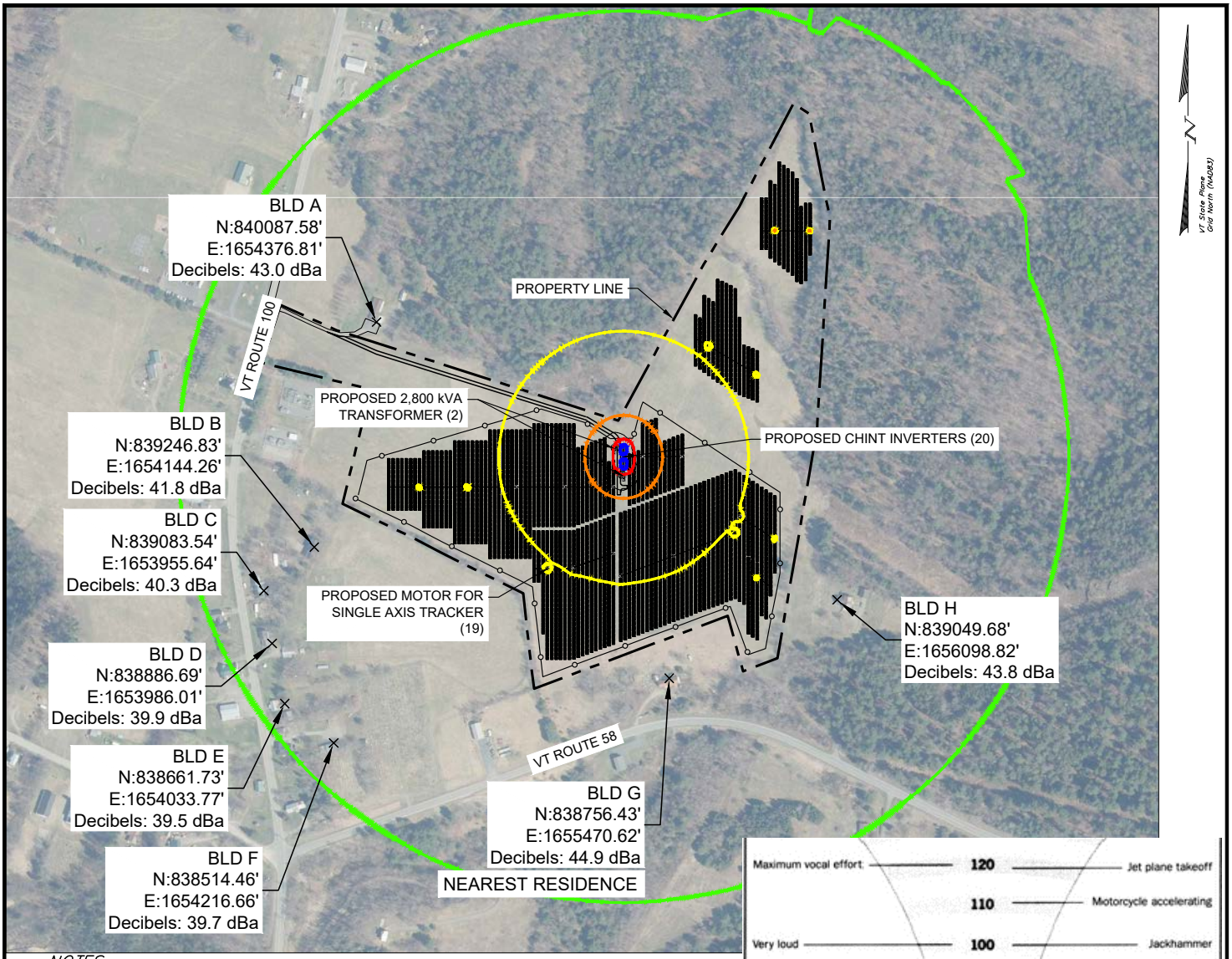


NOTES:

1. *Sound levels for the Cooper 2,800 kVA pad mounted transformers have sound level of 63 dBA [measured at 0.3 meter, as per NEMA TR1 (ANSI/IEEE Std. C57.12-90-1993, sec. 13.3.4)]. Assuming the measurement was taken at 1 meter to be conservative, the calculated sound level at 3 meters is 53.5 dBA. Chint specifies that the Chint 250/275kW string inverters create less than 80 dBA at a distance of 1 meter from the unit. The calculated sound level for at 3 meters is 70.5 dBA. ATI specifies that each motor creates 54 DBA at 1 meter. The calculated sound level at 3 meters is 44.5 dBA. All the equipment was modeled to be producing the maximum noise level with all equipment running simultaneously.*

2. *Other decibel ranges were derived using the following distance damping equation [L2 = L1 −20 Log(d1/d2)]. This damping equation was the only factor considered in decibel range attenuation estimates. Elevation, ambient noise, vegetation, angle of solar array and other structures which would further effect the attenuation of sound levels were not considered in this study. Daytime sound levels depicted on this plan are for (2) 2,800 kVA Cooper Pad Mounted Transformers, (20) Chint Inverters and (19) ATI Tracker motors with all equipment operating simultaneously at maximum noise level.*

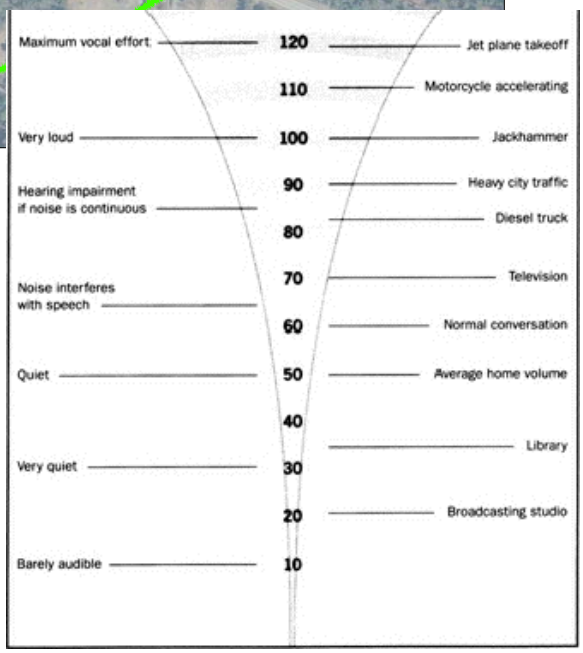
3. *Sound levels reported do not account for any background noise. Local background noise may exceed sound created by project equipment.*

Legend:

- >80 dBa
- 70 dBa
- 60 dBa
- 50 dBa
- 40 dBa

0' 300' 600' 1,200'

GRAPHIC SCALE 1" = 600'



Decibel Breakdown Compared to Everyday Noises

KREBS & LANSING CONSULTING ENGINEERS
164 Main Street, Suite 201
Colchester, Vermont 05446
P: (802) 878-0375
www.krebsandlansing.com

DAYTIME FULL OPERATION SOUND LEVEL PLAN

Basic Sound Level Estimates for Noise Produced by Transformers, Inverters & Tracker Motors

Project: Northland Solar Project

Location: VT Route 100, Lowell, VT

Source Data:

Plan ID: Sound 1

Scale: 1" = 600'

