



<b>Description</b>	<b>Model</b>	<b>Page</b>
Wound, Oil-Filled VT (High Accuracy available)	UTF-420	3-4
Wound, Oil-Filled CCVT (High Accuracy available)	DFK-362	5-6
Wound, Oil-filled CT (High Accuracy available)	CA-362(CXM-1300)	7-8

# UTF-420 Voltage Transformer

Outdoor 345kV, 1300kV BIL, Single & Dual Ratios (w/ Tertiary)  
Oil-Filled, Wound Type, Metering/Relaying

**345000 Volt**

March 2008

## application

The UTF-420 outdoor voltage transformer is rated for use on 345,000 volt systems with 1300kV BIL. Primary line to ground connected voltage ratios are available from 1800:1 thru 3000:1 for use on 345,000 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 bushings are ANSI 70 Gray, high strength porcelain with a high degree of stability for transportation and seismic withstand. They join in the center of the transformer where the two stage cascade design galvanized steel tank is located. 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 VT base. The unit is fitted with a 5kV H<sub>2</sub> terminal, oil level indicator, and oil sampling valve.

## accuracy performance

The UTF-420 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% thru 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.

## 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 an additional secondary winding (3 total), Polymer Bushings, Extra Creep Bushings, Stainless Steel Tank, and/or -50°C oil. Contact factory for other needs.



