

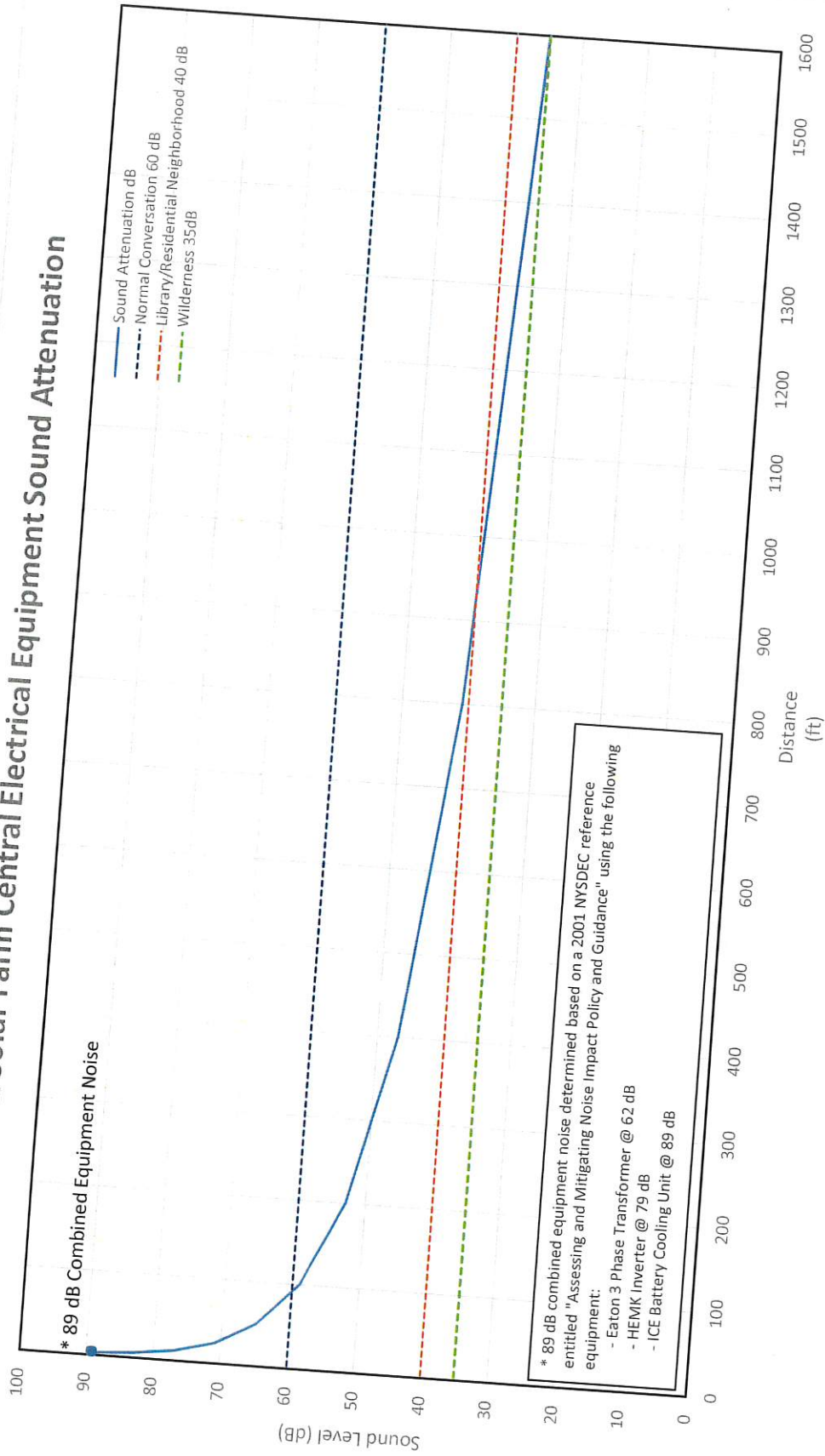
ICE - ECUA150ACD Battery Air Conditioner Unit

