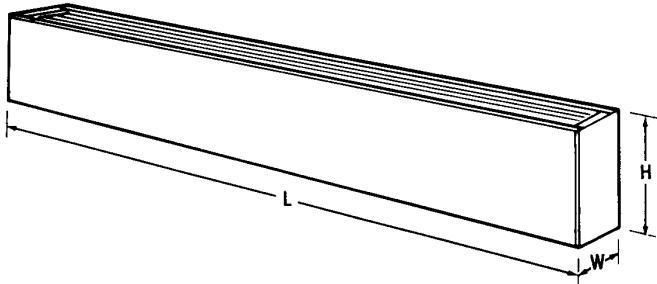




A Marley Engineered Products Brand
470 Beauty Spot Rd. E, Bennettsville, SC 29512

SUBMITTAL SHEET
CSL SERIES
COMMERCIAL
SILL LINE HEATERS

CSL SERIES - COMMERCIAL SILL LINE HEATERS



DIMENSIONS

Type	Height	Width	Length
CSLAS	5-1/2"	3"	28" to 10'
CSLAM	7"	5"	28" to 10'
CSLAL	14"	6"	28" to 10'



FILE #37116

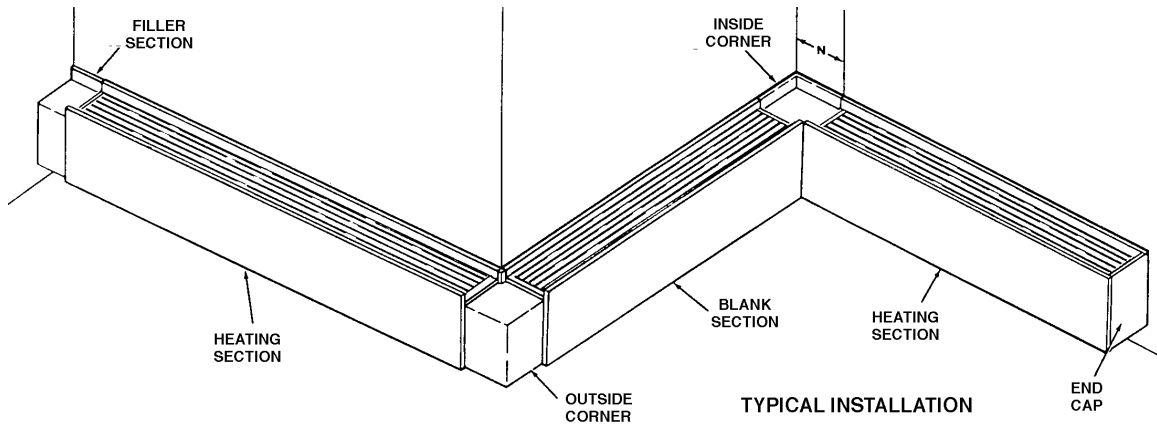
ITEM	QTY.	CATALOG NUMBER	TAG	LENGTH	NO. OF ELEMENTS	WATTS	VOLTS	Ø	AMPS	BUILT-IN CONTROLS

