TEMPEFF
NORTH AMERICA

RGSP

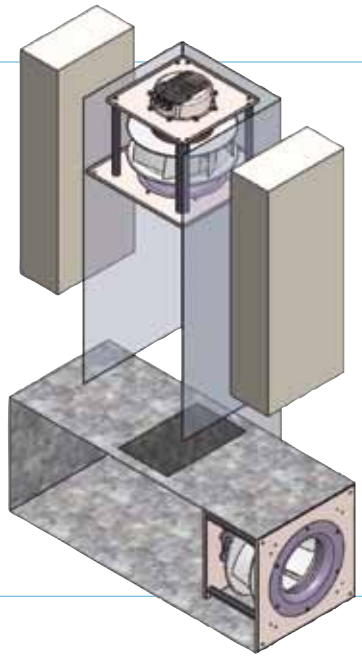
SERIES

Tempeff Dual Core® Energy

Recovery Operation

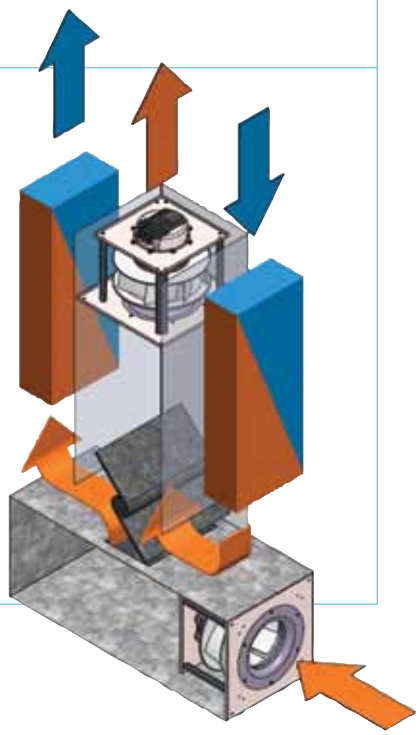
Simplest Form

A typical Tempeff Dual Core® unit contains 2 energy cores (A & B), special change over damper section, an exhaust fan, and a supply fan.



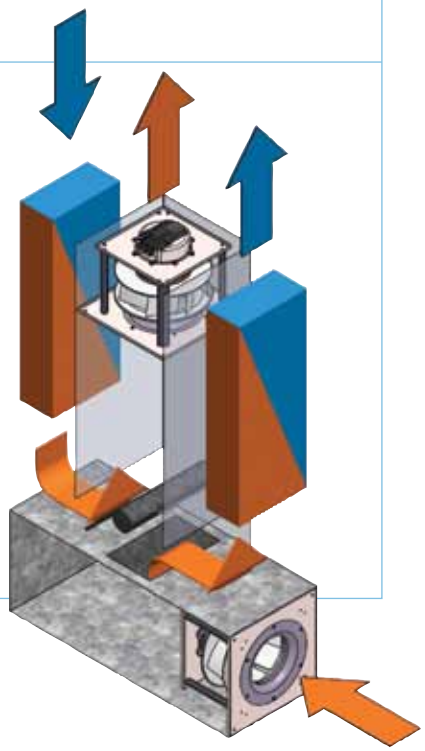
1 Cycling for Recovery PHASE 1

When energy recovery is called for, the dampers position so that Energy Core A will add energy to the supply air stream, heating up the air. Simultaneously Energy Core B is absorbing energy from the exhaust air stream.