Marvair Outdoor Sound Pressure Levels for the ICE - ECUA product Air Conditioners (dBA)							
Distance From Unit (Feet)	Model Number						
	ECUA90ACD	ECUA130ACD	ECUA150ACD	ECUDA180ACD	ECUDA240ACD	ECUDA300ACD	ECUDA360ACD
5	82	84	84*	85	87	88	88
10	78	79	79	80	82	84	83
20	73	73	73	75	76	78	78
30	70	72	72	73	75	76	76
40	69	70	70	72	73	74	75
50	67	69	69	70	72	71	73
60	65	67	67	68	70	70	71
70	63	65	65	67	68		
80							

- Notes: (1) Test Date: July 2016  
 (2) Background Sound Pressure Level: 30-33 dBA  
 (3) Sound Level Meter 1 Meter Above Ground Directly in Line with Outdoor Coil  
 (4) All units - 410A Refrigerant

\* Extrapolating to distance of 3 feet from unit suggests sound level of 88.8 (say 89) dBA.

# Oak Hill Solar Farm Central Electrical Equipment Sound Attenuation



\* 89 dB combined equipment noise determined based on a 2001 NYSDEC reference entitled "Assessing and Mitigating Noise Impact Policy and Guidance" using the following equipment:

- Eaton 3 Phase Transformer @ 62 dB
- HEMK Inverter @ 79 dB
- ICE Battery Cooling Unit @ 89 dB



Travis Mitchell <tmtitchell@edpllp.com>

## Sound Attenuation Study

Bill Pedersen <bpedersen@amp.energy>

To: Travis Mitchell <tmtitchell@edpllp.com>, Kevin Foster <kfoster@amp.energy>, Nicole LeBlanc <nleblanc@amp.energy>, Gillian Black <gillian.black@edenrenewables.com>, Pallav Shah <pshah@amp.energy>

Tue, Aug 24, 2021 at 5:55 PM

Hi Travis,

Thank you again for the help on the glare study revision. We wanted to run another last-minute request by you. How long would it take to create an equipment sound attenuation chart, similar to the one I have attached? If it is possible to receive it by the end of the week, could we receive an email proposal for the work?

We would be modeling one of our equipment pads with:  
-inverter = 79 dB at 1 meter (cut sheet attached)  
-Transformer = standard value, we see you used 62 Db for Eden  
-battery = 84 dBa at 5 ft (chart attached, use the ECUA150 column)

The plan is to model a single equipment pad (not all 4) that we will say is closest to Lynn's property line. Let us know if this is something you think EDP can help us with.

Thanks,

Bill

AMP\_Wordmark\_Color (1)

**Bill Pedersen**

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### 4 attachments

Frequency (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
100	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
125	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
160	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
200	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
250	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
315	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
400	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
500	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
630	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
800	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
1000	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
1250	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
1600	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
2000	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
2500	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
3150	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
4000	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
5000	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
6300	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
8000	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
10000	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79

battery noise\_Highlighted.PNG  
126K



65K

## 4 TECHNICAL INFORMATION

General information	
Tracker type	Single-axis horizontal tracker
System incline in north-south direction in relation to terrain slope	Parallel to the course of the terrain
Module layout	2 vertical or 4 horizontal (standard)
Output per machine	Approx. 80 kWp (module-specific), max. 240 PV modules
Tracking range	up to 120° (+/- 60°)
Lock position	In all holding positions (every 3°)
Storm position and night position	9°
Tracking interval	site-specific
Travel angle per interval	3°
Slope south/north	maximum 10°
Terrain slope east/west	maximum 10°
Covered area (GCR)	> 50 possible (site-specific)
Temperature range	- 25°C to +60°C / -13°F to 140°F
Tracking method	Astronomical calculation based on location and time
Backtracking	Yes
Snow position	Yes
Maintenance position	Yes
Noise emission	< 70 dB(A)
Maximum operational mounted load	According the structural calculation

Dimensions (depending on module, construction site and/or design)		
Module area	Up to approx. 480 m <sup>2</sup>	up to approx. 5167 ft <sup>2</sup>
Drives per MWp	approx. 12-18 (site-specific)	