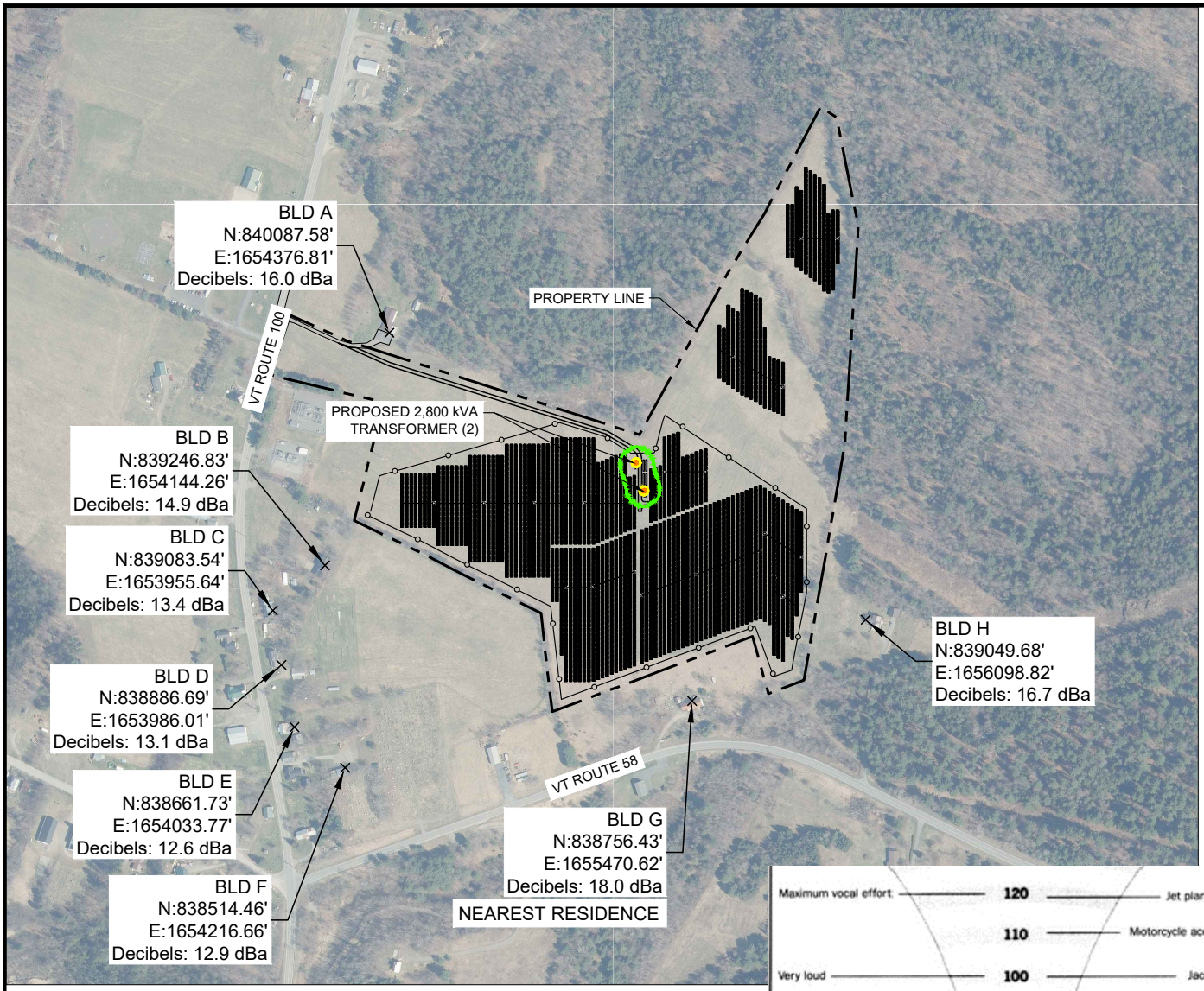
Date: 09/18/25

DRAWN BY: SDG

CHECKED BY: IAJ

Revision Date:

Northland Solar LLC
PO Box 1204
Manchester Center, VT 05255
www.mhgsolar.com



NOTES:

1. *Sound levels for the Cooper 2,800 kVA pad mounted transformers have sound level of 63 dBA [measured at 0.3 meter, as per NEMA TR1 (ANSI/IEEE Std. C57.12-90-1993, sec. 13.3.4)]. Assuming the measurement was taken at 1 meter to be conservative, the calculated sound level at 3 meters is 53.5 dBA.*

2. *Other decibel ranges were derived using the following distance damping equation [L2 = L1 -20 Log(d1/d2)]. This damping equation was the only factor considered in decibel range attenuation estimates. Elevation, ambient noise, vegetation, angle of solar array and other structures which would further effect the attenuation of sound levels were not considered in this study. Nightime sound levels depicted are for the (2) 2,800 kVA transformers operating at maximum noise level.*

3. *For nighttime calculations it was assumed that the array inverters and motors make negligible noise when not loaded with power or operating. For the nighttime calculation we assumed they will make no noise and only modeled the (2) 2,800 kVA transformers running at maximum noise.*

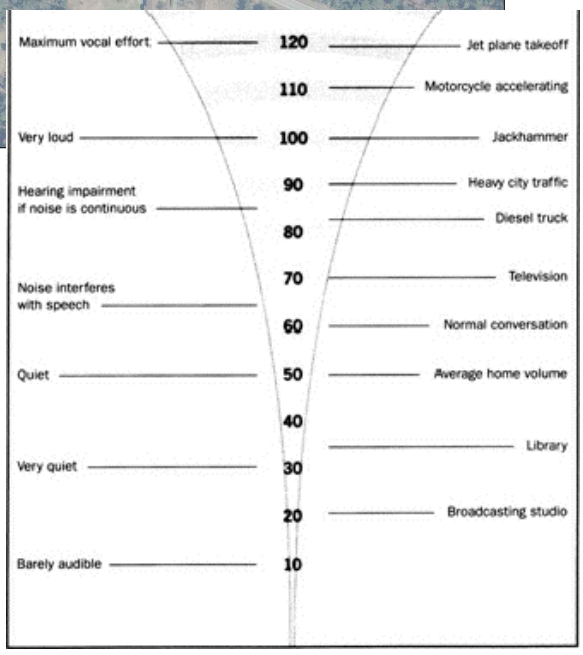
4. *Sound levels reported do not account for any background noise. Local background noise may exceed sound created by project equipment.*

Legend:

60 dBa
50 dBa
40 dBa

0' 300' 600' 1,200'

GRAPHIC SCALE 1" = 600'



Decibel Breakdown Compared to Everyday Noises

KREBS & LANSING CONSULTING ENGINEERS
164 Main Street, Suite 201
Colchester, Vermont 05446
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www.krebsandlansing.com

NIGHTTIME OPERATION SOUND LEVEL PLAN

Project: Northland Solar Project

Location: VT Route 100, Lowell, VT

Plan ID: Sound 2

Source Data:

Basic Sound Level Estimates for Noise Produced by Transformers

Scale: 1" = 600'

Date: 09/18/25

Northland Solar LLC
PO Box 1204
Manchester Center, VT 05255
www.mhgsolar.com

DRAWN BY: SDG

CHECKED BY: SDG

Revision Date:

275kW/275kVA, 1500Vdc String Inverters for North America

CPS SCH275KTL-DO/US-800

The 275kW high power CPS three phase string inverters are designed for ground mount applications. The units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiencies, wide operating voltages, broad temperature ranges and NEMA Type 4X enclosure enable this inverter platform to operate at high performance across many applications. The SCH275KTL inverters include 12 MPPTs and are available with either 36 fused PV string inputs or 24 unfused PV string inputs. The CPS FlexOM solution enables communication, controls and remote product upgrades.

Key Features

- NFPA 70, NEC 2017 compliant
- Touch safe DC Fuse holders adds convenience and safety
- CPS FlexOM Gateway enables remote FW upgrades
- Integrated DC disconnect switch
- Protection Functions for enhanced reliability and safety
- Selectable Max AC Active Power of 250kW or 275kW
- 12 MPPTs with 36 fused inputs or 24 unfused inputs
- Copper and Aluminum compatible AC connections
- NEMA Type 4X outdoor rated, tough tested enclosure
- Full power capacity up to 42°C
- Standard 5 year warranty with extensions to 20 years
- Supported comm protocols (Modbus RTU, TCP/IP, PLC, CAN)

Chint Power Systems America
6800 Koll Center Parkway, Suite 235 Pleasanton, CA 94566
Tel: 855-584-7168 Mail: AmericaSales@chintpower.com Web: www.chintpowersystems.com

