

Distribution TransFilter™

Type 'DV' Harmonic Mitigating Transformer for High K-Factor Loads

Exceeds NEMA TP1-2002, CSA C802.2-00 and US DOE Candidate Standard Level 3 Requirements

PRODUCT BENEFITS

- Reduces 'penalty losses' due to harmonic currents
- Reduces apparatus heating and A/C loading
- Reduces power costs
- Provides an attractive 'payback' and return-on-investment
- Balances primary phase currents
- Reduces THD_v to less than 5% at non-linear electronic loads
- Restores switch-mode power supply's 'ride-through' capability
- Assures system compatibility with sensitive electronic loads
- Optional TP unit exceeds NEMA TP1-2002, CSA C802.2-00 & EPA Energy Star® linear efficiency requirements
- Optional *e-Rated*® unit exceeds the preceding efficiency requirements under severe non-linear loading up to 100% THD_i



PRODUCT DESCRIPTION

Type 'DV' *Distribution TransFilters*™ are high efficiency, three-phase, single or multi-output distribution transformers that have been specifically designed to supply phase-to-neutral connected, non-linear electronic loads. These harmonic mitigating transformers reduce voltage distortion to less than 5% THD_v at their loads and eliminate the network communication problems caused by high neutral-to-ground voltages, the result of load-generated zero-sequence harmonic neutral currents in four-wire distribution systems.

Optional 'TP' transformers exceed the efficiency requirements of NEMA TP1-2002, CSA C802.2-00 and the EPA Energy Star® under linear loading. Optional *e-Rated*® units exceed these efficiency requirements under severe non-linear loading ($\leq 100\%$ THD_i).

Type 'DV' transformers cancel positive- and negative-sequence harmonic currents on their common primary bus or within their multi-output secondary windings. They are available in a number of standard primary-to-secondary phase-shifts so that they may be used to create twelve-, eighteen- or twenty-four-pulse systems.

Type 'DV' *Distribution TransFilters*™ also cancel zero-sequence harmonic flux within their secondary windings. As a result,

they provide ultra-low zero-sequence impedance, a characteristic that significantly reduces voltage distortion and 60Hz sine wave 'flat-topping' at their loads. This secondary winding configuration also eliminates zero-sequence harmonic current in the primary windings.

Type 'DV' transformers may be used as 'stand-alone' mitigation solutions (i.e. without zero-sequence harmonic filters), when circuit length and/or loading are controlled. These limitations are graphically detailed in two PQI Publications entitled: (i) 'Neutral-to-Ground Voltage vs. Branch Circuit Length & Loading for Typical Non-Linear Electronic Workstation Loads' and (ii) 'Neutral-to-Ground Voltage vs. Branch Circuit Length & Loading for Typical 120V Non-Linear Electronic Gaming Machine Loads'.

Type 'DV' units are cost-effective alternatives to de-rated or K-Rated distribution transformers, which cannot reduce voltage distortion and are only intended to survive in a harmonic environment.

Optional *e-Rated*® units exceed the energy efficiency requirements of NEMA Standard Publication TP1-2002, CSA Standard C802.2-00 and the US Department of Energy's Candidate Standard Level 3.



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A Solution for Voltage Distortion and Network Communication Problems

SELECTION TABLES

kVA	Enclosure Size (Inches)	Weight (lbs.) *
15	20.50W x 20.75D x 26.25H	310
30	20.50W x 20.75D x 26.25H	420
45	24.50W x 22.00D x 31.50H	580
75	30.75W x 27.75D x 30.75H	900
112.5	30.75W x 27.75D x 30.75H	1200
150	40.00W x 31.00D x 44.00H	1550
225	40.00W x 31.00D x 44.00H	2200
300	40.00W x 31.00D x 44.00H	2400
500	46.00W x 40.00D x 62.00H	2900
Other up to 3500kVA		

* = Approx

The above weights and measures apply to single output configurations up to 600V with a NEMA 1 enclosure and a standard temperature rise (150°). Multiple output units and some options may change the enclosure size and weights. Consult PQI for detailed product information for these and other configurations. Enclosure provided will be determined by PQI unless otherwise specified.

TECHNICAL SPECIFICATIONS

UL Listed

CSA Approved

Related Standards: UL-506, ANSI C75.110

NEMA ST-20, NEMA TP1-2002

CSA C9-M1981, CSA 22.2 No.47-1977

CSA C802.2-00

Voltage Class: 1.2kV [Standards to 35kV]

BIL Rating: 10kV [Standard for Class]

Voltage: 480 :120/208 [All Standards to 35kV]

Frequency: 60Hz [50Hz][400Hz][Other]

Type: ANN

Temp. Rise: 150°C [130°C][115°C][80°C][Other]

Zero Seq. Imp: <0.95% @ 60Hz

Zero Seq. React: <0.3% @ 60Hz

Insulation Class: 220°C

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e-Rated® is a Registered Trademark of the **e-Rated Transformer Corporation**

Definitions

Type:	DV (Delta : Ultra-Low Z ₀ Wye)
ANN:	Cooling Medium – Air, Internal & External Circulation - Natural
Hz:	Frequency
kVA:	Power Rating of Transformer
PV:	Primary Voltage
SV:	Secondary Voltage
Temp:	Temperature Rise: 150°C (Standard) [130°C][115°C][80°C][Other]

Options

Phase Shift:	0°, 15°, 20°, 30°, 40°, 45° [Other]
Efficiency TP1-2002:	TP
e-Rated® :	ER
Enclosure NEMA 1:	N1 (Standard)
NEMA 3R:	N3R (Optional)
Other:	(Optional)
Electrostatic Shield:	ES – Single 2ES – Dual 3ES – Triple
Thermal Sensors:	TS
Color:	PQI White [ASA 61 Gray][Other]

Catalogue Number Configuration

Type & Phase Shift(s)–Hz–kVA–PV:SV–Temp–Options

Sample Catalogue Number

DV15–60–075–480:120/208–150–ER–N3R–ES–TS



PQI Warranty - 10 years pro-rated.

All specifications are subject to change without notice. Revision 2, September 2007
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