## 2.4 Mechanical and Environmental Specification

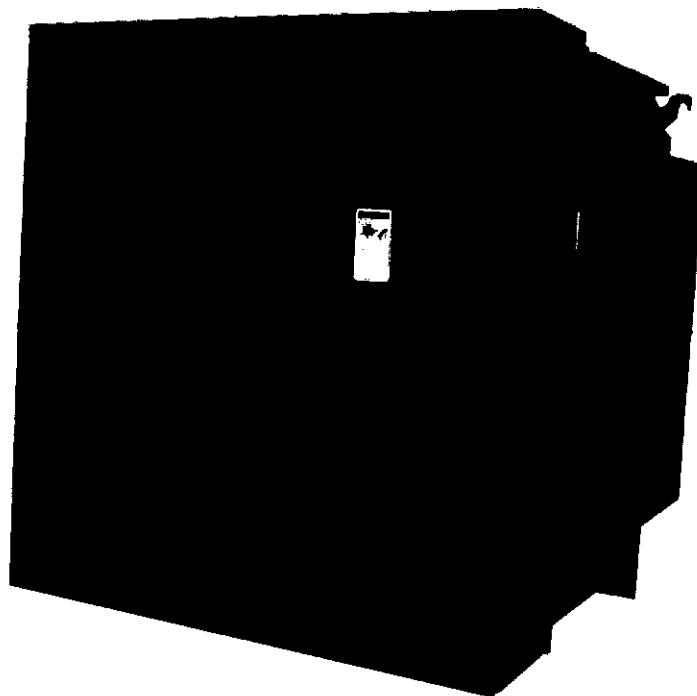
Operating Ambient Temperature:	-25 to +55°C (see derating curve)
Stand-by Temperature:	-40 to +60°C
Storage Temperature:	-40 to +70°C
Maximum Altitude:	1,000m above sea-level without de-rating
Relative Humidity:	95% non-condensing
Enclosure Rating:	Outdoor NEMA 3R (IP54)
Enclosure Dimensions:	33.5" x 39.4" x 80.5" (l x w x h)
Weight:	1,300 lbs.
Cable Connections:	Bottom or Side Entry
Cooling:	Forced air-cooled
Acoustic Rating:	<85dBA at 1m
Service Clearance:	28" front and back (Dwg. for detail)

Three-Phase  
Transformers  
CA202003EN

Effective April 2016  
Supersedes 210-12 July 2015

**COOPER POWER**  
SERIES

# Three-phase pad-mounted compartmental type transformer



## General

At Eaton, we are constantly striving to introduce new innovations to the transformer industry, bringing you the highest quality, most reliable transformers. Eaton's Cooper Power series Transformer Products are ISO 9001 compliant, emphasizing process improvement in all phases of design, manufacture, and testing. In order to drive this innovation, we have invested both time and money in the Thomas A. Edison Technical Center, our premier research facility in Franksville, Wisconsin. Such revolutionary products as distribution-class UltraSIL™ Polymer-Housed Evolution™ surge arresters and Envirotemp™ FR3™ fluid have been developed at our Franksville lab.

With transformer sizes ranging from 45 kVA to 12 MVA and high voltages ranging from 2400 V to 46 kV, Eaton has you covered. From fabrication of the tanks and cabinets to winding of the cores and coils, to production of arresters, switches, tap changers, expulsion fuses, current limit fuses, bushings (live and dead) and molded rubber goods, Eaton does it all. Eaton's Cooper Power series transformers are available with electrical grade mineral oil or Envirotemp™ FR3™ fluid, a less-flammable and bio-degradable fluid. Electrical codes recognize the advantages of using Envirotemp™ FR3™ fluid both indoors and outdoors for fire sensitive applications. The bio-based fluid meets Occupational Safety and Health Administration (OSHA) and Section 450.23 NEC Requirements.

