

VANCOUVER HOSPITAL & HEALTH SCIENCES CENTRE

CENTENNIAL PAVILION

FOUNDATION OFFICE RENOVATION

VANCOUVER, B.C.

MECHANICAL SYSTEMS OPERATING AND MAINTENANCE MANUAL

OWNER:

VHHSC
855 West 12th Avenue
Vancouver, B.C. V5Z 1M9

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CEI
Architecture, Planning Interiors
200 31 Water Street
Vancouver, B.C. V6B 4M3
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Earth Tech (Canada) Inc.
300-4170 Still Creek Drive
Burnaby, B.C. V5C 6C6
Phone: 604-298-6181 Fax: 604-294-8597

GENERAL CONTRACTOR:

Jenwest Construction (1983) Ltd.
1747 Shannon Court
Coquitlam, B.C. V3J 6C7
Phone: 604-931-7345 Fax: 604-939-3050

MECHANICAL CONTRACTOR:

Kerrisdale Heating and Sheet Metal
(1971) Ltd.
5445 West Boulevard
Vancouver, B.C. V6M 3W5
Phone: 604-266-2720 Fax: 604-266-7441

MANUALS PREPARED BY:

K.D. Engineering Co.
239 East 6th Avenue
Vancouver, B.C. V5T 1J7
Phone: 604-872-8651 Fax: 604-872-0281
E-mail: Manuals@teamKD.com

OPERATING AND MAINTENANCE MANUAL

INTRODUCTION

The intent of this manual is to familiarize the maintenance personnel with the operation, routine maintenance, and minor troubleshooting of the various mechanical systems installed in the building.

Included are the minor repairs and adjustments guidelines necessary to maintain the mechanical systems operating in a satisfactory manner. Used properly, the instructions included in this manual will extend the useful life of the mechanical equipment in the building, prevent breakdowns and maintain fuel and power efficiency.

No attempt has been made concerning instructions for maintenance or repair of components, which might require the services of specialized technicians and the use of the special tool or instrument.

Contact your local Mechanical Contractor, or Balancing Agency to obtain information on specialized maintenance literature, tools and service provided.

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J

**DRAFT**

SUPPLIERS & SUB CONTRACTORS LIST

AIR TERMINALS, FANS:

E.H. Price Ltd.
#118-7400 MacPherson Avenue
Burnaby, B.C. V5J 5B6
Phone: 454-0551 Fax: 454-9144

**PLUMBING FIXTURES AND PIPING
EQUIPMENT:**

Cronkhite Supply Ltd.
1234 Napier Street
Vancouver, B.C. V6A 2H6
Phone: 604-254-5131 Fax: 604-254-1041

INSULATION:

AARC-West Mechanical Insulation Inc.
109-42 Fawcett Road
Coquitlam, B.C. V3K 6X9
Phone: 604-524-4855 Fax: 604-524-4857

FIRE PROTECTION SYSTEM:

Vipond Fire Protection Inc.
2441 United Boulevard
Coquitlam, B.C. V3K 6A8
Phone: 604-464-3473 Fax: 604-464-3471

CONTROLS:

Energrated Systems Consultants Ltd.
17850 56th Avenue
Surrey, B.C. V2S 1G7

Phone: 604-574-7790 Fax: 604-574-7793

**BALANCING AGENCY
& MANUALS COMPILED BY:**

K.D. Engineering Ltd.
239 East 6th Avenue
Vancouver, B.C. V5T 1J7
Phone: 604-872-8651 Fax: 604-872-0281
E-mail: Manuals@teamKD.com

PLUMBING CONTRACTOR:

Alma Plumbing & Heating Ltd.
2103 Graveley Street
Vancouver, B.C. V5L 3B8
Phone: 604-251-2824 Fax: 604-251-2862

SHEET METAL CONTRACTOR:

Kerrisdale Heating and Sheet Metal
(1971) Ltd.
5445 West Boulevard
Vancouver, B.C. V6M 3W5
Phone: 604-266-2720 Fax: 604-266-7441

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SYSTEMS DESCRIPTION

INTRODUCTION

The intent of the following Systems Description is to familiarize the building operators and/or maintenance personnel with systems and the components of such systems installed in this project.

These Systems Description describe the type and purpose of each system along with a list of the system components and their locations.

The system operation and controls are briefly described or a reference is given to the controls system documentation contained in the Control System section (supplied by the Control Subcontractor) of the Operating and Maintenance Manual.

NOTE: These Systems Description have been written only as a general guide. The responsibility for obtaining additional detailed information regarding specific operational information remains with the building operators and/or maintenance personnel by researching the documentation contained throughout the Operating and Maintenance manual.

FAN SYSTEMS

For fan type, location, service and controls, refer to the following description:

TAG	TYPE	DRIVE	LOCATION	GRIDLINES	SERVICE	CONTROL
EF-1	Cabinet	Direct	Lunchroom	A/15	Lunchroom	Speed Switch
EF-2	Ceiling	Direct	Fax/Copy Storage	B/15	Fax/Copy Storage	Speed Switch
EF-3	Cabinet	Direct	Spare Workstation	C/16-18	Conference Room	Speed Switch
EF-4	Ceiling	Direct	Conference Room	C/16	Meeting Room	Speed Switch

HEAT PUMP FC-1 SYSTEMS

Heat Pump FC-1 is an existing water source heat pump, which serves Renovated Foundation Offices of VGH Centennial Pavilion.

Heat Pump FC-1 is located ceiling suspended above Spare Workstation near gridlines C-D/16-18.

Heat Pump FC-1 is essentially comprised of the following system components:

- FC-1 return air intake.
- FC-1 filter section.
- FC-1 water source coil section, (served by the building heat pump water loop).
- FC-1 refrigerant side coil section, (served by the heat pump condensing section).
- FC-1 supply fan section.
 - Supply air ductwork system.
 - Supply air outlets.

Return air from the served space is drawn into the heat pump, filtered, conditioned, and discharged back into the served space through supply air ductwork and supply air outlets.

Heat Pump FC-1 is controlled by local wall mounted thermostat to maintain room temperature at setpoint.

EXISTING SUPPLY AIR SYSTEM ADDITION

Existing supply air system has been extended to serve Foundation Office Renovations of VGH Centennial Pavilion. New ductwork and supply outlets have been installed.

New ductwork installed is connected to the existing duct near grid B/16.

MAINTENANCE AND LUBRICATION SCHEDULES

INTRODUCTION

The following maintenance and lubrication schedule is classified as “Preventive Maintenance” and does not cover major repairs and overhaul. Refer to the manufacturer’s product data for detailed maintenance instructions. Good preventive maintenance (PM) depends, to a large degree, on good housekeeping, constant observation and comparison, and a conscientious operating and maintenance staff. It also depends on having a planned PM program and making sure the program is followed. Part of the PM program is to inspect by looking, listening, feeling, wiping, and cleaning. If these tasks are seriously carried out, many developing problems can be detected and corrected before they become serious.

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The PM schedules, as made up, are based on the manufacturer’s recommendations and good PM practices. They are not inflexible, however, and may be modified by the operating and maintenance staff as directed by experience and management policy.

It is recommended that all indicating gauges have their normal operating ranges clearly identified to facilitate rapid checking for deviations from normal conditions.

It is further recommended that a daily logbook be kept. In this logbook, record such things as: daily temperature and pressure readings, dates of equipment lubrication, filter changes, and belt replacements. As well, record the occurrence and nature of problems and the action taken to correct these problems.

NOTE: The daily, weekly, monthly, quarterly, semi-annual and annual schedules should be carried out regardless of whether they coincide or not.

INDEX

PAGE NUMBER

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UNIT: **AIR TERMINALS (GRILLES, DIFFUSERS, REGISTERS, LOUVERS, DAMPERS)**

MAKE: **EH PRICE, NCA**

MODEL: **VARIOUS**

O & M MANUAL SECTION: **F**

MAINTENANCE:

-Always turn equipment/system off when carrying out maintenance or cleaning grilles/registers, diffusers, etc.

ANNUAL ROUTINE:

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-When fitted, remove grille/register from auxiliary frame. Unit may be cleaned by rinsing in warm soapy water; dry thoroughly with a soft cloth. When a damper is annexed to the grille, carry out the same cleaning procedure as above and on completion of drying, the moving parts may be lightly lubricated with a clear (vasoline) lubricant. If necessary, units that cannot be removed from their installed location may be washed and dried in site using warm soapy water and a soft cloth for drying.

-NOTE: The balanced damper position should be noted and reset after cleaning on grilles/registers fitted with in-face dampers.

