

Kuhlman Electric Corporation



hansterner Zelatters für a Charging Harld...Rehteran Hentels Corporation



Innalarmar Bahitlana dar a Glunglag Warkh...Kahluwa Blaadria Garparatika



Transformer Solutions for a Ghanging World., Rohlman Electric Corporation



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UTF-245 Voltage Transformer Outdoor 230kV, 1050kV BIL, Single & Dual Ratios (w/ Tertiary) Oil-Filled, Wound Type, Metering/Relaying

application

The UTF-245 outdoor voltage transformer is rated for use on 230,000 volt systems with 1050kV BIL. Primary line to ground connected voltage ratios are available from 1200:1 to 2000:1 for use on 230,000 volt systems, at 60 Hertz (Hz). This oil-filled voltage transformer will operate with high accuracy for metering or relay applications.

mechanical description

The tank is steel plate, pressure and vacuum tight and hermetically sealed at the factory to prevent breathing and oil contamination. The dome is corrosion resistant aluminum and contains stainless steel expansion bellows to allow for the expansion/contraction of oil for temperature and load fluctuations. The bellows maintain constant pressure on the oil under various ambient and load conditions to allow for horizontal shipment. Base/Tank components are shot-blasted, washed and coated with a heavy galvanized finish, effectively making the unit paint-free. The primary bushing is ANSI 70 Gray, high strength porcelain with a high degree of stability for transportation and seismic withstand. The primary terminal is a tin-plated copper alloy NEMA4-hole pad. The secondary terminals are M8 hex head bolts with associated hardware located inside a hinged cover, terminal box with three (3) 1 ¹/₂" NPT conduit hubs. The ground terminal is an integral NEMA 2-hole configuration on the VT base. The unit is fitted with a 5kV H₂ terminal, oil level indicator, and oil sampling valve.

accuracy performance

The UTF-245 will operate with 0.3 Class accuracy for metering applications with burdens of 0, W, X, M, Y, Z and ZZ. Upon request, 0.15 Class metering accuracy is available with burdens of 0, W, X, M, Y and Z. The transformer is accurate from 90% to 110% of rated primary voltage.

mounting

The UTF is designed for mounting on substations structures in an upright position with four mounting holes in the base.



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testing

The unit is individually tested per the IEEE C57.13 standard, including applied and induced voltage, accuracy and polarity. Additional tests include dissipation and partial discharge tests. Partial discharge testing is performed to guarantee the unit is free of partial discharge through 135% of the nominal system voltage.

options

The UTF is available with dual system voltage ratings, an additional secondary winding (3 total), Extra Creep Bushing, Polymer Bushing, Stainless Steel Tank, and/or -50°C oil. Contact factory for other needs.

DRDERING INFO FOR UTF-245						HIGH ACCURACY UTF-245		
Ratio Primary Secondary		Catalog Number	Accuracy/ Burden	Catalog Number	Accuracy/ Burden			
1200/2000:1:1	138000	115/69 & 115/69	N742000T0	0.3 0,W,X,M,Y,Z,ZZ		0.15 0,W,X,M,Y,Z		
1200/2000:1 & 1200:1:1	138000	115/69 & 115 & 115	N742000T0-812	0.3 0,W,X,M,Y,Z,ZZ	Contact	0.15 0,W,X,M,Y,Z		
600/1000:1 & 1200/2000:1	69000 or 138000	115/69 or 115/69	TBD	0.3 0,W,X,M,Y 0.3 W,X,M,Y,Z,ZZ	factory	0.15 0 to X, 0.3 Y 0.15 o to Z, 0.3 Z		

- Thermal Burden Rating (Typical): 3000VA. For 7500VA rated VT, contact factory.

- Overvoltage Ratings: 1.1x cont., 1.4x 1 min.

