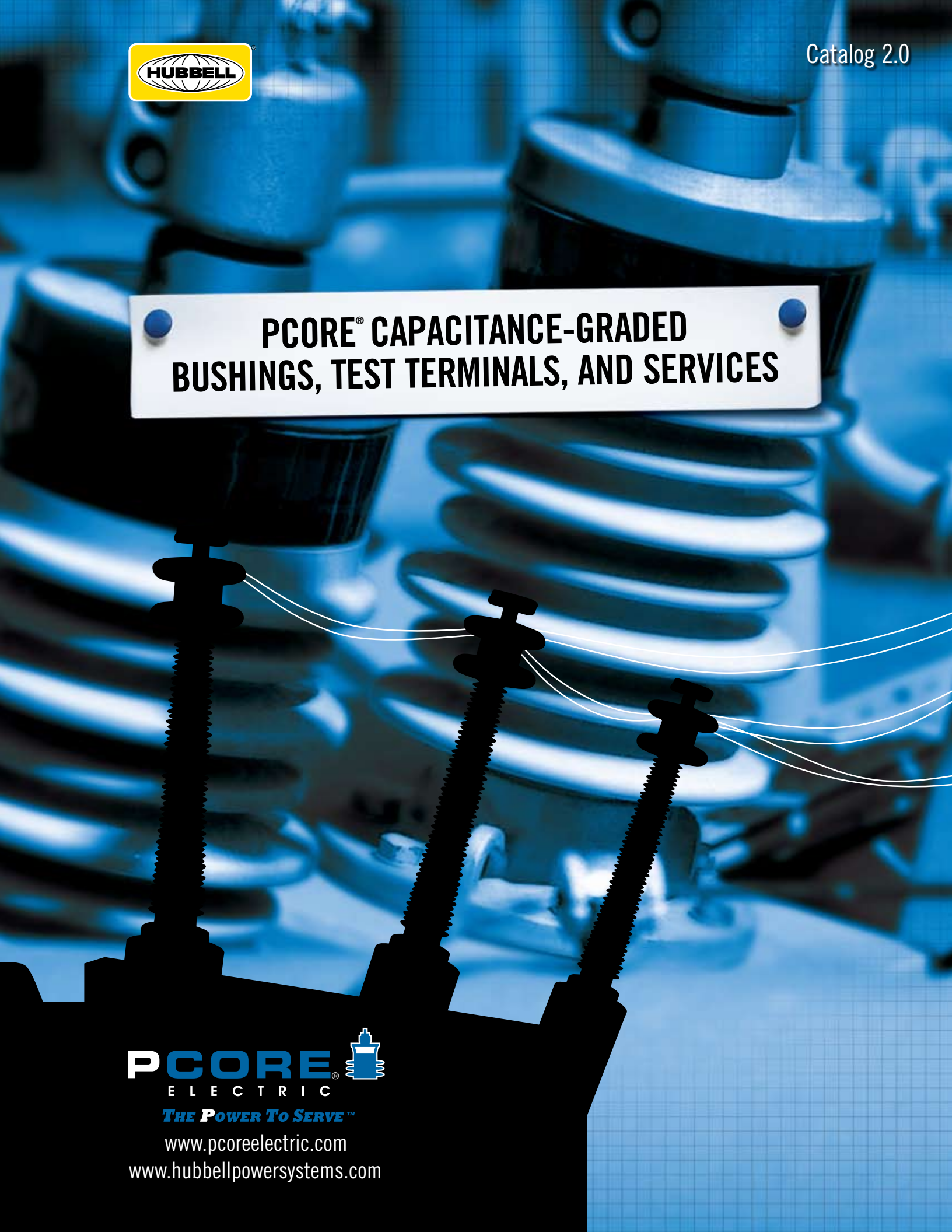
Catalog 2.0

PCORE® CAPACITANCE-GRADED BUSHINGS, TEST TERMINALS, AND SERVICES



PCORE® ELECTRIC

THE POWER TO SERVE™

www.pcoreelectric.com

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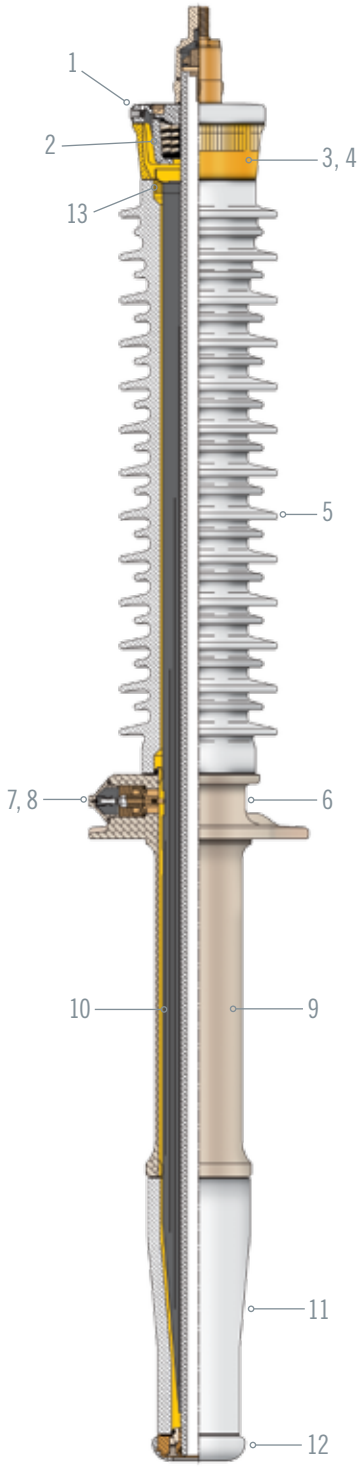
POC® (Paper-Oil-Capacitor)

PCORE® capacitance-graded bushings for transformer and oil circuit breaker applications are a proven design based on a capacitor core with aluminum foils and electrical grade kraft paper impregnated with dried, degassed oil. PCORE POC® bushings meet all ANSI/IEEE test standards for outdoor apparatus bushings, where these standards apply for voltage classes 25 kV through 500 kV. When a transformer application results in overload, a bushing having a higher current rating is recommended. PCORE POC bushings for other applications (e.g., oil-to-oil, oil-to-gas, outdoor-to-indoor air, etc.) are available for various voltage classes and current ratings.

Design Features

1. **Gaskets:** Cork-nitrile rubber gaskets are designed to provide even loading and oil-tight seals with extended life.
2. **High Compression Coil Springs:** Multiple heavy-duty coil springs provide uniform, active compressive loading on gaskets to compensate for temperature variations and to assure oil-tight joints and reliable mechanical strength.
3. **Clear-View Oil Reservoir (Medium and High Voltage Bushings):** The tinted glass oil reservoir filters damaging ultraviolet rays, preventing oil deterioration. The oil level and condition is clearly visible from any angle. The visibility is enhanced through PCORE's use of sight glass material with a fluted interior surface contour.
4. **Magnetic Oil Gauge (Extra High Voltage Bushings):** The oil level is indicated by the pointer on the gauge.
5. **Porcelain Housing:** The outdoor porcelain housing has sturdy sheds to provide the required creep (leakage) and strike distance and has ground surfaces on top and bottom ends for oil-tight gasket seals.
6. **Nameplate Data:** The nameplate affixed to the mounting flange identifies the bushing by catalog number, serial number, and year of manufacture with electrical ratings and factory measurement data.
7. **Test Tap (Medium Voltage Bushings):** 25 kV through 69 kV bushings have a power factor test tap. The test tap is connected to the ground layer of the capacitor core. An aluminum cap covers the insulated test tap assembly and grounds the tap to the flange.
8. **Voltage Tap (High and Extra High Voltage Bushings):** Bushings rated at 115 kV and above have a permanent internal ground. In addition, an insulated tap is connected to a capacitor layer. This tap, designated a voltage tap, is grounded except when used as a voltage source with a potential device. The voltage tap also serves as a means of measuring power factor and capacitance of the bushing core. The tap is ANSI/IEEE standard type A, normally grounded.
9. **Mounting Flange, Ground Sleeve Assembly:** The mounting flange and ground sleeve assembly is made of aluminum and provides nonmagnetic, corrosion-resistant, high-strength service.
10. **Paper-Foil Capacitor Core:** Layers of aluminum foil with electrical grade kraft paper are wound around the center conductor and into the bushing core to produce uniformly valued capacitors in series. This capacitance grading distributes the voltage and the electrical field uniformly throughout the core. The core is vacuum-dried and impregnated with dried, degassed oil.
11. **Lower Porcelain Assembly:** The lower porcelain has ground gasket surfaces on each end to facilitate alignment and maintain an oil-tight assembly.
12. **Bottom Cap Assembly:** A confined cork-nitrile rubber gasket provides a leak-proof seal between the porcelain and the cap. The end cap aligns the porcelain with the conductor. For bushings rated 115 kV through 161 kV, the bottom cap is adaptable for use in draw-lead and bottom-connected applications.
13. **Dried, Degassed Oil:** The internal space in the bushing between its exterior components and the core is filled with dried, degassed insulating oil.

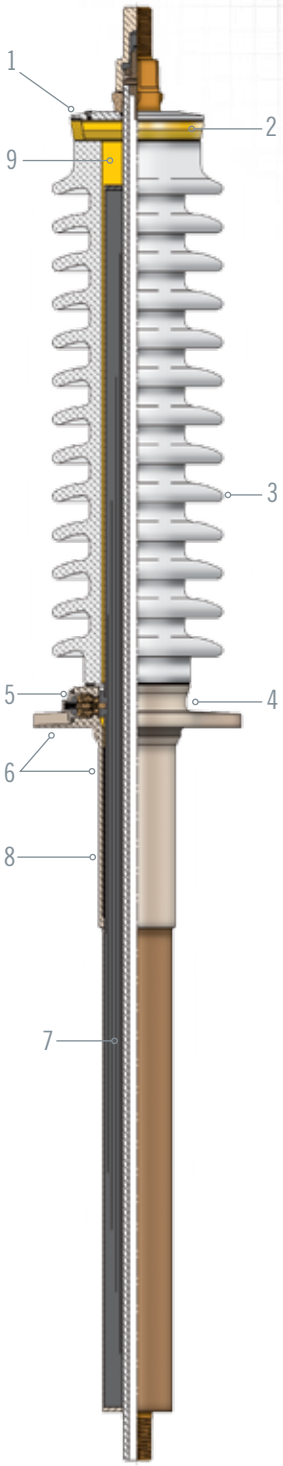


PRC® (Paper-Resin-Capacitor)

PCORE® capacitance-graded bushings for transformer and oil circuit breaker applications are a proven design based on a capacitor core with conductive layers and electrical grade paper impregnated with electrical grade epoxy resin. PCORE PRC® bushings meet all ANSI/IEEE test standards for outdoor apparatus bushings, where these standards apply, for voltage classes 15 through 69 kV. When a transformer application results in overload, a bushing having a higher current rating is recommended. PCORE PRC bushings for other applications (e.g., oil-to-oil, oil-to-gas, outdoor-to-indoor air, etc.) are available for various voltage classes and current ratings.

Design Features

1. **Gaskets:** Cork-nitrile rubber gaskets are designed to provide uniform, active loading to compensate for temperature variations and to assure oil-tight joints, reliable mechanical strength, and extended life.
2. **Clear-View Oil Reservoir:** The tinted glass oil reservoir filters damaging ultraviolet rays, preventing oil deterioration. The oil level and condition are clearly visible from any angle.
3. **Porcelain Housing:** The outdoor porcelain housing has sturdy sheds to provide required creep (leakage) and strike distance and has ground surfaces on top and bottom ends for oil-tight gasket seals.
4. **Nameplate Data:** The nameplate affixed to the mounting flange identifies the bushing by catalog number, serial number, and year of manufacture with electrical ratings and factory measurement data.
5. **Test Tap:** 15 kV through 69 kV bushings have a test tap. The test tap is connected to the ground layer of the capacitor core. An aluminum cap covers the insulated test tap assembly and grounds the tap to the flange when energized.
6. **Mounting Flange, Ground Sleeve Assembly:** The mounting flange and ground sleeve assembly is made of aluminum and provides nonmagnetic, corrosion-resistant, high-strength service.
7. **Paper-Foil Capacitor Core:** Conductive layers with electrical grade paper are wound around the center conductor and into the bushing core to produce uniformly valued capacitors in series. This capacitance grading distributes the voltage and the electrical field uniformly throughout the core. The core is vacuum-dried and impregnated with electrical grade epoxy-resin.
8. **Flange-Core Potting Compound:** Once cured, the slightly resilient potting compound mechanically holds the flange-core assembly together and is an excellent shock absorber under dynamic cantilever loading.
9. **Dried, Degassed Oil:** The internal space in the bushing above the flange and between the porcelain and core is filled with dried, degassed insulating oil.



