PREPAIR G2-SERIES

Installation Manual V2



Heat Recovery Ventilators G2-6 • G2-8 • G2-10 • G2-12



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Dimensions



MODEL	А	В	С	D	Е	F	G	Н
DST 127 G2-6	36 1/2	32 3/8	14	8	23 1/4	22	45 1/2	36 1/4
DST 128 G2-8	36 1/2	32 1/4	21	8	35	33 5/8	35	25 3/4
DST 129 G2-10	51 3/8	47 1/4	20	8	23 1/4	22	45 1/2	36 1/4
DST 130 G2-12	51 3/8	47 1/4	24	8	35	33 5/8	36	25 3/4

Dimensional information is in inches.

*Electrical box can easily be relocated to the field to either the front or the back of the cabinet, depending on port direction installer chooses.

Specifications

MODEL	Total Assembled Weight (lbs)*	Cores each 12'x12"x15" depth	Filters Washable Electrostatic Filters
DST 127 G2-6	193	2	4
DST 128 G2-8	208	2	4
DST 129 G2-10	250	3	6
DST 130 G2-12	248	3	6

Cabinet: 20 ga. steel w/powder coat finish

Fans: backward curved blades

· Mounting: unit may be suspended by using threaded rod (not supplied) or placed on a platform

Insulated with 1" aluminum foil-face fiberglass insulation to prevent condensation and meet the requirements of UL 94HF

• *weight is HRV with BPM installed

PREPARATION ROOM AIRFLOW ILLUSTRATIONS

- * Drawings are illustrations only and actual port locations and airflow directions may vary. See DST manufacturer's illustration drawings.
- * DST PrepAir systems do not have dehumidification capability. In regions of high humidity a separate stand-alone dehumidifier may be required. DST does not offer dehumidification products.

It is the responsibility of the installer to ensure all ductwork is sized and installed as designed to ensure the system will perform as intended. The amount of air (CFM) that an HRV will deliver is directly related to the total external static pressure (E.S.P.) of the system. Static pressure is a measure of resistance imposed on the blower by length of duct work/number of fittings used in duct work, duct heater etc.

Fully Dedicated System

- · Stale air drawn from areas of contamination
- Fresh air supplied to main areas
- · HRV airflow should be balanced
- DST furnished external heating and cooling coil must be installed per instructions.



Typical Preparation Room Layout



INSTALLATION

Location

The HRV must be located in a heated space where it will be possible to conveniently service the unit. Typically the HRV would be located in the mechanical room, garage, or above a drop ceiling. Attic installations are not normally recommended due to extreme temperatures, and difficulty in performing required service and maintenance. If an attic is selected, special care should be taken to ensure that the unit will perform as intended. Unit may need to be protected with an insulated shelter, built on site.

Equipment List

- · Heat recovery ventilator with installation kit
- By Pass Module (BPM)
- Cooling coil
- · Pre-heat electric strip (if required in your region, see materials proposal)
- Comfort heat electric strip
- Two motorized dampers
- RAWAL valve system
- Interior grills
- PrepAir control switch
- RED/GREEN visual signal
- · Pre-heat thermostat (if required in your region, see materials proposal)
- System thermostat
- Matched exterior condenser

Installation Loads





MODEL		A		В		С		D		E		F		G	
	MODEL	kg	lbs	kg	lbs	in	mm	kg	lbs	kg	lbs	kg	lbs	in	mm
	DST 127 G2-6	23.8	52.5	22.5	49.6	15.4	390	85	187	20	44	18.8	41.3	17.6	448
	DST 128 G2-8	20	44	17	37.5	15.9	404	71.5	158	19	41.9	16.5	36.4	11	282
	DST 129 G2-10	30.4	67	27	60	21.4	544	109	241	27.7	61	24.3	53.5	18	455
	DST 130 G2-12	29.2	64.4	24.5	54	19	483	116	255	30	66.2	34.7	76.5	10	254

INSTALLATION, cont.

Port Configuration

The unit has access doors on the front and back. Also, the main control panel may be moved from front to back allowing for ducting layout



Factory Setting. Unit may be easily reversed in field.