**EATON**

*Powering Business Worldwide*

### Three-phase pad-mounted compartmental type transformer

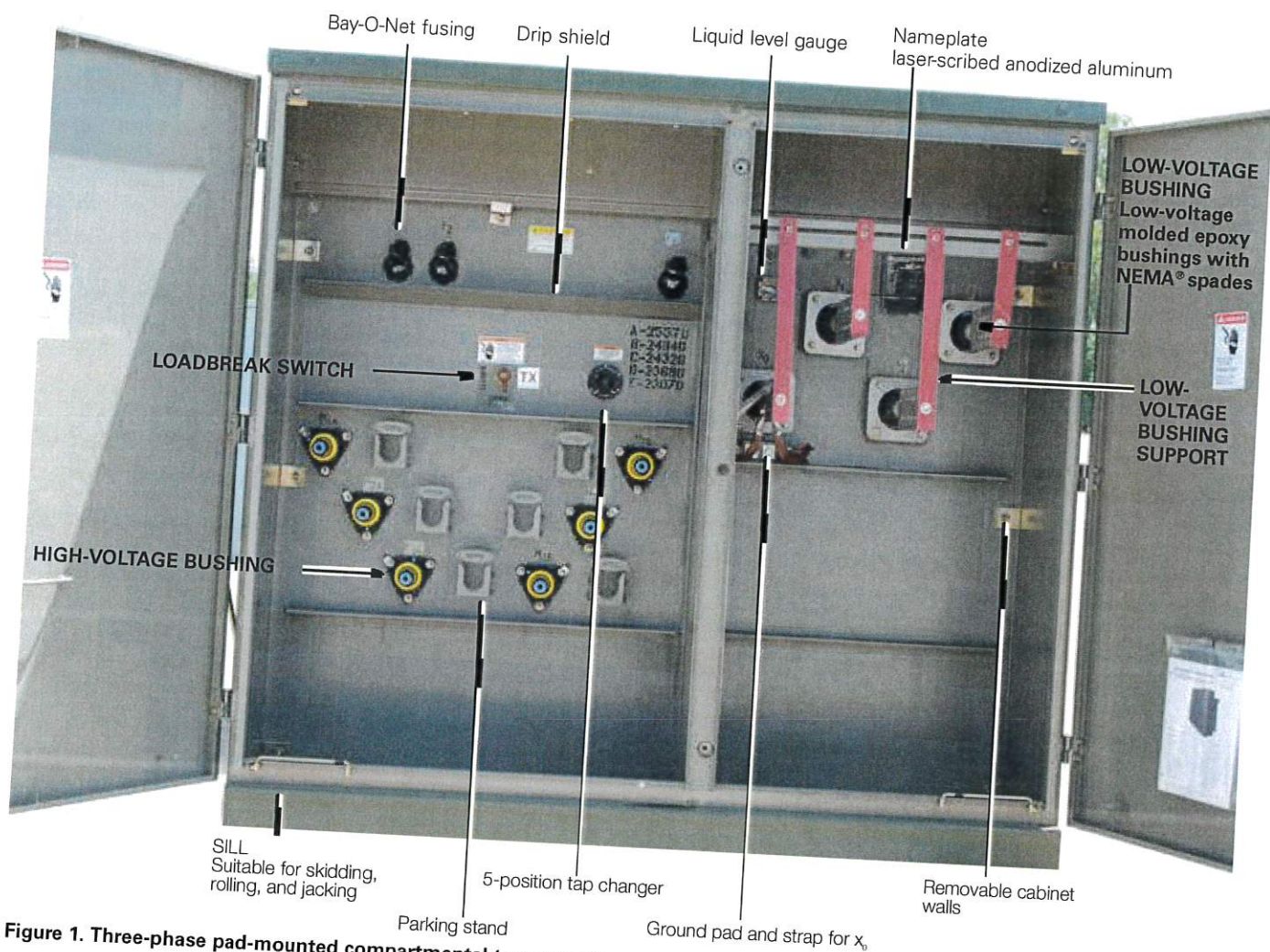


Figure 1. Three-phase pad-mounted compartmental type transformer.

