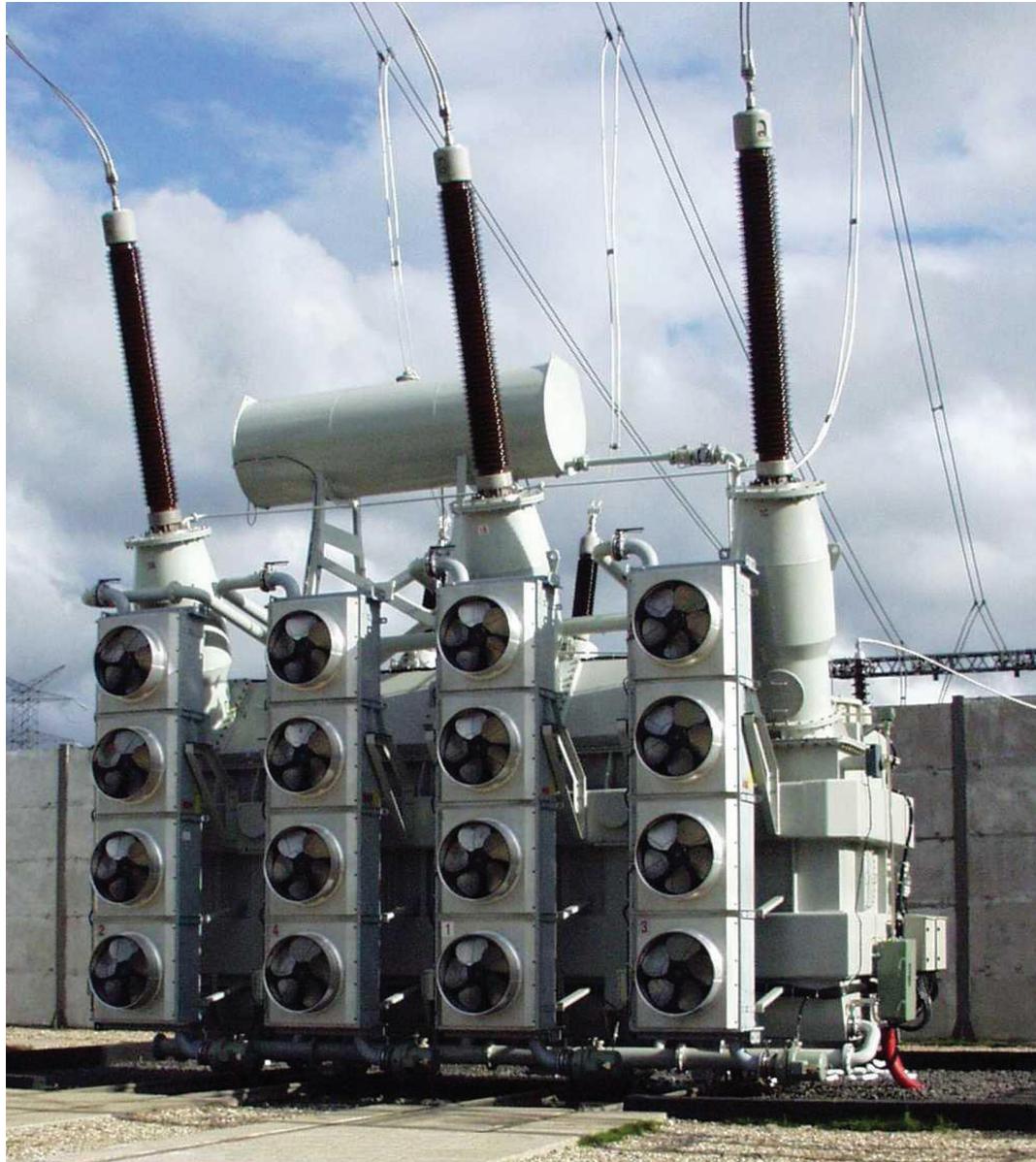


# COOLING PRODUCTS FOR POWER GENERATION



Coiltech<sup>®</sup> industrial  
heat transfer



# POWER GENERATION



## Transformer Oil Coolers

The Modine transformer oil cooler concept, type OFAF with forced air by fan and forced oil by circulation pump, has been designed for performance and serviceability – some of our benefits are listed on the right.