Installing Drain Line

Through normal operation the HRV may produce some condensation. This water should flow into a nearby drain, or be taken away by a condensate pump. The HRV and all condensate lines must be installed in a space where the temperature is maintained above the freezing point. A "P" trap should be made in the drain line. This will prevent odors from being drawn back up into the unit.

Install the drain hose, making a "P" trap



INSTALLATION, cont.

DST Preparation Room Ventilation System Schedule

		CFM		Sensible Performance Ratings		No						Duct Cooling Coil			
TAG	Manufacture /Model No.	@ 0.8 in.wc.	Duct Collar	Heating Effectiveness (32F 0A)	Cooling Effectiveness (95F 0A)	of Cores	Filters	Power	Amp	KW	*Wt (Lbs)	Nom (Tons)	Case Size (HxWxD)	Wt (Lbs)	
G2-6	DST/PREPAIR G2-6	653	14x8	58%	47	2	4 Electrostatic	120 V/ 1PH	5.92	0.66	193	2.0	17 - 1/2x14 - 1/2x21 - 1/2	42	
G2-8	DST/PREPAIR G2-8	656	21x8	58%	47	2	4 Electrostatic	120 V/ 1PH	5.3	0.64	208	2.0	17-1/2x14-1/2x21-1/2	42	
G2-10	DST/PREPAIR G2-10	1098	20x8	57%	46	3	6 Electrostatic	120 V/ 1PH	11.67	1.32	250	2.5	17-1/2x17-1/2x21-1/2	42	
G2-12	DST/PREPAIR G2-12	1238	24x8	56%	45	3	6 Electrostatic	120 V/ 1PH	10.6	1.27	248	3.0	22-1/2x17-1/2x21-1/2	50	

Notes:

1. Matched Condensing Unit and Line Kit provided by others, contractors to install DST furnished Rawal Hot Gas Bypass Valve.

2. The Fan Unit, Duct Mounted Cooling Coil, and Duct Mounted Heater are shipped separately for installation by the contractor.

3. Performance of Coil rated at evaporator temperature and corresponding pressure indicated.

4. External static pressure listed is available for supply and exhaust ductwork and diffusers. Cooling and heating coil air pressure drops have been accounted for.

5. *weight is HRV with BPM installed.

Installing Duct Connections

To maximize airflow in the ductwork system, all ducts should be kept short and have as few bends or elbows as possible. Radius or forty-five degree are preferred to 90° elbows. Use "Y" tees instead of 90° elbows whenever possible. Use turning veins when 90° elbows must be used.

All duct joints must be fastened with screws or duct sealant and wrapped with a quality duct tape to prevent leakage. Aluminum foil duct tape is recommended.

When installing an HRV, the installer should be aware of local codes that may require smoke detectors and/or firestats in the HVAC or HRV ductwork.

Because an HRV is designed to bring fresh air into the building, structures may require supply voltage interrupt when smoke or flame sensors are triggered, or when a central fire alarm system is activated.

AIRFLOW BALANCING



The balancing procedure consists of measuring the exhaust air leaving the system and the supply air entering the system and ensuring that these two are equal. A deviation of 10% or less is acceptable. See DST installation drawings and details for design CFM's.

The duct's airflow velocity is generally measured with a magnehelic gauge and a pitot tube.

To avoid airflow turbulence and incorrect readings, the airflow velocity should be measured on steel ducting a minimum of 3 duct cross-sections from the unit or elbow and before any transition.

A professional air balancer should be contacted to commission the system properly. A skilled HVAC Tech may complete the balance of air providing they possess the proper equipment.

INSTALLING THE BYPASS MODULE (BPM)

KIT CONTENTS

- 1x BPM Assembly
- 1x Bracket 'A'
- 2x Bracket 'B'
- 10x Screws
- 1x Black Extension Wire*
- 1x Red Extension Wire*
- * only used when electrical box is reversed





1. Loosely fasten both brackets "B" to cabinet using screws in the pilot holes (Fig. 1). Don't drive the screw all the way; leave about 1/4" of thread for the step 4.