ACCESSORIES
& CONTROLS

ITEM	QTY.	CAT. NO.	TAG	DESCRIPTION

SUBMITTED BY:	DATE

APPROVED BY:	DATE

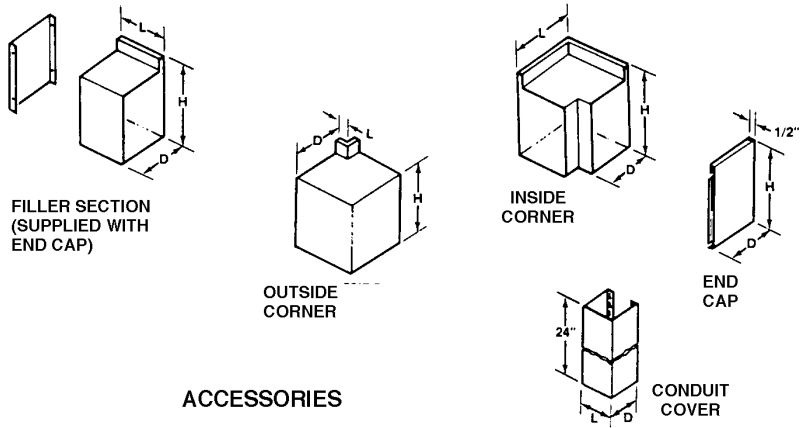


ACCESSORIES

CATALOG NUMBER	USE W/CSL	DIMENSIONS (inches)						
		H	D	L	N*			
LEFT END CAPS								
CSLASECL	05	5-1/2	2-1/2					
CSLAMECL	07	7	4-1/4	—	1/8			
CSLALACL	14	14	4-1/4					
RIGHT END CAPS								
CSLASECR	05	5-1/2	2-1/2					
CSLAMECR	07	7	4-1/4	—	1/8			
CSLALACR	14	14	4-1/4					
FILLER SECTIONS								
CSLASFL3	05	5-1/2	5-1/8	4	0-3			
CSLAMFL3	07	7	6-1/8	7	3-6			
CSLALFL3	14	14	13-1/8					
CSLASFL6	05	5-1/8	2-1/2					
CSLAMFL6	07	6-1/8	4-1/2	7	3-6			
CSLALFL6	14	13-1/8	4-1/2					
CSLASFL9	05	5-1/8	2-1/2					
CSLAMFL9	07	6-1/8	4-1/2	10	6-9			
CSLALFL9	14	13-1/8	4-1/2					
CSLASFL12	05	5-1/8	2-1/2					
CSLAMFL12	07	6-1/8	4-1/2	13	9-12			
CSLALFL12	14	13-1/8	4-1/2					
CSLASFL18	05	5-1/8	2-1/2					
CSLAMFL18	07	6-1/8	4-1/2	19	15-18			
CSLALFL18	14	13-1/8	4-1/2					
INSIDE CORNERS								
CSLASIC*	05	5-1/8	2-1/2	4-1/2	3-3-1/2			
CSLAMIC*	07	6-1/8	4-1/2	6	5-5-1/2			
CSLALIC*	14	13-1/8	4-1/2	6	5-5-1/2			
OUTSIDE CORNERS								
CSLASOC*	05	5-1/8	2-1/2	4-1/2	3-3-1/2			
CSLAMOC*	07	6-1/8	4-1/2	6	5-5-1/2			
CSLALOC*	14	13-1/8	4-1/2	6	5-5-1/2			
CONDUIT CORNERS								
CSLASCC	05	—	2-5/8	2-1/2	—			
CSLAMCC	07	—	—	—	—			
STAND-OFF BRACKETS								
SO-1	05	4-3/4	3/4	2-1/2	—			
SO-2	07	6-3/4	3/4	3	—			
BLANK SECTIONS (CSLAS)								
CSLASBL2*	05	5-1/2	3	28	28			
CSLASBL3*				36	36			
CSLASBL4*				48	48			
CSLASBL5*				60	60			
CSLASBL6*				72	72			
CSLASBL8*				96	96			
CSLASBL10*				120	120			
BLANK SECTIONS (CSLAM)								
CSLAMBL2*				07	7	5	28	28
CSLAMBL3*							36	36
CSLAMBL4*	48	48						
CSLAMBL5*	60	60						
CSLAMBL6*	72	72						
CSLAMBL8*	96	96						
CSLAMBL10*	120	120						
BLANK SECTIONS (CSLAL)								
CSLALBL2*	14	14	5				28	28
CSLALBL3*							36	36
CSLALBL4*				48	48			
CSLALBL5*				60	60			
CSLALBL6*				72	72			
CSLALBL8*				96	96			
CSLALBL10*				120	120			

