



REX POWER MAGNETICS

DRY TYPE TRANSFORMERS



**DISTRIBUTION TRANSFORMERS
STANDARD & SPECIAL SPEC
K-FACTOR RATED
DRIVE ISOLATION
ELECTROSTATIC SHIELDED
AUTOTRANSFORMER
ENCAPSULATED**

Publication Date: 10/14/2020



About Rex Power Magnetix

Established in 1972, Rex Power Magnetix is an ISO 9001-2015 registered leading manufacturer of CSA certified and UL listed standard and custom specification dry type transformers.

Rex is driven by customer service, innovation, and technology. Rex has a solid track record for high quality and product support. With a central and integrated engineering, manufacturing, and customer service facility located just north of Toronto, Ontario, Canada and warehouses throughout Canada and the United States, the company offers a broad range of dry type power magnetic products to markets throughout North America and internationally.

The Rex product line includes custom designed specialty transformers, power transformers up to 15 MVA and 46 kV, distribution transformers, reactors, autotransformers, control and machine tool transformers, custom enclosures, custom cut electrical steel cores, and other power magnetic products and services. Supported by considerable and sustained investment in research and development, and the adoption of automation, Rex Power Magnetix continually expands and enhances its product and service offering.

Rex Power Magnetix is the industry leader in delivery responsiveness, supported by our vertically integrated in-house design, manufacturing, and testing capabilities. We pride ourselves on our technology leadership supported by our extensive R&D activities, engineering expertise, and manufacturing know-how.

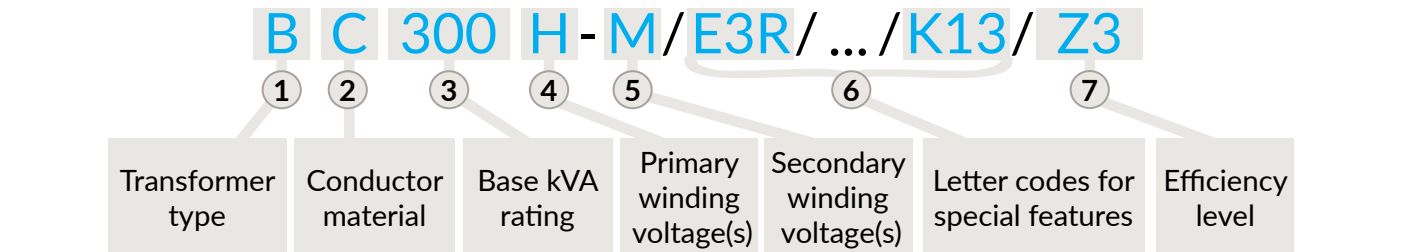


For general information about Rex Power Magnetix, our complete product offering, and our general terms of sale, please visit our website: www.rexpowermagnetix.com

- Rex has print/PDF catalogs available for:
- Power Transformers
 - Transformers for Hazardous Locations
 - Control Transformers
 - Reactors
 - Mini Power Centers

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① - Transformer type	
R	3 Phase Autotransformer
M	1 Phase Autotransformer
B	3 Phase Isolation Transformer
S	1 Phase Isolation Transformer
D	3 Phase Drive Isolation Transformer

② - Conductor Material	
C	Copper
A	Aluminum (where available)

③ - Base kVA Rating	
Standard 1 phase kVA levels: 1, 2, 3, 5, 7.5, 10, 15, 25, 37.5, 50, 75, 100, 150, 200, 250, 330	
Standard 3 phase kVA levels: 3, 6, 9, 15, 30, 45, 75, 112.5, 150, 225, 300, 450, 500, 750	

④&⑤ - Primary & Secondary Winding Voltage(s)	
For Single Phase: Use Group 1. Use group 2 for split windings.	
For Three Phase: Use Group 1 for delta windings; use group 3 for wye (star) windings.	
For Autotransformer: Use Group 1 only.	
For a voltage other than the ones indicated below, use X (under 1000 V).	

Group 1		Group 2		Group 3	
A	120	H	480	M	208Y/120
A1	115	H1	460	N	416Y/240
A2	110	H2	440	N1	400Y/231
B	208	J	600	N2	415Y/240
B1	200	J1	575	P	480Y/277
C	240	J2	550	P1	460Y/266
C1	230	J3	690	P2	440Y/254
C2	220			Q	600Y/347
D	277			Q1	575Y/332
E	347			Q2	550Y/318
F	380			Q3	690Y/398
G	416			R	380Y/220
G1	400			S	240Y/139
G2	415			S1	230Y/133
				S2	220Y/127

⑥ - Letter Codes for Special Features	
Add suffixes in order of appearance below, separated by slashes "/" as shown.	
50	50 Hz
C&C	Core & coil only, no enclosure
E3R	Type 3R Outdoor enclosure
E4	Type 4 Enclosure (E4X for Stainless Steel)
E12	Type 12 Enclosure
EP	Encapsulated design (see pg 13)
ESP	Special Enclosure spec (eg: Special paint color, tamper proof, enclosure with doors, etc)
K13	K-Factor rated (K4, K9, K13, K20, K30)
M	Special markings, nameplate, tag, etc.
S1	Electrostatic Shielding (S1, S2, S3) (see pg 16)
T115	Temperature rise 115 °C
T80	Temperature rise 80 °C
W1	6 taps: 2 x 2.5% FCAN, 4 x 2.5% FCBN
X	Special feature (eg: Specified dimensions, inrush rating, impedance, vector diagram, etc.)
Y1	External neoprene anti-vibration pads supplied
Y2	Special Lugs (deviation from standard)

⑦ - Efficiency Level	
For more information about transformer efficiency and the minimum efficiency levels, see page 6.	
No suffix	For transformers which are excluded from minimum efficiency legislation.
Z3	Meets or exceeds current North American minimum efficiency standards, known as NRCan 2019 (Canada) and DOE 2016 (USA).
ZX	Custom efficiency level, to be specified.

There exist a number of legacy efficiency levels that have been phased out (Z, Z2, ZCSL3, ZNP). Inquire with Rex sales if clarification is required on these levels.

Transformer Selection

For each of the products in this catalog, there are details about their intended application and purpose; Rex's standard specification is shown, and available alternate specifications are described. To select the rating for the desired transformer, a number of factors may be relevant: Provisions for future expansion, oversizing for purposes of efficiency or redundancy, etc. Fundamentally, however, the kVA rating is derived from the required Voltage [V] and Current [A]. The formulas and tables below may serve as a convenient reference.

Single Phase Applications

- Determine primary (supply) voltage and secondary (load) voltage. Determine currents.
- Confirm 1 phase, 60 Hz operation
- Determine kVA rating by formula or lookup table, to meet or exceed required current.
- Select a standard kVA rating equal to or greater than requirement.
- Make a determination of transformer type (IE Autotransformer, K-Factor Rated, Encapsulated, Isolation transformer, etc).

Line current [A] at rated Single Phase voltage					
kVA	120 V	240 V	480 V	600 V	
1	8.3	4.2	2.1	1.7	
2	16.7	8.3	4.2	3.3	
3	25.0	12.5	6.3	5.0	
5	41.7	20.8	10.4	8.3	
7.5	62.5	31.3	15.6	12.5	
10	83.3	41.7	20.8	16.7	
15	125.0	62.5	31.3	25.0	
25	208.0	104.0	52.1	41.7	
37.5	313.0	156.0	78.0	62.5	
50	417.0	208.0	104.0	83.3	
75	625.0	313.0	156.0	125.0	
100	833.0	417.0	208.0	167.0	
150	1250.0	625.0	313.0	250.0	

Formula for calculating Single Phase kVA

$$kVA_{1\phi} = \frac{Volts \times Amps}{1000}$$

Transformer Rating for Motor Horsepower (HP, Single Phase)

Motor HP	0.5	1	1.5	2	3	5	7.5	10
Actual kVA Required	1.16	1.9	2.30	2.76	3.92	6.45	9.23	11.5
Closest Standard kVA	2.0	3.0	3.0	3.0	5.0	7.5	10.0	15.0

Three Phase Applications

- Determine primary (supply) voltage and secondary (load) voltage. Determine currents.
- Confirm 3 phase, 60 Hz operation
- Determine kVA rating by formula or lookup table, to meet or exceed required current.
- Select a standard kVA rating equal to or greater than requirement.
- Make a determination of transformer type (IE Autotransformer, K-Factor Rated, Encapsulated, Isolation transformer, etc).

Line current [A] at rated Three Phase voltage					
kVA	208 V	240 V	480 V	600 V	
3	8.3	7.2	3.6	2.9	
6	16.6	14.4	7.2	5.8	
9	25.0	21.7	10.7	8.7	
15	41.7	36.1	18.1	14.5	
30	83.4	72.3	36.1	28.9	
45	125	108	54.2	43.4	
75	208	181	90.3	72.3	
112.5	313	271	135	108	
150	417	361	181	145	
225	625	542	271	217	
300	834	723	361	289	

Formula for calculating Three Phase kVA

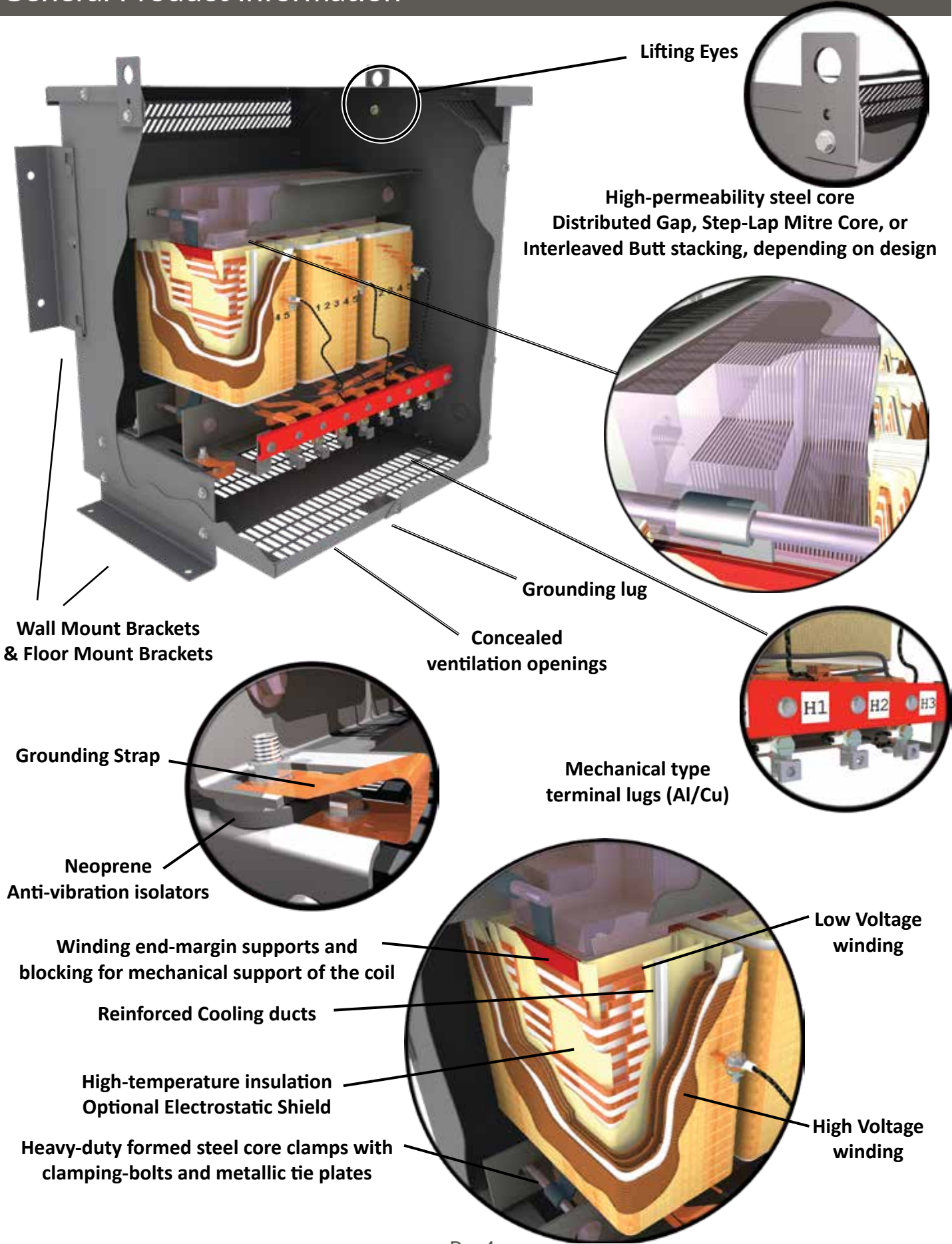
$$kVA_{3\phi} = \frac{Volts \times Amps \times 1.73}{1000}$$

*Use line-line volts

Transformer Rating for Motor Horsepower (HP, Three Phase)

Motor HP	2	3	5	7.5	10	15	20	25
Actual kVA Required	2.4	3.42	5.73	8.4	10.3	15	19.8	24.4
Closest Standard kVA	3.0	6.0	6.0	9.0	15	15	30	30

General Product Information



General Product Information

General Product Information

The following attributes are generally applicable to the each of the products detailed in this catalog. Specific details, exceptions, and variants are noted in each product's corresponding section.

Core

- Rex three-phase transformers utilize three-legged cores and single-phase transformers utilize two-legged cores, unless otherwise specified. Alternate constructions are available such as shell-type, four-leg, and five-leg.
- Only high-quality grain-oriented silicon steel is used. Core steel is precision cut and stacked for reduced noise and losses. Cores are clamped with heavy-duty steel brackets and metallic tie plates.
- A variety of core construction methods are available, such as "Step-lap miter-core," "Distributed-gap core," and "Interleaved butt-stacked core."

Coils

- All Rex windings (coils) are of high quality magnet wire (copper or aluminum are available).
- Class 220 °C insulation is used throughout the coil winding process. Class 220 is the highest insulation level recognized by the transformer industry.
- Coils are designed with reinforced cooling ducts.
- The complete core & coil assembly is impregnated in polyester resin and baked.
- Standard ±5% or ±2 x 2.5% primary voltage taps are provided on all isolation type transformers. Alternate tapping arrangements are available depending on product and size.
- Taps for supply voltage compensation are pre-cleaned and rated for the full-capacity of the transformer.

Vector Diagram

- For transformers where a Delta primary and a Wye secondary are specified, Rex's standard vector configuration is Dyn1 (30° phase shift, lagging).
- Rex is able to provide Dyn11, Dd, Yy, and a number of other vector configurations per specification. Please include X in the part number.

Testing

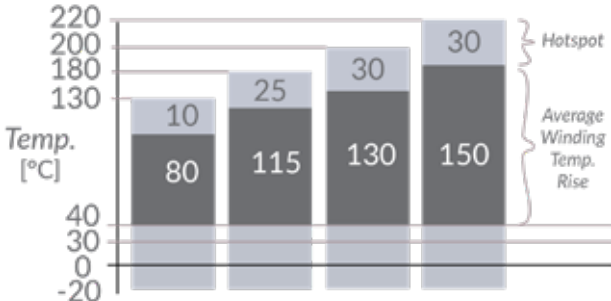
- Rex Power Magnetics produces and tests all products in full compliance with the requirements of its CSA and UL approvals.
- Reference test standards & documents include:
 - CSA C22.2 #47
 - UL 1561
 - UL 5085-2/CSA C66.2
 - CSA C66.1
 - CSA C9
 - IEEE C57.12.91
- The Rex test facility has been certified based on ISO/ IEC 17025:2005 (CSA Category Program)
- Witnessed testing is available (Toronto, Canada).

Design & Approvals

- CSA certified, File No. LR 34493
- UL Listed, File No. E108255
- Transformers are designed with sophisticated computerized modeling tools, based on years of research and test data. Designers are capable of exploiting the benefits of the latest in high performance materials that have become available, such as high-permeability laser-scribed grain-oriented silicone steel and high-temperature conductor insulation.
- Rex Standard Isolation transformers are manufactured with insulating materials that comply with CSA Winding Insulation System Class 220 °C as follows: Maximum acceptable temperature rise based on average ambient of 30 °C during any 24 hr period and a maximum ambient of 40 °C at any time. Altitude not to exceed 1000 m (3000 ft) above sea level. Rex can accommodate specs for special ambient and altitude.
- Unless otherwise specified, Rex follows applicable CSA/ UL guidelines and internal engineering guidelines for electrical performance criteria such as X/R ratio, Voltage Regulation, Inrush Current, Impedance, Losses, Short Circuit Withstand Performance, and Electromagnetic Field Intensity.

Temperature Rise

- Rex transformers are designed with due consideration to ensure that the hottest spot in the coil does not exceed the temperature class of the insulation.
- Ordinary ambient conditions are defined to be ranging from -20 °C to +30 °C (daily average), with a max temporary ambient of 40 °C. CSA and UL provide guidelines for estimation of the hot spot relative to the average.
- Rex utilizes class 220 °C insulation throughout the coil for ventilated transformers that are designed with 150 °C rise. Specifying 115 °C or 80 °C rise is available as an option.



Packaging & Warranty

- Transformer ships on a suitably sized skid, with nylon covering, straps, and anti-stacking markers.
- Rex's standard warranty terms are online. Typical warranty duration is 1 year, or as specified.

General Product Information

Lugs, Terminals, Connections

- Transformers ship with suitably sized mechanical Cu-Al lugs and hardware for cable connection, or suitably sized and cleaned terminal pads with the appropriate NEMA hole pattern.
- As an option, special lugs and non-standard terminal locations may be specified and quoted.
- 3-phase isolation transformers up to 300 kVA (600 V or 480 V to 208Y/120 V), and 1-phase isolation transformers up to 100 kVA (600 V or 480 V to 240/120V), are supplied with lugs on primary and secondary terminals per column 1 of the table below.
- Isolation transformers where Primary or Secondary voltages are other than those indicated above, or the rating exceeds 300 kVA (3Ø), or 100 kVA (1Ø), primary and secondary lugs are provided per column 2 of the table below.
- Drive Isolation Transformer, Encapsulated Transformers, and Autotransformers are supplied with primary and secondary lugs per column 2 of the table below.

Current Range	Rex Lug Name [Per phase]		Range of Wire Size per Lug
	Col. 1	Col. 2	
Up to 90 A	LA	LA	2-14 AWG
91 - 135 A	LB	LB	2/0 -6 AWG
136 - 230 A	LC	LC	300 MCM - 6 AWG
231 - 340 A	LD	LD	600 MCM - 2 AWG
341 - 368 A	2xLC	Pads	300 MCM - 6 AWG
369 - 544 A	2xLD	Pads	600 MCM - 2 AWG
545 - 714 A	3xLD	Pads	600 MCM - 2 AWG
715 - 952 A	4xLD	Pads	600 MCM - 2 AWG
952 A +	Pads	Pads	n/a

Sound Level

When energized, transformers emit a hum, largely due to the magnetization of the core. The tables below show the maximum audible sound levels for each kVA range. Rex transformers comply with these maximums; Modern high efficiency transformers operate with sound levels far below theses levels. Further lower sound levels can be specified. Column 1 indicates the maximum for ventilated transformers. Column 2 indicates the maximum for sealed transformers, as well as encapsulated transformers.

Single Phase			Three Phase		
Rating [kVA]	Col 1 [dB]	Col 2 [dB]	Rating [kVA]	Col 1 [dB]	Col 2 [dB]
0 - 9	40	45	0 - 9	40	45
10 - 50	45	50	10 - 50	45	50
51 - 100	50	55	51 - 150	50	55
101 - 150	50	57	151 - 300	55	57
151 - 333	55	59	301 - 500	60	59
334 - 500	60	59	501 - 700	62	61
501 - 1000	64	61	701 - 1000	64	63

Seismic Rating

- Rex transformers were shake table tested for Seismic withstand capability in accordance with the combined requirements of the International Building Code 2012 (IBC 2012), The California Building Code 2013 (CBC 2013), and the National Building Code of Canada 2010 (NBC 2010). As required by these codes, Rex transformers demonstrated their ability to function after the seismic tests, when suitably bolted & anchored to a fixed structure.
- Rex Power Magnetics cannot provide seismic engineering consulting services. Rex's seismic approval, combined with information about transformer mass and center of gravity can simplify the work of the seismic engineer, reducing overall project costs.
- Rex has available a variety of vibration absorbing materials, and can supply seismic spring/snubber assemblies, where specified by outside engineer.

Transformer Efficiency

- Transformers must meet regulations for minimum efficiency levels. The rules are applicable for kVA levels 15 kVA and up (1 and 3 phase). Some transformer types are excluded. For transformers where compliance is required, the transformer bears the "Green Line" trademark.



- Canadian and US minimum efficiency levels are harmonized. They are commonly referred to as "NRCan 2019" and "DOE 2016," respectively.
- In Canada, the NRCan 2019 refers to Natural Resources Canada "SOR/2018-201, Amendment 14." Provincial rules are harmonized so as to make the rule enforceable for interprovincial trade. In Ontario, the rule is known as "ON Reg. 404/12." The applicable Test Standard is C802.2-2012.
- In USA, the DOE 2016 refers to CFR 10 part 431.
- In forming the Rex Part Number for your transformer, use suffix Z3 where efficiency levels are applicable.
- Excluded transformer types:
 - Transformers with a nominal frequency other than 60 Hz
 - Autotransformers
 - Drive (isolation) transformers that have two or more output windings or a nominal low-voltage line current of more than 1500 A;
 - Grounding transformers
 - Rectifier transformers
 - Sealed transformers
 - Non-ventilated transformers (incl. encapsulated transformers)
 - testing transformers
 - furnace transformers
 - welding transformers
 - Special impedance transformers
 - Transformers that have a nominal low-voltage line current of 4000 A or more;
 - On-load regulating transformers
 - Resistance grounding transformers
- Additionally, The US DOE exempts the following types:
 - Drive (isolation) transformers
 - Uninterruptible power supply transformers
 - Transformers with a tap range of 20 percent or more

General Product Information

Enclosures

- Standard enclosures are constructed of formed sheet steel. After fabrication, all enclosure panels are finished in ASA 61 gray powder coating, suitable for most industrial and commercial installations. Knock-Outs (KOs) for conduit are provided where typically required. Removable front cover allows access to terminals. Ventilation openings are coordinated with coil cooling ducts to permit natural air circulation.
- Enclosures E1-2 through E3R-7 can be wall mounted in addition to floor mounting. Wall mount brackets are shipped already attached and do not require removal of floor mount brackets; simply turn the wall mount brackets outwards and use.
- Wall mountable transformers do not require additional structural support or catch-pan underneath, for most installations. Catch pan is available if required.
- Floor or platform mount enclosures are equipped with integral lifting lugs, and can be suspension mounted using the floor mounting points.

Available kits and components

- **Weather kit:** Convert Type 1 or Type 3R indoor enclosures to Type 3R outdoor. To include this kit with your transformer, add suffix **E3R** to part number.
- **Tray or catch pan:** For use if transformer may be mounted above or near combustible items.
- **Wall Mount bracket:** For wall mounting E3R-8. Note, bolting hardware not included.
- **Metallic Skid Base (with or without cage).** Intended for applications where frequent forklift or crane handling is expected (IE mobile power duty).



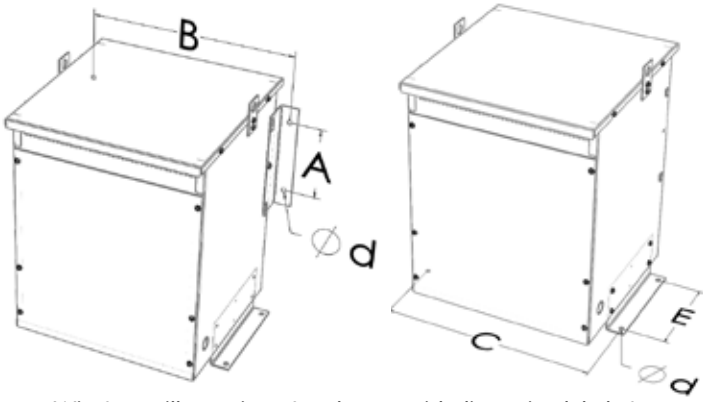
Type 3R Indoor enclosure (left) versus the same enclosure equipped with optional weather kit for Type 3R Outdoor (right)

Special Features and Customization

- Rex can meet most requests for special features. Ex:
- Special paint color, process, or finishing
 - Special dimensions, special mounting
 - Access doors instead of panels, padlock-able
 - Tamper-proof hardware
 - Anti-Condensation coating inside top cover
 - Special materials (Stainless 304, 316L, Aluminum)

Enclosure Types

- Rex transformers are available with a variety of different enclosure types:
- **Type 1 (NEMA 1):** Enclosures are constructed for indoor use to provide a degree of protection to personnel against access to hazardous parts and to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt). **Rex enclosure name: E1-#**
- **Type 2 (NEMA 2):** Similar to type 1; additionally, provides a degree of protection with respect to harmful effects on the equipment due to the ingress of water (dripping and light splashing). **Rex enclosure name: E2-#**
- **Type 3R Indoor (NEMA 3R):** Sprinkler-proof, when the angle between sprinkler heads and the opening does not exceed 45° from vertical. Most Rex standard enclosures are Type 3R Indoor as a standard, without any need for additional kits or hardware. **Rex enclosure name: E3R-#**
- **Type 3R Outdoor (NEMA 3R):** While there is no distinction in the definition of the technical requirements of Type 3R Indoor vs outdoor, Rex's outdoor variant includes additional covers and protection against snow and rain. This is recommended for outdoor units; for more severe exposure conditions (wind blown snow & rain, rodents, etc) further protection should be specified. **Rex enclosure name: E3R-#-W.** To specify this type of enclosure, include suffix **E3R** in part number.
- **Type 4 (NEMA 4):** Indoor or outdoor, Water tight, dust tight, sleet resistant. Provides ultimate level of protection. **Rex enclosure name: E4-#.** To specify in part number: **E4.** For Stainless Steel Type 304, use **E4X.** Type 316L is available.
- **Type 12 (NEMA 12):** Commonly referred to as “dust-tight” and compared to IP 52. Rex can meet this requirement by supplying a Type 4 (which exceeds the requirement), or a ventilated (filtered) construction. **Rex enclosure name: E12-#.** To specify in part number: **E12.**



Wireframe illustration of enclosure, with dimension labels for wall mounting and floor mounting (see page 8)

General Product Information

Reference Charts - Standard Enclosure Details

The tables below provide details on Rex’s Standard Enclosures.

- Each products page specifies which enclosure is used; Rex can supply customized enclosures where required.

Standard Ventilated Enclosures (Type 1 and 3R)

Standard Indoor Enclosure (Type 1 or Type 3R Indoor)								Type 3R Outdoor (with kit installed)	
Enclosure Name	Mounting	Type	Width [inch]	Depth [inch]	Height [inch]	Wall Mounting* d, A x B [inch]	Floor Mounting* d, C x E [inch]	Depth [inch]	Enclosure Name
E1-0	Floor	Type 1	9.50	7.00	8.00	n/a	3/16", 5" x 8"	n/a	n/a
E1-1	Floor	Type 1	12.00	9.00	9.30	n/a	5/16", 6" x 12.94	n/a	n/a
E1-2	Floor/Wall	Type 1	11.00	11.00	14.00	5/8", 8" x 13.25"	5/8", 13.25" x 8"	16.07	E3R-2-W
E1-3	Floor/Wall	Type 1	15.50	11.00	14.00	5/8", 8" x 17.75"	5/8", 17.75" x 8"	16.07	E3R-3-W
E3R-4	Floor/Wall	Type 3R indoor	15.75	16.00	21.00	1/2", 8" x 17.75"	1/2", 17.99" x 7.5"	21.12	E3R-4-W
E3R-5	Floor/Wall	Type 3R indoor	20.50	16.00	25.00	1/2", 8" x 22.50"	1/2", 22.74" x 7.5"	21.62	E3R-5-W
E3R-6	Floor/Wall	Type 3R indoor	20.50	20.75	30.00	1/2", 8" x 22.50"	1/2", 22.74" x 10"	26.39	E3R-6-W
E3R-7	Floor/Wall	Type 3R indoor	24.50	21.75	36.00	1/2", 11" x 26.50"	1/2", 26.11" x 11.5"	29.37	E3R-7-W
E3R-8	Floor	Type 3R indoor	30.75	33.40	44.00	n/a	5/8", 23.19" x 25"	37.49	E3R-8-W
E3R-8S	Floor	Type 3R indoor	27.00	29.00	47.00	n/a	5/8", 17.13" x 20"	29.00	E3R-8S-W
E3R-9	Floor	Type 3R indoor	40.00	38.00	52.00	n/a	5/8", 27.50" x 29"	41.75	E3R-9-W
E3R-9S	Floor	Type 3R indoor	32.00	32.00	52.00	n/a	5/8", 20.15" x 25"	32.00	E3R-9S-W
E3R-10	Floor	Type 3R indoor	46.00	50.00	66.00	n/a	5/8", 36" x 30"	50.00	E3R-10-W
E3R-11	Floor	Type 3R indoor	60.00	55.00	70.70	n/a	5/8", 37" x 30"	55.00	E3R-11-W
E3R-12	Floor	Type 3R indoor	73.00	56.00	79.50	n/a	5/8", 37" x 30"	56.00	E3R-12-W

* See diagram at bottom of page 7 for illustrations of A, B, C, d, E

Type 12 enclosures

Enclosure Name	Mounting	Width [inch]	Depth [inch]	Height [inch]	Floor Mounting* d, C x E [inch]
E12-6	Floor	20.50	25.40	30.00	1/2", 22.74" x 10"
E12-7	Floor	24.50	26.40	36.00	1/2", 26.11" x 11.5"
E12-8	Floor	30.75	34.50	44.00	5/8", 23.19" x 25"
E12-9	Floor	40.00	37.70	52.00	5/8", 27" x 29"
E12-10	Floor	46.00	46.30	66.00	5/8", 36" x 30"
E12-11	Floor	60.00	51.30	70.70	5/8", 37" x 30"
E12-12	Floor	73.00	51.70	79.50	5/8", 37" x 30"



* See diagram at bottom of page 7 for illustrations of C, d, E

Type 4 enclosures

Enclosure Name	Mounting	Width [inch]	Depth [inch]	Height [inch]	Floor Mounting* d, C x E [inch]
E4-4	Floor	15.50	16.50	18.00	5/8", 11.25" x 18.375"
E4-5	Floor	21.50	16.75	20.50	5/8", 15.25" x 19.50"
E4-6	Floor	21.50	22.00	27.00	5/8", 15.25" x 24.00"
E4-7	Floor	24.50	22.25	31.50	5/8", 19.00" x 24.25"
E4-8	Floor	30.75	30.50	32.00	5/8", 25.00" x 32.50"
E4-9	Floor	40.00	34.00	46.00	5/8", 29.00" x 36.00"
E4-10	Floor	46.50	43.25	64.50	5/8", 30.00" x 45.25"
E4-11	Floor	60.00	50.50	71.00	5/8", 30.00" x 52.50"
E4-12	Floor	73.00	48.50	79.50	5/8", 30.00" x 52.50"



* See diagram at bottom of page 7 for illustrations of C, d, E

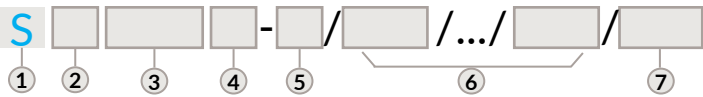
Isolation Transformer - Single Phase - Type S

Background

Rex Single Phase Isolation Transformers are manufactured under CSA file number LR34493, and UL Listed under File number E108255.

These general purpose transformers are ideal for supplying auxiliary lighting circuits and other commercial/industrial circuits from primary supply voltages under 1000V. In all cases where the load is grounded, isolation transformers should be used.

Catalog Number & Application Notes



① - 'S' Single Phase Isolation Transformer

② - Conductor Material

C	Copper
A	Aluminum (available 15 kVA and up)

③ - Base kVA Rating

- Select from standard 1 phase kVA levels below, or any other level 1 - 1000 kVA: 1, 2, 3, 5, 7.5, 10, 15, 25, 37.5, 50, 75, 100, 150, 200, 250, 330.
- Note: Use 7 for 7.5, and 37 for 37.5.

④&⑤ - Primary & Secondary Winding Voltage(s)

- See page 2; select letter codes corresponding to the primary voltage from group 1.
- Secondary connection is commonly split. Select secondary from group 2.
- For a special voltage, use X and specify voltage.
- Standard connection diagram is shown to the right. For special connection or tapping, use X in ⑥

⑥ - Optional Special Features

- A variety of optional special features exist. Page 2 lists many of the most commonly specified options. Page 10 offers additional information.

⑦- Efficiency Level

- The table on the right shows the efficiency levels for single phase dry type transformers (Canada & USA).
- Transformers rated <15 kVA are excluded. Other excluded types are listed on page 6. In such cases, leave ⑦ blank.
- In forming the Rex Part Number for your transformer, use suffix Z3 where efficiency levels are applicable.
- If a special efficiency level is required, use ZX, and specify efficiency with request.



Photos: Single Phase Transformer - Enclosed or Core & Coil

Connection diagrams

	1Ph0-NT-DO-1 Standard for 1, 2 & 3 kVA No taps
	1Ph0-ST1/1-DO-1 Standard for 5 kVA Taps: +/- 1 x 5%
	1Ph0-ST1/1-DO-2 Standard for 7.5 kVA Taps: +/- 1 x 5%
	1Ph0-ST2/2-DO-2 Standard for 10 to 150 kVA Taps: +/- 2 x 2.5%
	1Ph0-CT2/2-DO-2 Standard for 200 kVA and up Taps: +/- 2 x 2.5%

Efficiency Reference Table (Single Phase)

kVA	Efficiency [%]
15	97.70
25	98.00
37.5	98.20
50	98.30
75	98.50
100	98.60
150	98.70
250	98.80
330	98.90

Efficiency is reported at

- 35% load,
- purely sinusoidal,
- power factor of 1,
- Average winding temperature of 75 C.

For non standard kVA, use linear interpolation.

Isolation Transformer - Single Phase - Type S

Features & Specifications

Specification	Rex Standard	Optionally Available
Capacity	1, 2, 3, 5, 7.5, 10, 15, 25, 37.5, 50, 75, 100, 150, 200, 250, 330	Smaller kVA's are classified as control transformers. Larger kVA's are classified as power transformers.
Voltage class	1.2 kV (CSA), 600 V (UL)	Higher voltage classes are classified as power transformers
Conductor	C - Copper or A - Aluminum	n/a
Cooling	Self cooled (ANN)	ANC (Non ventilated units)
Frequency	60 Hz	50/60 Hz (use 50) .
Insulation System	Class 220 (220 °C at hottest spot, 150 °C average rise)	n/a
Temperature Rise	150 °C average rise	115 °C (use T115), 80 °C (use T80)
K Factor Rating	K1 - No K-Factor	Available K4, K9, K13, K20 (see page 32)
Impregnation	Polyester Resin Dipped and Baked	<ul style="list-style-type: none">Epoxy dipped and BakedOther custom specifications available
Efficiency level	Meets North American Energy Efficiency Standards: U.S. DOE 2016, NRCan 2019	Higher levels may be specified (use ZX)
Taps	See Connection diagrams (p.9)	+2 FCAN, -4 FCBN taps (use W1) Other primary or secondary tap configurations (use X)
Connection diagram	See Connection diagrams (p.9)	Tertiary windings, alternate configurations (use X)
Terminations	Lugs or pads - see table (p.6)	Specific Cu-Al lugs available. (Use Y2)
Wiring	Terminals are on front or front/back.	Pad or lug location may be specified (use X)
Electrical Performance	Per page 5.	Special X/R ratio, Inrush current, Short Circuit Withstand capability, EMF intensivity, etc. (use X)
Impedance	Per CSA C9	Special impedance may be specified (use X)
Sound Level	Per CSA C9 and NEMA ST-20 (see p.6)	3 dB below CSA level, or other (use X)
Enclosure Type	CSA Type 1 or 3R indoor, depending on kVA, see chart	<ul style="list-style-type: none">No enclosure, Core & Coil only (use C&C)CSA Type 3R Outdoor (use E3R)Type 4, non-ventilated (use E4)Type 12, ventilated (use E12)Special dimensions and construction (use X)
Enclosure Material	Steel panels, Combination of 12, 14, & 16 ga	Other gauge, Stainless Steel 304, Stainless Steel 316L, Galvanneal, Aluminum.
Enclosure Finish	ASA 61 Gray Powder Coat	Bare Stainless, special color/finish (use ESP)
Approvals	CSA Certified and UL Listed CSA File # LR34493 (5kV Max, 900kVA Max) UL File # E108255 (600V Max, 750kVA Max)	IEC (use CE), European or other spec, ABS, Lloyds Registry, Canadian Coast Guard, and more. Also see Hazardous Location Catalog
Thermostat	Not supplied	Available NC 185, NC 200, or other (use X)
Mounting	Floor only, or floor/wall, depending on size. See tables (p. 12)	Special mounting available
Nameplate	Metallic Foil, English/French	Aluminum, Stainless Steel (use M)
Seismic	Canada Zone 6, USA Zone 4. See page 6 for more detail.	Rex can facilitate site specific Seismic approvals. Mason Super W pads, or other specified snubbers.
Testing	See page 5	Optional tests available, such as temperature-rise test, sound level, EMF, etc. (Ordered separately)
Shipping	Bolted to skid, with nylon cover	Shrink wrap, special skid, export crating
Optional Features	Special ambient temperature, Special altitude, Anti-Condensation Strip Heaters, Thermal Sensing and Indication (analog/digital), Surge protection, Breaker Integration, Power Monitoring, etc.	

Isolation Transformer - Single Phase - Type S

Reference Charts - Electrical Performance - Type 1 and 3R enclosures

The tables below provide typical standard values for three phase transformers with standard specification.

- Sample catalog numbers are shown for 600 V to 120/240 V. For other voltage codes, please see page 2
- The values reported below will not vary with the selection of special voltages, shielding, and some other options
- Special specifications such as K-Factor Rating and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for for application specific information.

Copper windings (Type SC)

kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	600 V : 120/240		
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>	
5	n/a	5.5% - 7%	40	+/- 1 x 5%	1Ph0-ST1/1-DO-1	LA/LA	SC5J-K	
7.5	n/a	5.5% - 7%	40	+/- 1 x 5%	1Ph0-ST1/1-DO-2	LA/LA	SC7J-K	
10	n/a	5% - 6.5%	40	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LA	SC10J-K	
15	97.70%	3.5% - 5.5%	45	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LA	SC15J-K/Z3	
25	98.00%	3.5% - 5.5%	45	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LB	SC25J-K/Z3	
37.5	98.20%	3.5% - 5%	45	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LC	SC37J-K/Z3	
50	98.30%	3.5% - 5%	50	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LC	SC50J-K/Z3	
75	98.50%	3.5% - 5%	50	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LB/LD	SC75J-K/Z3	
100	98.60%	3.5% - 5%	50	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LC/2xLD	SC100J-K/Z3	
150	98.70%	3.5% - 5%	55	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LD/PADS	SC150J-K/Z3	
200	98.75%	4% - 6%	55	+/- 2 x 2.5%	1Ph0-CT2/2-DO-2	LD/PADS	SC200J-K/Z3	
250	98.80%	4% - 6%	55	+/- 2 x 2.5%	1Ph0-CT2/2-DO-2	PADS	SC250J-K/Z3	
330	98.90%	4% - 6%	60	+/- 2 x 2.5%	1Ph0-CT2/2-DO-2	PADS	SC330J-K/Z3	

Aluminum Windings (Type SA)

kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	600 V : 120/240		
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>	
5	n/a	5.5% - 7%	40	+/- 1 x 5%	1Ph0-ST1/1-DO-1	LA/LA	SA5J-K	
7.5	n/a	5.5% - 7%	40	+/- 1 x 5%	1Ph0-ST1/1-DO-2	LA/LA	SA7J-K	
10	n/a	5% - 6.5%	40	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LA	SA10J-K	
15	97.70%	3.5% - 5.5%	45	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LA	SA15J-K/Z3	
25	98.00%	3.5% - 5.5%	45	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LB	SA25J-K/Z3	
37.5	98.20%	3.5% - 5%	45	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LC	SA37J-K/Z3	
50	98.30%	3.5% - 5%	50	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LA/LC	SA50J-K/Z3	
75	98.50%	3.5% - 5%	50	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LB/LD	SA75J-K/Z3	
100	98.60%	3.5% - 5%	50	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LC/2xLD	SA100J-K/Z3	
150	98.70%	3.5% - 5%	55	+/- 2 x 2.5%	1Ph0-ST2/2-DO-2	LD/PADS	SA150J-K/Z3	
200	98.75%	4% - 6%	55	+/- 2 x 2.5%	1Ph0-CT2/2-DO-2	LD/PADS	SA200J-K/Z3	
250	98.80%	4% - 6%	55	+/- 2 x 2.5%	1Ph0-CT2/2-DO-2	PADS	SA250J-K/Z3	
330	98.90%	4% - 6%	60	+/- 2 x 2.5%	1Ph0-CT2/2-DO-2	PADS	SA330J-K/Z3	

Isolation Transformer - Single Phase - Type S

Reference Charts - Dimensions - Type 1 and 3R enclosures

The tables below provide typical standard values for three phase transformers with standard specification.