-Inspect fire damper fusible link. Broken fire damper link should be replaced with link of the same temperature rating.

453 WEST 12TH
VANCOUVER, B.C. V5Y 1V4
TEL : 673-7601 FAX : 873-7100



CITY OF VANCOUVER



DATE ISSUED OCTOBER 10, 2001	PERMIT TYPE SPRINKLER PERMIT	PERMIT NUMBER P SP 414855
--	--	-------------------------------------

LEGAL DESCRIPTION LOT BLOCK PLAN DIST	ADDRESS 855 W 12TH AV
ADDITIONAL ADDRESS INFORMATION RELATO PROJECT 801 W 12TH AV	SPECIFICS MAIN FLOOR
APPLICATION DATE OCT 10, 2001	PURPOSE SPEC INSP
TEMPORARY PERMIT DATES	TEMPORARY USE DATES
	PLACE NAME VGH-CENTENNIAL PVL
	SUBTYPE

APPLICANT CONTRACTOR VIPOND FIRE PROTECTION LTD. 2441 UNITED BOULEVARD COQUITLAM BC V3K 6A8	CONTACT 1	CONTACT 2	CONTACT 3
TEL: 464-3473 TEL: 464-3471	BUS. LICENSE 210990 CERTIFICATE	TEL: FAX:	BUS. LICENSE CERTIFICATE

PERMIT CONDITIONS AND NOTES:

001 THE WORK UNDER THIS PERMIT IS AUTHORIZED PURSUANT TO THE BUILDING BY-LAW AND THE PLUMBING BY-LAW.
 005 Piping must be accessible until inspected.
 011 The contractor shall provide the owner with:
 a) Instruction charts describing operation and proper maintenance of sprinkler devices.
 b) Publication titled NFPA 13A, "Recommended practice for the inspection, testing and maintenance of sprinkler systems."
 012 Consult other NFPA Standards for additional installation requirements.

GENERAL USE	SPECIFICS/LOCATION	AREA (SF)	OCC	GENERAL USE	SPECIFICS/LOCATION	AREA (SF)	OCC
N40 HOSPITAL	MAIN FLOOR						

RELATED PERMITS: * BU418089 ALTER 855 W 12TH AV
 APPROVALS REQUIRED BEFORE PERMIT IS COMPLETED INCLUDE: P104 PLUMBING/GAS INSP TED HAY 873-7659

ADDITIONAL NOTES:

005 a) Scope of this permit limited to minor sprinkler alteration on one floor or level of a building only.
 b) 20 sprinklers maximum including all changes, additions and relocations. Sprinklers to be same make and size as original.
 c) A written certification by a professional engineer and/or submission of record drawings may be required if work exceeds the above scope, or substantial changes to the design of existing systems is evident.
 d) The applicant is advised that any sprinkler alteration work must be carried out by a qualified sprinkler fitter.

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CITY OF VANCOUVER
COMMUNITY SERVICES
Licences and Inspections Department

SP 414855

Oct 11 2001

Coverage accepted
ok for occupancy

[Signature]

INSPECTOR

WITHIN THIS DOCUMENT AND ASSOCIATED DOCUMENTS
IN ACCORDANCE WITH ALL RELEVANT BY-LAWS AND STATUTES.

I ACKNOWLEDGE THAT RESPONSIBILITY FOR BY-LAW COMPLIANCE RESTS WITH THE OWNER AND THE OWNER'S EMPLOYEES, AGENTS AND CONTRACTORS. I WILL INDEMNIFY AND SAVE HARMLESS THE CITY OF VANCOUVER, ITS OFFICIALS, EMPLOYEES AND AGENTS AGAINST ALL CLAIMS, LIABILITIES AND EXPENSES OF EVERY KIND, IN RESPECT OF ANYTHING DONE OR NOT DONE PURSUANT TO THIS APPLICATION OR FACT SHEET OR ENSUING PERMIT, INCLUDING NEGLIGENCE AND/OR THE FAILURE TO OBSERVE ALL BY-LAWS, ACTS OR REGULATIONS.

DESCRIPTION 522 SPRINKLER INSPECTN	AMOUNT 103.00	FEE	AMOUNT	SIGNATURE <i>[Signature]</i>
INVOICE: 266343				DATE
TOTAL \$103.00				ISSUED BY D FLEMING
				FOR THE CITY BUILDING INSPECTOR

Shop Drawing Review

Project No: 83701-00 (16) **Date:** May 25, 2001
Project Name VGH Foundation Offices
Equipment: Thermafusers **Supplier:** Cronkhite Supply
Shop Drawing Date: May 17, 2001

Engineer's review is for general compliance with contract documents. The accuracy and completeness of the design, details and dimensions remains the sole responsibility of the Contractors.

Reviewed Revise & Re-Submit
 Reviewed as Noted Not Reviewed

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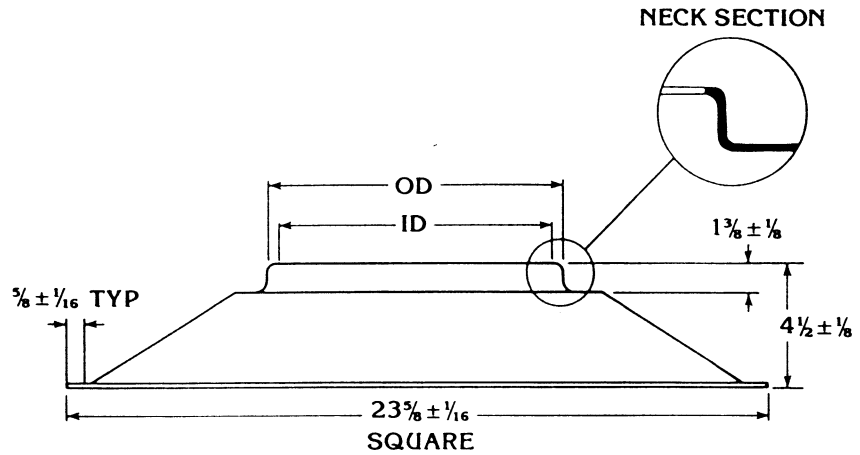
Jeanette Frost B.Sc., A.S.T.

Notes:

1. Provide seismic clips
2. Unit to be suitable for t-bar installation.
3. Number to suit addendum.

DIMENSIONS TB-C, TB-CW and TB-D

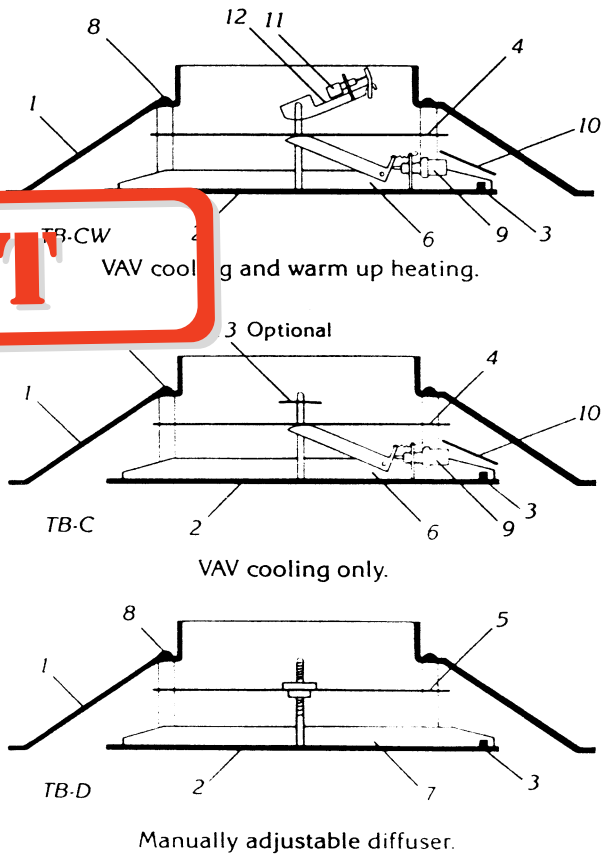
NOMINAL NECK SIZE	INCHES	
	ID $\pm \frac{1}{16}$	OD $\pm \frac{1}{16}$
6"	5 $\frac{3}{16}$	5 $\frac{5}{16}$
8"	7 $\frac{3}{16}$	7 $\frac{5}{16}$
10"	9 $\frac{3}{16}$	9 $\frac{5}{16}$
12"	11 $\frac{3}{16}$	11 $\frac{5}{16}$



PARTS LIST

No.	Description	Acu-therm Part No.	Model & Quantity Per Unit		
			TB-C	TB-CW	TB-D
1	Casing 6" Neck	100			
	8" Neck	101	1	1	1
	10" Neck	102			
	12" Neck	103			
2	Appearance Panel	025	1	1	1
3	Appearance Panel Latch	016	1	1	1
4	Diffusion Disc	036	1	1	1
5	Diffusion Disc	A036D			1
6	Channel Assembly	A002	1	1	
7	Channel Assembly	A002D			1
8	Screws	022	4	4	4
9	Cooling Room Temperature Sensing Element	052	1	1	
10	Scoop	005	1	1	
11	Warm-Up Element	051		1	
12	Warm-Up Assembly 6" Neck	A006			
	8" Neck	A008		1	
	10" Neck	A010			
	12" Neck	A012			
13	Minimum Flow Stop Clip	026	Op-tional	Op-tional	

Parts Location



Headquarters:
2000 Powell Street, Suite 1290 • Emeryville, CA 94608 • (415) 428-1064
Plant:
1766 Sabre Street • Hayward, CA 94545 • (415) 785-0510

TriVar Inc.