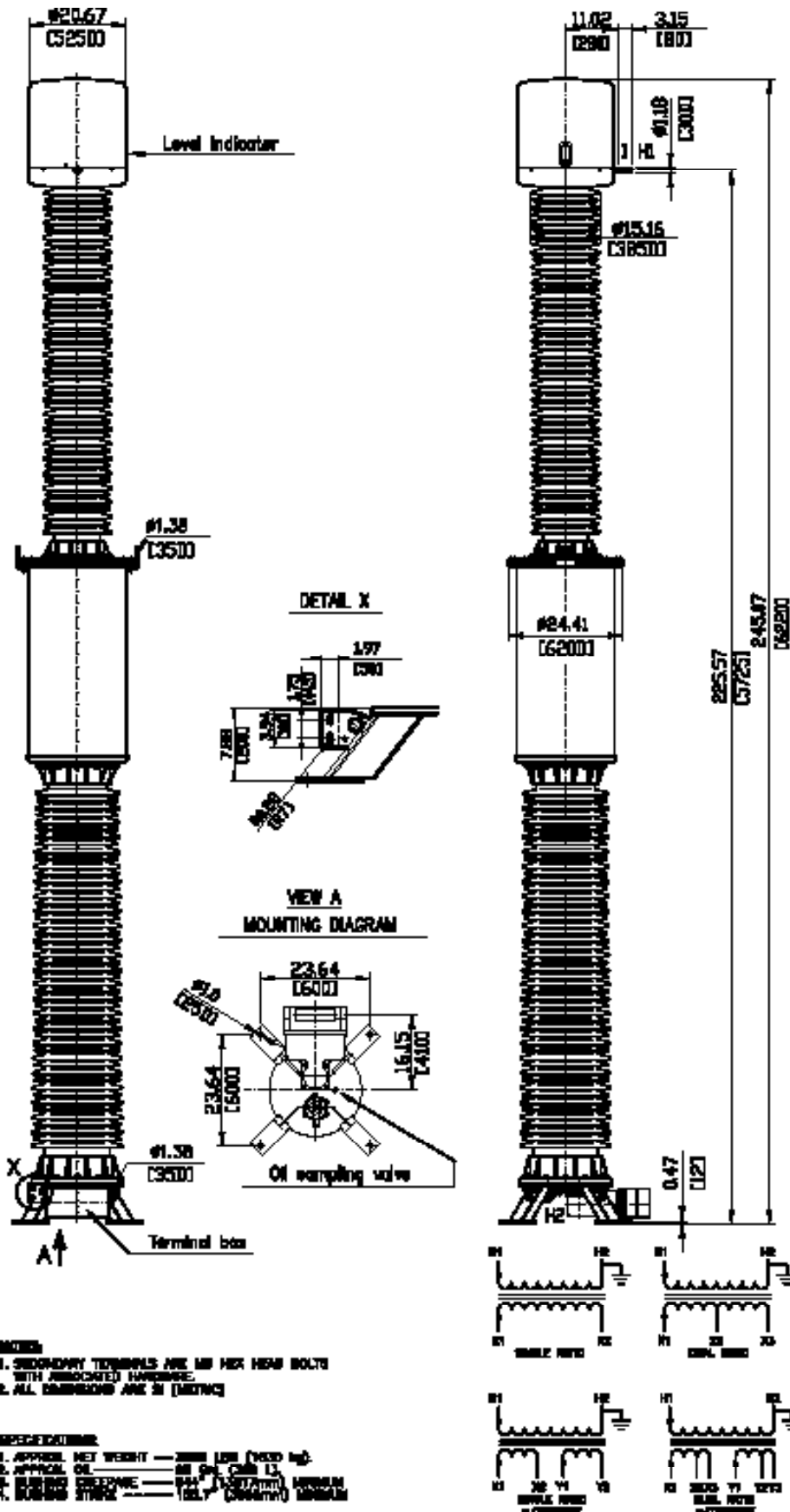
### ORDERING INFO FOR UTF-420

Ratio	Primary	Secondary	Catalog Number	Accuracy/ Burden
1800/3000:1:1	207000	115/69 & 115/69	<b>P743000T0</b>	0.3 0,W,X,M,Y,Z,ZZ
1800/3000:1 & 1800:1:1	207000	115/69 & 115 & 115	P743000T0-812	0.3 0,W,X,M,Y,Z,ZZ

- Thermal Burden Rating (Typical): 2000VA.
- Overvoltage Ratings: 1.1x cont., 1.4x 1 min.
- **IC Approval AE-0503 is noted by bold catalog number.**

### HIGH ACCURACY UTF-420

Catalog Number	Accuracy/ Burden
Contact factory	0.15 0,W,X,M,Y,Z 0.15 0,W,X,M,Y,Z



**NOTES**

1. SECONDARY TERMINALS ARE M6 HEX HEAD BOLTS WITH ASSOCIATED HARDWARE.
2. ALL DIMENSIONS ARE IN [METRIC]

**SPECIFICATIONS**

1. APPROX. NET WEIGHT — 2000 LBS (900 kg)
2. APPROX. OIL — 88 Gals (330 L)
3. BUSBAR SPECIFICATIONS — PER IEEE C37.101
4. BUSBAR STRIKE — 1/2" (12.7mm) MINIMUM

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



**application**

The DFK-362 outdoor coupling capacitive voltage transformer is rated for use on 345,000 volt systems with 1550kV BIL. Primary line to ground connected voltage ratios are available from 1800:1 to 3000:1 for use on 345,000 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-362 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 sub-stations 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.