- The values reported below will not vary with the selection of special voltages, shielding, and some other options
- Special specifications such as K-Factor Rating and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for application specific information.

For additional enclosure details (such as mounting), consult page 8.

Copper windings (Type SC)

kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor (with kit installed)	
	Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
5	Floor/Wall	11.00	11.00	14.00	80	E1-2	Type 1	16.07	E3R-2-W
7.5	Floor/Wall	15.75	16.00	21.00	128	E3R-4	Type 3R indoor	21.12	E3R-4-W
10	Floor/Wall	15.75	16.00	21.00	135	E3R-4	Type 3R indoor	21.12	E3R-4-W
15	Floor/Wall	15.75	16.00	21.00	150	E3R-4	Type 3R indoor	21.12	E3R-4-W
25	Floor/Wall	20.50	20.75	30.00	225	E3R-6	Type 3R indoor	26.39	E3R-6-W
37.5	Floor/Wall	20.50	20.75	30.00	272	E3R-6	Type 3R indoor	26.39	E3R-6-W
50	Floor/Wall	20.50	20.75	30.00	348	E3R-6	Type 3R indoor	26.39	E3R-6-W
75	Floor/Wall	24.50	21.75	36.00	444	E3R-7	Type 3R indoor	29.37	E3R-7-W
100	Floor	27.00	29.00	47.00	711	E3R-8S	Type 3R indoor	29.00	E3R-8S-W
150	Floor	27.00	29.00	47.00	851	E3R-8S	Type 3R indoor	29.00	E3R-8S-W
200	Floor	32.00	32.00	52.00	1170	E3R-9S	Type 3R indoor	32.00	E3R-9S-W
250	Floor	32.00	32.00	52.00	1308	E3R-9S	Type 3R indoor	32.00	E3R-9S-W
330	Floor	32.00	32.00	52.00	1720	E3R-9S	Type 3R indoor	32.00	E3R-9S-W

Aluminum Windings (Type SA)

kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor (with kit installed)	
	Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
5	Floor/Wall	11.00	11.00	14.00	n/a	E1-2	Type 1	16.07	E3R-2-W
7.5	Floor/Wall	15.75	16.00	21.00	n/a	E3R-4	Type 3R indoor	21.12	E3R-4-W
10	Floor/Wall	15.75	16.00	21.00	127	E3R-4	Type 3R indoor	21.12	E3R-4-W
15	Floor/Wall	15.75	16.00	21.00	143	E3R-4	Type 3R indoor	21.12	E3R-4-W
25	Floor/Wall	20.50	20.75	30.00	208	E3R-6	Type 3R indoor	26.39	E3R-6-W
37.5	Floor/Wall	20.50	20.75	30.00	234	E3R-6	Type 3R indoor	26.39	E3R-6-W
50	Floor/Wall	20.50	20.75	30.00	308	E3R-6	Type 3R indoor	26.39	E3R-6-W
75	Floor	24.50	21.75	36.00	405	E3R-7	Type 3R indoor	29.37	E3R-7-W
100	Floor	27.00	29.00	47.00	684	E3R-8S	Type 3R indoor	29.00	E3R-8S-W
150	Floor	27.00	29.00	47.00	800	E3R-8S	Type 3R indoor	29.00	E3R-8S-W
200	Floor	32.00	32.00	52.00	1015	E3R-9S	Type 3R indoor	32.00	E3R-9S-W
250	Floor	32.00	32.00	52.00	1225	E3R-9S	Type 3R indoor	32.00	E3R-9S-W
330	Floor	32.00	32.00	52.00	1550	E3R-9S	Type 3R indoor	32.00	E3R-9S-W

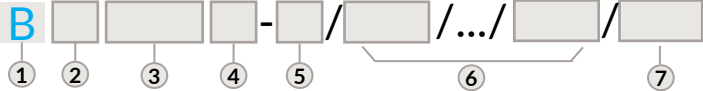
Isolation Transformer - Three Phase - Type B

Background

General Purpose Three Phase Isolation Transformers are intended for most commercial and industrial settings where robust and reliable power transformation is required. Hotels, schools, factories, and other such buildings will use transformers to feed lighting, heating, and general power distribution panels, rated 600 V and below.

- Transformers are available in a variety of enclosed types or as a Core & Coil.
- These transformers are intended for linear loads. Various options and features available on these transformers can be specified to accommodate electrical system requirements. For non-linear loads with a harmonic component in the power, consult the sections of this catalog for K-Factor Rating (p. 28) and Drive Isolation Transformers (p. 29)

Catalog Number & Application Notes



① - 'B' Three Phase Isolation Transformer

② - Conductor Material

C	Copper
A	Aluminum (available 15 kVA and up)

③ - Base kVA Rating

- Select from standard 3 phase kVA levels below, or any other level 3 - 1000 kVA: 3, 6, 9, 15, 30, 45, 75, 112.5, 150, 225, 300, 450, 500, 750. (Note: Use 112 for 112.5)

④&⑤ - Primary & Secondary Winding Voltage(s)

- See page 2; select letter codes corresponding to the primary and secondary voltage from group 1 (delta connected) and/or group 3 (wye or star connected).
- For a special voltage, use X and specify voltage.
- Standard connection diagram is shown to the right. For special connection or tapping, use X in ⑥

⑥ - Optional Special Features

- A variety of optional special features exist. These are noted in the specification (p.14). Some of the most commonly specified ones are noted on p.2.

⑦- Efficiency Level

- The table on the right shows the efficiency levels for three phase dry type transformers (Canada & USA).
- Transformers rated <15 kVA are excluded. Other excluded types are listed on page 6. In such cases, leave ⑦ blank.
- For the part number, use suffix Z3; If a special efficiency level is required, use ZX, and specify efficiency level.



Photos: Three Phase Transformer - Enclosed or Core & Coil

Connection diagrams

	3PDyn1-NT Standard for 3 kVA No Taps
	3PDyn1-ST1/1 Standard for 6&9 kVA Taps: +/- 1 x 5%
	3PDyn1-ST2/2 Standard 15-150 kVA Taps: +/- 2 x 2.5%
	3PDyn1-ST2/4 Optional 15-150 kVA use W1 Taps: +2 x 2.5%, -4 x 2.5%
	3PDyn1-CT2/2 Standard for 225 kVA and up Taps: +/- 2 x 2.5%
	3PDyn1-CT2/4 Optional 225 kVA and up; use W1 Taps: +2 x 2.5%, -4 x 2.5%

Efficiency Reference Table (Three Phase)

kVA	Efficiency [%]
15	97.89
30	98.23
45	98.40
75	98.60
112.5	98.74
150	98.83
225	98.94
300	99.02
500	99.14
750	99.23
1000	99.28

Efficiency is reported at

- 35% load,
- purely sinusoidal,
- power factor of 1,
- Average winding temperature of 75 C.

For non standard kVA, use linear interpolation.

Isolation Transformer - Three Phase - Type B

Features & Specifications

Specification	Rex Standard	Optionally Available
Capacity	3, 6, 9, 15, 30, 45, 75, 112.5, 150, 225, 300, 450, 500, 750.	Larger kVA's are classified as power transformers.
Voltage class	1.2 kV (CSA), 600 V (UL)	Higher voltage classes are classified as power transformers
Conductor	C - Copper or A - Aluminum	n/a
Cooling	Self cooled (ANN)	ANC (Non ventilated units)
Frequency	60 Hz	50/60 Hz (use 50).
Insulation System	Class 220 (220 °C at hottest spot, 150 °C average rise)	n/a
Temperature Rise	150 °C average rise	• 115 °C (use T115), 80 °C (use T80)
K Factor Rating	K1 - No K-Factor	• Available K4, K9, K13, K20 (see page 32)
Impregnation	Polyester Resin Dipped and Baked	• Epoxy dipped and Baked • Other custom specifications available
Efficiency level	Meets North American Energy Efficiency Standards: U.S. DOE 2016, NRCan 2019	Higher levels may be specified (use ZX)
Taps	See Connection diagrams (p.13)	+2 FCAN, -4 FCBN taps (use W1) Other primary or secondary tap configurations (use X)
Connection diagram	See Connection diagrams (p.13)	Tertiary windings, alternate configurations (use X)
Terminations	Lugs or pads - see table (p.6)	Specific Cu-Al lugs available. (Use Y2)
Wiring	Terminals are on front or front/back.	Pad or lug location may be specified (use X)
Electrical Performance	Per page 5.	Special X/R ratio, Inrush current, Short Circuit Withstand capability, EMF intensivity, etc. (use X)
Impedance	Per CSA C9	Special impedance may be specified (use X)
Sound Level	Per CSA C9 and NEMA ST-20 (see p.6)	3 dB below CSA level, or other (use X)
Enclosure Type	CSA Type 1 or 3R indoor, depending on kVA, see chart (p. 15 - 18)	• No enclosure, Core & Coil only (use C&C) • CSA Type 3R Outdoor (use E3R) • Type 4, non-ventilated (use E4) • Type 12, ventilated dust-tight (use E12) • Special dimensions and construction (use X)
Enclosure Material	Steel panels, Combination of 12, 14, & 16 ga	Other gauges, Stainless Steel 304, Stainless Steel 316L, Galvanneal, Aluminum.
Enclosure Finish	ASA 61 Gray Powder Coat	Bare Stainless, special color/finish (use ESP)
Approvals	CSA Certified and UL Listed CSA File # LR34493 (5kV Max, 900kVA Max) UL File # E108255 (600V Max, 750kVA Max)	IEC (use CE), European or other spec, ABS, Lloyds Registry, Canadian Coast Guard, and more. Also see Hazardous Location Catalog
Thermostat	Not supplied	Available N.C.-185, N.C.-200, or other (use X)
Mounting	Floor only, or floor/wall, depending on size. See tables (p. 16, 18)	Special mounting available
Nameplate	Metallic Foil, English/French	Aluminum, Stainless Steel (use M)
Seismic	Canada Zone 6, USA Zone 4. See page 6 for more detail.	Rex can facilitate site specific Seismic approvals. Mason Super W pads, or other specified snubbers.
Testing	See page 5	Optional tests available, such as temperature-rise test, sound level, EMF, etc. (Ordered separately)
Shipping	Bolted to skid, with nylon cover	Shrink wrap, special skid, export crating
Optional Features	Special ambient temperature, Special altitude, Anti-Condensation Strip Heaters, Thermal Sensing and Indication (analog/digital), Surge protection, Breaker Integration, Power Monitoring, etc.	

Isolation Transformer - Three Phase - Type B

Reference Charts - Electrical Performance - Type 1 and 3R enclosures

The tables below provide typical standard values for three phase transformers with standard specification.

- Sample catalog numbers are shown for 600 V delta to 208Y/120 V. For other voltage codes, please see page 2
- The values reported below will not vary with the selection of special voltages, shielding, and some other options
- Special specifications such as K-Factor ratings and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for application specific information.

Copper windings (Type BC)

kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	600 V : 208Y/120			kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor (with kit installed)	
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>			Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
3	n/a	5.5% - 7%	40	none	3PDyn1-NT	Terminal Blocks	BC3J-M		3	Floor/Wall	15.50	11.00	14.00	73	E1-3	Type 1	16.07	E3R-3-W
6	n/a	5.5% - 7%	40	+/- 1 x 5%	3PDyn1-ST1/1	Terminal Blocks	BC6J-M		6	Floor/Wall	15.75	16.00	21.00	116	E3R-4	Type 3R indoor	21.12	E3R-4-W
9	n/a	5% - 6.5%	40	+/- 1 x 5%	3PDyn1-ST1/1	Terminal Blocks	BC9J-M		9	Floor/Wall	15.75	16.00	21.00	132	E3R-4	Type 3R indoor	21.12	E3R-4-W
15	97.89%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BC15J-M/Z3		15	Floor/Wall	20.50	16.00	25.00	215	E3R-5	Type 3R indoor	21.62	E3R-5-W
30	98.23%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BC30J-M/Z3		30	Floor/Wall	20.50	20.75	30.00	308	E3R-6	Type 3R indoor	26.39	E3R-6-W
45	98.40%	3.5% - 5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LB	BC45J-M/Z3		45	Floor/Wall	20.50	20.75	30.00	397	E3R-6	Type 3R indoor	26.39	E3R-6-W
75	98.60%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LC	BC75J-M/Z3		75	Floor/Wall	24.50	21.75	36.00	580	E3R-7	Type 3R indoor	29.37	E3R-7-W
112.5	98.74%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LD	BC112J-M/Z3		112.5	Floor	30.75	33.40	44.00	890	E3R-8	Type 3R indoor	37.49	E3R-8-W
150	98.83%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/2xLD	BC150J-M/Z3		150	Floor	30.75	33.40	44.00	1040	E3R-8	Type 3R indoor	37.49	E3R-8-W
225	98.94%	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/3xLD	BC225J-M/Z3		225	Floor	40.00	38.00	52.00	1680	E3R-9	Type 3R indoor	41.75	E3R-9-W
300	99.02%	4% - 6%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/4xLD	BC300J-M/Z3		300	Floor	40.00	38.00	52.00	2055	E3R-9	Type 3R indoor	41.75	E3R-9-W
450	99.11%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BC450J-M/Z3		450	Floor	46.00	50.00	66.00	3350	E3R-10	Type 3R indoor	50.00	E3R-10-W
500	99.23%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BC500J-M/Z3		500	Floor	46.00	50.00	66.00	3500	E3R-10	Type 3R indoor	50.00	E3R-10-W
750	99.28%	4% - 6%	64	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BC750J-M/Z3		750	Floor	60.00	55.00	70.67	4795	E3R-11	Type 3R indoor	55.00	E3R-11-W

Aluminum Windings (Type BA)

kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	600 V : 208Y/120			kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor (with kit installed)	
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>			Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
15	97.89%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BA15J-M/Z3		15	Floor/Wall	20.50	16.00	25.00	230	E3R-5	Type 3R indoor	21.62	E3R-5-W
30	98.23%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BA30J-M/Z3		30	Floor/Wall	20.50	20.75	30.00	298	E3R-6	Type 3R indoor	26.39	E3R-6-W
45	98.40%	3.5% - 5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LB	BA45J-M/Z3		45	Floor/Wall	20.50	20.75	30.00	390	E3R-6	Type 3R indoor	26.39	E3R-6-W
75	98.60%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LC	BA75J-M/Z3		75	Floor/Wall	24.50	21.75	36.00	607	E3R-7	Type 3R indoor	29.37	E3R-7-W
112.5	98.74%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LD	BA112J-M/Z3		112.5	Floor	30.75	33.40	44.00	990	E3R-8	Type 3R indoor	37.49	E3R-8-W
150	98.83%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/2xLD	BA150J-M/Z3		150	Floor	30.75	33.40	44.00	1100	E3R-8	Type 3R indoor	37.49	E3R-8-W
225	98.94%	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/3xLD	BA225J-M/Z3		225	Floor	40.00	38.00	52.00	1750	E3R-9	Type 3R indoor	41.75	E3R-9-W
300	99.02%	4% - 6%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/4xLD	BA300J-M/Z3		300	Floor	40.00	38.00	52.00	2100	E3R-9	Type 3R indoor	41.75	E3R-9-W
450	99.11%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BA450J-M/Z3		450	Floor	46.00	50.00	66.00	3640	E3R-10	Type 3R indoor	50.00	E3R-10-W
500	99.23%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BA500J-M/Z3		500	Floor	46.00	50.00	66.00	4098	E3R-10	Type 3R indoor	50.00	E3R-10-W
750	99.28%	4% - 6%	64	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BA750J-M/Z3		750	Floor	60.00	55.00	70.67	5000	E3R-11	Type 3R indoor	55.00	E3R-11-W

Isolation Transformer - Three Phase - Type B

Reference Charts - Dimensions - Type 1 and 3R enclosures

The tables below provide typical standard values for three phase transformers with standard specification.

- The values reported below will not vary with the selection of special voltages, shielding, and some other options
- Special specifications such as K-Factor Rating and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for application specific information.

For additional enclosure details (such as mounting), consult page 8.

Copper windings (Type BC)

kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	600 V : 208Y/120			kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor (with kit installed)	
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>			Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
15	97.89%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BA15J-M/Z3		15	Floor/Wall	20.50	16.00	25.00	230	E3R-5	Type 3R indoor	21.62	E3R-5-W
30	98.23%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BA30J-M/Z3		30	Floor/Wall	20.50	20.75	30.00	298	E3R-6	Type 3R indoor	26.39	E3R-6-W
45	98.40%	3.5% - 5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LB	BA45J-M/Z3		45	Floor/Wall	20.50	20.75	30.00	390	E3R-6	Type 3R indoor	26.39	E3R-6-W
75	98.60%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LC	BA75J-M/Z3		75	Floor/Wall	24.50	21.75	36.00	607	E3R-7	Type 3R indoor	29.37	E3R-7-W
112.5	98.74%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LD	BA112J-M/Z3		112.5	Floor	30.75	33.40	44.00	990	E3R-8	Type 3R indoor	37.49	E3R-8-W
150	98.83%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/2xLD	BA150J-M/Z3		150	Floor	30.75	33.40	44.00	1100	E3R-8	Type 3R indoor	37.49	E3R-8-W
225	98.94%	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/3xLD	BA225J-M/Z3		225	Floor	40.00	38.00	52.00	1750	E3R-9	Type 3R indoor	41.75	E3R-9-W
300	99.02%	4% - 6%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/4xLD	BA300J-M/Z3		300	Floor	40.00	38.00	52.00	2100	E3R-9	Type 3R indoor	41.75	E3R-9-W
450	99.11%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BA450J-M/Z3		450	Floor	46.00	50.00	66.00	3640	E3R-10	Type 3R indoor	50.00	E3R-10-W
500	99.23%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BA500J-M/Z3		500	Floor	46.00	50.00	66.00	4098	E3R-10	Type 3R indoor	50.00	E3R-10-W
750	99.28%	4% - 6%	64	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BA750J-M/Z3		750	Floor	60.00	55.00	70.67	5000	E3R-11	Type 3R indoor	55.00	E3R-11-W

Isolation Transformer - Three Phase - Type B

Reference Charts - Electrical Performance - Type 12 and Type 4 enclosures

- The tables below provide typical standard values for three phase transformers with standard specification.
- Sample catalog numbers are shown for 600 V delta to 208Y/120 V. For other voltage codes, please see page 2
 - The values reported below will not vary with the selection of special voltages, shielding, and some other options
 - Special specifications such as K-Factor Rating and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for for application specific information.

Copper windings, Type 12 ventilated (Type BC.../E12)

kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	600 V : 208Y/120			kVA	Standard Enclosure (Type 12)					
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>			Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name
15	97.89	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BC15J-M/E12/Z3		15	Floor	20.50	25.40	30.00	271	E12-6
30	98.23	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BC30J-M/E12/Z3		30	Floor	20.50	25.40	30.00	340	E12-6
45	98.40	3.5% - 5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LB	BC45J-M/E12/Z3		45	Floor	20.50	25.40	30.00	437	E12-6
75	98.60	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LC	BC75J-M/E12/Z3		75	Floor	24.50	26.40	36.00	625	E12-7
112.5	98.74	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LD	BC112J-M/E12/Z3		112.5	Floor	30.75	34.50	44.00	960	E12-8
150	98.83	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/2xLD	BC150J-M/E12/Z3		150	Floor	30.75	34.50	44.00	1115	E12-8
225	98.94	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/3xLD	BC225J-M/E12/Z3		225	Floor	40.00	37.64	52.00	1700	E12-9
300	99.02	4% - 6%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/4xLD	BC300J-M/E12/Z3		300	Floor	40.00	37.64	52.00	2095	E12-9
450	99.11	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BC450J-M/E12/Z3		450	Floor	46.00	46.25	66.00	3460	E12-10
500	99.23	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BC500J-M/E12/Z3		500	Floor	46.00	46.25	66.00	3640	E12-10
750	99.28	4% - 6%	64	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BC750J-M/E12/Z3		750	Floor	60.00	55.00	70.67	4995	E12-11

Copper windings, Type 4 Totally Enclosed, Non Ventilated (Type BC.../E4)

kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	600 V : 208Y/120			kVA	Standard Enclosure (Type 4)					
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>			Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name
15	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BC15J-M/E4		15	Floor	21.50	22.00	27.00	310	E4-6
30	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	BC30J-M/E4		30	Floor	21.50	22.00	27.00	376	E4-6
45	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LB	BC45J-M/E4		45	Floor	24.50	22.25	31.50	525	E4-7
75	n/a	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LA/LC	BC75J-M/E4		75	Floor	30.75	30.40	32.00	850	E4-8
112.5	n/a	4% - 6%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LB/LD	BC112J-M/E4		112.5	Floor	30.75	30.50	32.00	995	E4-8
150	n/a	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/2xLD	BC150J-M/E4		150	Floor	40.00	34.00	46.00	1700	E4-9
225	n/a	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/3xLD	BC225J-M/E4		225	Floor	46.50	43.25	64.50	2300	E4-10
300	n/a	4% - 6%	64	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/4xLD	BC300J-M/E4		300	Floor	46.50	43.25	64.50	2700	E4-10
450	n/a	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BC450J-M/E4		450	Floor	60.00	50.50	71.00	4160	E4-11
500	n/a	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BC500J-M/E4		500	Floor	60.00	50.50	71.00	4400	E4-11
750	n/a	4% - 6%	64	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	BC750J-M/E4		750	Floor	73.00	48.50	80.00	6400	E4-12

Isolation Transformer - Three Phase - Type B

Reference Charts - Dimensions - Type 12 and Type 4 enclosures

- The tables below provide typical standard values for three phase transformers with standard specification.
- The values reported below will not vary with the selection of special voltages, shielding, and some other options
 - Special specifications such as K-Factor Rating and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for application specific information.
- For additional enclosure details (such as mounting), consult page 8.

Copper windings, Type 12 ventilated (Type BC.../E12)

Copper windings, Type 4 Totally Enclosed, Non Ventilated (Type BC.../E4)

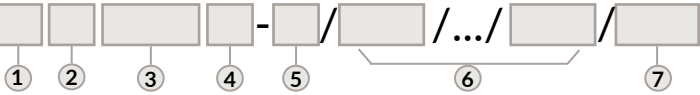
Autotransformer - Single & Three Phase - Type M & R

Background

Autotransformers are an economical and compact means of connecting electrical equipment to a power supply of a different voltage. Part of the winding is common to both the primary and secondary circuits. This means there is no isolation between the two, which may not be acceptable on some power systems where isolation is required, or if there is no grounded neutral on the secondary side of the upstream transformer. Typical applications include motor loads of industrial machinery, electric heating, and air conditioners. Specialty autotransformers are also available, such as:

- Autotransformer for motor-starters
 - Autotransformer for battery-chargers
 - Zig-Zag Grounding autotransformers
- Contact our inside sales department for more information

Catalog Number & Application Notes



① - Autotransformer Type	
M	Single Phase Autotransformer
R	Three Phase Autotransformer

② - Conductor Material	
C	Copper
A	Aluminum (available in some cases - See p.22)

- ③ - Base kVA Rating
- For Singe Phase: Select from standard kVA levels below, or any other level 3 - 1000+ kVA: 3, 5, 7.5, 10, 15, 25, 37.5, 50, 75, 100, 150, 225 (Note: Use 7 for 7.5, and 37 for 37.5).
 - For Three Phase: Select from standard kVA levels below, or any other level 1.5 - 1000+ kVA: 3, 6, 9, 15, 30, 45, 75, 112.5, 150, 225, 300 (Note: Use 112 for 112.5)

- ④&⑤ - Primary & Secondary Winding Voltage(s)
- See page 2; select letter codes corresponding to the primary and secondary voltage from group 1.
 - For a special voltage, use X and specify voltage.
 - Standard connection diagram is shown to the right. For special connection or tapping, use X in ⑥

- ⑥ - Optional Special Features
- A variety of optional special features exist. These are noted in the specification (p.20). Some of the most commonly specified ones are noted on p.2.
 - Autotransformers are exempt from North American Efficiency regulation.

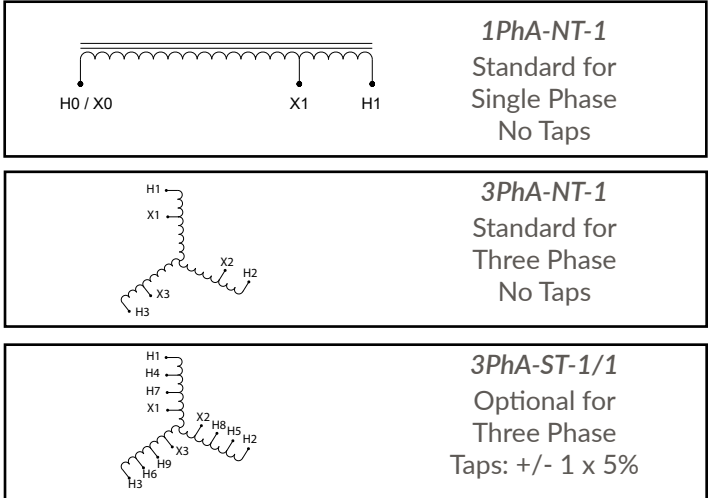


Photo: Three Phase Autotransformers
Left: 240 Y to 208 Y in chalk white enclosure
Right: 600 Y to 480 Y in standard enclosure

Application Notes

- As can be seen in the connection diagram below, the typical configuration is without taps. Taps are optionally available (use suffix X).
- See page 21 & 22 for the enclosure and weight for some of the most commonly specified voltage pairs. Other primary and secondary voltages are available.
- The details of page 21 & 22 are for the more commonly specified copper wound autotransformers. Aluminum wound autotransformers are available for some ratings, and they can represent an economical alternative.
- Autotransformers may also be specified as encapsulated types using suffix EP.
- May be used in step-up or step-down configuration.
- Low voltage Regulation; Less than 3%.
- Built with the same demanding specification as our isolation transformers.
- Rugged bracing, spacious and practically arranged wiring compartment, versatile and tough enclosure.
- Class 220 insulation is used.
- Autotransformers can be supplied in Type 12 and Type 4 boxes as well (use suffix E12 or E4, resepectively).
- For three phase autotransformers, there is no connection point to the neutral, unless specifically requested as an optional feature (use suffix N).

Connection diagrams



Autotransformer - Single & Three Phase - Type M & R

Features & Specifications

Specification	Rex Standard	Optionally Available
Capacity	Single Phase: 3, 5, 7.5, 10, 15, 25, 37.5, 50, 75, 100, 150, 225 Three Phase: 3, 6, 9, 15, 30, 45, 75, 112.5, 150, 225, 300	Larger kVA's are available and may be classified as power transformers
Voltage class	1.2 kV (CSA), 600 V (UL)	Higher voltage classes are classified as power transformers
Conductor	C - Copper or A - Aluminum	n/a
Cooling	Self cooled (ANN)	ANC (Non ventilated units)
Frequency	60 Hz	50/60 Hz (use 50) .
Insulation System	Class 220 (220 °C at hottest spot, 150 °C average rise)	n/a
Temperature Rise	150 °C average rise	115 °C (use T115), 80 °C (use T80)
K Factor Rating	K1 - No K-Factor	Available K4, K9, K13, K20 (see page 32)
Impregnation	Polyester Resin Dipped and Baked	Epoxy dipped and Baked Other custom specifications available
Efficiency level	No applicable efficiency compliance required	Higher levels may be specified (use ZX)
Taps	None. See Connection diagrams (p.19)	+1 FCAN, -1 FCBN taps (use W1) Other primary or secondary tap configurations (use X)
Connection diagram	See Connection diagrams (p.19)	Tertiary windings, alternate configurations (use X)
Terminations	Lugs or pads - see table (p.6)	Specific Cu-Al lugs available (use Y2) Accesible Neutral terminal (use N)
Wiring	Terminals are on front or front/back.	Pad or lug location may be specified (use X)
Electrical Performance	Per page 5.	Special X/R ratio, Inrush current, Short Circuit Withstand capability, EMF intensivity, etc. (use X)
Impedance	Autotransformers typically have a lower impedance value than isolation transformers (approximately 1 - 4%)	Special impedance may be specified (use X)
Sound Level	Per CSA C9 and NEMA ST-20 (see p.6)	3 dB below CSA level, or other (use X)
Enclosure Type	CSA Type 1 or 3R indoor, depending on kVA, see charts (p. 21, 22)	<ul style="list-style-type: none">• No enclosure, Core & Coil only (use C&C)• CSA Type 3R Outdoor (use E3R)• Type 4, non-ventilated (use E4)• Type 12, ventilated (use E12)• Special dimensions and construction (use X)
Enclosure Material	Steel panels, Combination of 12, 14, & 16 ga	Other gauges, Stainless Steel 304, Stainless Steel 316L, Galvanneal, Aluminum.
Enclosure Finish	ASA 61 Gray Powder Coat	Bare Stainless, special color/finish (use ESP)
Approvals	CSA Certified and UL Listed CSA File # LR34493 UL File # E108255	IEC (use CE), European or other spec, ABS, Lloyds Registry, Canadian Coast Guard, and more. Also see Hazardous Location Catalog
Thermostat	Not supplied	Available N.C.-185, N.C.-200, or other (use X)
Mounting	Floor only, or floor/wall, depending on size. See tables (p. 21, 22)	Special mounting available
Nameplate	Metallic Foil, English/French	Aluminum, Stainless Steel (use M)
Seismic	Canada Zone 6, USA Zone 4. See page 6 for more detail.	Rex can facilitate site specific Seismic approvals. Mason Super W pads, or other specified snubbers.
Testing	See page 5	Optional tests available, such as temperature-rise test, sound level, EMF, etc. (Ordered separately)
Shipping	Bolted to skid, strapped, with nylon cover	Shrink wrap, special skid, export crating
Optional Features	Special ambient temperature, Special altitude, Anti-Condensation Strip Heaters, Thermal Sensing and Indication (analog/digital), Surge protection, Breaker Integration, Power Monitoring, etc.	

Autotransformer - Single Phase, Copper - Type MC

Reference Charts - Enclosure & Weight - Single Phase Autotransformer

The tables below provides the weight and enclosure number for single phase autotransformers with standard specification. Contact Rex Sales for for application specific information.

kVA	600 V : 480 V			600 V : 416 V			600 V : 380 V		
	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name
3	MC3J-H	31	E1-0	MC3J-G	40	E1-0	MC3J-F	40	E1-0
5	MC5J-H	33	E1-0	MC5J-G	47	E1-1	MC5J-F	45	E1-1
7.5	MC7J-H	35	E1-1	MC7J-G	50	E1-1	MC7J-F	50	E1-1
10	MC10J-H	40	E1-1	MC10J-G	65	E1-1	MC10J-F	70	E1-2
15	MC15J-H	65	E1-1	MC15J-G	80	E1-2	MC15J-F	85	E1-2
25	MC25J-H	70	E1-2	MC25J-G	140	E3R-4	MC25J-F	140	E3R-4
37.5	MC37J-H	117	E3R-4	MC37J-G	145	E3R-4	MC37J-F	165	E3R-4
50	MC50J-H	143	E3R-4	MC50J-G	200	E3R-6	MC50J-F	205	E3R-6
75	MC75J-H	156	E3R-4	MC75J-G	225	E3R-6	MC75J-F	265	E3R-6
100	MC100J-H	222	E3R-6	MC100J-G	282	E3R-6	MC100J-F	320	E3R-6
150	MC150J-H	291	E3R-6	MC150J-G	360	E3R-6	MC150J-F	410	E3R-6
225	MC225J-H	379	E3R-6	MC225J-G	580	E3R-7	MC225J-F	680	E3R-8S

kVA	600 V : 240 V			480 V : 240 V			240 V : 208 V		
	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name
3	MC3J-C	45	E1-0	MC3H-C	50	E1-0	MC3C-B	30	E1-0
5	MC5J-C	65	E1-1	MC5H-C	60	E1-1	MC5C-B	36	E1-0
7.5	MC7J-C	81	E1-2	MC7H-C	75	E1-2	MC7C-B	45	E1-0
10	MC10J-C	92	E3R-4	MC10H-C	85	E1-2	MC10C-B	50	E1-0
15	MC15J-C	130	E3R-4	MC15H-C	105	E3R-4	MC15C-B	60	E1-0
25	MC25J-C	165	E3R-4	MC25H-C	182	E3R-4	MC25C-B	70	E1-1
37.5	MC37J-C	220	E3R-6	MC37H-C	212	E3R-4	MC37C-B	63	E3R-4
50	MC50J-C	250	E3R-6	MC50H-C	240	E3R-6	MC50C-B	112	E3R-6
75	MC75J-C	370	E3R-7	MC75H-C	326	E3R-6	MC75C-B	132	E3R-6
100	MC100J-C	440	E3R-7	MC100H-C	360	E3R-6	MC100C-B	181	E3R-6
150	MC150J-C	665	E3R-8S	MC150H-C	585	E3R-7	MC150C-B	218	E3R-6
225	MC225J-C	1060	E3R-8S	MC225H-C	932	E3R-8S	MC225C-B	350	E3R-7

kVA	240 V : 120 V		
	Catalog #	Weight [lbs]	Enclosure Name
3	MC3C-A	40	E1-0
5	MC5C-A	45	E1-1
7.5	MC7C-A	70	E1-2
10	MC10C-A	80	E1-2
15	MC15C-A	122	E3R-4
25	MC25C-A	152	E3R-4
37.5	MC37C-A	184	E3R-4
50	MC50C-A	240	E3R-6
75	MC75C-A	330	E3R-6
100	MC100C-A	400	E3R-6
150	MC150C-A	532	E3R-7
225	MC225C-A	874	E3R-8S

Autotransformer - Three Phase, Copper - Type RC

Reference Charts - Enclosure & Weight - Three Phase Autotransformer - Copper

The tables below provides the weight and enclosure number for three phase autotransformers with standard specification. Contact Rex Sales for for application specific information.

kVA	600 V : 480 V			600 V : 416 V			600 V : 380 V		
	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name
3	RC3J-H	21	E1-0	RC3J-G	32	E1-0	RC3J-F	38	E1-0
6	RC6J-H	34	E1-1	RC6J-G	70	E1-1	RC6J-F	75	E1-1
9	RC9J-H	45	E1-1	RC9J-G	85	E1-1	RC9J-F	110	E1-3
15	RC15J-H	65	E1-1	RC15J-G	120	E1-3	RC15J-F	140	E1-3
30*	RC30J-H	115	E1-3	RC30J-G	135	E1-3	RC30J-F	187	E3R-5
45*	RC45J-H	135	E1-3	RC45J-G	180	E3R-5	RC45J-F	206	E3R-5
75*	RC75J-H	225	E3R-5	RC75J-G	285	E3R-5	RC75J-F	293	E3R-5
112.5*	RC112J-H	250	E3R-5	RC112J-G	314	E3R-5	RC112J-F	425	E3R-6
150*	RC150J-H	271	E3R-6	RC150J-G	497	E3R-7	RC150J-F	530	E3R-7
225*	RC225J-H	381	E3R-6	RC225J-G	510	E3R-7	RC225J-F	687	E3R-7
300*	RC300J-H	479	E3R-7	RC300J-G	935	E3R-8	RC300J-F	833	E3R-8

kVA	600 V : 240 V			600 V : 208 V			480 V : 240 V		
	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name
3	RC3J-C	50	E1-1	RC3J-B	55	E1-1	RC3H-C	55	E1-1
6	RC6J-C	75	E1-1	RC6J-B	70	E1-1	RC6H-C	75	E1-1
9	RC9J-C	120	E1-3	RC9J-B	110	E1-3	RC9H-C	95	E1-3
15*	RC15J-C	155	E1-3	RC15J-B	135	E1-3	RC15H-C	110	E1-3
30*	RC30J-C	225	E3R-5	RC30J-B	225	E3R-5	RC30H-C	200	E3R-5
45*	RC45J-C	287	E3R-5	RC45J-B	271	E3R-5	RC45H-C	250	E3R-5
75*	RC75J-C	345	E3R-6	RC75J-B	390	E3R-6	RC75H-C	360	E3R-6
112.5*	RC112J-C	480	E3R-7	RC112J-B	610	E3R-7	RC112H-C	500	E3R-6
150*	RC150J-C	620	E3R-7	RC150J-B	791	E3R-8	RC150H-C	641	E3R-7
225*	RC225J-C	995	E3R-8	RC225J-B	1008	E3R-8	RC225H-C	947	E3R-8
300*	RC300J-C	1300	E3R-8	RC300J-B	1426	E3R-8	RC300H-C	1076	E3R-8

kVA	480 V :208 V			240 V :208 V		
	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name
3	RC3H-B	60	E1-1	RC3C-B	31	E1-0
6	RC6H-B	80	E1-1	RC6C-B	45	E1-0
9	RC9H-B	100	E1-3	RC9C-B	50	E1-1
15*	RC15H-B	110	E1-3	RC15C-B	60	E1-1
30*	RC30H-B	235	E3R-5	RC30C-B	85	E1-1
45*	RC45H-B	290	E3R-5	RC45C-B	90	E3R-3
75*	RC75H-B	350	E3R-6	RC75C-B	171	E3R-5
112.5*	RC112H-B	550	E3R-7	RC112C-B	228	E3R-5
150*	RC150H-B	700	E3R-7	RC150C-B	277	E3R-6
225*	RC225H-B	887	E3R-8	RC225C-B	338	E3R-6
300*	RC300H-B	1217	E3R-8	RC300C-B	358	E3R-6

* Catalog numbers shown in **bold italics** are available with aluminum windings. See Pg. 23.

Autotransformer - Three Phase, Aluminum - Type RA

Reference Charts - Enclosure & Weight - Three Phase Autotransformer - Aluminum

The tables below provides the weight and enclosure number for three phase autotransformers with standard specification. Contact Rex Sales for for application specific information.

kVA	600 V : 480 V			600 V : 416 V			600 V : 380 V		
	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name
15	n/a	n/a	n/a	RA15J-G	100	E1-3	RA15J-F	105	E1-3
30	RA30J-H	105	E1-3	RA30J-G	170	E3R-5	RA30J-F	180	E3R-5
45	RA45J-H	150	E3R-4	RA45J-G	210	E3R-6	RA45J-F	220	E3R-6
75	RA75J-H	190	E3R-5	RA75J-G	250	E3R-6	RA75J-F	270	E3R-6
112.5	RA112J-H	255	E3R-6	RA112J-G	320	E3R-6	RA112J-F	345	E3R-6
150	RA150J-H	310	E3R-6	RA150J-G	370	E3R-6	RA150J-F	490	E3R-7
225	RA225J-H	360	E3R-6	RA225J-G	520	E3R-7	RA225J-F	690	E3R-8
300	RA300J-H	500	E3R-7	RA300J-G	680	E3R-8	RA300J-F	825	E3R-8

kVA	600 V : 240 V			600 V : 208 V			480 V : 240 V		
	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name
15	RA15J-C	120	E1-3	RA15J-B	170	E3R-5	RA15H-C	110	E1-3
30	RA30J-C	190	E3R-5	RA30J-B	250	E3R-6	RA30H-C	180	E3R-5
45	RA45J-C	260	E3R-6	RA45J-B	270	E3R-6	RA45H-C	240	E3R-6
75	RA75J-C	365	E3R-6	RA75J-B	345	E3R-6	RA75H-C	305	E3R-6
112.5	RA112J-C	500	E3R-7	RA112J-B	520	E3R-7	RA112H-C	440	E3R-7
150	RA150J-C	690	E3R-8	RA150J-B	710	E3R-8	RA150H-C	515	E3R-7
225	RA225J-C	840	E3R-8	RA225J-B	920	E3R-8	RA225H-C	790	E3R-8
300	RA300J-C	1265	E3R-9	RA300J-B	1275	E3R-9	RA300H-C	995	E3R-8

kVA	480 V :208 V			240 V :208 V		
	Catalog #	Weight [lbs]	Enclosure Name	Catalog #	Weight [lbs]	Enclosure Name
15	RA15H-B	160	E3R-5	RA15C-B	60	E1-2
30	RA30H-B	195	E3R-5	RA30C-B	80	E1-3
45	RA45H-B	240	E3R-6	RA45C-B	95	E1-3
75	RA75H-B	260	E3R-6	RA75C-B	155	E3R-5
112.5	RA112H-B	480	E3R-7	RA112C-B	195	E3R-6
150	RA150H-B	700	E3R-8	RA150C-B	220	E3R-6
225	RA225H-B	850	E3R-8	RA225C-B	260	E3R-6
300	RA300H-B	1210	E3R-9	RA300C-B	320	E3R-6

Autotransformer, Encapsulated - Three Phase RA.../EP and RC.../EP

Reference Charts - Enclosure & Weight - Three Phase Encapsulated Autotransformer

The tables below provides the weight and enclosure number for three phase *encapsulated* autotransformers with standard specification. Contact Rex Sales for for application specific information.