UNIQUE FEATURES OF PCORE® PRC® BUSHING CORE

- Vacuum-impregnated with epoxy resin to provide a solid, void-free structure not subject to layer separation or internal partial discharge as are resin-bonded cores.
- Totally encapsulated with epoxy resin that is impervious to harmful conductive particle intrusion (i.e., water, carbon, etc.), unlike the surfaces of varnished paper cores, which crack due to aging.
- Proven by over 40 years of outstanding field service.

PRC® (Paper-Resin-Capacitor) 15 kV – 69 kV

PCORE® PRC® bushings are available for voltage classes from 15 kV through 69 kV and are fully interchangeable between transformer and oil circuit breaker applications.

The 15 kV bushings are available in current ratings from 600 amperes through 3000 amperes. The 600 amp rating is for draw-lead applications. The higher current ratings apply when the bushing is bottom-connected in a transformer or circuit breaker.

The 25 kV through 69 kV bushings are available in current ratings from 400 amperes through 2000 amperes. 400/1200 interchangeable bushings are designed to be used for either 400 amp draw-lead applications or 1200 amp bottom-connected applications.

The standard draw-lead terminal is a brazing type; a crimp type fitting is also available upon request. When the bushing is draw-lead connected, the bushing current rating is limited by the size (i.e., current carrying capacity) of the draw-lead cable from the transformer winding, but should not exceed the rating on the bushing nameplate.

The 15 kV to 34.5 kV 89 Series PRC bushings are available with minimum oil levels (current transformer pockets) of 10, 16.5, and 21 inches. The 46 kV and 69 kV 89 Series PRC bushings are available with minimum oil levels (current transformer pockets) of 16.5 and 21 inches.

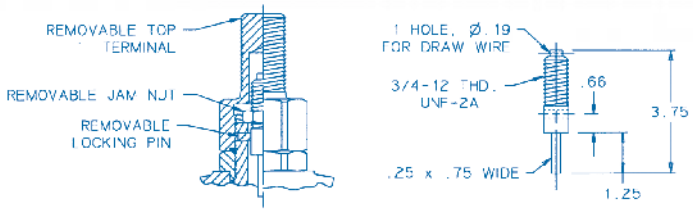
PRC bushings can be mounted vertically and tilted up to 70 degrees from vertical without the use of an external oil reservoir. Contact the factory for applications from 70 degrees to the horizontal position.

Standard PRC bushings have required porcelain strike distance to meet ANSI/IEEE electrical requirements up through 10,000 feet above sea level. For higher elevations, porcelain is available with increased strike distance.

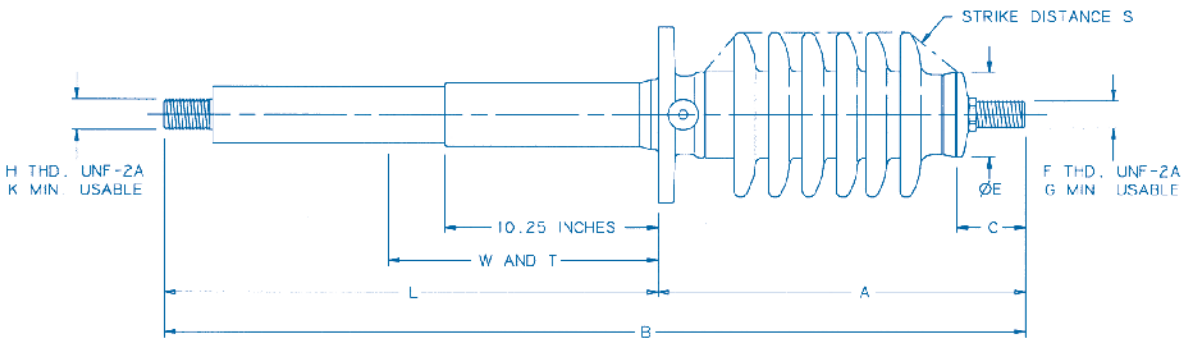
PRC Bushing with External Oil Reservoir for Horizontal Applications

VOLT. CLASS (Uy) kV	BUSHING CATALOG NUMBER	CURRENT RATING 65° C RISE	BIL kV	MIN. OIL LEVEL W	MIN. CREEP	MIN. STRIKE S	OVERALL LENGTH B	LENGTH ABOVE FLANGE A	LENGTH BELOW FLANGE L	"D" MAX D
15	89111-70	1200	110	16.50	17.50	10.00	38.00	15.00	23.00	2.62
	89112-70	1200	110	10.00	17.50	10.00	31.50	15.00	16.50	2.62
	89113-70	1200	110	21.00	17.50	10.00	42.50	15.00	27.50	2.62
	89121-70	2000	110	16.50	21.00	10.00	38.75	15.25	23.50	3.12
	89122-70	2000	110	10.00	21.00	10.00	32.25	15.25	17.00	3.12
	89123-70	2000	110	21.00	21.00	10.00	43.25	15.25	28.00	3.12
	89131-70	3000	110	16.50	20.50	10.00	40.75	16.25	24.50	5.00
	89132-70	3000	110	10.00	20.50	10.00	34.25	16.25	18.00	5.00
	89133-70	3000	110	21.00	20.50	10.00	45.25	16.25	29.00	5.00
	89181-70	600	110	16.50	21.00	10.00	37.00	17.00	20.00	3.12
	89182-70	600	110	10.00	21.00	10.00	30.50	17.00	13.50	3.12
	89183-70	600	110	21.00	21.00	10.00	41.50	17.00	24.50	3.12
25	89201-70	400	150	16.50	31.00	13.00	43.62	20.62	23.00	3.12
	89211-70	1200	150	16.50	31.00	13.00	42.38	18.88	23.50	3.12
	89212-70	1200	150	10.00	31.00	13.00	35.88	18.88	17.00	3.12
	89221-70	2000	150	16.50	27.50	14.00	42.50	18.50	24.00	4.00
	89223-70	2000	150	21.00	27.50	14.00	48.00	18.50	29.50	4.00
	89293-70	400/1200	150	21.00	31.00	13.00	50.12	20.62	29.50	3.12
34.5	89301-70	400	200	16.50	41.00	17.00	49.12	24.12	25.00	3.12
	89311-70	1200	200	16.50	41.00	17.00	51.88	22.38	29.50	3.12
	89312-70	1200	200	10.00	41.00	17.00	41.38	22.38	19.00	3.12
	89321-70	2000	200	16.50	37.50	17.00	48.00	22.00	26.00	4.00
	89323-70	2000	200	21.00	37.50	17.00	53.50	22.00	31.50	4.00
	89393-70	400/1200	200	21.00	41.00	17.00	55.62	24.12	31.50	3.12
46	89401-70	400	250	16.50	49.00	21.00	55.62	28.62	27.00	4.00
	89411-70	1200	250	16.50	49.00	21.00	58.38	26.88	31.50	4.00
	89421-70	2000	250	16.50	49.00	21.00	56.50	26.50	30.00	4.00
	89423-70	2000	250	21.00	49.00	21.00	60.00	26.50	33.50	4.00
	89493-70	400/1200	250	21.00	49.00	21.00	62.12	28.62	33.50	4.00
69	89501-70	400	350	16.50	69.50	30.00	67.38	36.88	30.50	4.00
	89511-70	1200	350	16.50	69.50	30.00	68.62	35.12	33.50	4.00
	89521-70	2000	350	16.50	69.50	30.00	68.25	34.75	33.50	5.00
	89523-70	2000	350	21.00	69.50	30.00	72.25	34.75	37.50	5.00
	89593-70	400/1200	350	21.00	69.50	30.00	74.38	36.88	37.50	4.00

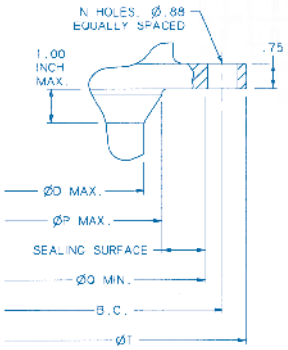
NOTE: ALL DIMENSIONS ON TABLE ARE IN INCHES.



Top Terminal Design
for Draw-Lead Applications

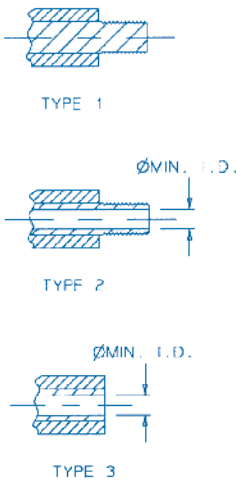


Bushing Detail



Mounting Flange Detail

DRAW-LEAD ABOVE FLANGE	LIVE PART		TOP TERMINAL		BOTTOM TERMINAL		BOTTOM TERMINAL TYPE	STUD I.D.	SEALING SURFACE		FLANGE		
	HEIGHT C	DIA. E	THD. SIZE F	MIN. THD. G	THD. SIZE B	MIN. THD. K			I.D. P	O.D. Q	NO. HOLES	B.C.	O.D. T
——	3.69	3.25	1⅛-12	2.12	1⅛-12	2.12	1	——	3.38	5.00	4	6.00	8.50
——	3.69	3.25	1⅛-12	2.12	1⅛-12	2.12	1	——	3.38	5.00	4	6.00	8.50
——	3.69	3.25	1⅛-12	2.12	1⅛-12	2.12	1	——	3.38	5.00	4	6.00	8.50
——	3.69	3.88	1½-12	2.12	1½-12	2.12	1	——	3.38	6.25	4	7.25	8.50
——	3.69	3.88	1½-12	2.12	1½-12	2.12	1	——	3.38	6.25	4	7.25	8.50
——	3.69	3.88	1½-12	2.12	1½-12	2.12	1	——	3.38	6.25	4	7.25	8.50
——	4.69	6.88	3-12	3.00	3-12	3.00	1	——	5.25	8.25	6	9.25	10.62
——	4.69	6.88	3-12	3.00	3-12	3.00	1	——	5.25	8.25	6	9.25	10.62
——	4.69	6.88	3-12	3.00	3-12	3.00	1	——	5.25	8.25	6	9.25	10.62
13.50	5.38	3.88	1⅛-12	2.00	——	——	3	1.50	3.38	5.00	4	6.00	8.50
13.50	5.38	3.88	1⅛-12	2.00	——	——	3	1.50	3.38	5.00	4	6.00	8.50
13.50	5.38	3.88	1⅛-12	2.00	——	——	3	1.50	3.38	5.00	4	6.00	8.50
16.75	5.81	3.88	1⅛-12	2.50	——	——	3	1.00	3.38	6.25	4	7.25	8.50
——	4.06	3.88	1½-12	2.50	1½-12	2.12	1	——	3.38	6.25	4	7.25	8.50
——	4.06	3.88	1½-12	2.50	1½-12	2.12	1	——	3.38	6.25	4	7.25	8.50
——	3.69	4.50	2-12	2.12	2-12	2.12	1	——	4.50	6.25	4	7.25	10.62
——	3.69	4.50	2-12	2.12	2-12	2.12	1	——	4.50	6.25	4	7.25	10.62
16.75	5.81	3.88	1½-12	2.50	1½-12	2.12	2	0.88	3.38	6.25	4	7.25	8.50
20.25	5.81	3.88	1⅛-12	2.50	——	——	3	1.00	3.38	6.25	4	7.25	8.50
——	4.06	3.88	1½-12	2.50	1½-12	2.12	1	——	3.38	6.25	4	7.25	8.50
——	4.06	3.88	1½-12	2.50	1½-12	2.12	1	——	3.38	6.25	4	7.25	8.50
——	3.69	4.50	2-12	2.12	2-12	2.12	1	——	4.50	6.25	4	7.25	10.62
——	3.69	4.50	2-12	2.12	2-12	2.12	1	——	4.50	6.25	4	7.25	10.62
20.25	5.81	3.88	1½-12	2.50	1½-12	2.12	2	0.88	3.38	6.25	4	7.25	8.50
24.75	5.81	4.50	1⅛-12	2.50	——	——	3	1.00	4.50	7.25	4	8.25	10.62
——	4.06	4.50	1½-12	2.50	1½-12	2.12	1	——	4.50	7.25	4	8.25	10.62
——	3.69	4.50	2-12	2.12	2-12	2.12	1	——	4.50	7.25	4	8.25	10.62
——	3.69	4.50	2-12	2.12	2-12	2.12	1	——	4.50	7.25	4	8.25	10.62
24.75	5.81	4.50	1½-12	2.50	1½-12	2.12	2	0.88	4.50	7.25	4	8.25	10.62
33.00	5.81	4.50	1⅛-12	2.50	——	——	3	1.00	4.50	8.25	6	9.25	10.62
——	4.06	4.50	1½-12	2.50	1½-12	2.12	1	——	4.50	8.25	6	9.25	10.62
——	3.69	6.88	2-12	2.12	2-12	2.12	1	——	5.25	8.25	6	9.25	10.62
——	3.69	6.88	2-12	2.12	2-12	2.12	1	——	5.25	8.25	6	9.25	10.62
33.00	5.81	4.50	1½-12	2.50	1½-12	2.12	2	0.88	4.50	8.25	6	9.25	10.62



Bottom Terminal Variations

POC® (Paper-Oil-Capacitor) 25 kV – 69 kV

PCORE® POC® 88 Series medium voltage bushings are available from 25 kV through 69 kV with current ratings from 400/1200 through 7000 amperes. These bushings are interchangeable between transformer and oil circuit breaker applications. 400/1200 interchangeable bushings are designed to be used either for 400 amp draw-lead applications or 1200 amp bottom-connected applications.

