

# ***ELECTRIC AIR HEATERS***



***BC(E) SERIES***

***INDOOR/OUTDOOR***



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## ***SPECIFICATIONS MANUAL***



MANUFACTURED BY :

***BOUSQUET***

BROTHERS LIMITED

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## BC(E) SERIES ELECTRIC AIR HEATERS

The Bousquet BC(E) series air heater is a CSA certified ventilation unit designed to heat fresh air an/or returned air. Compact and easy to maintain, this unit includes a centrifugal fan, an electric heating coil with its capacity control, motorized shut-off dampers and air intake hoods with integrated filters and bird screen. This heater can also be equipped with optional «V» bank filters and recirculation dampers. The capacity range covers up to 30000 CFM (14000 l/sec.), and heating capacity up to 1000 kW, at a maximum supply temperature of 150°F (65°C).

### A) CONSTRUCTION

The Bousquet BC series units are made of 18 gauge satin finish (Galvaneal) steel, enamel painted, insulated with 1" reinforced coated fibreglass. The casing is mounted on a welded structural steel base with lifting lugs.

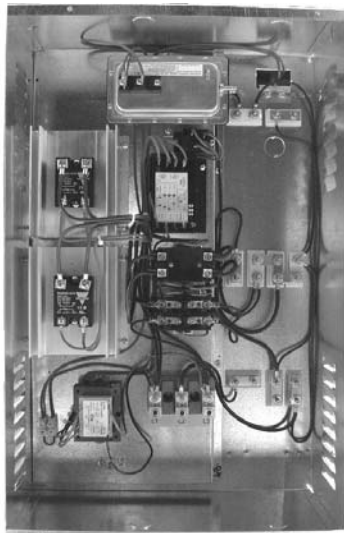
Each unit is submitted to several quality controls during its fabrication, and factory tested prior to shipment.

### B) PAINTING

External surfaces of casing are treated with a phosphate cleaner/conditioner and painted with one coat of epoxy conditioner/primer, exceeding Canadian standard 1-GP-40 and American standard TT-P-636 D for salted sea mist and humidity. The finish is made of first quality high performance alkyd resin enamel, factory applied.

### C) OPEN TYPE ELEMENTS ELECTRIC COIL

Electric coils are CSA (NRTL/C) certified, and encased in a galvanized steel casing. Heating elements are made of high grade Nickel-Chrome alloy resistant wire coils, insulated by floating ceramic bushings from the galvanized steel frame and free of mechanical constraint due to expansion and contraction.



The electric coil is equipped with built-in high limit cut-outs, control transformer, and airflow switch.