Copper windings, Type 3R Outdoor (Type RC.../EP)

kVA	600 V : 480 V			
	Catalog #	Lugs (HV/LV)	Weight [lbs]	Enclosure Name
3	RC3J-H/EP	LA/LA	97	E3R-3PEP-1
6	RC6J-H/EP	LA/LA	100	E3R-3PEP-1
9	RC9J-H/EP	LA/LA	156	E3R-3PEP-1
15	RC15J-H/EP	LA/LA	189	E3R-3PEP-2
30	RC30J-H/EP	LA/LA	240	E3R-3PEP-2
45	RC45J-H/EP	LA/LA	394	E3R-3PEP-3
75	RC75J-H/EP	LA/LB	559	E3R-3PEP-4
112.5	RC112J-H/EP	LB/LC	630	E3R-3PEP-5
150	RC150J-H/EP	LC/LC	742	E3R-3PEP-5
225	RC225J-H/EP	LC/LD	867	E3R-3PEP-6
300	RC300J-H/EP	LD/Pads	1205	E3R-3PEP-7

Aluminum windings, Type 3R Outdoor (Type RA.../EP)

kVA	600 V : 480 V			
	Catalog #	Lugs (HV/LV)	Weight [lbs]	Enclosure Name
15	RA15J-H/EP	LA/LA	194	E3R-3PEP-2
30	RA30J-H/EP	LA/LA	256	E3R-3PEP-2
45	RA45J-H/EP	LA/LA	375	E3R-3PEP-3
75	RA75J-H/EP	LA/LB	492	E3R-3PEP-4
112.5	RA112J-H/EP	LB/LC	657	E3R-3PEP-5
150	RA150J-H/EP	LC/LC	737	E3R-3PEP-5
225	RA225J-H/EP	LC/LD	829	E3R-3PEP-6
300	RA300J-H/EP	LD/Pads	1152	E3R-3PEP-7

Reference Chart - Enclosure details for Encapsulated Transformers

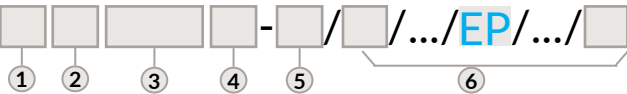
Type 3R Outdoor							Type 4	
Enclosure Name	Mounting	Width [inch]	Depth [inch]	Height [inch]	Wall Mounting* d, A x B [inch]	Floor Mounting* d, C x E [inch]	Enclosure Name	Depth [inch]
E3R-3PEP-1	Floor/Wall	11.00	10.00	15.25	1/2", 12.50" x 8"	7/16", 12.5" x 7"	E4-3PEP-1	12.00
E3R-3PEP-2	Floor/Wall	15.00	11.00	15.25	1/2", 16.50" x 8"	1/2", 16.5" x 8"	E4-3PEP-2	13.00
E3R-3PEP-3	Floor/Wall	18.00	12.50	17.00	1/2", 19.50" x 8"	1/2", 19.5" x 9.5"	E4-3PEP-3	14.50
E3R-3PEP-4	Floor/Wall	21.00	14.00	17.50	5/8", 22.50" x 10"	1/2", 22.5" x 10"	E4-3PEP-4	16.00
E3R-3PEP-5	Floor/Wall	21.00	18.00	20.00	5/8", 22.50" x 10"	1/2", 22.5" x 14.5"	E4-3PEP-5	20.00
E3R-3PEP-6	Floor	26.00	18.00	25.00	n/a	1/2", 28.5" x 15"	E4-3PEP-6	20.00
E3R-3PEP-7	Floor	32.00	18.00	30.00	n/a	1/2", 34.5" x 15"	E4-3PEP-7	20.00

Encapsulated Transformer - Single & Three Phase - Option EP

Background

Standard dry type ventilated transformers are cooled by circulating the surrounding air through the windings. For trouble-free operation and long life expectancy, the ambient air must be reasonably free of dust, moisture, corrosive gasses, or loose debris that may clog the inlets and outlets. For environments where this requirement cannot be met, polyester resin encapsulated transformers are ideal. Typical Applications include: abnormally corrosive, damp, or dusty indoor or outdoor installations (industrial, commercial, residential). Examples include mining duty, pump house, pulp and paper, petrochemical, and steel industries, as well as mobile power assemblies.

Catalog Number & Application Notes



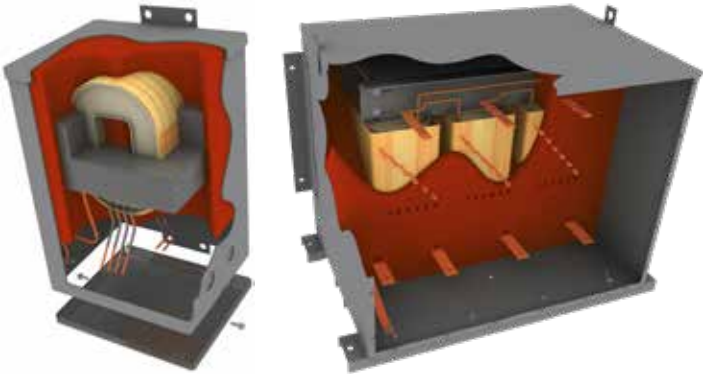
① - Encapsulated Transformer Type	
S	Single Phase
B	Three Phase

② - Conductor Material	
C	Copper
A	Aluminum (available 15 kVA and up)

- ③ - Base kVA Rating
- For Singe Phase: Select from standard kVA levels below, or any other level 0.25 - 125 kVA: 0.25, 0.5, 0.75, 1, 1.5, 2, 3, 5, 7.5, 10, 15, 25, 37.5, 50, 75, 100 (Note: Use 7 for 7.5, and 37 for 37.5.)
 - For Three Phase: Select from standard kVA levels below, or any other level 1 - 150 kVA: 1, 2, 3, 6, 9, 15, 30, 45, 75, 112.5. (Note: Use 112 for 112.5)

- ④&⑤ - Primary & Secondary Winding Voltage(s)
- Single phase: See page 2. Select letter code corresponding to the primary voltage from group 1. Secondary connection is commonly split; Select from group 2.
 - Three phase: See page 2. Select letter codes corresponding to the primary and secondary voltages from group 1 (delta connected) and/or group 3 (wye or star connected).
 - For a special voltage, use X and specify voltage.
 - Standard connection diagrams are the same as with non encapsulated transformers. For special connection or tapping, use X in ⑥.

- ⑥ - Optional Special Features
- EP must be listed in the part number
 - A variety of optional special features exist. These are noted in the specification (p.24). Some of the most commonly specified ones are noted on p.2.
 - There is no need for a suffix to denote efficiency level - Encapsulated transformers are exempt.



Construction Type 1
Singe Phase units
Wiring Compartment is located at underside

Construction Type 2
Three Phase units
Wiring Compartment is located at front

Construction

- A mixture of silica sand and polyester resin forms a solid block, encasing and protecting the core & coil, while significantly reducing audible noise.
- The polyester resin has a temperature class of 200. Class 220 insulation is used for coil insulation, however the temperature class must be considered to be Class 200 due to the presence of the polyester resin. Thus, the transformer is designed for 130 °C temperature rise. 115 °C rise, 80 °C rise, or other temperature rise levels may be specified.
- The core is solidly grounded (brought out to ground lug)
- Enclosure is constructed of heavy gauge steel with powder coated finish, suitable for type 3R or type 4 applications, indoor or outdoor. Optional stainless steel enclosures are recommended where the enclosure is exposed to severe corrosive environments.
- Transformer core & coil is designed and wound with unique attributes to optimize thermal performance.
- Wiring compartment is spacious, cool, and easily accessible. Bottom access is provided on smaller units (see type 1), and front access for larger units (see type 2).
- These epoxy transformers are considered suitable for “ordinary locations”; Transformers for “Hazardous Locations” as defined by IEC or CSA are available as well: Please see our catalog “Transformers for Hazardous Locations”
- Encapsulated transformers can be mated to primary & secondary protection, in a factory-wired and CSA/UL approved assembly: “Mini Power Center” - A dedicated brochure can be found at www.rexpowermagnetics.com
- Encapsulated transformers are exempt from DOE and NRCan requirements for efficiency level, however, encapsulated transformers are very efficient and most designs meet and exceed the requirements.

Encapsulated Transformer - Single & Three Phase - Option EP

Features & Specifications

Specification	Rex Standard	Optionally Available
Capacity	Single Phase: 0.25, 0.5, 0.75, 1, 1.5, 2, 3, 5, 7.5, 10, 15, 25, 37.5, 50, 75, 100 Three Phase: 1, 2, 3, 6, 9, 15, 30, 45, 75, 112.5, 150	For larger kVA, consider Totally Enclosed Non-Ventilated transformers, or Cast Coil Transformers.
Voltage class	1.2 kV (CSA), 600 V (UL)	Up to 5 kV available (CSA only)
Conductor	C - Copper or A - Aluminum	n/a
Cooling	Self cooled (ANC)	n/a
Frequency	60 Hz	50/60 Hz (use 50) .
Insulation System	Class 200 (200 °C at hottest spot, 130 °C average rise)	n/a
Temperature Rise	130 °C average rise	115 °C (use T115), 80 °C (use T80)
K Factor Rating	K1 - No K-Factor	Available K4, K9, K13, K20 (see page 32)
Impregnation	Encapsulated in silica sand and polyester resin	n/a
Efficiency level	No applicable efficiency compliance required	Efficiency levels may be specified (use ZX)
Taps	See Connection diagrams (Single Phase: p.9, Three Phase: p.13)	+2 FCAN, -4 FCBN taps (use W1) Other primary or secondary tap configurations (use X)
Connection diagram	See Connection diagrams (Single Phase: p.9, Three Phase: p.13)	Tertiary windings, alternate configurations (use X)
Terminations	Lugs or pads - see table (p.6)	Specific Cu-Al lugs available. (Use Y2)
Wiring	Wiring compartment located at underside or front. See construction diagrams, p. 25	Pad or lug location may be specified. Wiring compartment location may be specified. (use X)
Electrical Performance	Per page 5. Note: Encapsulated transformers typically have a higher inrush current (startup current) versus ventilated transformers	Special X/R ratio, Minimum Inrush current, Short Circuit Withstand capability, EMF intensivity, etc. (use X)
Impedance	Encapsulated transformers normally have a lower impedance value than ventilated transformers (approximately 1 - 2%)	Special impedance may be specified (use X)
Sound Level	Per CSA C9 and NEMA ST-20 (see p.6)	3 dB below CSA level, or other (use X)
Enclosure Type	CSA Type 3R outdoor	Type 4, non-ventilated (use E4)
Enclosure Material	Steel panels, Combination of 12, 14, & 16 ga	Other gauges, Stainless Steel 304, Stainless Steel 316L, Galvanneal
Enclosure Finish	ASA 61 Gray Powder Coat	Bare Stainless, special color/finish (use ESP)
Approvals	CSA Certified and UL Listed CSA File # LR34493 UL File # E108255	IEC (use CE), European or other spec, ABS, Lloyds Registry, Canadian Coast Guard, and more. Also see Hazardous Location Catalog
Thermostat	Not supplied	Available N.C.-185, N.C.-200, or other (use X)
Mounting	Floor only, or floor/wall, depending on size. See tables (p. 27, 28)	Special mounting available
Nameplate	Metallic Foil, English/French	Aluminum, Stainless Steel (use M)
Seismic	No approval (not tested as with ventilated transformers), however due to their fully encapsulated construction, they are well suited for environments where vibration may be present.	Rex can facilitate site specific Seismic approvals. Mason Super W pads, or other specified snubbers.
Testing	See page 5	Optional tests available, such as temperature-rise test, sound level, EMF, etc. (Ordered separately)
Shipping	Bolted to skid, with nylon cover	Shrink wrap, special skid, export crating
Optional Features	Special ambient temperature, Special altitude, Anti-Condensation Strip Heaters, Thermal Sensing and Indication (analog/digital), Surge protection, Breaker Integration, Power Monitoring, etc.	

Encapsulated Transformer - Single Phase - Option EP

Reference Charts - Electrical Performance - Type 3R and Type 4 enclosures

- The tables below provide typical standard values for encapsulated transformers with standard specification.
- Sample catalog numbers are shown for 600 V to 120/240 V. For other voltage codes, please see page 2.
 - The values reported below will not vary with the selection of special voltages, shielding, and some other options.
 - Special specifications such as higher K-Factor ratings and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for for application specific information.

Copper windings (Type SC.../EP) - No efficiency spec - Electrical Performance

kVA	Const. Type (see p.25)	Primary Taps	Standard Connection Diagram	Weight [lbs]	Enclosure Name	600 V : 120/240		
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>	
0.25	Type 1	none	1Ph0-NT-D0-1	17	E3R-1PEP-1	Leads	SC0.25J-K/EP	
0.5	Type 1	none	1Ph0-NT-D0-1	20	E3R-1PEP-1	Leads	SC0.5J-K/EP	
0.75	Type 1	none	1Ph0-NT-D0-1	23	E3R-1PEP-2	Leads	SC0.75J-K/EP	
1	Type 1	none	1Ph0-NT-D0-1	27	E3R-1PEP-2	Leads	SC1J-K/EP	
1.5	Type 1	none	1Ph0-NT-D0-1	40	E3R-1PEP-3	Leads	SC1.5J-K/EP	
2	Type 1	+/- 1 x 5%	1Ph0-NT-D0-1	45	E3R-1PEP-3	Leads	SC2J-K/EP	
3	Type 1	+/- 1 x 5%	1Ph0-NT-D0-1	55	E3R-1PEP-3	Leads	SC3J-K/EP	
5	Type 2	+/- 1 x 5%	1Ph0-ST1/1-D0-1	155	E3R-1PEP-4	LA/LA	SC5J-K/EP	
7.5	Type 2	+/- 1 x 5%	1Ph0-ST1/1-D0-1	210	E3R-1PEP-4	LA/LA	SC7.5J-K/EP	
10	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	230	E3R-1PEP-5	LA/LA	SC10J-K/EP	
15	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	296	E3R-1PEP-5	LA/LA	SC15J-K/EP	
25	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	310	E3R-1PEP-6	LA/LB	SC25J-K/EP	
37.5	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	625	E3R-1PEP-6	LA/LC	SC37.5J-K/EP	
50	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	750	E3R-1PEP-7	LA/LC	SC50J-K/EP	
75	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	960	E3R-1PEP-8	LB/LD	SC75J-K/EP	
100	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	1460	E3R-1PEP-8	LC/PADS	SC100J-K/EP	

Aluminum windings (Type SA.../EP) - No efficiency spec - Electrical Performance

kVA	Const. Type (see p.25)	Primary Taps	Standard Connection Diagram	Weight [lbs]	Enclosure Name	600 V : 120/240		
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>	
15	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	296	E3R-1PEP-5	LA/LA	SA15J-K/EP	
25	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	310	E3R-1PEP-6	LA/LB	SA25J-K/EP	
37.5	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	625	E3R-1PEP-6	LA/LC	SA37.5J-K/EP	
50	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	750	E3R-1PEP-7	LA/LC	SA50J-K/EP	
75	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	960	E3R-1PEP-8	LB/LD	SA75J-K/EP	
100	Type 2	+/- 2 x 2.5%	1Ph0-ST2/2-D0-2	1460	E3R-1PEP-8	LC/PADS	SA100J-K/EP	

Encapsulated Transformer - Single Phase - Option EP

Reference Charts - Dimensions - Type 3R and Type 4 enclosures

- The tables below provide typical standard values for three phase transformers with standard specification.
- The values reported below will not vary with the selection of special voltages, shielding, and some other options
 - Special specifications such as K-Factor Rating and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for application specific information.

Copper windings (Type SC.../EP) - No efficiency spec - Dimensions

kVA	Type 3R Outdoor						Type 4
	Mounting	Width [inch]	Depth [inch]	Height [inch]	Wall Mounting* d, A x B [inch]	Floor Mounting* d, C x E [inch]	
0.25	Wall	5.25	4.50	8.75	7/16", 10.0" x 2"	n/a	E4-1PEP-1
0.5	Wall	5.25	4.50	8.75	7/16", 10.0" x 2"	n/a	E4-1PEP-1
0.75	Wall	6.00	5.25	9.75	7/16", 11.0" x 2"	n/a	E4-1PEP-2
1	Wall	6.00	5.25	9.75	7/16", 11.0" x 2"	n/a	E4-1PEP-2
1.5	Wall	7.50	6.50	11.25	7/16", 12.5" x 2"	n/a	E4-1PEP-3
2	Wall	7.50	6.50	11.25	7/16", 12.5" x 2"	n/a	E4-1PEP-3
3	Wall	7.50	6.50	11.25	7/16", 12.5" x 2"	n/a	E4-1PEP-3
5	Floor/Wall	12.50	12.50	15.00	1/2", 14.0" x 8"	1/2", 9.5" x 14.0"	E4-1PEP-4
7.5	Floor/Wall	12.50	12.50	15.00	1/2", 14.0" x 8"	1/2", 9.5" x 14.0"	E4-1PEP-4
10	Floor/Wall	15.00	15.00	18.00	1/2", 10.0" x 16.5"	1/2", 16.5" x 10.0"	E4-1PEP-5
15	Floor/Wall	15.00	15.00	18.00	1/2", 10.0" x 16.5"	1/2", 16.5" x 10.0"	E4-1PEP-5
25	Floor/Wall	18.00	14.00	25.00	1/2", 14.0" x 19.5"	1/2", 19.5" x 11.0"	E4-1PEP-6
37.5	Floor/Wall	18.00	14.00	25.00	1/2", 14.0" x 19.5"	1/2", 19.5" x 11.0"	E4-1PEP-6
50	Floor	19.00	16.00	28.00	n/a	1/2", 20.5" x 13.0"	E4-1PEP-7
75	Floor	25.00	20.00	33.00	n/a	1/2", 26.5" x 17.0"	E4-1PEP-8
100	Floor	25.00	20.00	33.00	n/a	1/2", 26.5" x 17.0"	E4-1PEP-8

Aluminum windings (Type SA.../EP) - No efficiency spec - Dimensions

kVA	Type 3R Outdoor						Type 4
	Mounting	Width [inch]	Depth [inch]	Height [inch]	Wall Mounting* d, A x B [inch]	Floor Mounting* d, C x E [inch]	
15	Floor/Wall	15.00	15.00	18.00	1/2", 10.0" x 16.5"	1/2", 16.5" x 10.0"	E4-1PEP-5
25	Floor/Wall	18.00	14.00	25.00	1/2", 14.0" x 19.5"	1/2", 19.5" x 11.0"	E4-1PEP-6
37.5	Floor/Wall	18.00	14.00	25.00	1/2", 14.0" x 19.5"	1/2", 19.5" x 11.0"	E4-1PEP-6
50	Floor	19.00	16.00	28.00	n/a	1/2", 20.5" x 13.0"	E4-1PEP-7
75	Floor	25.00	20.00	33.00	n/a	1/2", 26.5" x 17.0"	E4-1PEP-8
100	Floor	25.00	20.00	33.00	n/a	1/2", 26.5" x 17.0"	E4-1PEP-8

* See diagrams at right for illustration of wall and floor mounting points.

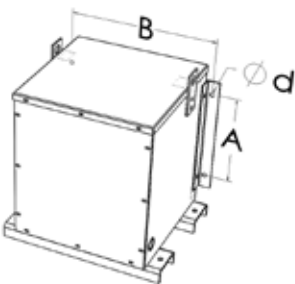


Diagram: Wall Mounting

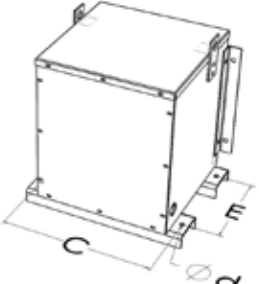


Diagram: Floor Mounting

Encapsulated Transformer - Three Phase - Option EP

Reference Charts - Electrical Performance - Type 3R and 4 enclosures

- The tables below provide typical standard values for encapsulated transformers with standard specification.
- Sample catalog numbers are shown for 600 V delta to 208Y/120 V. For other voltage codes, please see page 2.
 - The values reported below will not vary with the selection of special voltages, shielding, and some other options.
 - Special specifications such as higher K-Factor ratings and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for for application specific information.

Copper windings (Type BC.../EP) - No efficiency spec - Electrical Performance

kVA	Const. Type (see p.25)	Primary Taps	Standard Connection Diagram	Weight [lbs]	Enclosure Name	600 V : 208Y/120		
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>	
1.5	Type 2	none	3PDyn1-ST1/1	145	E3R-3PEP-1	LA/LA	BC1.5J-M/EP	
2	Type 2	none	3PDyn1-ST1/1	150	E3R-3PEP-1	LA/LA	BC2J-M/EP	
3	Type 2	+/- 1 x 5%	3PDyn1-ST1/1	175	E3R-3PEP-2	LA/LA	BC3J-M/EP	
6	Type 2	+/- 1 x 5%	3PDyn1-ST1/1	185	E3R-3PEP-2	LA/LA	BC6J-M/EP	
9	Type 2	+/- 1 x 5%	3PDyn1-ST1/1	240	E3R-3PEP-3	LA/LA	BC9J-M/EP	
15	Type 2	+/- 2 x 2.5%	3PDyn1-ST2/2	350	E3R-3PEP-4	LA/LA	BC15J-M/EP	
30	Type 2	+/- 2 x 2.5%	3PDyn1-ST2/2	520	E3R-3PEP-5	LA/LA	BC30J-M/EP	
45	Type 2	+/- 2 x 2.5%	3PDyn1-ST2/2	775	E3R-3PEP-6	LA/LB	BC45J-M/EP	
75	Type 2	+/- 2 x 2.5%	3PDyn1-ST2/2	1298	E3R-3PEP-7	LA/LC	BC75J-M/EP	
112.5	Type 2	+/- 2 x 2.5%	3PDyn1-CT2/2	1365	E3R-3PEP-8	LB/LD	BC112J-M/EP	
150	Type 2	+/- 2 x 2.5%	3PDyn1-CT2/2	2020	E3R-3PEP-9	LC/PADS	BC150J-M/EP	

Aluminum windings (Type BA.../EP) - No efficiency spec - Electrical Performance

kVA	Const. Type (see p.25)	Primary Taps	Standard Connection Diagram	Weight [lbs]	Enclosure Name	600 V : 208Y/120		
						Lugs (HV/LV)	Catalog # <i>Refer to page 2 for voltage codes</i>	
15	Type 2	+/- 2 x 2.5%	3PDyn1-ST2/2	350	E3R-3PEP-4	LA/LA	BA15J-M/EP	
30	Type 2	+/- 2 x 2.5%	3PDyn1-ST2/2	520	E3R-3PEP-5	LA/LA	BA30J-M/EP	
45	Type 2	+/- 2 x 2.5%	3PDyn1-ST2/2	775	E3R-3PEP-6	LA/LB	BA45J-M/EP	
75	Type 2	+/- 2 x 2.5%	3PDyn1-ST2/2	1298	E3R-3PEP-7	LA/LC	BA75J-M/EP	
112.5	Type 2	+/- 2 x 2.5%	3PDyn1-CT2/2	1365	E3R-3PEP-8	LB/LD	BA112J-M/EP	
150	Type 2	+/- 2 x 2.5%	3PDyn1-CT2/2	2100	E3R-3PEP-9	LC/PADS	BA150J-M/EP	

Encapsulated Transformer - Three Phase - Option EP

Reference Charts - Dimensions - Type 3R and Type 4 enclosures

- The tables below provide typical standard values for three phase transformers with standard specification.
- The values reported below will not vary with the selection of special voltages, shielding, and some other options
 - Special specifications such as K-Factor Rating and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for application specific information.

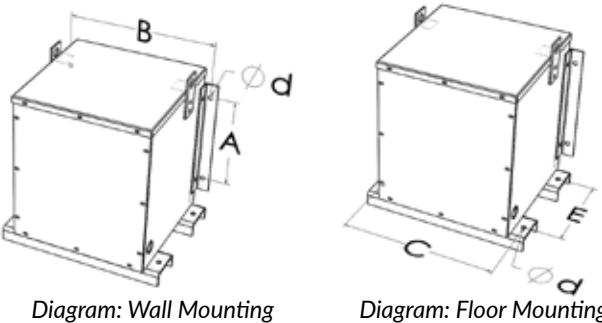
Copper windings (Type BC.../EP) - No efficiency spec - Dimensions

kVA	Type 3R Outdoor						Type 4	
	Mounting	Width [inch]	Depth [inch]	Height [inch]	Wall Mounting* d, A x B [inch]	Floor Mounting* d, C x E [inch]	Enclosure Name	Depth [inch]
1.5	Floor/Wall	11.00	10.00	15.25	1/2", 12.50" x 8"	7/16", 12.5" x 7"	E4-3PEP-1	12.00
2	Floor/Wall	11.00	10.00	15.25	1/2", 12.50" x 8"	7/16", 12.5" x 7"	E4-3PEP-1	12.00
3	Floor/Wall	15.00	11.00	15.25	1/2", 16.50" x 8"	1/2", 16.5" x 8"	E4-3PEP-2	13.00
6	Floor/Wall	15.00	11.00	15.25	1/2", 16.50" x 8"	1/2", 16.5" x 8"	E4-3PEP-2	13.00
9	Floor/Wall	18.00	12.50	17.00	1/2", 19.50" x 8"	5/8", 19.5" x 9.5"	E4-3PEP-3	14.50
15	Floor/Wall	21.00	14.00	17.50	5/8", 22.50" x 10.0"	1/2", 22.5" x 10.0"	E4-3PEP-4	16.00
30	Floor/Wall	21.00	18.00	20.00	5/8", 22.50" x 10.0"	1/2", 22.5" x 14.5"	E4-3PEP-5	20.00
45	Floor	26.00	18.00	25.00	n/a	1/2", 28.5" x 15.0"	E4-3PEP-6	20.00
75	Floor	32.00	18.00	30.00	n/a	1/2", 34.5" x 15.0"	E4-3PEP-7	20.00
112.5	Floor	36.00	25.00	32.00	n/a	1/2", 38.5" x 20.0"	E4-3PEP-8	27.00
150	Floor	36.00	25.00	36.00	n/a	1/2", 38.5" x 20.0"	E4-3PEP-9	27.00

Aluminum windings (Type BA.../EP) - No efficiency spec - Dimensions

kVA	Type 3R Outdoor						Type 4	
	Mounting	Width [inch]	Depth [inch]	Height [inch]	Wall Mounting* d, A x B [inch]	Floor Mounting* d, C x E [inch]	Enclosure Name	Depth [inch]
15	Floor/Wall	21.00	14.00	17.50	5/8", 22.50" x 10.0"	1/2", 22.5" x 10.0"	E4-3PEP-4	16.00
30	Floor/Wall	21.00	18.00	20.00	5/8", 22.50" x 10.0"	1/2", 22.5" x 14.5"	E4-3PEP-5	20.00
45	Floor	26.00	18.00	25.00	n/a	1/2", 28.5" x 15.0"	E4-3PEP-6	20.00
75	Floor	32.00	18.00	30.00	n/a	1/2", 34.5" x 14.5"	E4-3PEP-7	20.00
112.5	Floor	36.00	25.00	32.00	n/a	1/2", 38.5" x 20.0"	E4-3PEP-8	27.00
150	Floor	36.00	25.00	36.00	n/a	1/2", 38.5" x 20.0"	E4-3PEP-9	27.00

* See diagrams at right for illustration of wall and floor mounting points.



Electrostatic Shielding - Option S1, S2, S3

Background

Electrostatic (Faraday) Shielding is an optional feature for transformers which provides a degree of protection for sensitive electrical and electronic equipment from high frequency voltages (electrical noise) or transients. This feature is available on most isolation type transformers, including encapsulated & K-factor rated transformers. It is a relatively low cost means of protection from this type of power quality problem. Typical applications include computer and electronic loads, instrumentation, medical equipment, and industrial equipment (PLC, Process Control). Electrical noise is comprised of two types:
Normal mode: Noise which appears between the hot and neutral current carrying conductors.
Common mode: Noise which appears between both the hot and neutral conductor, relative to the ground. Common mode noise is more prevalent and should be the key criterion for any noise suppression device.

Features & Specifications

- The shielded transformer suppresses common mode noise thanks to the presence of a broad (full height) foil conductor that is wound in between the primary and secondary windings.
- The conductor material is typically selected to be the same as the winding material; copper or aluminum.
- The grounded shield provides a low-resistance path to ground by the effect of capacitive coupling. This prevents high frequency signals present in the source voltage from reaching the secondary of the transformer, and subsequently, the connected load.
- The electrostatic shield will not perform any function with regards to harmonic current or voltage distortion of waveforms.

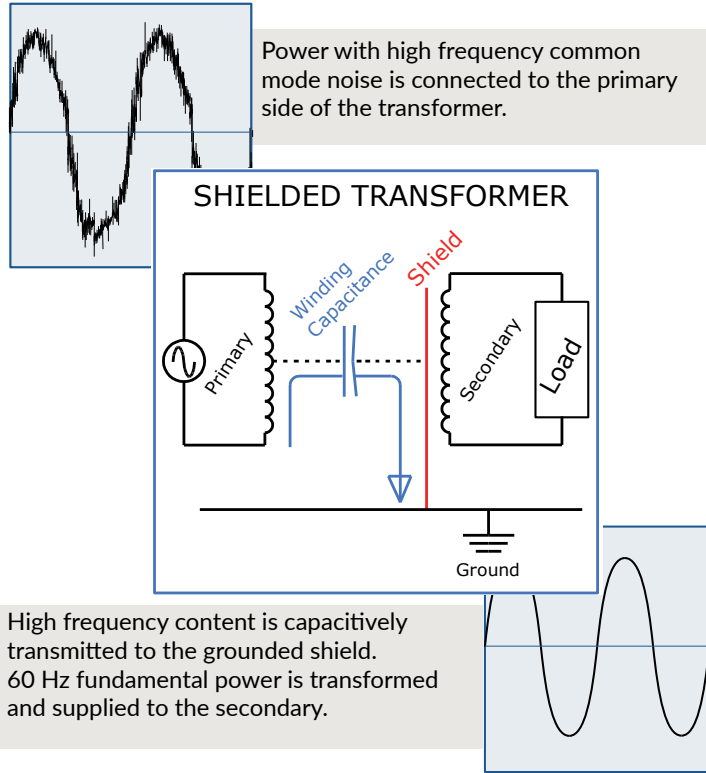
Construction	Suffix	Typical Attenuation range [dB] and [Ratio]
Transformer with no shield		12 dB min, 20 dB max 10:1
Single Shield - Between primary & secondary windings	S1	50 dB min, 65 dB max 1,000:1
Double Shield - As with S1, plus a shield between secondary and core	S2	60 dB min, 90 dB max 10,000:1
Triple Shield - As with S2, plus a shield surrounding primary	S3	90 dB min, 120 dB max 100,000:1
Ultra Isolating - Special shielding	X	120 dB min, 150 dB max 1,000,000:1



Photo: Electrostatic shield connection to the ground lug

Application Notes

- Four types of electrostatic shielding are available, offering incrementally greater degrees of common-mode noise attenuation.
- The ratio of the common mode noise attenuation is expressed in decibels (dB) or as a ratio.
- Use suffix “S1” or “S2” or “S3” or “X” in part number, as per Rex Catalog Number system
- The table below provides the typical attenuation with each type of shield.



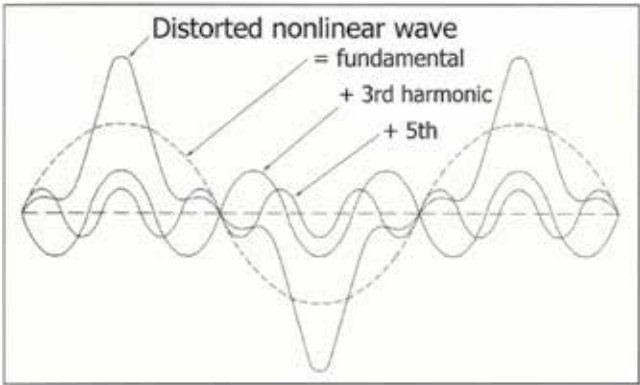
K-Factor Rated Transformer - Option K4, K9, K13, etc.

Background

Today's modern electronic devices, such as computers, copiers, printers, and display terminals utilize switching-mode power supplies, which are non-linear in the loading placed on the transformer. Systems designed without due consideration tend to exhibit significant power system problems, such as:

- Circuit breakers and fuses tripping far below their current ratings
- Neutrals in transformers and panel boards are much hotter than their ratings.
- Distribution transformers overheat, even when operating well within their specified nameplate ratings.

These problems are often the result of harmonics. The solid-state switching elements (SCRs, transistors, and capacitors) continually switch on and off to extract a Direct Current (DC) from the sinusoid. This reflects a higher frequency waveform on the supply line, which is a multiple of the fundamental frequency. These reflected signals become added to the original (fundamental) frequency. The result is a distorted voltage and current signal, with taller peaks and irregular shapes. The diagram below illustrates the typical distorted wave shape that is produced with the addition of 3rd order and 5th order harmonics



Example:
Fundamental frequency = 60 Hz
3rd Harmonic frequency = 3 x 60 = 180 Hz
5th Harmonic frequency = 5 x 60 = 300 Hz
Harmonic frequencies superimpose themselves upon the fundamental waveform, distorting it, and affecting the magnitude of its peaks.

The major components in the harmonic currents of switching mode power supplies are the third and the fifth harmonics. Harmonics which are even multiples of 3, such as the 3rd, 6th, 9th, etc are called triplen harmonics. When triplen harmonics are present in a 3 phase system, they add together in the neutral conductor. Third harmonics result in a large current flowing through the transformer neutral terminal. Furthermore, the harmonics amplify the eddy and stray losses in the transformer's core and coils. These effects cause the transformer to operate at significantly higher temperature, and at a lower efficiency.

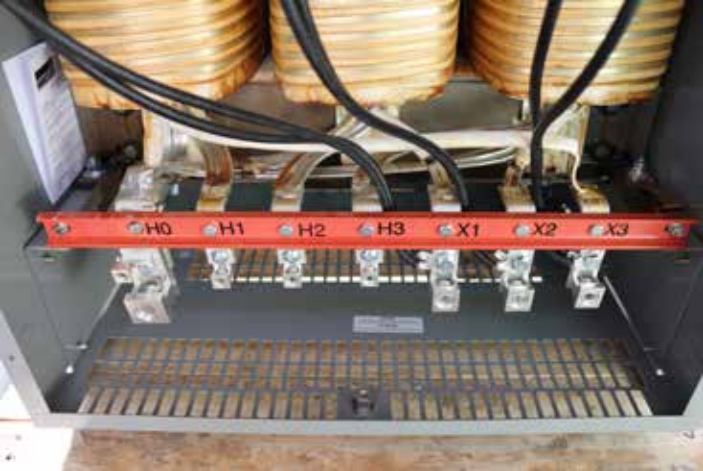


Photo: Double-Rated Neutral

Features & Specifications

The K-Factor rating of a transformer is an index of the transformer's ability to supply harmonic content in its load current while operating within its temperature limits. For dry type transformers, a “K-Factor” calculation is made to determine the amount of harmonic content present in a power system. K-Rated transformers are sized to handle 100% of the fundamental 60 Hz load, plus the non-linear loading level denoted by the K factor. The neutral of the transformer is sized at 200% of the current rating of the phase connections.

Application Notes

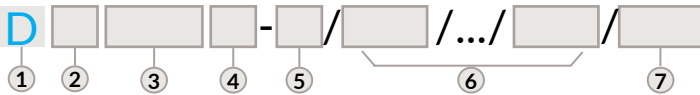
- A K-Factor may be specified on an isolation transformer, or encapsulated transformer
- Commonly specified K factors are K4, K9, K13, and K20.
- Use suffix “K4” or “K9” or “K13” or “K13” in part number, as per Rex Catalog Number system on page 2.

Drive Isolation Transformer (DIT) - Type D

Background

Drive Isolation Transformers (DIT) are specifically designed to meet the requirements of AC and DC variable speed drives or rectifier outputs. Standard DIT ratings are matched to standard motor horsepower ratings.

Catalog Number & Application Notes



① - 'D' Three Phase Isolation Transformer

② - Conductor Material

C	Copper
A	Aluminum (available 20 kVA and up)

③ - Base kVA Rating

- Select from standard 3 phase kVA levels below, or any other level 9 - 990 kVA: 9, 11, 14, 20, 27, 34, 40, 51, 63, 75, 93, 118, 145, 175, 220, 275, 330, 440, 550.

④&⑤ - Primary & Secondary Winding Voltage(s)

- See page 2: Select letter codes corresponding to the primary and secondary voltage from group 1 (delta connected) and/or group 3 (wye or star connected).
- For a special voltage, use X and specify voltage.
- Standard connection diagrams are the same as with 3 phase distribution transformers - See Page 13. For special connection or tapping, use X in ⑥

⑥ - Optional Special Features

- There is no need to specify K4 in the part number; For Drive isolation transformers, a K Factor Rating of 4 is standard. If K9, K13, or other is required, please specify.
- A variety of optional special features exist. These are noted in the specification (p.30). Some of the most commonly specified ones are noted on p.2.

⑦- Efficiency Level

- For drive isolation transformers that are intended for use in Canada, the suffix Z3 must be used to indicate compliance to NRCAN 2019.
- Drive isolation transformers that are intended for use in USA are exempted from DOE 2016 efficiency. Z3 may still be included, if higher efficiency is voluntarily required.



Photo: Enclosed Drive Isolation Transformer (Enclosure size E3R-8)

Features & Specifications

- Designed with due consideration to harmonics that are typical for drives. K Factor 4 is standard, with higher K Factor ratings available
- Braced to withstand the mechanical stresses associated with the current levels of SCR drives.
- Isolates the power source from noise generated by SCR voltage spikes and transient feedback.
- One Normally-Closed thermal contact is embedded into center coil, and brought out to a terminal block on the core frame. The thermal contact is 185 C for 115 C rise, and 200 C for 150 C rise.
- Limits the short circuit current of the system
- The neutral of the transformer is sized at 200% of the current rating of the phase connections.
- In USA, drive isolation transformers are exempt from minimum efficiency regulations. In Canada, drive isolation transformers are not exempt.