PCORE POC medium voltage bushings are available with minimum oil levels and current transformer pockets of 16.5 and 21 inches.

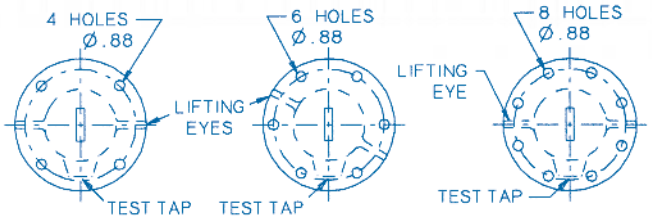
These bushings can be mounted vertically and tilted up to 60 degrees from the vertical without the use of an external reservoir. An external oil reservoir must be used in applications from 60 degrees to the horizontal position. An external oil reservoir is specified by adding a -03 suffix to the basic catalog number.

In addition, a high creepage porcelain is available by adding a -08 suffix.

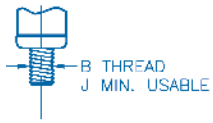
Standard bushings have required strike distance to meet ANSI/IEEE electrical requirements up to 3,300 feet above sea level. High altitude bushings have required porcelain strike distance to meet ANSI/IEEE requirements up to 10,000 feet above sea level. A high altitude bushing is indicated by adding a -09 suffix to the basic catalog number. For higher elevations, porcelain is available with increased strike distance.

VOLT. CLASS (Uy) kV	BUSHING CATALOG NUMBER	CURRENT RATING 65° C RISE	BIL kV	MIN. OIL LEVEL W	MIN. CREEP	MIN. STRIKE S	OVERALL LENGTH H	LENGTH ABOVE FLANGE A	LENGTH BELOW FLANGE L	"D" MAX D
25	88713-70	400/1200	150	21.00	19.50	11.00	50.00	20.50	29.50	3.12
	88722-70	2000	150	16.50	19.50	11.00	44.38	18.38	26.00	3.12
	88723-70	2000	150	21.00	19.50	11.00	47.88	18.38	29.50	3.12
	88732-70	3000	150	16.50	20.00	11.00	44.75	18.75	26.00	4.00
	88733-70	3000	150	21.00	20.00	11.00	48.25	18.75	29.50	4.00
	88742-70	4000	150	16.50	19.50	11.00	47.12	20.12	27.00	5.25
	88743-70	4000	150	21.00	19.50	11.00	50.62	20.12	30.50	5.25
34.5	88813-70	400/1200	200	21.00	30.00	14.00	55.62	24.12	31.50	3.50
	88822-70	2000	200	16.50	30.00	14.00	50.00	22.00	28.00	3.50
	88823-70	2000	200	21.00	30.00	14.00	53.50	22.00	31.50	3.50
	88832-70	3000	200	16.50	30.50	14.00	50.50	22.50	28.00	4.00
	88833-70	3000	200	21.00	30.50	14.00	53.94	22.44	31.50	4.00
	88842-70	4000	200	16.50	29.50	14.00	52.75	23.75	29.00	5.25
	88843-70	4000	200	21.00	29.50	14.00	56.25	23.75	32.50	5.25
46	88913-70	400/1200	250	21.00	37.50	18.00	62.19	28.69	33.50	4.00
	88922-70	2000	250	16.50	37.50	18.00	56.56	26.56	30.00	4.00
	88923-70	2000	250	21.00	37.50	18.00	60.06	26.56	33.50	4.00
	88932-70	3000	250	16.50	37.50	18.00	56.56	26.56	30.00	5.25
	88933-70	3000	250	21.00	37.50	18.00	60.06	26.56	33.50	5.25
	88942-70	4000	250	16.50	37.50	18.00	58.88	27.88	31.00	6.50
	88943-70	4000	250	21.00	37.50	18.00	62.38	27.88	34.50	6.50
69	88013-70	400/1200	350	21.00	54.00	24.00	72.56	35.06	37.50	5.25
	88022-70	2000	350	16.50	54.00	24.00	65.19	32.94	32.25	5.25
	88023-70	2000	350	21.00	54.00	24.00	70.44	32.94	37.50	5.25
	88032-70	3000	350	16.50	53.50	24.00	65.50	33.25	32.25	6.50
	88033-70	3000	350	21.00	53.50	24.00	70.75	33.25	37.50	6.50

NOTES:
1. ALL DIMENSIONS ON TABLE ARE IN INCHES.
2. HIGHER CURRENT RATINGS AVAILABLE – CONTACT PCORE FOR DETAILS.

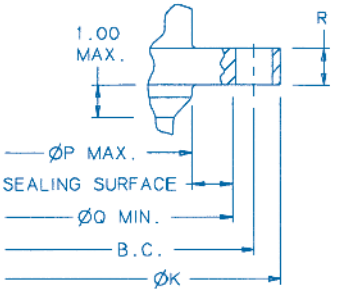


Alignment of Test Tap, Bottom Terminal, and Mounting Flange

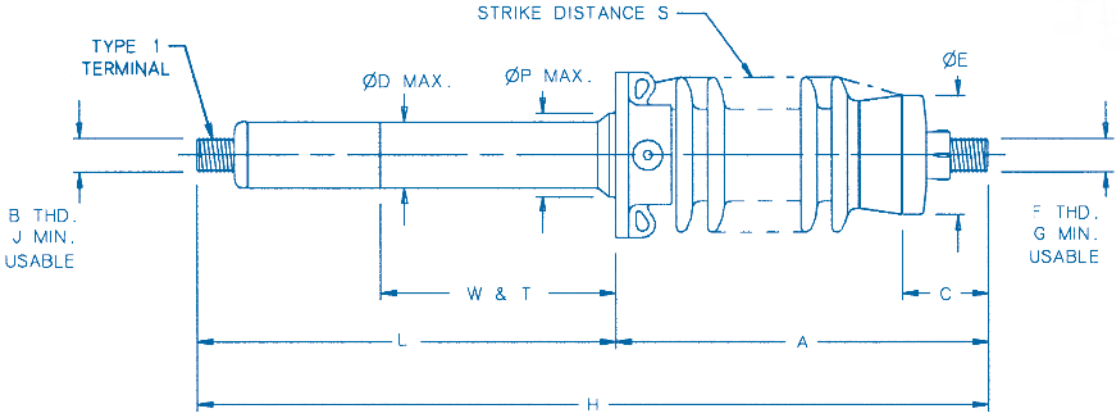


Type 1 Terminal

Type 2 Terminal



Mounting Flange Detail



Bushing Detail

DRAW-LEAD ABOVE FLANGE	LIVE PART		TOP TERMINAL		BOTTOM TERMINAL		BOTTOM TERMINAL TYPE	STUD I.D.	SEALING SURFACE		FLANGE		
	HEIGHT C	DIA. E	THD. SIZE F	MIN. THD. G	THD. SIZE B	MIN. THD. J			I.D. P	O.D. Q	NO. HOLES	B.C.	O.D. K
16.56	7.25	7.25	1½-12	2.50	1½-12	2.12	2	0.88	4.00	6.25	4	7.25	8.50
——	5.12	7.25	1½-12	2.12	1½-12	2.12	1	——	4.00	6.25	4	7.25	8.50
——	5.12	7.25	1½-12	2.12	1½-12	2.12	1	——	4.00	6.25	4	7.25	8.50
——	5.12	7.25	2-12	2.12	2-12	2.12	1	——	5.00	7.25	4	8.25	10.00
——	5.12	7.25	2-12	2.12	2-12	2.12	1	——	5.00	7.25	4	8.25	10.00
——	6.25	9.25	3-12	3.00	3-12	3.00	1	——	6.00	8.25	6	9.25	11.00
——	6.25	9.25	3-12	3.00	3-12	3.00	1	——	6.00	8.25	6	9.25	11.00
20.19	7.25	7.25	1½-12	2.50	1½-12	2.12	2	0.88	4.00	6.25	4	7.25	8.50
——	5.12	7.25	1½-12	2.12	1½-12	2.12	1	——	4.00	6.25	4	7.25	8.50
——	5.12	7.25	1½-12	2.12	1½-12	2.12	1	——	4.00	6.25	4	7.25	8.50
——	5.12	7.25	2-12	2.12	2-12	2.12	1	——	5.00	7.25	4	8.25	10.00
——	5.12	7.25	2-12	2.12	2-12	2.12	1	——	5.00	7.25	4	8.25	10.00
——	6.25	9.25	3-12	3.00	3-12	3.00	1	——	6.00	8.25	6	9.25	11.00
——	6.25	9.25	3-12	3.00	3-12	3.00	1	——	6.00	8.25	6	9.25	11.00
24.75	7.25	7.25	1½-12	2.50	1½-12	2.12	2	0.88	5.00	7.25	4	8.25	10.00
——	5.12	7.25	1½-12	2.12	1½-12	2.12	1	——	5.00	7.25	4	8.25	10.00
——	5.12	7.25	1½-12	2.12	1½-12	2.12	1	——	5.00	7.25	4	8.25	10.00
——	5.12	7.25	2-12	2.12	2-12	2.12	1	——	6.00	8.25	6	9.25	11.00
——	5.12	7.25	2-12	2.12	2-12	2.12	1	——	6.00	8.25	6	9.25	11.00
——	6.25	9.25	3-12	3.00	3-12	3.00	1	——	7.00	9.25	6	10.25	13.25
——	6.25	9.25	3-12	3.00	3-12	3.00	1	——	7.00	9.25	6	10.25	13.25
31.12	7.25	7.25	1½-12	2.50	1½-12	2.12	2	0.88	6.00	8.25	6	9.25	11.00
——	5.12	7.25	1½-12	2.12	1½-12	2.12	1	——	6.00	8.25	6	9.25	11.00
——	5.12	7.25	1½-12	2.12	1½-12	2.12	1	——	6.00	8.25	6	9.25	11.00
——	5.25	9.25	2-12	2.12	2-12	2.12	1	——	7.00	9.25	6	10.25	13.25
——	5.25	9.25	2-12	2.12	2-12	2.12	1	——	7.00	9.25	6	10.25	13.25

POC® (Paper-Oil-Capacitor) 115 kV – 230 kV

Through customer-focused innovation, PCORE® POC® Series II TBI (Transformer Breaker Interchangeable) bushings have been re-engineered to provide a higher level of performance in both power transformers and oil circut breakers.

The seismically certified PCORE POC high voltage Series II TBI bushings are available in voltage classes from 115 kV through 230 kV with current ratings from 800 amperes through 3000 amperes. These bushings provide maximum interchangeability between transformer and oil circuit breaker applications with the same basic bushing.