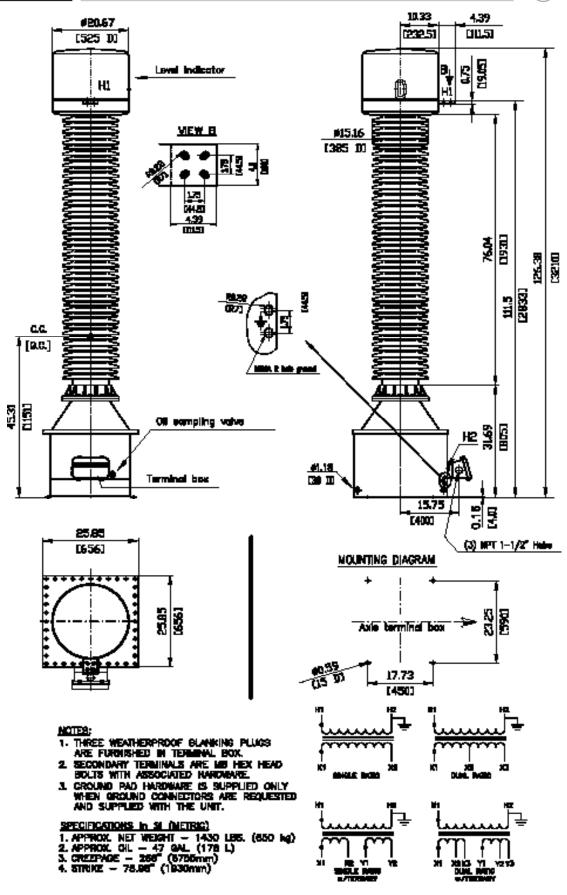
- IC Approval AE-0503 is noted by bold catalog number.



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UTF–245 Voltage Transformer





NOTE: OUTLINES ARE FOR REFERENCE ONLY. CONTACT FACTORY FOR ACTUAL DESIGN DRAWINGS.





DFK-245 Capacitive VT Outdoor 230kV, 1050kV BIL, Single & Dual Ratios (w/ Tertiary)

Oil-Filled, Wound Type, Metering/Relaying

application

The DFK-245 outdoor coupling capacitive voltage transformer is rated for use on 230,000 volt systems with 1050kV BIL. Primary line to ground connected voltage ratios are available from 1200:1 to 2000:1 for use on 230,000 volt systems, at 60 Hertz (Hz). This oil-filled coupling capacitive voltage transformer will operate with high accuracy for metering, monitoring, carrier communication, or relay applications.

mechanical description

The transformer contains mechanically stabilized capacitor layers, a multi-tap inductive voltage transformer, and a reactor for calibration of the voltage output built into a fully insulated, oil-filled base assembly. The tank is steel plate, pressure and vacuum tight and hermetically sealed at the factory to prevent breathing and oil contamination. The dome is aluminum and contains stainless steel expansion bellows to allow for the expansion/contraction of oil for temperature and load fluctuations. The bellows maintain constant pressure on the oil under various ambient and load conditions to allow for horizontal shipment. Tank components are shot-blasted, washed and coated with a heavy galvanized finish, effectively making the unit paint-free. The primary bushing is ANSI 70 Gray, high strength porcelain with a high degree of stability for transportation and seismic withstand. The primary terminal is a tin-plated copper alloy stud supplied with a NEMA 4-hole pad connector. The secondary terminals are M8 hex head bolts with associated hardware located inside a removable cover, terminal box with a 1 1/2" conduit opening in the bottom plate. The ground terminal is an integral NEMA 2-hole configuration on the base. The unit is fitted with a reconnectable ground terminal, for direct tank ground connection or for use with carrier accessories for high frequency injection, a voltage tap ground switch, oil level indicator, and oil sampling valve.

accuracy performance

The DFK-245 will operate with 0.3 Class accuracy for metering applications with burdens of 0, W, X, M, Y, Z and up to ZZ and 0.6 Class accuracy for relaying applications with burdens of 0, W, X, M, Y, Z and up to ZZ. Upon request, 0.15 Class metering accuracy is available and burden capability up to Z on each secondary winding. The transformer is accurate from 90% to 110% of rated primary voltage.

mounting

The DFK is designed for mounting on substations structures in an upright position with four mounting holes in the base.

testing

The unit is individually tested per the ANSI C93.1 standard, including applied and induced voltage, accuracy and polarity. Additional tests include dissipation and partial discharge tests. Partial discharge testing is performed to guarantee the unit is free of partial discharge through 135% of the nominal system voltage.



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options

The DFK is available with an additional secondary winding (3 total), Extra Creep Bushings, Polymer Bushings, Stainless Steel Tank, Carrier Accessories (Drain Coil, Carrier Ground Switch, Spark Gap), and/or -50°C oil. Line traps also available. Contact factory for other needs.

