

Premium 30 Energy Efficient, Low Voltage Transformers

General Purpose, Harmonic Mitigating, and K-Rated

Catalog
7400CT1001R07/14
2014
Class 7400



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Premium 30 Energy Efficient Transformers

Introduction

Introduction

The Premium 30 family of Low Voltage Transformers from Schneider Electric yields 30% fewer losses than the NEMA TP 1 efficiencies mandated by the 2005 Energy Act (Public Law 109-58). All Premium 30 products are part of the NEMA Premium Efficiency Transformers Program. For more information on the program, please see the following web page:

<http://www.nema.org/prod/pwr/trans/transformersProgram.cfm>

The following table shows the target efficiency levels and reduced losses of three-phase NEMA Premium transformers at 35% loading and 75 °C.

Efficiency Levels and Losses of Low-Voltage, Dry-Type, Distribution Transformers

kVA	NEMA Premium Efficiency	Losses 35% Loading @ 75 °C		
		NEMA TP 1	NEMA Premium	Reduction
15	97.90%	162.37	112.61	30.6%
30	98.25%	269.23	187.02	30.5%
45	98.39%	370.78	257.72	30.5%
75	98.60%	535.71	372.72	30.4%
112.5	98.74%	721.74	502.46	30.4%
150	98.81%	907.93	632.27	30.4%
225	98.95%	1199.24	835.65	30.3%
300	99.02%	1490.87	1039.18	30.3%
500	99.09%	2304.96	1607.12	30.3%
750	99.16%	3188.26	2223.68	30.3%
1000	99.23%	3892.82	2715.91	30.2%

Various studies have shown that the average loading of low voltage transformers is below the industry reference loading point of 35%. Some examples are shown in the table below.

Loading Examples

Application	Average Loading
Survey of low voltage transformers in commercial and industrial applications	16% +/-3%
Spot daily measurements of 89 low voltage transformers in the U.S. Department of Energy's Forrestal Building	29% ¹
One 75 kVA transformer in a manufacturing plant in North Carolina	19%

¹ During occupied hours.

Since many transformers are loaded below 30%, the Premium 30 product family is designed to maximize your energy savings by setting upper limits on the core losses for each kVA size.

Typical Data for the Square D™ brand Premium 30 Product Family

kVA	No Load (Core Loss, in Watts)	Full Load (Coil Loss, in Watts)	Efficiency		Typical Losses @ 35% 75 °C (in Watts)
			@ 35% 75 °C	@ 16.6% 75 °C	
15	54	545	97.90%	97.38%	112.30
30	87	921	98.25%	97.86%	185.52
45	121	1266	98.39%	98.02%	256.42
75	165	1850	98.60%	98.35%	362.89
112.5	230	2527	98.74%	98.47%	500.31
150	290	2675	98.81%	98.60%	576.14
225	435	3077	98.95%	98.66%	764.14
300	560	4207	99.02%	98.69%	1010.01

Premium 30 Energy Efficient Transformers

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All Distribution Transformers are tested per NEMA ST 20, NEMA TP 2, and 10 C.F.R. Part 431 ("Test Procedures for Distribution Transformers") requirements in a laboratory that participates in Underwriters Laboratories Client Data Test Program (UL File DA643). Routine test reports, including core losses and coil losses, are available for all units shipped. Other testing options are available at the time of order.

The Premium 30 product offering includes:

General Purpose Transformers

- Three-phase, 15–1000 kVA
- Aluminum or Copper windings
- 220 °C insulation system
- 115 °C temperature rise (80° and 150°C temperature rise is optional)
- Available primary voltages
Three-phase: 208 Delta, 240 Delta, 480 Delta, 600 Delta
- Available secondary voltages
Three-phase: 208Y/120, 480Y/277, 240 Delta
- Sound level: NEMA standard

Harmonic Mitigating Transformers

- 0° and 30° Phase Shift
- Three-phase, 15–750 kVA
- Aluminum or Copper windings
- 220 °C insulation system
- 130 °C temperature rise
- 0° and 30° phase shift
- Available primary voltages
Three-phase: 208 Delta, 240 Delta, 480 Delta, 600 Delta
- Available secondary voltages
Three-phase: 208/120 Zig Zag
- Sound level: 3 dB below NEMA standard

K-Rated (Non-Linear) Transformers

- K-9 and K-13 options
- Three-phase, 15–750 kVA
- Aluminum or Copper windings
- 220 °C insulation system
- K-9 Rated
115 °C temperature rise
- Available primary voltages
Three-phase: 208 Delta, 240 Delta, 480 Delta, 600 Delta
- Available secondary voltages
Three-phase: 208Y/120, 480Y/277
- Electrostatic shielding between primary and secondary
- Sound level: 3 dB below NEMA standard

Premium 30 Energy Efficient Transformers Product Selection

Product Selection

General Purpose Transformers

480 V Delta Primary to 208Y/120 Secondary—Aluminum Windings; 150 °C Rise

kVA	Catalog Number	Enclosure ¹ (see pages 6–17)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
					Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	EP15T3H	17D	See page 22	240	18.0	25	45	41.7	60
30	EP30T3H	17D		305	36.1	45	90	83.4	110
45	EP45T3H	18H		405	54.2	70	125	125.1	175
75	EP75T3H	20D		610	90.3	125	225	208.4	275
112.5	EP112T3H	21D		810	135.5	175	300	312.6	400
150	EP150T3H	22D		1060	180.6	225	450	416.9	500
225	EP225T3H	24D		1385	271.0	350	600	625.3	800
300	EP300T3H	25D		1790	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 75 kVA three-phase and 75 kVA single-phase can be mounted directly on wall via mounting brackets.