- Our Units are Pre-designed and configurable to order
- High cooling capacity and compact design
- Low engineered sound level
- Low energy consumption
- Designed for Horizontal or vertical installation
- Carefully cleaned inside by oil flushing process
- Delivered as fully factory-assembled units



# POWER GENERATION

All Modine Transformer Oil Coolers are classified as OFAF type (Oil Forced, Air Forced)

The cooler consists of a casing with a finned tube heat exchanger and one to four fan units. The heat exchanger is carefully cleaned inside by oil flushing.

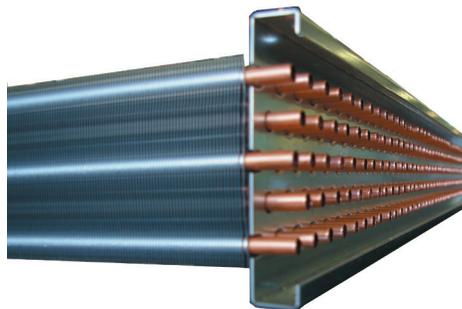
The cooler is designed to withstand vibrations, shocks, seismic forces and thermal movements.



Cooler with 3 fans

## Finned heat exchanger

All of our plate finned heat exchangers have been designed for the best performance by utilizing the greatest amount of heat transfer surface. Our standard fin spacing is 8.5 fins per inch so that cleaning is not only easier but less frequent. The fin pack may also be coated with ElectroFin for both corrosion resistance and even easier to clean.



The finned coil body can be made using either aluminum or copper tubing with Aluminum or copper plate fins. When aluminum tubing is used, we provide removable headers that are made of anti-corrosion coated steel and then coated to provide the cleanest oil path possible. This is also available as an option for copper tubed heat exchangers. ElectroFin coating can be added for more protection against corrosion.

Plugged vent and drain connections are provided on each header as standard.

## Fan unit

Two Fan options are available. The fan unit may be designed with either a direct-drive axial fan or external rotor drive. All fan units are dynamically balanced to a G-6.3 vibration specification.

Where NEMA is required, the direct drive fan is driven by a totally enclosed, three-phase motor with fan blades made of aluminum and a hub of anti-corrosion coated steel.

We also offer the highly efficient, super quiet and long lasting External Rotor Motor. It is essentially maintenance free external rotor motor and is balanced as a complete unit. This type of motor can be supplied with a hinged housing that will allow the fan to swing

out of the way for cleaning and serviceability.

All Fan Units are rigorously tested before delivery:

- Voltage / Amperage / Watts
- Speed (RPM) and Direction
- Correct Air Flow
- Vibration

## Cleanliness

Before delivery, each cooler is carefully cleaned inside by a transformer oil



Fan unit

flushing process with on-line particle counter to ensure requirement of cleanliness for all power transformer applications. The oil connections are sealed off and tightened for shipment.

All of our Coolers are cleaned internally using special filters capable of cleaning to an industry standard of ISO 4406-1999. We clean using only oil compatible with Naphthenic Transformer Oils such as Nynas.

# POWER GENERATION

## Motor Sound data (NEMA type)

Sound power level, dB(A), per one cooler according to ISO 3744

Frequency	50 Hz				60 Hz		
No. of poles	6	8	12	16	6	8	12
No. of fans	L <sub>w</sub>						
1	88	82	70	64	92	86	74
2	91	85	73	67	95	89	77
3	93	87	75	69	97	91	79
4	94	88	76	70	98	92	80

Sound pressure level, dB(A) at distance 2 m, per one cooler according to IEC 551

Frequency	50 Hz				60 Hz		
No. of poles	6	8	12	16	6	8	12
No. of fans	L <sub>p</sub>						
1	71	65	53	45	75	69	57
2	74	68	56	48	78	72	60
3	76	70	58	50	80	74	62
4	77	71	59	51	81	75	63

The tolerance of the sound levels are +/- 2 dB(A) depending on individual differences.

