

# T1000-2016™

## APPLICATION

T1000-2016 is an ultra-efficient low voltage dry-type harmonic mitigating transformer that exceeds the U.S. Dept. of Energy's new and more stringent efficiency legislation effective January 1, 2016<sup>1</sup>. T1000-2016 is optimized to reduce voltage distortion in harmonic-rich environments such as applications with high densities of electronic equipment.

## KEY PERFORMANCE CHARACTERISTICS

T1000™ transformers treat the 3rd harmonic through secondary flux cancellation and reduce fundamental current imbalance. Unlike delta-wye transformers, T1000 windings are configured such that 3rd and other zero sequence currents in the transformer do not couple into the primary winding. 5th and 7th harmonics are treated on a system basis by alternating phase-shifted models within the local distribution system.

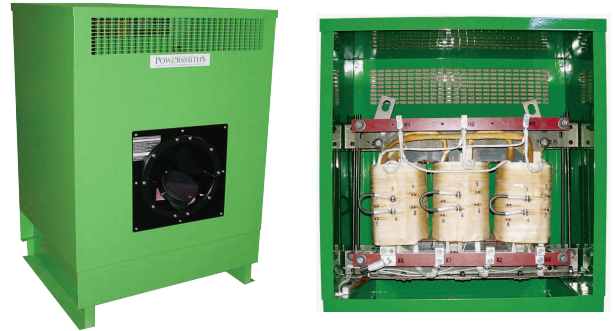
When tested according to the U.S. Dept. of Energy's 10 CFR Part 431, a linear load test at 35% of nameplate capacity, the T1000-2016 delivers on average 41% less losses than current EPC Act 2005 legislation/NEMA TP1 /C802.2, and 14% less losses than U.S. DOE 2016<sup>1</sup>, NEMA Premium® and the Consortium for Energy Efficiency CEE Tier 1 level over the kVA size range. Under harmonic-rich loading, savings can be substantially higher.

## EXPANDED KVA SELECTION ENABLES RIGHT-SIZING

Powersmiths enables right-sizing of electrical infrastructure by offering a much broader selection of transformer kVA sizes. The capital cost, operating cost and footprint reductions can be dramatic - on the order of 30-50%, through smaller transformers, breakers, conductors, and distribution panels.

## RETROFIT CONSIDERATIONS

Powersmiths' flexible design and manufacturing process removes the many barriers associated with replacing an existing transformer, including footprint, impedance, internal terminal layout, inrush, fault and arc flash levels.



75kVA T1000-2016 with Rotatable IR Port™ option and internal of transformer shown

## ENVIRONMENTAL/GREEN BUILDING CONTRIBUTIONS

T1000-2016 contributes to green building programs and carbon footprint reduction through its substantial reduction in energy losses compared to legislation. Additional benefits include our ISO14001 certified manufacturing, biodegradable packaging, integrated metering and ability to integrate with the Powersmiths WOW™ Sustainability Management Platform.

## CERTIFICATIONS & TESTING

Powersmiths certifications include ISO 9001 (Quality), ISO 14001 (Environment), ISO 17025 (Efficiency Test Lab), UL and CSA. In addition to standard industry tests, Powersmiths has a production-integrated nonlinear load test program that replicates real-world conditions to enable true losses and efficiency verification.

## WARRANTY

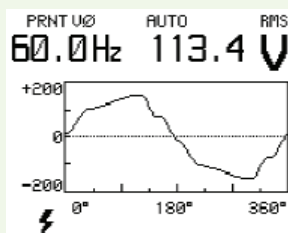
T1000-2016 has an industry leading 25-year pro-rated warranty.

## INTEGRATED OPTIONS

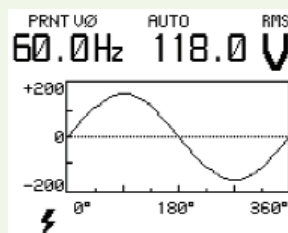
Powersmiths offers many options, such as integrated metering to provide information about capacity utilization, load profiles, power and energy use, and patented Rotatable IR Port™ and lockable hinged doors to enable safer, cost-effective and non-invasive thermal imaging of the live transformer.