480 V Delta Primary to 208Y/120 Secondary—Copper Windings; 150 °C Rise

kVA	Catalog Number	Enclosure ¹ (see pages 6–17)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
					Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	EP15T3HCU	17D	See page 22	265	18.0	25	45	41.7	60
30	EP30T3HCU	17D		350	36.1	45	90	83.4	110
45	EP45T3HCU	18H		450	54.2	70	125	125.1	175
75	EP75T3HCU	20D		680	90.3	125	225	208.4	275
112.5	EP112T3HCU	21D		870	135.5	175	300	312.6	400
150	EP150T3HCU	22D		1175	180.6	225	450	416.9	500
225	EP225T3HCU	24D		1615	271.0	350	600	625.3	800
300	EP300T3HCU	25D		2045	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 75 kVA three-phase and 75 kVA single-phase can be mounted directly on wall via mounting brackets.

480 V Delta Primary to 208Y/120 Secondary—Aluminum Windings; 115 °C Rise

kVA	Catalog Number	Enclosure ¹ (see pages 6–17)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
					Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	EP15T3HF	17D	See page 22	245	18.0	25	45	41.7	60
30	EP30T3HF	17D		305	36.1	45	90	83.4	110
45	EP45T3HF	18H		410	54.2	70	125	125.1	175
75	EP75T3HF	20D		615	90.3	125	225	208.4	275
112.5	EP112T3HF	21D		810	135.5	175	300	312.6	400
150	EP150T3HF	22D		1060	180.6	225	450	416.9	500
225	EP225T3HF	24D		1425	271.0	350	600	625.3	800
300	EP300T3HF	25D		1810	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 75 kVA three-phase and 75 kVA single-phase can be mounted directly on wall via mounting brackets.

Premium 30 Energy Efficient Transformers

Product Selection

480 V Delta Primary to 208Y/120 Secondary—Copper Windings; 115 °C Rise

kVA	Catalog Number	Enclosure ¹ (see pages 6–17)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
					Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	EP15T3HFCU	17D	See page 22	270	18.0	25	45	41.7	60
30	EP30T3HFCU	17D		350	36.1	45	90	83.4	110
45	EP45T3HFCU	18H		450	54.2	70	125	125.1	175
75	EP75T3HFCU	20D		660	90.3	125	225	208.4	275
112.5	EP112T3HFCU	21D		915	135.5	175	300	312.6	400
150	EP150T3HFCU	22D		1175	180.6	225	450	416.9	500
225	EP225T3HFCU	24D		1630	271.0	350	600	625.3	800
300	EP300T3HFCU	25D		2065	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 75 kVA three-phase and 75 kVA single-phase can be mounted directly on wall via mounting brackets.

Premium 30 Energy Efficient Transformers Product Selection

Harmonic Mitigating Transformers

480 V Delta Primary to 208Y/120 Secondary—Copper Windings; 130 °C Rise

kVA	Phase Shift	Catalog Number	Enclosure ¹ (see pages 6–17)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
						Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	0°	HM15T208HNCUEP	17D	see page 22	275	18.0	25	45	41.7	60
30		HM30T208HNCUEP	17D		370	36.1	45	90	83.4	110
45		HM45T208HNCUEP	18H		455	54.2	70	125	125.1	175
75		HM75T208HNCUEP	20D		720	90.3	125	225	208.4	275
112.5		HM112T208HNCUEP	21D		940	135.5	175	300	312.6	400
150		HM150T208HNCUEP	22D		1215	180.6	225	450	416.9	500
225		HM225T208HNCUEP	24D		1645	271.0	350	600	625.3	800
300		HM300T208HNCUEP	25D		2100	361.3	450	900	833.7	1000
15	+30°	HM15T255HNCUEP	17D	see page 23	270	18.0	25	45	41.7	60
30		HM30T255HNCUEP	17D		370	36.1	45	90	83.4	110
45		HM45T255HNCUEP	18H		470	54.2	70	125	125.1	175
75		HM75T255HNCUEP	20D		720	90.3	125	225	208.4	275
112.5		HM112T255HNCUEP	21D		935	135.5	175	300	312.6	400
150		HM150T255HNCUEP	22D		1220	180.6	225	450	416.9	500
225		HM225T255HNCUEP	24D		1640	271.0	350	600	625.3	800
300		HM300T255HNCUEP	25D		2090	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 75 kVA three-phase and 75 kVA single-phase can be mounted directly on wall via mounting brackets.

480 V Delta Primary to 208Y/120 Secondary—Copper Windings; 115 °C Rise

kVA	Phase Shift	Catalog Number	Enclosure ¹ (see pages 6–17)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
						Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	0°	HM15T208HFCUEP	17D	See page 22	275	18.0	25	45	41.7	60
30		HM30T208HFCUEP	17D		370	36.1	45	90	83.4	110
45		HM45T208HFCUEP	18H		470	54.2	70	125	125.1	175
75		HM75T208HFCUEP	20D		720	90.3	125	225	208.4	275
112.5		HM112T208HFCUEP	21D		940	135.5	175	300	312.6	400
150		HM150T208HFCUEP	22D		1215	180.6	225	450	416.9	500
225		HM225T208HFCUEP	24D		1645	271.0	350	600	625.3	800
300		HM300T208HFCUEP	25D		2100	361.3	450	900	833.7	1000
15	+30°	HM15T255HFCUEP	17D	See page 23	270	18.0	25	45	41.7	60
30		HM30T255HFCUEP	17D		370	36.1	45	90	83.4	110
45		HM45T255HFCUEP	18H		470	54.2	70	125	125.1	175
75		HM75T255HFCUEP	20D		720	90.3	125	225	208.4	275
112.5		HM112T255HFCUEP	21D		935	135.5	175	300	312.6	400
150		HM150T255HFCUEP	22D		1220	180.6	225	450	416.9	500
225		HM225T255HFCUEP	24D		1640	271.0	350	600	625.3	800
300		HM300T255HFCUEP	25D		2090	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 75 kVA three-phase and 75 kVA single-phase can be mounted directly on wall via mounting brackets.

