

R.E.UPTEGRAFF MFG. COMPANY, LLC

TRANSFORMERS

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Established in 1925, the R. E. Uptegraff Manufacturing Company continues to custom design and manufacture high-quality liquid filled small power and specialty transformers in Scottdale, PA.

Under the new leadership of Shenda Electric Group, R. E. Uptegraff Manufacturing Company, LLC will continue to produce quality products while maintaining and upholding its high manufacturing standards and customer service.



FEATURES OF UPTGRAFF TRANSFORMERS

CORES - The magnetic cores of Uptegraff transformers are made of high-permeability, grain oriented silicon steel, using three-, four-, or five-legged configurations, depending on technical and economic considerations. Most transformers, up through 2500 kVA, have five-legged wound cores. Three-legged stacked cores, rectangular and cruciform (round), with step-lap mitered joints are commonly used on larger sizes. The four- and five-legged cores are preferred for Y-Y connected transformers and for those involving extended underground primary service.

COILS - The general coil construction is elliptical in shape (layer wound). Round (circular) layer or disk coil construction is available upon request. Both copper and/or aluminum windings are available. Uptegraff pioneered the use of aluminum conductor in transformer windings, with successful results.

INSULATION - Uptegraff uses thermally upgraded kraft paper insulation in liquid filled units. A "B"-stage thermosetting epoxy is applied to the insulation in a diamond pattern to increase short circuit strength of the coil.

DIELECTRIC FLUIDS - Uptegraff liquid filled transformers can be provided with mineral oil (Type II standard, with Type I also available), or with fire-resistant alternatives such as Envirotemp® FR3™, Beta, or silicone fluid. Also, mineral oils suitable for low ambient (to -60 deg. C) can be provided. All liquid filled transformers can be used indoors or outdoors, provided they are installed in accordance with provisions set forth in the NEC and/or local codes which may take precedence. All Uptegraff liquid filled transformers are shipped with dry nitrogen in the gas space above the liquid.

ENCLOSURES - The standard transformer tank or enclosure is made of reinforced ASTM A-36 carbon steel plate. As an option for corrosive environments, the tank can be provided using stainless steel or copper bearing steel plate. For liquid filled transformers, a variety of radiator configurations can be provided depending on cost, size, and site conditions. They include tubular, corrugated, panel, or plate type. Standard radiator material is mild steel, but for increased corrosion resistance, galvanized mild steel or stainless steel radiators can be provided as well.

FINISHES - Standard paint system is alkyd enamel. Epoxy/polyurethane systems are also offered for corrosive areas.

TESTING - All standard IEEE tests are made on every Uptegraff transformer, using appropriate standard procedures. In addition, and probably more pertinent to qualifying the transformer for service, are such production tests as impulse, power factor, sound level, temperature rise, RIV, and SFRA.

INSPECTION - Completed transformers, subassemblies, and accessories are inspected by a Quality Control department responsible only to top management. An inspection report is made for every transformer.

WARRANTY - Express warranty is typical and applies to workmanship, design, and materials for a period of 30 months after receipt of the unit or two years after energization, whichever occurs first. Other warranty provisions may be made upon request. Uptegraff provides exceptional customer service and reasonable consideration no matter how long their equipment has been in service.

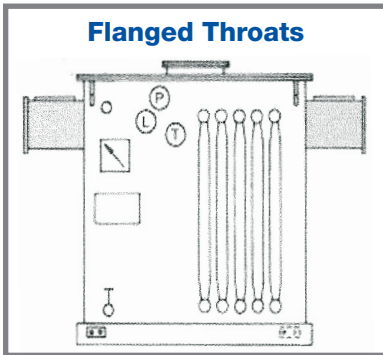
DELIVERY - Check with factory for current lead times. Shipment is by motor freight with complete carrier and routing information provided upon request.