**BETA**

Sound power level, dB(A), per one cooler according to ISO 3744

Frequency	50 Hz				60 Hz		
No. of poles	6	8	12	16	6	8	12
No. of fans	L <sub>w</sub>						
1	95	88	79	71	98	91	81
2	98	91	82	74	101	94	84
3	100	93	84	76	102	96	86
4	101	94	85	77	104	97	87

Sound pressure level, dB(A) at distance 2 m, per one cooler according to IEC 551

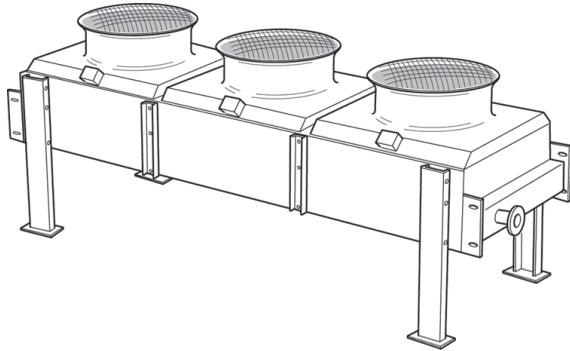
Frequency	50 Hz				60 Hz		
No. of poles	6	8	12	16	6	8	12
No. of fans	L <sub>p</sub>						
1	78	70	62	55	80	73	64
2	81	73	65	58	83	76	67
3	83	75	67	60	85	77	69
4	83	75	67	60	86	78	69

The tolerance of the sound levels are +/- 2 dB(A) depending on individual differences.