Model Name	CPS SCH275KTL-DO/US-800
DC Input	
Max. DC Input Voltage	1500V
Operating DC Input Voltage Range	500-1500Vdc
Start-up DC Input Voltage / Power	600Vdc / 300W
Number of MPP Trackers	12
MPPT Voltage Range @ PF>0.99[1]	900-1300Vdc
Max. PV Short-Circuit Current	600A, 50A per MPPT
Number of DC Inputs	36 Fused Inputs, 3 per MPPT or 24 Non-Fused Inputs, 2 per MPPT (determined by SKU)
DC Disconnection Type	Load-rated DC switches
DC Surge Protection	Type II
AC Output	
Max AC Output Power (Selectable) @ PF>0.99	250kW / 275kW
Max. AC Apparent Power	275kVA
Rated Output Voltage	800Vac
Output Voltage Range[2]	704-880Vac
Grid Connection Type	3-Phase / PE
Max. AC Output Current @800Vac	198.5A
Rated Output Frequency	60Hz
Output Frequency Range[2]	57 - 63Hz
Power Factor	>0.99 (±0.8 adjustable)
Current THD @ Rated Load	<3%
Max. Fault Current Contribution (1 Cycle RMS)	215.2A
Max. OCPD Rating	250A
AC Surge Protection	Type II
System and Performance	
Max. Efficiency	99.0%
CEC Efficiency	98.5%
Stand-by / Night Consumption	5W
Environment	
Enclosure Protection Degree	NEMA Type 4X
Cooling Method	Variable speed cooling fans
Operating Temperature Range[3]	-22°F to +140°F / -30°C to +60°C (derating from +107°F / +42°C)
Operating Humidity	0 to 100%
Operating Altitude	8202ft / 2500m (no derating)
Audible Noise	<80dBA @ 1m and 25°C
Display and Communication	
User Interface and Display	LED indicators, WiFi + APP
Inverter Monitoring	Modbus RS485 / Ethernet TCP/IP / PLC / CAN
Site Level Monitoring	CPS FlexOM (1 per 32 inverters)
Modbus Data Mapping	SunSpec / CPS
Remote Diagnostics / FW Upgrade Functions	Standard / (with FlexOM Gateway)
Mechanical	
Dimensions (HxWxD)	26.8 x 41.3 x 15.7in (680 x 1050 x 400mm)
Weight	Approx. 260lbs / 118kg
Mounting / Installation Angle	Vertical installation
AC Termination	Stud Type Terminal (Wire range: 3/0AWG – 600kcmil AL/CU, Lugs not supplied)
DC Termination	36 Fused Input: Screw Clamp Fuse Holder (Wire range: #14 - #6 AWG CU) 24 Non-Fused Input: Screw Clamp Terminal (Wire range: #14 - #8 and #6 - #4 AWG CU)
Fused String Inputs (3 per MPPT)[4]	20A fuses provided (Fuse values up to 30A acceptable)
Safety	
Certifications and Standards	UL1741SA-2018, CSA-22.2 NO.107.1-01, IEEE1547-2018, FCC PART15
Selectable Grid Standard	IEEE 1547-2018, CA Rule 21, ISO-NE, HECO Rule 14H
Smart-Grid Features	Volt-RideThru, Freq-RideThru, Ramp-Rate, Specified-PF, Volt-Var, Freq-Watt, Volt-Watt
Protection Functions	
Reactive Power at Night	Yes
IV Curve Tracing	Yes
Insulation Resistance Monitoring	Yes
Onboard Fault Oscillography	Yes
PV String Current Monitoring	Yes
Residual Current Monitoring	Yes
Input Reverse Polarity Protection	Yes
Output Overcurrent Protection	Yes
Output Short-Circuit Protection	Yes
Output Overvoltage Protection	Yes
Warranty	
Standard	5 Years
Extended Terms	10, 15 and 20 years

1) See user manual for further information regarding MPPT Voltage Range when operating at non-unity PF
2) The "Output Voltage Range" and "Output Frequency Range" may differ according to the specific grid standard.
3) See user manual for further requirements regarding non-operating conditions.
4) Fused string inputs only applicable to the SCH275KTL 36 input model.

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.

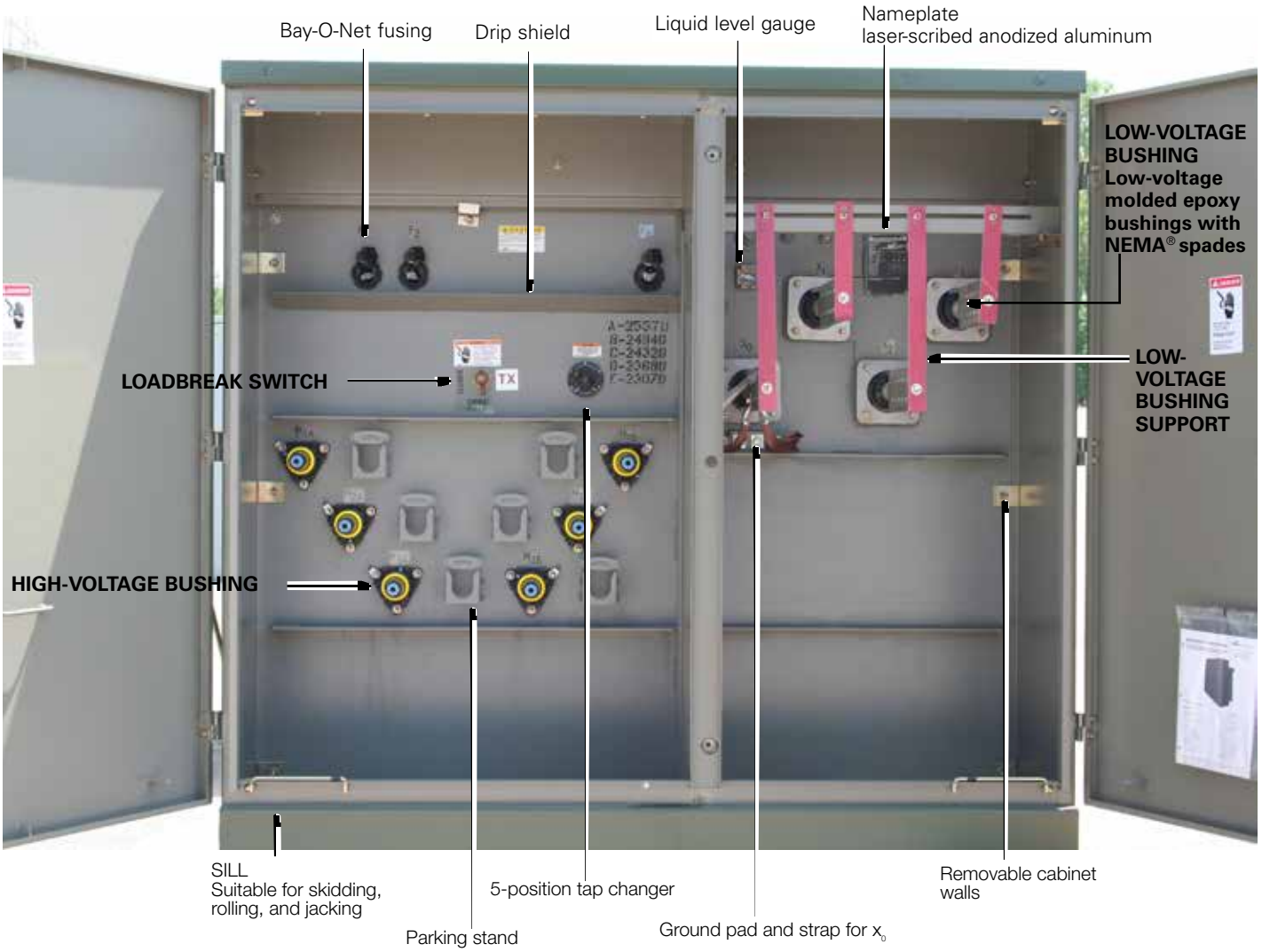

Figure 1. Three-phase pad-mounted compartmental type transformer.

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

Table 2. Three-Phase Ratings

Three-Phase 50 or 60 Hz
kVA Available[1]: 45, 75, 112.5, 150, 225, 300, 500, 750, 1000, 1500, 2000, 2500, 3000, 3750, 5000, 7500, 10000

[1]Transformers are available in the standard ratings and configurations shown or can be customized to meet specific needs.

Table 3. Impedance Voltage

	Low-voltage rating		
Rating (kVA)	**≤ 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

	NEMA® TR-1 Average
Self-Cooled, Two Winding kVA Rating	**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)

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

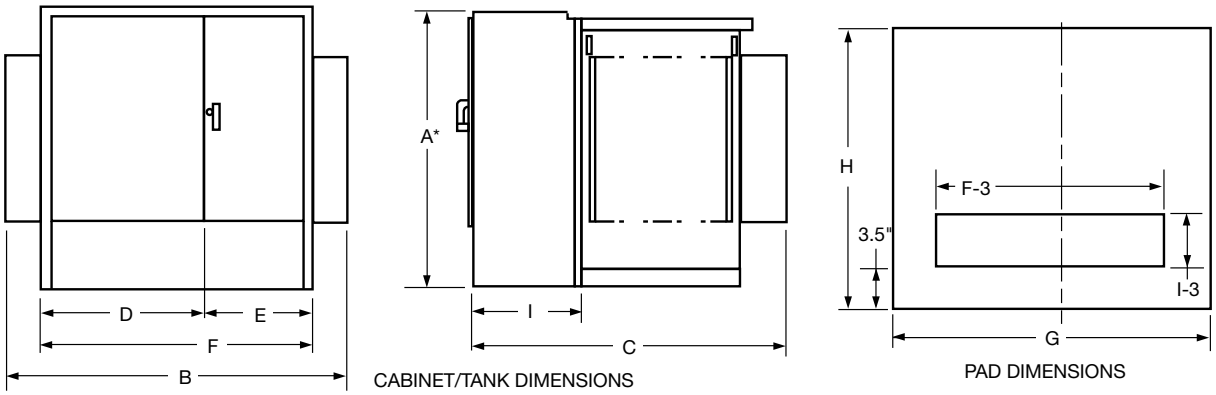

Figure 2. Transformer and pad dimensions.