RDERING INF	O FOR DF	HIGH ACCURACY DFK-245					
Capacitance Ratio - 1200/200		1200/2000:1:1	Catalog	Accuracy/	Catalog	Accuracy/	
(pF)	(pF) Primary Secondary Number		Number	Burden	Number	Burden	
1700	138000	115/69 & 115/69	N76017P2000N	1.2 0,W,X,M,Y,Z			
1700	138000	115/69 & 115/69	N76017R2000N	0.6 0,W,X,M,Y,Z			
1700	138000	115/69 & 115/69	N76017M2000N	0.3 0,W,X,M,Y,Z		0.15 0,W,X,M,Y	
2200	138000	115/69 & 115/69	N76022P2000N	1.2 0,W,X,M,Y,Z			
2200	138000	115/69 & 115/69	N76022R2000N	0.6 0,W,X,M,Y,Z			
2200	138000	115/69 & 115/69	N76022M2000N	0.3 0,W,X,M,Y,Z	Contact	0.15 0,W,X,M,Y	
4200	138000	115/69 & 115/69	N76042R2000N	0.6 0,W,X,M,Y,Z	factory for		
4200	138000	115/69 & 115/69	N76042M2000N	0.3 0,W,X,M,Y,Z	cataloging	0.15 0,W,X,M,Y	
5200	138000	115/69 & 115/69	N76052R2000N	0.6 0,W,X,M,Y,Z	information		
5200	138000	115/69 & 115/69	N76052M2000N	0.3 0,W,X,M,Y,Z		0.15 0,W,X,M,Y	
10600	138000	115/69 & 115/69	N76106M2000N	0.3 0,W,X,M,Y,Z		0.15 0,W,X,M,Y	
10600	138000	115/69 & 115/69	N76106Z2000N	0.3 0,W,X,M,Y,Z,ZZ		0.15 0,W,X,M,Y,	
12400	138000	115/69 & 115/69	N76124M2000N	0.3 0,W,X,M,Y,Z		0.15 0,W,X,M,Y	
12400	138000	115/69 & 115/69	N76124Z2000N	0.3 0,W,X,M,Y,Z,ZZ		0.15 0,W,X,M,Y,	

- Thermal burden rating (Typical): 1000VA (1500VA for 0.3 ZZ rated units).

- Overvoltage Ratings: 1.1x cont., 1.4x 1 min.

- Units available with carrier accessories. Change last letter of catalog number from N to C.



DFK–245 Capacitive VT

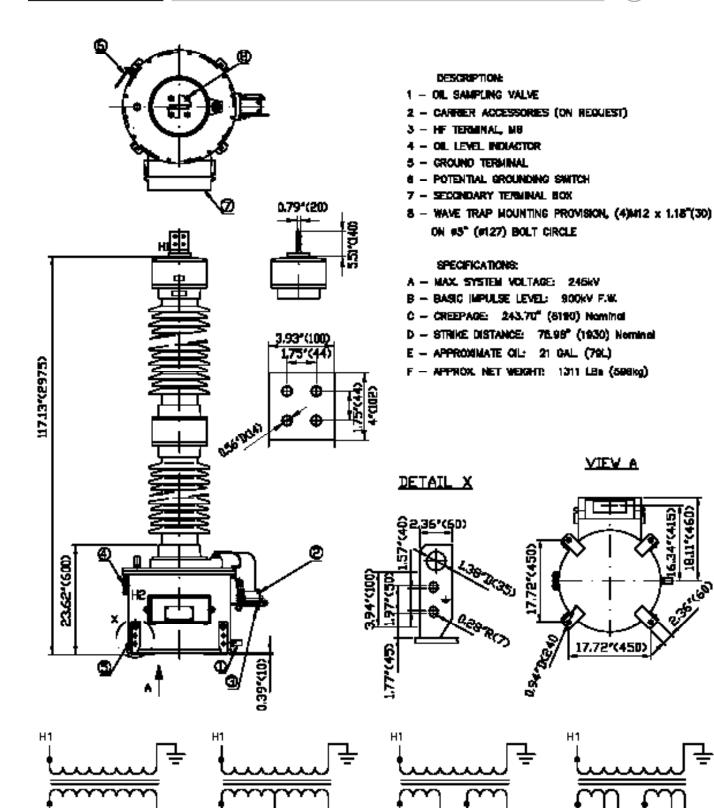
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SINGLE RATIO



