

THERMAL MANAGEMENT REGULATION

NOTICE: Thermal Management Products are not returnable

QUICK FIX

Part No.	Code
09510.0-01	9

Adhesive backing allows quick installation of heaters, thermostats and other small components into enclosure. (5 pieces per pack).



THERMOSTAT



Setting	Closed Contact to Heat	Open Contact to Cool	Wt oz.	Code
-15 to 45°C	01157.0-00	01156.0-00	2	9
-10 to 50°C	11100.0-01	11101.0-01	2	9
0 to 60°C	11100.0-00	11101.0-00	2	9
10 to 70°C	-	01149.9-00	2	9
20 to 80°C	11100.0-02	11101.0-02	2	9
14 to 122°F	11100.9-01	11101.9-01	2	9
32 to 140°F	11100.9-00	11101.9-00	2	9



DUAL THERMOSTAT



Part No.	Contact Type/Setting		Wt oz.	Code
	Open (Red)	Closed (Blue)		
01172.0-01	32 to 140°F	32 to 140°F	3	9
01175.0-01	14 to 22°F	68 to 176°F	4	9
01172.0-00	0 to 60°C	0 to 60°C	3	9
01175.0-00	-10 to 50°C	20 to 80°C	4	9



TAMPERPROOF THERMOSTAT



Part No.	Contact Type	Switch on/off Temp (°F)	Switch on/off Temp (°F)	Wt oz.	Code
01160.0-00	Closed	15°C(59)off	5°C(41)on	1	9
01160.0-01	Closed	25°C(77)off	15°C(59)on	1	9
01161.0-00	Open	50°C(122)on	40°C(104)off	1	9
01161.0-01	Open	60°C(140)on	50°C(122)off	1	9
01161.0-02	Open	35°C(95)on	25°C(77)off	1	9



TAMPERPROOF DUAL THERMOSTAT



Part No.	NC - open on rise		NO - close on rise		Wt oz.	Code
	Switch on Temperature	Switch off Temperature	Switch on Temperature	Switch off Temperature		
01163.0-00	59°F/15°C	41°F/5°C	122°F/50°C	104°F/40°C	2	9
01163.0-01	77°F/25°C	59°F/15°C	140°F/60°C	122°F/50°C	2	9
01163.0-02	59°F/15°C	41°F/5°C	95°F/35°C	77°F/25°C	2	9
01163.0-03	77°F/25°C	59°F/15°C	122°F/50°C	104°F/40°C	2	9



Part No.	NC - closed on rise		NO - close on rise		Wt oz.	Code
	Switch off Temperature	Switch on Temperature	Switch off Temperature	Switch on Temperature		
01164.0-00	122°F/50°C	104°F/40°C	140°F/60°C	122°F/50°C	2	9

HUMIDITY & TEMPERATURE CONTROL



Part No.	Voltage	Settings	Wt oz.	Code
01230.0-00	100-240V, 50/60 Hz	0-60°C, 50-90%RH	4	9
01230.9-00	100-240V, 50/60 Hz	32-140°F, 50-90%RH	4	9



HAZARDOUS AREA THERMOSTAT

Part No.	Contact Type	Switch Temperature	Switching Difference	Wt oz.	Code
01185.0-00	Normally Closed	59°F+15°C(±5°F/3Ktolerance)	9°F±5°Ftolerance(5K±3K)	1	9
01185.1-00	Normally Closed	77°F+25°C(±5°F/3Ktolerance)	9°F±5°Ftolerance(5K±3K)	1	9



THERMAL MANAGEMENT CONVECTION HEATING

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SMALL CONVECTION PTC HEATER (AC/DC 120-240V)



Part No.	Watts	Max. Current (inrush)	Approximate Surface Temp.	Weight (oz)	Code
01622.0-03	5 W	2.0 A	165°C(329°F)	0.5	9
01623.0-01	9 W	2.5 A	175°C(347°F)	1	9
01602.0-00	8 W	2.0 A	150°C(302°F)	1	9
01609.0-00	10 W	2.5 A	155°C(311°F)	1	9
01610.0-00	13 W	3.0 A	170°C(338°F)	1	9



SMALL CONVECTION PTC HEATER (AC/DC 110-120V)



Part No.	Power At 20°C (68°F)	Max. Current (inrush)	Weight (oz)	Code
04700.9-00	10 W	1.5 A	4	9
04701.9-00	20 W	1.8 A	5	9
04702.9-00	30 W	2.4 A	7	9



SAFE-TOUCH CONVECTION HEATER (AC/DC 120-240V)



Part No.	Watts	Weight (oz)	Code
06040.0-00	10 W	5	9
06030.0-00	20 W	6.1	9
06000.0-00	50 W	10.4	9
06010.0-00	100 W	10.6	9
06020.0-00	150 W	15.5	9



CONVECTION HEATER WITH QUICK CONNECT PUSH TERMINALS (AC/DC 120-240V)



Part No.	Watts	Weight (oz)	Code
14000.0-00	15 W	.5	9
14001.0-00	30 W	.5	9
14003.0-00	45 W	.5	9
14005.0-00	60 W	1	9
14006.0-00	75 W	1	9
14007.0-00	100 W	1	9
14008.0-00	150 W	1	9



THERMAL MANAGEMENT HAZARDOUS AREA CONVECTION HEATING

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TEMPERATURE CLASS T3 C€

Part No.	Description	Operating Voltage	Watts	Wt. lbs	Code
02031.0-00	Clip fixing	AC 230 V	50 W	1.5	9
02031.0-10	Screw flange fixing	AC 230 V	50 W	1.5	9
02031.9-00	Clip fixing	AC 120 V	50 W	1.5	9
02031.9-10	Screw flange fixing	AC 120 V	50 W	1.5	9
02032.0-00	Clip fixing	AC 230 V	100 W	2.2	9
02032.0-10	Screw flange fixing	AC 230 V	100 W	2.2	9
02032.9-00	Clip fixing	AC 120 V	100 W	2.2	9
02032.9-10	Screw flange fixing	AC 120 V	100 W	2.2	9
02033.0-00	Clip fixing	AC 230 V	150 W	3.1	9
02033.0-10	Screw flange fixing	AC 230 V	150 W	3.1	9
02033.9-00	Clip fixing	AC 120 V	150 W	3.1	9
02033.9-10	Screw flange fixing	AC 120 V	150 W	3.1	9
02034.0-00	Clip fixing	AC 230 V	200 W	3.7	9
02034.0-10	Screw flange fixing	AC 230 V	200 W	3.7	9
02034.9-00	Clip fixing	AC 120 V	200 W	3.7	9
02034.9-10	Screw flange fixing	AC 120 V	200 W	3.7	9
02035.0-10	Screw flange fixing	AC 230 V	250 W	5.1	9
02035.9-10	Screw flange fixing	AC 120 V	250 W	5.1	9



