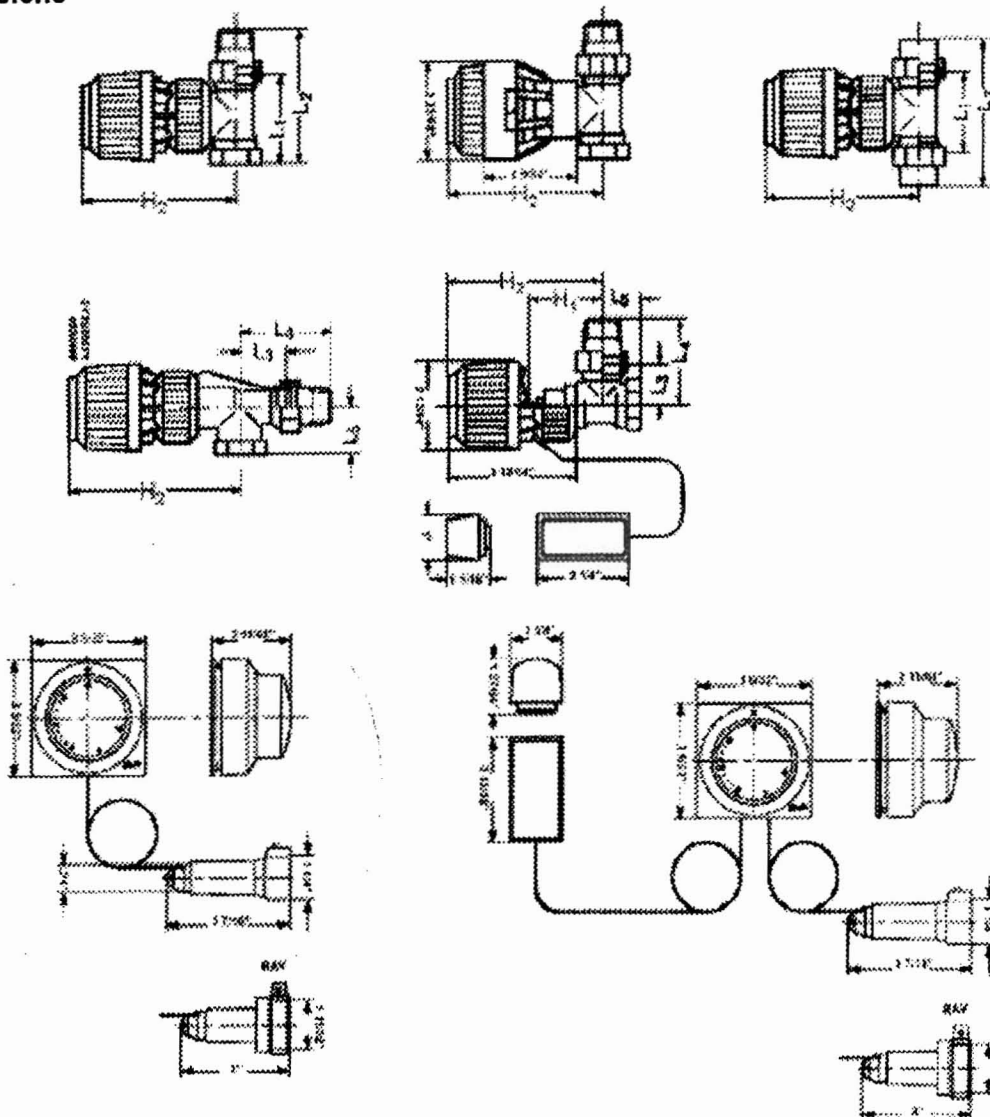
RA 2000 Operators				
Symbol	Code No.	Description	Sensor	Capillary
	013G8250	Valve mounted dial & sensor	Built-in	-
	013G8252	Valve mounted dial with remote sensor	Remote	6'
	013G8240	Valve mounted dial and sensor, tamper-resistant	Built-in	-
	013G2922	Valve mounted dial with remote sensor, tamper-resistant	Remote	6'
	013G8562	Combined remote mounted dial & sensor*	-	6'
	013G8565	Combined remote mounted dial & sensor*	-	16'
	013G5068	Combined remote mounted dial & sensor	-	26'
	013G8564	Separate remote mounted dial and sensor*	Remote	6' + 6'

* Includes socket for use on RAV, KOVM, and VMT valve bodies.