Table 1. Product Scope

Type	Three Phase, 50 or 60 Hz, 65 °C Rise (55 °C, 55/65 °C), 65/75 °C, 75 °C
Fluid Type	Mineral oil or Envirotemp™ FR3™ fluid
Coil Configuration	2-winding or 4-winding or 3-winding (Low-High-Low), 3-winding (Low-Low-High)
Size	45 – 10,000 kVA
Primary Voltage	2,400 – 46,000 V
Secondary Voltage	208Y/120 V to 14,400 V
Specialty Designs	Inverter/Rectifier Bridge
	K-Factor (up to K-19)
	Vacuum Fault Interrupter (VFI)
	UL® Listed & Labeled and Classified
	Factory Mutual (FM) Approved®
	Solar/Wind Designs
	Differential Protection
Seismic Applications (including OSHPD)	
Hardened Data Center	



# Three-phase pad-mounted compartmental type transformer

Catalog Data CA202003EN

Effective April 2016

## Eaton CA202003EN Three Phase Transformer

**Table 2. Three-Phase Ratings**

**Three-Phase 50 or 60 Hz**

kVA Available<sup>1</sup>

45, 75, 112.5, 150, 225, 300, 500, 750, 1000, 1500, 2000, 2500, 3000, 3750, 5000, 7500, 10000

<sup>1</sup>Transformers are available in the standard ratings and configurations shown or can be customized to meet specific needs.

**Table 3. Impedance Voltage**

Rating (kVA)	Low-voltage rating		
	≤ 600 V	2400 Δ through 4800 Δ	6900 Δ through 13800GY/7970 or 13800 Δ
45-75	2.70-5.75	2.70-5.75	2.70-5.75
112.5-300	3.10-5.75	3.10-5.75	3.10-5.75
500	4.35-5.75	4.35-5.75	4.35-5.75
750-2500	5.75	5.75	5.75
3750	5.75	5.75	6.00
5000		6.00	6.50

Note: The standard tolerance is ± 7.5%

**Table 4. Audible Sound Levels**

Self-Cooled, Two Winding kVA Rating	NEMA® TR-1 Average Decibels (dB)
45-500	56
501-700	57
701-1000	58
1001-1500	60
1501-2000	61
2001-2500	62
2501-3000	63
3001-4000	64
4001-5000	65
5001-6000	66
6001-7500	67
7501-10000	68

**Table 5. Insulation Test Levels**

KV Class	Induced Test 180 or 400 Hz 7200 Cycle	kV BIL Distribution	Applied Test 60 Hz (kV)
1.2	Twice Rated Voltage	30	10
2.5		45	15
5		60	19
8.7		75	26
15		95	34
25		125	40
34.5		150	50

**Table 6. Temperature Rise Ratings 0-3300 Feet (0-1000 meters)**

Unit Rating (Temperature Rise Winding)	Standard	Optional
Ambient Temperature Max	65 °C	55 °C, 55/65 °C, 75 °C
Ambient Temperature 24 Hour Average	40 °C	50 °C
Temperature Rise Hotspot	30 °C	40 °C
	80 °C	65 °C

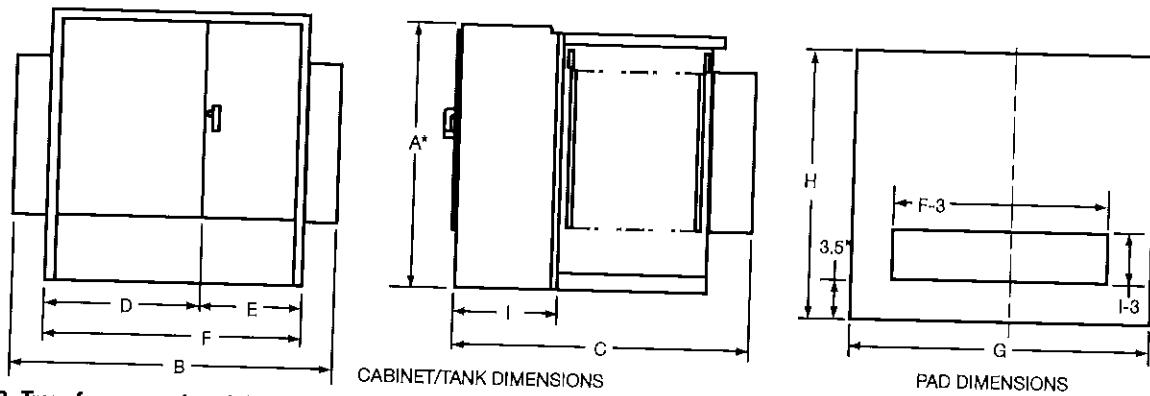


Figure 2. Transformer and pad dimensions.