**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.



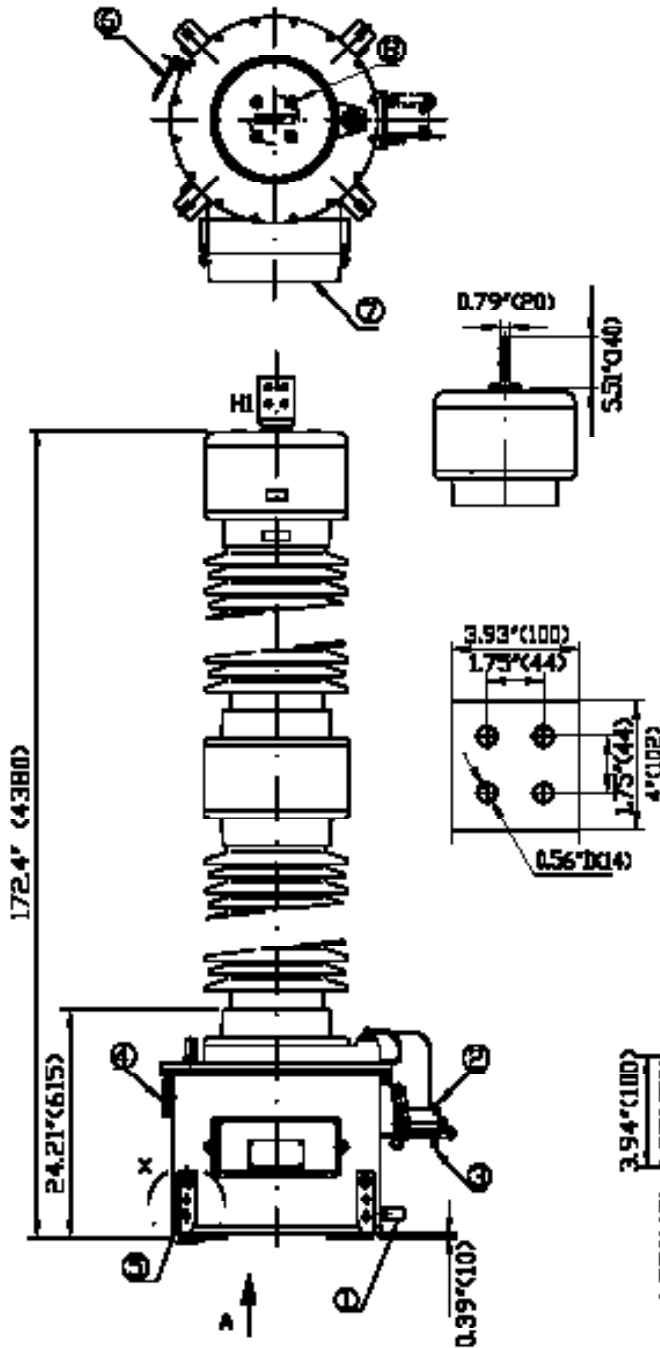
**ORDERING INFO FOR DFK-362**

Capacitance (pF)	Ratio - 1800/3000:1:1		Catalog Number	Accuracy/ Burden
	Primary	Secondary		
1700	207,000	115/69 & 115/69	P76017P3000N	1.2 0,W,X,M,Y,Z
1700	207,000	115/69 & 115/69	P76017R3000N	0.6 0,W,X,M,Y,Z
1700	207,000	115/69 & 115/69	P76017M3000N	0.3 0,W,X,M,Y,Z
2600	207,000	115/69 & 115/69	P76026R3000N	0.6 0,W,X,M,Y,Z
2600	207,000	115/69 & 115/69	P76026M3000N	0.3 0,W,X,M,Y,Z
4400	207,000	115/69 & 115/69	P76044R3000N	0.6 0,W,X,M,Y,Z
4400	207,000	115/69 & 115/69	P76044M3000N	0.3 0,W,X,M,Y,Z
4600	207,000	115/69 & 115/69	P76046R3000N	0.6 0,W,X,M,Y,Z
7000	207,000	115/69 & 115/69	P76070M3000N	0.3 0,W,X,M,Y,Z
7000	207,000	115/69 & 115/69	P76070Z3000N	0.3 0,W,X,M,Y,Z,ZZ

**HIGH ACCURACY DFK-362**

Catalog Number	Accuracy/ Burden
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	0.15 0,W,X,M,Y
Contact factory for cataloging information	--
	0.15 0,W,X,M,Y
	--
	0.15 0,W,X,M,Y
	0.15 0,W,X,M,Y,Z

- 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.