7625 Kimbel Street, Unit 22
Mississauga, Ontario L5S 1A9

SOLID STATE VARIABLE SPEED AC MOTOR SPEED CONTROL

Suitable for shaded pole, PSC, or universal motors

FEATURES

- Solid state.
- Easily installed.
- Saves energy and extends life of fan motor.
- Self-contained R.F.I. filtering, complies with CSA radio interference standard.
- Infinitely variable high-to-low clockwise rotation speed control with low speed adjustment/trim control.
- Ideal for overhead ceiling fans, range hoods, bathroom fans, humidifiers, wood and gas fireplace inserts, attic ventilators, air purifiers.
- Made in Canada

SCHEMATIC WIRING DIAGRAM



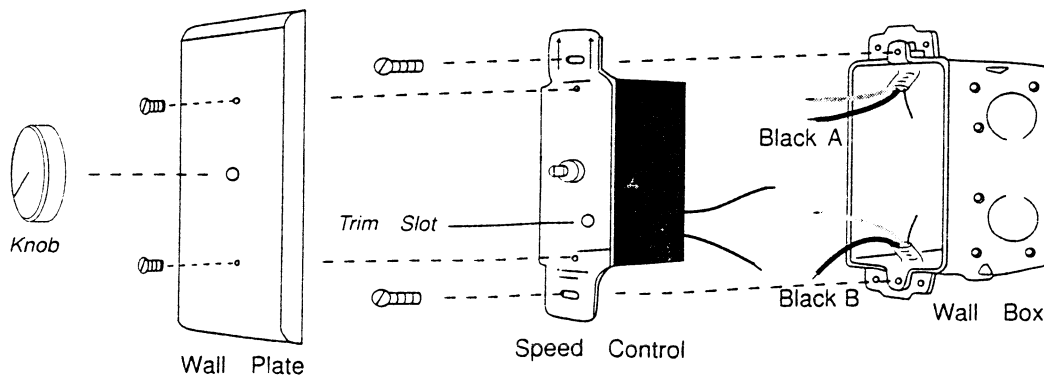
CSA Certified 

UL Listed 

INSTALLATION

1. For safety reasons, **disconnect line voltage before installing or replacing** the motor speed control.
2. Turn control counterclockwise (↺) to off. There will be a click.
3. Connect white wires together
4. Connect one control wire to Black A and the other to Black B
5. Tightly secure wire nuts, leaving no bare wire exposed
6. Secure both ground wires to wall box
7. Re-connect line voltage.
8. Adjust low speed if required, by inserting small screwdriver into trim slot. Turn counterclockwise (↺) to decrease low speed. Turn clockwise (↻) to increase low speed. Note: Use fine adjustment, do not over-adjust.
9. **Caution:** Ensure motor does not stall at minimum speed. Setting too low a start level could cause the motor to stall, and thereby cause damage to the motor and the control.
10. Install wall plate and knob.
11. Note: Motor speed controls may cause a hum at certain speed levels; this can be minimized by adjusting the motor speed to another level.

INSTALLATION DIAGRAM



Warranty: This product is warranted for a period of 12 months after the date of manufacture against defective material and/or workmanship. The manufacturer's sole liability under this warranty is limited to repair or replacement of returned product, subject to the conditions contained herein. The warranty is void at the expiry of the warranty period, or if during the warranty period, the control fails to operate as a result of damage caused by abuse, misuse, inadequate or improper installation. The manufacturer or seller is not responsible for any expense, liability, damage, inconvenience or consequential damage caused by the use or misuse of this product. The purchaser assumes all liability and holds harmless the manufacturer, and its seller, in respect of all losses. Defective units are to be returned to the dealer. Prior to returning goods to the manufacturer, a returned goods number must be obtained; with goods shipped at purchaser's expense. Product returned which, after inspection is found not to be defective, will be returned at purchaser's expense, including an inspection and handling charge. The date of manufacture is stamped on the product in the form of a three digit number denoting the year and month. For example, 502 would indicate manufacture in February 1995.

Shop Drawing Review

Project No: 83701-00 (16) **Date:** May 25, 2001
Project Name VGH Foundation Offices
Equipment: Fans **Supplier:** E.H. Price
Shop Drawing Date: May 17, 2001

Engineer's review is for general compliance with contract documents. The accuracy and completeness of the design, details and dimensions remains the sole responsibility of the Contractors.

Reviewed

Reviewed as Noted

Revise & Re-submit

Not Reviewed

DRAFT

Jeanette Frost B.Sc., A.Sc.T.

Notes:

1. Fans EF-1 and EF-2 are c/w inlet grille. Fans EF-3 and EF-4 are inline fans

SUBMITTAL

Job Name : VHHSC

Location : Vancouver, BC

Engineer : Earth Tech

Contractor : Kerrisdale Heating

Contact :

DRAFT

Phone # :

Date : 5/7/2001

Copies : 10

Submitted by : Harold Rossler

E.H. PRICE LIMITED
#118 - 7400 MacPherson Ave.
Burnaby, B.C., Canada
V5J-5B6

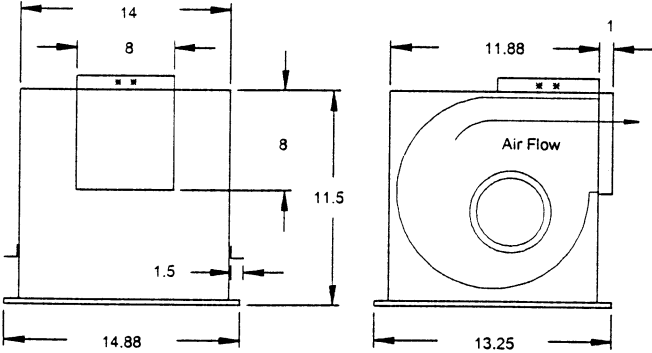
Ph. (604) 454-0551
Fax (604) 454-9144

Notes :

SP Ceiling Exhaust Fan

CONSTRUCTION FEATURES

- Galvanized steel housing
- Sound absorbing insulation
- White designer grille
- Outlet duct collar with integral backdraft damper
- Forward curved wheel
- Plug type disconnect
- Adjustable mounting brackets
- Square duct connection
- Field rotatable discharge



SELECTED OPTIONS & ACCESSORIES

- Motor w/ Thermal Overloads
- UL/cUL-507 - "Electric Fans"
- Solid State Speed Control - 5WSSC, Shipped Loose