Drive Isolation Transformer (DIT) - Type D

Features & Specifications

Specification	Rex Standard	Optionally Available
Capacity	9, 11, 14, 20, 27, 34, 40, 51, 63, 75, 93, 118, 145, 175, 220, 275, 330, 440, 550	kVA's greater than 990 kVA are classified as power transformers.
Voltage class	1.2 kV (CSA), 600 V (UL)	Higher voltage classes are classified as power transformers
Conductor	C - Copper or A - Aluminum	n/a
Cooling	Self cooled (ANN)	ANC (Non ventilated units)
Frequency	60 Hz	50/60 Hz (use 50) .
Insulation System	Class 220 (220 °C at hottest spot, 150 °C average rise)	n/a
Temperature Rise	150 °C average rise	115 °C (use T115), 80 °C (use T80)
K Factor Rating	K4	Available K9, K13, K20 (see page 32)
Impregnation	Polyester Resin Dipped and Baked	Epoxy dipped and Baked Other custom specifications available
Efficiency level	DIT for Canada meet the NRCAN 2019. For USA, DIT are exempted from DOE 2016	Higher levels may be specified (use ZX)
Taps	See connection diagrams for 3 phase isolation transformers (p.13)	+2 FCAN, -4 FCBN taps (use W1) Other primary or secondary tap configurations (use X)
Connection diagram	See connection diagrams (p.13)	Tertiary windings, alternate configurations (use X)
Terminations	Lugs or pads - see table (p.6). The neutral of the transformer is sized at 200% of the current rating of the phase connections	Specific Cu-Al lugs available. (Use Y2)
Wiring	Terminals are on front or front/back.	Pad or lug location may be specified (use X)
Electrical Performance	Per page 5.	Special X/R ratio, Inrush current, Short Circuit Withstand capability, EMF intensity, etc. (use X)
Impedance	Per CSA C9	Special impedance may be specified (use X)
Sound Level	Per CSA C9 and NEMA ST-20 (see p.5, 31-34)	3 dB below CSA level, or other (use X)
Enclosure Type	CSA Type 3R indoor, see chart (p. 31 - 34)	<ul style="list-style-type: none">No enclosure, Core & Coil only (use C&C)CSA Type 3R Outdoor (use E3R)Type 4, non-ventilated (use E4)Type 12, ventilated dust-tight (use E12)Special dimensions and construction (use X)
Enclosure Material	Steel panels, Combination of 12, 14, & 16 ga	Other gauges, Stainless Steel 304, Stainless Steel 316L, Galvanneal, Aluminum.
Enclosure Finish	ASA 61 Gray Powder Coat	Bare Stainless, special color/finish (use ESP)
Approvals	CSA Certified and UL Listed CSA File # LR34493 (5kV Max, 900kVA Max) UL File # E108255 (600V Max, 750kVA Max)	IEC (use CE), European or other spec, ABS, Lloyds Registry, Canadian Coast Guard, and more. Also see Hazardous Location Catalog
Thermostat	One Normally-Closed thermal contact is embedded into center coil, and brought out to a terminal block on the core frame. The thermal contact is 185 C for 115 C rise, and 200 C for 150 C rise	Additional contacts, other temp levels (use X)
Mounting	Floor only, or floor/wall, depending on size. See tables (p. 31-34)	Special mounting available
Nameplate	Metallic Foil, English/French	Aluminum, Stainless Steel (use M)
Seismic	Canada Zone 6, USA Zone 4. See page 6 for more detail.	Rex can facilitate site specific Seismic approvals. Mason Super W pads, or other specified snubbers.
Testing	See page 5	Optional tests available, such as temperature-rise test, sound level, EMF, etc. (Ordered separately)
Shipping	Bolted to skid, with nylon cover	Shrink wrap, special skid, export crating
Optional Features	Special ambient temperature, Special altitude, Anti-Condensation Strip Heaters, Thermal Sensing and Indication (analog/digital), Surge protection, Breaker Integration, Power Monitoring, etc.	

Drive Isolation Transformer (DIT) - Type D - For U.S.A.

Reference Charts - Electrical Performance - Type 3R enclosures

The tables below provide typical standard values for drive isolation transformers with standard specification.

- Sample catalog numbers are shown for 460 V delta to 460Y/266 V. For other voltage codes, please see page 2.
- The values reported below will not vary with the selection of special voltages, shielding, and some other options.
- Special specifications such as higher K-Factor ratings and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for for application specific information.

Copper windings (Type DC) - No efficiency spec (for USA installation only)

Drive HP	kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	460 V : 460Y/266 V		
							Lugs (HV/LV)	Sample Catalog # <small>Refer to page 2 for voltage codes</small>	
5	9	n/a	5% - 6.5%	40	+/- 1 x 5%	3PDyn1-ST1/1	Terminal Block	DC9H1-P1	
8	11	n/a	5% - 6.5%	45	+/- 1 x 5%	3PDyn1-ST1/1	LA/LA	DC11H1-P1	
10	14	n/a	5% - 6.5%	45	+/- 1 x 5%	3PDyn1-ST1/1	LA/LA	DC14H1-P1	
15	20	n/a	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC20H1-P1	
20	27	n/a	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC27H1-P1	
25	34	n/a	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC34H1-P1	
30	40	n/a	3.5% - 5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC40H1-P1	
40	51	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC51H1-P1	
50	63	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC63H1-P1	
60	75	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LB	DC75H1-P1	
75	93	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LB	DC93H1-P1	
100	118	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/LC	DC118H1-P1	
125	145	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/LC	DC145H1-P1	
150	175	n/a	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/LC	DC175H1-P1	
200	220	n/a	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/LD	DC220H1-P1	
250	275	n/a	4% - 6%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DC275H1-P1	
300	330	n/a	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DC330H1-P1	
400	440	n/a	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DC440H1-P1	
500	550	n/a	4% - 6%	62	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DC550H1-P1	

Aluminum windings (Type DA) - No efficiency spec (for USA installation only)

Drive HP	kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	460 V : 460Y/266 V		
							Lugs (HV/LV)	Sample Catalog # <small>Refer to page 2 for voltage codes</small>	
15	20	n/a	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA20H1-P1	
20	27	n/a	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA27H1-P1	
25	34	n/a	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA34H1-P1	
30	40	n/a	3.5% - 5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA40H1-P1	
40	51	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA51H1-P1	
50	63	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA63H1-P1	
60	75	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LB	DA75H1-P1	
75	93	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LB	DA93H1-P1	
100	118	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/LC	DA118H1-P1	
125	145	n/a	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/LC	DA145H1-P1	
150	175	n/a	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/LC	DA175H1-P1	
200	220	n/a	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/LD	DA220H1-P1	
250	275	n/a	4% - 6%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DA275H1-P1	
300	330	n/a	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DA330H1-P1	
400	440	n/a	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DA440H1-P1	
500	550	n/a	4% - 6%	62	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DA550H1-P1	

Drive Isolation Transformer (DIT) - Type D - For U.S.A.

Reference Charts - Dimensions - Type 3R enclosures

The tables below provide typical standard values for drive isolation transformers with standard specification.

- The values reported below will not vary with the selection of special voltages, shielding, and some other options
- Special specifications such as higher K-Factor ratings and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for application specific information.

For additional enclosure details (such as mounting), consult page 8.

Copper windings (Type DC) - No efficiency spec (for USA installation only)

kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor	
	Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
9	Floor/Wall	15.75	16.00	21.00	150	E3R-4	Type 3R indoor	21.12	E3R-4-W
11	Floor/Wall	20.50	16.00	25.00	175	E3R-5	Type 3R indoor	21.62	E3R-5-W
14	Floor/Wall	20.50	16.00	25.00	205	E3R-5	Type 3R indoor	21.62	E3R-5-W
20	Floor/Wall	20.50	16.00	25.00	240	E3R-5	Type 3R indoor	21.62	E3R-5-W
27	Floor/Wall	20.50	20.75	30.00	270	E3R-6	Type 3R indoor	26.39	E3R-6-W
34	Floor/Wall	20.50	20.75	30.00	310	E3R-6	Type 3R indoor	26.39	E3R-6-W
40	Floor/Wall	20.50	20.75	30.00	350	E3R-6	Type 3R indoor	26.39	E3R-6-W
51	Floor/Wall	20.50	20.75	30.00	460	E3R-6	Type 3R indoor	26.39	E3R-6-W
63	Floor/Wall	24.50	21.75	36.00	515	E3R-7	Type 3R indoor	29.37	E3R-7-W
75	Floor/Wall	24.50	21.75	36.00	605	E3R-7	Type 3R indoor	29.37	E3R-7-W
93	Floor	30.75	33.40	44.00	790	E3R-8	Type 3R indoor	37.49	E3R-8-W
118	Floor	30.75	33.40	44.00	865	E3R-8	Type 3R indoor	37.49	E3R-8-W
145	Floor	30.75	33.40	44.00	980	E3R-8	Type 3R indoor	37.49	E3R-8-W
175	Floor	40.00	38.00	52.00	1310	E3R-9	Type 3R indoor	41.75	E3R-9-W
220	Floor	40.00	38.00	52.00	1420	E3R-9	Type 3R indoor	41.75	E3R-9-W
275	Floor	40.00	38.00	52.00	1745	E3R-9	Type 3R indoor	41.75	E3R-9-W
330	Floor	40.00	38.00	52.00	1895	E3R-9	Type 3R indoor	41.75	E3R-9-W
440	Floor	46.00	50.00	66.00	2495	E3R-10	Type 3R indoor	50.00	E3R-10-W
550	Floor	46.00	50.00	66.00	2665	E3R-10	Type 3R indoor	50.00	E3R-10-W

Aluminum windings (Type DA) - No efficiency spec (for USA installation only)

kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor	
	Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
20	Floor/Wall	20.50	16.00	25.00	250	E3R-5	Type 3R indoor	21.62	E3R-5-W
27	Floor/Wall	20.50	20.75	30.00	250	E3R-6	Type 3R indoor	26.39	E3R-6-W
34	Floor/Wall	20.50	20.75	30.00	280	E3R-6	Type 3R indoor	26.39	E3R-6-W
40	Floor/Wall	20.50	20.75	30.00	305	E3R-6	Type 3R indoor	26.39	E3R-6-W
51	Floor/Wall	20.50	20.75	30.00	400	E3R-6	Type 3R indoor	26.39	E3R-6-W
63	Floor/Wall	24.50	21.75	36.00	470	E3R-7	Type 3R indoor	29.37	E3R-7-W
75	Floor/Wall	24.50	21.75	36.00	510	E3R-7	Type 3R indoor	29.37	E3R-7-W
93	Floor	30.75	33.40	44.00	770	E3R-8	Type 3R indoor	37.49	E3R-8-W
118	Floor	30.75	33.40	44.00	825	E3R-8	Type 3R indoor	37.49	E3R-8-W
145	Floor	30.75	33.40	44.00	915	E3R-8	Type 3R indoor	37.49	E3R-8-W
175	Floor	40.00	38.00	52.00	1230	E3R-9	Type 3R indoor	41.75	E3R-9-W
220	Floor	40.00	38.00	52.00	1335	E3R-9	Type 3R indoor	41.75	E3R-9-W
275	Floor	40.00	38.00	52.00	1475	E3R-9	Type 3R indoor	41.75	E3R-9-W
330	Floor	40.00	38.00	52.00	1540	E3R-9	Type 3R indoor	41.75	E3R-9-W
440	Floor	46.00	50.00	66.00	2405	E3R-10	Type 3R indoor	50.00	E3R-10-W
550	Floor	46.00	50.00	66.00	2670	E3R-10	Type 3R indoor	50.00	E3R-10-W

Drive Isolation Transformer (DIT) - Type D - Canada

Reference Charts - Electrical Performance - Type 3R enclosures

The tables below provide typical standard values for drive isolation transformers with standard specification.

- Sample catalog numbers are shown for 575 V delta to 460Y/266 V. For other voltage codes, please see page 2.
- The values reported below will not vary with the selection of special voltages, shielding, and some other options.
- Special specifications such as higher K-Factor ratings and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for for application specific information.

Copper windings (Type DC) - NRCan 2019 (Canada) compliant

Drive HP	kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	575 V : 460Y/266 V			kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor	
							Lugs (HV/LV)	Sample Catalog # <small>Refer to page 2 for voltage codes</small>			Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
5	9	n/a	5% - 6.5%	40	+/- 1 x 5%	3PDyn1-ST1/1	Terminal Block	DC9J1-P1		9	Floor/Wall	15.75	16.00	21.00	150	E3R-4	Type 3R indoor	21.12	E3R-4-W
8	11	n/a	5% - 6.5%	45	+/- 1 x 5%	3PDyn1-ST1/1	LA/LA	DC11J1-P1		11	Floor/Wall	20.50	16.00	25.00	175	E3R-5	Type 3R indoor	21.62	E3R-5-W
10	14	n/a	5% - 6.5%	45	+/- 1 x 5%	3PDyn1-ST1/1	LA/LA	DC14J1-P1		14	Floor/Wall	20.50	16.00	25.00	205	E3R-5	Type 3R indoor	21.62	E3R-5-W
15	20	98.00%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC20J1-P1/Z3		20	Floor/Wall	20.50	16.00	25.00	290	E3R-5	Type 3R indoor	21.62	E3R-5-W
20	27	98.16%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC27J1-P1/Z3		27	Floor/Wall	20.50	20.75	30.00	320	E3R-6	Type 3R indoor	26.39	E3R-6-W
25	34	98.28%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC34J1-P1/Z3		34	Floor/Wall	20.50	20.75	30.00	355	E3R-6	Type 3R indoor	26.39	E3R-6-W
30	40	98.34%	3.5% - 5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC40J1-P1/Z3		40	Floor/Wall	20.50	20.75	30.00	370	E3R-6	Type 3R indoor	26.39	E3R-6-W
40	51	98.44%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC51J1-P1/Z3		51	Floor/Wall	20.50	20.75	30.00	450	E3R-6	Type 3R indoor	26.39	E3R-6-W
50	63	98.52%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DC63J1-P1/Z3		63	Floor/Wall	24.50	21.75	36.00	635	E3R-7	Type 3R indoor	29.37	E3R-7-W
60	75	98.60%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LB	DC75J1-P1/Z3		75	Floor/Wall	24.50	21.75	36.00	585	E3R-7	Type 3R indoor	29.37	E3R-7-W
75	93	98.67%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LB	DC93J1-P1/Z3		93	Floor	30.75	33.40	44.00	880	E3R-8	Type 3R indoor	37.49	E3R-8-W
100	118	98.75%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LC	DC118J1-P1/Z3		118	Floor	30.75	33.40	44.00	930	E3R-8	Type 3R indoor	37.49	E3R-8-W
125	145	98.82%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/LC	DC145J1-P1/Z3		145	Floor	30.75	33.40	44.00	1080	E3R-8	Type 3R indoor	37.49	E3R-8-W
150	175	98.87%	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/LC	DC175J1-P1/Z3		175	Floor	40.00	38.00	52.00	1350	E3R-9	Type 3R indoor	41.75	E3R-9-W
200	220	98.93%	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/LD	DC220J1-P1/Z3		220	Floor	40.00	38.00	52.00	1630	E3R-9	Type 3R indoor	41.75	E3R-9-W
250	275	98.99%	4% - 6%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/PADS	DC275J1-P1/Z3		275	Floor	40.00	38.00	52.00	1985	E3R-9	Type 3R indoor	41.75	E3R-9-W
300	330	99.04%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/PADS	DC330J1-P1/Z3		330	Floor	40.00	38.00	52.00	2340	E3R-9	Type 3R indoor	41.75	E3R-9-W
400	440	99.10%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DC440J1-P1/Z3		440	Floor	46.00	50.00	66.00	2925	E3R-10	Type 3R indoor	50.00	E3R-10-W
500	550	99.16%	4% - 6%	62	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DC550J1-P1/Z3		550	Floor	46.00	50.00	66.00	3595	E3R-10	Type 3R indoor	50.00	E3R-10-W

Aluminum windings (Type DA) - NRCan 2019 (Canada) compliant

Drive HP	kVA	Efficiency (35% load, 75 °C)	Impedance	Average Sound Level [dB]	Primary Taps	Standard Connection Diagram	575 V : 460Y/266 V			kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor	
							Lugs (HV/LV)	Sample Catalog # <small>Refer to page 2 for voltage codes</small>			Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
15	20	98.00%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA20J1-P1/Z3		20	Floor/Wall	20.50	16.00	25.00	260	E3R-5	Type 3R indoor	21.62	E3R-5-W
20	27	98.16%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA27J1-P1/Z3		27	Floor/Wall	20.50	20.75	30.00	305	E3R-6	Type 3R indoor	26.39	E3R-6-W
25	34	98.28%	3.5% - 5.5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA34J1-P1/Z3		34	Floor/Wall	20.50	20.75	30.00	350	E3R-6	Type 3R indoor	26.39	E3R-6-W
30	40	98.34%	3.5% - 5%	45	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA40J1-P1/Z3		40	Floor/Wall	20.50	20.75	30.00	370	E3R-6	Type 3R indoor	26.39	E3R-6-W
40	51	98.44%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA51J1-P1/Z3		51	Floor/Wall	20.50	20.75	30.00	435	E3R-6	Type 3R indoor	26.39	E3R-6-W
50	63	98.52%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LA	DA63J1-P1/Z3		63	Floor/Wall	24.50	21.75	36.00	565	E3R-7	Type 3R indoor	29.37	E3R-7-W
60	75	98.60%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LA/LB	DA75J1-P1/Z3		75	Floor/Wall	24.50	21.75	36.00	620	E3R-7	Type 3R indoor	29.37	E3R-7-W
75	93	98.67%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LB	DA93J1-P1/Z3		93	Floor	30.75	33.40	44.00	825	E3R-8	Type 3R indoor	37.49	E3R-8-W
100	118	98.75%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LB/LC	DA118J1-P1/Z3		118	Floor	30.75	33.40	44.00	965	E3R-8	Type 3R indoor	37.49	E3R-8-W
125	145	98.82%	3.5% - 5%	50	+/- 2 x 2.5%	3PDyn1-ST2/2	LC/LC	DA145J1-P1/Z3		145	Floor	30.75	33.40	44.00	1090	E3R-8	Type 3R indoor	37.49	E3R-8-W
150	175	98.87%	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/LC	DA175J1-P1/Z3		175	Floor	40.00	38.00	52.00	1650	E3R-9	Type 3R indoor	41.75	E3R-9-W
200	220	98.93%	3.5% - 5%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LC/LD	DA220J1-P1/Z3		220	Floor	40.00	38.00	52.00	1960	E3R-9	Type 3R indoor	41.75	E3R-9-W
250	275	98.99%	4% - 6%	55	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/PADS	DA275J1-P1/Z3		275	Floor	40.00	38.00	52.00	2070	E3R-9	Type 3R indoor	41.75	E3R-9-W
300	330	99.04%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	LD/PADS	DA330J1-P1/Z3		330	Floor	40.00	38.00	52.00	2600	E3R-9	Type 3R indoor	41.75	E3R-9-W
400	440	99.10%	4% - 6%	60	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DA440J1-P1/Z3		440	Floor	46.00	50.00	66.00	3100	E3R-10	Type 3R indoor	50.00	E3R-10-W
500	550	99.16%	4% - 6%	62	+/- 2 x 2.5%	3PDyn1-CT2/2	PADS	DA550J1-P1/Z3		550	Floor	46.00	50.00	66.00	3840	E3R-10	Type 3R indoor	50.00	E3R-10-W

Drive Isolation Transformer (DIT) - Type D - For Canada

Reference Charts - Dimensions - Type 3R enclosures

The tables below provide typical standard values for drive isolation transformers with standard specification.

- The values reported below will not vary with the selection of special voltages, shielding, and some other options
- Special specifications such as higher K-Factor ratings and Temperature Rise may affect dimensions and the values below; Contact Rex Sales for application specific information.

For additional enclosure details (such as mounting), consult page 8.

Copper windings (Type DC) - NRCan 2019 (Canada) compliant

kVA	Standard Indoor Enclosure (Type 1 or Type 3R Indoor)							Type 3R Outdoor	
	Mounting	Width [inch]	Depth [inch]	Height [inch]	Weight [lbs]	Enclosure Name	Type	Depth [inch]	Enclosure Name
9	Floor/Wall	15.75	16.00	21.00	150	E3R-4	Type 3R indoor	21.12	E3R-4-W
11	Floor/Wall	20.50	16.00	25.00	175	E3R-5	Type 3R indoor	21.62	E3R-5-W
14	Floor/Wall	20.50	16.00	25.00	205	E3R-5	Type 3R indoor	21.62	E3R-5-W
20	Floor/Wall	20.50	16.00	25.00	290	E3R-5	Type 3R indoor	21.62	E3R-5-W
27	Floor/Wall	20.50	20.75	30.00	320	E3R-6	Type 3R indoor	26.39	E3R-6-W
34	Floor/Wall	20.50	20.75	30.00	355	E3R-6	Type 3R indoor	26.39	E3R-6-W
40	Floor/Wall	20.50	20.75	30.00	370	E3R-6	Type 3R indoor	26.39	E3R-6-W
51	Floor/Wall	20.50	20.75	30.00	450	E3R-6	Type 3R indoor	26.39	E3R-6-W
63	Floor/Wall	24.50	21.75	36.00	635	E3R-7	Type 3R indoor	29.37	E3R-7-W
75	Floor/Wall	24.50	21.75	36.00	585	E3R-7	Type 3R indoor	29.37	E3R-7-W
93	Floor	30.75	33.40	44.00	880	E3R-8	Type 3R indoor	37.49	E3R-8-W
118	Floor	30.75	33.40	44.00	930	E3R-8	Type 3R indoor	37.49	E3R-8-W
145	Floor	30.75	33.40	44.00	1080	E3R-8	Type 3R indoor	37.49	E3R-8-W
175	Floor	40.00	38.00	52.00	1350	E3R-9	Type 3R indoor	41.75	E3R-9-W
220	Floor	40.00	38.00	52.00	1630	E3R-9	Type 3R indoor	41.75	E3R-9-W
275	Floor	40.00	38.00	52.00	1985	E3R-9	Type 3R indoor	41.75	E3R-9-W
330	Floor	40.00	38.00	52.00	2340	E3R-9	Type 3R indoor	41.75	E3R-9-W
440	Floor	46.00	50.00	66.00	2925	E3R-10	Type 3R indoor	50.00	E3R-10-W
550	Floor	46.00	50.00	66.00	3595	E3R-10	Type 3R indoor	50.00	E3R-10-W



Our full range of dry type products

General Purpose Transformers
Distribution/Isolation, CE Marked
Autotransformers
K Factor-Rated, Drive Isolation
Electrostatically Shielded / Ultra Isolating
Motor Starting Auto Transformers
Specialty Transformers
Non-standard voltages & vector diagram
Encapsulated / Potted transformers
Marine Duty (with applicable certificates)
Power transformers (up to 15 MVA, 200 kV BIL)
VPI/VPE/Cast Coil, Snubbers
Transformers for Hazardous Locations
Mini Power Centers

Input & Output Reactors
Motor Guarding Transient Filters
DC Chokes, Saturable-Core Reactors
Inter-Bridge Reactors
Air Core Reactors
NEMA -1, -2, 3R, 4, 4X, 12
Stainless Steel 304 & 316
Specialty Industrial Enclosures
Transformer Cores
Snubbers (RC) with/without monitoring
Low & High Voltage Standoffs, Insulators
Surge (lightning) Arresters
Testing, Refurbishment, & Repair
Replacement of windings, core, etc.

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Toll Free USA/Canada: 1 (800) 387-2840
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sales@rexpowermagnetics.com

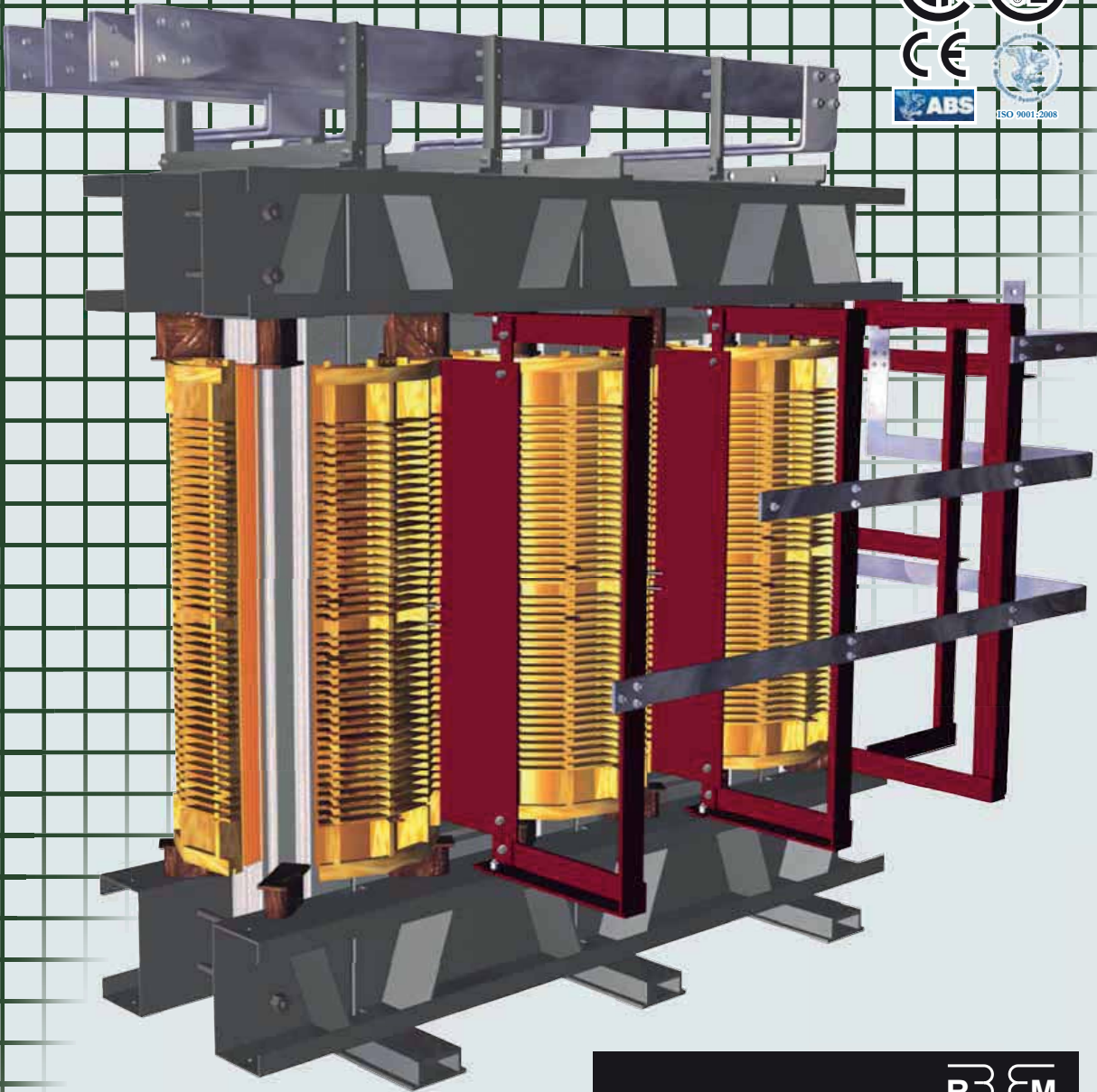
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Find us on:



DRY TYPE POWER TRANSFORMERS

VACUUM PRESSURE EPOXY IMPREGNATION • CAST COIL



A Division of Transfactor Industries Inc.
Concord, Ontario, Canada

REX POWER MAGNETICS

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Rex Power Magnetics is proud to have been recognized as one of
Canada's 50 Best Managed Companies



Rex Power Magnetics, established in 1972 is an ISO 9001 registered **leading manufacturer** of CSA certified and UL listed **custom dry type Transformers**. Rex is driven by **technology, innovation, and customer service**, and has a track record of sustained profitable growth. With a central and integrated engineering, manufacturing, and customer service facility located just north of Toronto, Ontario, Canada, and warehouses throughout Canada and the United States, the company offers a **broad range of dry type power magnetic products** to markets throughout North America and internationally.

The Rex product line includes custom designed specialty transformers, Power Transformers up to 15 MVA and 46 kV, distribution transformers, reactors, autotransformers, control and machine tool transformers, custom enclosures, custom cut electrical steel cores, and other power magnetic products and services. Supported by considerable and **sustained investment in research and development**, new and automated equipment, and efficient processes Rex Power Magnetics continually expands and enhances its product and service offering.

We pride ourselves: firstly in our **superior delivery responsiveness** supported by our passion for customer service and our vertically integrated in-house design, manufacture, and testing capabilities; and secondly in our **Technology leadership** supported by our industry leading R&D effort, engineering expertise, technical competence, and manufacturing know-how.

APPLICATIONS FOR MEDIUM VOLTAGE DRY TYPE POWER TRANSFORMERS

Rex dry type power transformers are primarily designed for stepping down high voltages from transmission and distribution systems to lower voltages for commercial and industrial, institutional, or utility applications. They are ideally suited for both indoor and outdoor applications.

Dry type power transformers require minimal maintenance to provide many years of reliable trouble free service. Unlike liquid filled transformers, which are cooled with oil or a fire resistant liquid dielectric, dry type units utilize only environmentally safe, CSA and UL recognized high temperature insulation systems. Every dry type design provides a safe and reliable power source that does not require fire proof vaults, catch basins or the venting of toxic gasses. These important safety factors allow the installation of dry type transformers inside buildings close to the load, which improves overall system regulation and reduces costly secondary line losses.

Rex Power Magnetics provides quality dry type power transformers up to 15 MVA at 46 kV and 200 kV BIL. Some of their applications are:

- **Power Distribution**
- **Indoor or Outdoor Primary and Secondary Unit Substations**
- **Grounding Transformers**
- **Mining, Pulp, and Paper Application Transformers**
- **Corrosion Resistant Transformers for Marine Power Distribution**
- **Low Electromagnetic Field Emission Transformers For Hospital and Institutional Use**
- **Traction Power Rectifier Transformers for Transit Systems**
- **Motor Starting & Drive System Applications**
- **High-Harmonic and Intermittent-Load Applications**
- **Snubbers; Transformers equipped with snubbers for suppression of Transient Voltage Resonance due to switching**



REX POWER MAGNETICS' TECHNICAL CAPABILITY

Rex Power Magnetics has the engineering capability to design, manufacture, and test all standard and specialty dry type transformers, related magnetic products, and power transformers rated up to 15 MVA and 200 kV BIL. All Rex products are CSA certified and most are UL listed, including power transformers. CE marking and ABS marking are also available.

Rex Power Magnetics maintains a complete sheet metal fabrication and paint facility to produce its own transformer enclosures, core clamps, brackets, and accessories, as well as manufactured custom enclosures.

The Rex engineering and design team consists of highly competent and qualified individuals with many years of transformer design experience.

STANDARD REX POWER TRANSFORMER DESIGNS

Cast Coil Transformers: The ultimate dry type transformer for use in harsh environments.

Drive Isolation Transformers: Specifically designed to meet the requirements of AC and DC variable speed drives or rectifier loads. Available in 6-pulse, 12-pulse, 18-pulse, and 24-pulse.

Electrostatically Shielded Transformers: Designed to protect systems from high-frequency transients that occur due to switching and loading on distribution lines.

Energy Efficient Transformers (Green Star): Designed to perform with lower than standard conductor and total losses which result in greater life expectancy, lower operating costs, and significant overload capabilities. Rex Power Magnetics Transformers are built to meet and exceed CSA C802 and NEMA TP-1 (DOE) standards.

Non-Linear Load (K-factor Rated): Power transformers for use where harmonic currents are present. Available in all ratings, for example K4, K9, K13, K20, K30, etc.

Low E.M.F. Emission Transformers: Designed to allow very low electromagnetic field emission outside of the enclosure.

Low Sound-Level Transformers: Designed to emit lower than normal audible hum.

Special Frequency Designs: Can operate at frequencies other than 60Hz.

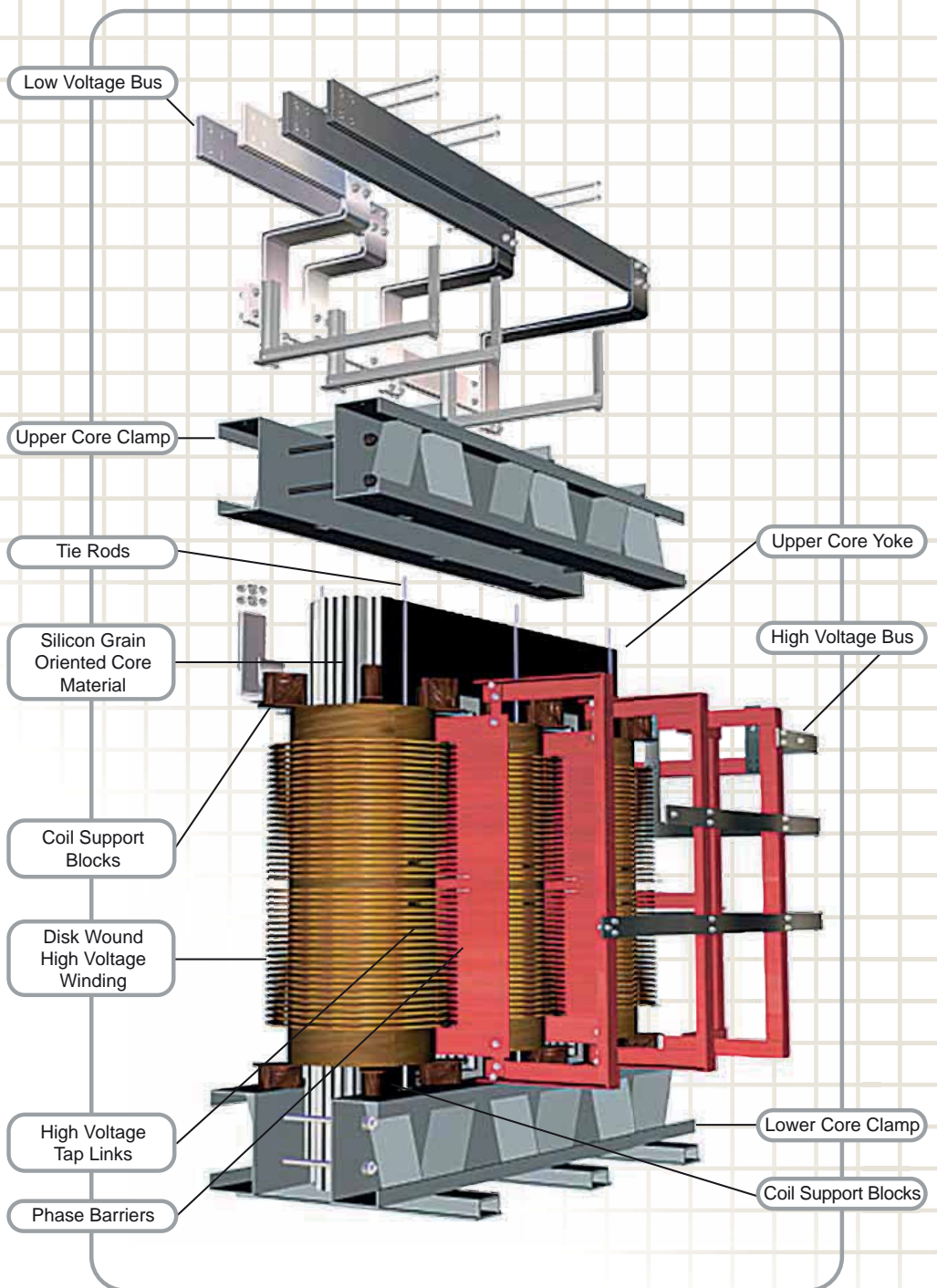
VPI and Epoxy Dipped Windings: All Rex Power Magnetics transformers windings are vacuum pressure impregnated with polyester resin. For applications with harsh operating conditions or where airborne contaminants are present an epoxy resin coating can be added to the polyester impregnated coils.

OPTIONAL ACCESSORIES:

- Provisions for future fans or fan packages completely installed with or without control power
- Bus coordination with primary and secondary switchgear
- Dial type or digital thermometers to monitor winding temperatures
- Neutral grounding resistors and monitors
- Strip heaters to avoid condensation when the transformer is not energized
- Ground fault relays
- Anti-vibration mountings to reduce transmission of vibration to the surrounding structure
- Provision for seismic mounting or seismic snubbers and restraints
- Lighting arrestors: distribution, intermediate, or station class
- Provisions for rolling, skidding, and lifting
- Provisions for bus duct entry
- Mimic bus
- Key interlock systems
- Fully insulated bus
- Special enclosures, NEMA 1, NEMA 3R (with or without filters), NEMA 4, NEMA 12; special paint or material



TYPICAL CONSTRUCTION OF A MEDIUM VOLTAGE POWER TRANSFORMER



COIL CONSTRUCTION

Rex power transformers utilize either barrel or disk wound coil construction. Winding type selection is determined by the design, which will provide the optimum combination of short circuit strength, impulse distribution, and dielectric withstand characteristics. All windings are insulated to withstand surge voltages and basic impulse level. Primary windings are manufactured of high quality Nomex wrapped copper or aluminum conductor.

Low voltage windings may be strip (foil) wound and are constructed to be electrically balanced to reduce axial short circuit forces.

BARREL WINDINGS:

This construction consists of progressively wound turns of magnet wire from one end of the coil to the other. Layers are electrically insulated by solid sheet insulation and cooling ducts.

DISK WINDINGS:

This construction is achieved by winding the conductor into slotted spacers (combs) that are arranged around the circumference of the coil. The continuous series-connected disk winding provides a high capacitance which improves the distribution of the impulse wave throughout the winding. Cooling efficiency is also maximized by exposing a large surface area of the conductor to the air.



VACUUM PRESSURE IMPREGNATION (VPI)

Subjecting coil windings to VPE treatment ensures that Rex Power transformers have outstanding electrical, thermal, and mechanical properties.

At the conclusion of the winding process, the completed transformer coil is prepared for impregnation by preheating to reduce moisture. The drying process is completed when the coil is subjected to full vacuum in a vacuum chamber removing all the moisture absorbed by the insulation from the atmosphere.

A clear, low-viscosity high temperature epoxy resin (Class 220°C) is introduced into the tank under vacuum, eliminating any air bubbles in the resin. When the winding is completely submerged, pressure is applied forcing the resin into all winding spaces and voids in the turn-to-turn and layer-to-layer insulation.

The vacuum/pressurization cycle is repeated four times to achieve full resin penetration. The coil is then removed from the chamber and placed in a baking oven to cure the resin. The entire vacuum impregnation process is repeated twice to ensure a uniform protective, hard and impermeable coating is formed on all exposed surfaces of the winding.

As an option and for greater protection, the coils can be coated with an additional layer of high-viscosity heat-cured epoxy resin.

INSULATION

The life span of the insulation is the main determinant in the longevity of the transformer. The working temperature of the transformer affects the life of the insulation. This working temperature is a combination of the *temperature rise* of the unit, the ambient temperature, and the *hot-spot temperature rise*.

Rex power transformers are manufactured with UL listed Class 220°C insulation. Only high temperature resistant materials of the best quality are used, including Nomex Aramid papers, silicone or polyester coated fiber-glass, Nomex sleeving, glass tapes and polyester/glass duct sticks.

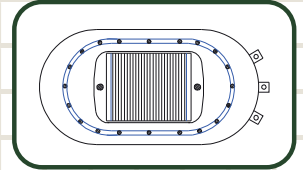
CORE CONSTRUCTION

Every Rex power transformer core is constructed from electrical grade, cold-rolled grain-oriented silicon steel of M5 grade or better. Grain-oriented steel is utilized for its superior magnetic permeability, low hysteresis, and eddy current losses. Steel is cut into individual laminations on automated cutting machines to ensure precise and consistent dimensions.

Core laminations are meticulously stacked on specially designed jig tables. The individual laminations of the core are then clamped together by structural grade steel core clamps. Once the core is complete, an epoxy coating is applied to guard against corrosion. Cores are of either a rectangular or cruciform configuration. The core configuration is a design consideration chosen to optimize efficiency and dimensional factors. With either configurations, either the butt lap stacking method or the full mitre stacking method can be utilized.

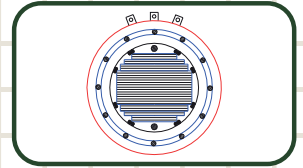
RECTANGULAR CORE

This configuration is used mainly for smaller units constructed with layer wound coils.



CRUCIFORM CORE

This configuration is utilized mainly for large round windings. The core shape is stepped to give as close as possible coupling with the round coils, which inherently have higher short circuit capability.



POWER TRANSFORMER LOSSES:

Losses of transformer mainly consist of:

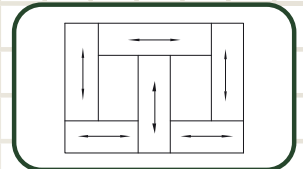
1. Conductor losses which are proportional to the load and vary with loading.
2. Core losses which are constant and are present as long as the transformer is energized.

Since most transformers are energized at all times, regardless of the loading, it is therefore evident that reducing the core losses will result in significant energy and cost savings.

CORE STACKING METHODS:

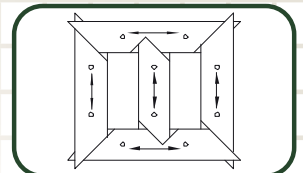
BUTT LAP CUT (*Good Efficiency*)

Consists of rectangular pieces of core steel arranged in such a way so that the grain orientation of the steel is along the flux path except in the corners where the flux path changes direction from the legs to the yoke members.