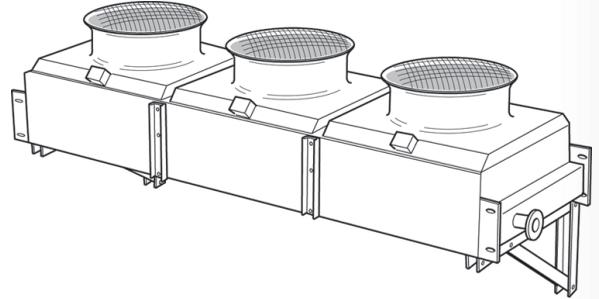
**CETA**

# POWER GENERATION

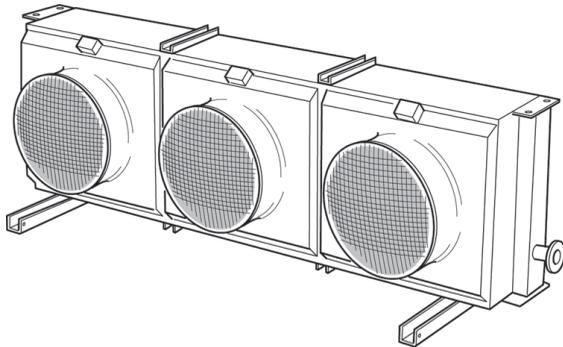
## Installation mounting arrangements



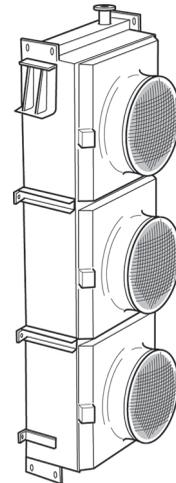
Arrangement 11



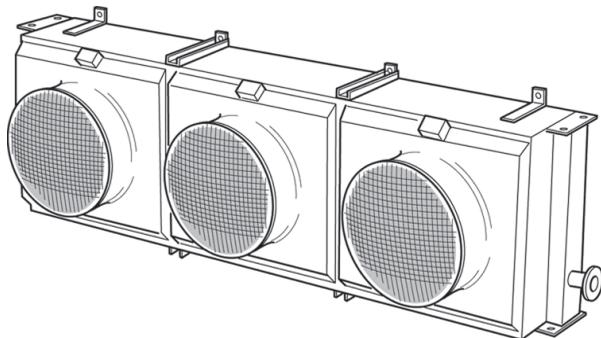
Arrangement 12



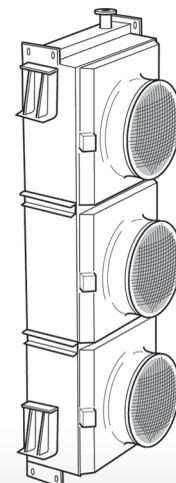
Arrangement 13



Arrangement 14



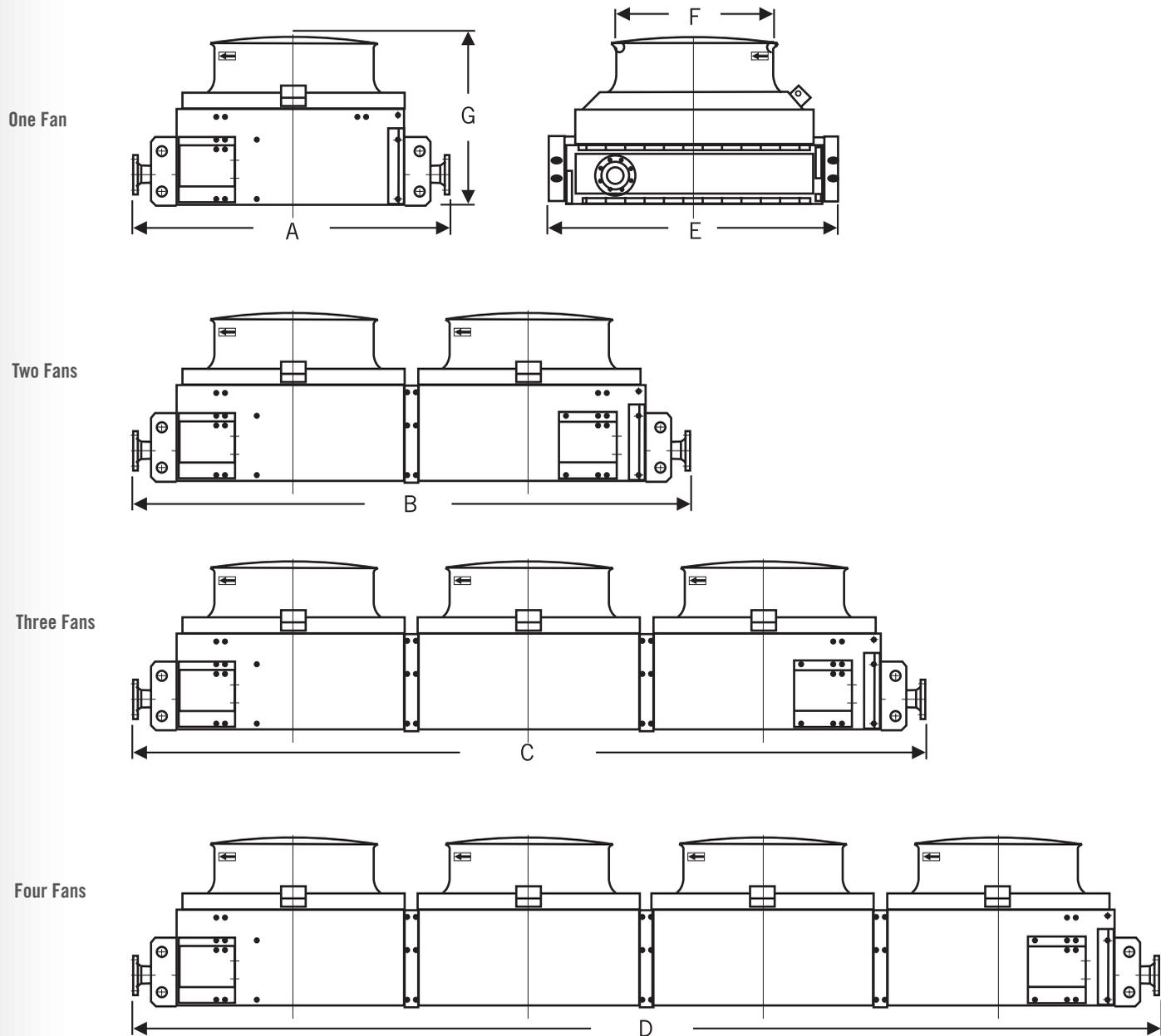
Arrangement 15



Arrangement 16

# POWER GENERATION

## Outline dimensions



Cooler		A	B	C	D	E	F	G
BETA	mm	1642	2842	4042	5242	1472	800	880
	inches	64.65	111.89	159.13	206.38	57.95	31.50	34.65
CETA	mm	1842	3242	4642	6042	1872	1000	956
	inches	72.52	127.64	182.76	237.87	73.70	39.37	37.64

# POWER GENERATION

## Air Heaters

All PreHeat Coils, whether Steam or Hot Water are manufactured to the highest industry standards in our plant in Grenada, MS. With over 50 years of Heat Transfer Experience, we can supply coils to meet the most demanding application.

We have a variety of manufacturing materials that are available in any of our products.

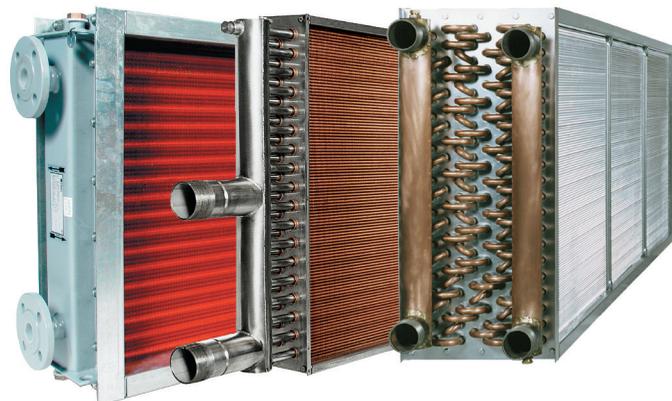
- Tubes of Copper, CuNi or Stainless Steel
- Fins made of Copper or Stainless Steel
- Casings of Galvanized or Stainless Steel
- ElectroFin Coating is available for exceptional corrosion resistance when required.

Sizes ranging in various lengths up to 39' (12 meters) & Height up to 8' (2.5 meters)