RA 2000 Valves					
Symbol	Code No.	Size	Pattern	C _v [†]	Connections (inlet x outlet)
	013G8015	½"	Straight	1.6	FPT X MPT Union Tailpiece
	013G8020	¾"		2.7	
	013G8025	1"		2.8	
	013G8032	1¼"		2.8	
	013G8014	½"	Angle	1.6	FPT X MPT Union Tailpiece
	013G8019	¾"		2.7	
	013G8024	1"		2.8	
	013G8031	1¼"		2.8	
	013G8013	½"	Side Mount Angle	1.6	FPT X MPT Union Tailpiece
	013G8018	¾"		2.1	
	013G8023	1"		2.8	
	013G8030	1¼"		2.8	
	013G8042	½"	Straight	1.6	Double Solder Union
	013G8044	¾"		2.7	

[†]C_v is the water flow rate through the fully open valve at a pressure drop of 1psi. To determine the pressure drop through the valve at other flow rates use the formula: $\Delta P = (Q/C_v)^2$, where Q = water flow in GPM.

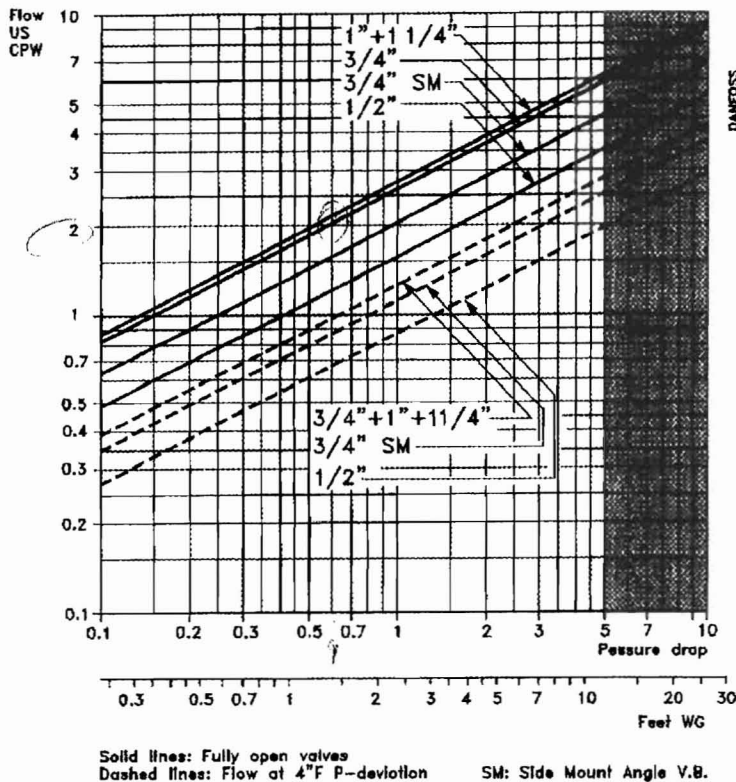
Dimensions



Valve Type	Connection Type	L1	L2	L3	L4	L5	H1	H2
Straight	1/2" NPT	2 5/8"	3 3/4"				1 5/16"	3 3/4"
	3/4" NPT	2 29/32"	4 1/16"				2 1/16"	3 15/16"
	1" NPT	3 17/32"	4 31/32"				2 1/16"	3 15/16"
	1 1/4" NPT	4 1/4"	5 29/32"				2 9/16"	4 1/16"
Angle	1/2" NPT			1 3/16"	2 9/32"	1 1/64"	1 5/16"	3 3/4"
	3/4" NPT			1 11/32"	2 5/8"	1 9/64"	2 1/16"	3 15/16"
	1" NPT			1 9/16"	3"	1 11/32"	2 1/16"	3 15/16"
	1 1/4" NPT			1 3/4"	3 3/8"	1 9/16"	2 1/16"	3 15/16"
Side Mount Angle	1/2" NPT			1 1/8"	2 1/4"	1 1/64"	2 3/8"	4 1/4"
	3/4" NPT			1 11/32"	2 5/8"	1 9/64"	2 1/16"	4 5/16"
	1" NPT			1 9/16"	3"	1 11/32"	2 3/8"	4 1/4"
	1 1/4" NPT			1 3/4"	3 3/8"	1 9/16"	2 3/8"	4 1/4"
Double Solder Union	1/2"	2 5/8"	3 15/16"				1 5/16"	3 3/4"
	3/4"	2 15/16"	4 5/8"				2 1/16"	3 15/16"



Capacity



Hydronic Hot Water Applications

Example:

Flow Required: 0.65 USgpm

Pipe Size: 1/2"

Solution: Draw a line from 0.65 USgpm until it intersects with the dashed line for the 1/2" valve. Draw a vertical line down to find the additional system pressure drop due to the valve will be 0.6psi.

Note: For best control, select valve based on 4°F P-deviation and maximum 5psi pressure drop. P-deviation is the difference between the thermostat setting and the actual space temperature. For best comfort control and long life, valves should be selected to provide design flow at a 4°F P-deviation. The shaded area represents differential