Figure 1: Bracket "B" Installed



2. Using the same screw already on the unit, assemble bracket "A" on the cabinet (Fig. 2).

Figure 2: Bracket "A Installed



3. Install BPM by tilting it (Fig. 3) so that the hole on the mounting bracket "A" lines up with the pilot hole on top of the BPM. Secure it with the fastener and release the BPM. The tilting will enable the hole to line up properly and will compress the gasket once released.

Figure 3: BPM Tilted

INSTALLING THE BYPASS MODULE (BPM), cont.



4. Assemble the remaining fasteners to secure the BPM (Fig. 4).

Figure 4: BPM Fastening



5. Continue to tighten the fasteners holding the bracket "B" to cabinet in order to compress the gasket between the BPM and the cabinet (Fig. 5).



Figure 5: Bracket "B" tightened

6. Next route the damper motor wires through the plastic bushing (Fig.6) of the electrical box.

Figure 6: Insert damper motor wires through bushing



For G2-6 and G2-8

7A. Cut the connectors off of the wire and run the wires to the screw terminal to the positions "N.O." and "COM"

Figure 7A: Terminal block TB2, showing "N.O." terminal location and "COM" terminal location



For G2-10 and G2-12

7B. Run the wires to the HCE controller on the terminal marked "N.O." in the field marked "DAMPER" and on the terminal marked "C" in the field marked "24VAC"

Figure 7B: HCE Controller, showing "N.O." terminal location and "C" terminal location



LOW VOLTAGE CONTROL SYSTEMS, G2-6/G2-8 * Please see instruction manuals for individual controls for proper wiring and set up of control systems.

Central Controls

these control options can only be used individually

CONTROLS	FEATURES	CONNECT TO
EDF1R	 EDF1R — Press button 3 times and the system will run on high speed. IT MUST BE IN THIS POSITION AT ALL TIMES. Install the EDF1R at the HRV unit location, not in the prep room. Apply DST supplied sticker next to EDF1R that notes: Press button 3 times for high speed. It must be in this position at all times. 	W 7 7 1 1 1 W 7 7 7 1 1 1



1. Ensure that unit is not plugged when connecting the control





The wiring connectors can be removed for easier connection.

MODES OF OPERATION

Exhaust Mode / Safe to Embalm / GREEN light on



In this mode of operation both fans are operating and exchanging air with the outside. The heat recovery ventilator (HRV) constantly exchanges the air at high speed.

Recirculation Mode / Embalming not allowed / RED light on



In recirculation mode, the supply motor continues to run whenever there is a need for heating or cooling and a damper moves to block off air entering from outside, drawing air instead from the conditioned space. The exhaust to outside motor is OFF when in recirculation mode.



APR CONTROL - R-410A - SPEC. & DIMENSION SHEET

			Unit Dim	ensions		Connection D	Dimension	ns (OD)		
Model #	Modulation Capacity	PrepAir Model	x	Y	z	EE	L	м	G	Application
APR-410-1	1.5 tons	G2-6, 8,10,12	8.5"	8"	4"	N/A	3/8"	5/8"	3/8"	G - BOTTOM CONNECTION
APR-410-2	2.5 tons	G2-25	8.5"	8"	4"	1/4"	3/8"	5/8"	3/8"	G - BOTTOM CONNECTION

The APR Control Hot Gas Valve should be set to begin opening at approximately 118 PSI ~40°F

CONNE

SUPPLY BALL SHUT-OFF VALVES FOR ALL CONNECTIONS

SUPPLY TEE FOR SUCTION LINE CONNECTION

SUPPLY TEE FOR HOT-GAS CONNECTION

SUPPLY TEE FOR LIQUID LINE CONNECTION

APR Control Selection:

System or Stage size is reduced by the Modulation Capacity listed above

Oil entrainment in suction line must be addressed

Please refer to Rawal Devices Fast Selection Chart or Consult with Rawal Devices Engineers