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

Table 7. Fluid-filled—aluminum windings 55/65 °C Rise[1]

65° Rise	DEAD-FRONT—LOOP OR RADIAL FEED—BAY-O-NET FUSING OIL FILLED—ALUMINUM WINDINGS										
	OUTLINE DIMENSIONS (in.)									Gallons of	Approx. Total
kVA Rating	A*	B	C	D	E	F	G	H	I	Fluid	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

1 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[1]

65° Rise	DEAD-FRONT—LOOP OR RADIAL FEED—BAY-O-NET FUSING OIL FILLED—COPPER WINDINGS										
	OUTLINE DIMENSIONS (in.)									Gallons of	Approx. Total
kVA Rating	A*	B	C	D	E	F	G	H	I	Fluid	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

[1] 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.

Standard features

Connections and neutral configurations

- Delta - Wye: Low voltage neutral shall be a fully insulated X0 bushing with removable ground strap.
- Grounded Wye-Wye: High voltage neutral shall be internally tied to the low voltage neutral and brought out as the H0X0 bushing in the secondary compartment with a removable ground strap.
- Delta-Delta: Transformer shall be provided without a neutral bushing.
- Wye-Wye: High voltage neutral shall be brought out as the H0 bushing in the primary compartment and the low voltage neutral shall be brought as the X0- bushing in the secondary compartment.
- Wye-Delta: High voltage neutral shall be brought out as the H0 bushing in the primary compartment. No ground strap shall be provided (line to line rated fusing is required).

High and low voltage bushings

- 200 A bushing wells (15, 25, and 35 kV)
- 200 A, 35 kV Large Interface
- 600 A (15, 25, and 35 kV) Integral bushings (dead-front)
- Electrical-grade wet-process porcelain bushings (live-front)

Tank/cabinet features

- Bolted cover for tank access (45-2500 kVA)
- Welded cover with hand hole (>2500 kVA)
- Three-point latching door for security
- Removable sill for easy installation
- Lifting lugs (4)
- Stainless steel cabinet hinges and mounting studs
- Steel divider between HV and LV compartment
- 20" Deep cabinet (45-1000 kVA)
- 24" Deep cabinet (1500-7500 kVA)
- 30" Deep cabinet (34.5/19.92 kV)
- Pentahead captive bolt
- Stainless steel 1-hole ground pads (45-500 kVA)
- Stainless steel 2-hole ground pads (750-10,000 kVA)
- Parking Stands (dead-front)

Valves/plugs

- One-inch upper filling plug
- One-inch drain plug (45-500 kVA)
- One-inch combination drain valve with sampling device in low voltage compartment (750-10,000 kVA)
- Automatic pressure relief valve

Nameplate

- Laser-scribed anodized aluminum nameplate

Figure 3. Drain valve with sampler.

Figure 4. Automatic Pressure relief valve.

Figure 5. Liquid level gauge.

Figure 6. External Gauges.

Figure 7. External visible break with gauges.

Optional features

High and low voltage bushings

- 200 A (15, 25 kV) bushing inserts
- 200 A (15, 25 kV) feed thru inserts
- 200 A (15, 25 kV) (HTN) bushing wells with removable studs
- High-voltage 600 A (15, 25, 35 kV) deadbreak one-piece bushings
- Low voltage 6-, 8-holes spade
- Low voltage 12-, 16-, 20-holes spade (750-2500 kVA)
- Low voltage bushing supports

Tank/cabinet features

- Stainless steel tank base and cabinet
- Stainless steel tank base, cabinet sides and sill
- 100% stainless steel unit
- Service entrance (2 inch) in sill or cabinet side
- Touch-up paint (domestic)
- Copper ground bus bar
- Kirk-Key provisions
- Nitrogen blanket
- Bus duct cutout

Special designs

- Factory Mutual (FM)
- UL® Classified
- Triplex
- High altitude
- K-Factors
- Step-up
- Critical application
- Modulation transformers
- Seismic applications (including OSHPD)

Switches

- One, two, or three On/Off loadbreak switches
- 4-position loadbreak V-blade switch or T-blade switch
- Delta-wye switch
- 3-position V-Blade selector switch
- 100 A, 150 A, 300 A tap changers
- Dual voltage switch
- Visible break with VFI interrupter interlock
- External visible break (15, 25, and 35 kV, up to 3 MVA)
- External visible break with gauges (15, 25, and 35 kV, up to 3 MVA)

Gauges and devices

- Liquid level gauge (optional contacts)
- Pressure vacuum gauge (optional contacts and bleeder)
- Dial-type thermometer (optional alarm contacts)
- Cover mounted pressure relief device (optional alarm contacts)
- Ground connectors
- Hexhead captive bolt
- Molded case circuit breaker mounting provisions
- External gauges in padlockable box

Overcurrent protection

- Bay-O-Net fusing (Current sensing, dual sensing, dual element, high amperage overload)
- Bay-O-Net expulsion fuse in series with a partial range under-oil ELSP current limiting fuse (below 23 kV)
- Cartridge fusing in series with a partial range under-oil ELSP current limiting fuse (above 23 kV)
- MagneX™ interrupter with ELSP current-limiting fuse
- Vacuum Fault Interrupter (VFI)
- Visible break window
- Fuse/switch interlock

Valves/plugs

- Drain/sampling valve in high-voltage compartment
- Globe type upper fill valve

Overvoltage protection

- Distribution-, intermediate-, or station-class surge arresters
- Elbow arresters (for dead-front connections)

Metering/fan/control

- Full metering package
- Current Transformers (CTs)
- Metering Socket
- NEMA® 4 control box (optional stainless steel)
- NEMA® 7 control box (explosion proof)
- Fan Packages

Testing

- Customer test witness
- Customer final inspection
- Zero Sequence Impedance Test
- Heat Run Test
- ANSI® Impulse Test
- Audible Sound Level Test
- RIV (Corona) Test
- Dissolved Gas Analysis (DGA) Test
- 8- or 24-Hour Leak Test

Coatings (paint)

- ANSI® Bell Green
- ANSI® #61 Light Gray
- ANSI® #70 Sky Gray
- Special paint available per request

Nameplate

- Stainless steel nameplate

Decals and labels

- High voltage warning signs
- Mr. Ouch
- Bi-lingual warning
- DOE compliant
- Customer stock code
- Customer stenciling
- Shock and arc flash warning decal
- Non-PCB decal

Construction

Core

The three-legged, step-lap mitered core construction is manufactured using a high-quality cutting machine. For maximum efficiency, cores are precisely stacked, virtually eliminating gaps in the corner joints.

Five-legged wound core or shell-type triplex designs are used for wye-wye connected transformers, and other special transformer designs.

Cores are manufactured with precision cut, burr-free, grain-oriented silicon steel or amorphous metal, depending on customer preference or optimal material based upon performance requirements. Many grades of core steel are available for optimizing core loss efficiency.

Coils

Pad-mounted transformers feature a rectangular coil configuration with wire-wound, high-voltage primaries and sheet-wound secondaries. The design minimizes axial stress developed by short circuits and provides for magnetic balancing of tap connections.

Coils are wound using the highest quality winding machines providing exacting tension control and conductor placement for superior short-circuit strength and maximum efficiency.

Extra mechanical strength is provided by diamond pattern, epoxy-coated paper insulation, used throughout the coil, with additional epoxy at heavy stress points. The diamond pattern distribution of the epoxy and carefully arranged ducts, provide a network of passages through which cooling fluid can freely circulate.