TEMPERATURE CLASS T4 C€

Part No.	Description	Operating Voltage	Watts	Wt. lbs	Code
02041.0-00	Clip fixing	AC 230 V	50 W	1.5	9
02041.0-10	Screw flange fixing	AC 230 V	50 W	1.5	9
02041.9-00	Clip fixing	AC 120 V	50 W	1.5	9
02041.9-10	Screw flange fixing	AC 120 V	50 W	1.5	9
02042.0-00	Clip fixing	AC 230 V	100 W	3.1	9
02042.0-10	Screw flange fixing	AC 230 V	100 W	3.1	9
02042.9-00	Clip fixing	AC 120 V	100 W	3.1	9
02042.9-10	Screw flange fixing	AC 120 V	100 W	3.1	9
02043.0-10	Screw flange fixing	AC 230 V	150 W	5.1	9
02043.9-10	Screw flange fixing	AC 120 V	150 W	5.1	9
02044.0-10	Screw flange fixing	AC 230 V	200 W	6.2	9
02044.9-10	Screw flange fixing	AC 120 V	200 W	6.2	9

TEMPERATURE CLASS T5 C€

Part No.	Description	Operating Voltage	Watts	Wt. lbs	Code
02051.0-00	Clip fixing	AC 230 V	50 W	3.1	9
02051.0-10	Screw flange fixing	AC 230 V	50 W	3.1	9
02051.9-00	Clip fixing	AC 120 V	50 W	3.1	9
02051.9-10	Screw flange fixing	AC 120 V	50 W	3.1	9
02052.0-10	Screw flange fixing	AC 230 V	100 W	6.2	9
02052.9-10	Screw flange fixing	AC 120 V	100 W	6.2	9

THERMAL MANAGEMENT FAN HEATERS

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SAFE TOUCH FAN HEATER

NEW

CE cULus

Part No. DIN Mount	Part No. Screw Mount	Operating Voltage	Watts	Weight oz.	Code
02800.0-00	02800.0-01	AC 230 V, 50/60 Hz	150 W	10.6	9
02800.9-00	02800.9-01	AC 120 V, 50/60 Hz	150 W	10.6	9
02811.0-00	02811.0-01	AC 230 V, 50/60 Hz	250 W	17.6	9
02811.9-00	02811.9-01	AC 120 V, 50/60 Hz	250 W	17.6	9
02810.0-00	02810.0-01	AC 230 V, 50/60 Hz	400 W	17.6	9
02810.9-00	02810.9-01	AC 120 V, 50/60 Hz	400 W	17.6	9



HEATER FAN

CE cULus

Part No. 120 VAC	Part No. 230 VAC	Watts	Weight oz.	Code
03102.9-00	03102.0-00	100 W	1	9
03103.9-00	03103.0-00	150 W	1	9
03113.9-00	03113.0-00	200 W	2	9
03114.9-00	03114.0-00	300 W	2	9
03115.9-00	03115.0-00	400 W	2	9



HEATER FAN

CE cULus

Part No. 120 VAC	Operating Voltage	Watts	Weight lbs.	Code
04640.0-00	AC 230 V, 50/60 Hz	250 W	3	9
04641.0-00	AC 230 V, 50/60 Hz	400 W	3	9
04640.9-00	AC 120 V, 50/60 Hz	250 W	3	9
04641.9-00	AC 120 V, 50/60 Hz	400 W	3	9



FAN

With built-in thermostat

CE cULus

Part No.	Operating Voltage	Watts	Hertz	Weight lbs.	Code
02700.0-00	220-230 VAC	250 W	50 Hz	2	9
02700.9-00	110-220 VAC	400 W	60 Hz	2	9
02701.0-00	220-230 VAC	250 W	50 Hz	2	9
02701.9-00	110-220 VAC	400 W	60 Hz	2	9



FAN HEATER

NEW

With thermostat

CE cULus

Part No.	Watts	Operating Voltage	Weight lbs.	Code
801125A33001	125 W	AC 120 V, 50/60 Hz	1.8	12
801125A44001	125 W	AC 230 V, 50/60 Hz	1.8	12
801200A33001	200 W	AC 120 V, 50/60 Hz	1.8	12
801200A44001	200 W	AC 230 V, 50/60 Hz	1.8	12
801400A33001	400 W	AC 120 V, 50/60 Hz	3.0	12
801400A44001	400 W	AC 230 V, 50/60 Hz	3.0	12
801800A33001	800 W	AC 120 V, 50/60 Hz	3.0	12
801800A44001	800 W	AC 230 V, 50/60 Hz	3.0	12



HIGH PERFORMANCE HEATER FAN

With built-in adjustable thermostat or fixed hydrostat

CE cULus

Part No. Foot Mount	Part No. Panel Mount	Operating Voltage	Watts	Setting	Code
03059.9-00	13059.9-00	AC 120 V, 50/60 Hz	950 W	32-140°F	9
03051.0-00	13051.0-00	AC 230 V, 50/60 Hz	950 W	0-60°C	9
03051.0-02	13051.0-02	AC 230 V, 50/60 Hz	950 W	65% RH	9
03060.9-00	13060.9-00	AC 120 V, 50/60 Hz	1200 W	32-140°F	9
03060.0-00	13060.0-00	AC 230 V, 50/60 Hz	1200 W	0-60°C	9