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Call Tech Support: (800) 727-6447

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WHEN REQUIRED, SUPPLY TEE FOR EE CONNECTIONS EXTERNAL EQUILIZERS - EE - HAVE 1/4" SWEAT CONNECTION TEE EE CONNECTIONS INTO SUCTION LINE

BOTH SENSING BULBS ON LIQ INJ VALVE AND HOT GAS VALVE MUST BE ATTACHED AND INSULATED TO SUCTION LINE BETWEEN TEE TO APR CONTROL DISCHARGE COMING FROM TOP OF THE CHAMBER AND COMPRESSOR

ONLY WHEN NECESSARY:

REMOVE CAPS FROM ADJUSTMENT STEMS PRIOR TO ADJUSTING

TO ADJUST VALVES WHEN FACING ADJUSTING STEM CLOCKWISE DECREASES PRESSURE / TEMPERATURE. COUNTER-CLOCKWISE INCREASES PRESSURE / TEMPERATURE.



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APR Control Installation Instructions APR-410A

If possible pump down system and lock existing refrigerant in the receiver or condenser. If you cannot secure existing system charge, use proper refrigerant recovery methods to save and store the refrigerant charge. Before installing the APR Control, make sure your system is clean – if not, or in doubt a new filter / strainer must be used to protect the APR Control to isolate and remove the system contaminants. Particles of dirt can settle on the valve seat of the hot gas bypass valve and prevent it from closing, leading to possible compressor overheating and system damage.

After you install the APR Control, use standard evacuation procedures and follow the directions listed below. All connections between the system and the APR Control can be made in the condensing section. The APR Control may be mounted outside the condensing unit housing if space or access are a problem. The APR Control should be mounted vertical, with discharge from the desuperheating chamber UP or an orientation so chamber discharge is above Schrader valve at bottom. Manual Shut off valves to isolate the APR Control connections to liquid, hot gas and suction lines *are to be field supplied and installed*. Functionally, isolation valves will assist in charging the systems and troubleshooting should difficulty with set-up arise.

Connections to the refrigerant circuit can be on horizontal or vertical pipes, but discharge from the APR Control desuperheating chamber to the suction line must be into the top of the suction line to prevent oil from draining into the APR Control chamber.

All connections to the APR Control should be made with Stay-Silv® 15 or equivalent Brazing Alloy. Keep in mind when brazing that the exterior of the APR Control is stainless while the interior is copper clad.

Always use plenty of wet rags or heat absorbing paste on the valves and aim your flame away from valve bodies to prevent possible damage.

1) Tee in a line shut off valve (G) at the compressor hot gas discharge line, (size to APR hot gas valve inlet) where strainer is supplied, install it in the APR hot gas inlet only.

2) Tee in a line shut off valve (M) at the suction line prior to compressor, (size to APR mixed gas discharge outlet at top of desuperheating chamber).

3) Tee in a line shut off valve (L) at the liquid line near the condenser coil or receiver outlet, size to APR injection valve inlet.4) Mount APR Control securely in the condensing unit.

5) Connect hot gas from the line valve (G) to the hot gas inlet on hot gas valve connected to APR Control. Hot Gas valve inlet marked with Red Hot Gas sticker.

6) Connect suction from the line valve (M) to the mixed gas outlet on top of APR Control desuperheating chamber.

7) Connect liquid from the line valve (L) to the liquid injection valve (TXV) inlet on APR Control.

8) External equalizers on sides of APR Control hot gas valve should be connected to the suction line between mixed gas discharge connection from the APR Control and compressor inlet.

9) The injection valve bulb and Hot Gas Bypass valve bulb *must* be mounted, and insulated, to the suction line between compressor and mixed gas discharge connection from the APR Control.

10) Leak test system and evacuate. Before charging system close all APR Control line valves, do not leave the APR Control open when charging the system. No additional charge is required for the APR Control to operate.

11) For R-410a High Temperature Systems – Hot Gas Bypass valve of the APR Control has been set to

12) Open at 118 psig (40° F). See adjustment sheet if you require further instructions.