## KEY FEATURES

- Designed and tested to deliver higher efficiency and power quality in harmonic-rich, heavily loaded environments
- Energy savings through lower losses and reduced associated cooling provide lower lifecycle cost
- Efficiency beyond NEMA Premium®, Consortium for Energy Efficiency CEE Tier 1, U.S. DOE 2016 legislation<sup>1</sup> and CSL-3
- K-rated as required by UL for today's electronic equipment
- Manufactured in a certified ISO 9001, ISO 14001 and ISO 17025 facility for quality, low environmental impact, and transformer efficiency testing



Voltage Waveform Before



Voltage Waveform with T1000

<sup>1</sup> U.S. Department of Energy, 10 CFR Part 431: Energy Conservation Program: Energy Conservation Standards for Distribution Transformers; Final Rule, April 2013.

## TECHNICAL SPECIFICATIONS

T1000-2016 is a copper-wound dry-type isolation transformer with zig-zag harmonic mitigating windings. It has a common-core, 10kV BIL, 200% rated neutral, built to NEMA ST-20, UL1561 and other applicable ANSI and IEEE standards, and is cULus Listed and CSA Efficiency Verified. Both primary and secondary terminals and voltage taps (typically six 2.5%) are readily accessible by removing the front enclosure panel. T1000-2016 is UL Listed for 2" clearance - a significant improvement over the typical industry 6" limit. Its 220°C class insulation system is NOMEX-based with an Epoxy Co-polymer impregnant with technical performance characteristics that embed lower environmental impact, long term reliability and long life expectancy. T1000-2016 comes standard with a single full width electrostatic shield, 60Hz, K-13 rating, 105°C temperature rise, and carries OSHPD and IBC Seismic Certification ( $S_{DS}=1.5g$ )\*. The seismic bracing option provides a higher 2.28g.

T1000-2016 exceeds U.S. DOE 2016 efficiency legislation (Final Rule issued April 2013), and reduces losses over the kVA size range by an average of 41% when compared to current EPA 2005/NEMA TP1/C802.2 legislation, and 14% less losses than NEMA Premium® and the Consortium for Energy Efficiency CEE Tier 1 level. Under harmonic-rich loading, savings can be substantially higher.

Designs have been carefully optimized to address primary breaker inrush characteristics and manage secondary short circuit currents and arc flash levels.

Keeping noise at a minimum is key. Every Powersmiths T1000-2016 meets NEMA ST-20 and is tested for noise prior to shipment. A lower noise option is available for very sensitive environments.

All T1000 models come standard in a NEMA 1 ventilated drip-proof indoor enclosure made of heavy gauge steel finished with epoxy powder coating for durability and low environmental impact. A wide variety of enclosures and options are available.

## ORDERING INFORMATION

kVA: Rating of unit (9-750 kVA)      PV: Primary voltage (up to 600V)  
DEG: Primary/Secondary phase shift      SV: Secondary voltage (up to 600/347V)  
(0,30 standard; 15,45 optional)

