

Distribution Transformers

Single-Phase Overhead

GENERAL

Cooper Power Systems manufactures a complete line of single-phase overhead-type distribution transformers. Single-phase transformers are available as conventional, protected, step-down, High BIL and as autotransformers. These transformers are available in a variety of ratings and meet or exceed the requirements of applicable ANSI and NEMA standards. Units designed per Rural Utilities Service (RUS) standards are also available.

Conventional overhead transformers are manufactured in 5-500 kVA. The completely self protected (CSP) units are rated 5-167 kVA.

CSP transformers have direct connected primary arresters, secondary breakers, and internal primary voltage fuses. This eliminates the need for separately mounted protective devices and installation economy results.

Single-phase step-down and autotransformers reduce single-phase distribution voltages to new distribution voltages. Step-down transformers are manufactured in 25-500 kVA with dual primary or secondary voltages thru 250 kV BIL. Autotransformers are manufactured in 167-5000 kVA, depending on the ratio between the primary and secondary voltages, and are available with a variety of tap arrangements.

Single-phase High BIL transformers are manufactured in 5-500 kVA and have BIL ratings from 200-250 kV.



Figure 1.
Single-phase overhead conventional transformer.



Figure 3.
Single-phase overhead completely self protected transformer.



Figure 2.
Single-phase overhead step-down transformer.