Premium 30 Energy Efficient Transformers

Product Selection

480 V Delta Primary to 208Y/120 Secondary—Aluminum Windings; 150 °C Rise

kVA	Phase Shift	Catalog Number	Enclosure ¹ (see pages 6–17)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
						Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	0°	HM15T208HEP	17D	See page 22	245	18.0	25	45	41.7	60
30		HM30T208HEP	17D		315	36.1	45	90	83.4	110
45		HM45T208HEP	18H		420	54.2	70	125	125.1	175
75		HM75T208HEP	20D		650	90.3	125	225	208.4	275
112.5		HM112T208HEP	21D		860	135.5	175	300	312.6	400
150		HM150T208HEP	22D		1090	180.6	225	450	416.9	500
225		HM225T208HEP	24D		1425	271.0	350	600	625.3	800
300		HM300T208HEP	25D		1810	361.3	450	900	833.7	1000
15	+30°	HM15T255HEP	17D	See page 23	245	18.0	25	45	41.7	60
30		HM30T255HEP	17D		315	36.1	45	90	83.4	110
45		HM45T255HEP	18H		415	54.2	70	125	125.1	175
75		HM75T255HEP	20D		650	90.3	125	225	208.4	275
112.5		HM112T255HEP	21D		860	135.5	175	300	312.6	400
150		HM150T255HEP	22D		1090	180.6	225	450	416.9	500
225		HM225T255HEP	24D		1425	271.0	350	600	625.3	800
300		HM300T255HEP	25D		1810	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 75 kVA three-phase and 75 kVA single-phase can be mounted directly on wall via mounting brackets.

Premium 30 Energy Efficient Transformers Product Selection

K-Rated Transformers

480 V Delta Primary to 208Y/120 Secondary—K-9 Rated—Aluminum Windings; 115 °C Rise

kVA	Catalog Number	Enclosure ¹ (see pages 6–17)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
					Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	EP15T3HFISNP	17D	See page 22	240	18.0	25	45	41.7	60
30	EP30T3HFISNP	17D		305	36.1	45	90	83.4	110
45	EP45T3HFISNP	18H		410	54.2	70	125	125.1	175
75	EP75T3HFISNP	20D		615	90.3	125	225	208.4	275
112.5	EP112T3HFISNP	21D		810	135.5	175	300	312.6	400
150	EP150T3HFISNP	22D		1060	180.6	225	450	416.9	500
225	EP225T3HFISNP	24D		1425	271.0	350	600	625.3	800
300	EP300T3HFISNP	25D		1810	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 75 kVA three-phase and 75 kVA single-phase can be mounted directly on wall via mounting brackets.

480 V Delta Primary to 208Y/120 Secondary—K-9 Rated—Copper Windings; 115 °C Rise

kVA	Catalog Number	Enclosure ¹ (see pages 10–21)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
					Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	EP15T3HFISCUNP	17D	see page 22	270	18.0	25	45	41.7	60
30	EP30T3HFISCUNP	17D		350	36.1	45	90	83.4	110
45	EP45T3HFISCUNP	18H		450	54.2	70	125	125.1	175
75	EP75T3HFISCUNP	20D		660	90.3	125	225	208.4	275
112.5	EP112T3HFISCUNP	21D		915	135.5	175	300	312.6	400
150	EP150T3HFISCUNP	22D		1175	180.6	225	450	416.9	500
225	EP225T3HFISCUNP	24D		1630	271.0	350	600	625.3	800
300	EP300T3HFISCUNP	25D		2065	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 45 kVA three-phase and 45 kVA single-phase can be mounted directly on wall via mounting brackets.

480 V Delta Primary to 208Y/120 Secondary—K-9 Rated—Copper Windings; 130 °C Rise

kVA	Catalog Number	Enclosure ¹ (see pages 10–21)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
					Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	EP15T3HNNISCUNP	17D	see page 22	265	18.0	25	45	41.7	60
30	EP30T3HNNISCUNP	17D		350	36.1	45	90	83.4	110
45	EP45T3HNNISCUNP	18H		450	54.2	70	125	125.1	175
75	EP75T3HNNISCUNP	20D		660	90.3	125	225	208.4	275
112.5	EP112T3HNNISCUNP	21D		870	135.5	175	300	312.6	400
150	EP150T3HNNISCUNP	22D		1175	180.6	225	450	416.9	500
225	EP225T3HNNISCUNP	24D		1595	271.0	350	600	625.3	800
300	EP300T3HNNISCUNP	25D		2045	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 45 kVA three-phase and 45 kVA single-phase can be mounted directly on wall via mounting brackets.