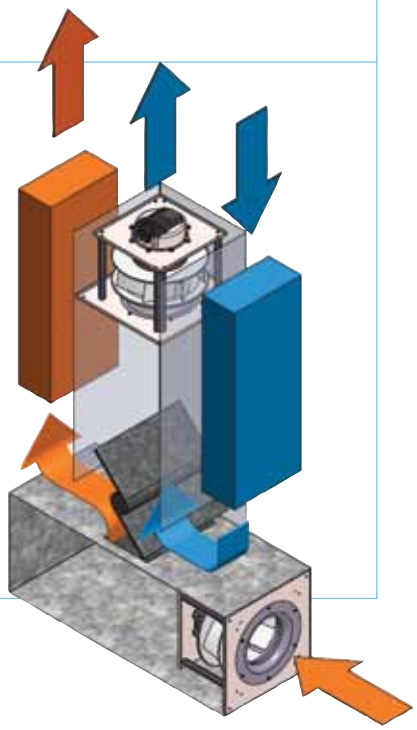
2 Cycling for Recovery PHASE 2

After 60 seconds, the dampers reposition. Now Energy Core B is adding the energy it reclaimed in Phase 1 to the supply air stream,heating it up. Simultaneously Energy Core A is “recharging” by absorbing energy from the exhaust air stream. Phase 1 and Phase 2 will alternate every 60 seconds, constantly delivering extremely high energy recovery regardless of outdoor air temperatures. Because the cores switch cycles every 60 seconds, frost does not have a chance to build up, thus energy recovery is constant day in and day out, unlike other traditional types of energy recovery devices.



3 Free Cooling

If exhaust air and supply air are above set point, unit will revert to Free Cooling Mode. No energy recovery is taking place. Damper will switch every 3 hours to clean core faces.



PERFORMANCE DATA **IMPERIAL**

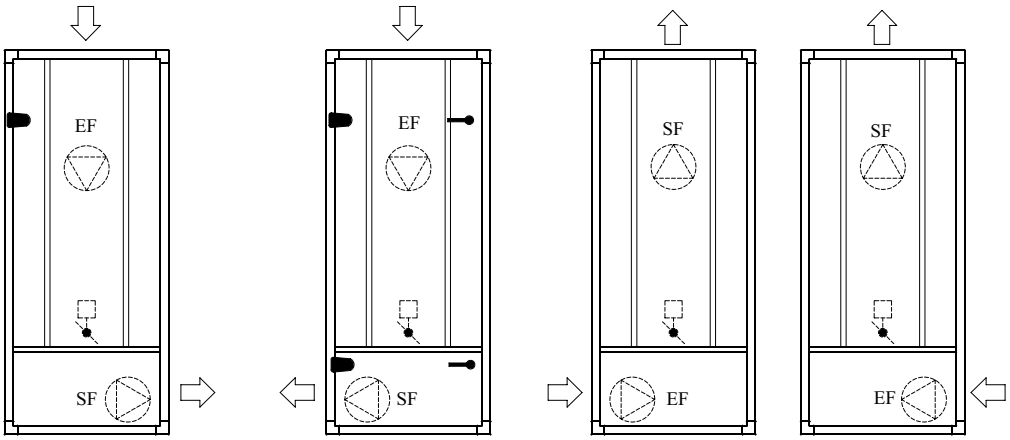
CFM	Model	Winter Effectiveness %	Summer Effectiveness %	Velocity FPM	Core Pressure Drop "WC	BHP @ ESP ("W.C) 1.0 "
110	RGSP 300	91	83	213	0.17	0.1
150	RGSP 300	88.8	80.8	290	0.33	0.11
	RGSP 450	90.9	82.9	218	0.18	0.11
200	RGSP 300	86.1	78.1	387	0.53	0.39
	RGSP 450	88.8	80.8	290	0.33	0.14
250	RGSP 300	83.4	75.4	484	0.74	0.51
	RGSP 450	86.8	78.8	363	0.48	0.15
300	RGSP 450	84.7	76.7	435	0.64	0.49
	RGSP 600	90.5	82.5	231	0.21	0.25
	RGSP 900	91.3	83.3	203	0.15	0.21
350	RGSP 600	89.4	81.4	269	0.29	0.3
	RGSP 900	90.3	82.3	236	0.22	0.24
400	RGSP 600	88.3	80.3	308	0.37	0.35
	RGSP 900	89.4	81.4	270	0.29	0.28
	RGSP 1200	91.2	83.2	205	0.15	0.23
450	RGSP 600	87.2	79.2	346	0.45	0.41
	RGSP 900	88.4	80.4	304	0.36	0.33
	RGSP 1200	90.5	82.5	230	0.21	0.27
500	RGSP 600	86.1	78.1	385	0.53	0.47
	RGSP 900	87.5	79.5	338	0.43	0.38
	RGSP 1200	89.8	81.8	256	0.26	0.31
550	RGSP 600	85.1	77.1	423	0.61	0.59
	RGSP 900	86.5	78.5	372	0.5	0.44
	RGSP 1200	89.1	81.1	281	0.31	0.36
600	RGSP 600	84	76	462	0.69	0.66
	RGSP 900	85.6	77.6	405	0.57	0.49
	RGSP 1200	88.3	80.3	307	0.37	0.4
650	RGSP 600	82.9	74.9	500	0.77	0.73
	RGSP 900	84.6	76.6	439	0.64	0.66
	RGSP 1200	87.6	79.6	333	0.42	0.45
	RGSP 1800	91.3	83.3	201	0.14	0.33
700	RGSP 900	83.7	75.7	473	0.71	0.73
	RGSP 1200	86.9	78.9	358	0.47	0.5
	RGSP 1800	90.9	82.9	217	0.18	0.37
750	RGSP 1200	86.2	78.2	384	0.53	0.66
	RGSP 1800	90.4	82.4	232	0.21	0.41
800	RGSP 1200	85.4	77.4	409	0.58	0.72
	RGSP 1800	90	82	248	0.24	0.47
850	RGSP 1200	84.7	76.7	435	0.64	0.78
	RGSP 1800	89.6	81.6	263	0.27	0.52
	RGSP 2700	91.1	83.1	208	0.16	0.51
900	RGSP 1200	84	76	461	0.69	0.85
	RGSP 1800	89.1	81.1	279	0.31	0.63
	RGSP 2700	90.8	82.8	220	0.18	0.56