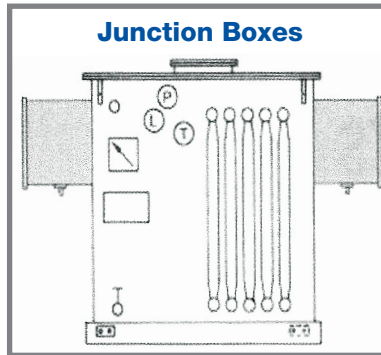
Zigzag Grounding Transformer (up to 15 MVA, 69 kV)

STANDARD TERMINATION ARRANGEMENTS

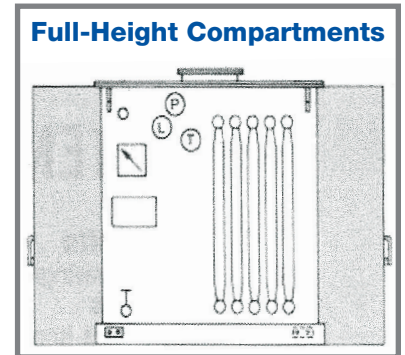
Flanged Throats



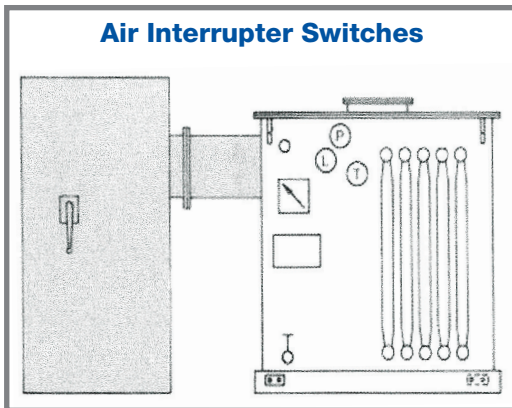
Junction Boxes



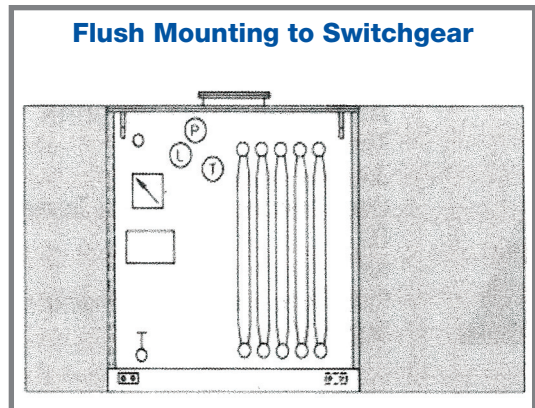
Full-Height Compartments



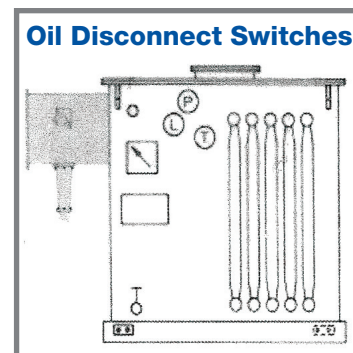
Air Interrupter Switches



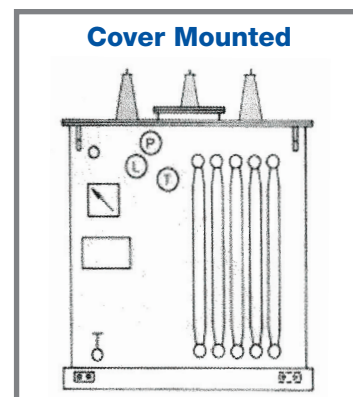
Flush Mounting to Switchgear



Oil Disconnect Switches



Cover Mounted



Compartmental Padmount (up to 12 MVA, 46 kV)

UPTEGRAFF STANDARD TRANSFORMER TYPES ...

TYPE	PHASE	DESCRIPTION	TEMP. RISE	KVA	VOLTAGE	IEEE STD.
PADT	3	Compartmental Padmount	65	Up to 12 MVA	46 kV and below	C57.12.26
PT or PTLC	3	Small Power	55/65	Up to 25 MV Up to 25 MVA	46 kV and below 69 kV	C57.12.10
OLC	3	Secondary Substation	55/65	Up to 3,500 kVA	34 kV and below	C57.12.10
UDT	3	Underground Distribution	55/65	Up to 3,000 kVA	34 kV and below	C57.12.24
PTZ	3	Zigzag Grounding	65	Up to 25 MVA Up to 25 MVA	46 kV and below 69 kV	C57.12.10 and Std. 32
PTG	3	Wye-Delta Grounding	65	Up to 15 MVA Up to 12 MVA	46 kV and below 69 kV	C57.12.10 and Std. 32
PTA	3	Autotransformer	55/65	Up to 45 MVA	69 kV and below	C57.12.10
P/A	1	Autotransformer	55/65	Up to 45 MVA	69 kV and below	C57.12.10
HD	1	Station Service	55/65	Up to 1 MVA	69 kV and below	C57.12.20
NOLC or NSLC	3	Network	55/65	Up to 2,800 kVA	34 kV and below	C57.12.40
OPF	1 or 3	Induction Furnace	55/65	Up to 18 MVA	46 kV and below	C57.12.10
P	1	Small Power	55/65	Up to 25 MVA	46 kV and below	C57.12.10

Standard primary tap range is two - 2.5% +/- nominal, via de-energized tap changer switch.
Alternate tap ranges are available upon request. Secondary load tap changing is also available.