## SELECTION TABLE

MODEL BC(E)	FAN SIZE	AIR FLOW ( SPCM )	COIL CAPACITY (kW)											MOTOR (HP)					
			Temperature rise ( °F )											External static pressure* ( in.w.c.)					
			70	75	80	85	90	95	100	105	110	115	120	1/4	1/2	3/4	1	1-1/4	1-1/2
25	9-7	1000	22	24	25	27	28	30	32	33	35	36	38	1/2	3/4	1	1	-	-
	9-9	1500	33	36	38	40	43	45	47	50	52	55	57	1	1	1	1-1/2	1-1/2	2
		2000	44	47	51	54	57	60	63	66	70	73	76	1-1/2	1-1/2	1-1/2	2	2	2
		2500	55	59	63	67	71	75	79	83	87	91	95	2	2	2	2	3	3
50	12-12	3000	66	71	76	81	85	90	95	100	104	109	114	1-1/2	1-1/2	1-1/2	2	2	3
		3500	77	83	89	94	100	105	111	116	122	127	133	2	2	2	3	3	3
	15-15	4000	89	95	101	108	114	120	127	133	139	145	152	1-1/2	2	3	3	3	3
		4500	100	107	114	121	128	135	142	149	157	164	171	2	2	3	3	3	3
		5000	111	119	127	134	142	150	158	166	174	182	190	3	3	3	3	5	5
75	18-18	5500	122	130	139	148	157	165	174	183	191	200	209	3	3	3	5	5	5
		6000	133	142	152	161	171	180	190	199	209	218	228	3	3	5	5	5	5
		6500	144	154	164	175	185	195	206	216	226	236	247	3	5	5	5	5	5
		7000	155	166	177	188	199	210	221	232	244	255	266	3	5	5	5	5	7-1/2
		7500	166	178	190	202	213	225	237	249	261	273	285	5	5	5	7-1/2	7-1/2	7-1/2
100	20-20	8000	177	190	202	215	228	240	253	266	278	291	304	3	5	5	5	5	7-1/2
		8500	188	202	215	228	242	255	269	282	296	309	323	5	5	5	5	5	7-1/2
		9000	199	213	228	242	256	270	285	299	313	327	342	5	5	5	5	7-1/2	7-1/2
		9500	210	225	240	255	270	285	300	315	330	346	361	5	5	5	7-1/2	7-1/2	7-1/2
		10000	221	237	253	269	285	300	316	332	348	364	380	5	5	5	7-1/2	7-1/2	7-1/2
150	20-20	11000	244	261	278	296	313	330	348	365	383	400	417	5	5	7-1/2	7-1/2	7-1/2	7-1/2
		12000	266	285	304	323	342	361	380	398	417	436	455	7-1/2	7-1/2	7-1/2	7-1/2	10	10
		13000	288	308	329	349	370	391	411	432	452	473	493	7-1/2	7-1/2	7-1/2	10	10	10
		14000	310	332	354	376	398	421	443	465	487	509	531	7-1/2	10	10	10	15	15
		15000	332	356	380	403	427	451	474	498	522	546	569	10	10	10	15	15	15
200	25-25	16000	354	380	405	430	455	481	506	531	557	582	607	7-1/2	7-1/2	10	10	10	15
		17000	376	403	430	457	484	511	538	565	591	618	645	7-1/2	10	10	10	15	15
		18000	398	427	455	484	512	541	569	598	626	655	683	7-1/2	10	10	15	15	15
		19000	421	451	481	511	541	571	601	631	661	691	721	10	10	15	15	15	15
		20000	443	474	506	538	569	601	633	664	696	727	759	10	15	15	15	15	15
300	28-28	22000	487	522	557	591	626	661	696	731	765	800	835	10	10	15	15	15	15
		24000	531	569	607	645	683	721	759	797	835	873	911	15	15	15	15	20	20
		26000	576	617	658	699	740	781	822	863	904	946	987	15	15	15	20	20	20
		28000	620	664	708	753	797	841	886	930	974	N/D	N/D	15	20	20	20	20	25
		30000	664	712	759	806	854	901	949	996	N/D	N/D	N/D	20	20	20	25	25	25

### \*STATIC PRESSURE DROP

The internal static pressure of the unit includes the air friction caused by air intake hood, bird screen, fresh air damper, 2 inches standard filters and the electric coil. The external static pressure is the additional air friction caused by all other components of the air system which are not in the unit.

**Note:** For higher static pressure, or higher CFM, please consult the manufacturer.

## CONTROL MODE SELECTION

When selecting the control mode, precision versus cost must be taken into consideration. The temperature control precision depends not only on the type of control used, but also on other factors associated with the ventilation system. In order to meet the heating requirements, it is sometimes necessary to divide the total coil capacity in a number of steps. Each step contributes to a portion of the required temperature elevation ( $\Delta T$ ). The smaller the steps, the more precise will be the leaving air temperature. To guide you in selecting the proper mode of control for your system, the manufacturer uses the following terminology:

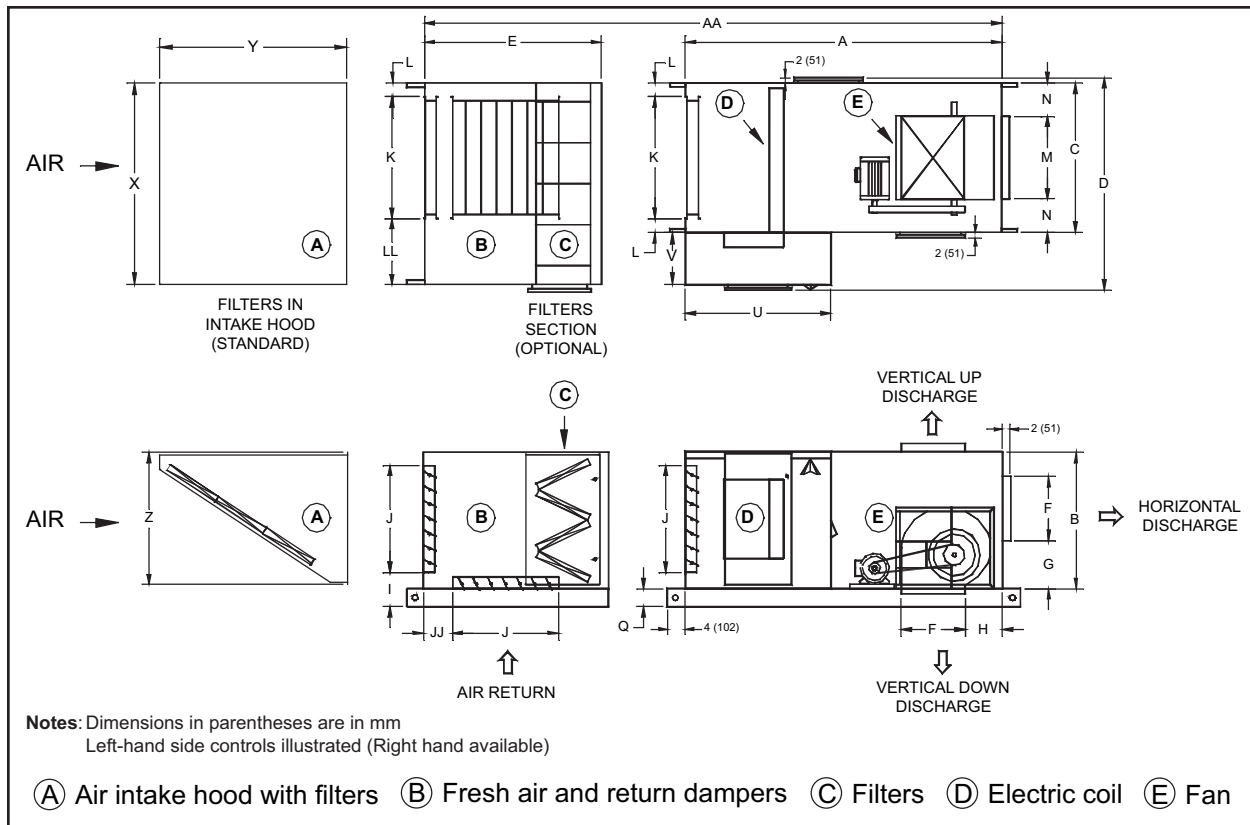
Temperature rise - °F per step of control	Final temperature precision level
5°F or less	HIGH
Between 6 & 20°F	MEDIUM
More than 20°F	LOW

When the electric coil is controlled by a SCR, it is considered as having an infinite number of steps, and therefore the control temperature precision will be HIGH. Unless otherwise specified, Bousquet electric air heaters are supplied with SCR controls. For other control mode arrangement, use the following table as a guide:

Recommended number of ON/OFF steps or SCR proportional controller							
$\Delta T$		6°C 10°F	11°C 20°F	17°C 30°F	22°C 40°F	28°C 50°F	28°C 50°F
Precision Level	Low	--	1 step	2 steps	2 steps	2 steps	SCR
	Medium	1 step	2 steps	3 steps	4 steps	5 steps	
	High	SCR	SCR	SCR	SCR	SCR	