13) APR Control injections valve is set to open at around 65° F (or 20° superheat) to protect the compressor from overheating.

*Please refer to the Spec. & Dimension sheet for connection sizes for specific model APR Control.

*Adjustment settings to all APR-410A valves need to be confirmed in the field.

DOC#410A-INST

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APR Control Operation and Adjustment (R-410A)

The APR Control® valve is a capacity modulation and dehumidification device that modulates the air conditioning system's refrigeration (circuit) capacity to match the varying load conditions of the space. Often utilized to minimize the challenges of oversized air conditioning systems, the APR Control is a device that operates in response to suction pressure of an active air conditioning system. As the heat load (including occupancy, ventilation and solar loads, for example) of the conditioned space drops, your suction pressure drops to the point the APR Control begins to open. A portion of hot gas gets sent through the desuperheating chamber, then back to the suction line. A liquid injection valve mixes liquid with the hot gas in the desuperheating chamber when the mixed gas temperature reaches approximately 20°superheat returning to the compressor.

The APR Control externally unloads the compressor, keeping the evaporator coil at a constant temperature below dew point, thereby dehumidifying during the extended run time achieved. Extended run time is achieved by keeping the thermostat from being satisfied too quickly (a standard cause of short cycling).

The APR Control comes factory set at approximately 120psig¹ and typically does not require adjustment. During part-load conditions, as the heat content of the return air (including the sensible temperature) drops, the saturated suction temperature will drop, resulting in a drop in suction pressure. As the suction pressure falls to 120psig the APR Control will begin to open and attempt to stabilize the system suction pressure at approximately 120psig.

However, if the runtime is inadequate or low load operation fails to cause suction pressure to fall low enough (the point at which the APR Control starts to open), you may need to adjust the APR Control® hot gas valve. The adjustment port can be found on the side or the bottom of the hot gas valve. Remove the cap to access the set screw. A standard hex wrench can be used to turn the screw and adjust the pressure setting. The pressure setting will adjust in the range of 5 lbs per 360° turn². Turning the wrench counter-clockwise (out) will increase the pressure setting and turning the wrench clockwise (in) will lower the pressure setting. The maximum pressure setting that most APR Controls can be adjusted to is approximately 130psig and the minimum is 95psig. As you adjust the APR Control, it will to reduce system capacity in order to match capacity to changing load conditions beginning at the new setting.

1: The factory setting for the APR-410-5 is 105psig, with an adjustment range of 95 - 115psig.

2: The pressure setting of the APR-410-5 will adjust 2.5 lbs per 360° turn. Also note that turning the adjustment screw counter-clockwise (out) will decrease the pressure setting while turning it clockwise (in) will increase the pressure setting.



Speed Setting

The HRV is shipped from the factory on low speed. For the required performance to address DST and OSHA standards, the fan must be set at high speed via the EDF1R controller for the G2-6/G2-8, and via the DDC settings for the G2-10/G2-12. See wiring diagram below for the required high speed operation.

FIELD WIRING - G2-6/G2-8



INSTALLATION VERIFICATION TEST, G2-6/G2-8

WITH EDF1R CONTROLLER

1. WIRING

- a. Verify wiring and jumpers are correct as per wiring diagram (page 13)
 - · Set EDF1R control to "Recirculation" red LED light
 - Ensure Honeywell controller is connected and active

2. RECIRCULATE

- a. Set PrepAir control switch to "Recirculate"
- b. Unit should be in Recirculation mode
 - · Supply fan runs on HIGH speed
 - Exhaust fan remains off
 - BPM module is recirculating
 - · Red status light is active

3. EXHAUST

- a. Set PrepAir control switch to "Exhaust"
- b. Unit should be in Ventilation mode
- · Supply fan runs on HIGH speed
- Exhaust fan runs on HIGH speed
- BPM module is not recirculating
- · Green status light is active

4. TEST COMPLETION

- a. Ensure fan speed selector switch is on standby
- b. Set PrepAir control switch to desired mode
- c. Installation verification is complete