** Optional Discharge Position
 NOTES: All dimensions shown are in units of inches
 Fan weight is without accessories

DIMENSIONS

Grille Size (in.)	Approx. Fan Weight (lb.)
12.75 x 14.75	21



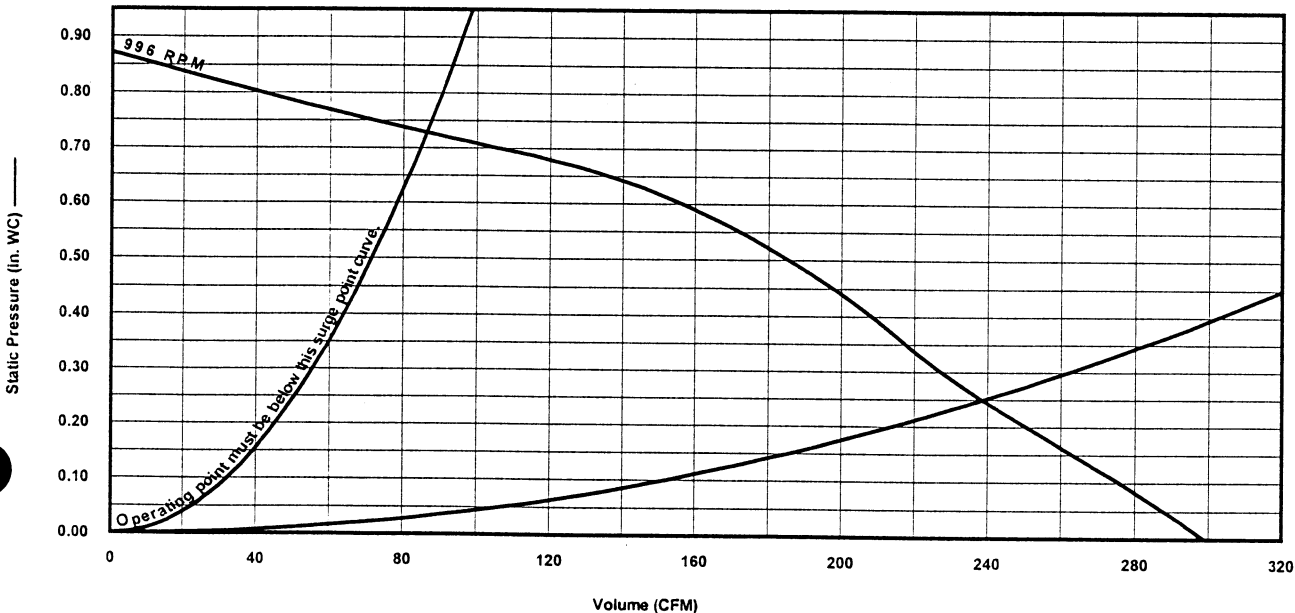
PERFORMANCE (Elevation ft. = 0, Airstream temperature °F)

Qty	Model	Volume (CFM)	Static Pressure (in. WC)	Maximum RPM	Input Operating Power (W)	V/C/P	Motor Information	Enclosure	RPM
1	SP-226	239	0.25	996	81	115/60/1		ODP	1050

SOUND

Inlet Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
61	62	59	54	50	43	38	31	56	45	3.5

LwA - A weighted sound power level, based on ANSI S1.4. dBA - A weighted sound pressure level, based on 11.5 dB attenuation per octave band at 5.0 ft. Sones calculated using AMCA 301 at 5.0 ft.

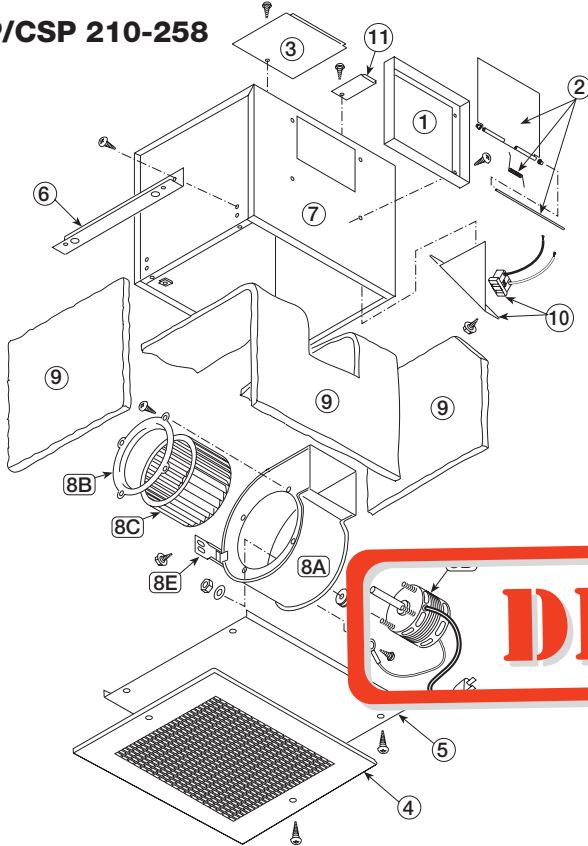




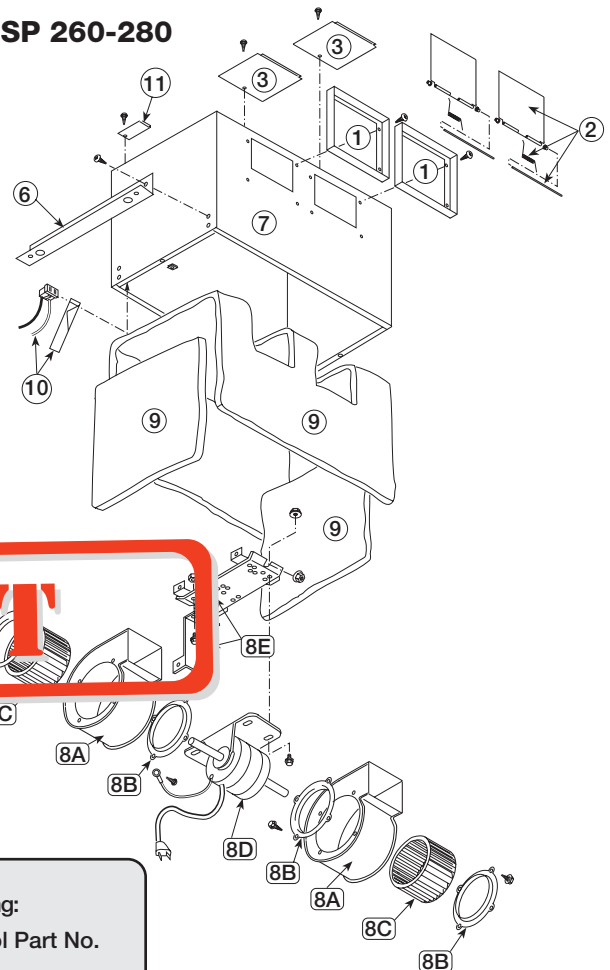
Models SP/CSP Ceiling and Cabinet Fans

Installation, Operation and Maintenance Manual

SP/CSP 210-258



SP/CSP 260-280



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WARNING !

To reduce the risk of fire, electric shock, or injury to persons, observe the following:

- Fan Models SP/CSP 210 - 260 should only be used with fan speed control Part No. KBWC-15K, manufactured by KB Electronics, Inc.
- Fan Models SP/CSP 262 - 275 should only be used with fan speed control Part No. KBWC-112LK, manufactured by KB Electronics, Inc.
- Use this unit only in the manner intended by the manufacturer. If you have any questions, contact the manufacturer.
- Before servicing or cleaning unit, switch power off at service panel and lock service panel to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
- Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
- The combustion airflow needed for safe operation of fuel-burning equipment may be affected by this unit's operation. Follow the heating equipment manufacturer's guideline and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.
- When cutting or drilling into wall or ceiling, do not damage electrical wiring or other hidden utilities.
- This unit is not to be installed directly over a tub or shower.
- Ducted fans must always be vented to the outdoors.

CAUTION

For general ventilating use only.

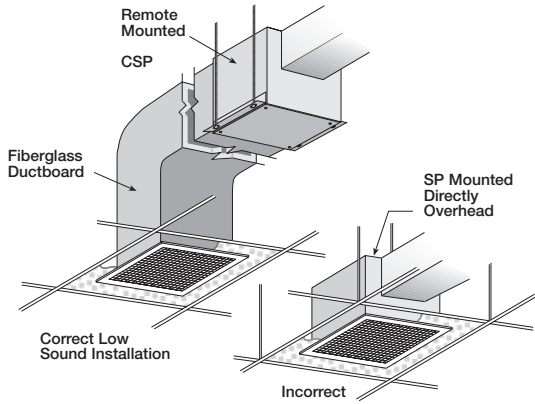
Do not use to exhaust hazardous or explosive materials and vapors.

Parts List

1. Duct Connector
2. Backdraft Damper Assembly
3. Discharge Cover Plate
4. Grille (SP)
5. Bottom Panel (CSP)
6. Mounting Angles
7. Housing
8. Power Assembly:
 - A. Scroll
 - B. Venturi
 - C. Wheel
 - D. Motor
 - E. Drive Frame
9. Insulation
10. Internal Receptacle and Bracket
11. Electrical Junction Cover Plate

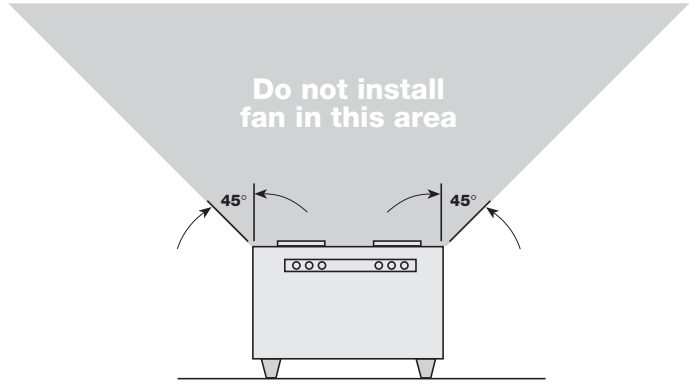
Tools Required - Phillips head screwdriver and wrenches.