FULL AND STEP LAP MITRE (*Best Efficiency*)

This type of core cutting and stacking ensures that the overlapping of the joints in the corners are mitred and staggered so that the best possible grain orientation and flux transition is achieved. By avoiding crowding of the flux lines, low core losses are achieved and therefore the best efficiency.



CAST COIL DRY TYPE TRANSFORMERS

The unique design and manufacturing process of cast coil type transformers offers several key advantages over liquid filled or conventional dry type transformers. Specifically, cast coil type transformers are environmentally safe units, providing long uninterrupted service in the most demanding applications and under the most severe conditions.

The most important distinguishing feature of the cast coil transformer design is that the primary and (optionally) secondary coils are solidly vacuum-cast in epoxy resin. The casting process effectively locks the windings in a very strong, high-dielectric resin which protects the transformer from extremely severe environments and electrical demands. During the casting process, the coil windings — layered with absorbent fiberglass — are fully and completely impregnated with the epoxy resin. The result is a coil construction which provides the following key features:

SUITABILITY FOR HARSH ENVIRONMENTS

Cast coil type transformers offer the greatest degree of protection against the presence of moisture and atmospheric pollutants affecting the performance and life expectancy of dry type transformers.

HIGH SHORT CIRCUIT STRENGTH

The fiberglass reinforced solid cast construction provides superior mechanical strength with the highest short circuit withstand capability of all transformer types including that of liquid filled units.

HIGH OVERLOAD CAPABILITY

Due to the longer thermal time-constant of cast coils in comparison with conventional ventilated dry type transformers, higher short-time overload capabilities are possible.

ENVIRONMENTALLY FRIENDLY

Cast coil transformers contain only chemically non hazardous materials.

SAFETY

Cast coil transformers are self extinguishing, virtually eliminating the possibility of fire or explosion. Installations do not require special fire protection systems.

HIGH IMPULSE VOLTAGE STRENGTH

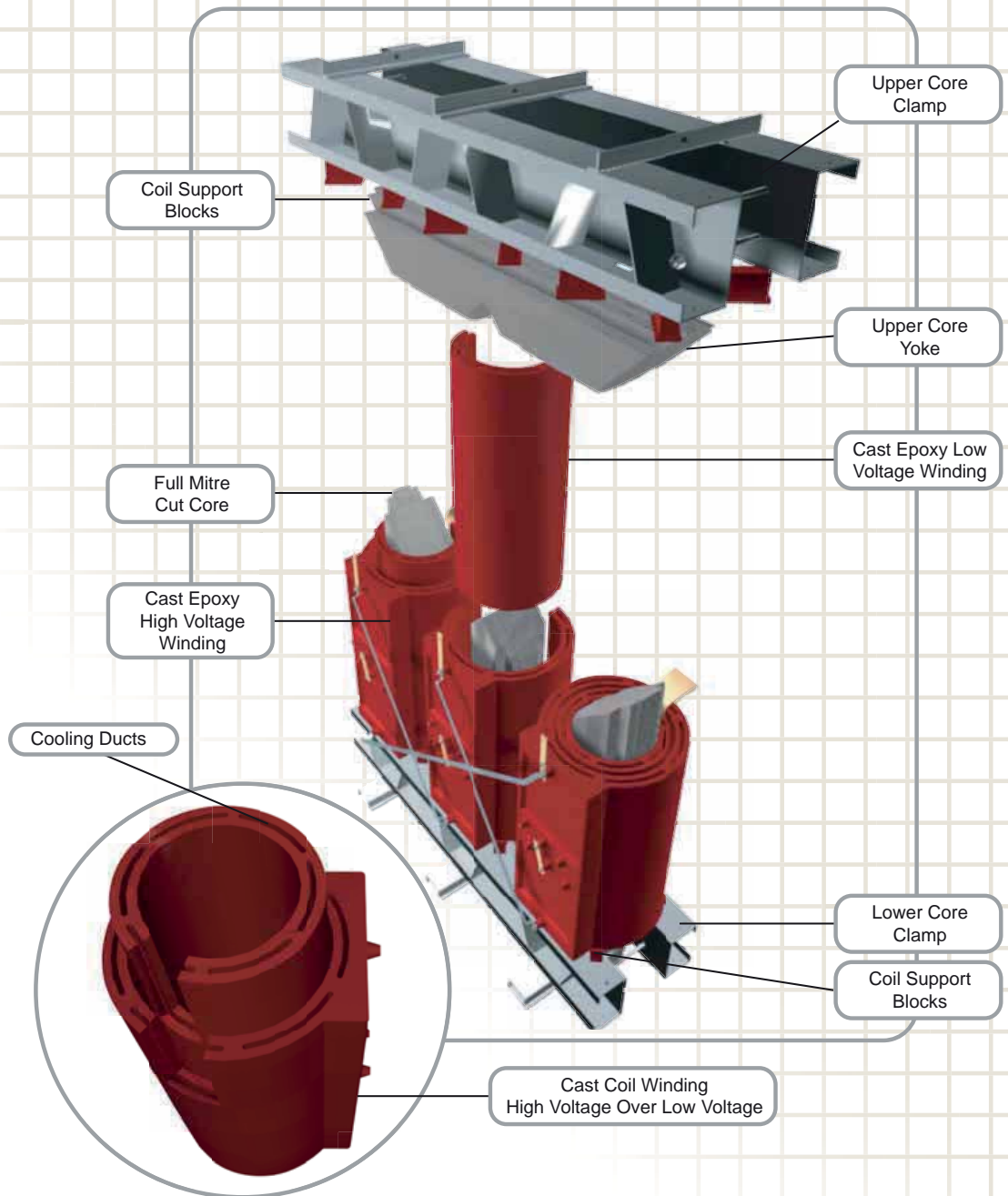
The impulse voltage withstand capability of cast coil transformers is higher than conventional dry types and is comparable to liquid filled units.

LOW MAINTENANCE

Cast coil type transformers are virtually maintenance free due to the smooth crevice-free construction of the coils. With proper precautions cast coil units can be installed at ambient temperatures as low as -50°C.



TYPICAL CONSTRUCTION OF A CAST COIL TRANSFORMER:



DESIGN AND CONSTRUCTION FEATURES OF CAST COIL TRANSFORMERS

- The primary and secondary windings are magnetically and electrically balanced to minimize mechanical stresses due to short circuits and momentary overloads, especially those due to axial forces.
- Unique coil construction techniques are used to reduce the dielectric stresses due to uneven distribution during impulse. The dielectric stresses are such that partial discharges are virtually non-existent at 180% overvoltage. The basic construction of the cast resin has high permittivity material in the series capacitance paths. The result is a more linear distribution of impulse voltages.
- The epoxy used in casting the coils is a two-part very low viscosity resin with excellent penetration capabilities and superior thermal shock performance. Extensive use of fiberglass reinforcement during coil construction enhances the strength and crack-resistance of the finished coils.
- Conductor and inter-layer insulation used during coil construction are Aramid paper (Nomex) and the casting epoxy resin is CSA & UL approved for use in 180°C systems.
- Each coil is preheated in its casting mold which must be specifically designed to withstand vacuum. The preheated mixed epoxy is then introduced under high vacuum into the mold. The procedure of pulling vacuum directly into the mold ensures the great penetration and most void-free casting possible. The filled mold is then subjected to a programmed pre-bake, bake, and post-bake cycles that can last from 16 to 30 hours to relieve the casting of all residual stresses before removing the finished coil from the mold.
- The primary and secondary coils are cast separately and assembled on the core. Special axial clamping techniques are used to give uniform pressure while allowing for thermal expansion and ensuring maximum creepage distance between the coils. This type of assembly also provides better isolation between the coils by reducing the number of creepage paths and increasing the lengths of these paths where they exist.

COMPARISON WITH OTHER TRANSFORMER TYPES

- Cast coil transformers are ideal for use in installations where environmental restrictions discourage the use of liquid filled units.
- Cast coil units require very little maintenance in comparison to liquid filled transformers, which require regular maintenance to check oil gauge levels as well as periodic sampling and testing of cooling fluids. Low maintenance type transformers are preferable for installation in harsh environments where regular maintenance routines are difficult or inconvenient to perform.
- The initial cost of cast coil type transformers is comparable to silicon filled units and is higher than the cost of conventional ventilated dry types. Although the equipment cost is marginally higher, the installation cost of cast coil transformers are similar to that of conventional dry type units and significantly lower than liquid filled transformers.
- Cast coil transformers are as adaptable as conventional ventilated dry type transformers allowing for easier coordination with other equipment compared to liquid filled units.
- Cast coil transformers are designed with a long thermal time-constant. This results in a transformer with superior short-term overload capabilities.
- The solid epoxy, fiberglass-reinforced cast construction produces coils that have outstanding mechanical strength which results in unparalleled short circuit withstand capabilities. This high short circuit withstand and the short-term overload capabilities of cast coil transformers make them ideal for heavy industrial installations such as automotive manufacturing and rapid transit/traction power applications.
- When specifying transformers there are many different types and many different options to consider, all of which can provide many years of satisfactory service when installed and maintained properly. However, cast coil type transformers offer a long life with practically maintenance-free operation in nearly any environment.

ENERGY EFFICIENT POWER TRANSFORMERS

All Rex Power Transformers are **Green Line Premium or Ultra Premium Energy Efficient Transformers**. These units are built to meet or exceed the current Canadian and U.S. required minimum levels of efficiency (C802.2 in Canada, DOE 2016 in USA).

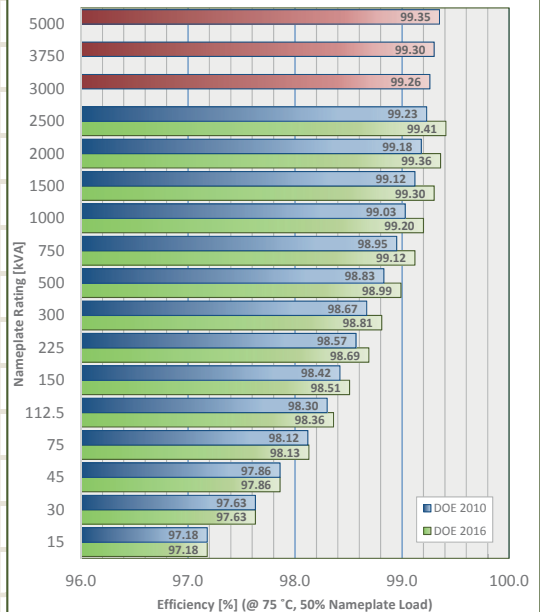
With ongoing improvements in transformer materials and design, as well as the rising cost of energy, higher and higher efficiency levels are becoming achievable and economically viable. Transformers inherently have losses that appear in the form of generated heat. When there is little or no load, the power needed to keep the transformer energized consumes electricity (core losses). When the loading is increased, the resistance of the conductors in the windings become the larger source of losses (load loss). To achieve the specified efficiency, Rex power transformers use higher grade materials and superior construction methods to reduce both types of losses, in order to meet the required efficiency level.

The following charts illustrate the currently legislated minimum efficiency levels. Please note that there is a separate chart for each range of Transformer BIL levels. Values in blue or red represent the current standard for Canadian Transformers, which are known as C802.2 levels, or DOE2010 levels. The values in green represent the recently increased minimum efficiency levels for transformers for the USA market, known as "DOE 2016." It is expected that Canadian minimum levels will harmonize with the American levels in 2018.



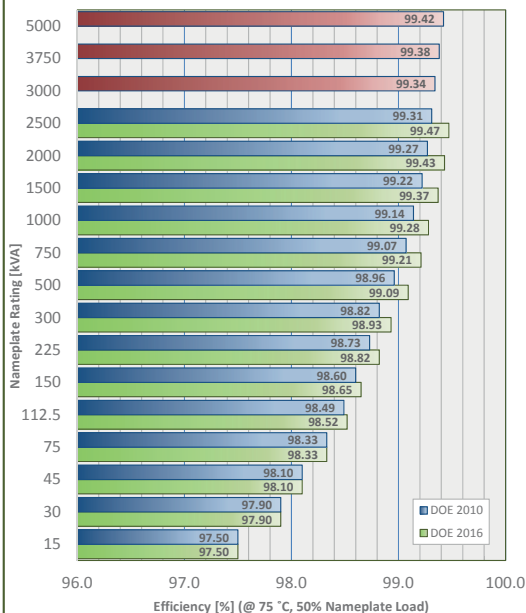
DOE 2010 vs DOE 2016 Efficiency

Three Phase, **Medium Voltage 46-95 kV BIL**



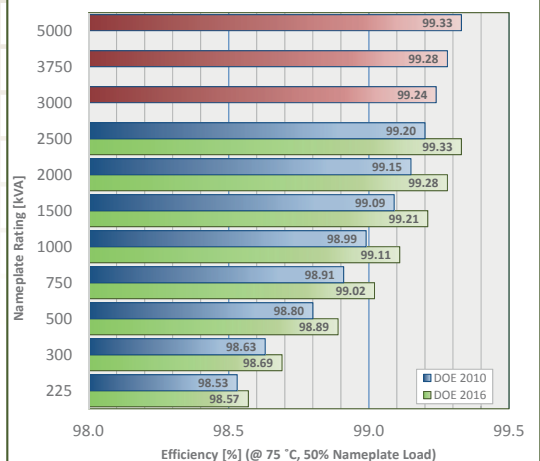
DOE 2010 vs DOE 2016 Efficiency

Three Phase, **Medium Voltage 25-45 kV BIL**



DOE 2010 vs DOE 2016 Efficiency

Three Phase, **Medium Voltage 96+ kV BIL**



LOW E.M.F. SHIELDED TRANSFORMERS

APPLICATION: Power frequency electromagnetic fields from electrical distribution systems are virtually omnipresent. The closer to a source the higher the field intensity, be it a transformer, feeder run, or switch gear.

To prevent interference with sensitive electronic equipment and to satisfy possible health concerns, major magnetic field “polluters” can be located in remote areas of a building. However, this is not always possible or practical and may add additional costs or limit useful space.

Solution: The installation of electrical equipment designed with low electromagnetic field emissions.

Rex Power Magnetics has developed a complete line of Low Emission power and distribution transformers that have the external stray flux attenuated by 95% or better than the standard transformer field emission.

Unshielded transformers 300 – 3000 kVA produce electromagnetic fields in the order of 100 – 500 milligauss in the immediate vicinity of the unit. Rex’s specially designed shielded transformers can lower these emissions by a factor of 10 or better depending on the specification.

This allows for the transformers to be located at practically any location in a building without any restrictions due to intrusive magnetic fields.

UNIQUE APPLICATIONS AND CUSTOM DESIGNS

Besides our custom transformer offerings, Rex Power Magnetics is also structured and prepared to work with our customers on very unique and specialized projects. Our engineering department’s focus on continual research and product development means we have the resources to offer unique and practical solutions to a wide variety of needs, in industries ranging from aerospace to medical test equipment.

The following is a list of magnetic devices built for specialized customer requirements in recent years:

- Variable-output high-current test set for testing circuit breakers
- High Capacity Neutral-Grounding Zig-Zag transformer
- Heavy clamped and reinforced cores for Inductive heating & mine duty
- Transformer mated to an automatic drive-controlled vacuum-tap changer
- Magnetics built for integration with UPS and voltage regulation system
- Ultra low-profile mining transformers
- Multiple reactance iron-core reactor
- Current limiting air core reactors
- Snubbers (fused RC circuit) for protection from switching surges
- Transformers with special seismic provisions



TESTING

Power transformers supplied by Rex Power Magnetics are tested per the latest versions of CSA C9 and IEEE C57.12.01. This includes the standard production tests that follow.

- **Resistance Measurement:** Measures the DC resistance of the windings to ensure integrity.
- **Ratio Test:** Determines that the ratio of the turns in the primary winding to the turns in the secondary windings is correct.
- **Polarity and Phase Relation Test:** Compares the instantaneous direction of the current and voltage in the primary relative to the secondary to determine the angular displacement and phase sequence. Determining the polarity is particularly important when paralleling or banking two or more transformers.
- **No-Load Loss and Excitation Current Test:** Measures the losses in a transformer operating at rated voltage and frequency under no load conditions. These losses include core loss, dielectric losses, and I²R losses from no-load current flow in the primary winding.
- **Load Loss Test:** Measures losses in the windings resulting from full load current flow and stray losses due to magnetic leakage to the core clamps and other structural members.
- **Impedance Test:** Measures the voltage required to circulate rated current through the windings.
- **Applied Potential Test:** Determines the dielectric strength of the insulation between windings and between the windings and ground.
- **Induced Potential Test:** Checks the dielectric strength and integrity of the turn-to-turn and layer-to-layer insulation.

Optional Power Transformer Tests (Witnessed or unwitnessed):

- **Basic Impulse Insulation Level (BIL):** A dielectric test consisting of a high frequency instantaneous impulse voltage applied to the windings to determine the ability of the unit to withstand voltage surges.
- **Temperature Rise Test:** The transformers are tested under loading conditions that give losses as near as possible to the nameplate rating to ensure its ability to operate within its designed temperature limit.
- **Partial Discharge Test (Corona):** An induced voltage is applied to the transformer to determine corona. Corona is a type of localized discharge resulting from transient gaseous ionization in the insulation under voltage stress (A standard test for cast coils.)
- **Sound Level Test:** Measures the level of sound (transformer hum) emitted by the transformer.

AVERAGE AUDIBLE SOUND LEVEL

VENTILATED SELF COOLED

KVA RATING	LINE TO LINE VOLTAGE CLASS UP TO 15 KV 95 KV BIL	ABOVE 15 KV VOLTAGE CLASS UP TO 125 KV BIL
300-500	60db	62db
501-750	62db	64db
751-1000	64db	66db
1001-1500	65db	67db
1501-2000	66db	68db
2001-3000	68db	70db
3001-4000	70db	72db
4001-5000	72db	74db

STANDARD IMPEDANCE RANGE

VOLTAGE CLASS	UP TO 2000 KVA	OVER 2000 KVA
5.0 KV	4.0-6.0 %	6.0-7.0 %
8.7 KV	4.5-6.5 %	6.0-8.0 %
15.0 KV	5.5-7.0 %	6.5-8.0 %
25.0 KV	6.5-7.5 %	7.0-8.5 %
35.0 KV	6.5-7.5 %	7.0-8.5 %

BASIC IMPULSE LEVELS (BIL)

BIL FULL AND CHOPPED WAVE KV CREST

VOLTAGE CLASS (KV)	CSA C9	OPTIONAL
2.5 KV	20	30 or 45
5 KV	30	45 or 60
8.7 KV	45	60 or 95
15 KV	60	95 or 110
18 KV	95	110 or 125
25 KV	110	125 or 150
34.5 KV	150	200

REX STANDARD ENCLOSURES

Rex power transformer enclosures are designed and manufactured to protect against accidental contact with the enclosed transformer, while protecting the transformer core and coil from a variety of different operating conditions. Rex enclosures are fabricated and painted in-house to ensure stringent controls over quality and a broad variety of custom features to match your coordination requirements.

Type 1 (NEMA 1)

A general-purpose indoor ventilated enclosure designed to provide a limited degree of protection against falling dirt particles. It is commonly utilized indoors for commercial and industrial applications.

Type 2 (NEMA 2)

A general-purpose indoor ventilated enclosure designed to provide a degree of protection against dripping and light splashing of non-corrosive liquids and falling dirt particles.

Type 3R (NEMA 3R)

A general-purpose ventilated enclosure for either indoor or outdoor use, designed to provide a degree of protection against rain, sprinklered water, and snow. Ideal for sprinklered commercial applications, severe industrial environments, and outdoor applications.

Note: For outdoor applications, Rex recommends the installation of optional ventilation filters.

Type 4 (NEMA 4)

A non-ventilated enclosure for either indoor or outdoor use, constructed to provide a degree of protection against windblown rain, snow, dust, and splashing water. Hose-directed water, and to be undamaged by the formation of ice externally. Ideal for industrial and commercial applications in harsh environments or where severe weather conditions are likely. Consult sales dept for availability.

Type 4X (NEMA 4X)

A non-ventilated enclosure identical to NEMA 4, but with added corrosion resistance. Ideal for industrial applications such as food processing, refineries, and mining. Consult sales dept for availability.

Type 12 (NEMA 12)

An indoor enclosure constructed to provide a degree of protection against circulating dust, lint, fibers, and flings. It also provides protection against dripping and light splashing of non-corrosive liquids. Ideal for industrial applications such as mills, refineries, or mines. Ventilated or Non-ventilated variants are available.



NEMA 1



NEMA 3R



NEMA 3R with filters

DIMENSIONS AND WEIGHTS — THREE PHASE POWER TRANSFORMERS

The dimensions shown here serve only as a general guideline. These values will vary with efficiency and other criteria.

DIMENSIONS AND WEIGHTS THREE PHASE POWER TRANSFORMERS

DIMENSIONS FOR CORE AND COIL ASSY CLASS 220°C INSULATION (150°C RISE)

ENCLOSURE DIMENSIONS STUBS-UP PADS ARRANGEMENT

KVA	WIDTH	DEPTH	HEIGHT	WEIGHT	WIDTH	DEPTH	HEIGHT	WEIGHT	TOT. WT.	
	DIMENSIONS IN INCHES				LBS	DIMENSIONS IN INCHES			LBS	LBS
5 kv (30 kv B.I.L.)										
300	41.00	30.00	39.00	1900	46.00	40.00	60.00	500	2400	
500	51.00	30.00	46.00	2800	60.00	45.00	70.00	700	3500	
750	60.00	35.00	60.00	3200	72.00	45.00	80.00	850	4050	
1000	62.00	35.00	62.00	4000	72.00	45.00	80.00	850	4850	
1500	66.00	45.00	66.00	7000	80.00	48.00	91.50	1050	8050	
2000	70.00	45.00	70.00	8400	90.00	60.00	91.50	1250	9650	
8.5 kv (45 kv B.I.L.)										
500	60.00	36.00	54.00	3300	72.00	45.00	80.00	850	4150	
750	62.00	42.00	62.00	4500	72.00	45.00	80.00	850	5350	
1000	66.00	42.00	64.00	5000	80.00	48.00	91.50	1050	6050	
1500	70.00	44.00	66.00	7600	80.00	48.00	91.50	1050	8650	
2000	72.00	44.00	68.00	8900	90.00	60.00	91.50	1250	10150	
2500	76.00	50.00	74.00	9700	90.00	60.00	91.50	1250	10950	
3000	80.00	50.00	78.00	11800	90.00	60.00	100.00	1300	13100	
15 kv (60 kv B.I.L.)										
750	66.00	42.00	62.00	5000	80.00	48.00	91.50	1050	6050	
1000	68.00	42.00	64.00	6200	80.00	48.00	91.50	1050	7250	
1500	72.00	44.00	68.00	8000	90.00	60.00	91.50	1250	9250	
2000	75.00	44.00	72.00	9500	90.00	60.00	91.50	1250	10750	
2500	78.00	50.00	77.00	10500	100.00	60.00	110.00	1450	11950	
3000	84.00	50.00	80.00	12100	100.00	60.00	110.00	1450	13550	
3750	90.00	55.00	84.00	17000	110.00	72.00	110.00	1600	18600	
5000	100.00	55.00	96.00	19500	120.00	72.00	120.00	1900	21400	
18 kv (95 kv B.I.L.)										
750	72.00	45.00	64.00	6200	90.00	60.00	91.50	1250	7450	
1000	78.00	45.00	70.00	6800	100.00	60.00	91.50	1300	8100	
1500	80.00	45.00	76.00	8200	100.00	60.00	110.00	1450	9650	
2000	80.00	45.00	80.00	9600	100.00	60.00	110.00	1450	11050	
2500	87.00	50.00	82.00	10800	110.00	60.00	110.00	1550	12350	
3000	95.00	50.00	86.00	13000	110.00	60.00	110.00	1550	14550	
3750	98.00	60.00	88.00	17700	120.00	72.00	120.00	1900	19600	
5000	100.00	60.00	92.00	20500	120.00	72.00	120.00	1900	22400	
25 kv (125 kv B.I.L.)										
1000	80.00	48.00	80.00	7200	100.00	60.00	110.00	1450	8650	
1500	84.00	48.00	82.00	8500	110.00	60.00	110.00	1550	10050	
2000	90.00	50.00	85.00	9800	110.00	60.00	110.00	1550	11350	
2500	92.00	50.00	90.00	11000	110.00	60.00	120.00	1600	12600	
3000	95.00	50.00	95.00	14000	120.00	60.00	120.00	1900	15900	
3750	98.00	55.00	108.00	18500	120.00	72.00	130.00	2100	20600	
5000	100.00	60.00	118.00	21000	130.00	72.00	130.00	2500	23500	

NOTE: Dimensions are estimates and may change. For firm dimensions, consult the office. Dimensions can be changed to accommodate switchgear coordination or other requirements.

View or download all of our product catalogs and brochures from our website:

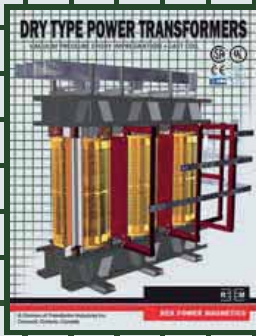
www.rexpowermagnetics.com

Contains up to date information on:

- Drawings and engineering specifications
- Selection and efficiency calculation tools
- Ordering information
- Warranty and terms & conditions

Contact and Sales info:

Tel 905.695.8844 or Fax 905.695.8855
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E-mail: sales@rexpowermagnetics.com
65 Basaltic Road, Concord, ON, L4K 1G4



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- **Power Transformers (Up to 15 MVA — 35 000 V)**
Cast Coil, VPE and VPI Construction
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Service Station Distribution
- **Specialty Type and Special Voltage Transformers**
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High Efficiency and Ultra High Efficiency
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Enclosed, Open Style, or Potted
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- **General Purpose Transformers**
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Motor Guarding Transient Filters
DC Chokes, Saturable-Core Reactors
Inter-Bridge Reactors
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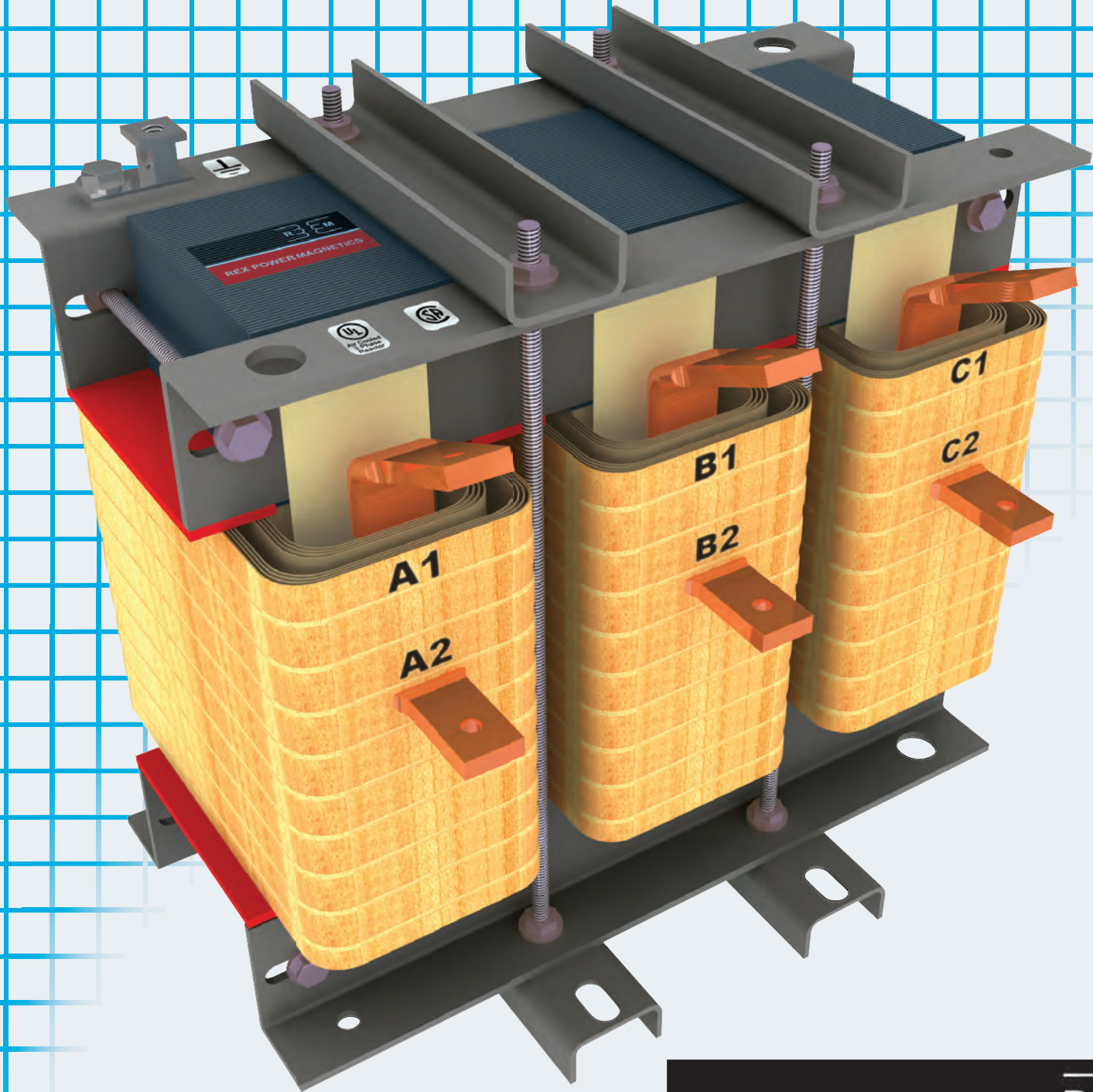
Our 145,000 sq. ft. design, manufacturing, and customer service facility in Concord, north of Toronto, Ontario

CAT DATE: 01/17



LINE REACTORS

INPUT REACTORS
OUTPUT REACTORS
MOTOR GUARDING TRANSIENT FILTERS



ISO 9001:2008

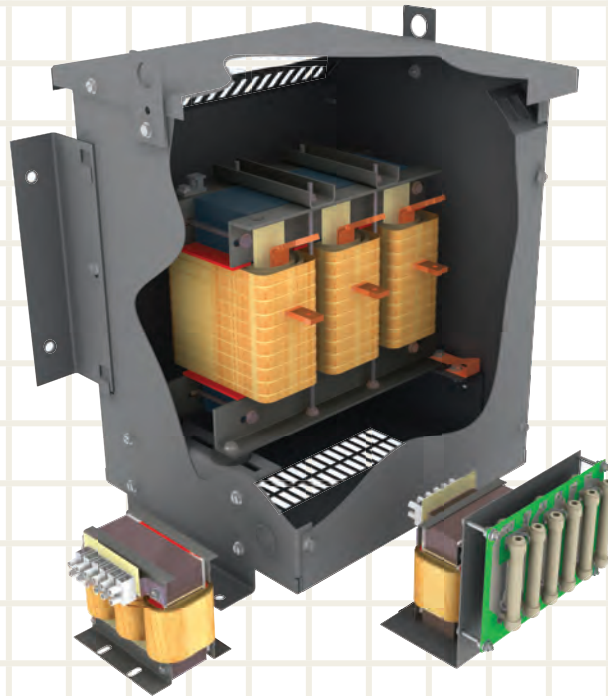
R3EM

A Division of Transfactor Industries Inc.
Concord, Ontario, Canada

REX POWER MAGNETICS

AC LINE REACTORS AND MOTOR GUARDING TRANSIENT FILTERS

REX POWER MAGNETICS LINE REACTORS ARE TODAY'S SOLUTION TO SCR DRIVE / INVERTER APPLICATION PROBLEMS



Inductors placed at the input and output of electrical equipment can provide protection and improve performance. Line Reactors absorb many power line disturbances which could damage or shut down your inverters, variable speed controllers, or other voltage-sensitive equipment.

- **Rex** Line Reactor designs conform to UL, CSA, and IEC international standards.
- Three phase AC line reactors when used as input or output filters on inverter electronic speed drive applications provide several significant benefits which are explained in this catalogue.

- **Rex** Motor Guarding Transient Filters incorporate reactors and resistors. When these devices are placed on the output of adjustable frequency drives they protect the motor windings from the damaging voltage spikes associated with the fast switching effects of IGBT's and long lines and cables.

FEATURES

- Easy to install
- High saturation levels
- Smaller and less expensive than isolation transformers
- Reduce harmful surge current
- Available in open or NEMA 1 enclosed construction
- Conforms to CSA, UL, and IEC standards
- Available in a wide range of standard ratings
- ISO 9001 registered quality system
- CE marking available

BENEFITS

- Reduce electrical line noise
- Protect and extend the life of S.C.R.'s and transistors
- Filter power line disturbances
- Limit short circuit currents
- Important in achieving compliance to IEEE 519
- Reduce harmonic distortion
- Reduce nuisance tripping
- Reduce Telephone Influence Factor (TIF)
- DIN rail mounting available in some ratings

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MOTOR GUARDING TRANSIENT FILTERS:

Applications and benefits	9
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Rex Power Magnetics, established in 1972 is an ISO 9001 registered **leading manufacturer** of CSA certified and UL listed **custom dry type Transformers**. Rex is **driven by technology, innovation, and customer service**, and has a track record of sustained profitable growth. With a central and integrated engineering, manufacturing, and customer service facility located just north of Toronto, Ontario, Canada, and warehouses throughout Canada and the United States, the company offers a **broad range of dry type power magnetic products** to markets throughout North America and internationally.

The Rex product line includes custom designed specialty transformers, Power Transformers up to 15 MVA and 35,000 Volts, distribution transformers, reactors, autotransformers, control and machine tool transformers, custom enclosures, custom cut electrical steel cores, and other power magnetic products and services. Supported by considerable and **sustained investment in research and development**, new and automated equipment, and efficient processes Rex Power Magnetics continually expands and enhances its product and service offering.

We pride ourselves: firstly in our **superior delivery responsiveness** supported by our passion for customer service and our vertically integrated in-house design, manufacture, and testing capabilities; and secondly in our **Technology leadership** supported by our industry leading R&D effort, engineering expertise, technical competence, and manufacturing know-how.

GENERAL

Traditionally the construction of Line Reactors has presented a challenge for manufacturers because, by the nature of their application, reactors are regularly subjected to overload conditions and severe power disturbances.

To control their impedance, Line Reactors are manufactured with gaps in their magnetic flux path. Maintaining the mechanical integrity and the consistency of these gaps requires particular care during engineering, design, and construction.

Rex Power Magnetics through years of experience in reactor applications has developed a unique combination of design techniques, utilizing materials and assembly practices that result in a product with reduced losses and low audible sound levels, providing years of reliable service under adverse conditions.

CORE

Manufactured from low loss, grain oriented silicon steel shunts, and assembled to reduce audible sound and minimize core losses.

WINDINGS & INSULATION

Class 220, 185, or 155 insulation is utilized depending on the size. All reactors have a standard 115°C temperature rise. The windings are of all copper construction, with terminals that are brazed or brought to terminal blocks depending on the size. The complete unit is impregnated with high temperature polyester varnish, and baked.

GAP

The impedance of the reactor is controlled and tuned by accurately maintaining the gap in the flux path. This is achieved using high temperature withstanding Nomex™ and fiberglass spacers, which are reinforced by an epoxy baked compound to reduce sound levels.

ASSEMBLY & BRACKETS

The reactor windings are secured to the core by high temperature fiberglass pultrusions. The core is framed at the top and bottom by formed steel brackets and braced by non-magnetic (stainless steel or bronze) tie bolts to minimize losses, reduce noise (hum), and provide exceptional mechanical strength.

ENCLOSURES

Reactor enclosures are manufactured from 14 gage formed steel panels which are washed, rinsed, corrosion coated and painted with ASA 61 grey powder paint suitable for most industrial and commercial applications. When ordering an enclosure alone for use with an open-type (core & coil) unit, a special bracket is required for mounting. Contact our office for details.

STANDARD TECHNICAL SPECIFICATIONS

- Max ambient temperature 40° C.
- Insulation class 155° C—Temperature rise up to 100° C.
- Insulation class 185° C—Temperature rise up to 115° C.
- Insulation class 220° C—150° C rise maximum.
- CSA certified / UL listed
- Current overload capability: 150% for 1 min.
- Saturation rating: not less than 250% of rated current (50% rated inductance min. at 350% rated current).

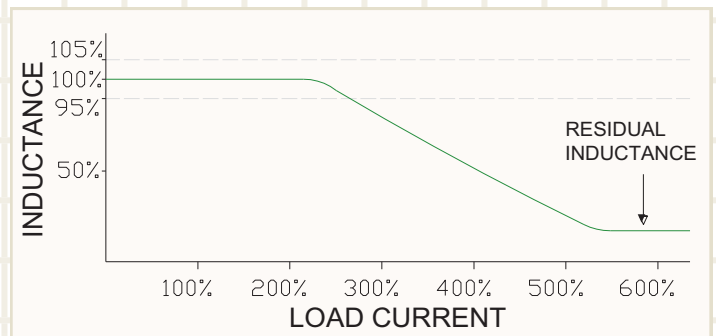


Figure 1. Excellent saturation characteristics of Rex reactors

- Audible sound level: 0—15 amp. 60dB. Max.
16—100 amp. 65dB. Max.
101—350 amp. 70dB. Max.
351—600 amp. 75dB. Max.
- Harmonic compensation: suitable for operation with non-sinusoidal load currents with up to 50% total harmonic distortion.

TEST AND QUALITY INSPECTION

- Dimensions (core & coil, and enclosure)
- Mechanical security of assembly, terminals, hardware
- Appearance (core & coil, enclosure, paint and finishing)
- Electrical wiring, grounding and markings
- Impulse: 4000 V for one min. winding to winding and winding to core ground.
- Impedance measurement and tolerances.
- Audible sound at rated current.
- **ISO 9001 quality assurance.**

APPLICATIONS & BENEFITS OF LINE REACTORS AS INPUT REACTORS

GENERAL

Line Reactors are placed in series with electrical equipment to introduce a specific controlled impedance to the circuit. This inserted impedance acts to **reduce line harmonics**, **moderate line transients**, or to isolate the **harmonic sensitive elements** (such as power factor correction capacitors, harmonic filters, etc.) from the rest of the system. In the case of particular equipment such as AC drives, the line reactors may be an integral and essential part of the drive acting primarily as an input filter. Other specialized roles for reactors with drives are described below.

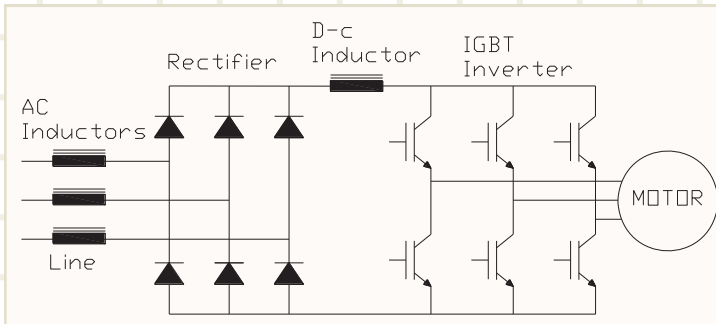


Figure 2. The IGBT Adjustable Frequency Drive with AC and DC Smoothing

1. LINE HARMONIC SUPPRESSION

Figure 2 displays a typical AC drive topology demonstrating AC and DC line current smoothing. DC smoothing is optional and is obtained by a DC reactor built into the drive as shown. Frequently, DC smoothing is eliminated for economy, relying only on the filtering effects of AC impedance. Regardless of what mix of DC and AC smoothing is used, inserting a specific amount of line reactance can reduce the line harmonics produced.