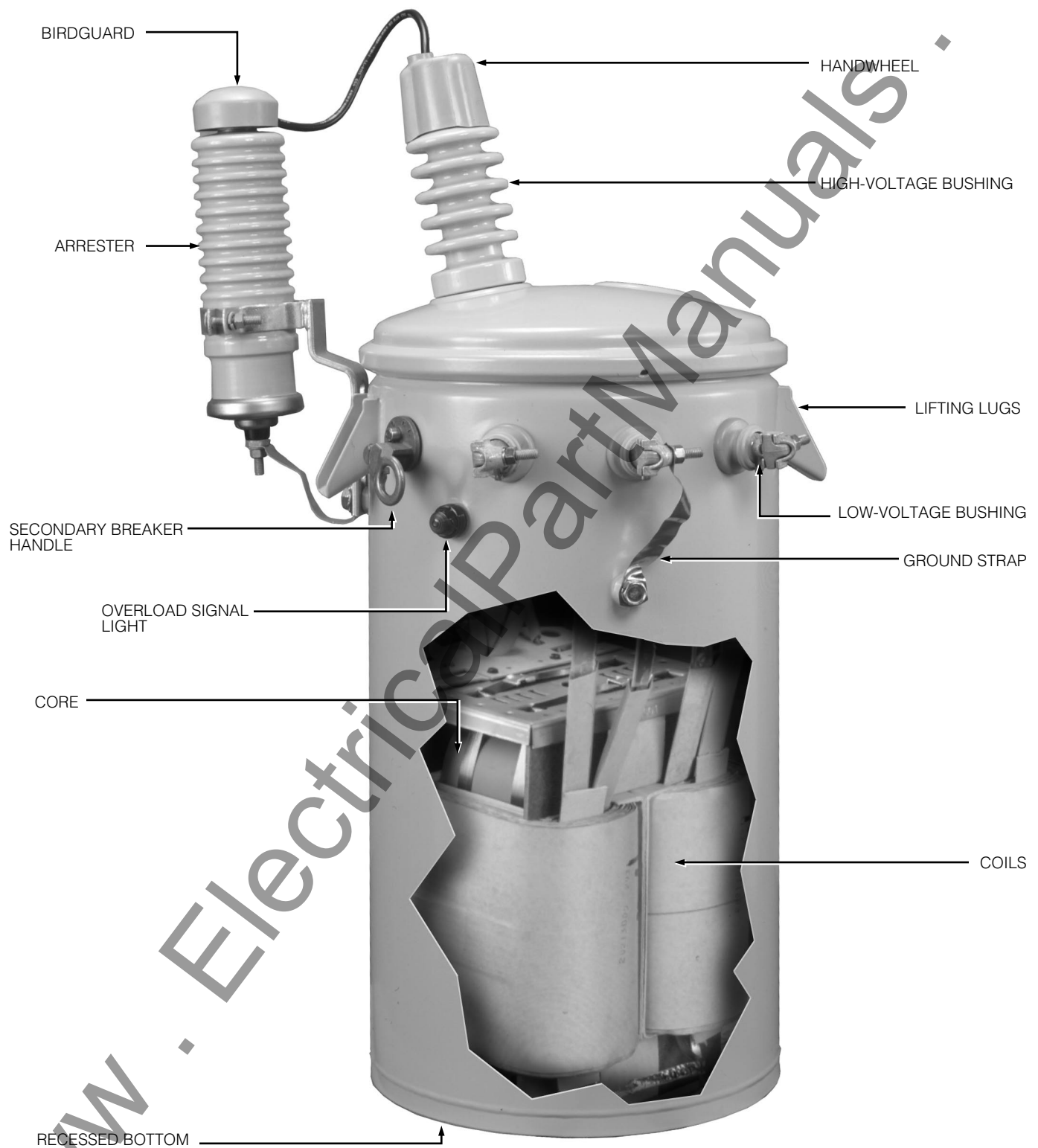


Figure 4.
Single-phase overhead transformer.

STANDARD FEATURES

- Meet or exceeds ANSI and NEMA standards
- EPRI recommended interlaced core-type design (5-50 kVA)
- Tank coating exceeds ANSI C57.12.31
- Cover with a minimum dielectric strength of 8 kV
- Tin-plated high- and low-voltage bushing terminals to accommodate aluminum or copper conductors
- Laser-engraved nameplate
- Wet process porcelain high-voltage bushings resistant to high-voltage corona
- Tank grounding provisions
- Electrical grade mineral oil
- Heavy-duty lifting lugs and hanger brackets per ANSI requirements¹
- Visible cover ground on units with cover-mounted bushings
- Recessed tank bottom that offers protection when sliding over rough surfaces
- Automatic pressure relief device
- Polymer low-voltage bushings (5-50 kVA)
- Arrester mounting and grounding provisions²
- Internal mark indicates the proper oil level
- Secondary leads are stamped to ensure proper identification
- Corrosion-resistant cover band
- Quality System ISO 9001 certified

OPTIONAL ACCESSORIES

- Taps either two 2.5 % above and below; four 2.5% below; NEMA taps or special taps
- Multiple voltage primaries
- Externally-operable, tap changer switches for safe operation
- Externally-operable, multiple voltage switches for safe operation (except auto)
- High corrosion area protection with extra creep bushings, stainless steel hardware and tanks
- Handwheel and birdguards
- R-Temp[®] fluid where less-flammable liquid is required
- Envirotemp[®] FR3[™] fluid where less-flammable fluid is required and where superior environmental characteristics are desired
- Cover with a minimum dielectric strength of 15 kV
- Cover mounted high-voltage bushings for ≤ 75 kV BIL primary
- Porcelain low-voltage bushings
- (RUS) Rural Utilities Service design
- CSA/CEA design
- Special designs to meet international specifications are also available
- Drain/sampling valve
- Pressure vacuum gauge (tank size limitations apply)
- Filter press connections
- Base bars for platform mounting
- Temperature gauge (tank size limitations apply)
- Liquid level gauge (tank size limitations apply)

OPTIONAL ACCESSORIES (STEP-DOWN)

- Dual primary or secondary voltages thru 150 kV BIL
- Wye or delta connections

OPTIONAL ACCESSORIES (HIGH BIL)

- Wye or delta connections

PROTECTION OPTIONS (Except HIGH BIL)

- Secondary breaker with weak link for secondary fault and overload protection (5-167 kVA) (except step-down)
- Primary weak link fuse
- Current-limiting fuse for high interrupting ratings and limiting fault currents
- Low-voltage distribution class MOV arrester – internally or externally mounted (except step-down)
- Magnex[®] Interrupter (Primary Breaker) with isolation link
- Magnex Interrupter (Primary Breaker) with partial range current-limiting fuse
- Lightning arresters for primary over-voltage protection: direct connected, normal or heavy duty, metal oxide varistor (MOV) either internal (VariSTAR[®]), or external, VariSTAR or VariGAP[®], either polymer UltraSIL[™] or porcelain housing

¹ Standard for extra large kVA and High-BIL: lugs and brackets per ANSI requirements up to 4500#.

² Optional on 250-500 kVA and High-BIL.