THERMAL MANAGEMENT HEATER CALCULATION SHEET

Project: _____

Project No.: _____

Follow Steps 1-5 to determine the heating requirement of an enclosure (US units – left column, metric – right)

STEP 1: Determine the Surface Area (A) of your enclosure which is exposed to open air

Enclosure Dimension: height = _____ feet _____ meters
width = _____ feet _____ meters
depth = _____ feet _____ meters

Choose Mounting Option from next page, and calculate the surface area as indicated

A = _____ ft²

or

_____ m²

STEP 2: Choose the Heat Transmission Coefficient (k) for your enclosure's material of construction

painted steel = _____	0.511 W/(ft ² •K)	5.5 W/(m ² •K)
stainless steel = _____	0.344 W/(ft ² •K)	3.7 W/(m ² •K)
aluminum = _____	1.115 W/(ft ² •K)	12 W/(m ² •K)
plastic (or insulated stainless) = _____	0.325 W/(ft ² •K)	3.5 W/(m ² •K)

k = _____ W/(ft²•K)

or

_____ (m²•K)

STEP 3: Determine the Temperature Differential (ΔT)

A. Desired enclosure interior temp. = _____ °F		_____ °C
B. Lowest ambient (outside) temp. = _____ °F		_____ °C
Subtract B from A + Temp. differential (ΔT) = _____ °F		_____ °C
		ΔT(°C)=ΔT (K)

For these calculations, ΔT must be in degrees Kelvin (K).

Therefore, divide ΔT(°F) by 1.8

ΔT = _____ K

or

_____ K

STEP 4: Determine Heating Power (P_v), if any (generated from existing components, i.e. transformer)

P_v = _____ W

or

_____ W

STEP 5: Calculate the Required Heating Power (P_H) for your enclosure based on the above values

If enclosure is located inside:

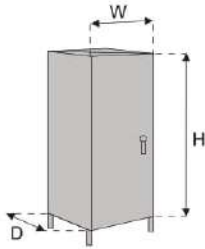
$$P_H = (A \times k \times \Delta T) - P_v = \text{_____ W}$$

If enclosure is located outside:

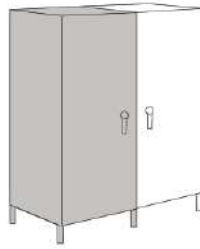
$$P_H = 2 \times (A \times k \times \Delta T) - P_v = \text{_____ W}$$

ENCLOSURE MOUNTING AND SURFACE AREA CALCULATIONS

1. FREE-STANDING



$$\text{Area (A)} = 1.8(H \times W) + 1.8(H \times D) + 1.8(W \times D)$$

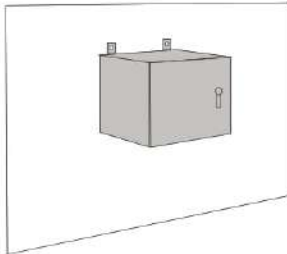


$$\text{Area (A)} = 1.8(H \times W) + 1.4(H \times D) + 1.8(W \times D)$$

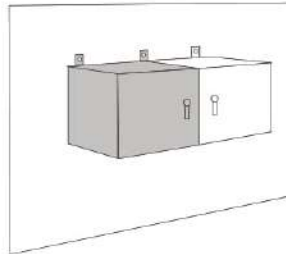


$$\text{Area (A)} = 1.8(H \times W) + (H \times D) + 1.8(W \times D)$$

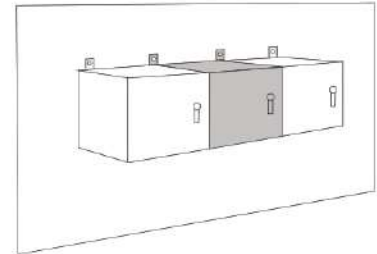
2. WALL-MOUNTED



$$\text{Area (A)} = 1.4(H \times W) + 1.8(H \times D) + 1.8(W \times D)$$

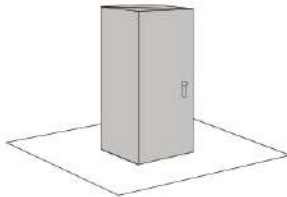


$$\text{Area (A)} = 1.4(H \times W) + 1.4(H \times D) + 1.8(W \times D)$$



$$\text{Area (A)} = 1.4(H \times W) + (H \times D) + 1.8(W \times D)$$

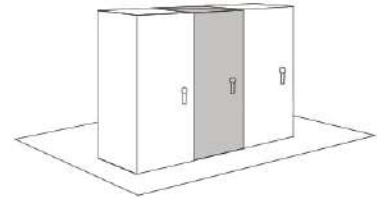
3. GROUND



$$\text{Area (A)} = 1.8(H \times W) + 1.8(H \times D) + 1.4(W \times D)$$

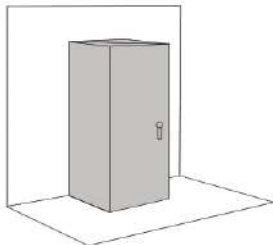


$$\text{Area (A)} = 1.8(H \times W) + 1.4(H \times D) + 1.4(W \times D)$$

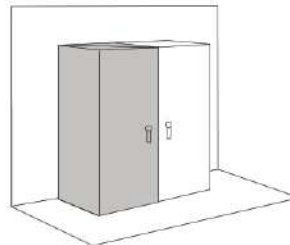


$$\text{Area (A)} = 1.8(H \times W) + (H \times D) + 1.4(W \times D)$$

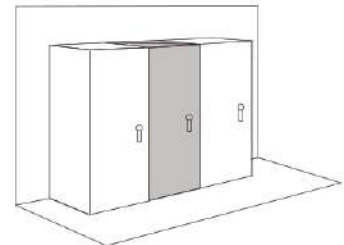
4. GROUND & WALL



$$\text{Area (A)} = 1.4(H \times W) + 1.8(H \times D) + 1.4(W \times D)$$



$$\text{Area (A)} = 1.4(H \times W) + 1.4(H \times D) + 1.4(W \times D)$$



$$\text{Area (A)} = 1.4(H \times W) + (H \times D) + 1.4(W \times D)$$

THERMAL MANAGEMENT FILTER FAN SIZING SHEET

Project: _____

Project No.: _____

To determine the Filter Fan size for a given enclosure, use the following calculation

$$\text{Required air volume (V)} = \frac{\text{Internal heat load (Pv)}}{\text{Temperature difference } (\Delta T)} \times \text{Air constant (f)}$$

US

Metric

STEP 1: Determine the Internal Heat Load of the enclosure (Pv)

Internal heat load, Pv (Watts)

[Note: 1 Watt = 3.413 BTU/hr.]