DUAL RATIO w/TERTIARY

 $\gamma_2\gamma_3$

X2X3 Y1

Χ1

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XЗ

Χ1

ΧZ

DUAL RATIO

ΧZ

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X2 Y1 SINGLE RATIO

w/TERTIARY

۲2

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CA–245(CXM–1050) Current Transformer

Outdoor 230kV, 1050kV BIL, Single, Dual & Multi Ratios Oil-Filled, Wound Type, Metering/Relaying

application

The CA-245(CXM-1050) outdoor current transformer is rated for use on 230,000 volt systems with 1050kV BIL. Primary current ratios are available from 5:5 to 4000:5 at 60 Hertz (Hz) with a Rating Factor of up to 4.0 (4800A max). This oil-filled current transformer will operate with high accuracy for metering or relay applications.

mechanical description

The tank dome is fabricated from corrosion resistant aluminum and contains stainless steel expansion bellows to allow for the expansion/contraction of oil for temperature and load fluctuations. The bellows maintain constant pressure on the oil under various ambient and load conditions to allow for horizontal shipment. Base components are shot-blasted, washed and coated with a heavy galvanized finish, effectively making the unit paint-free. The primary bushing is ANSI 70 Gray, high strength porcelain with a high degree of stability for transportation and seismic withstand. The primary terminals are tin plated aluminum, NEMA 4-hole pads (copper for units rated above 1800A). An adjustable primary spark gap is provided for all units to protect from high transients. The secondary terminals are M8 hex head bolts with associated hardware located inside a removable cover, terminal box with (3) 1 1/2" NPT conduit hubs. The ground terminal is an integral NEMA 2-hole configuration on the CT base. The unit is fitted with an oil level indicator, and oil sampling drain valve.

accuracy performance

The CA-245 will operate with 0.3 Class accuracy for metering applications with burdens of B0.1 to B1.8. The unit can be designed with relay accuracy up to C800. The transformer is accurate

through its Rating Factor, and can be used continuously to this level. The CXM-1050 will operate with 0.15 Class high accuracy for metering applications with burdens of B0.1 to B1.8. The transformer maintains 0.15 accuracy from 0.5% of Inom through its Rating Factor, and can be used continuously to this level.

mounting

The CA(CXM) is designed for mounting on substation structures in an upright position with four mounting holes in the base.

testing

The unit is individually tested per the IEEE C57.13 standard, including applied and induced voltage, accuracy and polarity. Additional tests include dissipation and partial discharge tests. Partial discharge testing is performed to guarantee the unit is free of partial discharge through 135% of the nominal system voltage.

options

The CA(CXM) is available with an Extra Creep Bushing, Polymer Bushing, Stainless Steel Tank, and/or -50°C oil. The unit can be offered in single, dual or multiple core designs. Contact factory for other needs.



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ORDERING INFO FOR CA-245					HIGH ACCURACY CXM-1050				
Ratio	Catalog Number*	Accuracy/ Rating Burden Factor			Catalog Number	0.15 B1.8 Acc Range	Rating Factor		
5:5	N731005S	0.3 B1.8	1.5		N890005SA	0.025 to 20A	4.0		
10:5	N731010S	0.3 B1.8	1.5		N890010SA	0.05 to 40A	4.0		
:	:	:	:		:	:	:		
100:5	N731100S	0.3 B1.8	1.5		N890100SA	0.5 to 400A	4.0		
150:5	N731150S	0.3 B1.8	1.5		N890150SA	0.75 to 600A	4.0		
:	:	:	:		:	:	:		
4000:5	N731402S	0.3 B1.8	1.0		N894000SA	20 to 4800A	1.2		
5/10:5	N731005D	0.3 B1.8/B1.8	2.0/1.5						
10/20:5	N731010D	0.3 B1.8/B1.8	2.0/1.5						
:	:	:	:						
1500/3000:5	N731152D	0.3 B1.8/B1.8	2.0/1.5						
2000/4000:5	N731202D	0.3 B1.8/B1.8	2.0/1.0						

- Available in multi-ratio designs (full tap ratings same as single ratio above).

- 1 Second Thermal/Mechanical Rating: CA (75x full winding Inom), CXM (150x Inom), 80kA max.