Premium 30 Energy Efficient Transformers

Product Selection

480 V Delta Primary to 208Y/120 Secondary—K-13 Rated—Copper Windings; 150 °C Rise

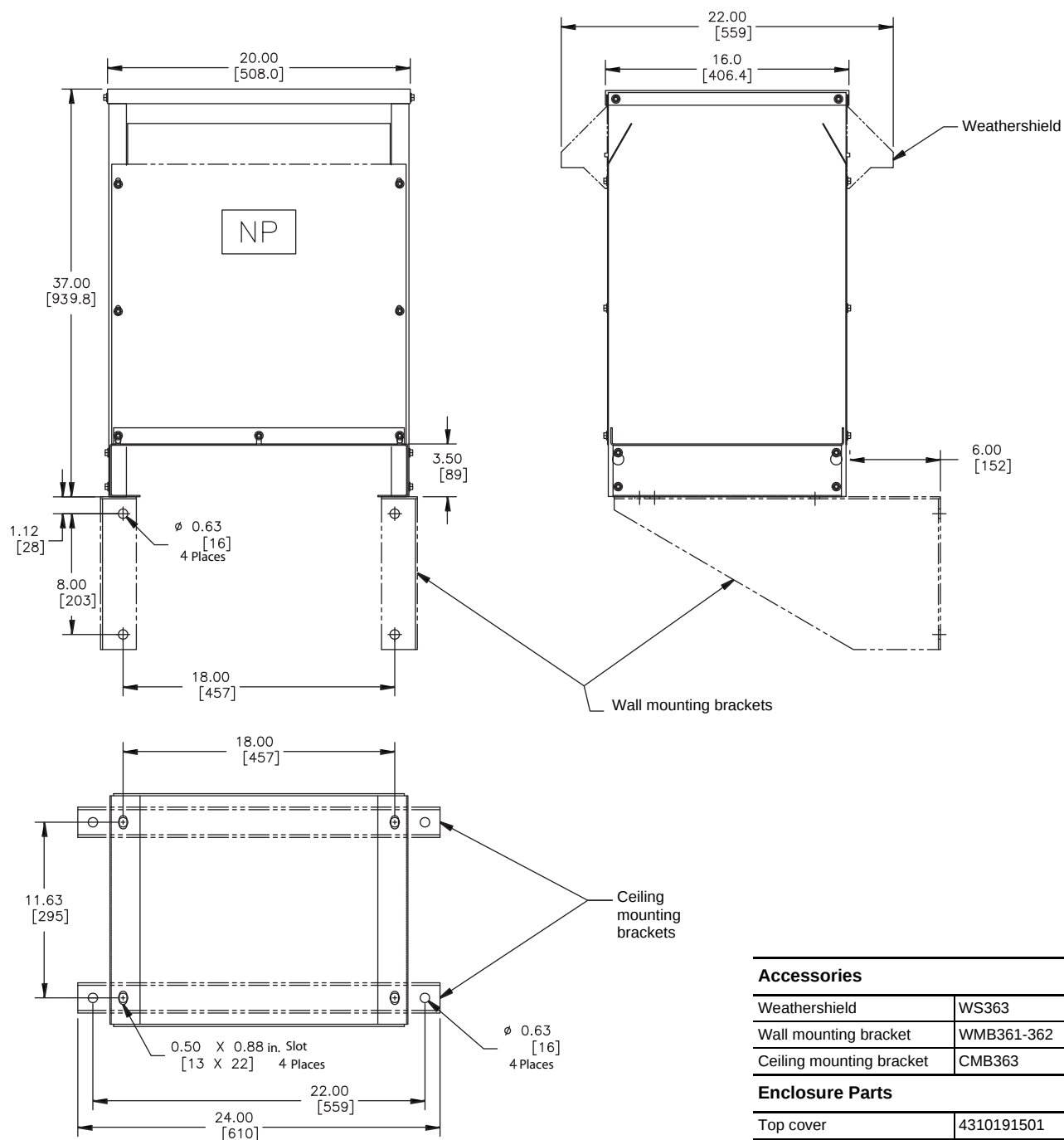
kVA	Catalog Number	Enclosure ¹ (see pages 10–21)	Wiring Diagram	Weight (lbs)	Primary Current (A)			Secondary Current (A)	
					Nameplate	NEC Max Rating 125%	NEC Max Rating 250%	Nameplate	NEC Max Rating 125%
15	EP15T3HISCUNLP	17D	see page 22	265	18.0	25	45	41.7	60
30	EP30T3HISCUNLP	17D		350	36.1	45	90	83.4	110
45	EP45T3HISCUNLP	18H		410	54.2	70	125	125.1	175
75	EP75T3HISCUNLP	20D		680	90.3	125	225	208.4	275
112.5	EP112T3HISCUNLP	21D		870	135.5	175	300	312.6	400
150	EP150T3HISCUNLP	22D		1175	180.6	225	450	416.9	500
225	EP225T3HISCUNLP	24D		1615	271.0	350	600	625.3	800
300	EP300T3HISCUNLP	25D		2045	361.3	450	900	833.7	1000

¹ NEMA Type 2 drip-proof enclosure. Weather shields are available to upgrade the enclosures to NEMA Type 3R (suitable for outdoor use). Standard transformers up through 45 kVA three-phase and 45 kVA single-phase can be mounted directly on wall via mounting brackets.

Premium 30 Energy Efficient Transformers

Technical Data

Enclosure 17H—Dry-Type Transformer



Accessories

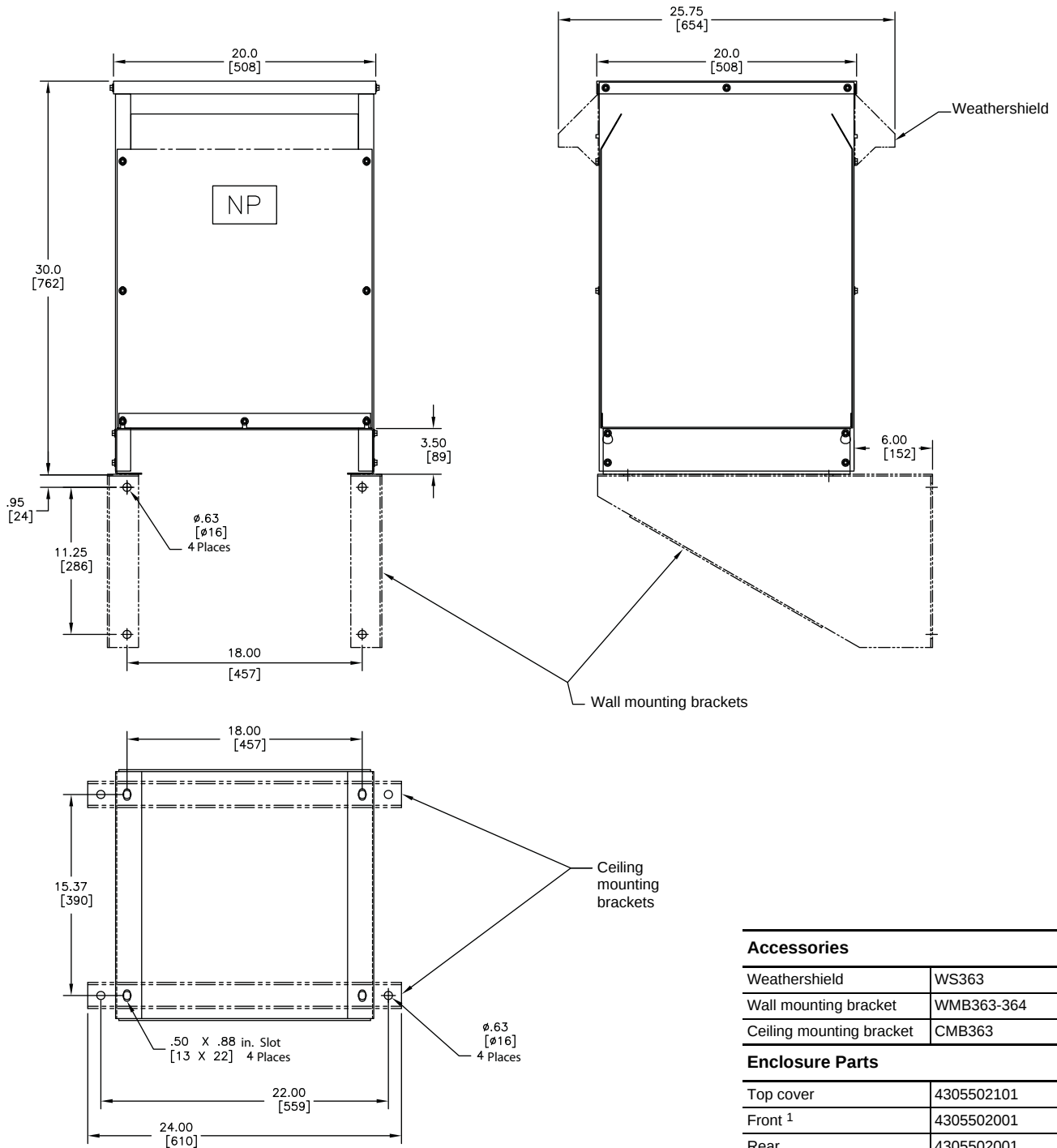
Weathershield	WS363
Wall mounting bracket	WMB361-362
Ceiling mounting bracket	CMB363