Installation Recommendations



Sound and Location

The location of these fans must be taken into consideration before installation. In sound critical installations insulated ductwork, flexible duct connections or placing the fan in a remote section of ductwork are solutions to meeting the required fan sound levels.

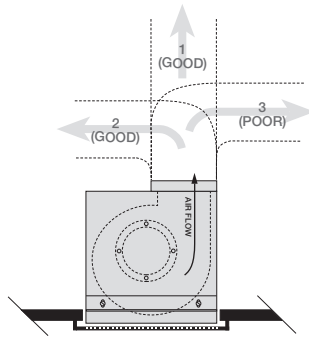


Placement Near Cooking Equipment

These fans are not recommended for cooking exhaust applications. They are designed primarily for low temperature, clean air applications only. The diagram shows the minimum distance these fans should be placed in relation to cooking equipment.

Ductwork and Performance

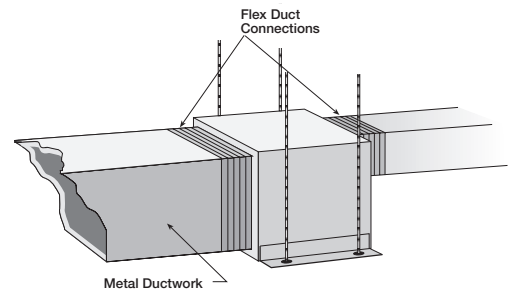
Installation of ductwork is critical to the performance of these fans (see drawing). Straight ductwork (1) or ductwork that turns in the same direction as the wheel (2) is recommended. Ductwork turning opposite the wheel direction (3) will cause turbulence and back pressure resulting in poor performance.



Note: If round duct is to be used, Model RDC (Round Duct Connector) can be purchased from Greenheck that bolt in place of the standard square duct connector.

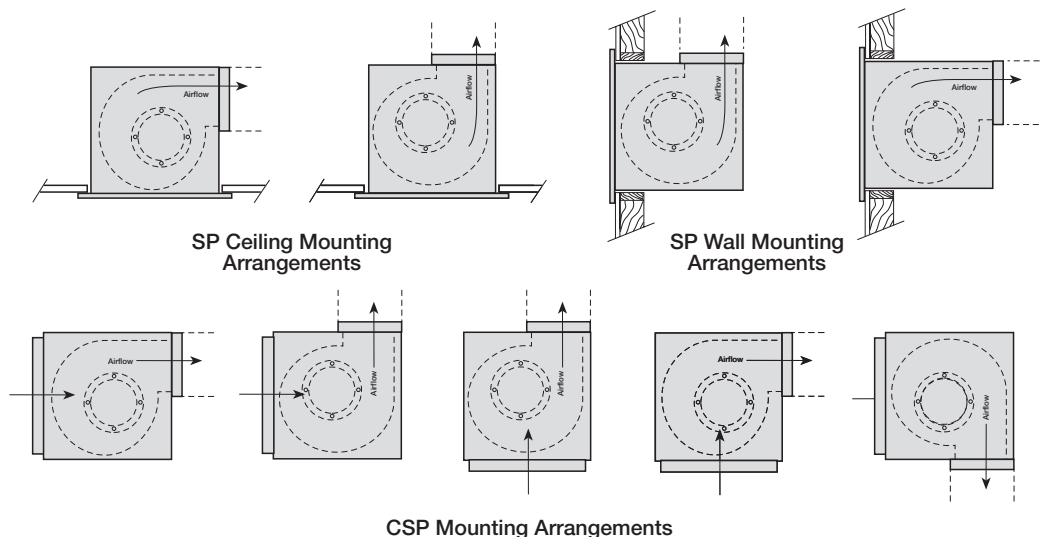
Ductwork and Noise

Fiberglass ductboard is a better choice than metal ductwork for reducing fan noise and is highly recommended for low sound applications. Where metal duct is used, sound transmission can be reduced with flexible duct connections between the fan and the duct.



Mounting Arrangements

This illustration shows some of the many configurations SP and CSP fans can be adapted to by simply changing discharge positions.



Grille and Bottom Panel Installation

Position the grille or bottom panel over the housing opening as shown and secure with fasteners provided.



Filters

The addition of an intake filter is highly recommended for these fans, even in clean air environments excess dirt can accumulate on wheels and motors causing reduced performance and imbalance.

Filters, once installed, should be checked and cleaned periodically to maintain performance.

Greenheck offers washable aluminum mesh filters specifically designed for these fans. Please consult SP/CSP catalog for more information.

Converting Duct Connector to Vertical Discharge

This procedure is for SP/CSP single blower units sizes 210-258. This also applies to double blower units sizes 260-280 with some slight differences in the number of fasteners and type and location of scroll mounting brackets.

- Step 1. Remove duct connector and cover plate. Exchange their positions and secure with fasteners. (See mounting arrangements on page 2.)
- Step 2. Remove grille (SP) or bottom panel (CSP).
- Step 3. Unplug power cord from internal receptacle.
- Step 4. Remove fasteners securing power assembly bracket to housing (2 fasteners for SP/CSP 210-228; 4 for 250-258).
- Step 5. Remove power assembly from housing, taking care not to damage insulation.

For SP/CSP 250-258:

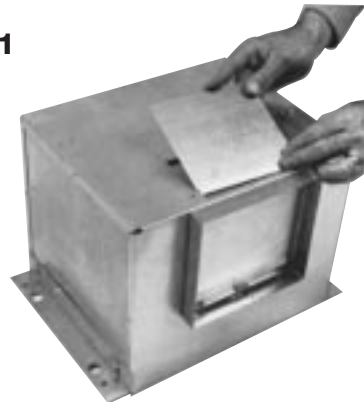
With power assembly removed, remove gusset/bracket assemblies from fan scroll by removing two fasteners on each side (do not disassemble gusset/bracket assembly).

Fasten gusset/bracket assemblies on scroll in position as shown in Photo B (the opposite of original position).

- Step 6. Re-install power assembly (for all sizes).
 - Plug power cord into internal receptacle.
 - Insert power assembly into housing, matching the scroll discharge with the housing duct connector.
 - Replace bracket fasteners and tighten.
- Step 7. Replace grill or bottom panel.

Conversion is complete ready to install.

Step 1



Step 4



SP/CSP 210-228



SP/CSP 250-258

Step 5 (for SP/CSP 250-258 only)



A. HORIZONTAL DISCHARGE



B. VERTICAL DISCHARGE

Step 6



SP/CSP 210-228

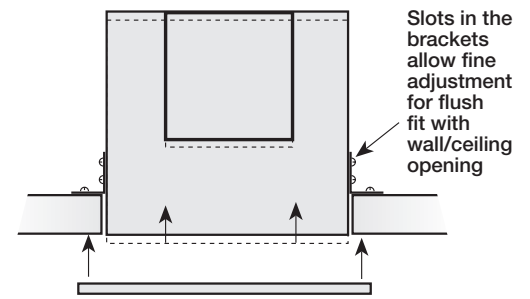
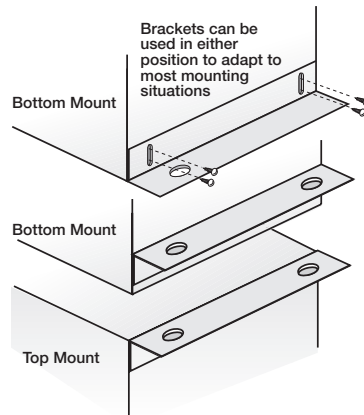


SP/CSP 250-258

Mounting Brackets

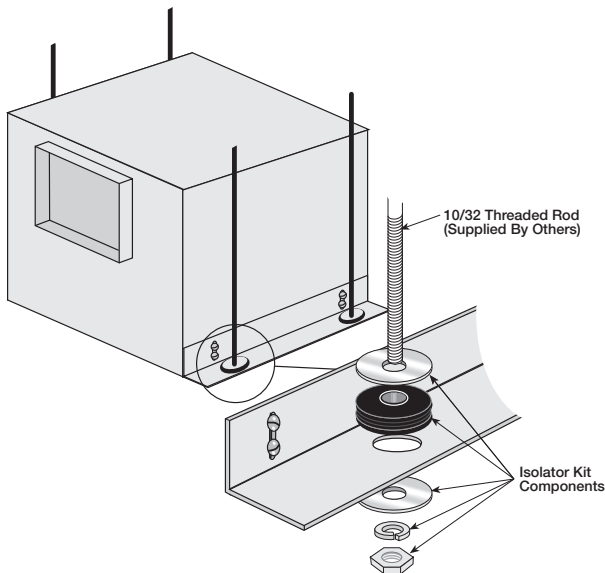
Mounting brackets are convertible to provide a wide range of adjustment for both solid mounting or hanging installations.