pressure above those recommended for quiet operation. The maximum differential pressure ratings indicate the maximum pressure at which valves regulate satisfactorily. In order to prevent noise, pumps that provide only the required pressure should be recommended. Experience shows that in most systems a differential pressure of 0.5 - 2.5psi across the valve is sufficient to provide the required flow.

Low Pressure Steam Applications

Step-by-step selection technique

1. Before selecting valves, consider P-deviation.
2. Check that system pressure is below 15psig.
3. Determine load requirements for each valve.

Example:

Design load: 28MBH
Pipe Size: 3/4"
P-deviation = 4°F

Solution:

From the table below a 3/4" valve will provide 28MBH at a 4°F P-deviation at a pressure drop of 3psi. If the system pressure is 3psi or greater a 3/4" valve can be used.

Pressure Drop		1 psig		2 psig		3 psig		4 psig		5 psig	
P-Deviation °F		4	Fully open	4	Fully open	4	Fully open	4	Fully open	4	Fully open
Valve Size	Rating Code										
1/2"	MBH	10	16	14	22	16	28	20	32	35	62
3/4"	MBH	15	30	20	40	28	50	32	58	60	108
1" & 1 1/4"	MBH	18	40	25	52	30	60	36	72	66	140

Conversion Factors:

Sq. ft. EDR to Btu/hr = Sq. ft. EDR x 240 (steam)

Btu/hr to Sq. ft. EDR = Btu/hr ÷ 240

1 MBH = 1,000 Btu/hr

Rating Abbreviations:

MBH = Thousands of Btu/hr.


EDR = Equivalent Direct Radiation


Important

P-deviation refers to the difference between the thermostat setting and the actual space temperature. For best comfort and long life, valves should be selected which provide the design heating load at approximately a 4°F P-deviation.

Spare Parts and Accessories

	Code No.	Description
RA-2000 Valve Mount Operators 013G8250 013G8252 013G8240 013G2922	013G1236	Screwdriver tool set
	013G1215	Limitation pins for RA 8250/52 (30 pcs)
	013G1237	Limitation pins for tamper resistant operators RA 8240 / 2922 (30 pcs)
	013G5245	Anti-theft protection clips for RA 8250/52 (20 pcs)
	013G1232	Locking screw plugs for tamper resistant operators RA 8240 / 2922 (50 pcs)
	013G1672	Cover plate for scale window of tamper-resistant operators (20 pcs)
	013L1239	Staple gun for securing of capillary tube