Enclosure Parts

Top cover	4310191501
Front ¹	4305502003
Rear	4305502003
Sides (ends)	4310191702
Base	4310191401

¹ When replacing a front panel, specify the transformer part number and "with nameplate and labels" on the order.

Enclosure 18D—Dry-Type Transformer



Accessories

Weathershield	WS363
Wall mounting bracket	WMB363-364
Ceiling mounting bracket	CMB363

Enclosure Parts

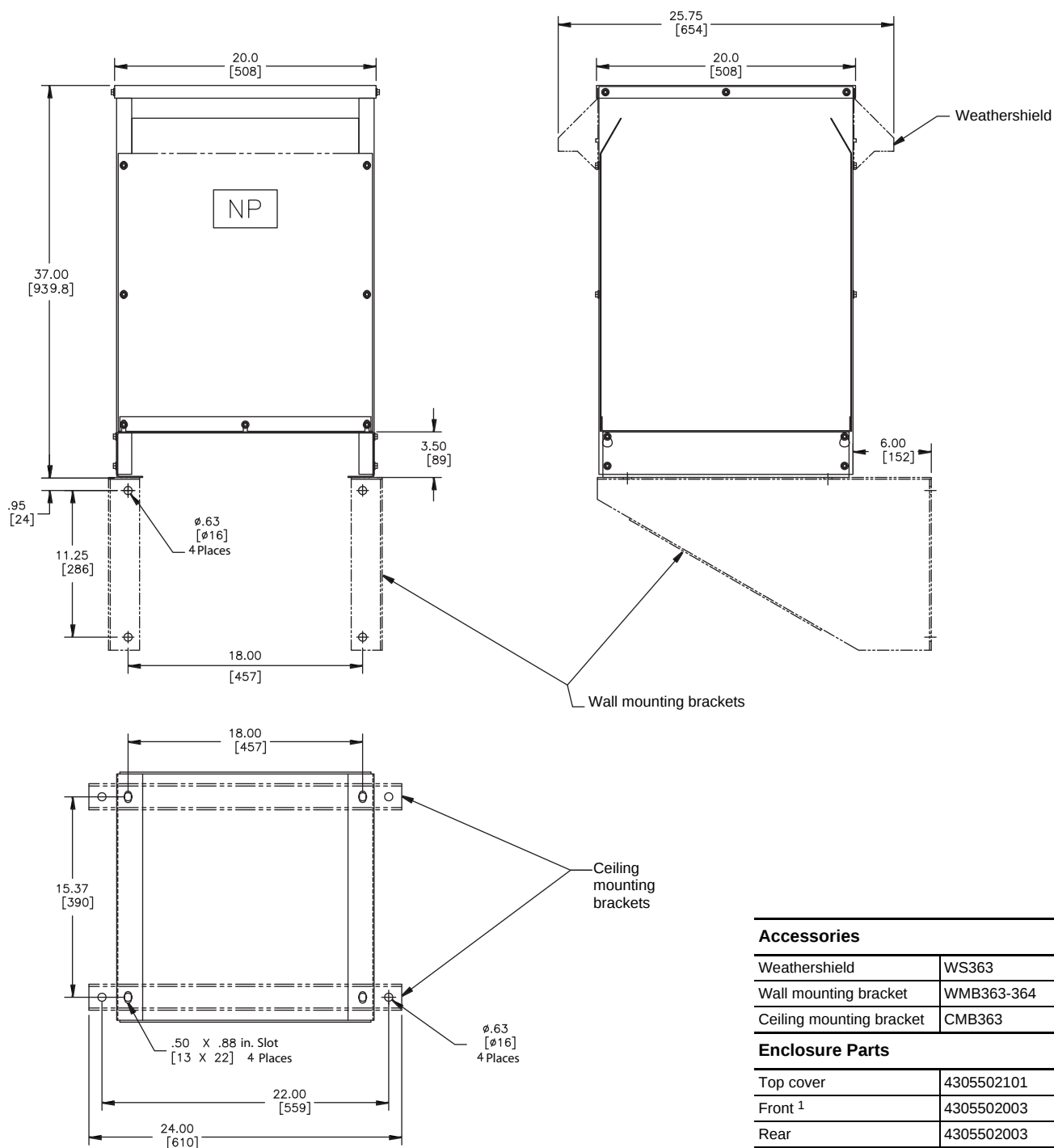
Top cover	4305502101
Front ¹	4305502001
Rear	4305502001
Sides (ends)	4305501001
Base	4305501801

¹ When replacing a front panel, specify the transformer part number and "with nameplate and labels" on the order.