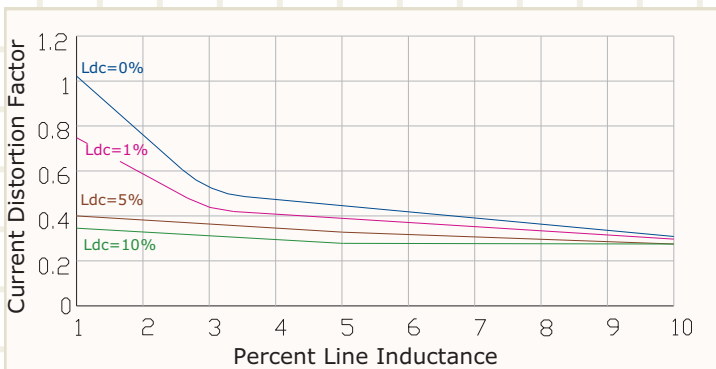


Figure 3. Current Distortion Factor versus Line and DC Link Inductance

Figure 3 demonstrates the effect of various amounts of line and DC inductance on line harmonics. The quality of the line current is measured on the basis of line current distortion factor (IDF) vs. percent of inserted line inductance and different DC inductances.

2. HIGHER FREQUENCY LINE HARMONIC SUPPRESSION, TELEPHONE INFLUENCE FACTOR (TIF)

In some instances higher frequency line harmonics must be suppressed to prevent possible interference with electrical equipment in proximity to the line. The most common examples of this are related to interference standards in telephone communications as described in IEEE-519. Telephone interference is characterized by a quantity defined as TIF. TIF is a current distortion factor calculated by applying specific weighting factors to each line harmonic, to emphasize the tendency of particular harmonics to cause interference in telephone audio band, in the vicinity of 3 KHz. **Series Line Reactors in combination with filter traps are effective in reducing such harmonics to the point that applicable standards can be met.**

3. LINE TRANSIENT SUPPRESSION

Frequently, severe transients are present on the line in the form of voltage spikes and over voltage excursions. Voltage spikes can produce different adverse effects. If the spike is of sufficient magnitude, it can cause the failure of the electrical components. In other circumstances, transients can cause the internal protective system to initiate nuisance trips making that equipment unreliable.

The introduction of series Line Reactors will reduce the effects of these transients to protect the equipment and improve reliability.

4. SPECIALIZED APPLICATIONS

Line Reactors are useful in other applications. For example, to assist in combining individual equipment as when paralleling rectifiers. In these roles, the reactors act to equalize impedance to achieve the balancing of currents. For these and other applications consult **Rex Engineering** staff for detailed application assistance.

SPECIFYING LINE REACTORS

It is common to specify the value of the impedance on the basis of a percentage (i.e. 5%) of the base impedance (at the rated line frequency i.e. 60Hz.) of the load.

Standard reactors are offered in sizes of 3% and 5% in specific current and voltage ratings. Depending on the requirements, custom reactors of other sizes and ratings can be supplied by consulting the factory.

The impedance rating is determined by the ratio of the voltage drop across the reactor to the supply voltage when operated at rated current.

Line reactor applications typically require an impedance of 2% or 3%. In some more severe applications (higher transients or where improved line current quality is required, etc.) an impedance of 4% to 5% could be specified.

THE BENEFITS OF USING REACTORS IN THE OUTPUT OF ADJUSTABLE FREQUENCY DRIVES

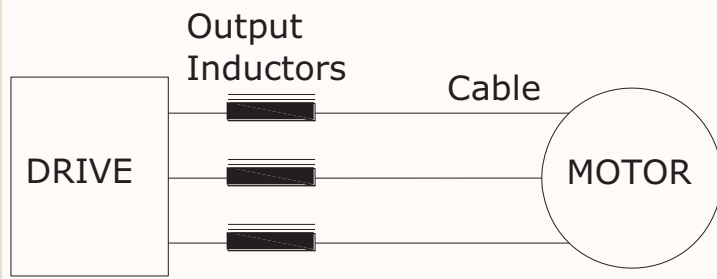


Figure 4. Typical Output Reactor Configuration

Line Reactors, placed on the output of drives, are effective in alleviating high frequency effects of long cables. The two principal benefits are:

1. Line Reactors will slope the edges of PWM waveforms applied to long cables and conductors, thereby reducing the dv/dt and stress due to uneven voltage distribution. However, Line Reactors used alone are only partially effective in reducing the peak voltage appearing at the end of long lines, see **Fig. 5a-5c**.
2. Long lines, particularly long cables, have capacitive effects producing charging currents in the order of 10 to 20 amperes which can cause spurious protective trips in small or low power drives. Reactors reduce cable charging current, producing higher reliability of operation and freedom from nuisance trips.

By using reactors alone on the output of PWM inverters, the potential spikes of 200% of the applied voltage due to reflections in long cables are reduced to typically less than 150% as shown in **Fig. 5c**. This and the combination of low dv/dt translate to safe operation even at 575 volts input.

NOTE: Output reactors should be installed adjacent to the inverter output.

Combining Line Reactors with resistors results in the formation of highly effective motor guarding filters which further reduce dv/dt and the voltage peaks (to less than 125%) appearing at the motor, see Fig. 5d. The voltage stresses are reduced to levels well within the design limits of motor insulation thereby restoring full insulation life expectancy. The incremental cost of adding the filter components to the reactors is minimal. See page 9 for information on Rex Motor Guarding Output Filters

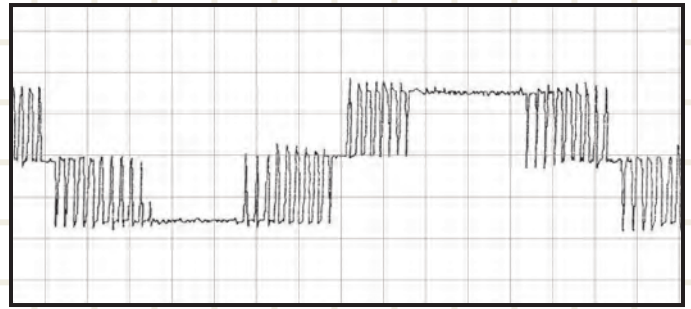


Figure 5a. depicts the voltage output of a PWM drive, measured directly at the drive terminals. Note the characteristic pattern of individual narrow pulses of fixed height and variable width. Note the steep leading and trailing edges representing high frequency content.

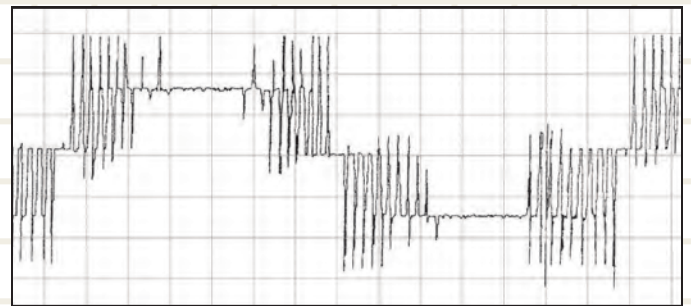


Figure 5b. is the voltage measured at the motor, at the end of a long cable feeding a motor. Note the spikes of double voltage (200%) at leading edges of the pulses.

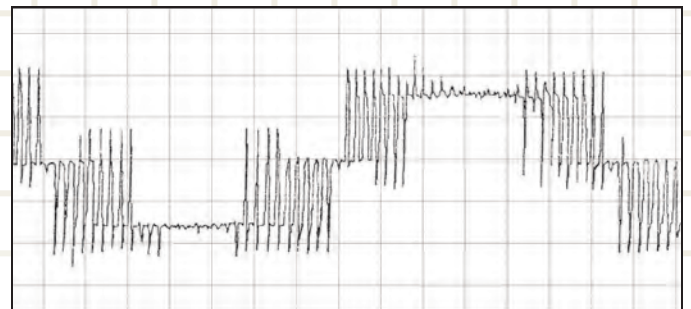


Figure 5c. depicts the result of using only a REX Line Reactor in the output. Note that the transients are reduced to approximately 150% of the applied voltage.

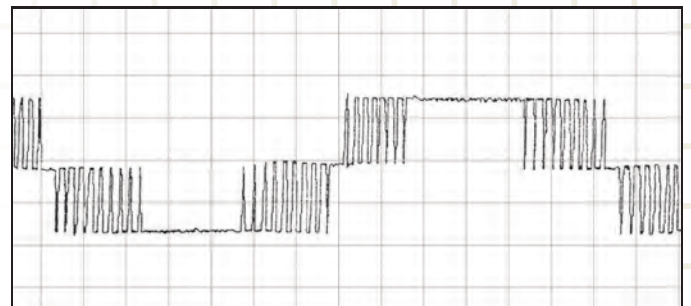


Figure 5d. demonstrates the effectiveness of REX Motor Guarding Output Filters in reducing spikes and overshoots.

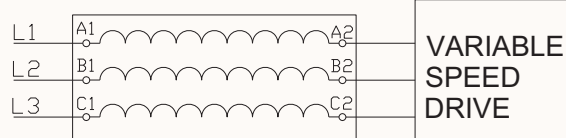
SELECTION GUIDE FOR LINE REACTORS

1. Determine the HP (horse power) rating or the current rating of the drive or motor.
2. Select the supply voltage. (208, 240, 480, or 600 Volts)
3. Determine the % impedance required for the application.
4. From the table below, select the Part No. of the reactor corresponding to the current/HP, Voltage and the % impedance.
5. For each Part No. selected, the inductance, dimensions, and the weight is given in the following two pages.

Rating HP	Voltage= 208 Volts			Voltage= 240 Volt		
	Maximum Current (Amps)	Impedance		Maximum Current (Amps)	Impedance	
		3%	5%		3%	5%
1	4	3PR-0004C3L	3PR-0004C5L	4	3PR-0004C3L	3PR-0004C5L
1.5	8	3PR-0008C3L	3PR-0008C5L	8	3PR-0008C3L	3PR-0008C5L
2	8	3PR-0008C3L	3PR-0008C5L	8	3PR-0008C3L	3PR-0008C5L
3	11	3PR-0011C3L	3PR-0011C5L	11	3PR-0011C3L	3PR-0011C5L
5	17	3PR-0017C3L	3PR-0017C5L	17	3PR-0017C3L	3PR-0017C5L
7.5	27	3PR-0027C3L	3PR-0027C5L	27	3PR-0027C3L	3PR-0027C5L
10	34	3PR-0034C3L	3PR-0034C5L	27	3PR-0027C3L	3PR-0027C5L
15	45	3PR-0045C3L	3PR-0045C5L	45	3PR-0045C3L	3PR-0045C5L
20	60	3PR-0060C3L	3PR-0060C5L	60	3PR-0060C3L	3PR-0060C5L
25	80	3PR-0080C3L	3PR-0080C5L	80	3PR-0080C3L	3PR-0080C5L
30	100	3PR-0100C3L	3PR-0100C5L	80	3PR-0080C3L	3PR-0080C5L
40	130	3PR-0130C3L	3PR-0130C5L	100	3PR-0100C3L	3PR-0100C5L
50	160	3PR-0160C3L	3PR-0160C5L	130	3PR-0130C3L	3PR-0130C5L
60	160	3PR-0160C3L	3PR-0160C5L	160	3PR-0160C3L	3PR-0160C5L
75	200	3PR-0200C3L	3PR-0200C5L	200	3PR-0200C3L	3PR-0200C5L
100	255	3PR-0255C3L	3PR-0255C5L	255	3PR-0255C3L	3PR-0255C5L
125	320	3PR-0320C3L	3PR-0320C5L	320	3PR-0320C3L	3PR-0320C5L
150	410	3PR-0410C3L	3PR-0410C5L	410	3PR-0410C3L	3PR-0410C5L
200	500	3PR-0500C3L	3PR-0500C5L	500	3PR-0500C3L	3PR-0500C5L
250	600	3PR-0600C3L	3PR-0600C5L	600	3PR-0600C3L	3PR-0600C5L
300	750	3PR-0750C3	3PR-0750C5	750	3PR-0750C3	3PR-0750C5
350	1000	3PR-1000C3	3PR-1000C5	1000	3PR-1000C3	3PR-1000C5
400	1000	3PR-1000C3	3PR-1000C5	1000	3PR-1000C3	3PR-1000C5
500	1250	3PR-1250C3	3PR-1250C5	1250	3PR-1250C3	3PR-1250C5

TYPICAL CONFIGURATIONS:

LINE REACTORS AS INPUT REACTOR



LINE REACTOR AS OUTPUT REACTOR

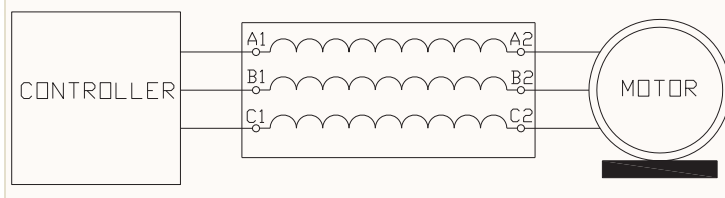


Figure 6. Configurations for reactors

SELECTION GUIDE FOR LINE REACTORS

Rating HP	Voltage= 480 Volts			Voltage= 600 Volt		
	Maximum Current (Amps)	Impedance		Maximum Current (Amps)	Impedance	
		3%	5%		3%	5%
1	2	3PR-0002C3H	3PR-0002C5H	2	3PR-0002C3H	3PR-0002C5H
1.5	4	3PR-0004C3H	3PR-0004C5H	2	3PR-0002C5L	3PR-0002C3H
2	4	3PR-0004C3H	3PR-0004C5H	4	3PR-0004C3H	3PR-0004C5H
3	8	3PR-0008C3H	3PR-0008C5H	4	3PR-0004C5L	3PR-0004C5H
5	8	3PR-0008C3H	3PR-0008C5H	8	3PR-0008C3H	3PR-0008C5H
7.5	11	3PR-0011C3H	3PR-0011C5H	11	3PR-0011C3H	3PR-0011C5H
10	17	3PR-0017C3H	3PR-0017C5H	11	3PR-0011C3H	3PR-0011C5H
15	27	3PR-0027C3H	3PR-0027C5H	17	3PR-0017C3H	3PR-0017C5H
20	27	3PR-0027C3H	3PR-0027C5H	27	3PR-0027C3H	3PR-0027C5H
25	34	3PR-0034C3H	3PR-0034C5H	27	3PR-0027C3H	3PR-0027C5H
30	45	3PR-0045C3H	3PR-0045C5H	34	3PR-0034C3H	3PR-0034C5H
40	60	3PR-0060C3H	3PR-0060C5H	45	3PR-0045C3H	3PR-0045C5H
50	80	3PR-0080C3H	3PR-0080C5H	60	3PR-0060C3H	3PR-0060C5H
60	80	3PR-0080C3H	3PR-0080C5H	60	3PR-0060C3H	3PR-0060C5H
75	100	3PR-0100C3H	3PR-0100C5H	80	3PR-0080C3H	3PR-0080C5H
100	130	3PR-0130C3H	3PR-0130C5H	100	3PR-0100C3H	3PR-0100C5H
125	160	3PR-0160C3H	3PR-0160C5H	130	3PR-0130C3H	3PR-0130C5H
150	200	3PR-0200C3H	3PR-0200C5H	160	3PR-0160C3H	3PR-0160C5H
200	255	3PR-0255C3H	3PR-0255C5H	200	3PR-0200C3H	3PR-0200C5H
250	320	3PR-0320C3H	3PR-0320C5H	255	3PR-0255C3H	3PR-0255C5H
300	410	3PR-0410C3H	3PR-0410C5H	320	3PR-0320C3H	3PR-0320C5H
350	410	3PR-0410C3H	3PR-0410C5H	320	3PR-0320C3H	3PR-0320C5H
400	500	3PR-0500C3H	3PR-0500C5H	410	3PR-0410C3H	3PR-0410C5H
500	600	3PR-0600C3H	3PR-0600C5H	500	3PR-0500C3H	3PR-0500C5H

Note: All Rex enclosures larger than #3 are standard NEMA 3R sprinkler proof. Boxes #7 and smaller can be floor or wall mounted. Consult the website or our engineering department for the most up-to-date information on enclosures.



Enclosure Dimensions

Dimensions are in inches

Size No.	Length	Depth	Height
0	9.50	7.00	8.00
1	12.00	9.00	9.50
2	11.00	11.00	14.00
3	15.50	11.00	14.00
4	15.75	16.00	21.00
5	20.50	16.00	21.00
6	20.50	20.75	26.50
7	24.50	21.75	31.50
8	30.75	29.75	31.75
9	40.00	38.00	45.75
10	46.00	50.00	64.50

REACTOR DIMENSIONS

Add the suffix /E at the end of the part number to denote enclosed style.

OPEN STYLE					ENCLOSED STYLE	
Catalogue No.	Max. Amps	Inductance (mH)	Dimensions (Inches) A/B/C/D/E	Weight (Lbs)	Enclosure	Approx. Weight (Lbs)
3PR-0002C5L	2	9.19	4.25/2.375/4.375/2.875/2.25	4.0	#0	13.0
3PR-0002C3H	2	13.78	4.25/2.75/4.375/2.875/2.50	4.5	#0	13.5
3PR-0002C5H	2	22.97	4.25/3.00/4.375/2.875/2.625	5.3	#0	14.3
3PR-0004C3L	4	2.78	4.25/2.25/4.375/2.875/2.125	5.8	#0	14.8
3PR-0004C5L	4	4.59	4.25/2.625/4.375/2.875/2.375	6.5	#0	15.5
3PR-0004C3H	4	6.89	4.25/3.00/4.375/2.875/2.50	7.0	#0	16.0
3PR-0004C5H	4	11.49	4.25/3.125/4.375/2.875/2.75	8.0	#0	17.0
3PR-0008C3L	8	1.38	6.00/3.375/4.875/2.00/2.375	6.8	#0	15.0
3PR-0008C5L	8	2.30	6.00/3.50/4.875/2.00/2.50	7.3	#0	16.3
3PR-0008C3H	8	3.45	6.00/4.00/4.875/2.00/2.75	9.0	#0	18.0
3PR-0008C5H	8	5.73	6.00/4.375/4.875/2.00/3.375	10.8	#0	19.8
3PR-0011C3L	11	1.00	6.00/3.375/4.875/2.00/2.625	7.3	#0	16.3
3PR-0011C5L	11	1.67	6.00/3.50/4.875/2.00/2.75	8.7	#0	17.7
3PR-0011C3H	11	2.50	6.00/3.75/4.875/2.00/2.875	10.1	#0	19.1
3PR-0011C5H	11	4.18	6.00/4.125/4.875/2.00/3.125	12.0	#0	21.0
3PR-0017C3L	17	0.65	6.00/3.875/4.875/2.00/3.00	10.0	#0	19.0
3PR-0017C5L	17	1.08	6.00/4.25/4.875/2.00/3.125	12.0	#0	21.0
3PR-0017C3H	17	1.62	6.00/4.375/4.875/2.00/3.25	13.8	#0	22.8
3PR-0017C5H	17	2.70	6.00/4.50/4.875/2.00/3.50	15.0	#0	24.0
3PR-0027C3L	27	0.41	7.00/4.00/6.00/3.25/2.75	14.6	#0	23.6
3PR-0027C5L	27	0.68	7.00/4.50/6.00/3.25/3.25	15.8	#0	24.8
3PR-0027C3H	27	1.02	7.00/4.75/6.00/3.25/3.375	18.6	#0	27.6
3PR-0027C5H	27	1.70	7.00/5.00/6.00/3.25/3.75	21.4	#0	30.4
3PR-0034C3L	34	0.32	7.00/4.625/6.00/3.25/3.00	16.4	#0	25.4
3PR-0034C5L	34	0.54	7.00/5.00/6.00/3.25/3.375	19.6	#0	28.6
3PR-0034C3H	34	0.81	7.00/5.25/6.00/3.25/3.625	22.6	#0	31.6
3PR-0034C5H	34	1.35	7.00/5.50/6.00/3.25/3.875	25.0	#0	34.0
3PR-0045C3L	45	0.25	9.00/4.25/7.00/3.00/2.625	25.0	#1	35.0
3PR-0045C5L	45	0.41	9.00/5.00/7.00/3.00/3.375	29.9	#1	40.9
3PR-0045C3H	45	0.61	9.00/5.25/7.00/3.00/3.625	34.5	#1	45.5
3PR-0045C5H	45	1.02	9.00/6.00/7.00/3.00/4.375	41.2	#1	52.2
3PR-0060C3L	60	0.18	9.00/4.75/7.00/3.00/3.125	25.5	#1	36.5
3PR-0060C5L	60	0.31	9.00/5.25/7.00/3.00/3.625	30.0	#1	41.0
3PR-0060C3H	60	0.46	9.00/6.00/7.00/3.00/4.375	40.0	#1	51.0
3PR-0060C5H	60	0.77	9.00/6.125/7.00/3.00/4.50	48.0	#1	59.0
3PR-0080C3L	80	0.14	9.00/6.00/7.00/3.00/3.125	28.3	#2	42.3
3PR-0080C5L	80	0.23	9.00/6.50/7.00/3.00/3.625	35.0	#2	49.0
3PR-0080C3H	80	0.35	9.00/7.00/7.00/3.00/4.50	40.0	#2	54.0
3PR-0080C5H	80	0.57	9.00/7.50/7.00/3.00/4.75	51.0	#2	65.0

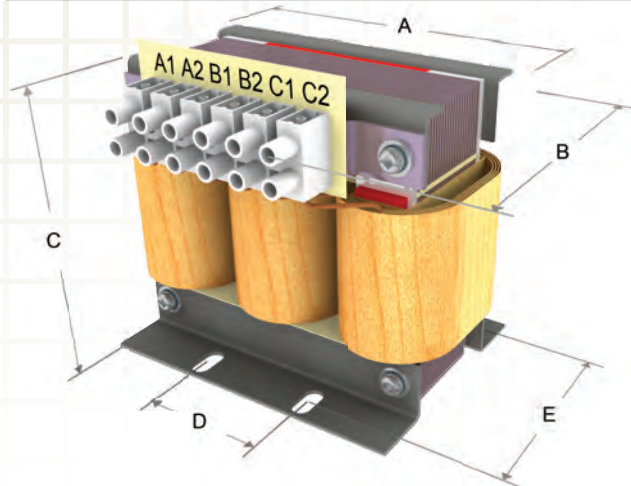


Figure 7. Dimensioned view for reactors rated up to 45 A

REACTOR DIMENSIONS

Add the suffix /E at the end of the part number to denote enclosed style.

OPEN STYLE					ENCLOSED STYLE	
Catalogue No.	Max. Amps	Inductance (mH)	Dimensions (Inches) A/B/C/D/E	Weight (Lbs)	Enclosure	Approx. Weight (Lbs)
3PR-0100C3L	100	0.11	12.00/4.50/8.50/3.50/3.25	38.8	#4	69.8
3PR-0100C5L	100	0.18	12.00/5.00/8.50/3.50/3.75	46.4	#4	77.4
3PR-0100C3H	100	0.28	12.00/7.00/8.50/3.50/4.50	58.0	#4	89.0
3PR-0100C5H	100	0.46	12.00/8.00/8.50/3.50/5.50	66.2	#4	97.2
3PR-0130C3L	130	0.09	12.00/6.00/8.50/3.50/3.75	37.0	#4	68.0
3PR-0130C5L	130	0.14	12.00/7.00/8.50/3.50/4.50	46.5	#4	77.5
3PR-0130C3H	130	0.21	12.00/7.50/8.50/3.50/4.75	56.0	#4	870.0
3PR-0130C5H	130	0.35	12.00/8.50/8.50/3.50/5.75	73.0	#4	104.0
3PR-0160C3L	160	0.07	12.00/7.50/8.50/3.50/4.00	45	#4	76
3PR-0160C5L	160	0.12	12.00/8.20/8.50/3.50/4.75	56	#4	87
3PR-0160C3H	160	0.17	12.00/9.25/8.50/3.50/5.75	74	#4	105
3PR-0160C5H	160	0.29	12.00/10.00/8.50/3.50/6.50	87	#4	118
3PR-0200C3L	200	0.06	12.00/7.50/8.50/3.50/4.50	56	#4	87
3PR-0200C5L	200	0.09	12.00/8.25/8.50/3.50/5.00	67	#4	98
3PR-0200C3H	200	0.14	12.00/9.25/8.50/3.50/6.25	99	#4	130
3PR-0200C5H	200	0.23	12.00/10.00/8.50/3.50/6.50	108	#4	139
3PR-0255C3L	255	0.04	12.00/8.00/8.50/3.50/5.50	66	#4	97
3PR-0255C5L	255	0.07	12.00/8.75/8.50/3.50/5.50	79	#4	110
3PR-0255C3H	255	0.11	12.00/9.25/8.50/3.50/6.50	105	#4	136
3PR-0255C5H	255	0.18	12.00/10.00/8.50/3.50/6.50	120	#4	151
3PR-0320C3L	320	0.03	12.00/8.00/14.00/4.50/4.00	80	#6	150
3PR-0320C5L	320	0.06	12.00/9.00/14.00/4.50/4.50	98	#6	168
3PR-0320C3H	320	0.09	12.00/10.00/14.00/4.50/5.25	113	#6	183
3PR-0320C5H	320	0.14	12.00/11.00/14.00/4.50/5.50	148	#6	218
3PR-0410C3L	410	0.03	12.00/8.50/14.00/4.60/4.25	82	#6	152
3PR-0410C5L	410	0.05	12.00/9.00/14.00/4.60/4.75	112	#6	182
3PR-0410C3H	410	0.07	18.00/9.50/14.00/4.60/4.75	160	#6	230
3PR-0410C5H	410	0.11	18.00/10.50/14.00/4.60/5.50	220	#6	290
3PR-0500C3L	500	0.02	18.00/9.00/18.00/9.75/15.50	126	#6	196
3PR-0500C5L	500	0.04	18.00/9.50/18.00/9.75/15.50	167	#6	237
3PR-0500C3H	500	0.06	18.00/10.50/18.00/9.75/15.50	194	#6	264
3PR-0500C5H	500	0.09	18.00/11.00/18.00/9.75/15.50	242	#6	312
3PR-0600C3L	600	0.02	18.00/10.50/18.00/9.75/15.50	144	#6	214
3PR-0600C5L	600	0.04	18.00/11.50/18.00/9.75/15.50	180	#6	250
3PR-0600C5H	600	0.08	18.00/12.50/18.00/9.75/15.50	253	#6	323
3PR-0750C3	750	0.03	18.00/11.00/19.00/7.25/6.50	207	#6	277
3PR-0750C5	750	0.05	18.00/11.50/19.00/7.25/7.00	254	#6	324
3PR-1000C3	1000	0.02	22.00/10.50/21.00/7.50/9.00	226	#7	306
3PR-1000C5	1000	0.04	22.00/11.50/21.00/7.50/9.00	270	#7	350
3PR-1250C3	1250	0.02	22.00/12.00/23.00/7.50/9.00	270	#8	350
3PR-1250C5	1250	0.03	22.00/13.50/23.00/7.50/9.00	310	#8	390

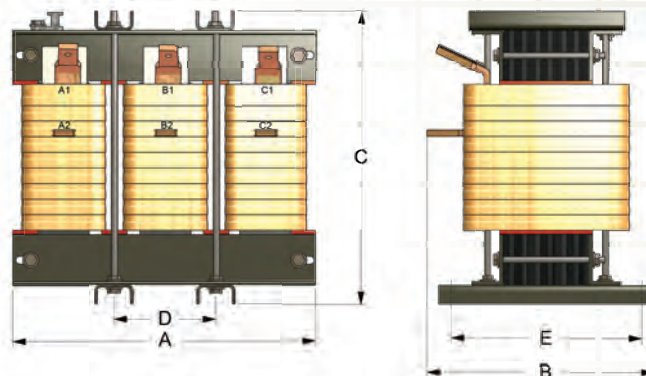


Figure 8. Dimensioned view for reactors rated 46 A and up

MOTOR GUARDING TRANSIENT FILTERS

THE PROBLEM

The steep voltage wave fronts of the Pulse Width Modulated (PWM) output of Adjustable Frequency Drives (AFD's) produce high frequency effects which may damage the insulation of motors operated by the equipment. The problems result from two distinct effects.

1. HIGH DV/DT EFFECTS

The rapid rate of voltage rise (dv/dt) at the leading edges of each output pulse of the PWM inverter, produces an uneven distribution of voltage within the motor windings. The result is a concentration of the voltage at particular points of the winding causing abnormal stress leading to breakdown of the insulation. This phenomenon has been described as "first coil breakdown" and is well documented.

2. REFLECTIONS IN LONG LINES AND CABLES

A long cable, in addition to resistance, has distributed inductance and capacitance, producing effects similar to a transmission line as shown below.

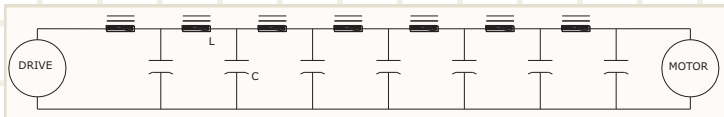


Figure 9. Electrical representation of a long transmission line

The high frequencies present in the output of PWM waveforms cause reflections in long conductors connecting the motors to the drives (see Fig. 10a). Harmful effects with conductors as short as 10 meters have been observed. However, the effects are most severe with cables of lengths greater than 50 meters leading to the doubling of the applied voltage. This translates to voltage peaks approaching 1600 Volts in 575 Volt systems.

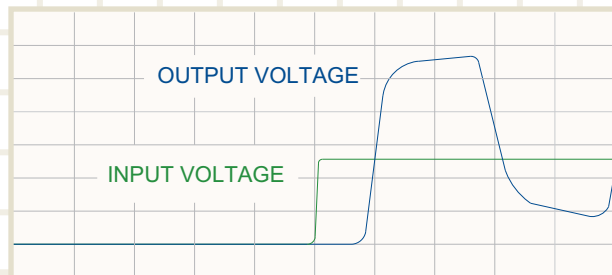


Figure. 10a. Output of a PWM inverter reaching 200% due to reflections in long cables

The combination of these two effects stresses the winding insulation considerably beyond design limits and has been known to shorten the insulation life and in some instances leads to early catastrophic failure of motors.

THE SOLUTION

It has been demonstrated that these transient effects can be reduced by using filters placed at the output of the AFD's thereby allowing safe operation of the motors and an expectation of full insulation life (see Fig. 10b). After years of experience and research, **Rex Power Magnetics** has developed a comprehensive line of state of the art output filters suitable for a wide range of prospective applications. The filters are constructed using optimized combinations of inductors and resistors.

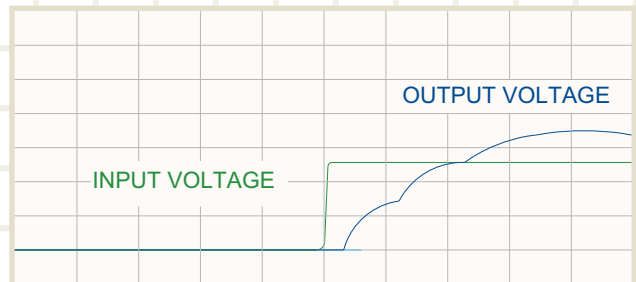


Figure 10b. Voltage peak reduced to less than 125% appearing at the motor, due to the addition of a Rex Motor Guarding Filter.

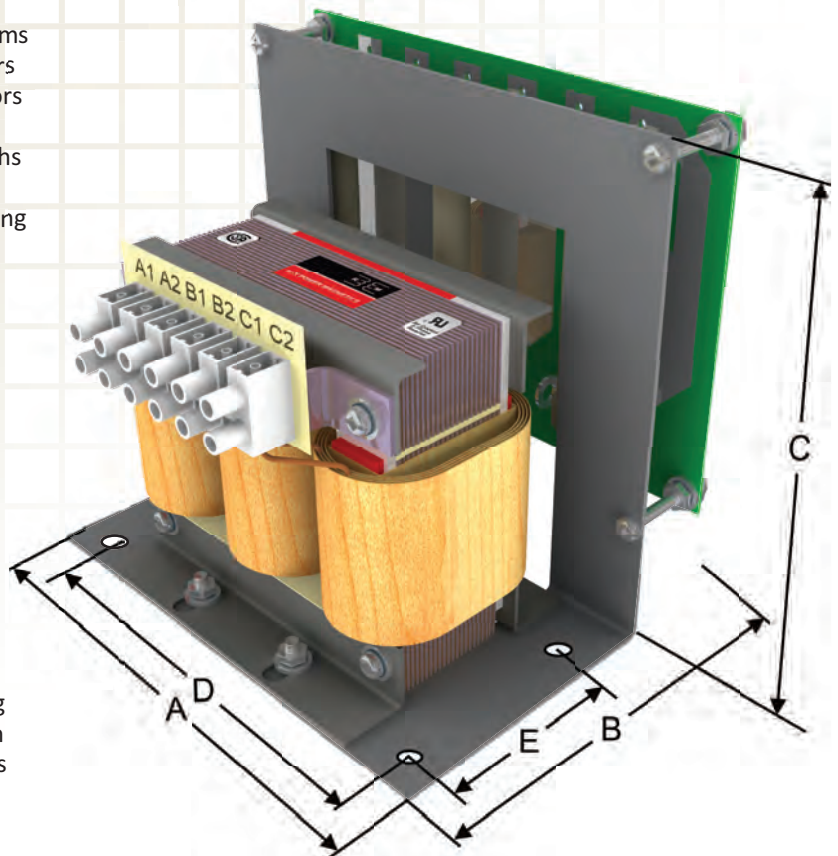


Figure 11. Dimensioned view of a Rex Motor Guarding Filter

MOTOR GUARDING TRANSIENT FILTERS

Filter Reactors					
Current Rating [A]	Part No.	Dimensions Open Core&Coil A/B/C/D/E	Enclosure # See Pg 6	Weight (Lbs)	
				Open	Enclosed
2	2C5LF	8.25/6.50/7.00/7.25/2.00	0	5	14
4	4C5LF	8.25/6.50/7.00/7.25/2.00	0	6	15
8	8C5LF	8.25/6.50/7.00/7.25/2.00	0	9	19
11	11C5LF	8.25/6.50/7.00/7.25/2.00	0	10	20
17	17C5LF	8.25/6.50/7.00/7.25/2.00	1	11	23
27	27C5LF	8.25/7.20/7.00/7.25/2.00	1	19	32
34	34C5LF	8.25/7.20/7.00/7.25/2.00	1	25	37
45	45C5LF	11.00/9.00/8.10/10.00/4.00	3	29	48
60	60C5LF	11.00/9.00/8.10/10.00/4.00	3	30	50
80	80C5LF	11.00/12.00/6.80/10.00/4.00	4	42	68
100	100C5LF	11.00/12.00/6.80/10.00/4.00	4	47	78
130	130C5LF	11.00/12.00/6.80/10.00/4.00	4	48	79
160	160C5LF	11.00/13.00/8.20/10.00/4.00	4	49	88
200	200C5LF	11.00/13.00/8.20/10.00/4.00	4	68	99
255	255C5LF	11.00/13.00/8.20/10.00/4.00	4	84	115
320	320C5LF	11.00/13.00/8.20/10.00/4.00	6	90	150
410	410C5LF	14.00/14.50/14.00/13.00/6.00	6	95	158
500	500C5LF	20.00/16.00/18.00/19.00/8.00	6	140	200
600	600C5LF	20.00/17.50/18.00/19.00/8.00	6	148	210

- Rex filters are current rated, therefore easy to specify. Simply use the total motor load current to select the appropriate filter rating.
- Filters are available enclosed or open style. Add the suffix /E at the end of the part number to denote enclosed style.

FEATURES OF REX OUTPUT FILTERS FOR ADJUSTABLE FREQUENCY DRIVES

1. The prospective voltage spike of 200% at the motor due to reflections in the cable is typically reduced to less than 125% as shown in Figure 6b. This is a significant improvement over using Line Reactors alone.
2. The dv/dt is reduced promoting more uniform voltage distribution among the motor windings.
3. Standard filter designs are suitable for a wide range of applications including line lengths of 100 meters and switching frequencies up to 5 kHz. A wider range and mix of applications and conditions are possible by consulting the office.
4. Filter designs are capable of reducing reflection transients even in the most severe cases involving cables with grounded metal casings.
5. The losses introduced with the use of these filters are small, approaching the losses experienced in using cables without filters. The use of Rex output filters generally introduces no additional losses but merely transfers the losses associated with charging and discharging the line capacitance from the cable to the filter. Thus the use of Rex filters has little effect on the efficiency of the system.
6. Components used in the filters are specified for specialized qualities and are operated at a fraction of their design limitations to reduce stress and provide reliability. These steps ensure that the filters will operate without overheating even at the limits of their specifications at the extremes of the longest metal-sheathed cables.

View or download all of our product catalogs and brochures from our website:
www.rexpowermagnetics.com

Contains up to date information on:

- Drawings and engineering specifications
- Selection and efficiency calculation tools
- Ordering information
- Warranty and terms & conditions

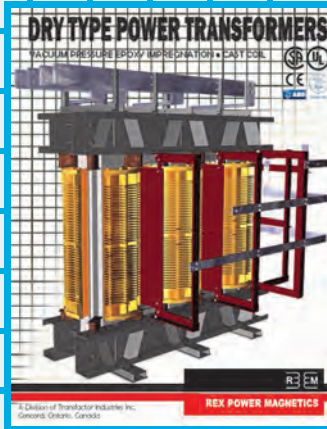
Contact and Sales info:

Tel 905.695.8844 or Fax 905.695.8855

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- **Specialty Type and Special Voltage Transformers**
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Electromagnetic Field Shielded
Epoxy Potted, Hazardous Location
Marine Duty Types (with applicable certificates)
Mini Power Centres
High Efficiency and Ultra High Efficiency
On Line Tap Switching and Auto Voltage Regulating Units
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- **Control & Machine Tool Transformers (50 VA to 7500 VA)**
Enclosed, Open Style, or Potted
DIN Rail Mountable Units

- **General Purpose Transformers**
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- **Switchgear Components**
Low and High voltage Standoffs and Insulators
Surge (lightning) Arresters
- **Transformer Testing, Refurbishment, and Repair**
Replacement of windings, core, insulation, etc.



Our 145,000 sq. ft. design, manufacturing, and customer service facility in Concord, north of Toronto, Ontario

CAT DATE: 11/11

INDUSTRIAL CONTROL AND MACHINE TOOL TRANSFORMERS

OPEN AND ENCLOSED TYPES



Platinum member



A Division of Transfactor Industries Inc.
Concord, Ontario, Canada

REX POWER MAGNETICS

INDUSTRIAL CONTROL AND MACHINE TOOL TRANSFORMERS



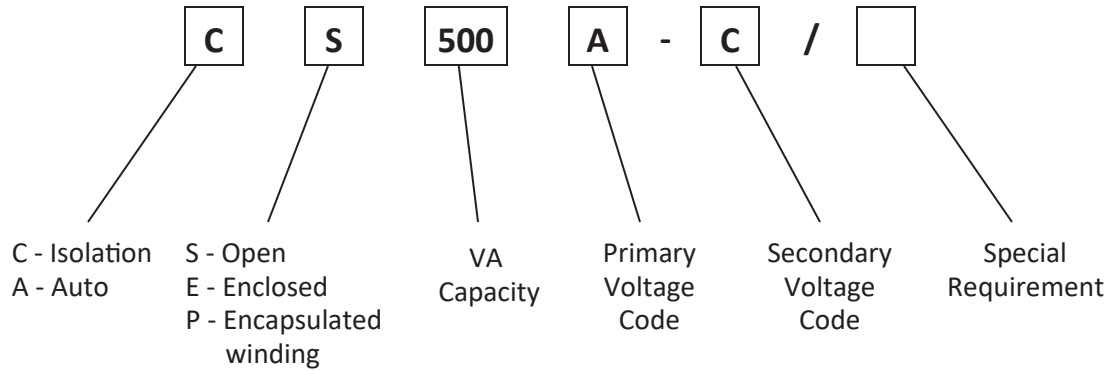
Established in 1972, Rex Power Magnetics is an ISO 9001-2015 registered leading manufacturer of CSA certified and UL listed standard and custom specification dry type transformers.

Rex is driven by customer service, innovation, technology, and has a track record for quality and product support. With a central and integrated engineering, manufacturing, and customer service facility located just north of Toronto, Ontario, Canada and warehouses throughout Canada and the United States, the company offers a broad range of dry type power magnetic products to markets throughout North America and internationally.

The Rex product line includes custom designed specialty transformers, power transformers up to 15 MVA and 46 kV, distribution transformers, reactors, autotransformers, control and machine tool transformers, custom enclosures, custom cut electrical steel cores, and other power magnetic products and services. Supported by considerable and sustained investment in research and development, and the adoption of automation, Rex Power Magnetics continually expands and enhances its product and service offering.

Rex Power Magnetics is the industry leader in delivery responsiveness, supported by our vertically integrated in-house design, manufacture, and testing capabilities. We pride ourselves on our technology leadership supported by our extensive R&D activities, engineering expertise, and manufacturing know-how.