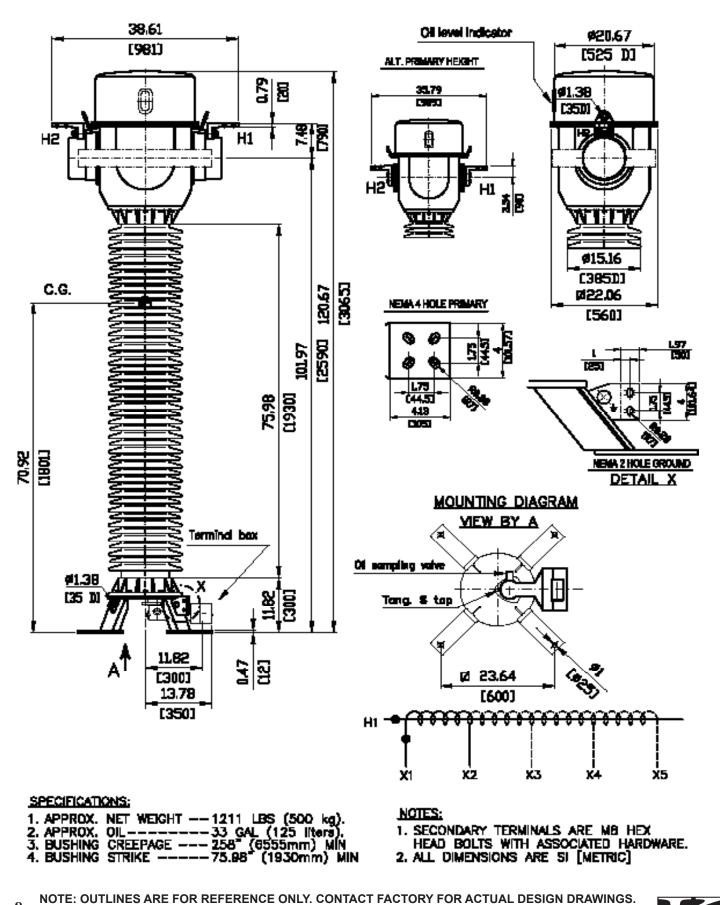
* IC Approval AE-0760 Rev 1 is noted by bold catalog number.



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CA–245(CXM–1050) Current Transformer





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SSVT-900 Station Service VT Outdoor 230kV, 900kV BIL, Power Winding, Single & Dual Ratios (w/ Tertiary) Oil-Filled, Wound Type, Control Power/Metering/Relaying

application

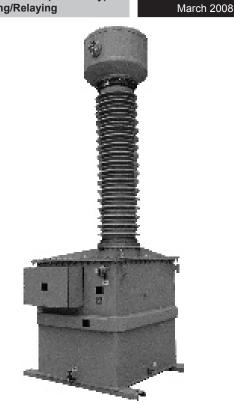
The SSVT-900 outdoor station service voltage transformer is rated for use on 230,000 volt systems with 900kV BIL. The unit is a station service voltage transformer with power and can be supplied with metering rated secondary windings. It provides a convenient and cost effective means of serving small power and/ or metering requirements directly from a transmission line. Standard 125/250V nomianl power winding designs are available with thermal ratings of 100, 167, 250 kVA and higher. Primary line to ground connected voltage measurement ratios are available from 1200:1 to 2000:1 for use on 230,000 volt systems, at 60 Hertz (Hz). This oil-filled station service voltage transformer will provide control power and can provide high accuracy for metering or relay applications.

mechanical description

The tank and expansion chambers are steel plate, pressure and vacuum tight and hermetically sealed at the factory to prevent breathing and oil contamination. Expansion chambers allow for the expansion/contraction of oil for temperature and load fluctuations. Tank components are shot-blasted, washed and coated with anticorrosive iron phosphate and then finished with ANSI 70 Gray baked-on electrostatic polyester powder. The primary bushing is ANSI 70 Gray, high strength porcelain with a high degree of stability for transportation and seismic withstand. The primary terminal is a stailess steel NEMA 4-hole pad. The secondary station service power terminals are also NEMA 4-hole pads housed in a removable low voltage terminal box with a 3" opening in the bottom for conduit access. The neutral, tank ground connector accepts 1/0 to 500 MCM conductors. The optional secondary metering terminals are 1/4"-20 copper alloy studs with flat and lock washers located inside the removable terminal box. The ground terminal is a stainless steel NEMA 2-hole pad. The unit is fitted with a 5kV H_o Bushing, oil level indicator, 2" oil fill plug, and 1" drain valve.

accuracy performance

The SSVT-900 will operate with nominal 125/250V control power output and if specified, a 0.3 Class metering accuracy for burdens of 0, W, X, M, Y, Z and ZZ. The transformer is accurate from 90% to 110% of rated primary voltage. Metering winding is primarily used for control or relay applications and may not maintain accuracy shown when the unit is loaded up with kVA.