Premium 30 Energy Efficient Transformers

Technical Data

Enclosure 18H—Dry-Type Transformer



Accessories

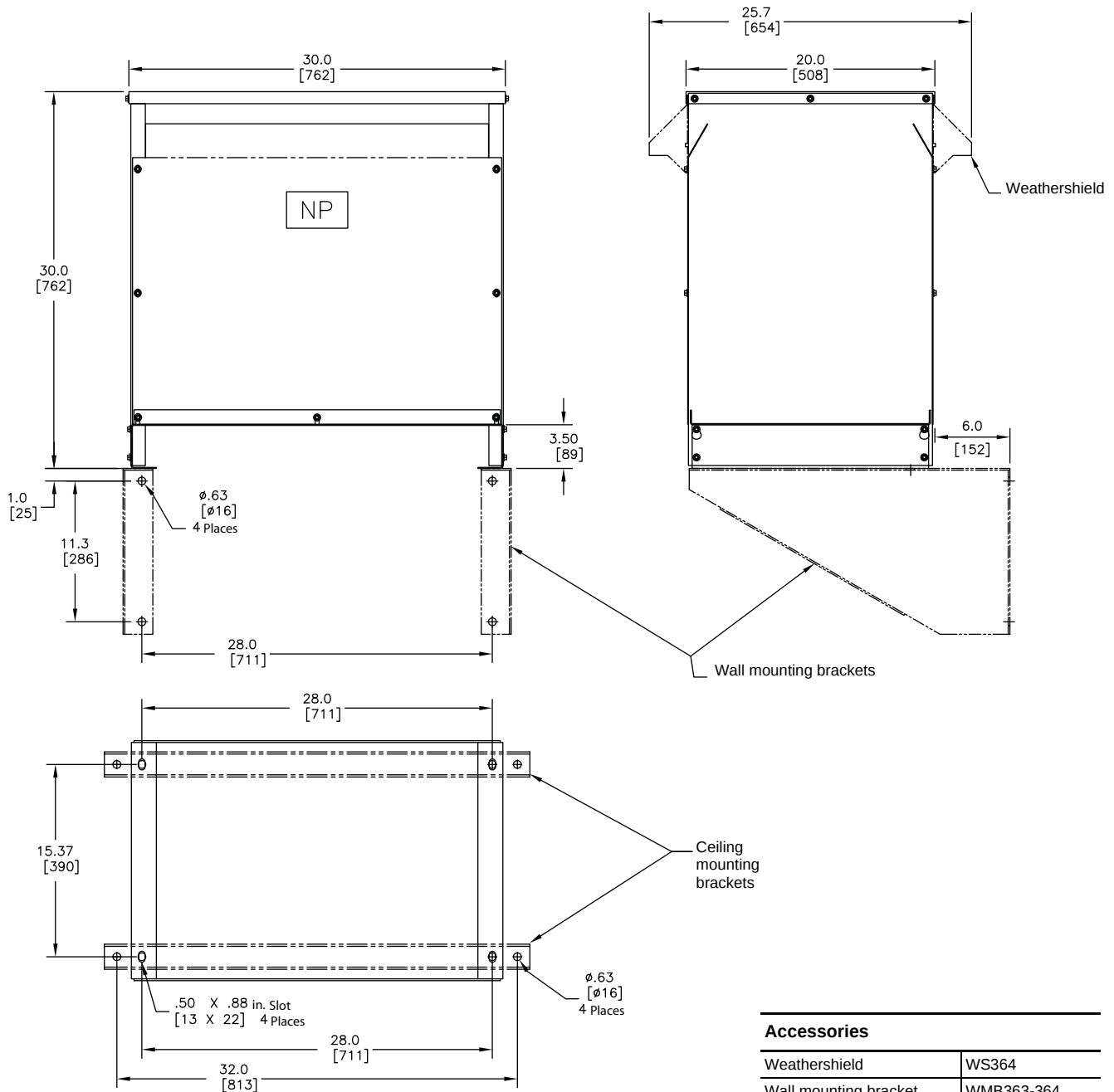
Weathershield	WS363
Wall mounting bracket	WMB363-364
Ceiling mounting bracket	CMB363

Enclosure Parts

Top cover	4305502101
Front ¹	4305502003
Rear	4305502003
Sides (ends)	4310179701
Base	4305501801

¹ When replacing a front panel, specify the transformer part number and "with nameplate and labels" on the order.

Enclosure 19D—Dry-Type Transformer



Accessories

Weathershield	WS364
Wall mounting bracket	WMB363-364
Ceiling mounting bracket	CMB364