CFM	Model	Winter Effectiveness %	Summer Effectiveness %	Velocity FPM	Core Pressure Drop "WC	BHP @ ESP ("W.C) 1.0 "
950	RGSP 1200	83.3	75.3	486	0.74	0.93
	RGSP 1800	88.7	80.7	294	0.34	0.69
	RGSP 2700	90.4	82.4	232	0.21	0.61
1000	RGSP 1800	88.3	80.3	310	0.37	0.74
	RGSP 2700	90.1	82.1	244	0.23	0.66
1200	RGSP 1800	86.5	78.5	372	0.5	1
	RGSP 2700	88.7	80.7	293	0.34	0.87
1400	RGSP 1800	84.8	76.8	433	0.63	1.34
	RGSP 2700	87.3	79.3	342	0.44	1.21
1600	RGSP 1800	83	75	495	0.76	1.73
	RGSP 2700	86	78	391	0.54	1.57
1800	RGSP 2700	84.6	76.6	440	0.65	2
2000	RGSP 2700	83.2	75.2	489	0.75	1.8

All winter effectiveness is calculated using ECM fans and 35 deg F (1.67 deg C).
All Summer effectiveness is calculated using ECM fans and 90 deg F
Efficiencies may vary depending on site conditions
All efficiencies are across entire base unit, including fans and motors
HP values shown include core pressure drop, standard 30% (MERV 10) SA filter and basic cabinet losses.
For unbalanced air streams, contact your local Tempeff representative
For larger ESP values, contact your local Tempeff representative

Available Configurations

- *The configurations differ based on locations of the fans.*
- *Supply and exhaust air connection may be on the backside.*
- *Please contact your local Tempeff Representative for additional configurations.*