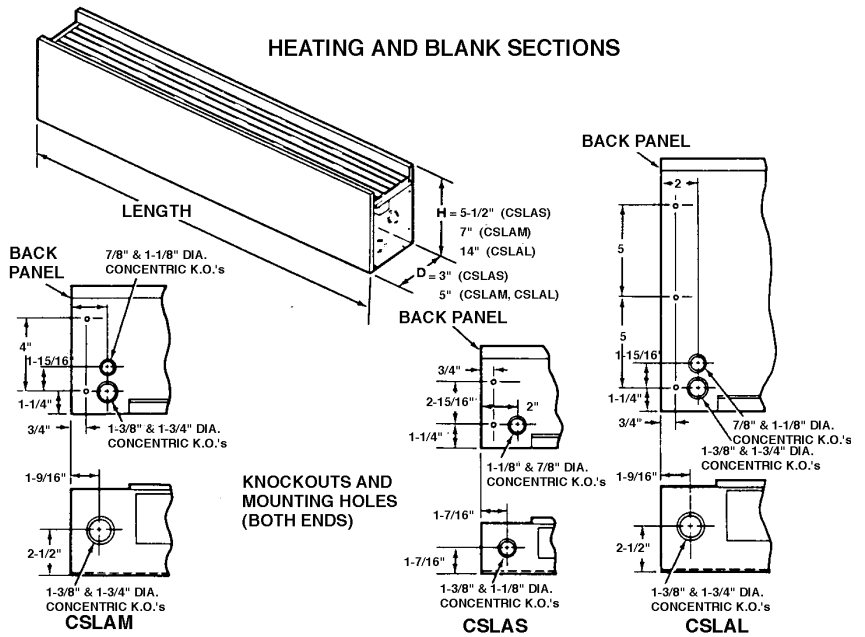
NOTES

- If color is not specified, front covers will be neutral gray.
 - When ordering, specify heater Catalog No., voltage, phase, suffix Catalog No. for built in controls, color and options.
- (*) - Add suffix 1 for bottom inlet, add 2 for front inlet.



ACCESSORIES

HEATING AND BLANK SECTIONS



* X is the additional length the accessory adds to the total installation.

** Built-in duplex receptacle available. (See page 3.)

CSLAS SELECTION CHART

CATALOG NO.	LGTH.	WATTS PER FT.	TOTAL WATTS	TOTAL BTU/HR.	AMPERAGE			
					120V	208V	240V	277V
CSLAS2	28 in.	125	250	853	2.4	1.2	1.0	0.9
		188	375	1280	3.1	1.8	1.6	1.4
		250	500	1706	4.2	2.4	2.1	1.8
CSLAS3	3 ft.	125	375	1280	3.1	1.8	1.6	1.4
		188	564	1925	4.7	2.7	2.4	2.0
		250	750	2560	6.2	3.6	3.1	2.7
CSLAS4	4 ft.	125	500	1760	4.2	2.4	2.1	1.8
		188	750	2560	6.2	3.6	3.1	2.7
		250	1000	3413	8.3	4.8	4.2	3.6
CSLAS5	5 ft.	125	625	2133	5.2	3.0	2.6	2.2
		188	940	3208	7.8	4.5	3.9	3.4
		250	1250	4266	10.4	6.0	5.2	4.5
CSLAS6	6 ft.	125	750	2560	6.2	3.6	3.1	2.7
		188	1125	3840	9.4	5.4	4.7	4.1
		250	1500	5120	12.5	7.2	6.2	5.4
CSLAS8	8 ft.	125	1000	3413	—	4.8	4.2	3.6
		188	1500	5120	—	7.2	6.2	5.4
		250	2000	6826	—	9.6	8.3	7.2
CSLAS10	10 ft.	125	1250	4266	—	6.0	5.2	4.5
		188	1875	6400	—	9.0	7.8	6.7
		250	2500	8532	—	12.0	10.4	9.0

Optional Built-in Control Specifications

Optional built-in Control (CATALOG No. Suffix)		Ratings
1-Pole Thermostat (-T)		Thermostat adjustable through grill; tamper resist ant; range 60-120°F; rated 24 amps @ 120-240 VAC and 22 amps @ 277 VAC; Pilot Duty rating of 125 VA @ 24-277 VAC.
2-Pole Thermostat (-2T)		Thermostat adjustable through grill; tamper resist ant; range 60-120°F; rated 24 amps @ 120-240 VAC and 22 amps @ 277 VAC; Pilot Duty rating of 125 VA @ 24-277 VAC.
2-Stage Thermostat (-2ST)		Thermostat adjustable through grill; tamper resistant; range 60-120°F; rating (per stage) 24 amps @ 120-240 VAC and 22 amps @ 277 VAC; Pilot Duty (per stage) 125 VA @ 24-277 VAC; 3°F differential between stages.
Disconnect Switch* (-DS)		Disconnect switch energized through grill; Tamper resistant; double pole single throw switch rated 20 amps (per pole) @ 120-277 VAC.
Transformer Relay (-TR)		Single pole relay with 24 volts holding coil and built-in transformer; relay contacts rated 24 amp @ 120-240 VAC and 22 amps @ 277 VAC for 07 and 14 units; 22 amps @ 120-240 VAC and 19 amps @ 277 VAC for 05 units. 24 volt control.
Power Relay (-PR)		Single pole magnetic relay rated 25 amps @ 120-277 VAC; available with 24, 120, 208/240, or 277 VAC holding coil.