\* Add 9" for Bay-O-Net fusing.

Table 7. Fluid-filled—aluminum windings 55/65 °C Rise<sup>1</sup>

65° Rise DEAD-FRONT—LOOP OR RADIAL FEED—BAYO-NET FUSING OIL FILLED—ALUMINUM WINDINGS											
OUTLINE DIMENSIONS (in.)											
kVA Rating	A*	B	C	D	E	F	G	H	I	Gallons of Fluid	Approx. Total Weight (lbs.)
45	50	68	39	42	26	68	72	43	20	110	2,100
75	50	68	39	42	26	68	72	43	20	115	2,250
112.5	50	68	49	42	26	68	72	53	20	120	2,350
150	50	68	49	42	26	68	72	53	20	125	2,700
225	50	72	51	42	30	72	76	55	20	140	3,150
300	50	72	51	42	30	72	76	55	20	160	3,650
500	50	89	53	42	30	72	93	57	20	190	4,650
750	64	89	57	42	30	72	93	61	20	270	6,500
1000	64	89	59	42	30	72	93	63	20	350	8,200
1500	73	89	86	42	30	72	93	90	24	410	10,300
2000	73	72	87	42	30	72	76	91	24	490	12,500
2500	73	72	99	42	30	72	76	103	24	530	14,500
3000	73	84	99	46	37	84	88	103	24	620	16,700
3750	84	85	108	47	38	85	88	112	24	660	19,300
5000	84	96	108	48	48	96	100	112	24	930	25,000
7500	94	102	122	54	48	102	100	126	24	1,580	41,900

<sup>1</sup> Weights, gallons of fluid, and dimensions are for reference only and not for construction. Please contact Eaton for exact dimensions.

\* Add 9" for Bay-O-Net fusing.

Table 8. Fluid-Filled—Copper Windings 55/65 °C Rise<sup>1</sup>

65° Rise DEAD-FRONT—LOOP OR RADIAL FEED—BAYO-NET FUSING OIL FILLED—COPPER WINDINGS											
OUTLINE DIMENSIONS (in.)											
kVA Rating	A*	B	C	D	E	F	G	H	I	Gallons of Fluid	Approx. Total Weight (lbs.)
45	50	64	39	34	30	64	69	43	20	110	2,100
75	50	64	39	34	30	64	69	43	20	115	2,350
112.5	50	64	49	34	30	64	69	53	20	115	2,500
150	50	64	49	34	30	64	69	53	20	120	2,700
225	50	64	51	34	30	64	73	55	20	140	3,250
300	50	64	51	34	30	64	75	55	20	160	3,800
500	50	81	53	34	30	64	85	57	20	200	4,800
750	64	89	57	42	30	72	93	61	20	255	6,500
1000	64	89	59	42	30	72	93	63	20	300	7,800
1500	73	89	86	42	30	72	93	90	24	410	10,300
2000	73	72	87	42	30	72	76	91	24	420	11,600
2500	73	72	99	42	30	72	76	103	24	500	14,000
3000	73	84	99	46	37	84	88	103	24	720	18,700
3750	84	85	108	47	38	85	88	112	24	800	20,500
5000	84	96	108	48	48	96	100	112	24	850	25,000
7500	94	102	122	54	48	102	100	126	24	1,620	46,900

<sup>1</sup> Weights, gallons of fluid, and dimensions are for reference only and not for construction. Please contact Eaton for exact dimensions.

\* Add 9" for Bay-O-Net fusing.