Coil assemblies are heat-cured under calculated hydraulic pressure to ensure performance against short-circuit forces.

Core and coil assemblies

Pad-mounted transformer core and coil assemblies are braced with heavy steel ends to prevent the rectangular coil from distorting under short-circuit conditions. Plates are clamped in place using presses, and welded or bolted to form a solid core and coil assembly. Core and coil assemblies exceed ANSI® and IEEE® requirements for short-circuit performance. Due to the rigidity of the design, impedance shift after short-circuit is comparable to that of circular wound assemblies.

Tanks

Transformer tanks are designed for high strength and ease of handling, installation, and maintenance. Tanks are welded using precision-cut, hot rolled, pickled and oiled steel. They are sealed to protect the insulating fluid and other internal components.

Transformer tanks are pressure-tested to withstand 7 psig without permanent distortion and 15 psig without rupture.

Tank finish

An advanced multi-stage finishing process exceeds IEEE Std C57.12.28™-2014 standards. The eight-stage pre-treatment process assures coating adhesion and retards corrosion. It converts tank surfaces to a nonmetallic, water insoluble iron phosphate coating.

The paint method consists of two distinct layers of paint. The first is an epoxy primer (E-coat) layer which provides a barrier against moisture, salt and corrosives. The two-component urethane final coat seals and adds ultraviolet protection.

Vacuum processing

Transformers are dried and filled with filtered insulating fluid under vacuum, while secondary windings are energized. Coils are heated to drive out moisture, ensuring maximum penetration of fluid into the coil insulation system.

Insulating fluid

Eaton's Cooper Power series transformers are available with electrical-grade mineral insulating oil or Envirotemp™ FR3™ fluid. The highly refined fluids are tested and degassed to assure a chemically inert product with minimal acid ions. Special additives minimize oxygen absorption and inhibit oxidation. To ensure high dielectric strength, the fluid is re-tested for dryness and dielectric strength, refiltered, heated, dried, and stored under vacuum before being added to the completed transformer.

Eaton's Cooper Power series transformers filled with Envirotemp™ FR3™ fluid enjoy unique fire safety, environmental, electrical, and chemical advantages, including insulation life extending properties.

A bio-based, sustainable, natural ester dielectric coolant, Envirotemp™ FR3™ fluid quickly and thoroughly biodegrades in the environment and is non-toxic per acute aquatic and oral toxicity tests.

Building for Environmental and Economic Sustainability (BEES) total life cycle assessment software, utilized by the US Dept. of Commerce, reports its overall environmental performance impact score at 1/4th that reported for mineral oil. Envirotemp™ FR3™ fluid has also earned the EPA Environmental Technology Verification of transformer materials.

With a fire point of 360 °C, Envirotemp™ FR3™ fluid is FM Approved® and Underwriters Laboratories (UL®) Classified "Less-Flammable" per NEC® Article 450-23, fitting the definition of a Listed Product per NEC®.

Figure 8. VFI transformer with visible break.

Pad-mounted VFI transformer

Eaton's Cooper Power series VFI transformer combines a conventional distribution transformer with the proven Vacuum Fault Interrupter (VFI). This combination provides both voltage transformation and transformer over current protection in one space saving and money saving package. The pad-mounted VFI transformer protects the transformer and provides proper coordination with upstream protective devices. When a transformer fault or overload condition occurs, the VFI breaker trips and isolates the transformer.

The three-phase VFI breaker has independent single-phase initiation, but is three-phase mechanically gang-tripped. A trip signal on any phase will open all three phases. This feature eliminates single-phasing of three phase loads. It also enables the VFI breaker to be used as a three-phase load break switch.

Due to the resettable characteristics of the VFI breaker, restoring three-phase service is faster and easier.

The sealed visible break window and switch is an option that can be installed to provide visible break contact. This feature provides enhanced safety and allows an operator to see if the loadbreak switch contacts are in an open or closed position before performing

maintenance.

Envirotran™ FM Approved special protection transformer

Eaton's Cooper Power series Envirotran™ transformer is FM Approved and suitable for indoor locations. Factory Mutual Research Corporation's (FMRC) approval of the Envirotran transformer line makes it easy to comply with and verify compliance with Section 450.23, 2008 NEC, Less-Flammable Liquid-Filled Transformer Requirements for both indoor and outdoor locations.

Envirotran FM Approved transformers offer the user the benefit of a transformer that can be easily specified to comply with NEC, and makes FM Safety Data Sheet compliance simpler, while also providing maximum safety and flexibility for both indoor and outdoor installations.

Because the "FM Approved" logo is readily visible on the transformer and its nameplate, NEC compliance is now easily verifiable by the inspector.

Envirotran FM Approved transformers are manufactured under strict compliance with FMRC Standard 3990 and are filled with

FM APPROVED

FM Approved Envirotemp™ FR3™ fluid, a fire-resistant dielectric coolant.

Special application transformers

Data Center transformer

With focus rapidly shifting from simply maximizing uptime and supporting demand to improving energy utilization, the data center industry is continually looking for methods to increase its energy efficiency and reliability. Utilizing cutting edge technology, Eaton's Cooper Power series Hardened Data Center (HDC) transformers are the solution. Designed with special attention given to surge protection, HDC liquid-filled transformers provide superior performance under the harshest electrical environments. Contrary to traditional dry-type units, HDC transformers provide unsurpassed reliability, overloadability, operational life, efficiency, thermal loading and installed footprint. These units have reliably served more than 100 MW of critical data center capacity for a total of more than 6,000,000 hours without any reported downtime caused by a thermal or short-circuit coil failure.

The top priority in data center operations is uninterrupted service. Envirotran HDC transformers from Eaton, having substantially higher levels of insulation, are less susceptible to voltage surges. Eaton has experienced zero failures due to switching transients. The ANSI® and IEEE® standard impulse withstand ratings are higher for liquid-filled transformers, making them less susceptible to insulation failure. The Envirotran HDC transformer provides ultimate protection by increasing the BIL rating one level higher than standard liquid-filled transformer ratings. The cooling system of liquid-filled transformers provides better protection from severe overloads—overloads that can lead to significant loss of life or failure.

Data center design typically includes multiple layers of redundancy, ensuring maximum uptime for the critical IT load. When best in class transformer manufacturing lead times are typically weeks, not days, an unexpected transformer failure will adversely affect the facility's reliability and profitability. Therefore, the ability to determine the electrical and mechanical health of a transformer can reduce the probability of costly, unplanned downtime. Routine diagnostic tests, including key fluid properties and dissolved gas analysis (DGA), can help determine the health of a liquid-filled transformer. Although sampling is not required for safe operation, it will provide the user with valuable information, leading to scheduled repair or replacement, and minimizing the duration and expense of an outage. With a dry-type transformer, there is no reliable way to measure the health or likelihood of an impending failure.

Solar transformer

As a result of the increasing number of states that are adopting aggressive Renewable & Alternative Energy Portfolio Standards, the solar energy market is growing—nearly doubling year over year. Eaton, a key innovator and supplier in this expanding market, is proud to offer its Cooper Power series Envirotran transformers specifically designed for Solar Photovoltaic medium-voltage applications. Eaton is working with top solar photovoltaic developers, integrators and inverter manufacturers to evolve the industry and change the way we distribute power.

In accordance with this progressive stance, every Envirotran Solar transformer is filled with non-toxic, biodegradable Envirotemp™ FR3™ dielectric fluid, made from renewable seed oils. On top of its biodegradability, Envirotemp™ FR3™ fluid substantially extends the life of the transformer insulation, saving valuable resources. What better way to distribute green power than to use a green transformer. In fact, delaying conversion to Envirotran transformers places the burden of today's environmental issues onto tomorrow's generations. Eaton can help you create a customized transformer, based on site specific characteristics including: temperature profile, site altitude, solar profile and required system life. Some of the benefits gained from this custom rating include:

- Reduction in core losses
- Improved payback on investment
- Reduction in footprint
- Improved fire safety
- Reduced environmental impact

For the solar photovoltaic industry, Eaton is offering standard step up transformers and dual secondary designs, including 4-winding, 3-winding (Low-High-Low) and 3-winding (Low-Low-High) designs.

Wind transformer

Eaton is offering custom designs for renewable energy power generation. Eaton manufactures its Cooper Power series Generator Step-Up (GSU) transformers for installation at the base of every wind turbine. Additionally, grounding transformers are available for wind power generation.