RA Socket for RA-2000 Wall Mount Operators 013G8562 013G8565 013G5068 013G8564			
	Position No.	Description	Code No.
	1	Socket Body for RA-2000	013G5191
	2	Bellows Holder (set of 2 pcs)	013G5503

RAV Socket for RA-2000 Wall Mount Operators 013G8562 013G8565 013G5068 013G8564			
	Position No.	Description	Code No.
	1	Socket Body for RAV, VMT, and KOVM	013G5193
	2	Bellows Holder (set of 2 pcs)	013G5503

	Code No.	Description
RA-2000 Valve Bodies	013G0290	Packing gland
	013G5002	Manual adjustment handle (Water applications only)
	013-7045	Gasket for RA valves
	013G8070	RA to RA 2000 adapter
	013G8072	RAV to RA 2000 adapter

WARNING: Brass products such as Danfoss thermostatic radiator valves should not be installed in hydronic or steam heating systems that are being treated with medias that contain, or that during the process of treatment could develop, agents aggressive to brass. In concentrations larger than shown, agents such as Ammonia (0.2mg/l), Mercury (0.01mg/l), Oxygen (0.01mg/l), Carbon Dioxide (0.05mg/l), or Chloride (20mg/l) must be avoided. Further the pH-value of the medium in contact with the brass products should not exceed 9.5.

Neglecting the above restrictions may in some circumstances cause damage to the brass in the valve allowing the heating fluid to escape, possibly scalding any bystanders.

Note: To avoid internal damage and void the warranty, mineral oils must not come in contact with EPDM valve components.

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FLOORA



Fan-C-Lect 5.36

EF-3
ME DISTRICT COURT

Model: VEDK06J2

SPUN ALUM PRV-CENT

Qty: 1

Air Performance

70 Deg F @ 0 ft

CFM 200

S.P. 0.500 SP

Bhp 0.06

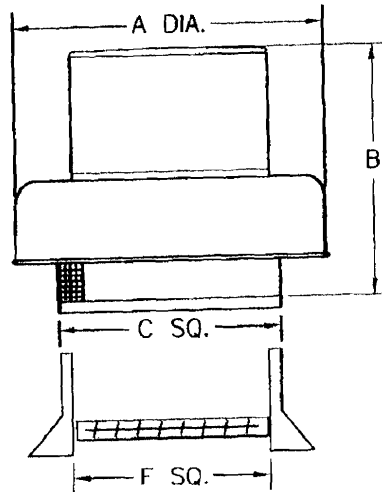
RPM 1350

Motor Details

H.P. 1/8

TYPE ODP

ELEC 120v/1ph



Dimensions

A	25 3/4 "
B STD	13 3/8 "
B EXT	21 7/8 "
C	15 1/2 "
F	11 "
Curb OD	14 "
Weight	30 lb