Angle mounting holes are slotted where bracket attaches to housing to allow for finer adjustment when installations such as flush mounts in ceilings or walls are required.



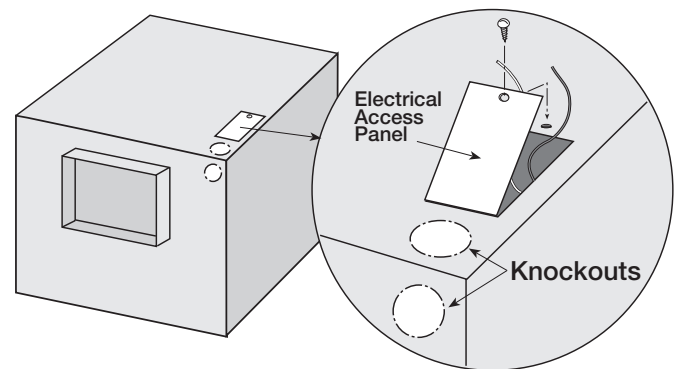
Hanging Vibration Isolators

Isolator kits, available from Greenheck, are highly recommended to insure quiet, vibration-free installations of these fans. The kits consist of items shown except threaded ready rod which is provided by others. Mounting angles are prepunched for these kits.



Electrical Connections

Figure below shows exterior electrical access cover for field wiring. Connect electrical supply conduit through one of the two knockouts illustrated. Connections are made directly to black and white leads, a separate green fastener is provided for ground wire connection. Refasten cover when connections are complete.



Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove to be defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid.

The motor is warranted by the motor manufacturer for a period of one year. Should the motor prove defective during this period, it should be returned to the nearest authorized motor service station.

Greenheck will not be responsible for any installation or removal costs.

General Maintenance Suggestions

Models SP and CSP ceiling exhaust fans require very little maintenance. However, since small problems over time left unchecked could lead to loss of performance or early motor failure, we do recommend that the unit be inspected periodically (once or twice a year).

The fan motor and wheel(s) should be checked for dust and dirt accumulations. (See Filters on page 3). Dirt buildup can lead to loss of performance and motor overheating. Cleaning can be accomplished by brushing off any dust that may have accumulated. Even filtered units can accumulate build up and should be checked when cleaning filters.

The motor should be checked for lubrication at this time. Lubricate only those motors which have an oil hole provided. A few drops of all-purpose oil (SAE 20) will be sufficient.



SP/CSP models shown are UL and cUL listed E 33599 Maximum airstream temperature not to exceed 95°F.



SP/CSP models shown are CSA certified LR-34470 models 210-280

IOM SP/CSP FS
Rev. 2
September 1999

Shop Drawing Review

Project No: 83701-00 (16) **Date:** June 25, 2001
Project Name VGH Foundation Office Renovation
Equipment: Heat Pump **Supplier:** Climate Master
Shop Drawing Date: June 19, 2001

Engineer's review is for general compliance with contract documents. The accuracy and completeness of the design details and dimensions remains the sole responsibility of the Contractors.

DRAFT

- Reviewed Revise & Re-Submit
 Reviewed as Noted Not Reviewed

Jeanette Frost B.Sc., A.Sc.T.

Notes:

1. Co-ordinate with Division 16 for electrical requirements.

Horizontal Dimensional Data

GR Submittal Data

Contractor: KERRISDALE HTG
 Engineer: *EARTH TELH*
 Project: *VGH* Unit Tag: *FC-1*

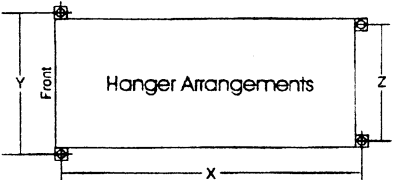
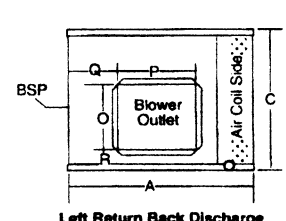
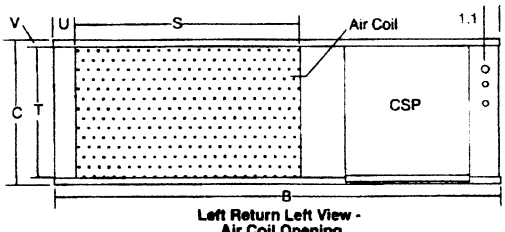
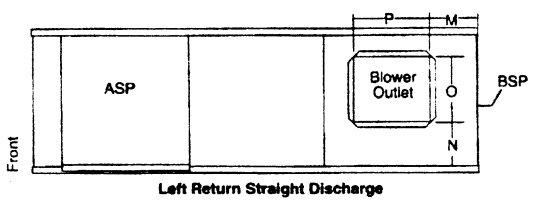
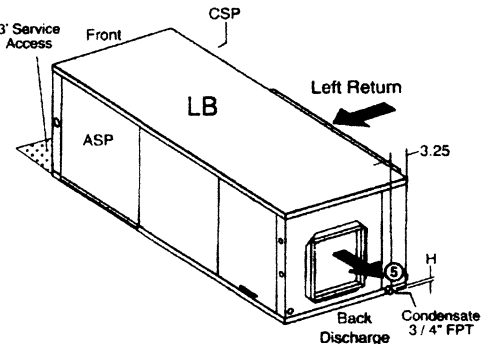
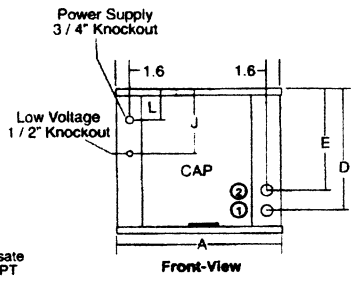
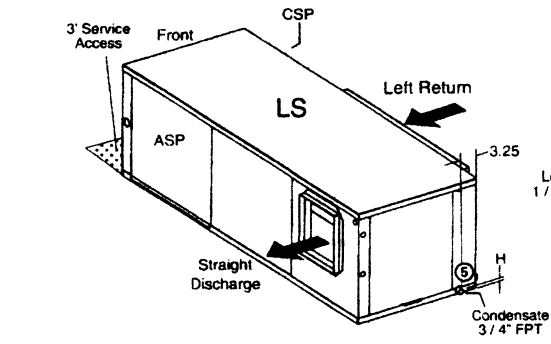
HORIZONTAL MODEL	Overall Cabinet			Water Connections						Electrical Knockouts		Discharge Connections						Return Connections					
	Width	Length	Height	1		2		5		Loop	Condensate	1/2" Low Voltage	3/4" Power Supply	M	N	Supply Height	Supply Depth	Q	R	Return Depth	Return Height	U	V
				In	Out	In	Out	In	Out														
	A	B	C	D	E	H																	
006 009 012	in cm	22.4 56.8	43.1 109.5	11.3 28.7	2.4 6.1	5.4 13.7	0.6 1.5	1/2	3/4	3.5 8.9	8.2 20.8	5.8 14.7	4.0 10.2	5.8 14.7	8.0 20.3	5.8 14.7	1.5 3.8	17.1 43.4	9.3 23.6	2.2 5.6	1.0 2.5		
015 019 024	in cm	22.4 56.8	43.1 109.5	17.3 43.9	2.4 6.1	5.4 13.7	0.6 1.5	3/4	3/4	3.5 8.9	10.2 25.9	5.0 12.7	5.6 14.2	10.4 26.4	9.3 23.6	5.0 12.7	1.5 3.8	17.1 43.4	15.3 38.9	2.2 5.6	1.0 2.5		
030	in cm	22.4 56.8	53.2 135.1	19.3 49.0	2.4 6.1	5.4 13.7	0.6 1.5	3/4	3/4	5.7 14.5	12.2 31.0	5.0 12.7	6.8 17.3	10.4 26.4	9.3 23.6	5.0 12.7	2.1 5.3	23.1 58.7	17.3 43.9	2.2 5.6	1.0 2.5		
036	in cm	22.4 56.8	53.2 135.1	19.3 49.0	2.4 6.1	5.4 13.7	0.6 1.5	3/4	3/4	5.7 14.5	12.2 31.0	2.9 7.4	3.8 9.7	13.5 34.3	13.1 33.3	2.9 7.4	1.9 4.8	23.1 58.7	17.3 43.9	2.2 5.6	1.0 2.5		
042 048	in cm	22.4 56.8	62.2 158.0	19.3 49.0	2.4 6.1	5.4 13.7	0.6 1.5	1	3/4	5.7 14.5	12.2 31.0	2.9 7.4	3.8 9.7	13.5 34.3	13.1 33.3	2.9 7.4	1.9 4.8	32.1 81.5	17.3 43.9	2.2 5.6	1.0 2.5		
060	in cm	25.4 64.5	71.2 180.8	21.3 54.1	2.4 6.1	5.4 13.7	0.6 1.5	1	3/4	8.7 22.1	14.6 36.8	5.0 12.7	5.0 12.7	13.6 34.5	13.3 33.8	5.8 14.7	2.9 7.4	36.1 91.7	19.3 49.0	2.2 5.6	1.0 2.5		