CSLAM & CSLAL SELECTION CHART

CATALOG NO.	LGTH.	WATTS PER FT.	TOTAL WATTS	TOTAL BTU/HR.	AMPERAGE					NO. OF ELEM.		
					208V 1 PH.	208V 3 PH.	240V 1 PH.	240V 3 PH.	277V 1 PH.			
CSLAM2 or CSLAL2	28 in.	125	250	853	1.2	—	1.0	—	0.9	1		
		188	375	1280	1.8	—	1.6	—	1.4			
		250	500	1706	2.4	—	2.1	—	1.8			
		CSLAM3 or CSLAL3	3 ft.	375	750	2560	3.6	—	3.1	—	2.7	2
				500	1000	3413	4.8	—	4.2	—	3.6	
				564	1125	3840	5.4	3.1	4.7	2.7	4.0	
CSLAM4 or CSLAL4	4 ft.			625	1250	4266	6.0	3.5	5.2	3.0	4.5	3
				750	1500	5120	7.2	4.2	6.2	3.6	5.4	
				125	375	1280	1.8	—	1.6	—	1.4	
		CSLAM5 or CSLAL5	5 ft.	188	564	1925	2.7	—	2.4	—	2.0	1
				250	750	2560	3.6	—	3.1	—	2.7	
				375	1125	3840	5.4	—	4.7	—	4.0	
CSLAM6 or CSLAL6	6 ft.			500	1500	5120	7.2	—	6.2	—	5.4	2
				564	1690	5768	8.1	4.7	7.4	4.3	6.1	
				625	1875	6400	9.0	5.2	7.8	4.5	6.7	
		CSLAM8 or CSLAL8	8 ft.	750	2250	7680	11.0	6.5	9.4	5.4	8.1	3
				125	500	1760	2.4	—	2.1	—	1.8	
				188	750	2560	3.6	—	3.1	—	2.7	
CSLAM10 or CSLAL10	10 ft.			250	1000	3413	4.8	—	4.2	—	3.6	1
				375	1875	6400	9.0	—	7.8	—	6.7	
				500	2500	8532	12.0	—	10.4	—	9.0	
		CSLAM2 or CSLAL2	28 in.	564	2820	9625	13.5	7.8	11.8	6.8	10.2	2
				625	3125	10,665	15.0	8.7	13.0	7.5	11.3	
				750	3750	12,800	18.0	10.4	15.6	9.0	13.5	
CSLAM3 or CSLAL3	3 ft.			564	2820	9625	13.5	7.8	11.8	6.8	10.2	3
				625	3125	10,665	15.0	8.7	13.0	7.5	11.3	
				750	3750	12,800	18.0	10.4	15.6	9.0	13.5	
		CSLAM4 or CSLAL4	4 ft.	564	2820	9625	13.5	7.8	11.8	6.8	10.2	1
				625	3125	10,665	15.0	8.7	13.0	7.5	11.3	
				750	3750	12,800	18.0	10.4	15.6	9.0	13.5	
CSLAM5 or CSLAL5	5 ft.			564	2820	9625	13.5	7.8	11.8	6.8	10.2	2
				625	3125	10,665	15.0	8.7	13.0	7.5	11.3	
				750	3750	12,800	18.0	10.4	15.6	9.0	13.5	
		CSLAM6 or CSLAL6	6 ft.	564	2820	9625	13.5	7.8	11.8	6.8	10.2	3
				625	3125	10,665	15.0	8.7	13.0	7.5	11.3	
				750	3750	12,800	18.0	10.4	15.6	9.0	13.5	
CSLAM8 or CSLAL8	8 ft.			564	2820	9625	13.5	7.8	11.8	6.8	10.2	1
				625	3125	10,665	15.0	8.7	13.0	7.5	11.3	
				750	3750	12,800	18.0	10.4	15.6	9.0	13.5	
		CSLAM10 or CSLAL10	10 ft.	564	2820	9625	13.5	7.8	11.8	6.8	10.2	2
				625	3125	10,665	15.0	8.7	13.0	7.5	11.3	
				750	3750	12,800	18.0	10.4	15.6	9.0	13.5	
CSLAM10 or CSLAL10	10 ft.			564	2820	9625	13.5	7.8	11.8	6.8	10.2	3
				625	3125	10,665	15.0	8.7	13.0	7.5	11.3	
				750	3750	12,800	18.0	10.4	15.6	9.0	13.5	