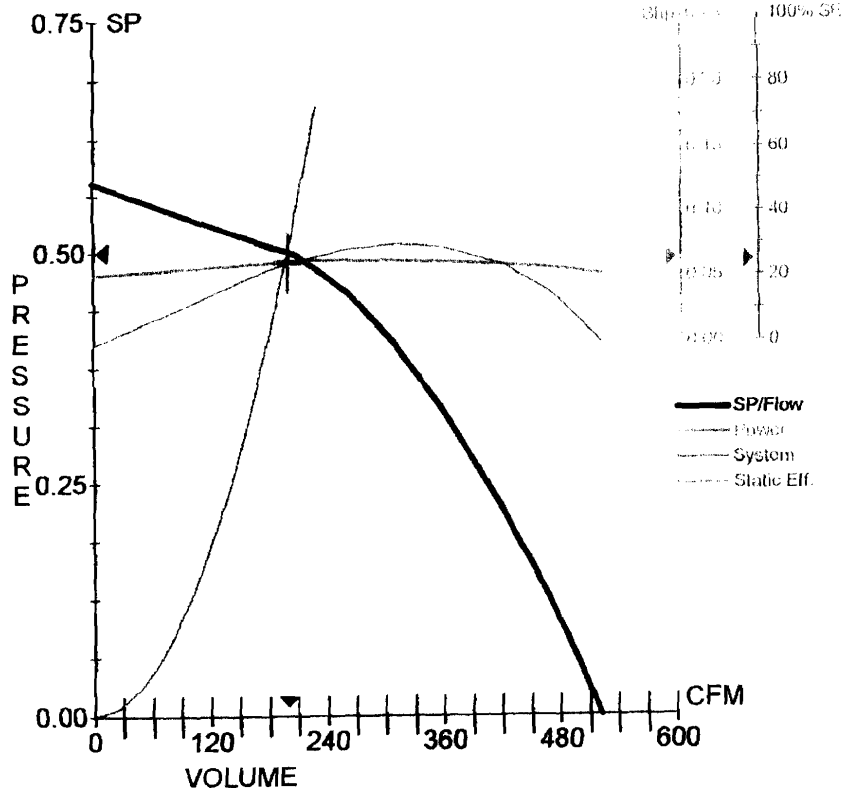
Standard Features

- Spun and shaped aluminum housing, mill finish standard
- Integral motor overload protection on all standard single phase motors
- Disconnect switch on all motors except explosion proof
- Ventilated motor compartment with motor out of airstream
- Non-overloading, backwardly inclined wheel
- Isolated, suspended motor wheel-drive assembly
- 2-speed motors include 2 separate disconnect switches

Sound Data

Octave Band								LwA	Sones
1	2	3	4	5	6	7	8	65	7.1
77	68	65	60	62	55	51	46		

(dB re 10⁻¹² watts)



Fan Options Selected

- UL 705 Listed
- Spark Resistant Construction
- Galvanized Birdscreen
- Mill Finish (Default) - 20
- Standard Disconnect

Accessories Selected

- Curb - 14" Standard Galv
- Damper - Automatic

Kitchen
115 volt.



Fan-C-Lect 5.36

EF-1,2
ME DISTRICT COURT

Model: VEDK06J2

SPUN ALUM PRV-CENT

Qty: 2

Air Performance

70 Deg F @ 0 ft	
CFM	350
S.P.	0.500 SP
Bhp	0.09
RPM	1514

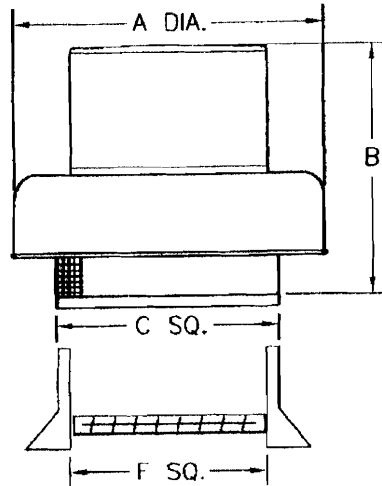
Motor Details

H.P.	1/8
TYPE	ODP
ELEC	120v/1ph

Sound Data

Octave Band								LwA	Sones
1	2	3	4	5	6	7	8		
78	71	65	61	62	56	53	48	66	7.6

(dB re 10⁻¹² watts)



Dimensions

A	25 3/4 "
B STD	13 3/8 "
B EXT	21 7/8 "
C	15 1/2 "
F	11 "
Curb OD	14 "
Weight	30 lb

Standard Features

- Spun and shaped aluminum housing, mill finish standard
- Integral motor overload protection on all standard single phase motors
- Disconnect switch on all motors except explosion proof
- Ventilated motor compartment with motor out of airstream
- Non-overloading, backwardly inclined wheel
- Isolated, suspended motor wheel-drive assembly
- 2-speed motors include 2 separate disconnect switches

Fan Options Selected

- UL 705 Listed
- Spark Resistant Construction
- Galvanized Birdscreen
- Mill Finish (Default) - 20
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Accessories Selected

- Curb - 14" Standard Galv
- Damper - Automatic

11500it
Bath Rm
Electrical Rm