DRAFT

NOTES: 1. Condensate is 3/4" FPT copper. 2. Horizontal unit shipped with filter bracket only. This bracket should be removed for return duct connections. 3. Hanger brackets are factory installed.

LEFT RETURN

LEFT RETURN



Unit Hanger Dimensions

Model	X	Y	Z
006-024	43.1	24.375	20.375
030-036	53.1	24.375	20.375
042-048	62.1	24.375	20.375
060	71.1	27.375	23.375

Legend
 CAP=Control Access Panel
 CSP=Compressor Service Panel
 BSP=Blower Service Panel
 ASP=Alternate Service Panel

ClimateMaster works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact ClimateMaster's Service Department at 1-405-745-6000 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely ClimateMaster's opinion or commendation of its products.

KERRISDALE HEATING AND AIR CONDITIONING
 5425 WEST 12TH AVENUE
 VANCOUVER, BC V6P 2C6
 PHONE: 604-273-0000

Shop Drawing Review

Project No: 83701-00 (16) Date: May 25, 2001
Project Name VGH Foundation Offices
Equipment: Plumbing Fixtures/Danfoss Supplier: Cronkhite Supply
Shop Drawing Date: May 17, 2001

Engineer's review is for general compliance with contract documents. The accuracy and completeness of the design, details and dimensions remains the sole responsibility of the Contractors.

Reviewed Revise & Re-Submit
 Reviewed as Noted Not Reviewed

DRAFT

Jeanette Frost B.Sc., A.C.T.

Notes:

1. Plumbing Fixtures
 - Architect to review, Acceptable to Earth Tech.
2. Danfoss Valves
 - Confirm straight or angle valve requirements with existing piping arrangement.

SPECIFICATIONS FOR:
VGH OFFICE RENO

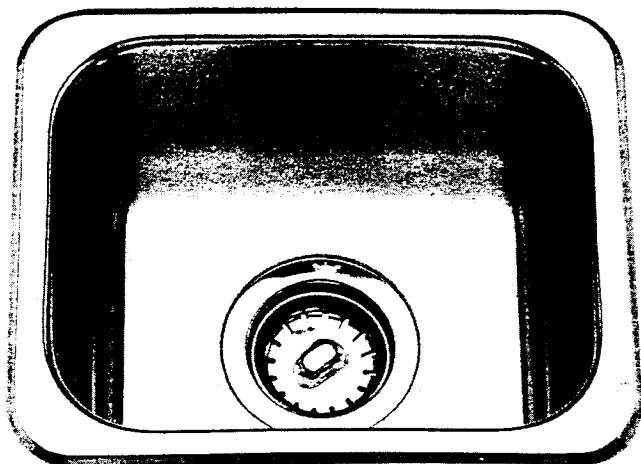
PREPARED FOR:
ALMA PLUMBING

DRAFT
PREPARED BY

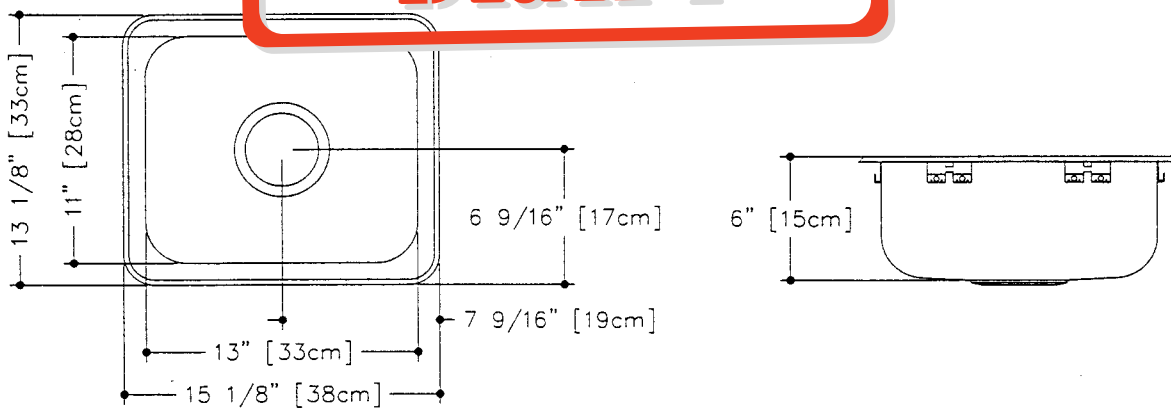
CRONKHITE SUPPLY

PH: 1-604-254-5131

FX: 1-604-254-1041



DRAFT



QS1315/6 SPECIFICATION

Model QS1315/6 is a single bowl, rimback sink manufactured by Kindred Industries Limited from 20 gauge, 18-8 stainless steel. Product has a bright mirror finished rim and satin finished bowl. Sink is fully undercoated. Basket strainer waste fitting (3 1/2", 89 mm) and installation kit are included Sink is backed with a limited buyer lifetime warranty.

- O.D. 13 1/8" x 15 1/8" x 6"
33 x 38 x 15 cm
- Recommended for minimum 18" cabinet



102mm (4") Deckmount Sink Faucet

CAMBRIDGE BRASS™

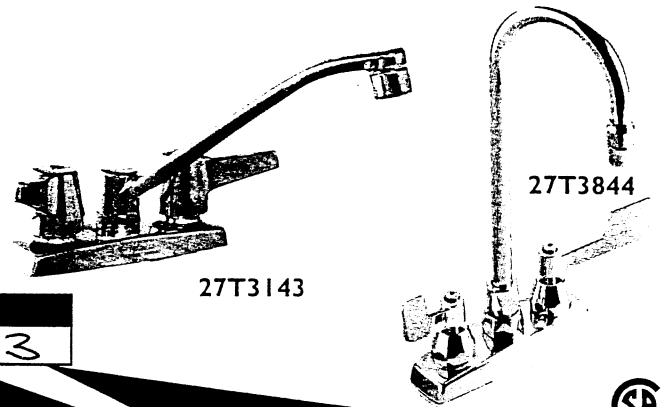
COMMERCIAL FAUCETS

DELTA 

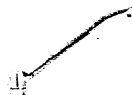

















See Page 3-2 for 27T3 Series Product Features

Specification: (example)

102mm (4") center, two handle cast brass body deckmount faucet, polished chrome plated finish, chrome plated stainless steel coverplate with deck gasket, Tuf-Teck institutional structures, brass spout and trim, color indexed metal handles with vandal resistant screws and...
 with ... (add spout required)
 with ... (add outlet required)
 with ... (add handle required)