Bushings in each voltage class have multiple current ratings when bottom connected—and are dependent on the application. The current rating for transformer application is based on an oil temperature of 65°C rise maximum. The current rating for circuit breaker application is based on an oil temperature of 40°C rise maximum.

All 1200/1600 ampere bushings are fully interchangeable and may be used as draw-lead connected bushings with an 800 ampere rating by using a brazing type draw-lead terminal. Crimp type fittings are available on request. When the bushing is draw-lead connected, the current rating is limited by the size (i.e., current carrying capacity) of the draw-lead cable from the transformer winding.

POC high voltage bushings, as shown in the table, are normally shipped with the small transformer shield attached to the lower terminal. For circuit breaker applications, the breaker ring needs to be specified. Large shield and spade assemblies are available for bottom connecting the transformer winding lead to the bushing.

The high voltage bushings for 115 kV through 161 kV have a minimum oil level (current transformer pocket) of 23 inches and for 230 kV have a minimum oil level (CT pocket) of 26.75 inches.

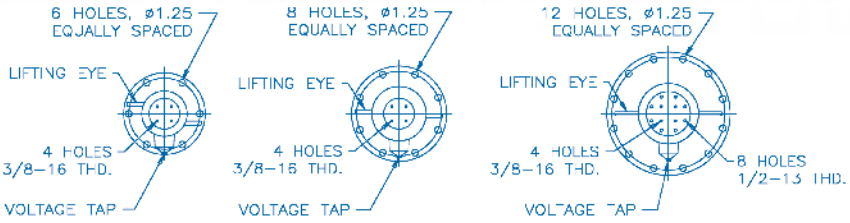
PCORE POC high voltage bushings can be mounted vertically and tilted up to 60 degrees from the vertical without the use of an external reservoir. A remotely mounted external oil reservoir must be used for applications from 60 degrees to the horizontal position.

Standard high voltage bushings at 115 kV and above have required strike distance to meet ANSI/IEEE electrical requirements up through 10,000 feet above sea level. For higher elevations, porcelain is available with increased strike distance.

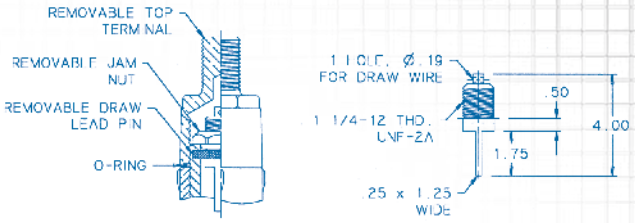
A “smart numbering system” has been developed for the POC Series II TBI bushing line. The catalog number identifies the bushing type (POC), BIL rating (e.g., 550), porcelain glaze, (“G” for gray), and amperage (e.g., 0800 would equal 800A). Special bushing requirements are identified by a suffix.

VOLTAGE CLASS (U_r) kV	BUSHING CATALOG NUMBER	CURRENT RATING TRANS. 65° C RISE	CURRENT RATING OCB 40° C RISE	BIL kV	MIN. OIL LEVEL W	MIN. CREEP	MIN. STRIKE S	OVERALL LENGTH H	LENGTH ABOVE FLANGE A
115	POC550G0800S	800	——	550	23.00	100.00	45.50	100.88	57.88
	POC550G1216RS	1200	1600	550	23.00	100.00	45.50	100.88	57.88
	POC550G2500RS	2500	2500	550	23.00	100.00	45.50	99.75	56.75
	POC550G3000S	3000	3000	550	23.00	100.00	45.50	100.25	57.25
138	POC650G0800S	800	——	650	23.00	126.00	54.00	113.38	66.62
	POC650G1216RS	1200	1600	650	23.00	126.00	54.00	113.38	66.62
	POC650G2500RS	2500	2500	650	23.00	126.00	54.00	112.25	65.50
	POC650G3000S	3000	3000	650	23.00	126.00	54.00	112.75	66.00
161	POC750G0800S	800	——	750	23.00	161.00	65.00	128.19	77.94
	POC750G1216RS	1200	1600	750	23.00	161.00	65.00	128.19	77.94
	POC750G2500RS	2500	2500	750	23.00	161.00	65.00	127.06	76.81
	POC750G3000S	3000	3000	750	23.00	161.00	65.00	127.56	77.31
230	POC900G0800S	800	——	900	26.75	230.00	78.00	149.94	90.44
	POC900G1216S	1200	1600	900	26.75	230.00	78.00	149.94	90.44
	POC900G2500S	2500	2500	900	26.75	230.00	78.00	148.81	89.31
	POC900G3000S	3000	3000	900	26.75	230.00	78.00	149.31	89.81

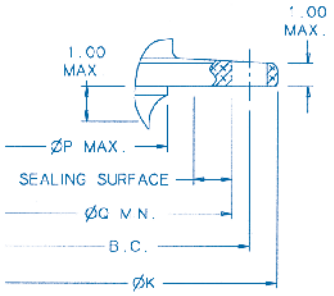
NOTES:
1. R SUFFIX INDICATES A CIRCUIT BREAKER RING IS INSTALLED. THIS IS NECESSARY FOR BOTTOM CONNECTIONS. THIS APPLIES ONLY TO 550 BIL THROUGH 750 BIL BUSHINGS.



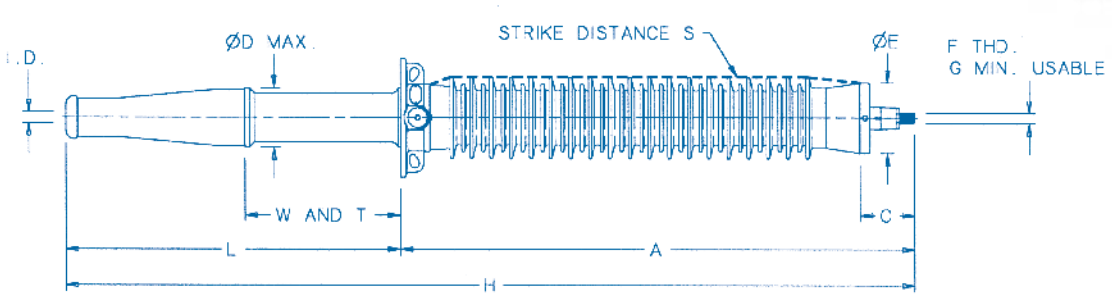
Alignment of Voltage Tap, Bottom Terminal, and Mounting Flange



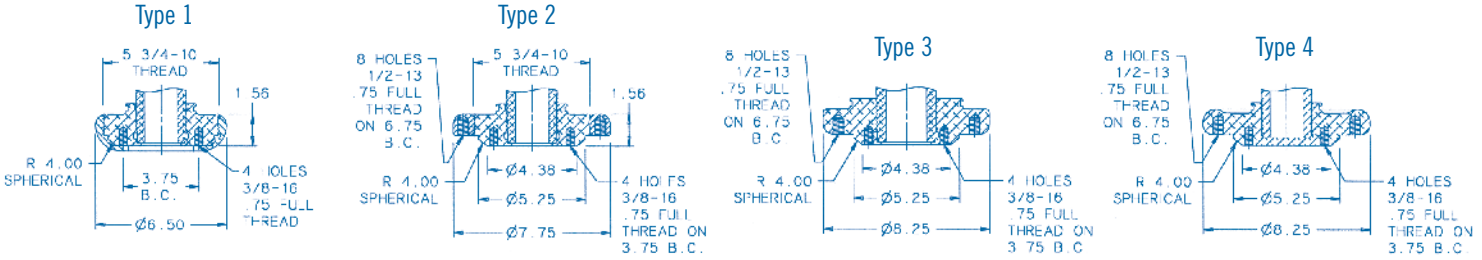
Top Terminal Design
for 800 Amp Draw-Lead Applications



Mounting Flange Detail



Bushing Detail



Bottom Terminal Variations

LENGTH BELOW FLANGE L	"D" MAX D	DRAW-LEAD ABOVE FLANGE	LIVE PART		TOP TERMINAL		BOTTOM TERMINAL TYPE	STUD I.D.	SEALING SURFACE		FLANGE			TOP VIEW
			HEIGHT C	DIA. E	THD. SIZE F	MIN. THD. G			I.D. P	O.D. Q	NO. HOLES	B.C.	O.D. K	
43.00	7.38	53.62	8.06	9.25	1½-12	2.00	1	1.62	7.38	11.88	6	13.25	15.25	A
43.00	7.75	—	8.06	9.25	1½-12	2.00	2	1.62	7.38	11.88	6	13.25	15.25	A
43.00	7.75	—	7.00	9.25	1½-12	2.50	2	—	7.38	11.88	6	13.25	15.25	A
43.00	8.25	—	7.50	9.25	2-12	3.00	4	—	7.38	11.88	6	13.25	15.25	A
46.75	8.00	62.38	8.06	9.25	1½-12	2.00	1	1.62	8.00	12.88	6	14.25	16.25	A
46.75	8.00	—	8.06	9.25	1½-12	2.00	2	1.62	8.00	12.88	6	14.25	16.25	A
46.75	8.00	—	7.00	9.25	1½-12	2.50	2	—	8.00	12.88	6	14.25	16.25	A
46.75	8.25	—	7.50	9.25	2-12	3.00	4	—	8.00	12.88	6	14.25	16.25	A
50.25	8.88	73.69	8.12	10.50	1½-12	2.00	1	1.62	8.88	14.38	8	15.75	17.75	B
50.25	8.88	—	8.12	10.50	1½-12	2.00	2	1.62	8.88	14.38	8	15.75	17.75	B
50.25	8.88	—	7.06	10.50	1½-12	2.50	2	—	8.88	14.38	8	15.75	17.75	B
50.25	8.88	—	7.56	10.50	2-12	3.00	4	—	8.88	14.38	8	15.75	17.75	B
59.50	10.12	86.19	8.12	10.50	1½-12	2.00	3	2.00	10.12	19.62	12	21.00	23.00	C
59.50	10.12	—	8.12	10.50	1½-12	2.00	3	2.00	10.12	19.62	12	21.00	23.00	C
59.50	10.12	—	7.06	10.50	1½-12	2.50	4	—	10.12	19.62	12	21.00	23.00	C
59.50	10.12	—	7.56	10.50	2-12	3.00	4	—	10.12	19.62	12	21.00	23.00	C

2. S SUFFIX INDICATES SILVER-PLATED TOP TERMINAL.
3. 230 kV BUSHINGS THAT MEET THE IEEE C57.19.01-2000 STANDARDS "L" DIMENSION ARE AVAILABLE UPON REQUEST. CONTACT PCORE FOR DETAILS.
4. ALL DIMENSIONS ON TABLE ARE IN INCHES.

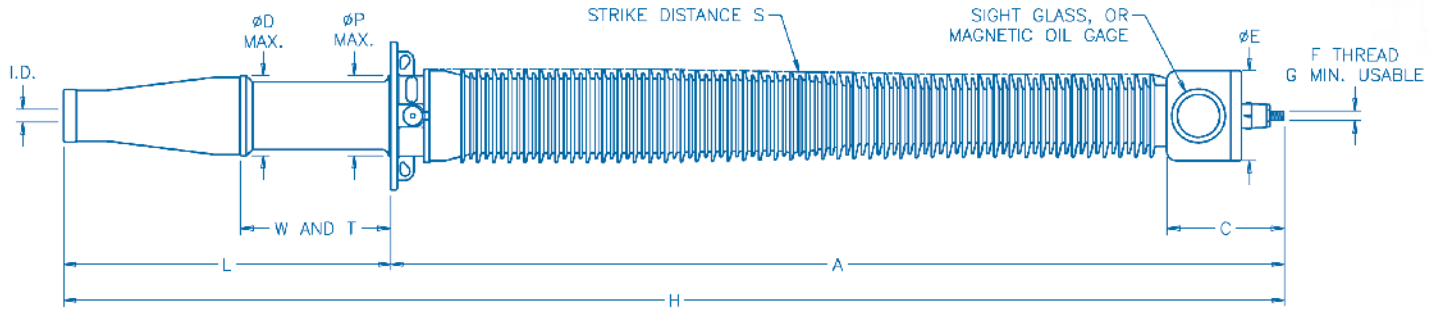
POC® (Paper-Oil-Capacitor) 345 kV – 500 kV

Through customer-focused innovation, POC Series II 345 kV bushings have been re-engineered to provide a higher level of performance in EHV transformers and reactor applications. PCORE's 345 kV bushings have been certified to the highest seismic performance level as specified in IEEE-STD-693-2005. Current ratings are available from 800 amperes to 4000 amperes. POC Series II 345 kV bushings have a minimum oil level (current transformer pocket) of 23 inches. These units can be mounted vertically and tilted up to 60 degrees from the vertical without the use of an external reservoir. POC Series II 345 kV bushings have the required strike distance to meet ANSI/IEEE electrical requirements up through 10,000 feet above sea level. For higher elevations, porcelain is available with increased strike distance. A "smart numbering system" has been developed for the POC Series II line. The catalog number identifies the bushing type (POC), BIL rating (e.g., 1175), porcelain glaze ("G" for gray), and amperage (e.g., 0800 would equal 800A). Special bushing requirements are identified by a suffix.