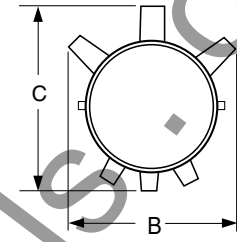
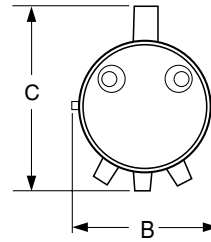
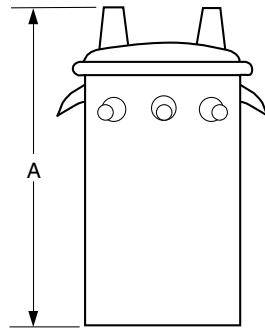
SINGLE-PHASE OVERHEAD CONVENTIONAL

Product Scope:

kVA: 5-500

Primary Voltage: 2400-19,920 V

Secondary Voltage: 120-600 V



≥95 kV BIL and all 250-500 kVA

≤75 kV BIL

TABLE 1
Typical Dimensions and Weights³

kVA	Dimensions (in.)							Approx. Weight (lbs.)
	“A”				“B”		“C”	
	≤75 kV BIL	95 kV BIL	125 kV BIL	150 kV BIL	≤75 kV BIL	≥95 kV BIL		
5	26	32	42	45	28 ¹	17	20	220
10	26	32	42	45	28 ¹	17	20	220
15	30	35	46	49	28 ¹	17	20	280
25	31	38	48	51	30 ¹	20	22	350
37.5	33	40	52	55	31 ¹	20	24	450
50	36	44	52	55	33 ¹	22	25	600
75	39	51	54	57	33 ¹	24	28	820
100	40	55	58	61	33 ¹	27	31	1100
167	47	55	58	61	35 ¹	35	37	1400
250	54	60	65	68	55 ²	55 ²	39	2000
333	56	60	67	70	60 ²	60 ²	41	2500
500	58	62	69	72	63 ²	63 ²	44	3200

¹ Includes sidewall mount H.V. bushings.

² Includes radiators.

³ Weights, gallons of fluid and dimensions are for reference only, and not for construction. Please contact Cooper Power Systems for exact dimensions.

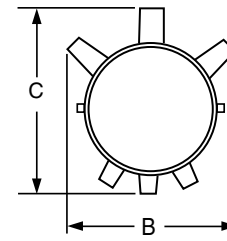
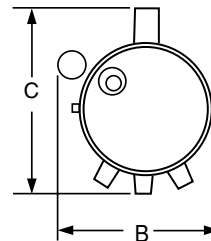
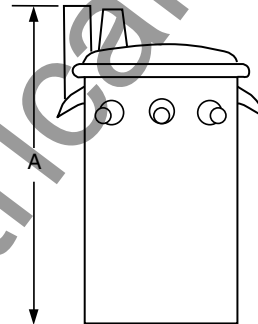
SINGLE-PHASE OVERHEAD COMPLETELY SELF PROTECTED (CSP)

Product Scope:

kVA: 5-167

Primary Voltage: 2400-19,920 V

Secondary Voltage: 120-480 V



≥95 kV BIL

≤75 kV BIL

TABLE 2
Typical Dimensions and Weights²

kVA	Dimensions (in.)							Approx. Weight (lbs.)
	“A”				“B”		“C”	
	≤75 kV BIL	95 kV BIL	125 kV BIL	150 kV BIL	≤75 kV BIL	≥95 kV BIL		
5	26	36	42	45	28 ¹	17	20	240
10	26	36	42	45	28 ¹	17	20	240
15	30	42	46	49	28 ¹	17	20	300
25	31	44	48	51	30 ¹	20	22	400
37.5	33	46	52	55	31 ¹	20	25	500
50	36	46	52	55	33 ¹	22	26	600
75	39	51	54	57	33 ¹	24	30	900
100	40	55	58	61	33 ¹	27	34	1100
167	47	55	58	61	35 ¹	35	40	1600

¹ Includes sidewall mount H.V. bushings.

² Weights, gallons of fluid and dimensions are for reference only, and not for construction. Please contact Cooper Power Systems for exact dimensions.

SINGLE-PHASE OVERHEAD STEP-DOWN & AUTO

Product Scope:

kVA: 25-500 (autotransformers
available 167-5000 kVA)

Primary Voltage: 4160-46,000 V
(60-250 kV BIL)

Secondary Voltage: 2400-14,400 V
(60-125 kV BIL)