1-Pole Thermostat and Disconnect Switch (-TDS)	Line voltage control, both thermostat and disconnect in power circuit; thermostat adjustable through grill (range 60-120°F); disconnect switch energized through grill; control combination rated 20 amps @ 120-277 VAC.
Disconnect Switch and Transformer Relay (-DSTR)	Line voltage control (requires a remote 24V Pilot Duty thermostat); both disconnect switch and transformer relay in power circuit; disconnect switch energized through grill; control combination rate 20 amps @ 120-240 VAC and 19 amps @ 277 VAC.
Disconnect Switch and Power Relay (-DSPR)	Line voltage control; both disconnect switch and power relay in power circuit; requires a remote control voltage and thermostat for power relay (holding coil voltages available: 24, 120, 208/240, 277 VAC); disconnect switch energized through grill. Control combination rated 18 amps @ 120-277 VAC.
Pilot Duty Thermostat (-PDT)	Thermostat adjustable through grill; tamper resistant; range 60-120°F; thermostat (rated 125 VA @ 24-277 VAC) is wired for Pilot Duty operation of Power Relay (PR) or Transformer Relay (TR). See circuit amperage restrictions with -PR or -TR.
120V Duplex Receptacle (-R)	20 amp duplex receptacle built into left or right end cap or 6, 9, 12 or 18-inch filler section.

* 2 required for 3-phase units and single-phase units over 20 amps

HOW TO ORDER

Berko's factory model number is made up of groups of numerals and letters to provide a complete description of the product. A typical factory model number will consist of six groups.
 EXAMPLE: If you want a 28" CSL heater, 3" x 5-1/2" case size, 500 watts at 120 volts, with a built-in single pole thermostat and disconnect switch, this is what you should order:

I II III IV V VI
 CSLAS 2 250 12 1 TDS

I CASE SIZE

CSLAS - 3" X 5-1/2" CSLAM - 5" X 7" CSLAL - 5" X 14"

II LENGTH INDICATOR

The following numbers in this group designate the length of the heater body as follows:
 2 = 28" 3 = 3' 4 = 4' 5 = 5' 6 = 6' 8 = 8' 10 = 10'

III OUTPUT - WATTS INDICATOR

Standard Watt Densities are 125W/ft, 188 W/ft, 250 W/ft for all case sizes. For CSLAM & CSLAL, additional watt densities are 375 W/ft, 500 W/ft, 564 W/ft, 625 W/ft and 750 W/ft.

IV VOLTAGE

Identify the heater voltage using these two digit numbers:
 12 = 120V 20 = 208V 24 = 240V 27 = 277V

V PHASE

Identify voltage phase using these single digit numbers:
 1 = 1 phase 3 = 3 phase

VI OPTIONAL BUILT-IN CONTROLS

Specify optional controls to be built into the heater by the letters shown in parentheses in control specification chart above.