CATALOG NUMBERING SYSTEM



Primary and Secondary Voltage Letter Codes:

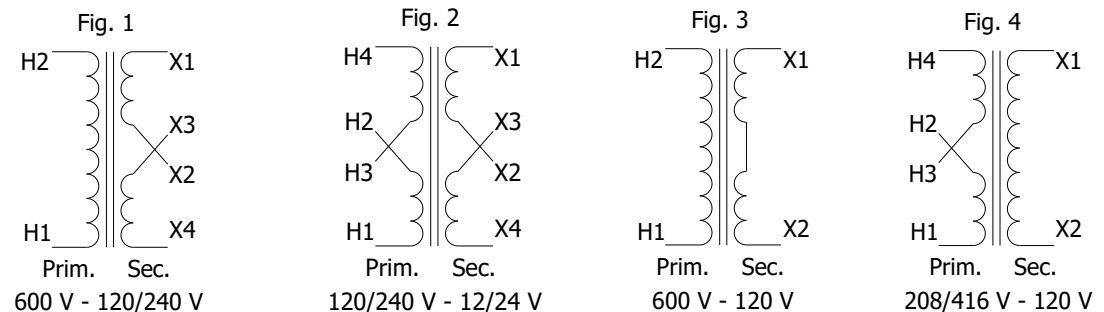
A - 120	E - 347	J1 - 575	V - 12
A1 - 115	F - 380	J2 - 550	W - 24
A2 - 110	G - 416	K - 120/240	T - 16
B - 208	G1 - 400	K1 - 115/230	Y - 32
C - 240	H - 480	K2 - 110/220	
C1 - 230	H1 - 460	L - 240/480	
C2 - 220	H2 - 440	L1 - 230/460	
D - 277	J - 600	L2 - 220/440	For an unlisted voltage, use 'X'

Special Requirement Codes:

T - Terminals
L - Leads
S - Electrostatic Shield
50 - 50 Hz operation
CE - CE marking
For an unlisted requirement, use 'X'

Rex Power Magnetics can design and build to your custom requirements for connections, construction (such as terminals and dimensions), and electrical performance. Various codes exist for fuse kits and touch safe covers. Page 6 provides further information.

TYPICAL SCHEMATIC DIAGRAMS



FUSING OPTIONS

- Rex Power Magnetics industrial control transformers are available with 13/32" X 1 1/2" or 1/4" X 1 1/4" secondary fusing options. These may be factory installed or available in kit form for field installation.
- Various primary fusing options are available for rejection or non-rejection type fuses up to 600 V. Detailed information is available on page 6. Consult website for the most current information.

CONTROL TRANSFORMER SELECTION

SINGLE PHASE TRANSFORMER

Industrial control transformers are used to convert the available supply voltage to the voltage that is required to supply industrial control circuits and motor control loads.

These loads consist of a combination of electromagnetic devices such as solenoid operated valves, switches, bells, alarms, and other components such as indicator lights, timers, electronic equipment, and logic boards.

Some components of a circuit, especially electromagnetic devices require a very high level of power at start-up. This start-up power requirement is called **inrush VA**. After their initial start-up these components settle down to a lower power requirement for normal continuous operation. This lower operating power requirement is called **Sealed or Steady State VA**.

Some devices can draw up to 10 times the normal operating or sealed current for periods of up to 50 milliseconds upon start up.

Most devices have a minimum voltage requirement for normal operation at both start-up and steady state conditions.

Control transformers must be designed, constructed, and selected to ensure that they provide the output voltage stability needed for trouble free operation of all circuit components.

Rex control transformers incorporate several features to optimize output voltage stability and regulation when supplying industrial control circuits with high inrush current requirements.

To ensure that the selected control transformer is sized adequately and suitable for the application, the following 6 step selection guidance should be followed.

SELECTION GUIDE

1. **Calculate the Total Inrush VA Required:** From the data supplied by the manufacturers of the individual devices of the control circuit, add the inrush VA requirements of each device to be energized simultaneously.
2. **Calculate the total sealed VA required:** From the data supplied by the manufacturers of the individual devices of the control circuit, add the sealed VA requirements of all the components within the circuit.
3. **Calculate the Total Circuit Inrush VA:** The Total Circuit Inrush VA requirement is equal to Total Inrush VA + Total Sealed VA.

NOTE: Complex vector analysis of each component within a control circuit may be required to determine the accurate inrush load power factor. Rex has determined a 30% power factor to be the typical control transformer requirement for a representative mix of devices.

4. **Select the control transformer VA requirement:** For proper transformer VA selection, adjustments must be made for supply voltage variations. Should the supply voltage be relatively stable and fluctuates no more than +/- 5%, refer to the 90% secondary voltage column of the regulation data table. If the supply voltage fluctuates as much as +/- 10% refer to the 95% column. Go down the column until the Total Inrush VA closest to but not less than that calculated in step 3. Read to the far left column to select the continuous nominal VA rating of the control transformer required.
5. **Determine the input and output voltage requirements:** The input voltage and frequency is the available supply voltage. The output voltage required is the control circuit voltage to be supplied by the transformer.
6. **Determine the transformer catalog number:** Refer to the catalog numbering system to select the proper catalog number for the transformer with the input and output voltage and the continuous VA required for the application

Regulation Data Table

Continuous VA Transformer Name Plate Rating	Inrush VA at 30% Power Factor	
	90% Secondary Voltage	95% Secondary Voltage
25	145	105
50	240	190
75	450	320
100	700	470
150	1020	750
200	1700	1200
250	2150	1450
350	3800	2750
500	5500	3750
750	9800	6650
1000	15400	10300
1500	20000	12450
2000	22000	17000
3000	42000	29000

Standard Features of Common and Enclosed Types

APPLICATION

Rex Power Magnetics Control Transformers are specifically designed for electrical control applications where secondary voltage stability is maintained within practical limits, accommodating momentary inrush current.

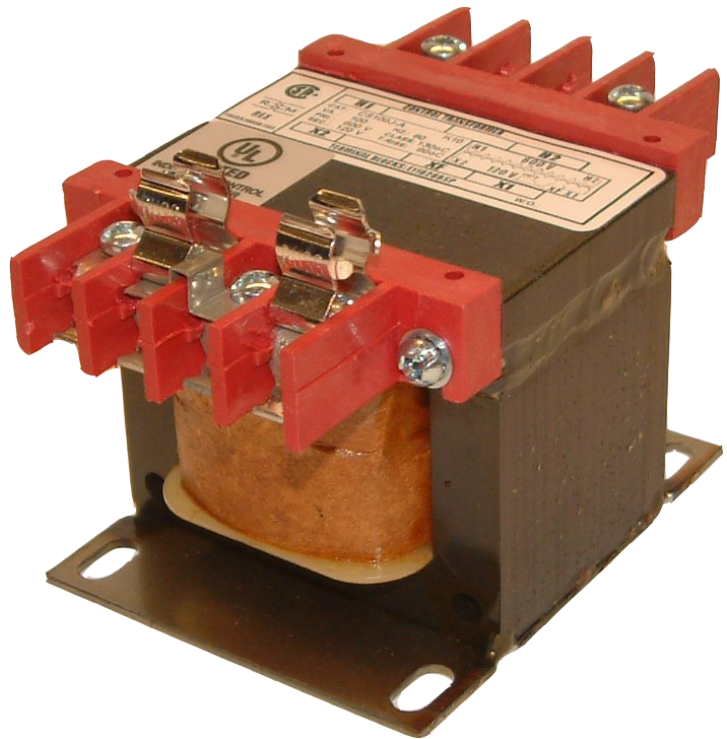
These transformers can be used to adjust load requirements to match supply voltage in control panels. They are suitable for operating machine lights, small motors, solenoids, indicator lights, etc., and to provide circuit isolation.



CONSTRUCTION

Rex cores feature high-permeability silicon steel laminations which are welded into a one piece construction assuring low noise and optimum efficiency. All coils are computer designed and wound on accurate coil winding machines utilizing copper magnet wire and premium grade insulating material.

All Rex control transformers are fully tested by qualified personnel, and are CSA certified file No. LR34493, UL listed file No, E110286



Transformer pictured above illustrates our standard construction.

FEATURES

- Ratings from 25 VA to 7500 VA available
- Voltage class approval:
 - CSA: 750 V max
 - UL: 600 V max
- Vertical or Horizontal mounting
- Sound level below 40 dB
- Markings, additive polarity
- Insulation systems:
 - 25 - 500 VA class 130 °C, 80 °C temp Rise Max
 - 501 - 7500 VA class 180 °C , 115 °C temp Rise Max

NOTE: For connections refer to typical schematic diagrams on inside front cover.

Fig. 1 - single primary - dual secondary

Fig. 2 - dual primary - dual secondary

Fig. 3 - single primary - single secondary

Fig. 4 - dual primary - single secondary

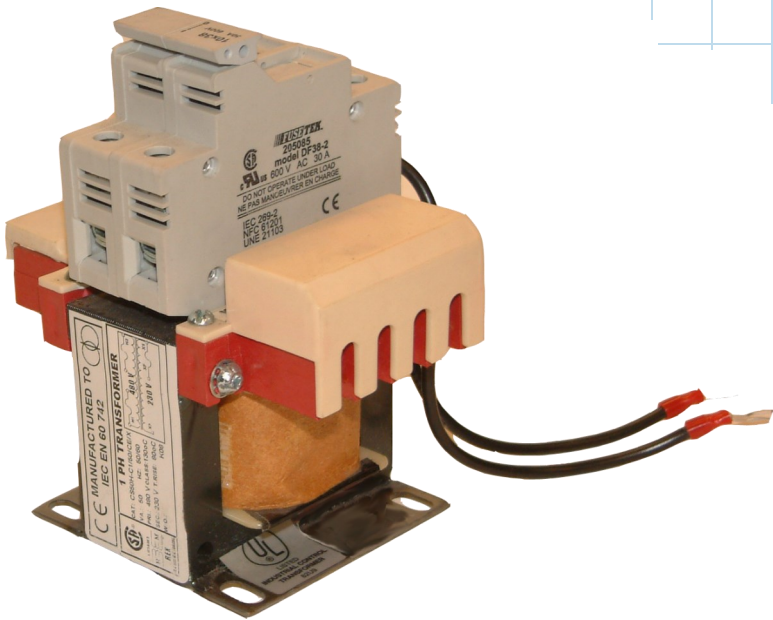
OPTIONS

- Special designs are available upon request
- Frequencies other than 60 Hz
- Multiple primary and secondary voltages
- Electrostatic Shielding
- Lead wire or screw type terminations
- See page 5 for potted-coil design for harsh environments
- Terminal blocks
- Fuse kits
- Designed to comply with CE
- CE markings are available, consult head office

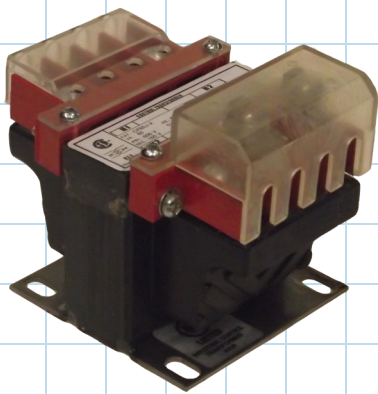
Single Phase Open Style - Type CS

FEATURES

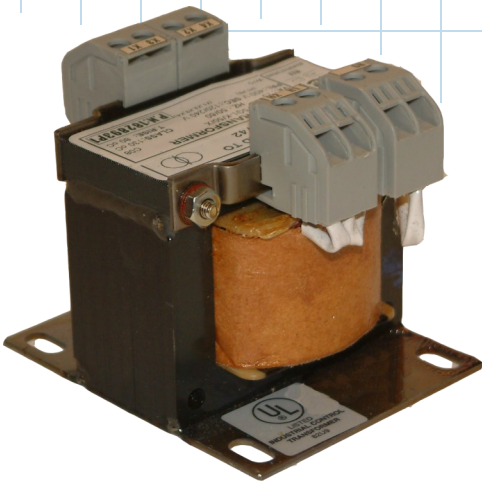
- Standard screw type terminals
- Clearly marked terminals for easy wiring
- Conservative design for cool, long-lasting operation
- Vacuum impregnated and baked for quiet operation
- Smooth and uniform varnish finish
- Easy to read nameplate
- Suitable for mounting in ventilated enclosures



Transformer pictured above with optional 600 V rejection-type fuse kit, leads, touch safe covers, and CE markings installed.



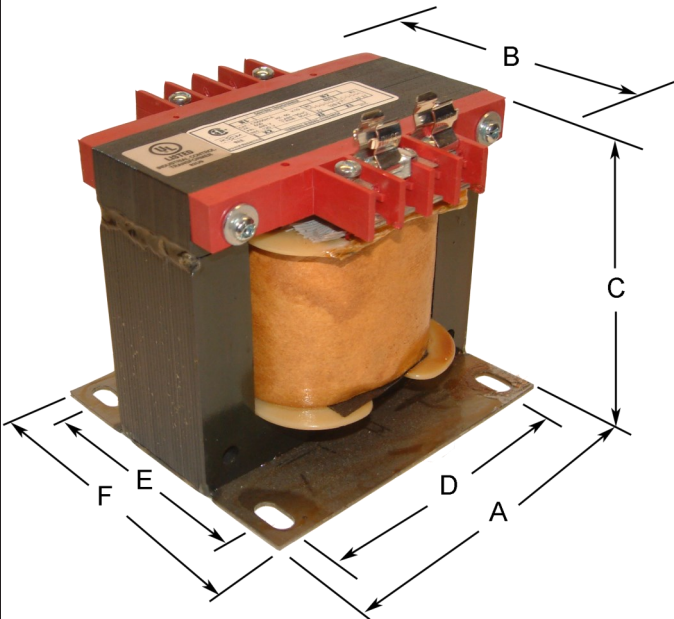
'CP' (Encapsulated Winding) type control transformers offer enhanced capabilities of withstanding harsh environments. See next page for details.



Rex Power Magnetics can design and build to your custom requirements for connections, construction (such as terminals and dimensions), and electrical performance.

Table of Dimensions

VA Rating	Overall Dimensions						Mounting Slot	WT. (Lbs)
	A	B	C	Mounting Centres D x E		F		
25	3.00	3.00	2.50	2.50	2.50	3.125	0.25 x 0.625	2.3
50	3.00	3.00	2.50	2.50	2.50	3.125	0.25 x 0.625	3.0
100	3.00	4.00	2.50	2.50	3.00	3.75	0.25 x 0.625	5.0
150	3.75	4.25	3.13	3.25	3.50	4.50	0.25 x 0.625	6.0
200	3.75	4.50	3.13	3.25	3.50	4.50	0.25 x 0.625	8.0
250	3.75	5.00	3.13	3.25	3.50	4.50	0.31 x 0.625	10.0
350	4.50	4.50	3.75	3.75	3.75	4.75	0.31 x 0.625	12.0
500	5.25	5.00	4.38	4.50	3.75	4.75	0.31 x 0.625	14.0
750	5.25	5.50	4.38	4.50	3.75	4.75	0.31 x 0.625	18.0
1000	5.25	6.50	4.38	4.50	4.75	5.75	0.31 x 0.625	23.0
1500	6.75	7.25	5.63	5.00	3.75	5.25	0.31 x 0.625	40.0
2000	7.50	7.50	6.25	6.00	4.25	5.25	0.31 x 0.625	50.0
3000	7.50	8.75	6.25	6.00	5.50	6.50	0.31 x 0.625	70.0
5000	9.00	10.00	8.00	7.00	7.00	8.00	0.44 x 0.750	110
7500	9.00	13.00	8.00	7.00	9.00	10.00	0.44 x 0.750	145

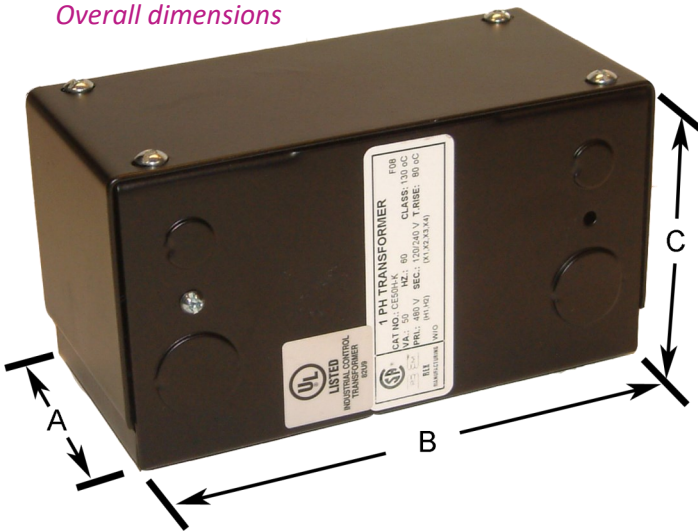


Single Phase Enclosed Style (CE) and Encapsulated Winding Style (CP)

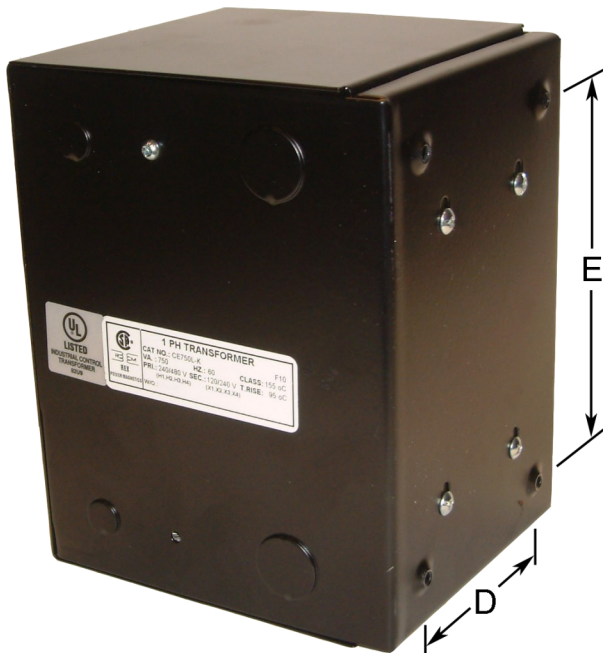
TYPE 'CE' ENCLOSED - FEATURES

- Attractive black semigloss finish
- Clearly marked leads for easy wiring
- Easily accessible and generous wiring compartments
- Knockouts are provided for easy access
- Rugged all-steel construction
- Conservatively designed for cool long lasting operation
- Vacuum impregnated and baked for quiet operation
- Easy to read nameplate

Overall dimensions

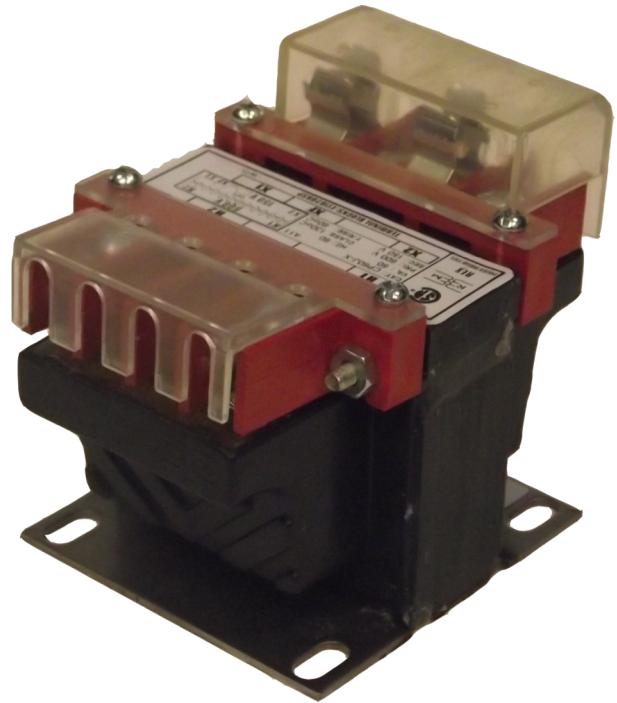


Base (mounting) dimensions



TYPE 'CP' ENCAPSULATED (POTTED) WINDING— FEATURES

- Windings are resin and silica sand encapsulated for protected operation in dusty, moist, and other harsh environments
- Rugged plastic encasement for encapsulated (potted) coils
- Protected terminals and fuse clips
- Conservatively designed for reliable operation
- Easy to read nameplate

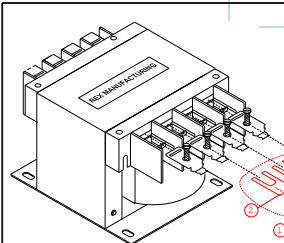
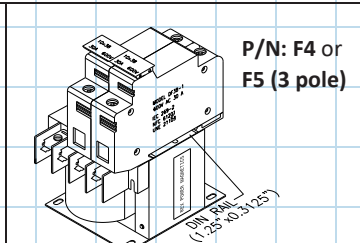
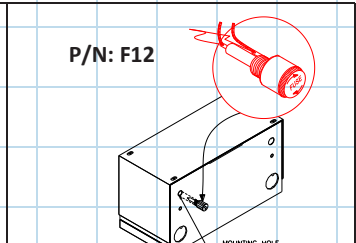
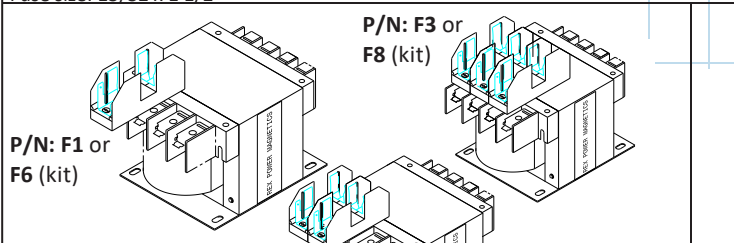
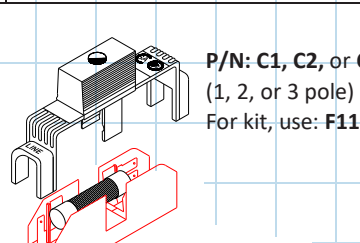
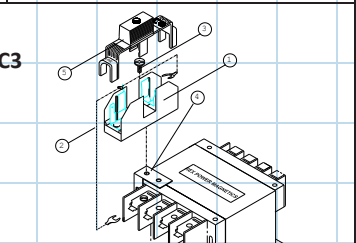


Control Transformer Enclosure Sizes and Mounting
Dimensions provided in inches

KVA	A	B	C	D	E
50	3.00	6.00	3.50	1.375	4.375
100	3.00	6.00	3.50	1.375	4.375
150	3.50	6.658	4.25	2.00	5.00
200	3.50	6.658	4.25	2.00	5.00
250	3.50	6.658	4.25	2.00	5.00
350	4.125	6.50	5.00	2.375	7.875
500	4.875	7.00	5.625	3.25	5.50
750	4.875	7.00	5.625	3.25	5.50
1000	4.875	7.00	5.625	3.25	5.50
1500	5.625	9.00	6.625	4.00	7.25
2000	6.875	9.25	8.625	5.00	8.00
3000	6.875	9.25	8.625	5.00	8.00
5000	8.00	10.50	9.50	6.00	9.00

FUSING OPTIONS

Selected options are shown, see website for most complete and up-to-date listing. Part numbers shown can be added to catalog numbers. Fuses not included.

 <p>Fig. 1 - Factory installed fuse clip Secondary side (250 V max) Fuse size: 13/32 x 1 1/2</p>	 <p>Fig. 3 - Rejection type, CE marked touch safe, 600 V max, din rail mtg.</p>	 <p>Fig. 4 - For enclosed units. 250 V max c/w pigtails, Fuse size: 1/4 x 1 1/4</p>
 <p>Fig. 5 - Non-rejection type fuse block, 600 V max Fuse size: 13/32 x 1 1/2</p>	 <p>Fig. 6 - Touch-safe cover for non-rejection type</p>	 <p>Fig. 2 - Touch Safe Terminal Covers</p>



GENERAL TERMS AND CONDITIONS

For the most up-to-date and complete terms, policies, and conditions, please consult our website.

All orders are subject to approval by the Head Office Sales Department. Written quotations are subject to change at any time and are void after 30 days. Rex Power Magnetics reserves the rights to change the design and/or construction of any transformer in any manner in keeping with its constant product improvement. Terms are net 30 days, subject to credit approval.

Shipping Damage

Responsibility for the product is transferred to the customer when it leaves the factory. The customer is responsible for damage or loss in transit. Therefore it is recommended that the customer carefully examine the shipment before accepting delivery from the carrier. In the event of shortage or damage, the customer must note loss or damage on the transportation receipt and immediately file a claim with the carrier and at the same time send a copy to Rex.

Warranty

Rex Power Magnetics warrants to its customers that the products delivered conform to the specifications and are free from defects in material and workmanship for a period of one year. For additional detail, consult factory or visit website.

Defects

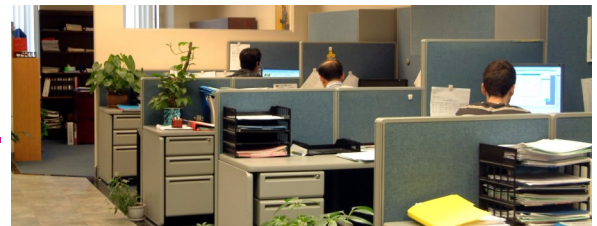
If any defect in material or workmanship develops within one year from the date of shipment, Rex will replace or repair the defective part (at its discretion), F.O.B. factory, if (a) Rex has been notified in writing immediately upon the defect coming to light, (b) it has been shipped prepaid to Rex without delay, and (c) the product has not been misused, abused, altered, neglected, improperly installed, or damaged.

Cancellation

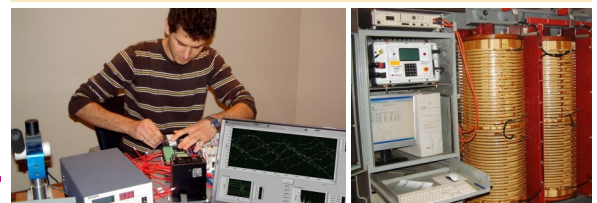
No order accepted by Rex may be altered or modified by the purchaser unless agreed to in writing signed by an authorized official of Rex and no such order may be cancelled or terminated except upon payment of Rex's loss and expense arising from such cancellation.



Advanced Manufacturing Techniques; Central Integrated Facility and warehouse



Sustained Research and Development for technology leadership and improvement



Extensive testing and repair capabilities, and flexible, responsive engineering team

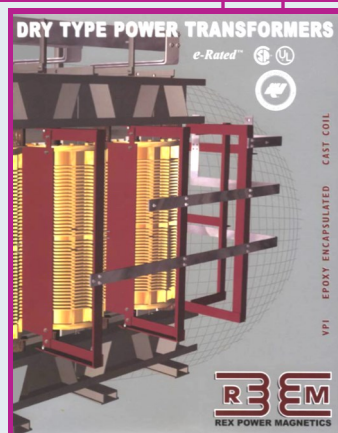
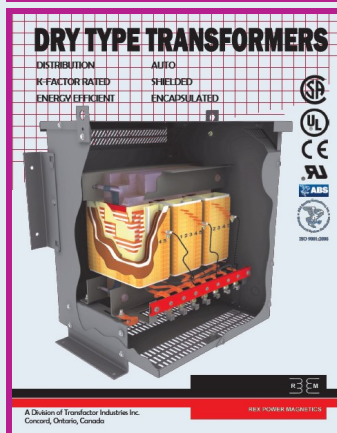
View or download all of our product catalogs and brochures from our website:
www.rexpowermagnetics.com

Contains up to date information on:

- Drawings and engineering specifications
- Selection and efficiency calculation tools
- Ordering information
- Warranty and terms & conditions

Contact and Sales info:

Tel 905.695.8844 or Fax 905.695.8855
TOLL FREE USA/CANADA 1-800-387-2840
E-mail: sales@rexpowermagnetics.com
65 Basaltic Rd., Concord, ON, L4K 1G4



OUR FULL PRODUCT RANGE:

- **Power Transformers (Up to 15 MVA — 46 000 V)**
Cast coil, VPE and VPI construction
Substation type complete with primary disconnects
Traction Power, Rectifier, Crane duty, special regulation, Service station distribution
- **Specialty Type and Special Voltage Transformers**
K-Rated, Electrostatically shielded
Ultra isolating multiple shielded
Harmonic Mitigating
Electromagnetic Field Shielded
Epoxy Potted, Hazardous location
Marine duty types (with applicable certificates)
Mini Power Centres
High Efficiency and Ultra High Efficiency
On line Tap switching and Auto Voltage Regulating units
Hazardous-Location Transformers (class 1, div 2)
- **Control & Machine Tool Transformers (25 VA to 7500 VA)**
Enclosed, open style, or potted
DIN rail mountable units

- **General Purpose Transformers**
Distribution/Isolation, CE marked transformers
Autotransformers
Drive Isolation
Motor Starting
- **Reactors**
Input and Output reactors
Motor guarding transient filters
DC chokes, Saturable-core reactors
Inter-bridge reactors
High Voltage Iron Core or Air Core Reactors
- **Enclosures**
NEMA -1, -2, -3R, -4, -4x, -12
Stainless steel and special paint
Custom switchgear and specialty industrial enclosures
- **Switchgear Components**
Low and High voltage standoffs and insulators
Surge (lightning) Arresters
- **Transformer Testing, Refurbishment, and Repair**
Replacement of windings, core, insulation, etc.



Our 145 000 sq. ft. design, manufacturing, and customer service facility in Toronto, Ontario

CAT DATE: 10/18



REX POWER MAGNETICS

MINI POWER CENTER

Simple Elegant Smart

Encapsulated transformer complete with primary circuit breaker protection and secondary main breaker distribution loadcenter

Save Time: Pre-wired, ready for hook up

Save Space: Compact wall mountable configuration

Save Money: Installing one component versus three



Publication Date: 9/2020

Rex Power Magnetics Mini Power Center - Introduction



Practical, time saving, and customizable!

Rex Power Magnetics' Mini Power Centers combine three individual components into a single pre-wired assembly: a primary main breaker, an encapsulated isolation transformer, and a main breaker load center. With all of the components installed and factory wired in a single rugged enclosure, field installation time is reduced and simplified extensively. Mini Power Centers are used on single-phase and three-phase low voltage distribution systems and loads requiring 208Y/120V three-phase or 120/240V single-phase. While the Load Center is normally shipped without the secondary branch breakers, Rex can supply and install them if a panel schedule is provided.

Shown on brackets for display only. Floor mounting is optionally available.

Part Numbering System

MP3 C 45 H-M/ / ... /

Product
Type

Conductor
Material

kVA
Rating

Primary
Voltage

Secondary
Voltage

Optional Special
Features

Product Type

MP1	1 phase Mini Power Center
MP3	3 phase Mini Power Center

Transformer Conductor Material

C	Copper
A	Aluminum

kVA Rating

1 phase kVA levels:

5	7.5	10	15	25	30
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3 phase kVA levels:

9	15	22.5	30	45
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Primary Voltage

A	120	C1	230	G	416	J	600
A1	115	C2	220	G1	400	J1	575
A2	110	D	277	H	480	J2	550
B	208	E	347	H1	460		
C	240	F	380	H2	440		

For any other voltage use X (600 V max).

Secondary Voltage

M	208Y/120	or	K	120/240
---	----------	----	---	---------

Optional Special Features

50	50/60 Hz system frequency
BB	Branch breakers supplied (per request)
BO	Bolt on breaker load center
CLC	Copper bus load center
E4	Type 4 rating
E4X	Type 4X enclosure (SS 304 or 316L)
T80	80 °C rise
T115	115 °C rise
S1	Single electrostatic shield

for all other custom requirements use X...

X	Special specification breaker(s)
	Specified breakers (Rex to supply)
	Special paint color
	Special low loss (high efficiency)
	Special tags and markings
	Thermostat(s)
	Special dimensions
	Floor mounting

Rex Power Magnetics Mini Power Center - Specifications

Transformer

Standard Rex Power Magnetics copper wound encapsulated transformer

- ◆ 1Ø up to 30 kVA, 3Ø up to 45 kVA, 600 V max.
- ◆ Transformer is completely encapsulated in polyester resin and silica sand, with only terminals and taps protruding from block.
- ◆ 200 °C insulation class.
- ◆ 130 °C winding temperature rise (115 °C and 80 °C available)
- ◆ Terminals are labelled, taps are cleaned for connection.

Primary Breaker

Molded Case Circuit Breaker (MCCB) for primary side protection

- ◆ Standard Eaton FDB and EHD primary breakers are used with 14 kA interrupting current capacity.
- ◆ Optional Eaton FD, HFD, and FDC breakers may be specified for 18 kA, 25 kA, and 35 kA interrupting current.
- ◆ Square D, GE, or other components may be specified.

Secondary Main Breaker Load Center

Molded Case Circuit Breaker (MCCB) for secondary side protection

- ◆ Space for up to 30 secondary branch breakers (see table).
- ◆ Secondary branch circuit breakers may be supplied and installed per customer panel schedule (optional)
- ◆ Load center is suitable for Eaton Type BR Push-on breakers, or optionally suitable for Eaton Type BAB Bolt-on breakers
- ◆ Square D, GE, or other components may be specified.
- ◆ Neutral bar is grounded to enclosure

Enclosure

- ◆ Wall-mounting
- ◆ Padlockable quarter-turn for panel
- ◆ Standard enclosure: Type 3R indoor/outdoor
- ◆ Optionally available:
 - ◆ Tamperproof hardware
 - ◆ Type 3R Stainless Steel,
 - ◆ Type 4 (totally enclosed)
 - ◆ Type 4X (totally enclosed, stainless steel, 304 or 316L)
 - ◆ Floor mounting brackets or provisions

Applications

- ◆ Industrial Loads (factory, laboratory, etc)
- ◆ Commercial (EV charging, parking lots, etc.)
- ◆ Temporary Power (rental application, generator power)
- ◆ Tunnel Power (emergency power, tunnel lighting, mining)
- ◆ General Purpose (lighting, distribution, etc.)

Approvals & Certifications



CSA Certified
File No.: LR 34493



UL Listed
File No.: E495724



ISO 9001:2015
Rex is registered to
ISO 9001: 2015



ABS, CE, and others
available.



Typical appearance for larger sizes



Typical appearance for smaller sizes

Tables & Diagrams

Aluminum Bus & Push-On Breaker Load Center MPC (CSA & UL)

Type	Catalog #	kVA	Diagram*	Pri. Breaker	Sec. Breaker	Breakers [Max quantity]			Dimensions (Type 3R)				
						1-pole	2-pole	3-pole	W [inch]	D [inch]	H [inch]	wt [lbs]	Enclosure Name
Single Phase 600 V to 120/ 240 V	MP1C5J-K	5	1	20A ¹	25A ³	12	6	-	17.25	12.5	39.5	265	E3R-1PMPC-1
	MP1C7J-K	7.5	1	30A ¹	40A ³	12	6	-	17.25	12.5	39.5	275	E3R-1PMPC-1
	MP1C10J-K	10	2	40A ¹	50A ³	20	10	-	17.25	14.5	50.5	345	E3R-1PMPC-2
	MP1C15J-K	15	2	60A ¹	70A ³	20	10	-	17.25	14.5	50.5	375	E3R-1PMPC-2
	MP1C25J-K	25	2	100A ¹	125A ³	30	14	-	18.00	14.5	59.5	570	E3R-1PMPC-3
	MP1C30J-K	30	2	100A ¹	150A ⁵	30	14	-	24.00	16.0	60.5	780	E3R-1PMPC-4
Single Phase 480 V to 120/ 240 V	MP1C5H-K	5	1	20A ²	25A ³	12	6	-	17.25	12.5	39.5	265	E3R-1PMPC-1
	MP1C7H-K	7.5	1	30A ²	40A ³	12	6	-	17.25	12.5	39.5	275	E3R-1PMPC-1
	MP1C10H-K	10	2	40A ²	50A ³	20	10	-	17.25	14.5	50.5	345	E3R-1PMPC-2
	MP1C15H-K	15	2	60A ²	70A ³	20	10	-	17.25	14.5	50.5	375	E3R-1PMPC-2
	MP1C25H-K	25	2	100A ²	125A ³	30	14	-	18.00	14.5	59.5	570	E3R-1PMPC-3
	MP1C30H-K	30	2	125A ²	150A ⁵	30	14	-	24.00	16.0	60.5	780	E3R-1PMPC-4
Three Phase 600 V to 208Y/ 120 V	MP3C9J-M	9	3	20A ¹	30A ³	12	6	4	18.00	12.5	43.5	315	E3R-3PMPC-1
	MP3C15J-M	15	4	30A ¹	50A ³	27	13	9	23.25	14.0	52.5	475	E3R-3PMPC-2
	MP3C22J-M	22.5	4	50A ¹	70A ³	27	13	9	23.25	18.0	55.0	630	E3R-3PMPC-3
	MP3C30J-M	30	4	70A ¹	100A ³	27	13	9	23.25	18.0	55.0	710	E3R-3PMPC-3
	MP3C45J-M	45	4	90A ¹	150A ⁴	30	14	10	25.50	18.0	65.5	960	E3R-3PMPC-4
Three Phase 480V to 208Y/ 120 V	MP3C9H-M	9	3	25A ²	30A ³	12	6	4	18.00	12.5	43.5	315	E3R-3PMPC-1
	MP3C15H-M	15	4	40A ²	50A ³	27	13	9	23.25	14.0	52.5	475	E3R-3PMPC-2
	MP3C22H-M	22.5	4	60A ²	70A ³	27	13	9	23.25	18.0	55.0	630	E3R-3PMPC-3
	MP3C30H-M	30	4	80A ²	100A ³	27	13	9	23.25	18.0	55.0	710	E3R-3PMPC-3
	MP3C45H-M	45	4	125A ¹	150A ⁴	30	14	10	25.50	18.0	65.5	960	E3R-3PMPC-4

*See back page for Electrical Connection Diagrams

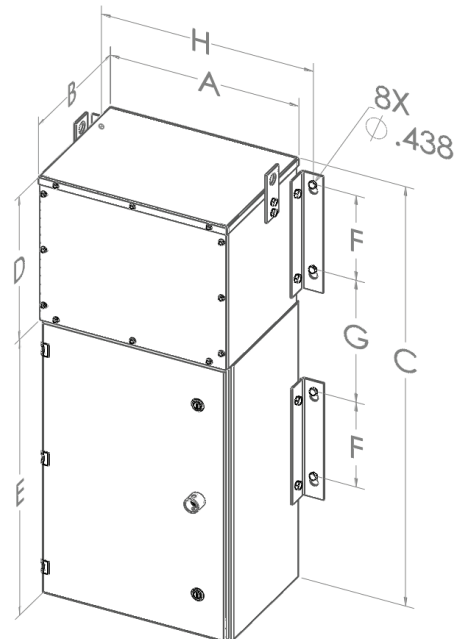
1. Eaton Type FDB Breaker
2. Eaton Type EHD Breaker
3. Eaton Type BR Breaker
4. Eaton Type CC Breaker
5. Eaton Type CSR Breaker

Dimensions [inches]

Enclosure Name	A	B	C	D	E	F	G	H
E3R-1PMPC-1	17.25	12.50	39.50	13.56	25.94	8.00	11.50	19.38
E3R-1PMPC-2	17.25	14.50	50.50	16.56	33.94	8.00	18.50	19.38
E3R-1PMPC-3	18.00	14.50	59.50	23.56	35.94	8.00	26.50	20.13
E3R-1PMPC-4	24.00	16.00	60.50	23.56	36.94	8.00	27.00	26.13
E3R-3PMPC-1	18.00	12.50	43.50	15.56	27.94	8.00	14.50	20.13
E3R-3PMPC-2	23.25	14.00	52.50	16.06	36.44	8.00	19.25	25.38
E3R-3PMPC-3	23.25	18.00	55.00	18.56	36.44	8.00	21.75	25.38
E3R-3PMPC-4	25.50	18.00	65.50	23.56	41.94	8.00	29.50	27.63

Get detail cut sheets (drawings) for each of our standard sizes:

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Tables & Diagrams

Copper Bus & Bolt-On Breaker Load Center MPC (CSA only)