DOE efficiency

The United States Department of Energy (DOE) has mandated efficiency values for most liquid type, medium voltage transformers. As a result, all applicable Eaton's Cooper Power series transformers 2500 kVA and below conform to efficiency levels as specified in the DOE ruling "10 CFR Part 431 Energy Conservation Program".

Underwriters Laboratories® (UL®) Listed and Labeled/ Classified

The Envirotran transformer from Eaton can be specified as UL® Listed & Labeled, and/or UL® Classified. Underwriters Laboratories (UL®) listing is a verification of the design and construction of the transformer to the ANSI® and IEEE® standards. UL® listing generally is the most efficient, cost-effective solution for complying with relevant state and local electrical codes. UL® Combination Classification/Listing is another way in which to comply with Section 450.23, 2008 NEC® requirements. This combines the UL® listed transformer with a UL® Classified Less-Flammable Liquid and complies with the use restrictions found within the liquid Classification.

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K-Factor transformer

With a drastic increase in the use of ferromagnetic devices, arcing devices, and electric power converters, higher frequency loads have increased significantly. This harmonic loading has the potential to generate higher heat levels within a transformer's windings and leads by as much as 300%. Harmonic loading has the potential to induce premature failure in standard-design distribution transformers.

In addition to standard UL® "K-Factor" ratings, transformers can be designed to customer-provided specifications detailing precise loading scenarios. Onsite measurements of magnitude and frequency, alongside harmonic analysis of the connected load can be performed by Eaton engineers or a third party consultant. These field measurements are used to determine exact customer needs and outline the transformer specifications.

Eaton will design harmonic-resistant transformers that will be subjected to the unique harmonic loads. These units are designed to maintain normal temperature rise under harmonic, full-load conditions. Standard UL® "K-Factor" designs can result in unnecessary costs when the "next-highest" K-Factor must be selected for a calculated design factor. To save the customer these unnecessary costs, Eaton can design the transformer to the specific harmonic spectrum used in the application. Eaton's Cooper Power series K-factor transformers are filled with mineral oil or Envirotemp™ FR3™ fluid and enjoy the added benefits of dielectric cooling such as higher efficiencies than dry-type transformers.

Modulation transformer

Bundled with an Outboard Modulation Unit (OMU) and a Control and Receiving Unit (CRU), a Modulation Transformer Unit (MTU) is designed to remotely achieve two way communication.

The use of an MTU reduces travel time and expense versus traditional meter reading performed by high voltage electricians. Additionally, with MTU it is possible to manage and evaluate energy consumption data, providing reduced metering costs and fewer tenant complaints.

An MTU utilizes existing utility infrastructure, therefore eliminating the need to engineer and construct a dedicated communication network.

Figure 9. Modular transformer.

Inverter/rectifier bridge

Eaton complements its range of applications for transformers by offering dual winding designs. These designs are intended for connection to 12-pulse rectifier bridges.

Product attributes

To set us apart from other transformer manufactures, Eaton includes the following guarantees with every three-phase pad-mounted transformer.

Engineered to order (ETO)

Providing the customer with a well developed, cost-effective solution is the number one priority at Eaton. Using customer specifications, Eaton will work with the customer from the beginning to the end to develop a solution to fit their needs. Whether it is application specific, site specific, or a uniquely specified unit, Eaton will provide transformers with the best in class value and performance, saving the customer time and money.

Made in the U.S.A.

Eaton's three-phase pad-mounted transformers are produced right here in the United States of America. Our manufacturing facilities are positioned strategically for rapid shipment of products. Furthermore, should the need arise, Eaton has a broad network of authorized service repair shops throughout the United States.

Superior paint performance

Protecting transformers from nature's elements worldwide, Eaton's E-coat system provides unrivaled transformer paint life, and exceeds IEEE Std C57.12.28™-2014 and IEEE Std C57.12.29™-2005 standards. In addition to the outside of the unit, each transformer receives a gray E-coat covering in the interior of the tank and cabinet, providing superior rust resistance and greater visibility during service.

If the wide range of standard paint selections does not suit the customer's needs, Eaton will customize the paint color to meet their requirements.

Rectangular coil design

Eaton utilizes a rectangular coil design. This winding technique results in a smaller overall unit footprint as well as reducing the transformer weight. The smaller unit size does not hinder the transformer performance in the least. Units have proven short circuit withstand capabilities up to 10 MVA.

Testing

Eaton performs routing testing on each transformer manufactured including the following tests:

- Insulation Power Factor: This test verifies that vacuum processing has thoroughly dried the insulation system to required limits.
- Ratio, Polarity, and Phase Relation: Assures correct winding ratios and tap voltages; checks insulation of HV and LV circuits. Checks entire insulation system to verify all live-to-ground clearances.
- Resistance: This test verifies the integrity of internal high-voltage and low-voltage connections; provides data for loss upgrade calculations.
- Routine Impulse Tests: The most severe test, simulating a lightning surge. Applies one reduced wave and one full wave to verify the BIL rating.
- Applied Potential: Applied to both high-voltage and low-voltage windings, this test stresses the entire insulation system to verify all live-to-ground clearances.
- Induced Potential: 3.46 times normal plus 1000 volts for reduced neutral designs.
- Loss Test: These design verification tests are conducted to assure that guaranteed loss values are met and that test values are

within design tolerances. Tests include no-load loss and excitation current along with impedance voltage and load loss.

- Leak Test: Pressurizing the tank to 7 psig assures a complete seal, with no weld or gasket leaks, to eliminate the possibility of moisture infiltration or fluid oxidation.

Design performance tests

The design performance tests include the following:

- Temperature Rise: Our automated heat run facility ensures that any design changes meet ANSI® and IEEE® temperature rise criteria.
- Audible Sound Level: Ensures compliance with NEMA® requirements.
- Lightning Impulse: To assure superior dielectric performance, this test consists of one reduced wave, two chopped waves and one full wave in sequence, precisely simulating the harshest conditions.

Thomas A Edison Research and Test Facility

We are constantly striving to introduce new innovations to the transformer industry, bringing you the highest quality transformer for the lowest cost. Eaton's Cooper Power series Transformer Products are ISO 9001 compliant, emphasizing process improvement in all phases of design, manufacture, and testing. We have invested millions of dollars in the Thomas A. Edison Technical Center, our premier research facility in Franksville, Wisconsin affirming our dedication to introducing new innovations and technologies to the transformer industry. This research facility is fully available for use by our customers to utilize our advanced electrical and chemical testing labs.

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Publication No. CA202003EN

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Powering Business Worldwide

Change information:

Chap. /page	**Description** (changes to the last edition)	**Modification no.**
P.6 + P.8	2-pole DRN and 6-pole DRN added	SF-20159022

4-pole, 50Hz

Pn	DRS	L_{pA}	L_{WA}	Pn	DRE	L_{pA}	L_{WA}	Pn	DRP	L_{pA}	L_{WA}
kW		dB(A)		kW		dB(A)		kW		dB(A)	
0,37	DRS 71S4	45	57	-	-						
0,55	DRS 71M4	45	57	-	-						
0,75	DRS 80S4	49	61	0,55	DRE 80M4						
1,1	DRS 80M4	52	64	0,75	DRE 80M4	51	63				
1,5	DRS 90M4	52	64	1,1	DRE 90M4	51	63	0,75	DRP 90M4	51	63
2,2	DRS 90L4	54	66	1,5	DRE 90L4	51	63	1,1	DRP 90L4	51	63
3	DRS 100M4	55	67	2,2	DRE 100M4	52	64	1,5	DRP 100M4	50	62
		-	-	-	DRE 100L4	52	64	2,2	DRP 100L4	53	65
4	DRS 100LC4	55	67	3	DRE 100LC4	54	66				
4	DRS 112M4	57	69	3	DRE 112M4	57	69	3	DRP 112M4	56	68
5,5	DRS 132S4	58	70	4	DRE 132S4	57	69				
7,5	DRS 132M4	59	71	5,5	DRE 132M4	58	70	4	DRP 132M4	57	69
9,2	DRS 132MC4	61	73	7,5	DRE 132MC4	61	73	5,5	DRP 132MC4	58	70
9,2	DRS 160S4	61	73	7,5	DRE 160S4	59	71	5,5	DRP 160S4	58	70
11	DRS 160M4	61	73	9,2	DRE 160M4	60	72	7,5	DRP 160M4	59	71
15	DRS 160MC4	63	75	11	DRE 160MC4	67	79	9,2	DRP 160MC4	66	78
15	DRS 180S4	63	76	11	DRE 180S4	63	76	9,2	DRP 180S4	62	75
18,5	DRS 180M4	64	77	15	DRE 180M4	64	77	11	DRP 180M4	63	76
22	DRS 180L4	65	78	18,5	DRE 180L4	65	78	15	DRP 180L4	64	77
30	DRS 180LC4	66	79	22	DRE 180LC4	66	79	18,5	DRP 180LC4	65	78
30	DRS 200L4	65	78	30	DRE 200L4	65	78	18,5	DRP 200L4	65	78
								22	DRP 200L4	66	78
37	DRS 225S4	65	78	37	DRE 225S4	65	78	30	DRP 225S4	65	78
45	DRS 225M4	65	78	45	DRS 225M4	65	78	37	DRP 225M4	65	78
55	DRS 225MC4	68	81								
55	DRS 250M4	70	84	55	DRE 250M4	70	84	45	DRP 250M4	65	79
75	DRS 280S4	69	83	75	DRE 280S4	69	83	55	DRP 280S4	66	80
90	DRS 280M4	74	88	90	DRE 280M4	74	88	75	DRP 280M4	66	80
110	DRS 315K4	73	87	110	DRE 315K4	73	87	90	DRP 315K4	72	86
132	DRS 315S4	76	90	132	DRE 315S4	76	90	110	DRP 315S4	74	88
160	DRS 315M4	77	91	160	DRE 315M4	76	90	132	DRP 315M4	75	89
200	DRS 315L4	78	92	200	DRE 315L4	77	91	160	DRP 315L4	76	90