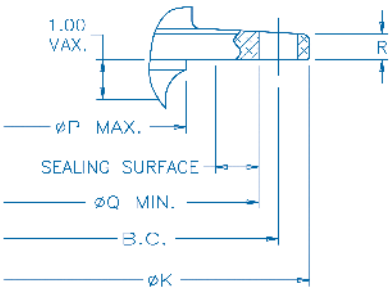
PCORE® POC® bushings listed in the table have system voltage classes of 345 kV through 500 kV and are the bushings normally used for EHV transformer or reactor applications. All EHV bushings are available in BIL ratings to match bushing characteristics to their application. The POC Series II 345 kV bushings have been standardized around the 1175 BIL rating, but the 1050 BIL rating is still available upon request. The 500 kV bushings are available in the POC style 1300 BIL rating or the 65 Series style 1550 BIL and 1675 BIL ratings, plus the 1425 BIL rating is still available upon request. Large shield and spade assemblies are available for bottom connecting the transformer winding lead to the bushing.

VOLTAGE CLASS (U_y) kV	CORE BIL kV	BUSHING CATALOG NUMBER	CURRENT RATING TRANS. 65° C RISE	CURRENT RATING OCB 40° C RISE	MIN. OIL LEVEL W	MIN. CREEP	MIN. STRIKE S	OVERALL LENGTH H	LENGTH ABOVE FLANGE A	LENGTH BELOW FLANGE L	"D" MAX D	DRAW-LEAD ABOVE FLANGE	LIVE PART HEIGHT C	LIVE PART DIA. E
345	1175	POC1175G0800S	800	—	23.00	345.00	115.00	190.38	139.38	51.00	12.50	135.00	18.31	14.00
		POC1175G1216S	1200	1600	23.00	345.00	115.00	190.38	139.38	51.00	12.50	—	18.31	14.00
		POC1175G2000S	2000	2000	23.00	345.00	115.00	189.25	138.25	51.00	12.50	—	17.19	14.00
		POC1175G3000S	3000	3000	23.00	345.00	115.00	189.75	138.75	51.00	12.50	—	17.69	14.00
		POC1175G4000S	4000	4000	23.00	345.00	115.00	189.75	138.75	51.00	12.50	—	17.69	14.00
500	1300	POC1300G0800JS	800	—	23.00	345.00	115.00	200.63	139.38	61.25	14.75	134.96	18.31	14.00
		POC1300G1216JS	1200	1600	23.00	345.00	115.00	200.63	139.38	61.25	14.75	—	18.31	14.00
		POC1300G2000JS	2000	2000	23.00	345.00	115.00	199.50	138.25	61.25	14.75	—	17.19	14.00
		POC1300G3000JS	3000	3000	23.00	345.00	115.00	200.00	138.75	61.25	14.75	—	17.69	14.00
	1550	65240-70	800	2000	23.00	332.00	126.00	230.75	151.75	79.00	20.00	146.88	20.25	18.12
		65240-11-70	800	2000	23.00	361.00	136.00	240.75	161.75	79.00	20.00	156.88	20.25	18.12
		65240-12-70	800	2000	23.00	388.00	146.00	250.75	171.75	79.00	20.00	166.88	20.25	18.12
	1675	65340-139-70	2000	2000	23.00	415.00	156.00	260.75	181.75	79.00	20.00	—	20.25	18.12

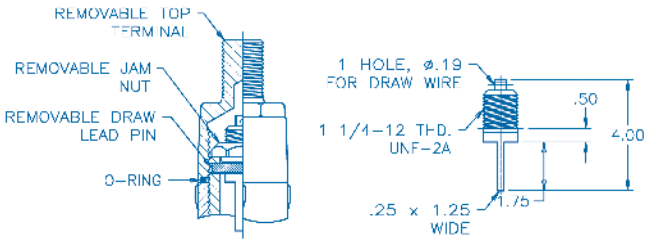
NOTES:
1. J SUFFIX INDICATES 3,300 FEET MAXIMUM ALTITUDE.
2. ADDITIONAL 345 kV AND 500 kV BUSHINGS AVAILABLE – CONTACT PCORE FOR DETAILS.
3. ALL DIMENSIONS ON TABLE ARE IN INCHES.



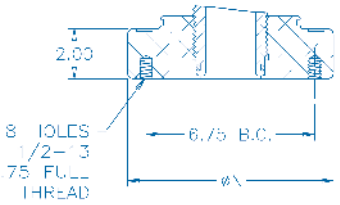
Bushing Detail



Mounting Flange Detail

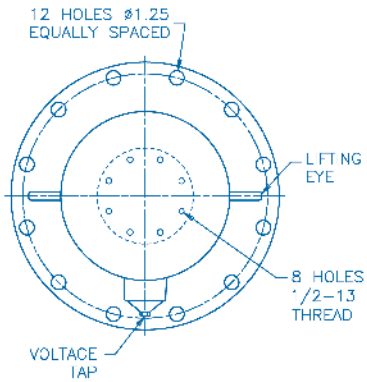


Top Terminal Design
for 800 Amp Draw-Lead Applications



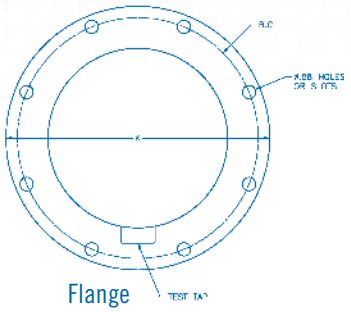
Bottom Terminal Design

TOP TERMINAL		BOTTOM TERMINAL	STUD	SEALING SURFACE		FLANGE			
THD. SIZE F	MIN. THD. G	DIA. N	I.D.	I.D. P	O.D. Q	NO. HOLES	B.C.	O.D. K	THICK R
1⅛- 12	2.00	8.25	2.00	12.50	19.62	12	21.00	23.00	1.00
1⅛- 12	2.00	8.25	——	12.50	19.62	12	21.00	23.00	1.00
1⅛ -12	2.50	8.25	——	12.50	19.62	12	21.00	23.00	1.00
2-12	3.00	8.25	——	12.50	19.62	12	21.00	23.00	1.00
3-12	3.00	8.25	——	12.50	19.62	12	21.00	23.00	1.00
1⅛-12	2.00	8.25	2.00	15.50	19.62	12	21.00	23.00	1.50
1⅛-12	2.00	8.25	——	15.50	19.62	12	21.00	23.00	1.50
1⅛-12	2.50	8.25	——	15.50	19.62	12	21.00	23.00	1.50
3-12	3.00	8.25	——	15.50	19.62	12	21.00	23.00	1.50
2-12	2.50	10.00	2.00	21.00	23.62	12	25.00	28.00	1.50
2-12	2.50	10.00	2.00	21.00	23.62	12	25.00	28.00	1.50
2-12	2.50	10.00	2.00	21.00	23.62	12	25.00	28.00	1.50
2-12	2.50	10.00	——	20.00	26.62	12	28.00	30.00	1.50



Alignment of Voltage Tap, Bottom Terminal,
and Mounting Flange

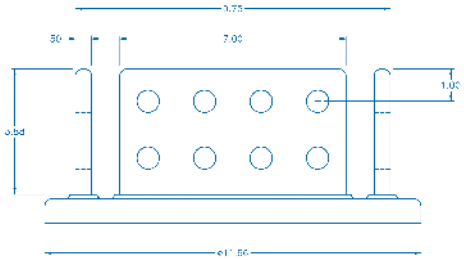
POC® (Paper-Oil-Capacitor) 25 kV



Flange

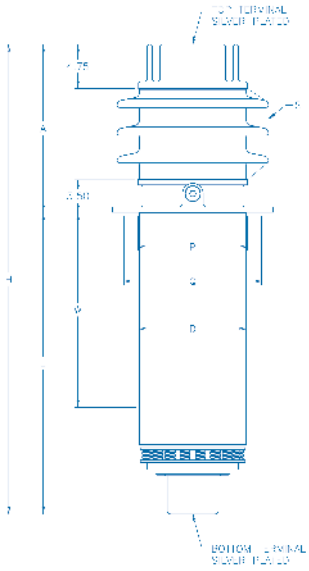
PCORE® POC® bushings for use in GSU (Generator Step-Up) Transformers are currently available at a voltage of 25 kV with current ratings of 4500 to 14000 amperes. These units are manufactured with high temperature gaskets, o-rings, and paper.

PCORE POC-GSU bushings have a minimum oil level (current transformer pocket) of 21 inches. These bushings, at this time, can only be mounted vertically.

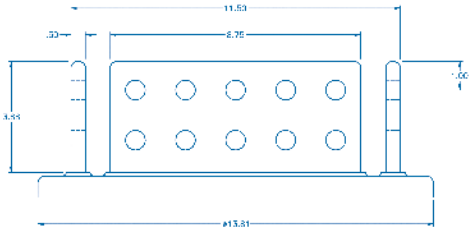


Type 3, Top Terminal, 4 Blades
8 Holes Ø.69 Per Blade
Nema Hole Spacing

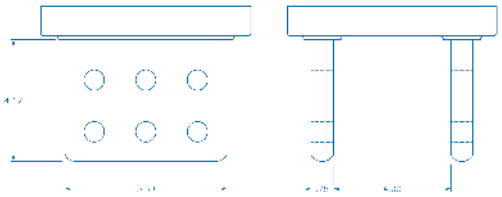
GSU Series Bushing



Bushing Detail



Type 4, Top Terminal, 4 Blades
10 Holes Ø.69 Per Blade
Nema Hole Spacing



Type D, Bottom Terminal, 2 Blades
6 Holes Ø.69 Per Blade
Nema Hole Spacing

VOLTAGE CLASS (U_r) kV	BUSHING CATALOG NUMBER	CURRENT RATING	BIL kV	MIN. OIL LEVEL W	MIN. CREEP	MIN. STRIKE S	OVERALL LENGTH H	LENGTH ABOVE FLANGE A	LENGTH BELOW FLANGE L	"D" MAX D	TOP TERMINAL TYPE	BOTTOM TERMINAL TYPE	SEALING SURFACE I.D. P	SEALING SURFACE O.D. Q	FLANGE NO. HOLES	FLANGE B.C.	FLANGE O.D. K
25	GSU150G10000	10000	150	21.00	21.00	11.75	54.88	22.38	32.50	11.50	3	D	11.50	14.75	8	15.75	17.25
	312212-3-300-70	12000	150	21.00	21.00	11.00	50.62	18.12	32.50	13.81	4	D	13.81	17.50	12	18.50	20.00
	312214-3-300-70	14000	150	21.00	21.00	11.00	50.62	18.12	32.50	13.81	4	D	13.81	17.50	12	18.50	20.00

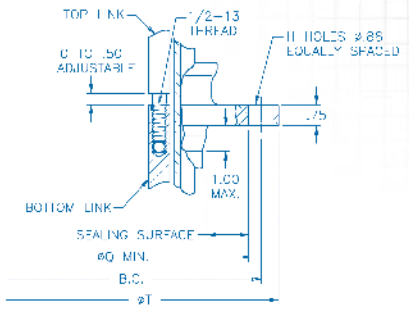
NOTES:
1. ALL DIMENSIONS ON TABLE ARE IN INCHES.
2. ADDITIONAL PART NUMBERS AVAILABLE — CONTACT PCORE FOR DETAILS.