TYPE 1 TYPE 2 TYPE 3 TYPE 4

PERFORMANCE DATA **METRIC**

Air Volume l/s	Air Volume m3/s	Model	Winter Effectiveness %	Summer Effectiveness %	Velocity m/s	Core Pressure Drop Pa	Motor kW required @ ESP (Pa) 250
52	0.05	RGSP 300	91	83	1.08	42	0.07
71	0.07	RGSP 300	88.8	80.8	1.47	82	0.08
		RGSP 450	90.9	82.9	1.11	45	0.08
94	0.09	RGSP 300	86.1	78.1	1.97	132	0.29
		RGSP 450	88.8	80.8	1.47	82	0.10
118	0.12	RGSP 300	83.4	75.4	2.46	184	0.38
		RGSP 450	86.8	78.8	1.84	119	0.11
142	0.14	RGSP 450	84.7	76.7	2.21	159	0.37
		RGSP 600	90.5	82.5	1.17	52	0.19
		RGSP 900	91.3	83.3	1.03	37	0.16
165	0.17	RGSP 600	89.4	81.4	1.37	72	0.22
		RGSP 900	90.3	82.3	1.20	55	0.18
189	0.19	RGSP 600	88.3	80.3	1.56	92	0.26
		RGSP 900	89.4	81.4	1.37	72	0.21
		RGSP 1200	91.2	83.2	1.04	37	0.17
212	0.21	RGSP 600	87.2	79.2	1.76	112	0.31
		RGSP 900	88.4	80.4	1.54	90	0.25
		RGSP 1200	90.5	82.5	1.17	52	0.20
236	0.24	RGSP 600	86.1	78.1	1.96	132	0.35
		RGSP 900	87.5	79.5	1.72	107	0.28
		RGSP 1200	89.8	81.8	1.30	65	0.23
260	0.26	RGSP 600	85.1	77.1	2.15	152	0.44
		RGSP 900	86.5	78.5	1.89	124	0.33
		RGSP 1200	89.1	81.1	1.43	77	0.27
283	0.28	RGSP 600	84	76	2.35	172	0.49
		RGSP 900	85.6	77.6	2.06	142	0.37
		RGSP 1200	88.3	80.3	1.56	92	0.30
307	0.31	RGSP 600	82.9	74.9	2.54	192	0.54
		RGSP 900	84.6	76.6	2.23	159	0.49
		RGSP 1200	87.6	79.6	1.69	105	0.34
		RGSP 1800	91.3	83.3	1.02	35	0.25
330	0.33	RGSP 900	83.7	75.7	2.40	177	0.54
		RGSP 1200	86.9	78.9	1.82	117	0.37
		RGSP 1800	90.9	82.9	1.10	45	0.28
354	0.35	RGSP 1200	86.2	78.2	1.95	132	0.49
		RGSP 1800	90.4	82.4	1.18	52	0.31
378	0.38	RGSP 1200	85.4	77.4	2.08	144	0.54
		RGSP 1800	90	82	1.26	60	0.35
401	0.40	RGSP 1200	84.7	76.7	2.21	159	0.58
		RGSP 1800	89.6	81.6	1.34	67	0.39
		RGSP 2700	91.1	83.1	1.06	40	0.38
425	0.42	RGSP 1200	84	76	2.34	172	0.63
		RGSP 1800	89.1	81.1	1.42	77	0.47
		RGSP 2700	90.8	82.8	1.12	45	0.42

Air Volume l/s	Air Volume m3/s	Model	Winter Effectiveness %	Summer Effectiveness %	Velocity m/s	Core Pressure Drop Pa	Motor kW required @ ESP (Pa) 250
448	0.45	RGSP 1200	83.3	75.3	2.47	184	0.69
		RGSP 1800	88.7	80.7	1.49	85	0.51
		RGSP 2700	90.4	82.4	1.18	52	0.46
472	0.47	RGSP 1800	88.3	80.3	1.57	92	0.55
		RGSP 2700	90.1	82.1	1.24	57	0.49
566	0.57	RGSP 1800	86.5	78.5	1.89	124	0.75
		RGSP 2700	88.7	80.7	1.49	85	0.65
661	0.66	RGSP 1800	84.8	76.8	2.20	157	1.00
		RGSP 2700	87.3	79.3	1.74	109	0.90
755	0.76	RGSP 1800	83	75	2.51	189	1.29
		RGSP 2700	86	78	1.99	134	1.17
850	0.85	RGSP 2700	84.6	76.6	2.24	162	1.49
944	0.94	RGSP 2700	83.2	75.2	2.48	187	1.34

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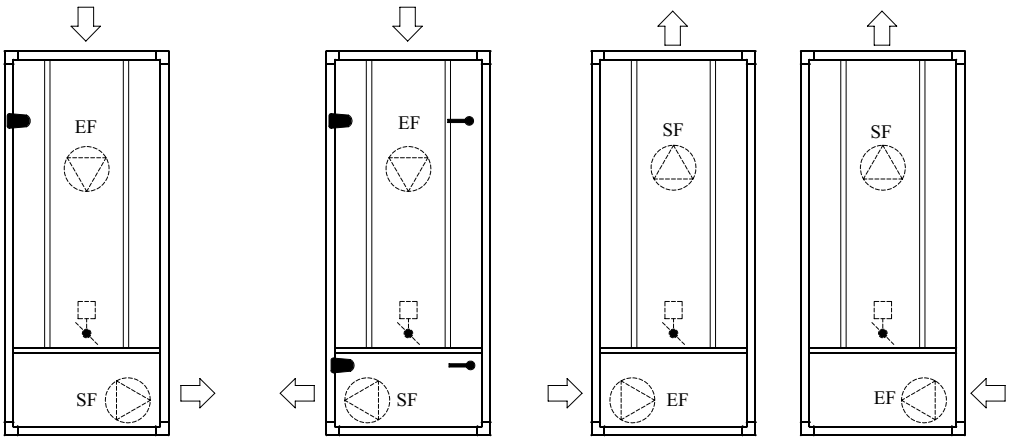