**DESCRIPTION:**

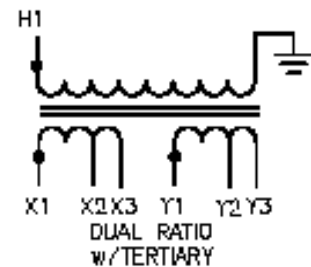
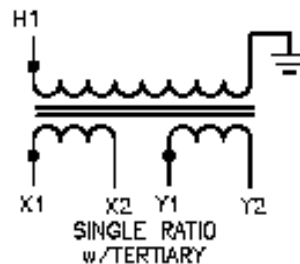
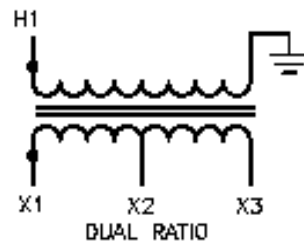
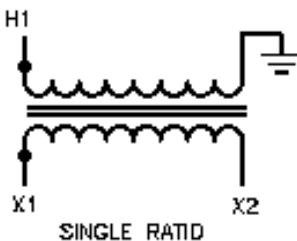
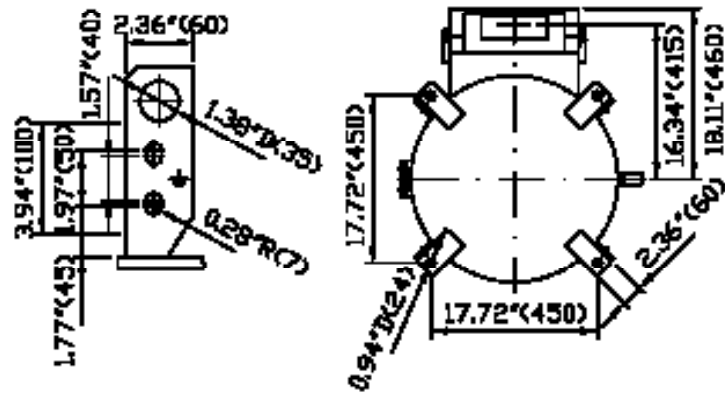
- 1 - OIL SAMPLING VALVE
- 2 - CARRIER ACCESSORIES (ON REQUEST)
- 3 - HF TERMINAL, M8
- 4 - OIL LEVEL INDICATOR
- 5 - GROUND TERMINAL
- 6 - POTENTIAL GROUNDING SWITCH
- 7 - SECONDARY TERMINAL BOX
- 8 - WAVE TRAP MOUNTING PROVISION, (4)M12 x 1.18" (30) ON 45° (#127) BOLT CIRCLE

**SPECIFICATIONS:**

- A - MAX. SYSTEM VOLTAGE: 382kV
- B - BASIC IMPULSE LEVEL: 1350kV F.W.
- C - CREEPAGE: 418.69" (10680) Nominal
- D - STROKE DISTANCE: 122.83" (3120) Nominal
- E - APPROXIMATE OIL: 43 GAL. (163 L)
- F - APPROX. NET WEIGHT: 2050 LBS (924 kg)

**DETAIL X**

**VIEW A**



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



### application

The CA-362(CXM-1300) outdoor current transformer is rated for use on 345,000 volt systems with 1300kV 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 a 1 1/2" conduit opening in the bottom plate. 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-362 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-1300 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  $I_{nom}$  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.



### ORDERING INFO FOR CA-362

Ratio	Catalog Number*	Accuracy/Burden	Rating Factor
5:5	<b>P731005S</b>	0.3 B1.8	1.5
10:5	<b>P731010S</b>	0.3 B1.8	1.5
⋮	⋮	⋮	⋮
100:5	<b>P731100S</b>	0.3 B1.8	1.5
150:5	<b>P731150S</b>	0.3 B1.8	1.5
⋮	⋮	⋮	⋮
4000:5	<b>P731402S</b>	0.3 B1.8	1.0
5/10:5	<b>P731005D</b>	0.3 B1.8/B1.8	2.0/1.5
10/20:5	<b>P731010D</b>	0.3 B1.8/B1.8	2.0/1.5
⋮	⋮	⋮	⋮
1500/3000:5	<b>P731152D</b>	0.3 B1.8/B1.8	2.0/1.5
2000/4000:5	<b>P731202D</b>	0.3 B1.8/B1.8	2.0/1.0