Quick-Link Bushings

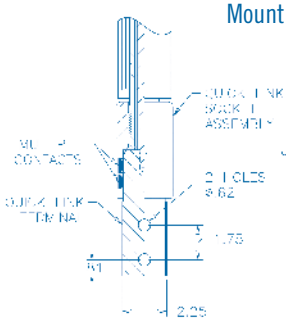
In the past, utility engineers and transformer design engineers were faced with a choice of either bottom-connected bushings (with current capability of 1200 amperes or more) or draw-lead type bushings (limited to 400 or 800 amperes). In applications where current levels were below 400 or 800 amps, the engineer would choose the draw-lead type bushing, which allowed simpler and quicker installation and removal. This often would permit transportation and installation of the "oil-filled" transformer, saving thousands of dollars. The PCORE® Quick-Link Bushing allows the best of both worlds, with the convenience of a draw-lead bushing and the current capability of a bottom-connected bushing.

- Current capability of 2000 amperes
- Installation and removal similar to "draw-lead" type bushings
- Proven multiple contact connector transferring current from the bottom terminal to the bushing conductor
- PCORE Quick-Link Bushing mechanism can withstand short circuit current of up to 25 times the rated current
- The Quick-Link system has been proven to maintain its full rating after more than 500 operations
- The Quick-Link mechanism has no internal connections that could become loose or overheat
- Installation is made by simply connecting the rod and pulling through the bushing
- No special tools or specific torque values are required. Overall bushing diameter is reduced because the current is carried by the bushing rather than a draw-lead or draw-rod
- The Quick-Link rod is much lighter than typical draw-leads or draw-rods, making installation and removal more convenient

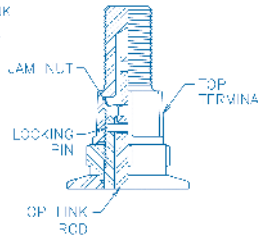
Cut-Away View of the Quick-Link Bushing Bottom Terminal



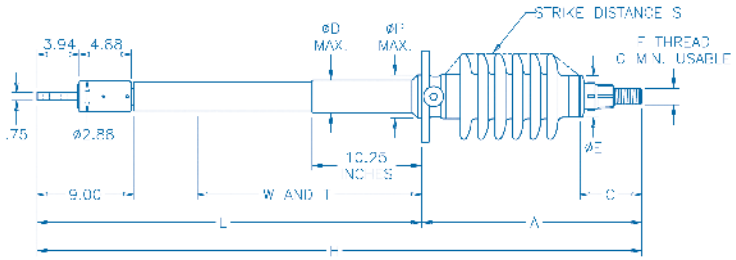
Mounting Flange



Bottom Terminal



Top Link Terminal



Quick-Link Bushing™ Detail

VOLT. CLASS (Uy) kV	BUSHING CATALOG NUMBER	CURRENT RATING 65° C RISE	BIL kV	MIN. OIL LEVEL W	MIN. CREEP	MIN. STRIKE S	OVERALL LENGTH H	LENGTH ABOVE FLANGE A	LENGTH BELOW FLANGE L	"D" MAX	DRAW-LEAD ABOVE FLANGE	LIVE PART HEIGHT C	LIVE PART DIA. E	TOP TERMINAL THD. SIZE F	TOP TERMINAL MIN. THD. G	SEALING SURFACE I.D. P	SEALING SURFACE O.D. Q	FLANGE NO. HOLES	FLANGE B.C.	FLANGE O.D. T
25	88713-200-70	1200	150	21.00	19.50	11.00	56.56	20.50	36.06	3.12	16.56	7.25	7.25	1½-12	2.50	4.00	6.25	4	7.25	8.50
	88723-204-70	2000	150	21.00	20.00	11.00	56.94	20.88	36.06	4.00	16.94	7.25	7.25	2-12	2.50	5.00	7.25	4	8.25	10.00
	89293-200-70	1200	150	21.00	31.00	13.00	56.62	20.62	36.00	3.12	16.75	5.81	3.88	1½-12	2.50	3.38	6.25	4	7.25	8.50
	89253-200-70	2000	150	21.00	27.50	14.00	56.62	20.62	36.00	4.00	16.75	5.81	4.50	2-12	2.50	4.50	6.25	4	7.25	10.62
34.5	88813-200-70	1200	200	21.00	30.00	14.00	62.19	24.12	38.06	4.00	20.19	7.25	7.25	1½-12	2.50	4.00	6.25	4	7.25	8.50
	89393-200-70	1200	200	21.00	41.00	17.00	62.12	24.12	38.00	3.12	20.25	5.81	3.88	1½-12	2.50	3.38	6.25	4	7.25	8.50
	89353-200-70	2000	200	21.00	37.50	17.00	62.12	24.12	38.00	4.00	20.25	5.81	4.50	2-12	2.50	4.50	6.25	4	7.25	10.62
46	88913-200-70	1200	250	21.00	37.50	18.00	68.75	28.69	40.06	4.00	24.75	7.25	7.25	1½-12	2.50	5.00	7.25	4	8.25	10.00
	89493-200-70	1200	250	21.00	49.00	21.00	68.62	28.62	40.00	4.00	24.75	5.81	4.50	1½-12	2.50	4.50	7.25	4	8.25	10.62
	89453-200-70	2000	250	21.00	49.00	21.00	68.62	28.62	40.00	4.00	24.75	5.81	4.50	2-12	2.50	4.50	7.25	4	8.25	10.62
69	88013-200-70	1200	350	21.00	54.00	24.00	79.12	35.06	44.06	5.25	31.12	7.25	7.25	1½-12	2.50	6.00	8.25	6	9.25	11.00
	89593-200-70	1200	350	21.00	69.50	30.00	80.88	36.88	44.00	4.00	33.00	5.81	4.50	1½-12	2.50	4.50	8.25	6	9.25	10.62
	89553-200-70	2000	350	21.00	69.50	30.00	80.88	36.88	44.00	5.00	33.00	5.81	6.88	2-12	2.50	5.25	8.25	6	9.25	10.62

NOTES:
1. ALL DIMENSIONS ON TABLE ARE IN INCHES. 2. SILVER-PLATED BOTTOM TERMINAL AVAILABLE UPON REQUEST – CONTACT PCORE FOR DETAILS.

PCORE® Test Terminals

PCORE Test Terminal – Working Position
Blades Closed

PCORE Test Terminal – Testing Position
Blades Open

The PCORE® Test Terminal is designed for use with field dielectric test equipment for more accurate, faster, and safer field power factor measurement of apparatus insulation at a substantial savings. For a personalized estimate as to the savings you may realize, please try the Test Terminal Calculator tool on our website.

The PCORE Test Terminal is manufactured by PCORE for use with all types of bushings on circuit breakers, transformers, and similar equipment through 765 kV.

The terminal is connected to any standard apparatus stud or terminal and in closed position, permits normal operation of the equipment. Since leads on station equipment are long, significant currents may be induced in them. By use of the terminal, these currents are eliminated from the measuring circuit, providing greater test accuracy.

The original PCORE Test Terminal design is an assembly of two porcelain insulators and three copper castings. Two copper blades swing up and connect the top and bottom castings for normal operation.

In 2006, PCORE introduced an alternate version of the Test Terminal manufactured from lightweight aluminum. Currently available in four styles and rated at currents up to 2,500A, the Aluminum Test Terminals provide the same convenience as the copper models but do so at a weight that is as much as 55% less than the copper equivalent, depending on the specific model. Aluminum models are designated by an “A” in the part number.

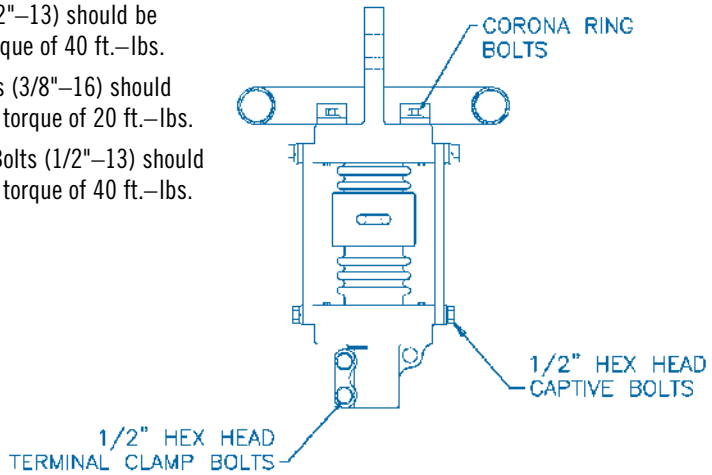
For test purposes, the two captive outside bolts at the top are backed off, and the other bolts are loosened to let the blades swing out in open position to disconnect the bus and isolate the apparatus for testing. Standard field dielectric tests can then be made without removing the bus.

Also available is a PCORE Test Terminal designed for field dielectric tests of station class arresters with system voltages from 15 kV through 765 kV. This PCORE Test Terminal has been designed to take advantage of the less demanding electrical characteristics of lightning arresters.

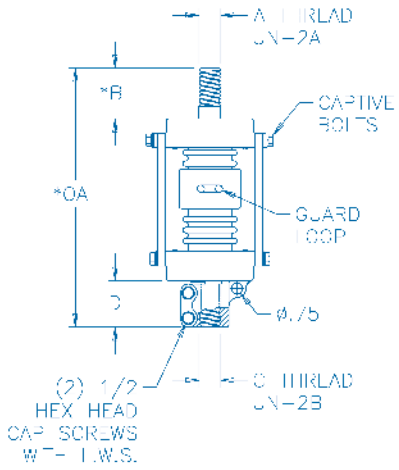
Shielding is available for terminals when used on EHV equipment at 345 kV and above. For 345 kV, one corona ring is recommended and specified by adding the suffix “E” to the catalog number. For 500 and 765 kV, two corona rings are recommended and specified by adding the suffix “EE”.

RECOMMENDED TORQUE VALUES FOR PCORE® TEST TERMINALS

1. Captive Bolts (1/2"–13) should be tightened to a torque of 40 ft.–lbs.
2. Corona Ring Bolts (3/8"–16) should be tightened to a torque of 20 ft.–lbs.
3. Terminal Clamp Bolts (1/2"–13) should be tightened to a torque of 40 ft.–lbs.

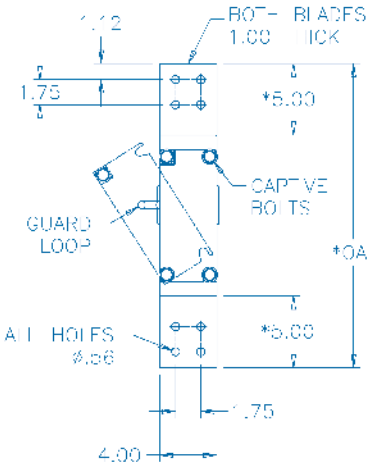


Type 1



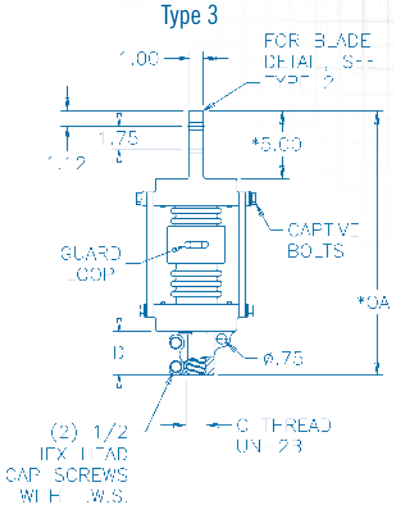
Threaded Connectors
Top and Bottom

Type 2



Blade Connectors
Top and Bottom

Type 3



Blade Connector Top
Threaded Connector Bottom

*Note: add one inch to the length when specifying a corona ring on any top or bottom externally threaded or nema pad terminal.