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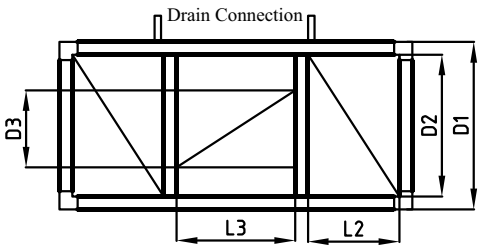
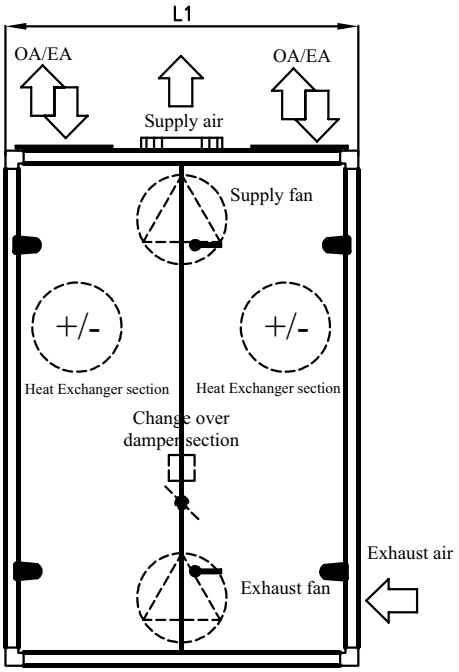
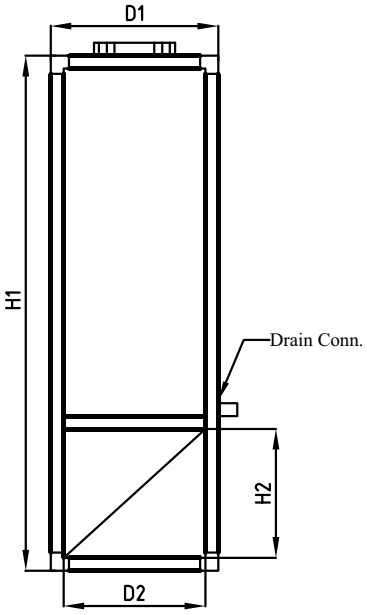


PLAN VIEW



ELEVATION VIEW



SIDE VIEW

Notes:

1) For reference use only, all information subject to change without notice
2) Units in this series can also include heating and/or cooling coils. Please contact your local TEMPEFF Representative for job specfic data
3) Units in this series are also available in several horizontal configurations. Please contact Rep for details

IMPERIAL (inches)

Model	L1	L2	L3	D1	D2	D3	H1	H3	Approx. Weight (lbs)
RGSP 300	29 7/8	5 3/4	13 3/8	18 1/8	15	9	70 1/8	9	315
RGSP 450	35 3/8	8 7/8	11 3/8	22	18 7/8	10	72 7/8	15 1/2	363
RGSP 600	42 1/8	9 1/4	17 3/8	24	20 7/8	10 3/8	77 1/8	19 5/8	583
RGSP 900	47 5/8	10 7/8	18 1/8	25 5/8	21 5/8	10	78 3/4	19 5/8	660
RGSP 1200	53 7/8	14	18 1/8	25 5/8	21 5/8	11 3/4	78 3/4	19 5/8	770
RGSP 1800	59 1/2	17 1/8	17 3/8	33 1/2	29 1/2	16 3/4	82 5/8	19 5/8	1089
RGSP 2700	59 1/2	17 1/8	17 3/8	41 3/8	37 3/8	20 5/8	82 5/8	19 5/8	1287