Enclosure Parts

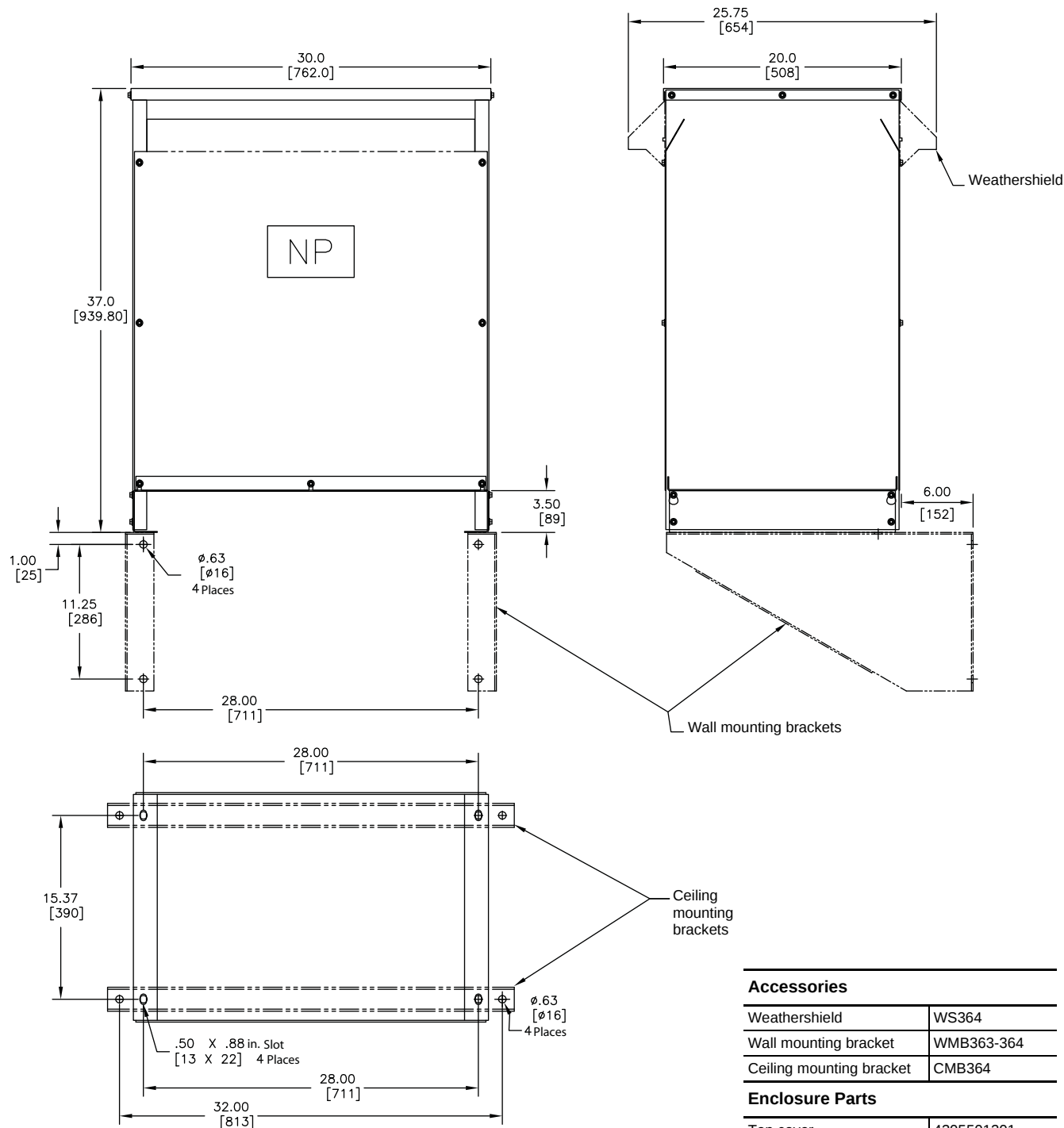
Top cover	4305501201
Front ¹	4305501101
Rear	4305501101
Sides (ends)	4305501001
Base	4305500901

¹ When replacing a front panel, specify the transformer part number and "with nameplate and labels" on the order.

Premium 30 Energy Efficient Transformers

Technical Data

Enclosure 20D—Dry-Type Transformer



Accessories

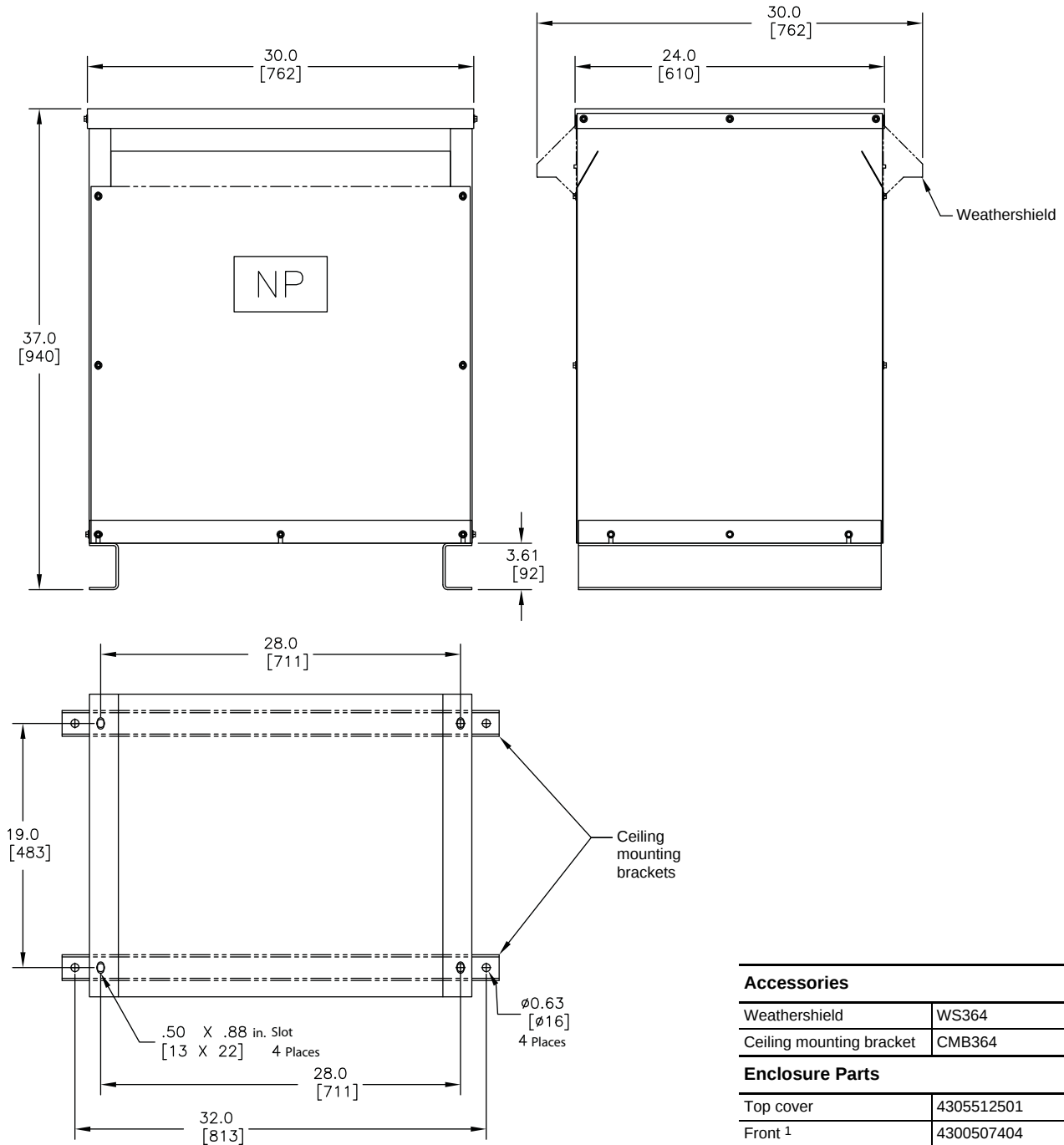
Weathershield	WS364
Wall mounting bracket	WMB363-364
Ceiling mounting bracket	CMB364