**Warning:** Remember that a low precision control will cycle contactors more often and lead to premature maintenance.

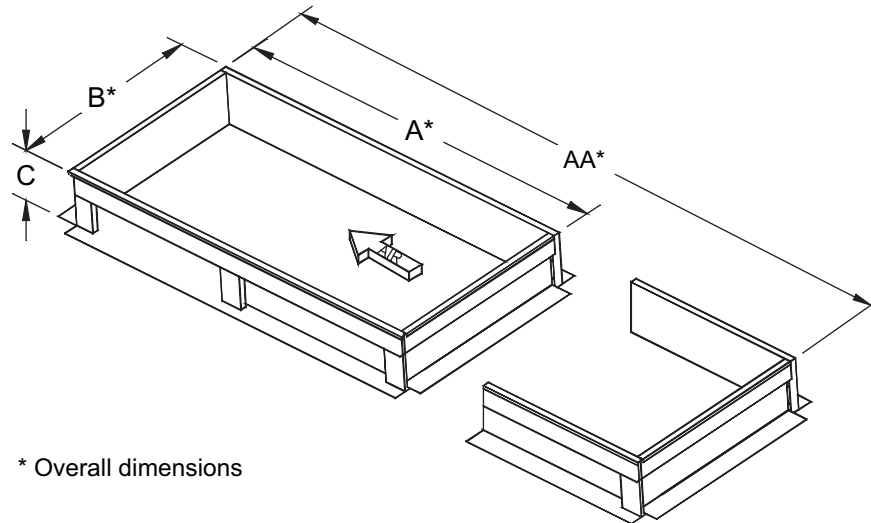
## DIMENSIONS BC(E) - MODELS 25 TO 300



	BC(E)-25	BC(E)-50	BC(E)-75	BC(E)-100	BC(E)-150	BC(E)-200	BC(E)-300
<b>FAN</b>	9-7 / ( 9-9 )	15-15	18-18	20-20	20-20	25-25	28-28
<b>FILTERS «V» bank</b>	1-16x20 1-20x20	4-20x20	2-20x20 4-16x20	9-16x20	8-16x20 4-16x25	5-20x20 10-20x25	18-20x20 6-20x25
<b>FILTERS In air intake</b>	1-20x20 1-20x25	2-16x20 2-16x25	3-16x20 3-16x25	6-20x25	9-20x25	8-16x25 8-20x25	12-20x25 6-20x20
<b>A<sup>1</sup></b>	75-1/2	75-1/2	75-1/2	90-1/2	90-1/2	106-1/2	110
<b>AA</b>	107-1/2	107-1/2	107-1/2	133-1/2	138-1/2	166-1/2	170
<b>B</b>	38	38	38	45	45	58	58
<b>C</b>	26	40	40	45	50	58	73
<b>D</b>	45	59	59	67	72	80	95
<b>E</b>	32	32	32	43	48	60	60
<b>F</b>	10-3/8 / (10-3/8)	16-1/8	19-1/8	25	25-3/8	31-3/4	35-5/8
<b>G<sup>2</sup></b>	6-7/8	9-7/8	10-3/4	11	11	13-7/8	15-7/8
<b>H</b>	7-1/2	10-7/8	13	13-1/4	13-1/4	16-1/8	18-1/8
<b>I</b>	17	17	17	14	9	10	11
<b>J</b>	20	20	20	31	36	48	48
<b>JJ</b>	6	6	6	6	6	6	6
<b>K</b>	20	25	34	36	42	51	66
<b>L</b>	3	7-1/2	3	4-1/2	4	3-1/2	3-1/2
<b>LL</b>	18	22-1/2	18	22-1/2	22	21-1/2	22-1/4
<b>M</b>	9-1/4 / (12)	18-7/8	22	25-1/8	25-3/8	31-3/4	35-5/8
<b>N</b>	8-3/8 / (7)	10-1/2	9	9-7/8	12-5/16	13-1/8	18-5/8
<b>Q</b>	3	3	3	4	4	4	5
<b>U</b>	40	40	40	45	45	50	50
<b>V</b>	15	15	15	18	18	18	18
<b>X</b>	20	32	48	50	60	72	85
<b>Y<sup>1</sup></b>	42	42	42	58	70	89	91
<b>Z</b>	27	27	27	34	43	56	52
<b>Weight<sup>3</sup></b>	866 Lbs	1099 Lbs	1255 Lbs	1570 Lbs	1740 Lbs	2100 Lbs	2600 Lbs

- Notes:**
- 1) Add dimensions A or AA and Y to obtain total unit length, including the air intake hood for outdoor model.
  - 2) Consult the manufacturer for «G» dimension with spring isolator option.
  - 3) Weight is for a standard outdoor unit with 1" (25 mm) insulation and standard air intake hood. For any other option, refer to manufacturer.

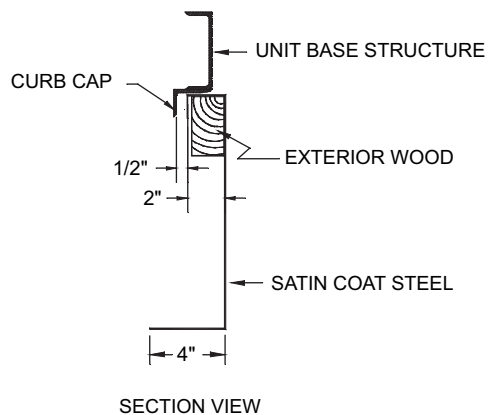
## ROOF CURBS



\* Overall dimensions

	BC(E)-25	BC(E)-50	BC(E)-75	BC(E)-100	BC(E)-150	BC(E)-200	BC(E)-300
<b>A</b>	75	75	75	90	90	106	109-1/2
<b>AA</b>	107	107	107	133	138	166	169-1/2
<b>B</b>	25-1/2	39-1/2	39-1/2	44-1/2	49-1/2	57-1/2	72-1/2
<b>C</b>	18	18	18	18	18	18	18
<b>Weight</b>	115 Lbs	130 Lbs	130 Lbs	150 Lbs	158 Lbs	185 Lbs	206 Lbs