... AND ACCESSORIES

CURRENT TRANSFORMERS	NITROGEN CONTROL EQUIPMENT ****	SUDDEN PRESSURE RELAY	PRESSURE RELIEF DEVICE	PRESSURE VACUUM BLEEDER DEVICE	PRESSURE VACUUM GAUGE	LIQUID LEVEL GAUGE	WINDING TEMPERATURE THERMOMETER	TOP LIQUID THERMOMETER	LIGHTING ARRESTORS	REMOVABLE RADIATORS	FORCED AIR COOLING
O	O/A	O/A	S,A	O	O,A	O,A	O/A	O,A	O	O	O
O	O/A	O/A	S,A	O	S,A	S,A	O/A	S,A	O	O	O
O	O/A	O/A	S,A	O	S,A	S,A	O/A	S,A	O	O	O
N/A	N/A	N/A	O	N/A	N/A	O	N/A	O	N/A	N/A	N/A
O	O/A	O/A	S,A	O	S,A	S,A	O/A	S,A	O	O	N/A
O	O/A	O/A	S,A	O	S,A	S,A	O/A	S,A	O	O	N/A
O	O/A	O/A	S,A	O	S,A	S,A	O/A	S,A	O	O	O
O	O/A	O/A	S,A	O	S,A	S,A	O/A	S,A	O	O	O
N/A	N/A	N/A	S	O	O	S	N/A	O	O	N/A	N/A
N/A	N/A	N/A	O	N/A	N/A	O	N/A	S,A	N/A	N/A	N/A
O	O/A	O/A	S,A	O	S,A	S,A	O/A	S,A	O	O	O
O	O/A	O/A	S,A	O	S,A	S,A	O/A	S,A	O	O	O

S - Standard **O** - Optional **O/A** - Optional, alarm contacts standard

A - Alarm contacts available when specified **N/A**—Not available

*** Standard is sealed tank, with nitrogen blanket above top liquid level.

Why Repair/Refurbish/Modify Older Transformers?

Repair/Refurbish/Modify or Replace. Everyone faces this dilemma sooner or later.



The battle to reduce costs while maintaining production occupies much of any business manager's time and effort. We, at Uptegraff, would like to pass along a few cost-saving ideas that have been beneficial to many of our customers. Failing, aging, or failed processing equipment can often be put back into service rather than replaced.



On liquid immersed, single and three phase transformers, 500 kVA and larger, aside from the cost savings compared with that of purchasing a new replacement unit, additional peripheral benefits of repair/refurbishment/modification are also gained.

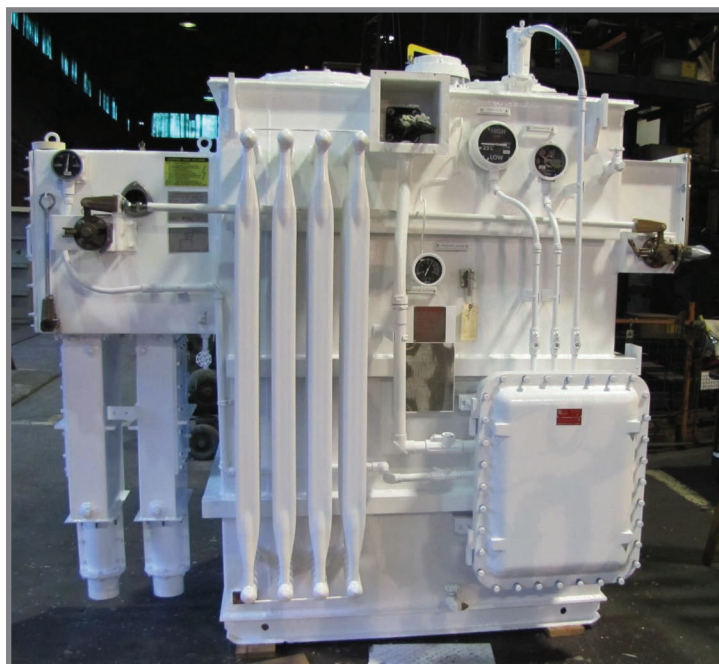
Please consider the following:

- Substation redesign engineering costs related to new unit design can often be eliminated.
- Environmentally, reuse makes sense. Salvageable materials, such as core, tank, etc. can be recycled instead of being scrapped.
- The time required to repair/refurbish/modify a unit is often less than that to build a new unit.
- Rewound units carry the same warranty as that of a new unit.
- Transformers are designed and manufactured for a typical life expectancy of approximately 20 to 40 years. Our experience has shown that the majority of transformer failures can be traced to the introduction of some foreign matter (usually water) into the unit. It is imperative that the unit seal be maintained. This requires periodic inspection/maintenance of gaskets, weld integrity, paint integrity, etc. This task can be cumbersome for the user that is not in the business of building transformers. Liquid filled transformers are generally heavy and require heavy equipment for disassembly. Handling and temporary storage of the insulating fluid can also present a unique problem.

Being a new transformer manufacturer, the Uptegraff factory is specifically equipped to handle units as large as 15 MVA. Our familiarity with transformer component suppliers makes accessory acquisition easy. Our intimate knowledge of national standards regarding construction and test of transformers allows us to update your unit to current standards. For a minimum cost, you can extend the life of your unit.

REPAIR? REFURBISH? MODIFY?

	REPAIR	REFURBISH	MODIFY
WINDINGS	Rewind to existing design, or redesign using modern techniques/materials	Subject existing assembly to oven dry out	Rewind to another voltage/kVA rating
BUSHINGS	Replace existing with duplicates	Regasket/clean	Replace/relocate
TANK	Fix leaks, replace rusted parts	Shot blast/repaint	Move throats/ bushing locations
ACCESSORIES	Replace broken items	New glass/rewire existing items	Relocate /add new items
GASKETS	Replace	Inspect, replace only where required	Change material
TEST	Retest dielectrics @ 75% capacity, 100% if coils rewound	Retest dielectrics at 75% capacity	Special test available
FLUID	Remove and replace	Filter/de-gas	Replace/change fluid type



Hazardous duty (with primary oil-filled switch)



Rectifier duty (up to K = 9)



SHENDA ELECTRIC GROUP CO., LTD

Shenda Electric is a global leader in the power transmission & distribution industry. Founded in 2000 and currently employing 1,150 employees worldwide, Shenda Electric operates three factories (two in China and one in the United States of America – R. E. Uptegraff Manufacturing Company, LLC) as well as ten subsidiaries in China. 2015 gross sales were \$250 million USD.

Product line (annual production capacity is about 18,000 MVA):

- Power transformers up to 330 kV
- Distribution transformers up to 35 kV
- Dry-type transformers up to 35 kV
- Combined substation transformers up to 35 kV
- Reactor transformers up to 230 kV
- Specialty transformers: furnace transformers and converter transformers up to 180 MVA
- Turnkey projects: engineering, manufacturing and construction services

Providing quality products with competitive pricing and excellent after-sales service, Shenda Electric has won the trust and confidence of clients from over 60 countries and regions throughout the world, including customers in the United States, Canada, Australia, Korea, Ecuador, Philippines, South Africa, Turkey, Iran, and others.

All Shenda Electric transformers are designed, manufactured, and tested strictly in accordance and compliance with standards such as ISO 9001, ISO 14001, OHSAS 18001, IEC, and IEEE. Shenda Electric transformer designs have been evaluated and certified by internationally accredited laboratories, such as KEMA, CESI, and CTQC:

- **100 MVA/220 kV Power Transformer** short circuit test report - issued by CESI Italy & CTQC China
- **120 MVA/33 kV Oil EAF Transformer, 50 MVA/69 kV Oil Power Transformer, 10 MVA/33 kV Dry Type Transformer** type test report - issued by KEMA Netherlands
- **63 MVA/110 kV Power Transformer** short circuit test report - issued by CTQC China
- **12.5 MVA/22 kV Rectifier Transformer** routine test report - issued by V-check Korea
- **ISO 9001 & ISO 14001 & OHSAS 18001**
- **CE - Power Transformer & Furnace Transformer & Dry Type Transformer & Reactor**
- **CSA - 10 MVA/24.94 kV Dry Type Transformer**

www.shenda.com