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mounting

The SSVT is designed for mounting on substations structures in an upright position. CAUTION: There are four mounting holes in the base rails which are to be used for bolt down only. The unit must be supported under the bottom of the tank.

testing

The unit is individually tested per the IEEE C57.13 standard, including applied and induced voltage, accuracy and polarity. Additional tests include dissipation and partial discharge tests. Partial discharge testing is performed to guarantee the unit is free of partial discharge through 135% of the nominal system voltage.

options

The SSVT is available with an Extra Creep Bushing, Polymer Bushing, Stainless Steel Tank and/or Dome, one or two secondary metering windings, de-energized taps and/or -50°C oil. Contact factory for other needs.

RDERING INFO FOR SSVT-900								
kVA	Primary Secondary Volts Catalog Number		Catalog Number		Metering			
Rating	Voltage	Power°	Metering	w/o Metering	w/ 2 Metering	Accuracy/Burden		
100	138000	125/250	115/69	N91110P100	N91110Z100	0.3 0,W,X,Y,Z,ZZ		
167	138000	125/250		N91110P167				
250	138000	125/250		N91110P250				
333	138000	125/250		N91110P333				

°Nominal output. Actual rated output is supplied on unit nameplate.

- Overvoltage Ratings: 1.1x cont., 1.73x 1 min.

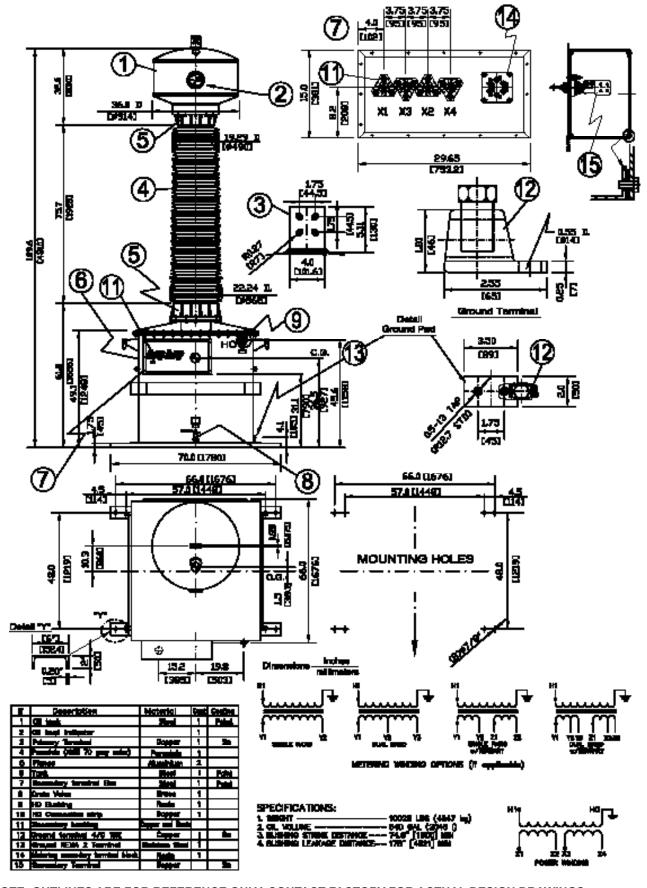


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SSVT-900 Station Service VT





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KA-245(KXM-1050) 1 Ø Metering Unit

Outdoor 230kV, 1050kV BIL, Single, Dual & Multi Ratios Oil-Filled, Wound Type, 1Ø Metering

application

The KA-245(KXM-1050) outdoor single phase metering unit is rated for use on 230,000 volt systems with 1050kV BIL. Primary current ratios are 5:5 to 4000:5 for 60 Hertz (Hz) with a Rating Factor of up to 4.0 (4800A max). Primary line to ground rated voltage ratios are available from 1200:1 to 2000:1 for use on 230,000 volt systems. This oil-filled metering unit will operate with high accuracy for metering applications.