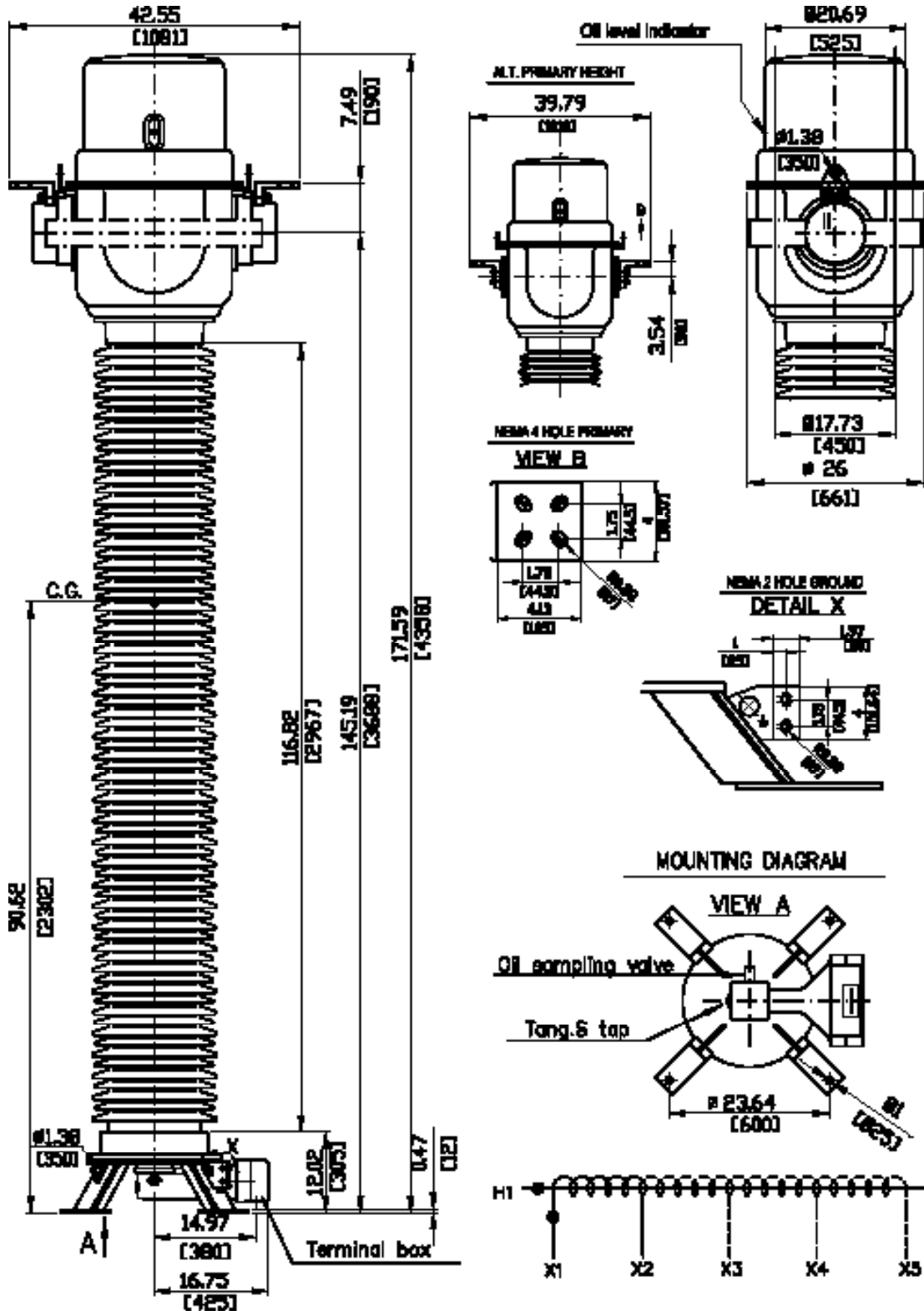
### HIGH ACCURACY CXM-1300

Catalog Number	0.15 B1.8 Acc Range	Rating Factor
P890005SA	0.025 to 20A	4.0
P890010SA	0.05 to 40A	4.0
⋮	⋮	⋮
P890100SA	0.5 to 400A	4.0
P890150SA	0.75 to 600A	4.0
⋮	⋮	⋮
P894000SA	20 to 4800A	1.2
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- Available in multi-ratio designs (full tap ratings same as single ratio above).

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

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



**SPECIFICATIONS:**

1. APPROX. NET WEIGHT --- 1052 LBS (900 kg).
2. APPROX. OIL --- 71 GAL (267 L).
3. BUSHING CREEPAGE --- 414.37" (10525mm) MIN
4. BUSHING STRIKE --- 116.73" (2985mm) MIN

**NOTES:**

1. SECONDARY TERMINALS ARE M8 HEX HEAD BOLTS WITH ASSOCIATED HARDWARE.
2. ALL DIMENSIONS ARE SI [METRIC]