A Marley Engineered Products Brand
470 Beauty Spot Rd. E, Bennettsville, SC 29512

**CONTROL SECTIONS
SELECTION CHART**

CAT. NO.	DESCRIPTION
BLANK CONTROL SECTIONS	
CSLAMBCS	7" High, Bottom Inlet/Top Outlet
CSLALBCS	14" High, Bottom Inlet/Top Outlet
MERCURY RELAYS (6 VA EACH)	
M1-20	1 - Single Pole Mercury Relay Rated 30 Amps @ 208, 240, 277 VAC
M1-60	1 - Single Pole Mercury Relay Rated 60 Amps @ 208, 240, 277 VAC
M2-30	2 - Single Pole Mercury Relay Rated 30 Amps @ 208, 240, 277 VAC
M2-60	2 - Single Pole Mercury Relay Rated 60 Amps @ 208, 240, 277 VAC
M3-30	3 - Single Pole Mercury Relay Rated 30 Amps @ 208, 240, 277 VAC
M3-60	3 - Single Pole Mercury Relay Rated 60 Amps @ 208, 240, 277 VAC
M4-30	4 - Single Pole Mercury Relay Rated 30 Amps @ 208, 240, 277 VAC
M4-60	4 - Single Pole Mercury Relay Rated 60 Amps @ 208, 240, 277 VAC
M6-30	6 - Single Pole Mercury Relay Rated 30 Amps @ 208, 240, 277 VAC
M6-6	26 - Single Pole Mercury Relay Rated 60 Amps @ 208, 240, 277 VAC

CAT. NO.	DESCRIPTION
BLANK CONTROL SECTIONS	
1CB-2P30	1 - Two Pole Circuit Breaker Rated 30 Amps @ 208, 240, 277 VAC
1CB-2P60	1 - Two Pole Circuit Breaker Rated 60 Amps @ 208, 240, 277 VAC
1CB-3P30	1 - Three Pole Circuit Breaker Rated 30 Amps @ 208, 240, 277 VAC
1CB-3P60	1 - Three Pole Circuit Breaker Rated 60 Amps @ 208, 240, 277 VAC
2CB-2P30	2 - Two Pole Circuit Breaker Rated 30 Amps @ 208, 240, 277 VAC
2CB-2P60	2 - Two Pole Circuit Breaker Rated 60 Amps @ 208, 240, 277 VAC
2CB-3P30	2 - Three Pole Circuit Breaker Rated 30 Amps @ 208, 240, 277 VAC
2CB-3P60	2 - Three Pole Circuit Breaker Rated 60 Amps @ 208, 240, 277 VAC
PNEUMATIC CONTROL	
PE	Pneumatic/Electric switching of heater or relays. Pneumatic Rating: Range 3 to 20 PSIG. Electric Rating: SPDT Switch, 16 amps @ 120 VAC, 9.2 Amps @ 028 VAC, 8 Amps @ 240 VAC, 7.2 Amps @ 277 VAC. Pilot Duty Rating: 125 VA @ 24-277 VAC.
CONTROL TRANSFORMER (50 VA RATING)	
TR24	Low Voltage Transformer, 24V Secondary

CAT. NO.	DESCRIPTION
THERMOSTAT	
1PDT	Single Pole Pilot Duty Thermostat 60° to 120°F Temperature Range - 125 VA Rating
2PDT	Two Stage Pilot Duty Thermostat 60° to 120°F Temperature Range - 125 VA Rating
DISCONNECT SWITCH	
DS	Pilot Duty Disconnect Switch - Double Pole (Disconnects relay holding coil circuit)
SCR CONTROLS	
(Zero Voltage Switching Device operating on 10 second time base; continuous modulation 0 to max. output - all solid state components)	
M-SCR	Master SCR Control Rated 22.5 Amps @ 208/240 or 277 volts
MS-SCR	Master and Slave SCR Controls each rated 22.5 Amps @ 208/240 or 277 volts
SCR THERMOSTAT	
T-SCR	Thermister Type Solid State Thermostat Temperature Range 65° to 85°F
SCR INTERFACE	
I-SCR	Interface samples potentiometer resistance of the temperature controller and gives a command signal to the master SCR. 0-1135 ohm potentiometer input required.

ARCHITECT'S AND ENGINEER SPECIFICATIONS*

Furnish and install, where indicated on plans, convector type heaters suitable for continuous operation as manufactured by Berko, A Marley Engineered Products Brand, Bennettsville, SC. Units shall be Underwriter's Laboratories Listed to US and Canadian standards, shall have a low profile (3" x 5-1/2", 5" x 7", 5 x 14"), and be available in lengths from 28" through 10'.