FIELD WIRING - G2-10/G2-12





INSTALLATION VERIFICATION TEST, G2-10/G2-12

WITH DDC WIRING

1. DDC WIRING

- a. Verify DDC wiring and jumpers are correct as per wiring diagram (pages 14-15)
 - · Set fan speed selector switch to standby
 - · Set DDC jumper to "DDC" from "Normal"
 - · Ensure Honeywell controller is connected and active

2. RECIRCULATE

- a. Set PrepAir control switch to "Recirculate"
- b. Unit should be in Recirculation mode
 - Supply fan runs on HIGH speed
 - · Exhaust fan remains off
 - BPM module is recirculating
 - Red status light is active

3. EXHAUST

- a. Set PrepAir control switch to "Exhaust"
- b. Unit should be in Ventilation mode
 - Supply fan runs on HIGH speed
 - Exhaust fan runs on HIGH speed
 - BPM module is not recirculating
 - · Green status light is active

4. TEST COMPLETION

- a. Ensure fan speed selector switch is on standby
- b. Set PrepAir control switch to desired mode
- c. Installation verification is complete

MAINTENANCE

CAUTION: MAKE SURE UNIT IS UNPLUGGED BEFORE ATTEMPTING ANY MAINTENANCE WORK

The following components should also be inspected regularly and well maintained.

THE MOTOR: The motors are factory balanced and lubricated for life. They require no maintenance.

THE UNIT: The inside of the unit should be wiped clean as needed.

CONDENSATION PAN: Units with drain hoses should have their line and connection checked regularly

FILTERS: The filters need to be checked and cleaned once a month or when they appear dirty.

FIXED PLATE: Clean core on a average every 3-6 months or as needed.



TO CLEAN CORE:

- 1. Open access door and remove filters.
- 2. Carefully grip ends of core and pull evenly outward. Core may be snug, but will slide out of the channel.
- 3. Wash the core in warm soapy water or light coil solution.
- 4. Install clean core
- 5. Install the clean filters
- 6. Replace access door

TO INSTALL THE CLEAN CORE AND FILTERS:

- 1. First mount the bottom flange of the core guide into the bottom channel approximately 1/4" (6mm)
- 2. Mount the left or right side flange of the core guide approximately 1/4" (6mm) followed by the other side 3. Mount the top flange of the core guide into the top channel approximately 1/4" (6mm)
- 4. With all four corners in place and the core straight and even, push hard in the center of the core until the core stops on the back of the cabinet.
- * Core installation label on the outer end of the core.

LIMITED WARRANTY

- The heat recovery aluminum core has a limited lifetime warranty.
- The HRV's have a warranty that is limited to 3 years on all parts from the date of purchase, including parts replaced during this time period. If there is no proof of purchase available, the date associated with the serial number will be used for the beginning of the warranty period.
- The motors found in all HRVs require no lubrication, and are factory balanced to prevent vibration and promote silent operation.
- The limited warranty covers normal use. It does not apply to any defects, malfunctions or failures as a result of improper installation, abuse, mishandling, misapplication, fortuitous occurrence or any other circumstances outside DST's control.
- Inappropriate installation or maintenance may result in the cancellation of the warranty.
- Any unauthorized work will result in the cancellation of the warranty.
- DST is not responsible for any incidental or consequential damages incurred in the use of the ventilation system.
- DST is not responsible for providing an authorized service center near the purchaser or in the general area.
- DST reserves the right to supply refurbished parts as replacements.
- Transportation, removal and installation fees are the responsibility of the purchaser.
- The purchaser is responsible for adhering to all codes in effect in his area.
- This warranty is the exclusive and only warranty in effect relative to the ventilation system and all other warranties either expressed or implied are invalid.

Your ventilation system must be installed in conformance with the current edition of the National Building/ Mechanical Codes and/or ASHRAE's "Good Engineering Practices".

DST reserves the right to modify, at any time and without notice, any or all of its' products features, designs, components and specifications to maintain their technological leadership position. Please visit duncanstuarttodd.com or contact us directly for more detailed technical information. V. 8/16



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