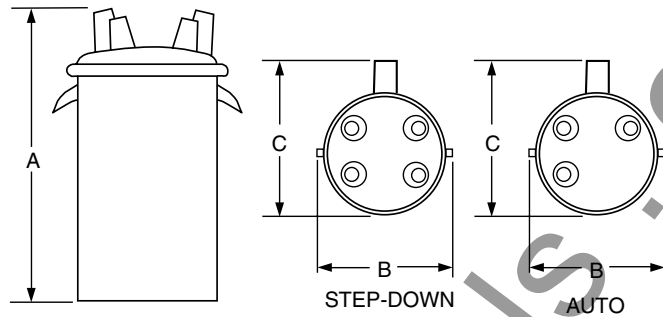


TABLE 3
Typical Dimensions and Weights - Two Winding Step-Down^{2,3}

kVA	Dimensions (in.)			Approx. Weight (lbs.)
	"A"	"B"	"C"	
25	44	28	27	525
37.5	52	28	27	650
50	57	28	27	750
75	59	31	27	880
100	59	33	27	1000
167	68	41	34	1850
250	68	50 ¹	34	2325
333	73	50 ¹	36	2950
500	77	65 ¹	36	3650

¹ Includes radiators.

² Autotransformers are up to 40% smaller.

³ Weights, gallons of fluid and dimensions are for reference only, and not for construction. Please contact Cooper Power Systems for exact dimensions.

SINGLE-PHASE OVERHEAD HIGH BIL

Product Scope:

kVA: 5-500

Primary Voltage: 22,000-46,000 V

Secondary Voltage: 120-600 V

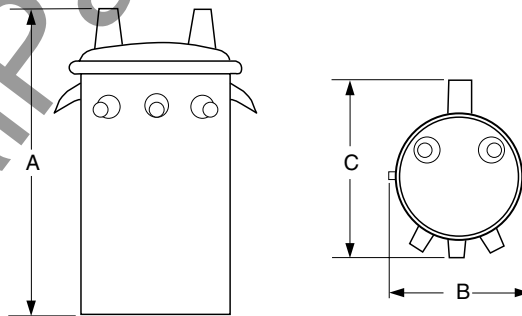


TABLE 4
Typical Dimensions and Weights²

kVA	Dimensions (in.)					Approx. Weight (lbs.)	
	“A”		“B”	“C”			
	200 kV BIL	250 kV BIL	200-250 kV BIL	200 kV BIL	250 kV BIL	200 kV BIL	250 kV BIL
5	46	67	24	30	36	830	1100
10	46	67	24	30	36	830	1100
15	46	67	24	30	36	830	1100
25	46	67	24	30	36	830	1100
37.5	60	67	27	33	36	975	1150
50	60	67	27	33	36	1060	1410
75	64	71	30	35	38	1375	1630
100	64	71	40	35	38	1655	1971
167	64	77	47	39	40	2000	2430
250	68	80	55 ¹	41	44	2500	2860
333	76	80	60 ¹	41	44	3100	3570
500	76	84	63 ¹	44	44	4000	4400

¹ Includes radiators.

² Weights, gallons of fluid and dimensions are for reference only, and not for construction. Please contact Cooper Power Systems for exact dimensions.

QUALITY CONTROL

Single-phase overhead-type transformers manufactured by Cooper Power Systems provide outstanding performance.

All Cooper transformers pass tests as prescribed by ANSI, prior to shipment. Cores and coils are designed for high reliability and low field failure rates. The domed cover design in conjunction with the formed cover band provides increased pressure withstand capability, eliminates bushing overhang and improves cover retention. The high-voltage bushing design improves gasket protection and seal. The low-voltage polymer bushing virtually eliminates ultraviolet deterioration with its captured gasket, compression-limiting design.

These transformers are designed and manufactured to be corrosion-resistant. Special attention is given to all welded external parts, to avoid potential corrosion problems caused by moisture entrapment. The recessed bottom design, as well as the stainless steel cover band ends, provide corrosion protection in these areas, which are more susceptible to coating damage during handling. All coating systems exceed ANSI C57.12.31.

The Quality System at Cooper Power Systems Transformer Products is ISO 9001 certified.

FLUID OPTIONS

Transformers can be filled with standard electrical grade mineral insulating oil, R-Temp fluid, Envirotemp FR3 fluid or other dielectric coolants manufactured by Cooper Power Systems.

For fire-sensitive locations, the transformer can be filled with R-Temp fire-resistant natural hydrocarbon fluid or Envirotemp FR3 fluid, a fire resistant natural ester-based fluid. Envirotemp FR3 fluid offers the benefit of a seed oil-based dielectric coolant with food grade additives, in addition to increased fire safety over conventional mineral oil. Check with Cooper Power Systems for the availability of other dielectric coolants in single-phase overhead transformers.


COOPER Power Systems