= _____ W

or

= _____ W

STEP 2: Determine the Temperature Differential (ΔT)

Temperature difference (ΔT)

= _____ °F

or

= _____ °C = K

[Maximum temperature outside enclosure minus maximum allowable temperature inside enclosure]

STEP 3: Choose the Air Constant (f)

Air Constant (f)

= _____ ft³ • °F/W min

or

= _____ m³ • K/W hr

[Based on elevation, see below]

0 - 100 m	=>	3.3ft ³ • °F/W minor 3.1m ³ • K/W hr
100 - 250 m	=>	3.4ft ³ • °F/W minor 3.2m ³ • K/W hr
250 - 500 m	=>	3.5ft ³ • °F/W minor 3.3m ³ • K/W hr
500 - 750 m	=>	3.6ft ³ • °F/W minor 3.4m ³ • K/W hr
750 - 1000 m	=>	3.7ft ³ • °F/W minor 3.5m ³ • K/W hr

Example: 600 W internal heat load, $\Delta T = 15$ K, at 75 m elevation

0 - 100 m => 3.3ft³ • °F/W minor 3.1m³ • K/W hr

$$V = \frac{600 \text{ W}}{15 \text{ K}} \times 3.3 \text{ m}^3 \cdot \text{K/W hr}$$

$$V = 132 \text{ m}^3/\text{hr}$$

THERMAL MANAGEMENT COOLING

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INDOOR FILTER FANS

IP54, TYPE 12 - 115 Volt



Part No.	ANSI 61 Grey	Dimensions	Free Flow Air Delivery		With Exhaust Filter		Watts (50/60)	Wt (lbs)	Code
			CFM(50/60)	M3/h(50/60)	CFM(50/60)	M3/h(50/60)			
RAL-7035									
*FF-08-115-R	*FF-08-115-G	107x107x80	13/16	21/26	9/12	19	12/10	1.3	10
FF-12-115-R	FF-12-115-G	150x150x73	27/30	45/50	19/22	37	16/15	1.7	10
FF-13-115-R	FF-13-115-G	204x204x96	50/65	100/110	39/45	75	19/18	2.3	10
EF-250-115-R5	-	252x252x103.7	92/101	171	68/75	127	18/17	3.3	1
FF-15-115-R	FF-15-115-G	250x250x124	136/159	230/270	95/112	190	31/31	3.6	10
FF-20-115-R	FF-20-115-G	325x325x160	261/286	445/485	190/205	360	74/83	7.7	10
FF-20G-115-R	FF-20G-115-G	325x325x159	295/306	675/738	295/306	520	110/156	9.8	10

*FF-08 filter fans do not work with 14 ga. steel enclosure



INDOOR FILTER FANS

IP54, TYPE 12 - 230 Volt



Part No.	ANSI 61 Grey	Dimensions	Free Flow Air Delivery		With Exhaust Filter		Watts (50/60)	Wt (lbs)	Code
			CFM(50/60)	M3/h(50/60)	CFM(50/60)	M3/h(50/60)			
RAL-7035									
*FF-08-230-R	*FF-08-230-G	107x107x80	13/16	21/26	9/12	19	12/10	1.3	10
FF-12-230-R	FF-12-230-G	150x150x73	27/30	45/50	19/22	37	16/15	1.8	10
FF-13-230-R	FF-13-230-G	204x204x96	50/65	100/110	39/45	75	19/18	2.3	10
EF-250-230-R5	-	252x252x103.7	92/101	156	68/75	116	18/17	3.3	1
FF-15-230-R	FF-15-230-G	250x250x124	136/159	230/270	95/112	190	31/31	3.7	10
FF-20-230-R	FF-20-230-G	325x325x160	268/296	445/485	190/212	360	74/83	7.6	10
FF-20G-230-R	FF-20G-230-G	325x325x159	400/450	675/738	296/324	520	110/156	9.7	10

*FF-08 filter fans do not work with 14 ga. steel enclosure



OUTDOOR FILTER FANS

IP55, TYPE 12, 3R - 115 Volt, Black



Part No.	Dimensions	Free Flow Air Delivery		With Exhaust Filter		Watts (50/60)	Wt (lbs)	Code
		CFM(50/60)	M3/h(50/60)	CFM(50/60)	M3/h(50/60)			
*FF-08-115-B	107x107x80	13/16	21/26	9/12	19	12/10	1.4	10
FF-12-115-B	150x150x73	19/23	45/50	13/15	37	15/16	2	10
FF-13-115-B	204x204x96	46/52	100/110	27/33	75	18/18	2.6	10
EF-250-115-R5	252x252x103.7	92/101	145	68/75	109	18/17	3.3	1
FF-15-115-B	250x250x124	95/115	230/270	65/83	190	31/31	3.8	10
FF-20-115-B	325x325x160	261/286	445/485	190/205	360	74/83	8	10
FF-20G-115-B	325x325x159	397/435	675/738	295/306	520	110/156	10.3	10

*Ip54, FF-08 filter fans do not work with 14 ga. steel enclosure



OUTDOOR FILTER FANS

IP55, TYPE 12, 3R - 230 Volt, Black



Part No.	Dimensions	Free Flow Air Delivery		With Exhaust Filter		Watts (50/60)	Wt (lbs)	Code
		CFM(50/60)	M3/h(50/60)	CFM(50/60)	M3/h(50/60)			
*FF-08-230-B	107x107x80	13/16	21/26	9/12	19	12/11	1.4	10
FF-12-230-B	150x150x73	19/23	45/50	13/15	37	18/17	2	10
FF-13-230-B	204x204x96	46/52	100/110	27/33	75	18/18	2.6	10
EF-250-230-R5	252x252x103.7	92/101	145	68/75	109	18/17	3.3	1
FF-15-230-B	250x250x124	95/115	230/270	65/83	190	32/36	3.8	10
FF-20-230-B	325x325x160	268/296	445/485	190/205	360	70/85	8	10
FF-20G-230-B	325x325x159	400/450	675/738	295/306	520	120/158	10.3	10