METRIC (mm)

Model	L1	L2	L3	D1	D2	D3	H1	H3	Approx. Weight (kg)
RGSP 300	760	145	340	460	380	230	1780	230	145
RGSP 450	900	225	290	560	480	254	1850	395	165
RGSP 600	1070	236	440	610	530	265	1960	500	265
RGSP 900	1210	275	460	650	550	254	2000	500	300
RGSP 1200	1370	356	460	650	550	300	2000	500	350
RGSP 1800	1510	435	440	850	750	425	2100	500	495
RGSP 2700	1510	435	440	1050	950	525	2100	500	585

PART 2: PRODUCTS

2.01 MANUFACTURERS

A. The following manufacturers are approved for use. No substitutions will be permitted.

1. Tempeff Dual Core® as basis of design

2.02 GENERAL DESCRIPTION

A. Configuration: Fabricate as detailed on drawings.

B. Performance:

C. Acoustics: Sound power levels (dB) for the unit shall not exceed the following specified levels. The manufacturer shall provide the necessary sound treatment to meet these levels if required.

	OCTAVE BAND AT CENTER FREQUENCY (Hz)							
	63	125	250	500	1000	2000	4000	8000
Radiated								
Discharge								
Return								

2.03 UNIT CONSTRUCTION

A. Fabricate unit with double wall galvanized panels secured with mechanical fasteners. All access doors shall be sealed with permanently applied bulb-type gasket.

1. Panels and access doors up to the RGSP 600 shall be constructed as a 1-inch (25-mm) nominal thick. The RGSP 900 to RGSP 2700 shall be constructed as 2 inch panels; with injected polyurethane foam insulation. R value shall be 6.5 per inch of wall thickness. The outer panel shall be constructed of G90 galvanized steel. The inner liner shall be constructed of G90 galvanized steel. Manufacturer shall supply test data demonstrating less than L/240 deflection for an unsupported 48x48 panel under 30" W.C pressure. Units that cannot demonstrate this deflection are unacceptable.

B. Access Doors shall be flush mounted to cabinetry, with minimum of two hinges, locking latch and full size handle assembly.

2.04 SUPPLY / RETURN FANS

A. Provide direct-drive plenum fan(s) with ECM motors. Fan assemblies including fan, motor and sheaves shall be dynamically balanced by the manufacturer on all three planes and at all bearing supports. Manufacturer must ensure maximum fan RPM is below the first critical speed.

2.05 ELECTRICAL

A. All electrical components shall bear a UL and CSA safety listing.

B. Wiring Termination: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. All wires shall be number tagged and cross-referenced to the wiring diagram for ease of troubleshooting.

C. Controls must include Self diagnostics and PLC error code. On board fault detection and diagnostics that senses and alerts when the damper is not operating correctly.

D. Air handler manufacturer shall provide and mount a damper controls for standalone operation of the ERV.

2.06 PARTICULATE FILTERS

A. Filter section with filter racks and guides with hinged access doors for side loading and removal of filters

B. Filter media shall be UL 900 listed, Class I or Class II.

C. Flat arrangement with 2", 50mm pleated MERV 10 panel filters.

2.09 ENERGY RECOVERY

A. Dual Core® Energy Recovery

1. Unit shall be equipped with Dual Core® energy recovery technology. The unit shall be 90% efficient (sensible +-5%) at equal airflow in winter and up to 80% sensible in summer. It shall also provide up to 70% latent recovery in winter mode. Unit shall accomplish this recovery without a defrost cycle that will reduce the effectiveness of the device. Devices employing defrost cycles that bypass the energy recovery device, or reduce the effectiveness are not acceptable. Energy recovery device shall not require frost protection in applications down to -40 degrees. Cores shall be Generation 3, comprised of precisely corrugated high grade aluminum.
2. Switchover damper section shall be comprised of low leakage dampers operated by fast acting electric actuators having damper switching times of 0.75 seconds. Dampers that do not switch within the specified times without objectionable noise are not acceptable.
3. Recovery cycles shall be controlled by internal programmed thermostats measuring both supply and exhaust air, and optimizing performance of both heat recovery and free cooling modes.

PART 3: EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's Installation & Maintenance instructions.

3.02 ENVIRONMENTAL REQUIREMENTS

A. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

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