## ROOF CURB - INSTALLATION DETAILS



## ELECTRIC AIR HEATERS BC(E) SERIES

### TYPICAL SPECIFICATIONS

#### GENERAL

Supply and install a Bousquet electric air heater model BC(E)-\_\_\_\_\_, for indoor (or outdoor) installation. The manufacturer shall be certified CWB (Canadian Welding Bureau) in conformity with CSA W47.1. standards.

#### PERFORMANCE

The electric air heater shall have the capacity to heat \_\_\_\_\_ SCFM from \_\_\_\_\_°F to \_\_\_\_\_°F, for an output capacity of \_\_\_\_\_ kW.

#### UNIT CONSTRUCTION

The supporting frame will be made of welded U-shaped structural steel. The sides and top of the unit will be single wall construction, insulated with 1 inch thick reinforced coated fiberglass. Each panel shall not exceed 20 inches wide, and made of 18 gauge satin finish «Galvaneal» steel, double folded at vertical edges for structural rigidity, bolted together and sealed with a PVC gasket plus an urethane joint for maximum tightness. The external surface will be treated with a phosphate cleaner/conditioner, painted with one coat of anti-corrosive epoxy primer exceeding the Canadian 1-GP-40 and the American TT-P-636-D standards for salt mist and humidity. The finish will be ensured with first quality high performance alkyd resin enamel.

#### ELECTRIC COIL

The electric coil will be CSA (NRTL/C) listed, and made of high grade Nickel-Chrome alloy coil, isolated from the casing by free floating ceramic bushings.

The coil terminal pins shall be stainless steel isolated by means of non-rotating ceramic bushings.

The coil shall be equipped with SCR modulating controls, air flow sensor, duct thermostat, load fuses, solid state relays, and protective screen.

It shall also be equipped with fail safe automatic reset disc type thermal cut-outs, as required by CSA.

Cut-out sensors shall be shielded from mechanical impact, and shall de-energize the heater in case of insufficient air flow.

#### FAN SECTION

The fan section will be designed according to AMCA (Air Movement & Control Association) standards. Fan and motor will be mounted on rubber pads vibration isolators and attached to the structural base frame. An access door will be provided to enable the maintenance of the blower, motor, bearings, belts and pulleys. The fan will be centrifugal type forward curved blades (FC), double width double inlet (DWDI) model \_\_\_\_\_, for \_\_\_\_\_ CFM at \_\_\_\_\_ inches w.c. total static pressure. The motor will be a premium efficiency ODP type, \_\_\_\_\_ HP, thermally protected and mounted on an adjustable base to allow belt tension with bolts.



## **FILTERS**

Unless otherwise specified, filters will be mounted in air intake hood in galvanized steel slides, and accessible through a hinge panel.

Filters will be disposable type extended surface pleated media, 2 inches thick, with 30% filtration efficiency.

## **DAMPERS**

Air intake damper shall be standard galvanized steel parallel blades, with on-off electric actuator and end proving switch.

## **AIR INTAKE HOOD**

The air intake hood will be located on the end of the unit, sized for 500 feet per minute maximum air velocity and equipped with bird screen.

## **ELECTRICITY & CONTROLS**

- Electric supply at \_\_\_\_\_ volts, \_\_\_\_\_ phases, 60 cycles
- Terminal block for electrical connection
- Temperature control with SCR
- Magnetic starter with overloads
- High limit temperature
- Air flow sensor
- All components required for proper operation

## **CERTIFICATION**

All Bousquet BC(E) series electric air heaters shall bear the CSA label and certify to CAN/CSA-C22.2 No. 236-95 standards.

## **START-UP & ADJUSTMENTS**

The heater shall be factory tested prior to shipping.

The start-up shall be done by a qualified and authorized service technician.