Type	Catalog #	kVA	Diagram *	Pri. Breaker	Sec. Breaker	Breakers [Max quantity]			Dimensions (Type 3R)				
						1-pole	2-pole	3-pole	W [inch]	D [inch]	H [inch]	wt [lbs]	Enclosure Name
Single Phase 600 V to 120/240 V	MP1C5J-K/BO/CLC	5	1	20A ¹	25A ⁶	18	8	-	23.25	12.5	43.5	335	E3R-1PMPC-1B
	MP1C7J-K/BO/CLC	7.5	1	30A ¹	40A ⁶	18	8	-	23.25	12.5	43.5	345	E3R-1PMPC-1B
	MP1C10J-K/BO/CLC	10	2	40A ¹	50A ⁶	30	14	-	23.25	14.5	53.0	455	E3R-1PMPC-2B
	MP1C15J-K/BO/CLC	15	2	60A ¹	70A ⁶	30	14	-	23.25	14.5	53.0	485	E3R-1PMPC-2B
	MP1C25J-K/BO/CLC	25	2	100A ¹	125A ⁶	30	14	-	23.25	14.5	60.0	635	E3R-1PMPC-3B
	MP1C30J-K/BO/CLC	30	2	100A ¹	150A ⁷	30	14	-	23.25	16.0	65.0	750	E3R-1PMPC-4B
Single Phase 480 V to 120/ 240 V	MP1C5H-K/BO/CLC	5	1	20A ²	25A ⁶	18	8	-	23.25	12.5	43.5	335	E3R-1PMPC-1B
	MP1C7H-K/BO/CLC	7.5	1	30A ²	40A ⁶	18	8	-	23.25	12.5	43.5	345	E3R-1PMPC-1B
	MP1C10H-K/BO/CLC	10	2	40A ²	50A ⁶	30	14	-	23.25	14.5	53.0	455	E3R-1PMPC-2B
	MP1C15H-K/BO/CLC	15	2	60A ²	70A ⁶	30	14	-	23.25	14.5	53.0	485	E3R-1PMPC-2B
	MP1C25H-K/BO/CLC	25	2	100A ²	125A ⁶	30	14	-	23.25	14.5	60.0	635	E3R-1PMPC-3B
	MP1C30H-K/BO/CLC	30	2	125A ¹	150A ⁷	30	14	-	23.25	16.0	65.0	750	E3R-1PMPC-4B
Three Phase 600 V to 208Y/ 120 V	MP3C9J-M/BO/CLC	9	3	20A ¹	30A ⁶	18	8	6	23.25	12.5	45.5	395	E3R-3PMPC-1B
	MP3C15J-M/BO/CLC	15	4	30A ¹	50A ⁶	30	14	10	23.25	14.0	52.5	520	E3R-3PMPC-2B
	MP3C22J-M/BO/CLC	22.5	4	50A ¹	70A ⁶	30	14	10	23.25	18.0	55.0	710	E3R-3PMPC-3B
	MP3C30J-M/BO/CLC	30	4	70A ¹	100A ⁶	30	14	10	23.25	18.0	55.0	780	E3R-3PMPC-3B
	MP3C45J-M/BO/CLC	45	4	90A ¹	150A ⁷	30	14	10	25.50	18.0	65.0	1000	E3R-3PMPC-4B
Three Phase 480V to 208Y/ 120 V	MP3C9H-M/BO/CLC	9	3	25A ²	30A ⁶	18	8	6	23.25	12.5	45.5	395	E3R-3PMPC-1B
	MP3C15H-M/BO/CLC	15	4	40A ²	50A ⁶	30	14	10	23.25	14.0	52.5	520	E3R-3PMPC-2B
	MP3C22H-M/BO/CLC	22.5	4	60A ²	70A ⁶	30	14	10	23.25	18.0	55.0	710	E3R-3PMPC-3B
	MP3C30H-M/BO/CLC	30	4	80A ²	100A ⁶	30	14	10	23.25	18.0	55.0	780	E3R-3PMPC-3B
	MP3C45H-M/BO/CLC	45	4	125A ¹	150A ⁷	30	14	10	25.50	18.0	65.0	1000	E3R-3PMPC-4B

*See back page for Electrical Connection Diagrams

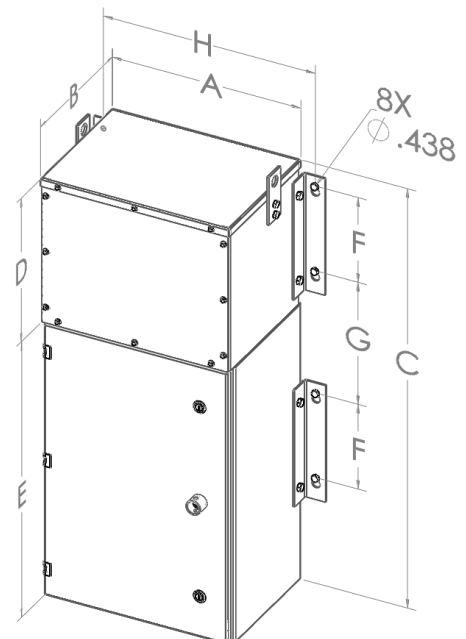
1. Eaton Type FDB Breaker
2. Eaton Type EHD Breaker
6. Eaton Type BAB Breaker
7. Eaton Type ED Breaker

Dimensions [inches]

Enclosure Name	A	B	C	D	E	F	G	H
E3R-1PMPC-1B	23.25	12.50	43.50	13.56	25.94	8.00	11.50	25.38
E3R-1PMPC-2B	23.25	14.50	53.00	16.56	36.44	8.00	18.50	25.38
E3R-1PMPC-3B	23.25	14.50	60.00	23.56	36.44	8.00	26.50	25.38
E3R-1PMPC-4B	23.25	16.00	65.00	23.56	41.44	8.00	27.00	25.38
E3R-3PMPC-1B	23.25	12.50	45.50	15.56	29.94	8.00	14.50	25.38
E3R-3PMPC-2B	23.25	14.00	52.50	16.06	36.44	8.00	19.25	25.38
E3R-3PMPC-3B	23.25	18.00	55.00	18.56	36.44	8.00	21.75	25.38
E3R-3PMPC-4B	25.50	18.00	65.00	23.56	41.44	8.00	29.50	27.63

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Electrical Connection Diagrams

Diagram 1

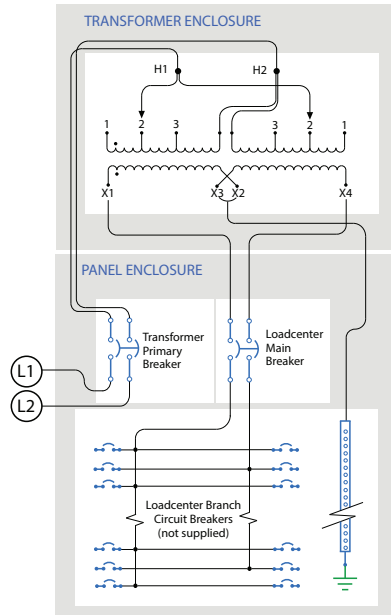


Diagram 2

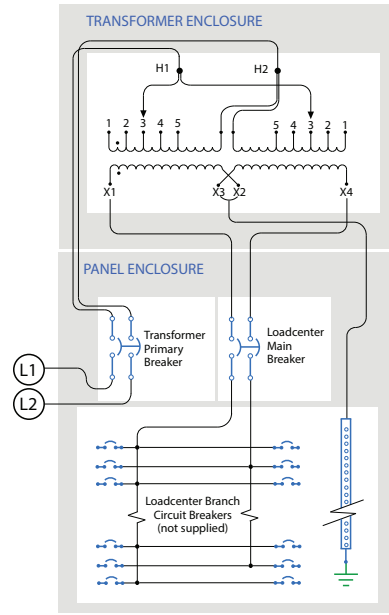


Diagram 3

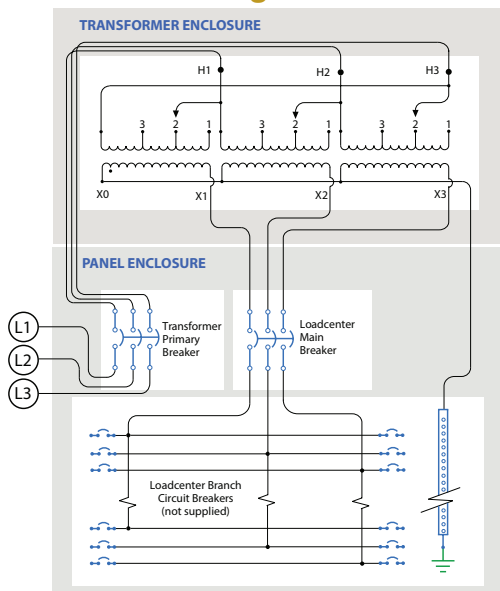
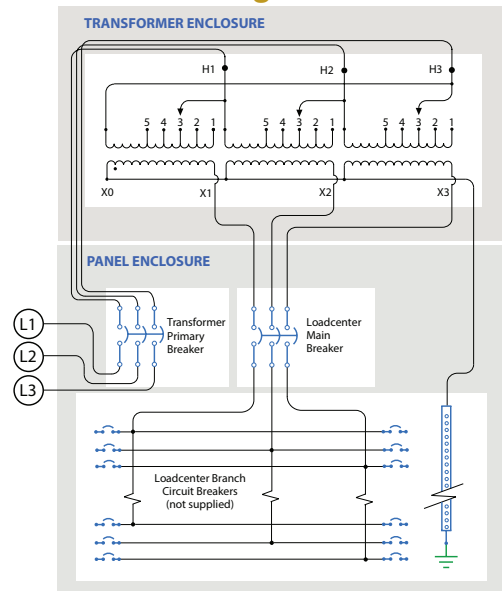


Diagram 4



- Diagrams above are for illustrative purposes only and are not intended to serve as a reference electrical schematic for wiring.

Contact our Sales Team

Use our website to find your local sales representative:

www.rexpowermagnetics.com

Canadian Sales & Inquiries

1-800-387-2840

sales@rexpowermagnetics.com

USA Sales & Inquiries

774-571-9479

bobcannon@rexpowermagnetics.com



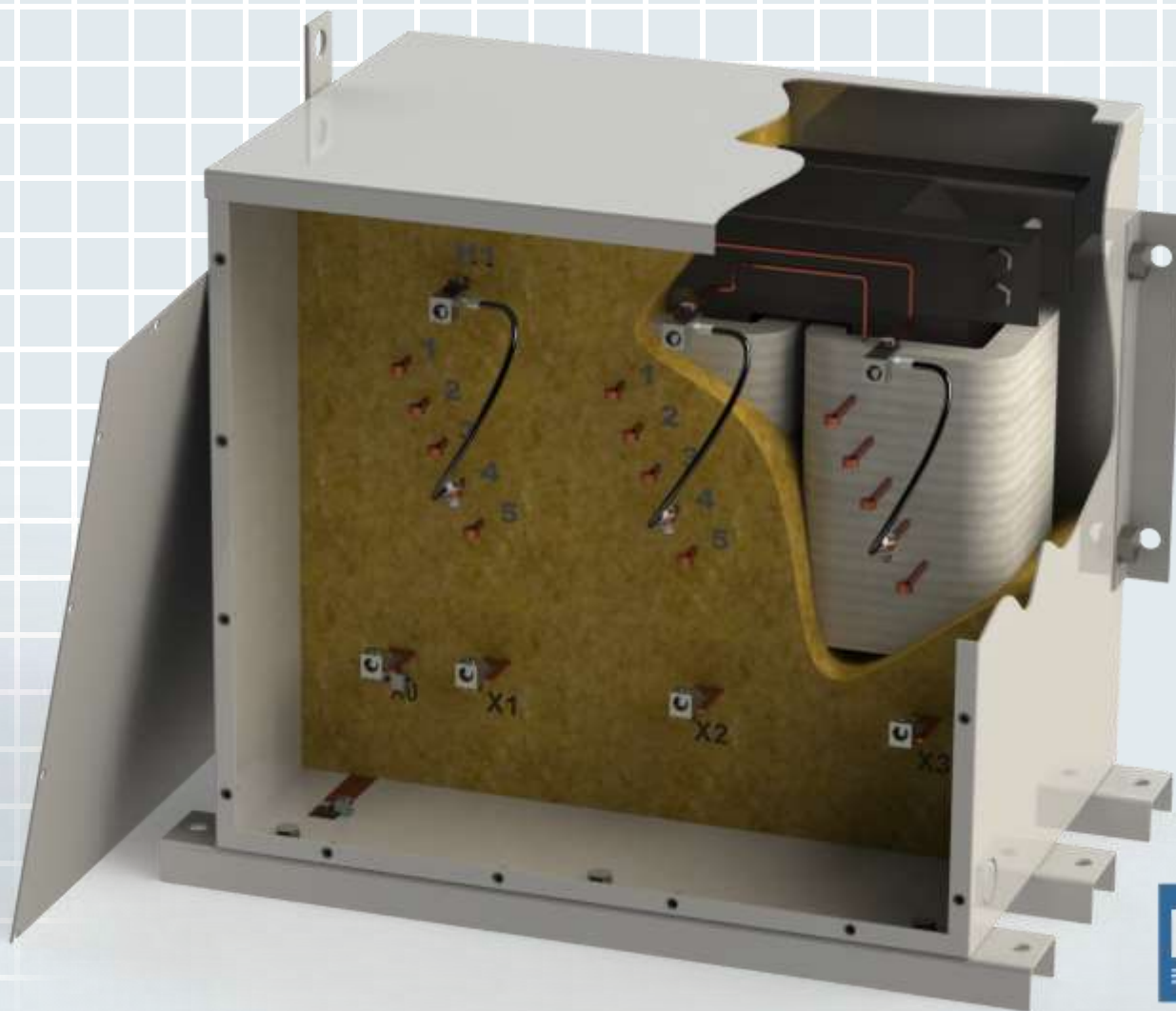
TRANSFORMERS FOR HAZARDOUS LOCATIONS

Ventilated & Encapsulated Designs

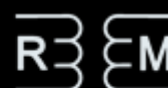
CLASS I, DIVISION 2 - GROUPS A, B, C, D

CLASS I, ZONE 2 - GROUPS IIA, IIB, IIC

TEMPERATURE CODE T2C, T3, T3C



ISO 9001:2008



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REX POWER MAGNETICS

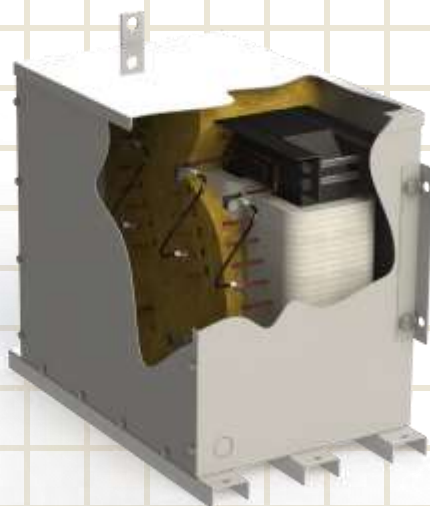


TRANSFORMERS FOR HAZARDOUS LOCATIONS ARE AVAILABLE FROM REX POWER MAGNETICS

Rex Power Magnetics, established in 1972 is an ISO 9001 registered **leading manufacturer** of CSA certified and UL listed **custom dry type Transformers**. Rex is **driven by technology, innovation, and customer service**, and has a track record of sustained profitable growth. With a central and integrated engineering, manufacturing, and customer service facility located just north of Toronto, Ontario, Canada, and warehouses throughout Canada and the United States, the company offers a **broad range of dry type power magnetic products** to markets throughout North America and internationally.

The Rex product line includes custom designed specialty transformers, Power Transformers up to 15 MVA and 46,000 Volts, distribution transformers, reactors, autotransformers, control and machine tool transformers, custom enclosures, custom cut electrical steel cores, and other power magnetic products and services. Supported by considerable and **sustained investment in research and development**, new and automated equipment, and efficient processes Rex Power Magnetics continually expands and enhances its product and service offering.

We pride ourselves: firstly in our **superior delivery responsiveness** supported by our passion for customer service and our vertically integrated in-house design, manufacture, and testing capabilities; and secondly in our **Technology leadership** supported by our industry leading R&D effort, engineering expertise, technical competence, and manufacturing know-how.

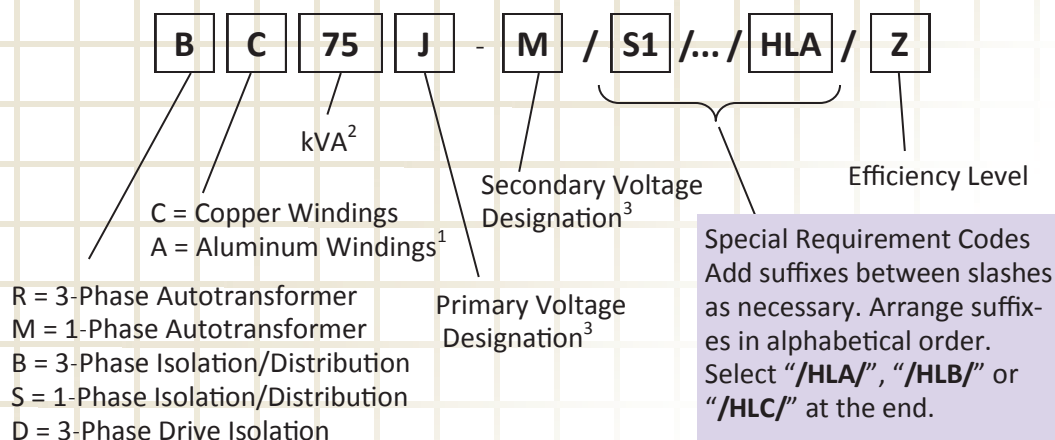


Since 2001, Rex Power Magnetics has been designing and producing a line of dry type transformers for **Hazardous Locations and Harsh Industrial Environments**. Rex's product offering in this category includes three varieties, known as the HLA, HLB & HLC product lines, which are explained in detail in this catalog.

"Hazardous Locations and Harsh Industrial Environments" typically refers to areas which may contain dangerous and corrosive, explosive or combustible gasses, liquids, or dusts. Typical applications include the mining, petrochemical, and pulp and paper industries.

For harsh environments that are not formally classified as a Hazardous Location, as defined by IEC or other standards, Rex's conventional encapsulated transformers may be used, which are detailed in Rex's main distribution transformer Catalog.

The following diagram explains how to form a Catalog Number for a Rex HLA, HLB or HLC transformer.



Primary and Secondary Voltage Letter Codes:

A – 120	E – 347	J1 – 575
A1 – 115	F – 380	J2 – 550
A2 – 110	G – 416	K – 120/240
B – 208	G1 – 400	K1 – 115/230
C – 240	H – 480	K2 – 110/220
C1 – 230	H1 – 460	L – 240/480
C2 – 220	H2 – 440	L1 – 230/460
D – 277	J – 600	L2 – 220/440
M – 208Y/120	P1 – 460Y/266	R – 380Y/220
N – 416Y/240	P2 – 440Y/254	S – 240Y/139
N1 – 400Y/231	Q – 600Y/347	S1 – 230Y/133
P – 480Y/277	Q1 – 575Y/332	S2 – 220Y/127
	Q2 – 550Y/318	

For an unlisted or special voltage, use 'X'

Only use letters M to S2 for "wye" (star) connections. For all single phase voltages, delta connections, and autotransformer voltages, use letter codes A to L2

Notes: 1 - Not all kVA levels are available with aluminum conductor. 2 - For HLA & HLB transformers, maximum kVA is 112.5 kVA (3 phase). For HLC, Max 900 kVA depending on product type. 3 - Highest available voltage is 5 kV. For UL approved Div. 2,

Special Requirement Codes:

50 – 50 cycles (Hz) (Other frequencies also available)
E – Special Enclosure
EP – Encapsulated Transformer
K – K-Factor Rated (K4, K13, K20 or other)
M – Special Mounting Brackets
P – Special Paint
S – Electrostatic Shield
T – Special Temperature Rise (eg T80 or T115)
Many other options exist. Consult our sales team!
For an unlisted requirement, use 'X'

Efficiency Level:

Most common efficiency levels:

Z – Standard efficiency (CSA C802.2, NEMA TP-1)
Z2 – Green Line Premium (CSL-2 efficiency)
Z3 – Green Line Ultra Premium (2016 DOE Level)

Other common efficiencies:

ZNP - NEMA Premium level
ZCSL3 - Candidate Standard Level 3 (CSL 3) efficiency
X - Specified losses/efficiency

CERTIFICATION DETAILS

Rex HLA, HLB, and HLC type transformers (detailed in the following pages) are CSA and UL approved for CLASS I, DIVISION 2, GROUPS A, B, C, & D

CSA FILE NUMBER: LR34493 UL LISTING: E348963

Group A: Atmospheres containing acetylene;

Group B: Atmospheres containing butadiene, ethylene oxide, hydrogen (or gases of vapours equivalent in hazard to hydrogen, such as manufactured gas) or propylene oxide

Group C: Atmospheres containing acetaldehyde, cyclopropane, diethyl ether, ethylene, hydrogen sulphide, or unsymmetrical dimethyl hydrazine (UDHM), or other gases or vapours of equivalent hazard

Group D: Atmospheres containing acetone, acrylonitrile, alcohol, ammonia, benzene, benzol, butane, ethylene, dichloride, gasoline, hexane, isoprene, lacquer solvent vapours, naphtha, natural gas, propane, propylene, styrene, vinyl acetate, vinyl chloride, xylenes, or other gases or vapours of equivalent hazard

****NEW**** A variant of Rex's HLA & HLB transformers is available with
IECEx approved CLASS 1 Zone 2 certification

Please contact our sales office for more information on IECEx approved transformers

CLASS I, ZONE 2, GROUPS IIA, IIB, IIC — IECEx CSA 13.0011X

Group II A: Atmospheres containing acetaldehyde, acetone, cyclopropane, alcohol, ammonia, benzene, benzol, butane, ethylene, dichloride, gasoline, hexane, isoprene, lacquer solvent vapours

Group II B: Atmospheres containing acrylonitrile, butadiene, diethyl ether, ethylene, ethylene oxide, hydrogen sulphide, propylene oxide, or unsymmetrical dimethyl hydrazine (UDHM), or other gases or vapours of equivalent hazard

Group II C: Atmospheres containing acetylene, carbon disulphide, or hydrogen or other gases or vapours of equivalent hazard.

Do you have an application that requires other Hazardous Location certifications?

Contact us: sales@rexpowermagnetics.com

TEMPERATURE CODES AND CORRESPONDING SURFACE AND WINDING TEMPERATURE

AVERAGE TEMPERATURE RISE OF WINDINGS (ABOVE AMBIENT)	TEMPERATURE CODE	MAXIMUM WINDING TEMPERATURE
150 °C	T2C	230 °C
115 °C	T3	200 °C
80 °C	T3C	160 °C

REX POWER MAGNETICS' TECHNICAL CAPABILITY

Rex Power Magnetics has the engineering capability to design, manufacture, and test all standard and specialty dry type transformers, related magnetic products, and power transformers rated up to 10 MVA and 200 kV BIL. All Rex products are CSA certified and most are UL listed, including power transformers. CE marking and ABS marking are also available.

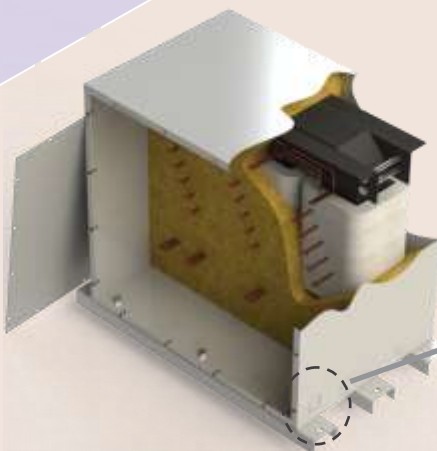
Rex Power Magnetics operates its own fully independent, complete sheet metal fabrication and paint facility to produce its own transformer enclosures, core clamps, brackets, and accessories, as well as manufactured custom enclosures. The Rex engineering and design team consists of highly competent and qualified individuals with many years of transformer design experience.

REX TRANSFORMERS CONSTRUCTED FOR HAZARDOUS LOCATIONS

Rex offers three transformer options that are suitable for hazardous locations.

FEATURES	Type HLA	Type HLB	Type HLC
Construction Features	<ul style="list-style-type: none"> • ANC Design • Epoxy Encapsulated • Bottom access (Figure 8) • Front access (Figure 9) • Conduit K/O on sides • Nameplate marking 	<ul style="list-style-type: none"> • ANC Design • Epoxy Encapsulated • Bottom access (Figure 8) • Front access (Figure 9) • Conduit K/O on sides • Nameplate marking 	<ul style="list-style-type: none"> • ANN Design • Bottom access (Figure 8) • Front access (Figure 9) • Conduit K/O on sides
Insulation Class	185 °C	185 °C	185 °C or 220 °C
Temperature Rise	115 °C Maximum	115 °C Maximum	80 °C, 115 °C, or 150 °C
Temperature Code	T3	T3	T3C, T3, or T2C
Enclosure	<ul style="list-style-type: none"> • ASA #61 Grey paint • Type 3R Outdoor <p>Optionally available, for HLA, HLB, & HLC enclosures:</p> <ul style="list-style-type: none"> • Type 4 Non-Vented (When used with CSA certified watertight conduit hubs) • IP 66 (When used with specified IEC certified watertight conduit hubs) • Stainless Steel 304 or 316 / Other materials, finishes, colors. 		
Certification	CSA and UL approval for Class I, Division 2	CSA and UL approval for Class I, Division 2	CSA and UL approval for Class I, Division 2
Application	Windings are encapsulated in epoxy, preventing airborne contaminants from reaching the coils, and thus preventing damage to electrical insulation.	As with HLA, the windings are encapsulated. Additionally, the connection between the leads and the coils are encapsulated. Wiring to the rest of the system is done at the leads	Conventional construction: non-encapsulated, vented design. Designed to conform to specified temperature code.

Construction



HLA: Encapsulated transformer, with terminals and taps accessible at the front-access wiring chamber.



HLB: Encapsulated transformer *and connections*; Leads for terminations and taps brought out.



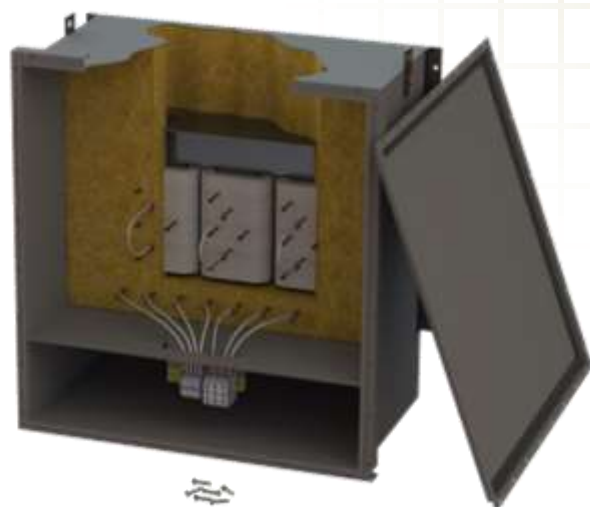
HLC: Ventilated transformer (no encapsulation), meeting Div. 2 requirements.

TYPICAL DIMENSIONS AND WEIGHTS - SINGLE PHASE HAZ LOC TRANSFORMERS

Part Number	kVA	Figure	Mounting	Width		Depth		Height		Weight
				inches	mm	inches	mm	inches	mm	
SC0.25J-K/HLA	0.25	1 & 8	Wall/Floor	5¼	133	4½	114	9	229	17
SC0.5J-K/HLA	0.5	1 & 8	Wall/Floor	5¼	133	4½	114	9	229	20
SC0.75J-K/HLA	0.75	1 & 8	Wall/Floor	6	152	5	127	10	254	23
SC1J-K/HLA	1	1 & 8	Wall/Floor	6	152	5	127	10	254	27
SC1.5J-K/HLA	1.5	1 & 8	Wall/Floor	7 ⅝	191	6½	165	11¼	286	40
SC2J-K/HLA	2	1 & 8	Wall/Floor	7 ⅝	191	6½	165	11¼	286	45
SC3J-K/HLA	3	2 & 8	Wall/Floor	7 ⅝	191	6½	165	11¼	286	55
SC5J-K/HLA	5	3 & 9	Wall/Floor	12½	318	12½	318	15	381	100
SC7J-K/HLA	7	3 & 9	Wall/Floor	12½	318	12½	318	15	381	117
SC10J-K/HLA	10	4 & 9	Wall/Floor	15	381	14¾	375	18	457	141
SC15J-K/HLA	15	4 & 9	Wall/Floor	15	381	14¾	375	18	457	210
SC25J-K/HLA	25	4 & 9	Wall/Floor	18	457	14	356	24¾	629	300
SC37J-K/HLA	37.5	4 & 9	Floor	19	483	16	407	28¾	718	685
SC50J-K/HLA	50	4 & 10	Floor	19	483	16	407	28¾	718	750

Notes:

- See following page for referenced figures
- HLB variants of the above transformers will have the same outside appearance as HLA transformers, with the addition of permanent cable glands.
- Dimensions provided are for the standard HLA product, with Type 3R outdoor enclosure.
- A specification drawing for your requested configuration may be available online, or by requesting it from our engineering department.



IP 65 & IP 66 CONSTRUCTION

For applications where enclosure type is specified using the IP system rather than the CSA / NEMA enclosure type code, Rex is able to provide transformers with enclosures marked in accordance to the IP system.

IP 65: Rex has an approved bolted panel construction that is approved for non-hazardous applications, and Class I, Division 2 applications.

IP 66: Rex has an approved welded construction with removable cover, that can be floor or wall mounted depending on the size and weight. This construction employs a securely bolted lip-in-gasket design.

For IECEx Zone 2 applications, this enclosure can be built with a specialty gasket that allows it retain its IP66 rating.

TYPICAL DIMENSIONS AND WEIGHTS - THREE PHASE HAZ LOC TRANSFORMERS

Part Number	kVA	Figure	Mounting	Width		Depth		Height		Weight lbs.
				inches	mm	inches	mm	inches	mm	
BC3J-M/HLA	3	5 & 9	Wall/Floor	15	381	11	279	15 1/8	384	152
BC6J-M/HLA	6	6 & 9	Wall/Floor	15	381	11	279	15 1/8	384	210
BC9J-M/HLA	9	6 & 9	Wall/Floor	18	457	12 1/2	318	17	432	282
BC15J-M/HLA	15	7 & 9	Wall/Floor	21	533	14	356	17 1/2	432	380
BC30J-M/HLA	30	7 & 9	Wall/Floor	21	533	18	457	19 7/8	505	540
BC45J-M/HLA	45	7 & 10	Floor	26	660	18	457	25	635	820
BC75J-M/HLA	75	7 & 10	Floor	32	813	18	457	25	635	1100
BC112J-M/HLA	112.5	7 & 10	Floor	36	915	25	635	31 1/2	800	1500

Part Number	kVA	Figure	Mounting	Width		Depth		Height		Weight lbs.
				inches	mm	inches	mm	inches	mm	
BC3J-M/HLB	3	5 & 9	Wall/Floor	15	381	11	279	15 1/8	384	152
BC6J-M/HLB	6	6 & 9	Wall/Floor	15	381	11	279	15 1/8	384	236
BC9J-M/HLB	9	6 & 9	Wall/Floor	18	457	12 1/2	318	17	432	310
BC15J-M/HLB	15	7 & 9	Wall/Floor	21	533	14	356	17 1/2	446	410
BC30J-M/HLB	30	7 & 9	Wall/Floor	21	533	18	457	19 7/8	505	630
BC45J-M/HLB	45	7 & 10	Floor	26	660	18	457	25	635	970
BC75J-M/HLB	75	7 & 10	Floor	32	813	18	457	25	635	1200
BC112J-M/HLB	112.5	7 & 10	Floor	36	915	25	635	31 1/2	800	1620

Part Number	kVA	Figure	Mounting	Width		Depth		Height		Weight lbs.
				inches	mm	inches	mm	inches	mm	
BC15J-M/HLC	15	7 & 11	Wall/Floor	20 1/2	521	21 5/8	549	21	533	188
BC30J-M/HLC	30	7 & 11	Wall/Floor	20 1/2	521	26 1/4	667	26 1/4	667	285
BC45J-M/HLC	45	7 & 11	Wall/Floor	20 1/2	521	26 1/4	667	26 1/4	667	360
BC75J-M/HLC	75	7 & 11	Wall/Floor	24 1/2	622	29 1/4	743	31 1/2	800	540
BC112J-M/HLC	112.5	7 & 12	Floor	30 3/4	781	37 1/2	953	31 3/4	806	1085

Notes:

- See following page for referenced figures
- HLB variants of the above transformers will have the same outside appearance as HLA transformers, with the addition of permanent cable glands.
- Dimensions provided are for the standard HLA product, with Type 3R outdoor enclosure.
- A specification drawing for your requested configuration may be available online, or by requesting it from our engineering department.

ELECTRICAL CONFIGURATION¹

FIG. 1

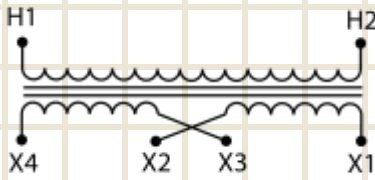


FIG. 2

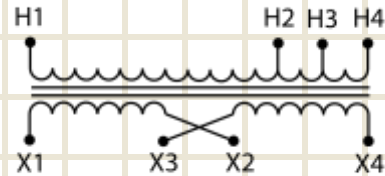


FIG. 3

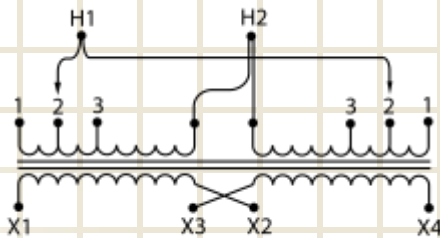


FIG. 4

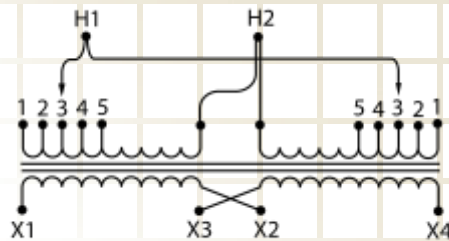


FIG. 5

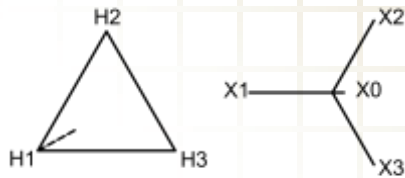


FIG. 6

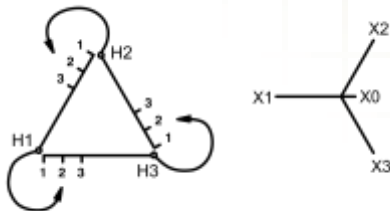
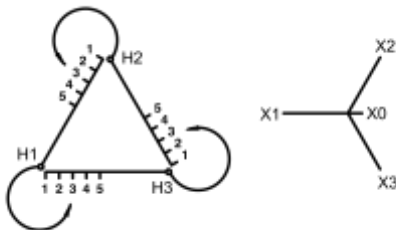


FIG. 7



1 - Electrical configurations shown are the standard configurations. Alternate configurations can be specified with your order. Standard configurations are subject to change without notice.

OUTLINE VIEW²

FIG. 8

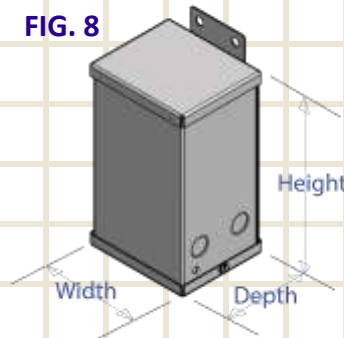


FIG. 9

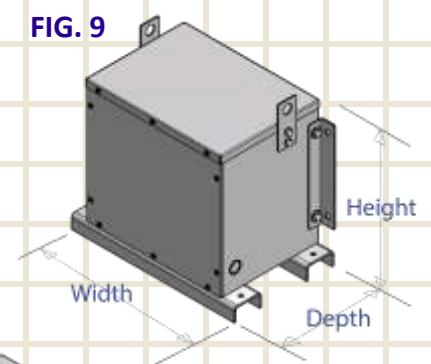


FIG. 10

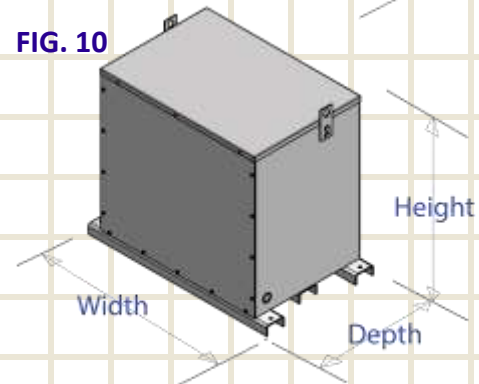


FIG. 11

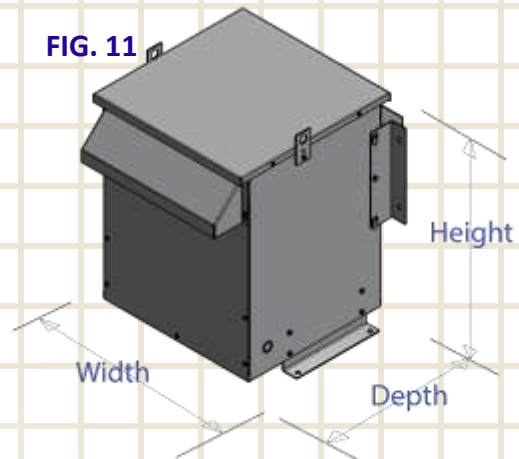
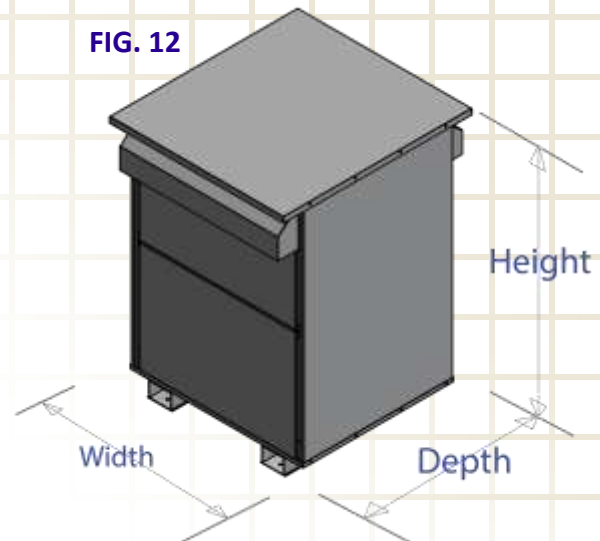


FIG. 12



2 - Outline dimensions and features shown are the standard specification. Alternate dimensions and features can be specified with your order. Standard specifications are subject to change without notice.

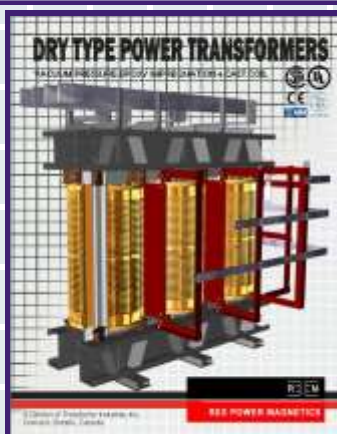
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HIGH OVERLOAD CAPABILITY:

Due to the longer thermal time-constant of cast coils in comparison with conventional ventilated dry type transformers, higher short-time overload capabilities are possible.

ENVIRONMENTALLY FRIENDLY:

Cast Coil transformers contain only chemically non hazardous materials

SAFETY:

Cast Coil transformers are self extinguishing, virtually eliminating the possibility for fire or explosion. Installations do not require special fire protection systems.

HIGH IMPULSE VOLTAGE STRENGTH:

The impulse voltage withstand capability of Cast Coil transformers is higher than conventional dry types and is comparable to liquid filled units

MAINTENANCE:

Cast Coil type transformers are virtually maintenance free due to the smooth crevice-free construction of the coils. With proper precautions cast coil units can be installed at ambient temperatures as low as -25°C and can be energized from a cold start.

HIGH SHORT CIRCUIT STRENGTH:

The fiberglass reinforced solid cast construction provides superior mechanical strength with the highest short circuit withstand capability of all transformer types, including that of liquid-filled units.