mechanical description

The transformer contains two fully insulated coils for both current and voltage measurement. The tank is steel plate, pressure and vacuum tight and hermetically sealed at the factory to prevent breathing and oil contamination. The dome is corrosion resistant aluminum and contains stainless steel expansion bellows to allow for the expansion/contraction of oil for temperature and load fluctuations. The bellows maintain constant pressure on the oil under various ambient and load conditions to allow for horizontal shipment. Tank components are shot-blasted, washed and coated with a heavy galvanized finish, effectively making the unit paint-free. The primary bushing is ANSI 70 Gray, high strength porcelain with a high degree of stability for transportation and seismic withstand. The primary terminals are tin plated aluminum, NEMA 4-hole pads (copper for units rated above 1800A). An adjustable primary spark gap is provided for all units to protect from high transients. The secondary terminals are M8 hex head bolts with associated hardware located inside a removable cover, terminal box with a 1 1/2" conduit opening in the bottom plate. The ground terminal is an integral NEMA 2-hole configuration on the base. The unit is fitted with a 5kV H_o terminal, oil level indicator, and oil sampling valve.

accuracy performance

The KA-245 will operate, for the current transformer, with 0.3 Class accuracy for metering with burdens of B0.1 to B1.8. The CT is accurate through its Rating Factor, and can be used continuously to this level. The unit will operate, for the voltage

transformer, with 0.3 Class accuracy for metering with burdens of 0, W, X, M, Y, Z and ZZ. The VT is accurate from 90% to 110% of rated primary voltage. The KXM-1050 will operate, for the current transformer, with 0.15 Class high accuracy for metering applications with burdens of B0.1 to B1.8. The transformer maintains 0.15 Class accuracy from 0.5% of $\rm I_{\rm nom}$ through its Rating Factor, and can be used continuously to this level. The unit can be provided, for the voltage transformer, with 0.15 Class accuracy for metering with burdens of 0, W, X, M, Y and Z. The VT is accurate from 90% to 110% of rated primary voltage.

mounting

The KA(KXM) is designed for mounting on substation structures in an upright position with four mounting holes in the base.

testing

The unit is individually tested per the IEEE C57.13 standard, including applied and induced voltage, accuracy and polarity. Additional tests include dissipation and partial discharge tests. Partial discharge testing is performed to guarantee the unit is free of partial discharge through 135% of the nominal system voltage.

options

The KA(KXM) is available with an Extra Creep Bushing, Polymer Bushing, Stainless Steel Tank, and/or -50°C oil. The unit can be offered in single, dual or multiple core designs. Contact factory for other needs.

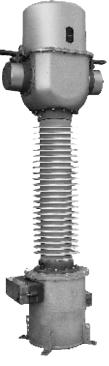
ORDERING INF	FO FOR KA-245	HIGH ACCURAC	Y KXM-1050				
Voltage	Ratio* - 1200/2000:1:1	Accuracy/Burden		Accuracy/Burden			
Ratings	Pri*:Sec - 138000:115/69 & 115/69	0.3 0,W,X,M,Y,Z,ZZ		0.3 0,W,X,M,Y,Z,ZZ			
Current	Catalog	Accuracy/	Rating	Catalog	0.15 B1.8	Rating	
Ratio	Number	Burden	Factor	Number	Acc Range	Factor	
5:5	N752000T005S	0.3 B1.8	1.5	N752000T005X	0.025 to 20A	4.0	
10:5	N752000T010S	0.3 B1.8	1.5	N752000T010X	0.05 to 40A	4.0	
:		:	:	:	:	:	
100:5	N752000T100S	0.3 B1.8	1.5	N752000T100X	0.5 to 400A	4.0	
150:5	N752000T150S	0.3 B1.8	1.5	N752000T150X	0.75 to 600A	4.0	
1	: :	:	:	:		:	
4000:5	N752000T402S	0.3 B1.8	1.0	N752000T402X	20 to 4800A	1.2	
5/10:5	N752000T005D	0.3 B1.8/B1.8	2.0/1.5				
10/20:5	N752000T010D	0.3 B1.8/B1.8	2.0/1.5				
:	: :	:	1				
2000/4000:5	N752000T202D	0.3 B1.8/B1.8	2.0/1.0				

* Available in other Primary Voltage Ratings. - Thermal Burden Rating (Typical): 3000VA.

- Overvoltage Ratings: 1.1x cont., 1.9x 8 hours.

- 1 Second Thermal/Mechanical Rating: KA (75x full winding I_{nom}), KXM (150x I_{nom}), 80kA max.





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KA-245(KXM-1050) 1 Ø Metering Unit