## STANDARD & OPTIONAL COMPONENTS

### STANDARD :

- CSA LISTED - Canada & USA
- Horizontal or vertical discharge
- Electrical power supply (575, 460, 208 volts/3 phases/60 cycles)
- Temperature control from an external signal supplied by others
- Single speed ODP premium efficiency fan motor thermally protected, 1800 rpm
- Adjustable motor base
- Terminals for main electrical connections
- All electrical and mechanical equipment required for the unit operation
- High and low air temperature limit control
- DWDI forward curved (FC) centrifugal fan with ball bearings
- Unit wall: 18 gauge satin finish «Galvaneal» steel, enamel painted
- Welded steel structural base
- 1" reinforced coated fiberglass insulation
- Hinged access doors with knob handles
- Adjustable pulley on 5 HP motor and smaller
- Fixed pulley on 7.5 HP motor and bigger
- Lifting lugs
- Rubber vibration isolators for fan & motor
- Fan outlet flexible joints
- Motorized fresh damper
- Air intake hood with 2 inches 30% pleated filters
- Galvanized steel liner in electric coil compartment for radiation protection

### OPTIONAL:

- Remote control panel (basic: stop, fan, heat)
- Duct or room temperature controller
- Main electrical disconnect (fused or non fused)
- TEFC motor
- Low temperature limit control
- Roof curb (not insulated)
- Marine type lamp fixture and/or 120V electrical outlet (see page 10)
- Return air damper (on-off or modulating)
- «V» filters section
- Dirty filters indicator
- Galvanized steel liner
- Backward inclined DWDI fan
- Spring vibration isolators (see page 10)
- Mushroom type air intake
- Service platform (see page 10)
- Vertical arrangement
- Service corridor (see page 10)
- DX or chilled water coil

**NOTE: For other options, consult the manufacturer**

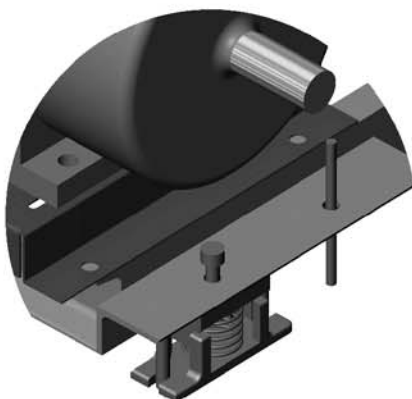
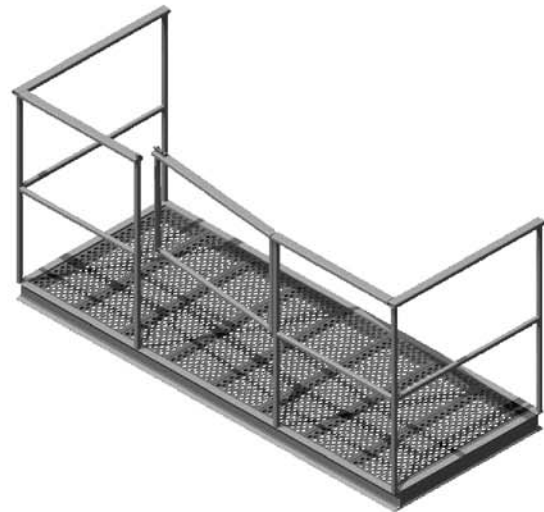
## OPTIONAL COMPONENTS

MARINE TYPE LAMP →



← SERVICE CORRIDOR

SERVICE PLATFORM →



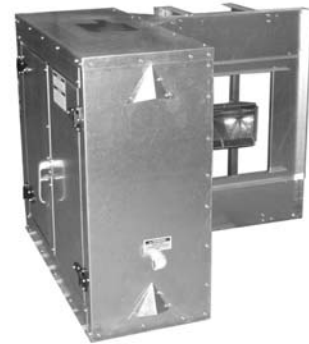
← SPRING VIBRATION ISOLATORS

## OTHER EQUIPMENT MANUFACTURED BY BOUSQUET



**Direct gas-fired  
make-up air heaters  
SDM Series**

**Direct gas-fired  
insertion duct heaters  
SDM(I) Series**



**Indirect gas-fired  
duct heaters  
HDG(I) Series**

**Indirect gas-fired  
air heater  
HDG(H) Series**



**Air to Air  
Energy conservation module  
BC-ECW Series**



2121, Nobel  
Sainte-Julie (Quebec)  
J3E 1Z9

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