*Ip54 exhaust filter do not work with 14 ga. steel enclosures



EXHAUST FILTERS

Indoor Filters Type 12, IP54

Outdoor Filters Type 12, 3R, IP55



Type 12 Part No.	Type 12 Part No.	Type 3R Part No.	Dimensions	Wt. lbs	Code
RAL-7035	ANSI 61	RAL-9005			
Light Grey	Grey	Black			
EF-08-R	EF-08-G	*EF-08-B	mm in	107x107x23 4.2x4.2x0.9	0.2 10
EF-12-R	EF-12-G	EF-12-B	mm in	150x150x29 5.9x5.9x1.1	0.4 10
EF-13-R	EF-13-G	EF-13-B	mm in	204x204x30 8x8x1.2	0.7 10
EF-15-R	EF-15-G	EF-15-B	mm in	250x250x34 9.8x9.8x1.3	1.1 10
EF-20-R	EF-20-G	EF-20-B	mm in	325x325x34 12.8x12.8x1.3	2 10

*Ip54 exhaust filter do not work with 14 ga. steel enclosures

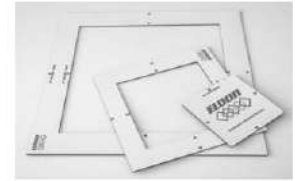


THERMAL MANAGEMENT COOLING

NOTICE: Thermal Management Products are not returnable

Magnetic Cut-Out Template for Fan and Exhaust Units

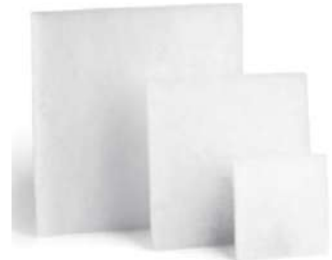
Part No.	Wt.	Code
EFTMP-01	1.1	2



REPLACEMENT FILTER MATS

(6 Per Package)

Part No. Indoor Mat	List Price	Part No. Outdoor Mat	Outdoor Mat For	Code
FM-08	37.80	FM-08	EF & FF	10
FM-12	47.40	FM-12-3R	EF & FF	10
FM-13	74.40	FM-13-3R	EF & FF	10
FM-15	99.00	FM-15-3R	EF & FF	10
FM-20	150.60	FM-20-3R	EF	10
		*FM-20-FF-3R	FF	10



*Note: FM-20-FF-3R comes 1 per pack

WASH-DOWN HOOD STAINLESS STEEL



Part No.	H	Size W	D	Works With	Wt (lbs)	Code
08670.0-00	8.42	7.67	1.18	EF, FF-08	1.76	9
08671.0-00	10.98	8.85	2.28	EF, FF-12	2.64	9
08672.0-00	14.13	11.57	2.67	EF, FF-13	4.4	9
08673.0-00	16.33	14.52	3.07	EF, FF-15	6.17	9
08674.0-00	19.09	16.1	4.05	FF-20, FF-20G	8.15	9



ROOF FILTER FANS INDOOR USE



Part No.	Dimensions (in)			Operating Voltage	Air Delivery (CFM)		Power	Wt (kg)	Code
	H	W	D		CFM	M3h			
RF-19U-115-R	12.75	12.75	3.7	115V / 60Hz	228	490	97W	2.1	10

An EF intake filter at the bottom is required to prevent a vacuum



FILTER FANS INCREASED PROTECTION

Part No.	Dimensions	Wt. (lbs)	Code
11821.0-00	Outdoor exhaust filter 8.8" H x 6.5" W x 2.6" D	2	9



THERMAL MANAGEMENT AC & HEAT EXCHANGER CALCULATION SHEET

NOTICE: Thermal Management Products are not returnable

The following calculations have been developed for standard uninsulated metal NEMA rated enclosures for indoor applications.

Sizing Parameters

Watts = Heat Energy Produced by Electronic Equipment

Surface Area in Square Feet = Surface Area of the Enclosure that will Allow Heat Transfer

Measurements in Inches

$$\frac{[(H \times W) \times 2] + [(H \times D) \times 2] + [(W \times D) \times 2]}{144 \text{ sq. inches}}$$

144 sq. inches

ΔT = Difference between the maximum temperature outside the enclosure and the desired maximum temperature inside the enclosure.

Calculations

STEP 1: Determine the Internal Heat Dissipation of the enclosed equipment in BTU

$$\text{BTU per Hour} = \text{Watts} \times 3.413$$

STEP 2: Determine External Heat Transfer

$$\text{BTU per Hour} = \text{Surface Area (sq. ft.)} \times 1.25 \times \Delta T$$

Note: The enclosure internal temperature must be at least 5 degrees Fahrenheit higher than the ambient temperature to select a Heat Exchange/ This will result in a negative BTU per hour in Step 2.

STEP 3: Determine the Required Cool Capacity in BTU per hour

$$\text{BTU per Hour} = \frac{\text{Sum of Step 1 and Step 2}}{\text{x 1.1 Safety Factor}}$$

Air Conditioner Selection: Select the air conditioner that meets or exceeds the cooling capacity in BTU per hour from Step 3.