ENCLOSURE - Shall be fabricated of 16 gauge cold-rolled steel (14 gauge optional), with a built-in wireway with factory installed wiring rated up to 45 Amps. This makes it unnecessary to fish wires through when wiring two or more heaters in parallel. Removal of the front panel will provide unobstructed access to the element area and terminal boxes. Enclosures will have an extruded aluminum grille with a 1/4" mesh under the grille to discourage insertion of foreign objects into the heaters. There will be top discharge outlets and bottom inlet outlets.

HEATING ELEMENTS - Constructed of nickel chromium heating element wire, embedded in magnesium oxide, and enclosed in a metal sheath for maximum strength and corrosion resistance. Aluminum fins shall be pressure bonded to the sheath. One, two or three elements shall be installed side-by-side to uniformly warm the incoming air. They shall be center anchored and float freely on each end in nylon bushings.

OVER TEMPERATURE PROTECTION - An automatic reset thermal overheat protector shall run the length of the heater turning the unit off in the event an overheating situation should occur. The protector shall automatically reset after the unit has cooled down.

HEATING LENGTHS AND VOLTAGES - Heater lengths, voltages, and wattage capacities shall be as indicated on the plans.

FINISH - All heaters and trim accessories shall be phosphatized and painted by a baked enamel painting process.

TRIM ACCESSORIES - Optional trim accessories to provide an attractive off-set fit shall be provided. These shall include end caps, filler sections, inside corners, outside corners, and blank sections.

CONTROL SECTIONS - Control sections, sized to match the 5" x 7" and 5" x 14" units shall be furnished as an optional accessory for field installation of controls or shall be used to house factory installed controls as specified.

OPTIONAL BUILT-IN CONTROLS - Shall be provided singularly or in combination as specified. These shall include thermostats, power relays, transformer relays, and disconnect switches.

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

APPLICATION LIMITATIONS AND PRECAUTIONS

A. Hazardous Atmosphere - Because the possibility of a concealed spark can exist from the built-in thermal limit switch, heaters should not be used in potentially explosive atmospheres.

B. Corrosive Atmosphere - The high quality finish and steel internal sheet metal parts will give excellent service under most operating conditions, including coastal salt air and industrial atmospheres. However, the finish is not intended for direct salt spray exposure in marine application or highly corrosive greenhouse, swimming pool, chemical storage or industrial atmospheres.

C. Cleanliness - Although specifically designed for mounting below window areas, heaters can be installed on plaster, wood paneled, metal, masonry, or composition wall surfaces with reasonable expectation of clean wall operation. Should some soiling occur, after a period of years, smooth walls may be cleaned with standard maintenance materials. For deep textured walls, consideration should be given to choice of enclosure height and watt per foot capacity - generally, the enclosure with lowest surface temperature will have the least soiling tendency.

D. Comfort - Optimum room comfort results when heater is mounted just below the window sill, since window cold down draft is eliminated and maximum convection air distribution without stratification is maintained throughout the room. Because of the tendency for warm air to stratify, installing heaters close to the ceiling is not recommended. If it should be necessary, at least 18" clearance above the air discharge must be maintained. Bottom of heaters are not intended for attractive appearance when mounted above eye level.

E. Air Throw - Since heaters provide only natural convection air throw, they are not recommended for combatting cold outside air blasts through high traffic, main entryways and vestibules. Heaters will maintain satisfactory comfort conditions in low traffic, side entryways and vestibules, but for most entryways, faster response fan driven heaters would be preferred.

F. Curtains, Drapes, or Blinds - Should clear the top of the heater by at least six inches. Never permit draperies to completely cover the unit.
Furniture - should be placed so it does not touch

the heater and so it does not completely block the air vents. Allow at least 4" free space between furniture and the heaters.

G. Recess Mounting - UL labeled for free standing wall surface mounting only. Not recommended for mounting behind built-in book shelves, storage cabinets, window seats, etc.

H. In institutional applications such as hospitals, nursing homes, child day-care centers, and clinics, it is recommended that low-watt density convectors be used to provide optimum comfort at lowest case temperatures.

I. Due to variations in vinyl compositions and their potential to discolor, the use of stand-off brackets (SO1 and SO2) and/or specifying a lower watt density unit may be required when installing on vinyl wall-coverings or under vinyl window dressings. Prior to setting specifications, consult factory for installation recommendations.