Standard motors without gear unit at rated load S1
Noise measurement according to DIN EN ISO 3744:2009

The values have a tolerance of +3 dB(A).

L_{pA} sound pressure (1m)
L_{WA} sound power

4-pole, 60Hz

Pn	DRS	L_{pA}	L_{WA}	Pn	DRE	L_{pA}	L_{WA}	Pn	DRP	L_{pA}	L_{WA}
kW		dB(A)		kW		dB(A)		kW		dB(A)	
0,37	DRS 71S4	45	57	-	-						
0,55	DRS 71M4	45	57	-	-						
0,75	DRS 80S4	50	62	0,55	DRE 80M4	51	63				
1,1	DRS 80M4	52	64	0,75	DRE 80M4	51	63				
1,5	DRS 90M4	52	64	1,1	DRE 90M4	51	63	0,75	DRP 90M4	51	63
								1,1	DRP 90L4	51	63
2,2	DRS 90L4	52	64	1,5	DRE 90L4	51	63	1,5	DRP 90L4	51	63
3	DRS 100M4	53	65								
3,7	DRS 100M4	57	69	2,2	DRE 100L4	52	64				
4	DRS 100L4	57	69	3	DRE 100LC4	56	68				
4	DRS 112M4	60	72	3	DRE 112M4	60	72	2,2	DRP 112M4	52	64
5,5	DRS 132S4	60	72	4	DRE 132S4	60	72	3,7	DRE 132S4	62	74
7,5	DRS 132M4	64	76	5,5	DRE 132M4	63	75				
9,2	DRS 132MC4	64	76	7,5	DRE 132MC4	63	75				
								5,5	DRP 160S4	63	75
9,2	DRS 160S4	64	76	7,5	DRE 160S4	64	76	7,5	DRP 160S4	64	76
11	DRS 160M4	66	78	9,2	DRE 160M4	65	77	9,2	DRP 160M4	65	77
15	DRS 160MC4	68	80	11	DRE 160MC4	66	78	11	DRP 160MC4	66	78
15	DRS 180S4	68	81	11	DRE 180S4	67	80	11	DRP 180S4	66	79
18,5	DRS 180M4	68	81	15	DRE 180M4	67	80	15	DRP 180M4	66	79
22	DRS 180L4	68	81	18,5	DRE 180L4	67	80	18,5	DRP 180L4	66	79
30	DRS 180LC4	69	82	22	DRE 180LC4	68	81	22	DRP 180LC4	68	81
30	DRS 200L4	70	83	30	DRE 200L4	70	83	22	DRP 200L4	68	81
37	DRS 225S4	70	83	37	DRE 225S4	70	83				
45	DRS 225M4	71	84	45	DRS 225M4	71	84	30	DRP 225S4	68	81
55	DRS 225MC4	72	85					37	DRP 225M4	69	82
55	DRS 250M4	73	87	55	DRE 250M4	73	87	45	DRP 250M4	68	82
75	DRS 280S4	72	86	75	DRE 280S4	72	86	55	DRP 280S4	69	83
90	DRS 280M4	77	91	90	DRE 280M4	77	91	75	DRP 280M4	69	83
110	DRS 315K4	77	91	110	DRE 315K4	77	91				
132	DRS 315S4	79	93	132	DRE 315S4	79	93				
150	DRS 315S4	80	94	150	DRE 315S4	80	94				
160	DRS 315M4	80	94	160	DRE 315M4	80	94				
185	DRS 315M4	81	95	185	DRE 315M4	81	95				
200	DRS 315L4	81	95	200	DRE 315L4	81	95				
225	DRS 315L4	82	96	225	DRE 315L4	82	96				

Standard motors without gear unit at rated load S1

Noise measurement according to DIN EN ISO 3744:2009

The values have a tolerance of +3 dB(A).

L_{pA} sound pressure (1m)

L_{WA} sound power

4-pole, 50Hz, 60Hz

Pn	DRN	L_{pA}	L_{WA}	Pn	DRN	L_{pA}	L_{WA}
kW	**50Hz**	dB(A)		kW	**60Hz**	dB(A)	
0,75	DRN 80M4	48	60	0,75	DRN 80M4	49	61
1,1	DRN 90S4	51	63	1,1	DRN 90S4	51	63
1,5	DRN 90L4	54	66	1,5	DRN 90L4	54	66
2,2	DRN 100LS4	56	68	2,2	DRN 100L4	55	67
3,0	DRN 100L4	50	62	3,0	DRN 100L4	56	68
-	-			3,7	DRN 100L4	57	69
4,0	DRN 112M4	52	64	4,0	DRN 112M4	54	66
5,5	DRN 132S4	67	79	5,5	DRN 132S4	66	78
7,5	DRN 132M4	57	69	7,5	DRN 132M4	60	72
9,2	DRN 132L4	63	75	9,2	DRN 132L4	64	76
11	DRN 160M4	67	79	11	DRN 160M4	61	73
15	DRN 160L4	68	80	15	DRN 160L4	62	74
18,5	DRN 180M4	66	79	18,5	DRN 180M4	64	77
22	DRN 180L4	67	80	22	DRN 180L4	66	79
30	DRN 200L4	65	78	30	DRN 200L4	68	83
37	DRN 225S4	66	79	37	DRN 225S4	71	84
45	DRN 225M4	66	79	45	DRN 225M4	72	85
55	DRN 250M4	67	81	55	DRN 250ME4	68	82
75	DRN 280S4	66	80	75	DRN 280S4	69	83
90	DRN 280M4	65	79	90	DRN 280M4	68	82
110	DRN 315S4	71	85	110	DRN 315S4	75	89
132	DRN 315M4	71	85	132	DRN 315ME4	75	89
160	DRN 315L4	73	87	160	DRN 315L4	77	91
-	-			185	DRN 315H4	76	90
200	DRN 315H4	72	89	200	DRN 315H4	76	93

Standard motors without gear unit at rated load S1
Noise measurement according to DIN EN ISO 3744:2009

The values have a tolerance of +3 dB(A).