Virtually any combination of Steam or Hot Water coil that can be designed, can be built by our experienced workers.

ASME Section-II listed materials, calculated to Section-VIII requirements apply to all pressure holding components used in the construction of our listed coils. Our Steam Coils are leak-tested to 500 psig (3.4 Pa) and our Hot Water coils are tested to 350 psig (2.4 Pa).

Modine is certified and registered as a ISO 9001-2008 manufacturer guaranteeing manufacturing processes that set the standard for quality and durability. Our dedicated processes insure that your finished product is being produced under the strictest guidelines to guarantee the finest industrial duty coil available.



## Fluid Coolers

Modine 800mm Series fluid coolers are available with single speed 1100 rpm or 500 rpm fan motors or with variable speed electronically commutated (VSEC) fan motors. Our standard features are impressive and our available options are extensive. Take a look at how Modine will make you unwilling to compromise also.

- Up to 25% more energy efficient
- Up to 75% lower sound amplitude

## Coil Selection

Available in single wide configuration from 1 to 7 fans and double wide configuration from 4 to 14 fans. Heat transfer custom designed for your specific application.





Modine Grenada LLC  
Tel: 800-225-4328  
Fax: 662-229-4212  
Grenada, MS  
Email: [powergen@modine.com](mailto:powergen@modine.com)