TEST TERMINAL CATALOG NUMBER	CURRENT RATING (AMPS)	TYPE	OA (OVERALL LENGTH)	TOP TERMINAL				BOTTOM TERMINAL			
				TYPE	NO. HOLES	A (THREAD)	B (MIN. USABLE THREAD)	TYPE	NO. HOLES	C (THREAD)	D (MIN. USABLE THREAD)
63032-70	1200	1	17.62	MALE	—	1¼-12	2.12	FEMALE	—	1¼-12	3.00
63033-70	2000	1	18.00	MALE	—	1½-12	2.50	FEMALE	—	1½-12	3.00
63034-70	2000	1	18.00	MALE	—	2-12	2.50	FEMALE	—	2-12	3.00
63035-70	4000	1	19.50	MALE	—	3-12	3.50	FEMALE	—	3-12	3.50
63037-70	3000	2	21.25	BLADE	4	—	—	BLADE	4	—	—
63037-A-70	2500	2	21.44	BLADE	4	—	—	BLADE	4	—	—
63040-70	1600	3	19.50	BLADE	4	—	—	FEMALE	—	1¼-12	3.00
63042-70	1200	3	19.50	BLADE	4	—	—	FEMALE	—	1¼-12	3.00
63043-70	2000	3	19.50	BLADE	4	—	—	FEMALE	—	1½-14	3.00
63051-70	2000	1	20.00	MALE	—	2-12	4.50	FEMALE	—	2-12	3.00
63054-70	2000	1	18.00	MALE	—	2-12	2.50	FEMALE	—	1½-12	3.00
63055-70	3000	3	19.50	BLADE	4	—	—	FEMALE	—	2-12	3.00
63055-A-70	2000	3	19.69	BLADE	4	—	—	FEMALE	—	2-12	3.00
63056-70	2000	3	19.50	BLADE	4	—	—	FEMALE	—	1½-12	3.00
63056-A-70	2500	3	19.69	BLADE	4	—	—	FEMALE	—	3-12	3.50
63061-70	800	1	17.62	MALE	—	1¼-12	2.12	FEMALE	—	1½-12	3.00
63066-70	3000	3	20.00	BLADE	4	—	—	FEMALE	—	2½-12	3.50
63071-70	3000	3	20.00	BLADE	4	—	—	FEMALE	—	3-12	3.50
63071-A-70	2500	3	20.19	BLADE	4	—	—	FEMALE	—	3-12	3.50
63073-70	4500	1	22.50	MALE	—	4-12	4.50	FEMALE	—	4-12	4.50
63099-70	3000	3	20.00	BLADE	4	—	—	FEMALE	—	2¼-12	3.50
64000-70	1200	1	18.00	MALE	—	1½-14	2.50	FEMALE	—	1½-14	3.00
64036-70	2000	1	17.50	MALE	—	2-12	2.50	FEMALE	—	2-12	3.00
64049-70	3000	1	19.50	MALE	—	2½-12	3.50	FEMALE	—	2½-12	3.50
64055-70	2000	1	20.00	MALE	—	1¾-12	4.50	FEMALE	—	1¾-12	3.00
64062-70	4000	1	21.75	MALE	—	3-12	4.00	FEMALE	—	3-12	4.50

NOTES:
1. ALL DIMENSIONS ON TABLE ARE IN INCHES.
2. ADDITIONAL TEST TERMINAL TYPES AVAILABLE – CONTACT PCORE FOR DETAILS.
3. FOR 345 kV, ONE CORONA RING IS RECOMMENDED AND SPECIFIED BY ADDING THE SUFFIX "E" TO THE CATALOG NUMBER. EX. 63037-E-70.
4. FOR 500 kV, TWO CORONA RINGS ARE RECOMMENDED AND SPECIFIED BY ADDING THE SUFFIX "EE" TO THE CATALOG NUMBER. EX. 63037-EE-70.
5. ALUMINUM TEST TERMINAL MODELS ARE DESIGNATED BY AN "A" WITHIN THE PART NUMBER.

CSA/EEMAC Bushings

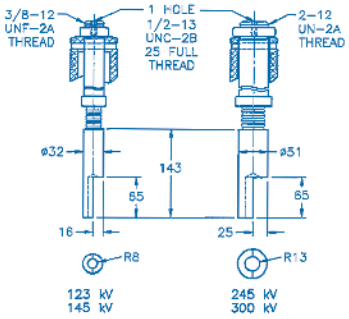
PCORE manufactures bushings for the CSA standard in both medium and high voltage classes.

Within the CSA standard, we offer our PRC® 85 Series, available from 15 kV through 72.5 kV. All of the 85 Series bushings are available with minimum oil levels (current transformer pockets) of 254 and 500 millimeters.

PRC bushings can be mounted vertically and tilted up to 70 degrees from vertical without the use of an external oil reservoir. These bushings can also be ordered for horizontal applications and are designated by using "-40" within the part number.

We also offer our POC® 86 Series available from 123 kV through 300 kV. The 123 kV and 145 kV 86 Series bushings are available with minimum oil levels (current transformer pockets) of 600 millimeters. The 245 kV and 300 kV 86 Series bushings are available with minimum oil levels (current transformer pockets) of 750 millimeters.

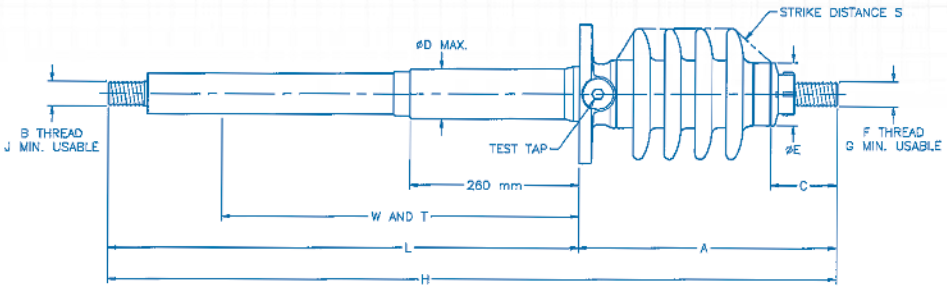
As with all PCORE bushings, the CSA standard units are interchangeable between transformer and oil circuit breaker applications. Additionally, our CSA standard bushings have porcelain strike distance for electrical requirements up through 10,000 feet above sea level.



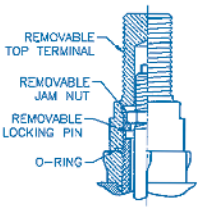
Draw Lead for POC Bushings

VOLT. CLASS (Uy) kV	BUSHING CATALOG NUMBER	CURRENT RATING 65° C RISE	BIL kV	MIN. OIL LEVEL W	MIN. CREEP	MIN. STRIKE S	OVERALL LENGTH B	LENGTH ABOVE FLANGE A	LENGTH BELOW FLANGE L	"D" MAX D	DRAW-LEAD ABOVE FLANGE	LIVE PART		TOP TERMINAL		BOTTOM
												HEIGHT C	DIA. E	THD. SIZE F	MIN. THD. G	THD. SIZE B
15	85102-70	400	110	254	533	254	808	437	371	79	343	143	98	1½-12	64	—
	85103-70	400	110	549	533	254	1103	437	667	79	343	143	98	1½-12	64	—
	85112-70	1200	110	254	533	254	826	397	429	79	—	102	98	1½-12	64	1½-12
	85113-70	1200	110	549	533	254	1121	397	724	79	—	102	98	1½-12	64	1½-12
	85122-70	2000	110	254	457	254	895	422	473	89	—	127	114	2-12	89	2-12
	85123-70	2000	110	549	457	254	1191	422	768	89	—	127	114	2-12	89	2-12
	85132-70	3000	110	254	521	254	933	438	495	127	—	143	175	3-12	102	3-12
	85133-70	3000	110	549	521	254	1229	438	791	127	—	143	175	3-12	102	3-12
27.5	85202-70	400	150	254	787	356	941	519	422	79	425	143	98	1½-12	64	—
	85203-70	400	150	549	787	356	1233	519	714	79	425	143	98	1½-12	64	—
	85212-70	1200	150	254	787	356	959	479	479	79	—	102	98	1½-12	64	1½-12
	85213-70	1200	150	549	787	356	1254	479	775	79	—	102	98	1½-12	64	1½-12
35	85302-70	400	200	254	1041	432	1080	610	470	79	514	143	98	1½-12	64	—
	85303-70	400	200	549	1041	432	1375	610	765	79	514	143	98	1½-12	64	—
	85312-70	1200	200	254	1041	432	1095	568	527	79	—	102	98	1½-12	64	1½-12
	85313-70	1200	200	549	1041	432	1391	568	822	79	—	102	98	1½-12	64	1½-12
50	85402-70	400	250	254	1245	559	1240	722	518	102	629	143	114	1½-12	64	—
	85403-70	400	250	549	1245	559	1535	722	813	102	629	143	114	1½-12	64	—
	85412-70	1200	250	254	1245	559	1260	683	578	102	—	102	114	1½-12	64	1½-12
	85413-70	1200	250	549	1245	559	1556	683	879	102	—	102	114	1½-12	64	1½-12
72.5	85502-70	400	350	254	1765	762	1535	932	603	102	838	143	114	1½-12	64	—
	85503-70	400	350	549	1765	762	1830	932	899	102	838	143	114	1½-12	64	—
	85512-70	1200	350	254	1765	762	1553	892	660	102	—	102	114	1½-12	64	1½-12
	85513-70	1200	350	549	1765	762	1848	892	956	102	—	102	114	1½-12	64	1½-12
123	86100-70	600	550	600	2540	1168	2638	1521	1118	222	600	217	235	1½-12	64	—
	86110-70	1200	550	600	2540	1168	2638	1521	1118	222	—	217	235	1½-12	64	—
145	86200-70	600	650	600	3035	1422	2921	1803	1118	222	600	217	235	1½-12	64	—
	86210-70	1200	650	600	3035	1422	2921	1803	1118	222	—	217	235	1½-12	64	—
245	86500-70	600	950	750	5436	1930	3889	2315	1575	305	600	217	267	1½-12	64	—
	86510-70	1200	950	750	5436	1930	3889	2315	1575	305	—	217	267	1½-12	64	—
300	86600-70	600	1050	750	5156	2083	4496	2718	1778	371	600	514	460	1½-12	64	—

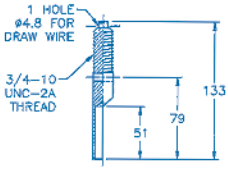
NOTES:
1. All DIMENSIONS ON TABLE ARE IN MILLIMETERS.
2. ADDITIONAL PART NUMBERS AVAILABLE - CONTACT PCORE FOR DETAILS.
3. 123 kV, 145 kV, 245 kV, & 300 kV DISTANCE TO DRAW LEAD ABOVE FLANGE IS THE DISTANCE TO THE DRAW LEAD CONNECTOR NOT TO THE PIN.