L_{pA} sound pressure (1m)
L_{WA} sound power

2-pole, 50Hz

Pn	DRS	L_{pA}	L_{WA}	Pn	DRE	L_{pA}	L_{WA}	Pn	DRP	L_{pA}	L_{WA}
kW		dB(A)		kW		dB(A)		kW		dB(A)	
0,37	DRS 71S2	52	64	-	-						
0,55	DRS 71M2	52	64	-	-						
0,75	DRS 80S2	58	70	-	-						
1,1	DRS 80M2	58	70	0,75	DRE 80M2	58	70	0,75	DRP 80M2	58	70
1,5	DRS 90M2	59	71	1,1	DRE 90M2	58	70	1,1	DRP 90M2	58	70
2,2	DRS 90L2	59	71	1,5	DRE 90M2	58	70				
3	DRS 100M2	62	74	2,2	DRE 100M2	61	73	1,5	DRP 100M2	61	73
		-	-	-				2,2	DRP 100M2	61	73
				3-	DRE 100L2	62	74				
4	DRS 100LC2	62	74					3	DRP 100LC2	61	73
4	DRS 112M2	65	77	4	DRE 112M2	65	77	3	DRP 112M2	65	77
5,5	DRS 132S2	65	77	5,5	DRE 132S2	65	77	4	DRP 132S2	65	77
7,5	DRS 132M2	66	78	7,5	DRE 132M2	66	78	5,5	DRP 132M2	66	78
9,2	DRS 132M2	71	83	9,2	DRE 132MC2	70	82				

Standard motors without gear unit at rated load S1

2-pole, 60Hz

Pn	DRS	L_{pA}	L_{WA}	Pn	DRE	L_{pA}	L_{WA}	Pn	DRP	L_{pA}	L_{WA}
kW		dB(A)		kW		dB(A)		kW		dB(A)	
0,37	DRS 71S2	56	68	-	-						
0,55	DRS 71M2	56	68	-	-						
0,75	DRS 80S2	59	71	-	-						
1,1	DRS 80M2	59	71	0,75	DRE 80M2	59	71	0,75	DRP 80M2	59	71
1,5	DRS 90M2	60	72	1,1	DRE 90M2	59	71	1,1	DRP 90M2	59	71
2,2	DRS 90L2	61	73	1,5	DRE 90L2	60	72				
3	DRS 100M2	65	77	2,2	DRE 100M2	65	77	1,5	DRP 100M2	64	76
								2,2	DRP 100M2	65	77
3,7	DRS 100L2	65	77	3-	DRE 100L2	64	76				
				3,7	DRE 112M2	70	82	3	DRP 112M2	70	82
5,5	DRS 132S2	71	83	4	DRE 112M2	70	82	3,7	DRP 132S2	70	82
7,5	DRS 132M2	71	83	5,5	DRE 132M2	70	82	4,0	DRP 132S2	70	82
9,2	DRS 132M2	73	84	7,5	DRE 132MC2	72	84	5,5	DRP 132M2	70	82

Standard motors without gear unit at rated load S1
Noise measurement according to DIN EN ISO 3744:2009

The values have a tolerance of +3 dB(A).

L_{pA} sound pressure (1m)
L_{WA} sound power

2-pole, 50Hz, 60Hz

Pn	DRN	L_{pA}	L_{WA}	Pn	DRN	L_{pA}	L_{WA}
kW	**50Hz**	dB(A)		kW	**60Hz**	dB(A)	
0,75	DRN 80MS2	56	68	0,75	DRN 80MS2	62	74
1,1	DRN 80M2	56	68	1,1	DRN 80M2	60	72
1,5	DRN 90S2	61	73	1,5	DRN 90S2	64	76
2,2	DRN 90L2	67	79	2,2	DRN 90L2	67	79
3,0	DRN 100LM2	63	75	3,0	DRN 100LM2	65	77
3,7	DRN 100L2	63	75	3,7	DRN 100L2	67	79
4,0	DRN 112M2	70	82	4,0	DRN 112M2	70	82
5,5	DRN 132S2	69	81	5,5	DRN 132S2	69	81
7,5	DRN 132S2	71	83	7,5	DRN 132S2	70	82

Standard motors without gear unit at rated load S1
Noise measurement according to DIN EN ISO 3744:2009

The values have a tolerance of +3 dB(A).

L_{pA} sound pressure (1m)
L_{WA} sound power

6-pole, 50Hz

Pn	DRS	L_{pA}	L_{WA}	Pn	DRE	L_{pA}	L_{WA}	Pn	DRP	L_{pA}	L_{WA}
kW		dB(A)		kW		dB(A)		kW		dB(A)	
0,25	DRS 71S6	50	62	-	-						
0,37	DRS 71M6	50	62	0,25	DRE 71M6-	49	61				
0,55	DRS 80S6	50	62	0,37	DRE 80S6	49	61				
0,75	DRS 80M6	51	63	0,55	DRE 80M6	50	62				
1,1	DRS 90L6	52	64	0,75	DRE 90L6	51	63	0,75	DRP 90L6	51	63
1,5	DRS 100M6	53	65	1,1	DRE 100M6	52	64				
				1,5	DRE 100L6	52	64	1,1	DRP 100L6	52	64
2,2	DRS 100LC6	54	66								
2,2	DRS 112M6	54	66	2,2	DRE 112M6	54	66	1,5	DRP 112M6	53	65
3	DRS 112M6	55	67								
4	DRS 132S6	57	69	3	DRE 132S6	55	67	2,2	DRP 132S6	55	67
				4	DRE 132M6	56	68	3	DRP 132M6	56	68
5,5	DRS 132MC6	58	70	5,5	DRE 132MC6	58	70	4	DRP 132MC6	57	69
5,5	DRS 160M6	59	71								
7,5	DRS 160M6	60	72	5,5	DRE 160M6	59	71	4	DRP 160M6	58	70

6-pole, 60Hz

Pn	DRS	L_{pA}	L_{WA}	Pn	DRE	L_{pA}	L_{WA}	Pn	DRP	L_{pA}	L_{WA}
kW		dB(A)		kW		dB(A)		kW		dB(A)	
0,25	DRS 71S6	53	65	-	-						
0,37	DRS 71M6	53	65								
0,55	DRS 80S6	54	66								
0,75	DRS 80M6	55	67								
1,1	DRS 90L6	55	67	0,75	DRE 90L6	54	66				
1,5	DRS 100M6	56	68					0,75	DRP 100M6	54	66
				1,1	DRE 100LC6	56	68				
2,2	DRS 112M6	56	68	1,1	DRE 112M6	55	67	1,1	DRP 112M6	55	67
3	DRS 112M6	56	68	1,5	DRE 112M6	55	67				
				2,2	DRE 132M6	55	67	1,5	DRP 132M6	55	67
3,7	DRS 132M6	57	69	3	DRE 132M6	56	68	2,2	DRP 132MC6	55	67
4	DRS 132M6	57	69	3,7	DRE 132M6	57	69	3,0	DRP 132MC6	55	67
				4	DRE 132M6	57	69	3,7	DRP 132MC6	57	69
5,5	DRP 132MC6	61	73					4,0	DRP 132MC6	57	69
5,5	DRS 160S6	61	73					3,7	DRP 160M6	60	72
7,5	DRS 160M6	61	73	5,5	DRE 160M6	61	73	4	DRP 160M6	60	72

Standard motors without gear unit at rated load S1

Noise measurement according to DIN EN ISO 3744:2009

The values have a tolerance of +3 dB(A).

L_{pA} sound pressure (1m) L_{WA} sound power

6-pole, 50Hz

Pn	DRN	L_{pA}	L_{WA}
kW	**50Hz**	dB(A)	
0,75	DRN 90S6	41	53
1,1	DRN 90L6	46	58
1,5	DRN 100L6	54	66
2,2	DRN 112M6	62	74
3,0	DRN 132S6	59	71
4,0	DRN 132S6	63	75
5,5	DRN 132L6	62	74
7,5	DRN 160M6	61	73

6-pole, 50Hz, 60Hz (global)

Pn	DRN	L_{pA}	L_{WA}	Pn	DRN	L_{pA}	L_{WA}
kW	**50Hz**	dB(A)		kW	**60Hz**	dB(A)	
0,75	DRN 90S6	41	53	0,75	DRN 90S6	48	60
1,1	DRN 112M6	56	68	1,1	DRN 112M6	63	75
1,5	DRN 112M6	58	70	1,5	DRN 112M6	65	77
2,2	DRN 132S6	59	71	2,2	DRN 132S6	58	70
3,0	DRN 132S6	59	71	3,0	DRN 132S6	60	72
3,7	DRN 132M6	62	74	3,7	DRN 132M6	62	74
4,0	DRN 132M6	62	74	4,0	DRN 132M6	63	75
5,5	DRN 160M6	59	71	5,5	DRN 160M6	66	78
7,5	DRN 160M6	61	73	7,5	DRN 160M6	67	79

Standard motors without gear unit at rated load S1
Noise measurement according to DIN EN ISO 3744:2009

The values have a tolerance of +3 dB(A).

L_{pA} sound pressure (1m)
L_{WA} sound power