Heat Exchange Selection: Select the heat exchanger that meets or exceeds the required cooling capacity in Watts per Degree Fahrenheit. To obtain Watts per Degree Fahrenheit, use the following formula:

$$\text{Watts per } ^\circ\text{F} = \frac{\text{BTU per Hour (Step 3)}}{(\text{Max. Internal Temp} - \text{Max. Outside Temp.}) \times 3.413}$$

THERMAL MANAGEMENT COOLING

NOTICE: Thermal Management Products are not returnable, consult factory for pricing



AIR CONDITIONERS - VERTICAL MOUNT

NEMA/EEMAC Type 12, 3R, 4 or 4x



BTU/hr	Part No.	Stainless Part No.	Volts Hz	Max Amps	Dimensions H x W x D	Ship Wt. lbs.
1000	IQ-1000V-126	IQ-1000V-126-SS	120/60	4.0	13.27 x 14.41 x 8.02	43.5
1000	IQ-1000V-236	IQ-1000V-236-SS	230/60/50	2.0	13.27 x 14.41 x 8.02	43.5
2500	IQ-2500V-126	IQ-2500V-126-SS	120/60	7.3	28.50 x 19.25 x 6.38	73.0
2500	IQ-2500V-236	IQ-2500V-236-SS	230/60/50	3.5 / 3.9	28.50 x 19.25 x 6.38	73.0
3500	IQ-3500V-126	IQ-3500V-126-SS	120/60	8.8	28.50 x 19.25 x 6.38	73.0
3500	IQ-3500V-236	IQ-3500V-236-SS	230/60/50	4.3 / 4.7	28.50 x 19.25 x 6.38	73.0
4500	IQ-4500V-126	IQ-4500V-126-SS	120/60	9.5	28.50 x 19.25 x 6.38	71.0
4500	IQ-4500V-236	IQ-4500V-236-SS	230/60/50	4.6 / 5.1	28.50 x 19.25 x 6.38	71.0
6000	IQ-6000V-126	IQ-6000V-126-SS	120/60	10.9	28.50 x 19.25 x 6.50	87.0
6000	IQ-6000V-236	IQ-6000V-236-SS	230/60/50	4.8 / 5.3	28.50 x 19.25 x 6.50	87.0
10000	IQ-10000V-126	IQ-10000V-126-SS	120/60	15.1	52.09 x 17.65 x 10.34	141.5
10000	IQ-10000V-236	IQ-10000V-236-SS	230/60/50	7.9 / 8.7	52.09 x 17.65 x 10.34	141.5
12000	IQ-12000V-126	IQ-12000V-126-SS	120/60	19.6	52.09 x 17.65 x 10.34	141.5
12000	IQ-12000V-236	IQ-12000V-236-SS	230/60/50	9.8 / 10.8	52.09 x 17.65 x 10.34	141.5
14000	IQ-14000V-126	IQ-14000V-126-SS	230/60/50	13.9 / 15.3	56.00 x 20.06 x 14.31	198.0
17000	IQ-17000V-236	IQ-17000V-236-SS	230/60/50	15.5 / 17.1	56.00 x 20.06 x 14.31	196.5
20000	IQ-20000V-236	IQ-20000V-236-SS	230/60/50	17.4 / 19.2	56.00 x 20.06 x 14.31	196.5
27000	IQ-27000V-236	IQ-27000V-236-SS	230/60/50	21	50.10 x 22.83 x 19.17	290.0

SLIM VERTICAL MOUNT

BTU/hr	Part No.	Stainless Part No.	Volts Hz	Max Amps	Dimensions H x W x D	Ship Wt. lbs.
1200	IQ-1200VS-126	IQ-1200VS-126-SS	120/60	3.9	22.25 x 11.51 x 6.26	47.5
1200	IQ-1200VS-236	IQ-1200VS-236-SS	230/60/50	1.8 / 2.0	22.25 x 11.51 x 6.26	47.5
1500	IQ-1500VS-126	IQ-1500VS-126-SS	120/60	4	22.25 x 11.51 x 6.26	47.5
1500	IQ-1500VS-236	IQ-1500VS-236-SS	230/60/50	1.9 / 2.1	22.25 x 11.51 x 6.26	47.5
1800	IQ-1800VS-126	IQ-1800VS-126-SS	120/60	4	22.25 x 11.51 x 6.26	47.5
1800	IQ-1800VS-236	IQ-1800VS-236-SS	230/60/50	2.0 / 2.2	22.25 x 11.51 x 6.26	47.5
2200	IQ-2200VS-126	IQ-2200VS-126-SS	120/60	6.6	30.09 x 12.27 x 6.34	57.0
2200	IQ-2200VS-236	IQ-2200VS-236-SS	230/60/50	3.3 / 3.7	30.09 x 12.27 x 6.34	57.0
3000	IQ-3000VS-126	IQ-3000VS-126-SS	120/60	6.9	30.09 x 12.27 x 6.34	57.0
3000	IQ-3000VS-236	IQ-3000VS-236-SS	230/60/50	3.4 / 3.8	30.09 x 12.27 x 6.34	57.0
4000	IQ-4000VS-126	IQ-4000VS-126-SS	120/60	8.3	30.09 x 12.27 x 6.34	65.0
4000	IQ-4000VS-236	IQ-4000VS-236-SS	230/60/50	4.2 / 4.7	30.09 x 12.27 x 6.34	65.0
5000	IQ-5000V16-126	IQ-5000V16-126-SS	120/60	8.4	30.09 x 12.27 x 8.34	80.5
5000	IQ-5000V16-236	IQ-5000V16-236-SS	230/60/50	4.1 / 4.5	35.97 x 15.93 x 7.34	80.5
5500	IQ-5500VS-126	IQ-5500VS-126-SS	120/60	10.4	30.09 x 12.27 x 10.39	75.0
5500	IQ-5500VS-236	IQ-5500VS-236-SS	230/60/50	5.2 / 5.7	30.09 x 12.27 x 10.39	75.0
6000	IQ-6000VS-126	IQ-6000VS-126-SS	120/60	8	30.09 x 12.27 x 10.39	77.0
6000	IQ-6000VS-236	IQ-6000VS-236-SS	230/60/50	4.0 / 4.4	30.09 x 12.27 x 10.39	77.0
6000	IQ-6000V16-126	IQ-6000V16-126-SS	120/60	8.8	35.97 x 15.93 x 7.34	81.5
6000	IQ-6000V16-236	IQ-6000V16-236-SS	230/60/50	4.3 / 4.7	35.97 x 15.93 x 7.34	81.5
8000	IQ-8000V16-126	IQ-8000V16-126-SS	120/60	13.7	42.09 x 15.93 x 10.34	107.5
8000	IQ-8000V16-236	IQ-8000V16-236-SS	230/60/50	6.8 / 7.5	42.09 x 15.93 x 10.34	107.5