## PRODUCT & MODEL INFORMATION

T1000-2016 model no. format: T1000-C4-KVA-DEG-PV-SV

## TECHNICAL DATA

kVA	Efficiency (%)	Impedance (%Z)	CU Model Weight (lbs)	Standard Case Size (in)	Alternate Smaller Case Size (in)
15	98.22	3.0-6.0	275-325	A (18W x 17D x 27H)	17.4W x 14.5D x 25H
20	98.31	3.0-6.0	325-375	B (26W x 18D x 30H)	23W x 15.5D x 27.5H
25	98.41	3.0-6.0	350-400	B (26W x 18D x 30H)	23W x 15.5D x 27.5H
30	98.50	3.0-6.0	375-420	B (26W x 18D x 30H)	23W x 15.5D x 27.5H
45	98.64	3.0-6.0	500-550	B (26W x 18D x 30H)	25W x 16D x 29H
50	98.67	3.0-6.0	550-600	C (32W x 22D x 40H)	26.5W x 17D x 33H
63	98.74	3.0-6.0	600-650	C (32W x 22D x 40H)	26.5W x 17D x 33H
75	98.80	3.0-6.0	725-800	C (32W x 22D x 40H)	26.5W x 17D x 33H
100	98.85	3.0-6.0	875-975	C (32W x 22D x 40H)	30.5W x 20D x 33H
112.5	98.91	3.0-6.0	1000-1100	C (32W x 22D x 40H)	30.5W x 20D x 33H
125	98.94	3.0-6.0	1150-1250	D (38W x 27D x 48H)	33W x 22.5D x 38H
150	98.99	3.0-6.0	1300-1400	D (38W x 27D x 48H)	33W x 22.5D x 38H
175	99.02	3.0-6.0	1400-1500	D (38W x 27D x 48H)	34.5W x 24D x 42H
200	99.05	3.0-6.0	1500-1600	D (38W x 27D x 48H)	34.5W x 24D x 42H
225	99.08	3.0-6.0	1600-1750	D+ (38W x 32D x 52H)	34.5W x 24D x 42H
250	99.10	3.0-6.0	1750-1850	D+ (38W x 32D x 52H)	37W x 26D x 43H
300	99.14	3.0-6.0	2000-2150	D+ (38W x 32D x 52H)	37W x 26D x 43H
400	99.19	3.0-6.0	2500-2650	E+ (52W x 38D x 61H)	43W x 33D x 51H
450	99.22	3.0-6.0	2750-2900	E+ (52W x 38D x 61H)	43W x 33D x 51H
500	99.24	3.0-6.0	3150-3350	E+ (52W x 38D x 61H)	43W x 33D x 51H
600	99.27	3.0-6.0	3650-3800	F (64W x 47D x 67H)	51.4W x 37.5D x 60.6H
750	99.31	3.0-6.0	4150-4350	F (64W x 47D x 67H)	51.4W x 37.5D x 60.6H

NOTE: The above data applies to the standard configuration of each kVA. Selection of some options may change enclosure size and/or transformer weight. Consult factory for detailed product data sheet for these and other configurations. Efficiencies tested according to U.S. Dept. of Energy's 10 CFR Part 431, a linear load test at 35% of nameplate capacity.

## AVAILABLE OPTIONS

**Metering:** Express Logger™, SMART™ or Cyberhawk TX™ (See product cut sheets for more info)

**N3R:** NEMA 3R, ventilated enclosure

**N2S:** Indoor sprinkler proof enclosure

**OSEC:** Enclosure for outdoor public areas

**OV:** Enclosure for outdoor secure areas

**SS:** Painted stainless steel enclosure

**NVI:** Non-ventilated indoor enclosure

**IRP:** Rotatable IR Port™

**HD:** Hinged Door

**F50:** 50 Hz design

**2S:** Dual electrostatic shields

**3S:** Triple electrostatic shields

**SPD:** (120/208 V OR 277/480V)

**PRO80:** 80kA, 7 mode, Filter

**PRO120:** 120kA, 7 mode, Filter

**PRO200:** 200kA, 7 mode, Filter

**PRO240:** 240kA, 7 mode Filter

**PROXX:** Where XX is custom ID

**LKS:** Lug kit, screw-type

**LKC:** Lug kit, compression type

**LI:** Low inrush

**COL:** Custom color

**TS:** Thermal sensors at 170°C and 200°C

**NLT:** Nonlinear load test

**SE:** Sensitive environment, extra low noise

**SB:** Seismic bracing

*\*For Seismic certification details contact Powersmiths*

Wall-mount kit is available and sold separately

Technical specifications subject to change without notice.

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