DESCRIPTION	PRODUCT NO.
4" Deckmount Sink Faucet	27T3 8 4 3

SPOUT			OUTLET			HANDLE		
	0	<input checked="" type="checkbox"/>		0	<input checked="" type="checkbox"/>		0	<input checked="" type="checkbox"/>
203mm (8") Wallform Swing Spout (2) 	1	<input type="checkbox"/>	Vandal Resistant 2.1 GPM (8.1 L/min) Flow Control Aerator 	1	<input type="checkbox"/>	Five Flute Handles 	1	<input type="checkbox"/>
203mm (8") Tubular Swing Spout (2) 	2	<input type="checkbox"/>	Vandal Resistant 2.2 GPM (8.4 L/min) Laminar Non-Splash Flow Control Moderator 	2	<input type="checkbox"/>		2	<input type="checkbox"/>
152mm (6") Tubular Swing Spout (2) 	3	<input type="checkbox"/>	Vandal Resistant 2.2 GPM (8.4 L/min) Flow Control Aerator 	3	<input type="checkbox"/>	70mm (2-3/4") Lever Blade Handles 	3	<input type="checkbox"/>
279mm (11") Tubular Swing Spout (2) 	4	<input type="checkbox"/>	Standard 2.2 GPM (8.4 L/min) Flow Control Aerator 	4	<input type="checkbox"/>	102mm (4") Blade Handles, Sanitary Hoods 	4	<input type="checkbox"/>
356mm (14") Tubular Swing Spout (2) 	5	<input type="checkbox"/>	Vandal Resistant 0.5 GPM (1.9 L/min) Flow Control Non-Aerating Spray Outlet 	5	<input type="checkbox"/>	152mm (6") Wrist Handles, Sanitary Hoods 	5	<input type="checkbox"/>
406mm (16") Tubular Swing Spout (2) 	6	<input type="checkbox"/>	Hose Thread Outlet 	6	<input type="checkbox"/>		6	<input type="checkbox"/>
	7	<input type="checkbox"/>		7	<input type="checkbox"/>		7	<input type="checkbox"/>
Heavy Duty 114mm (4.5") Bend Rigid/Swivel Gooseneck Spout (1) 	8	<input type="checkbox"/>		8	<input type="checkbox"/>		8	<input type="checkbox"/>
Same As Noted Above But With 152mm (6") Bend (1) 	9	<input type="checkbox"/>		9	<input type="checkbox"/>		9	<input type="checkbox"/>

(1) See Page 11-1 for additional available rigid/swivel optional spouts.

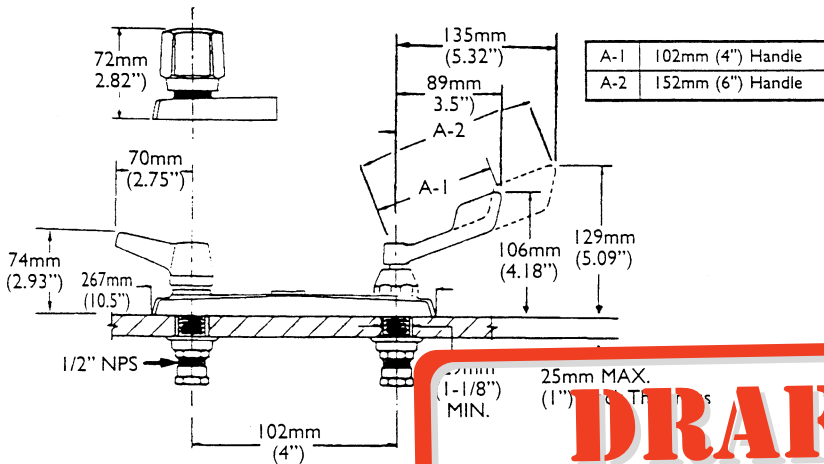
(2) See Page 11-3 for additional available optional swing spouts.

*Available on 27T2 Deckmount Sink Faucet only (Patent Applied For)

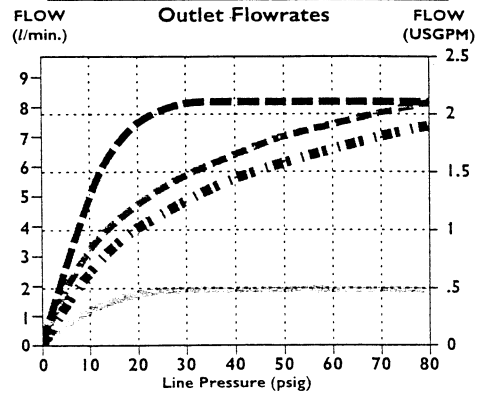
Approvals:

CSA certified
 Complies to ANSI/ASME Standard A112.18.1M
 Lever Blade Handle No.'s 3, 4 & 5, ADA Compliant and meet Handicapped
 Accessibility Standard ANSI 117.1 of less than 5 lbs. operating force.
 IAPMO listed
 (Contact Delta Representative for State and/or Local Approvals.)

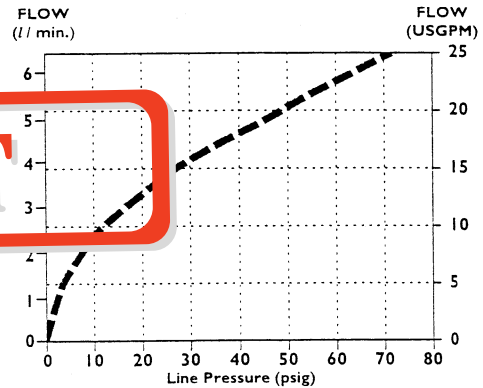
DECK FAUCET



FLOWRATE vs PRESSURE



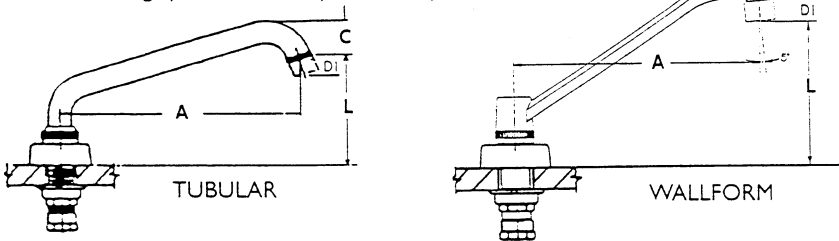
Spout Outlets
 - - - No. 3 & 4 Aerator - - - No. 1 Rose Spray
 ||| No. 2 Laminar Flow Outlet - - - No. 5 Low Flow Outlet



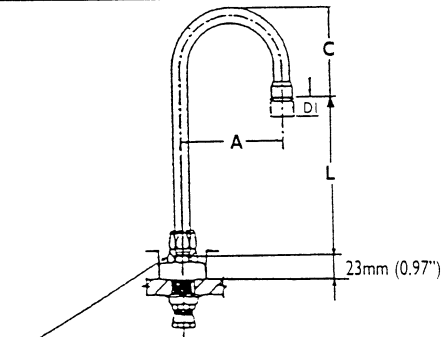
No. 6 HOSE END OUTLET

SWING SPOUTS

Note: Swing spouts fit directly onto body.



GOOSENECK SPOUTS



SWING SPOUT ASSEMBLIES

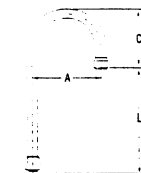
SPOUT #	DIMENSIONS	A		C		L	
		mm	in.	mm	in.	mm	in.
1	WALLFORM 8" LENGTH	203	8	15	0.6	155	6.1
2	TUBULAR 8" LENGTH	185	7.3	38	1.5	180	7.1
4	TUBULAR 11" LENGTH	279	11	30	1.2	135	5.3
5	TUBULAR 14" LENGTH	356	14	30	1.2	157	6.2
6	TUBULAR 16" LENGTH	406	16	30	1.2	173	6.6

See Page 11-3 for additional optional swing spouts.

OUTLET CHART - FEMALE

OUTLET OPTION	DI	
	mm	INCHES
1	16	.62
2	20	.77
3	18	.69
4	15	.61
5	18	.69

INLETS - 1/2" MIP/Coupling Nuts
 Note: Measurements may vary plus or minus 6mm (0.25")



See Page 11-1 for additional optional spouts.

GOOSENECK SPOUT ASSEMBLIES

"ADD-ON" SUFFIX	DIMENSIONS	Part No.	"A"		"C"		"L"	
			mm	in.	mm	in.	mm	in.
	Gooseneck-Standard (No. 8)	16223	114	4.5	97	3.8	178	7
R1	Gooseneck-Special	76445-1	89	3.5	53	2.1	170	6.7
R3	Gooseneck-Special	17089-1	152	6	117	4.6	64	2.5
	Gooseneck-Standard (No. 9)	17089-2	152	6	117	4.6	155	6.1
R5	Gooseneck-Special	17089-3	152	6	117	4.6	196	7.7
R6	Gooseneck-Special	17089-4	152	6	117	4.6	236	9.3
R7	Gooseneck-Special	16320-1	229	9	155	6.1	178	7