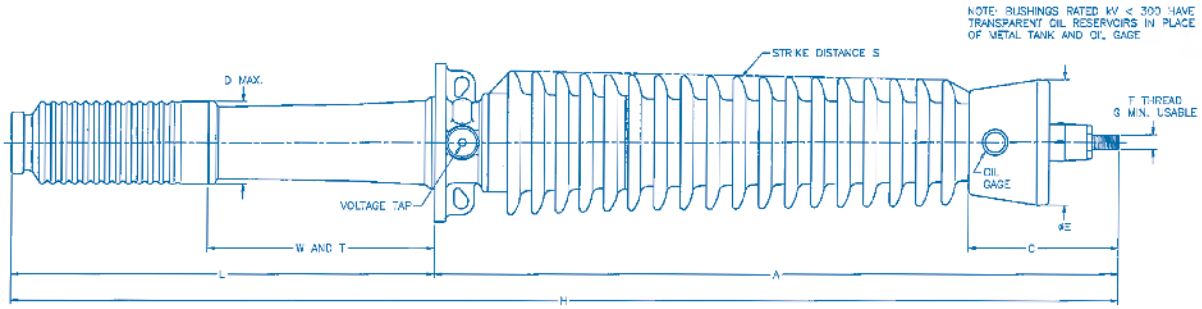
15 kV-72.5 kV PRC Bushing Detail



Top Terminal Design for Draw-Lead Applications

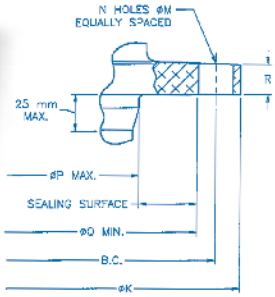


Draw Lead for PRC Bushings

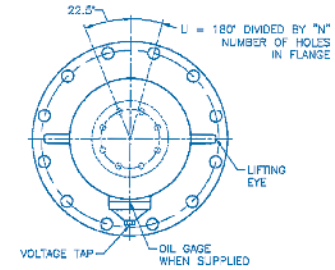


123 kV-300 kV PRC Bushing Detail

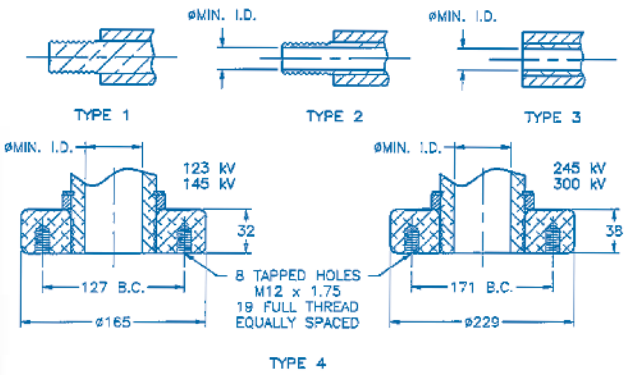
TERMINAL			SEALING SURFACE		FLANGE				
MIN. THD. K	BOTTOM TERMINAL TYPE	STUD I.D.	I.D. P	O.D. Q	NO. HOLES	SIZE Ø M	B.C.	O.D. T	THICKNESS R
—	3	25	86	159	4	22	184	216	19
—	3	25	86	159	4	22	184	216	19
54	1	—	86	159	4	22	184	216	19
54	1	—	86	159	4	22	184	216	19
102	1	—	102	159	4	22	184	219	19
102	1	—	102	159	4	22	184	219	19
114	2	—	133	210	6	22	235	270	19
114	2	—	133	210	6	22	235	270	19
—	3	25	86	159	4	22	184	216	19
—	3	25	86	159	4	22	184	216	19
54	1	—	86	159	4	22	184	216	19
54	1	—	86	159	4	22	184	216	19
—	3	25	86	159	4	22	184	216	19
—	3	25	86	159	4	22	184	216	19
54	1	—	86	159	4	22	184	216	19
54	1	—	86	159	4	22	184	216	19
—	3	25	114	184	4	22	210	270	19
—	3	25	114	184	4	22	210	270	19
54	1	—	114	184	4	22	210	270	19
54	1	—	114	184	4	22	210	270	19
—	3	25	114	210	6	22	235	270	19
—	3	25	114	210	6	22	235	270	19
54	1	—	114	210	6	22	235	270	19
54	1	—	114	210	6	22	235	270	19
—	4	41	222	352	8	25	381	419	29
—	4	41	222	352	8	25	381	419	29
—	4	41	222	352	8	25	381	419	29
—	4	41	222	352	8	25	381	419	29
—	4	57	314	562	12	32	597	648	32
—	4	57	314	562	12	32	597	648	32
—	4	57	394	562	12	32	597	648	38



Mounting Flange Detail



Alignment of Test/Voltage Tap, Bottom Terminal, and Mounting Flange



Bottom Terminal Variations

Repair and Diagnostics

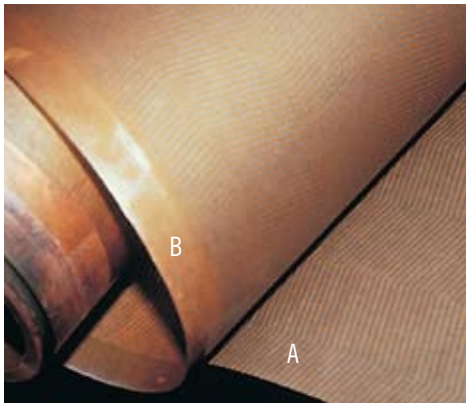
A specially designated Bushing Repair Group with its own facilities and years of experience will keep utility turnaround times to a minimum. Returned bushings are repaired and rebuilt to the same high-quality standards that PCORE has for new bushings, while keeping the original bushing characteristics. With our repair program, savings up to 55% of the cost of a new bushing can be realized.

PCORE Repair Capabilities:

- Bushing Regasket
- Core Replacement
- Minor Porcelain Repair

Procedure:

1. A certificate of analysis showing the PCB content of the oil in each bushing by manufacturer, catalog number, and serial number sent to PCORE Marketing for review.
2. An RMA (Return Material Authorization) number is assigned to the bushings being returned to PCORE for repair. The RMA number needs to be marked on each bushing crate prior to shipping.
3. Purchase order from the customer for one or a group of bushings with the quoted repair cost provided based on apparent problem as shipped to PCORE.



Conductive Ink Moves From Conductive Layer (A) To Insulating Layer (B) Within Bushing Core.

4. Once the returned bushing is at PCORE, we:
   - Evaluate to determine extent and feasibility of repair.
   - Advise the customer of the evaluation results and actual repair charges.
   - Obtain customer approval to proceed with the bushing repair.

   If bushing is determined not to be repairable or customer disapproves proposed repair, a charge will be assessed for the initial bushing evaluation.
5. Following repair of a bushing: ANSI/IEEE standard routine production tests and/or measurements will be made on the bushing as follows:
   - Leak test by internal pressurization
   - One-minute dry-withstand voltage
   - Power factor
   - Capacitance
   - Partial discharge

PCORE Repair Exceptions:

Bushings not considered for repair at PCORE:

- Compound-filled bushings
- Bushings with varnished paper cores (i.e., no lower porcelain housing)
- IEC bushing designs
- Bushings with oil having a PCB content greater than 10 ppm

Replacement Bushings

Equipment life extension has become an integral part of a utility's philosophy in both austere and normal economic times. Also while extending equipment life, a very reliable electrical system must be maintained to supply quality electric power. A reliable source of replacement bushings is required to maximize operating revenues and therefore, minimize equipment downtime.

Finding a replacement bushing for ANSI or CSA standard bushings is quite easy since the intent of these standards is to define the critical dimensions. Therefore, the electrical and dimensional interchangeability is ensured for ANSI and CSA standard bushings made by several different manufacturers for transformer and oil circuit breaker applications.

PCORE uses a comparative analysis system to document and to guarantee dimensional and electrical interchangeability between the original bushing and the PCORE replacement bushing. The comparative analysis information includes but is not limited to the electrical characteristics, minimum oil level, above and below flange lengths, and terminal connections.

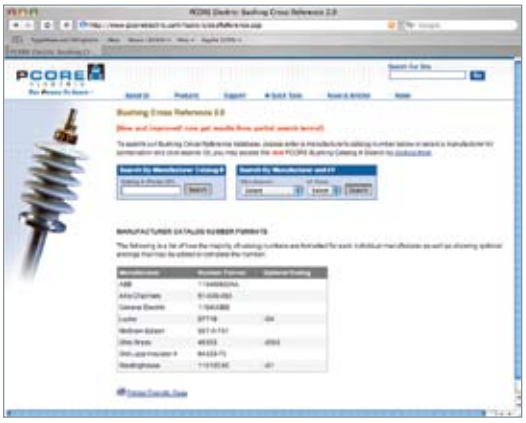
The comparative analysis along with the outline drawings of the bushing and adaptors (if required) are sent to the customer for review.

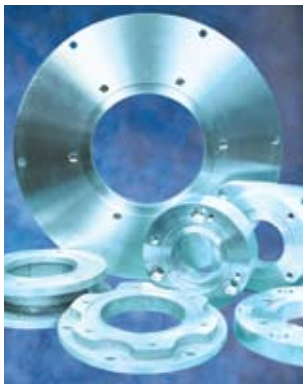
PCORE has an extensive collection of comparative analyses for ABB, General Electric, Lapp, Locke, McGraw-Edison, Ohio Brass, and Westinghouse bushings. If changes to the suggested replacement bushing are desired (e.g., longer upper porcelain), the customer should make a specific request and the request will be reviewed and resolved.

For the convenience of our customers, the PCORE website offers multiple online tools to assist with the bushing replacement process. Our Bushing Cross Reference Guide allows users to input as much, or as little, information that they may have about the existing bushing they are looking to replace. Depending on the amount of information entered, the system will provide a link to the critical dimensions of the likely PCORE replacement bushing or, in the case of minimal available information, to multiple links that the user can use to further narrow the field of options.

115 kV Westinghouse Bushing

115 kV PCORE® Replacement Bushing





PCORE® Flange Adaptors

115 kV Draw-Lead Adaptors

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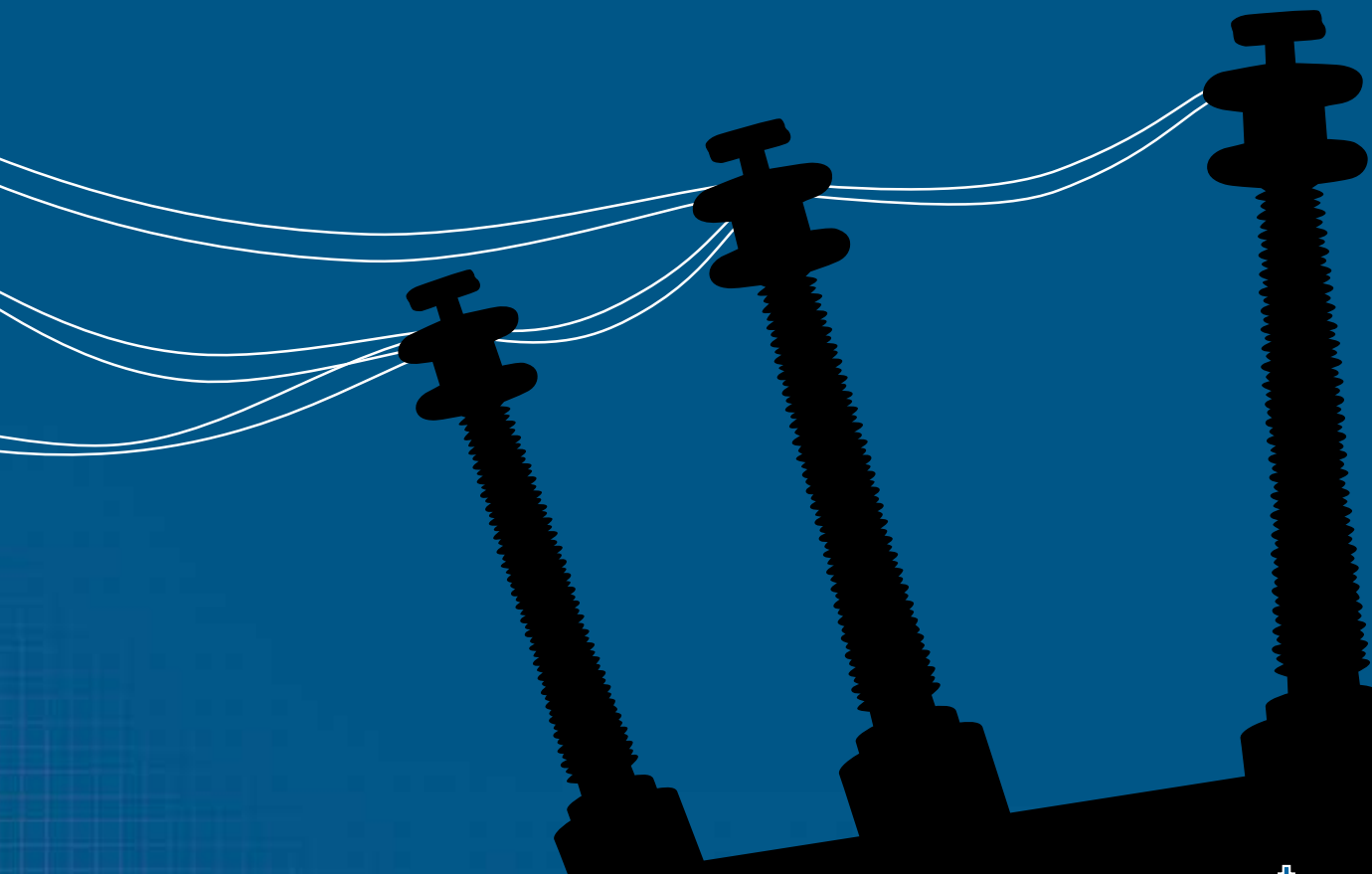
About Us

PCORE Electric, a subsidiary of Hubbell Power Systems Inc., is North America's only company 100% focused on the manufacturing of capacitance-graded bushing—and related components— for transformers and oil circuit breakers in the ANSI and CSA marketplace. In addition to our wide range of precision products, we offer diagnostic services and bushing repairs that enable our customers to maximize their equipment investment.

Formerly the Bushing Division of Lapp Insulator Company LLC, PCORE Electric is an ISO 9001-2000 certified supplier that continues to support all bushing products and remain committed to providing the highest quality and most reliable products supported by the outstanding level of service our customers have come to expect. That's *The Power To Serve.*

For more information about PCORE, visit us today at www.pcoreelectric.com or visit the Hubbell Power Systems website at www.hubbellpowersystems.com.



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