EXTRA SLIM VERTICAL MOUNT

BTU/hr	Part No.	Stainless Part No.	Volts Hz	Max Amps	Dimensions H x W x D	Ship Wt. lbs.
1200	IQ-1200VXS-126	IQ-1200VXS-126-SS	120/60	4.0	30.00 x 6.50 x 11.50	54
1200	IQ-1200VXS-236	IQ-1200VXS-236-SS	230/60/50	1.8 / 2.0	30.00 x 6.50 x 11.50	54
1500	IQ-1500VXS-126	IQ-1500VXS-126-SS	120/60	4.7	30.00 x 6.50 x 11.50	54
1500	IQ-1500VXS-236	IQ-1500VXS-236-SS	230/60/50	1.8 / 2.1	30.00 x 6.50 x 11.50	54
1800	IQ-1800VXS-126	IQ-1800VXS-126-SS	120/60	5.2	30.00 x 6.50 x 11.50	54
1800	IQ-1800VXS-236	IQ-1800VXS-236-SS	230/60/50	2.0 / 2.2	30.00 x 6.50 x 11.50	54
2000	IQ-2000VXS-126	IQ-2000VXS-126-SS	120/60	6.6	24.00 x 10.00 x 10.00	60
2000	IQ-2000VXS-236	IQ-2000VXS-236-SS	230/60/50	3.4 / 3.8	24.00 x 10.00 x 10.00	60
2400	IQ-2400VXS-126	IQ-2400VXS-126-SS	120/60	7.1	24.00 x 10.00 x 10.00	60
2400	IQ-2400VXS-236	IQ-2400VXS-236-SS	230/60/50	3.5 / 3.9	24.00 x 10.00 x 10.00	60
4000	IQ-4000VXS-126	IQ-4000VXS-126-SS	120/60	9.6	36.00 x 11.50 x 15.00	104
4000	IQ-4000VXS-236	IQ-4000VXS-236-SS	230/60/50	4.5 / 5.0	36.00 x 11.50 x 15.00	109
5000	IQ-5000VXS-126	IQ-5000VXS-126-SS	120/60	10.0	36.00 x 11.50 x 15.00	109
5000	IQ-5000VXS-236	IQ-5000VXS-236-SS	230/60/50	4.7 / 5.2	36.00 x 11.50 x 15.00	109
6000	IQ-6000VXS-126	IQ-6000VXS-126-SS	120/60	10.4	36.00 x 11.50 x 15.00	109
6000	IQ-6000VXS-236	IQ-6000VXS-236-SS	230/60/50	4.9 / 5.4	36.00 x 11.50 x 15.00	109

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THERMAL MANAGEMENT COOLING

NOTICE: Thermal Management Products are not returnable, consult factory for pricing

AIR CONDITIONERS



TOP MOUNT

NEMA / EEMAC TYPE 12, 3R, OR 4X

Note: Air Conditioner controls are located on width ("W") dimension.



BTU/hr	Part No	Stainless Part No.	Volts Hz	Max Amps	Dimensions H x W x D	Ship Wt lbs
3000	IQ-3000T-126	IQ-3000T-126-SS	120 / 60	7.6	12.06 x 19.94 x 19.91	75
3000	IQ-3000T-236	IQ-3000T-236-SS	230 / 60 / 50	3.8 / 4.2	12.06 x 19.94 x 19.91	75
4500	IQ-4500T-126	IQ-4500T-126-SS	120 / 60	8.5	12.06 x 19.94 x 19.91	72
4500	IQ-4500T-236	IQ-4500T-236-SS	230 / 60 / 50	4.2	12.06 x 19.94 x 19.91	72
6000	IQ-6000T-126	IQ-6000T-126-SS	120 / 60	9.1	12.06 x 19.94 x 19.91	78.5
6000	IQ-6000T-236	IQ-6000T-236-SS	230 / 60 / 50	4.6 / 5.1	12.06 x 19.94 x 19.91	78.5
7000	IQ-7000T-126	IQ-7000T-126-SS	120 / 60	11.7	15.06 x 19.94 x 19.94	95
7000	IQ-7000T-236	IQ-7000T-236-SS	230 / 60 / 50	5.3 / 5.8	15.06 x 19.94 x 19.94	95
8000	IQ-8000T-126	IQ-8000T-126-SS	120 / 60	12.2	15.06 x 19.94 x 19.94	103
8000	IQ-8000T-236	IQ-8000T-236-SS	230 / 60 / 50	5.7 / 5.7	15.06 x 19.94 x 19.94	103

TOP MOUNT EXTRA SLIM

BTU/hr	Slim Design Part No	Stainless Part No.	Volts Hz	Max Amps	Dimensions H x W x D	Ship Wt lbs
2000	IQ-2000TXS-126	IQ-3000TXS-126-SS	120 / 60	4.7	9.25 x 10.28 x 24.28	50
2000	IQ-2000TXS-236	IQ-3000TXS-236-SS	230 / 60 / 50	2.3 / 2.6	9.25 x 10.28 x 24.28	50
2500	IQ-2500TXS-126	IQ-6000TXS-126-SS	120 / 60	7.6	9.25 x 10.28 x 24.28	50
2500	IQ-2500TXS-236	IQ-6000TXS-236-SS	230 / 60 / 50	3.6 / 4.0	9.25 x 10.28 x 24.28	50

COOLING OPTIONS

NEMA 4, 4X GASKET KIT

Part No.	Description
N4GK	To obtain Type 4 rating on painted AC units, N4GK is included with stainless units

CORROSIVE PACKAGE

Corrosion protection to components against acids, solvents, salt and other corrosive environments.



Part No.	Description
CP	<u>Ambients Corrosive Package</u> Baked polyester coating on condenser coil and corrosive inhibitions applied to internal piping
CP2/3	<u>Total Environment Corrosive Package</u> Baked polyester coating on condenser coil and evaporator. Corrosive inhibitions applied to internal piping

EXTERNAL HEAT OUTPUT

Part No.	Description
EHO	Ability to install an external heater to be operated by the air conditioner's controls

ALARM OUTPUT

Each air conditioner's digital control panel is equipped with an alarm indicator. Optional alarm output is the provision of wire output leads providing a dry contact signal to install optional signal and audible alarms

Part No.	Description
X-03	Normally Open / Closed

ALARMS

See Page 92

- *Signal Lights
- *Audible Alarms



THERMAL MANAGEMENT COOLING Hazardous Duty Air Conditioners

Class 1, Division 2, Groups B, C, and D Certification

Zone 1 ATEX/IECEX Zone 2 ATEX/IECEX



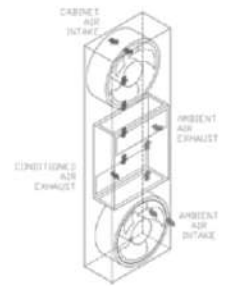
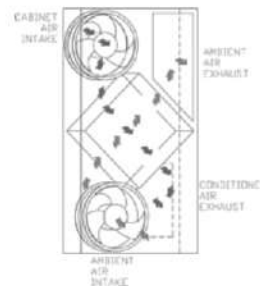
NEW

1000 - 27000 BTUH units available

Consult Factory for pricing

HEAT EXCHANGERS

NEMA / EEMAC TYPE 12, 3R, OR 4X  



Part No.	Stainless Part No	Volts Hz	Watts / Degrees F	Max Amps	Dimensions H x W x D	Ship Wt lbs
IQ-700HE-CF-126	IQ-700HE-CF-126-SS	120 / 60	5.7	0.24	14.5 x 7.18 x 4	10
IQ-700HE-CF-236	IQ-700HE-CF-236-SS	230 / 50 / 60	5.7	0.12 / 0.13	14.5 x 7.18 x 4	10
IQ-2200HE-CF-126	IQ-2200HE-CF-126-SS	120 / 60	18	2.8	35.18 x 10.68 x 5.13	37
IQ-2200HE-CF-236	IQ-2200HE-CF-236-SS	230 / 50 / 60	18	0.96 / 1.06	35.18 x 10.68 x 5.13	37
IQ-6100HE-CF-126	IQ-6100HE-CF-126-SS	120 / 60	47	3.7	39.99 x 17.18 x 6.03	60
IQ-6100HE-CF-236	IQ-6100HE-CF-236-SS	230 / 50 / 60	47	1.8 / 1.4	39.99 x 17.18 x 6.03	60
IQ-7400HE-CF-126	IQ-7400HE-CF-126-SS	120 / 60	57	3.7	39.99 x 17.18 x 6.03	74
IQ-7400HE-CF-236	IQ-7400HE-CF-236-SS	230 / 50 / 60	57	1.8 / 2	39.99 x 17.18 x 6.03	74
IQ-10000HE-CF-126	IQ-10000HE-CF-126-SS	120 / 60	83	5.02	50 x 20.75 x 7.81	100
IQ-10000HE-CF-236	IQ-10000HE-CF-236-SS	230 / 50 / 60	83	2.21	50 x 20.75 x 7.81	100

THERMAL MANAGEMENT

VENT / PRESSURE COMPENSATION DEVICE



08400.9-01



28401.0-00



28402.0-01

Part No.	Material	Dimensions inches	Air Permeability	Protection Type	Code
08400.9-01	Grey ABS Polycarbonate	Ø2.58 x 1.2	Free air flow	Type 12	9
28401.0-00	Stainless Steel	Ø2.285 x 1.22	1200 L/hr at pressure difference of min. 70 mbar	Type 4, 4X	9
28402.0-01	Stainless Steel	Ø0.71 x 0.71	120 L/hr at pressure difference of min. 70 mbar	Type 4, 4X	9

EXHAUST FILTERS

Indoor Filters Type 12, IP54

Outdoor Filters Type 12, 3R, IP55



Indoor Part No. RAL-7035	Indoor Part No. ANSI 61 Grey	Part Number Outdoor Black	Dimensions	Code
EF-08-R	EF-08-G	EF-08-B	107 x 107 x 23	10
EF-12-R	EF-12-G	EF-12-B	150 x 150 x 29	10
EF-13-R	EF-13-G	EF-13-B	204 x 204 x 30	10
EF-15-R	EF-15-G	EF-15-B	250 x 250 x 34	10
EF-20-R	EF-20-G	EF-20-B	325 x 325 x 34	10

Part Number	Description	Code
EFTMP-01	Magnetic Cut Out Template	2

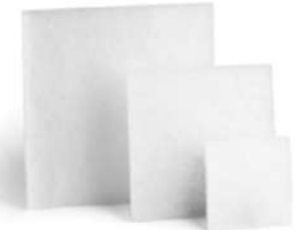


REPLACEMENT FILTER MATS

(5 Per Package)

Part No. Indoor Mat	Part No. Outdoor Mat	Outdoor mat For Series	Code
FM-08	FM-08	EF & FF	10
FM-12	FM-12-3R	EF & FF	10
FM-13	FM-13-3R	EF & FF	10
FM-15	FM-15-3R	EF & FF	10
FM-20	FM-20-3R	EF	10
	FM-20-FF-3R	FF	10

NOTE: FM-20-FF-3R comes 1 per pack



**Z-5010
LOUVER PLATE**



**DVM, DVG
VENTILATION DEVICE**



**UPVD-01
VENTILATION GRIDS**
(Hole Ø 34.9 mm)



**DWP-02
DRAIN VALVE**
(Hole Ø 11 mm)



**DV
DRAIN VALVE - 10/PACK**
(Hole Ø 9 mm)

Part No.	Description	Code
DV	9 mm diameter grey non-metallic	1
DVM	1" x 1" light grey non-metallic	1
DVG	2.75" x 2" light grey non-metallic (2/pk)	1
DWP-02	11mm diameter black non-metallic	1
UPVD-01	34.9mm diam. grey non-metallic (2/pk)	1
Z-5010	6" x 6" ventilation plate	2