Enclosure Parts

Top cover	4305501201
Front ¹	4310192201
Rear	4310192201
Sides (ends)	4310179701
Base	4305500901

¹ When replacing a front panel, specify the transformer part number and "with nameplate and labels" on the order.

Enclosure 21D—Dry-Type Transformer



Accessories

Weathershield	WS364
Ceiling mounting bracket	CMB364

Enclosure Parts

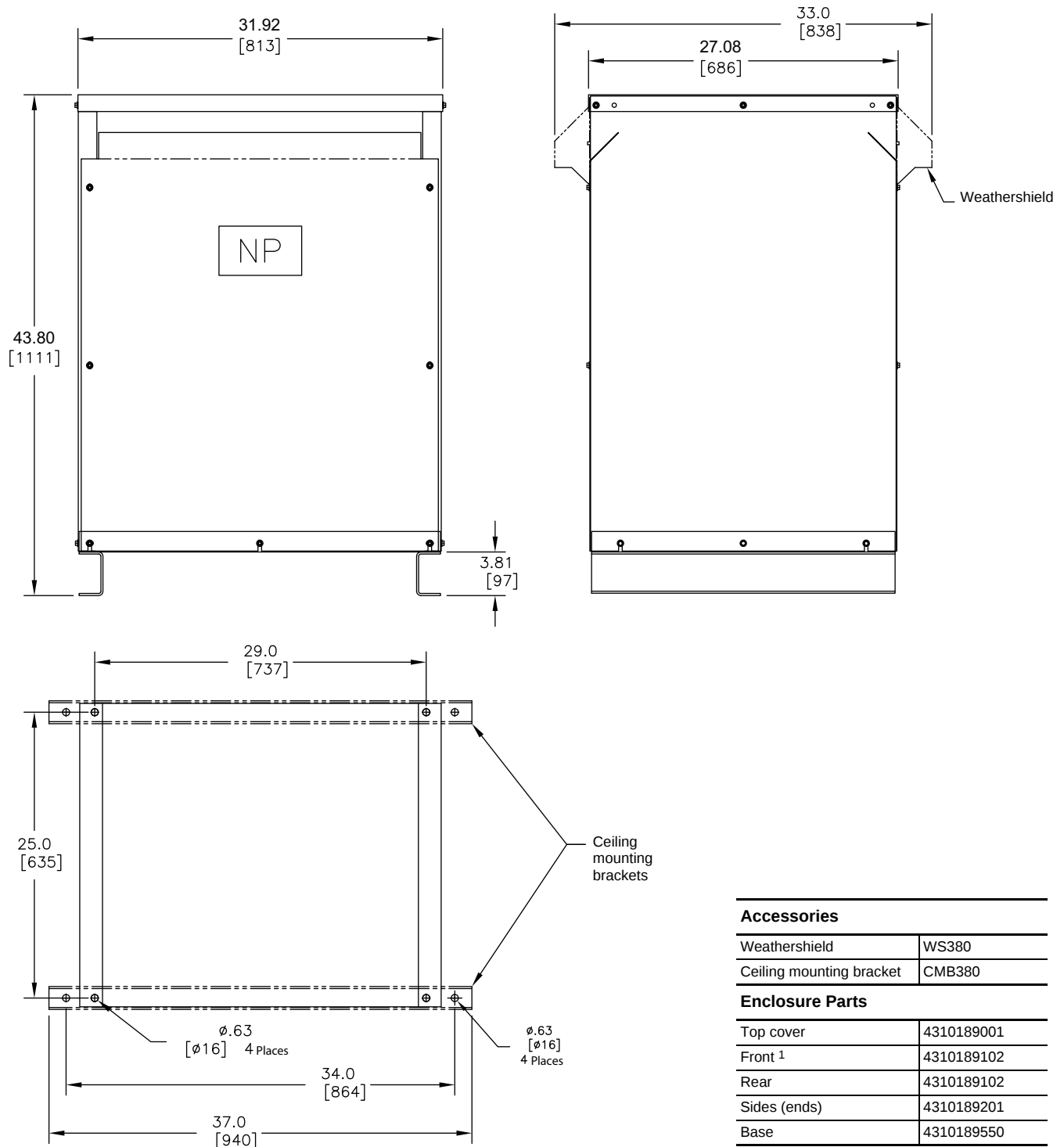
Top cover	4305512501
Front ¹	4300507404
Rear	4300507404
Sides (ends)	4305512601
Base	4305512450

¹ When replacing a front panel, specify the transformer part number and "with nameplate and labels" on the order.

Premium 30 Energy Efficient Transformers

Technical Data

Enclosure 22D—Dry-Type Transformer



Accessories

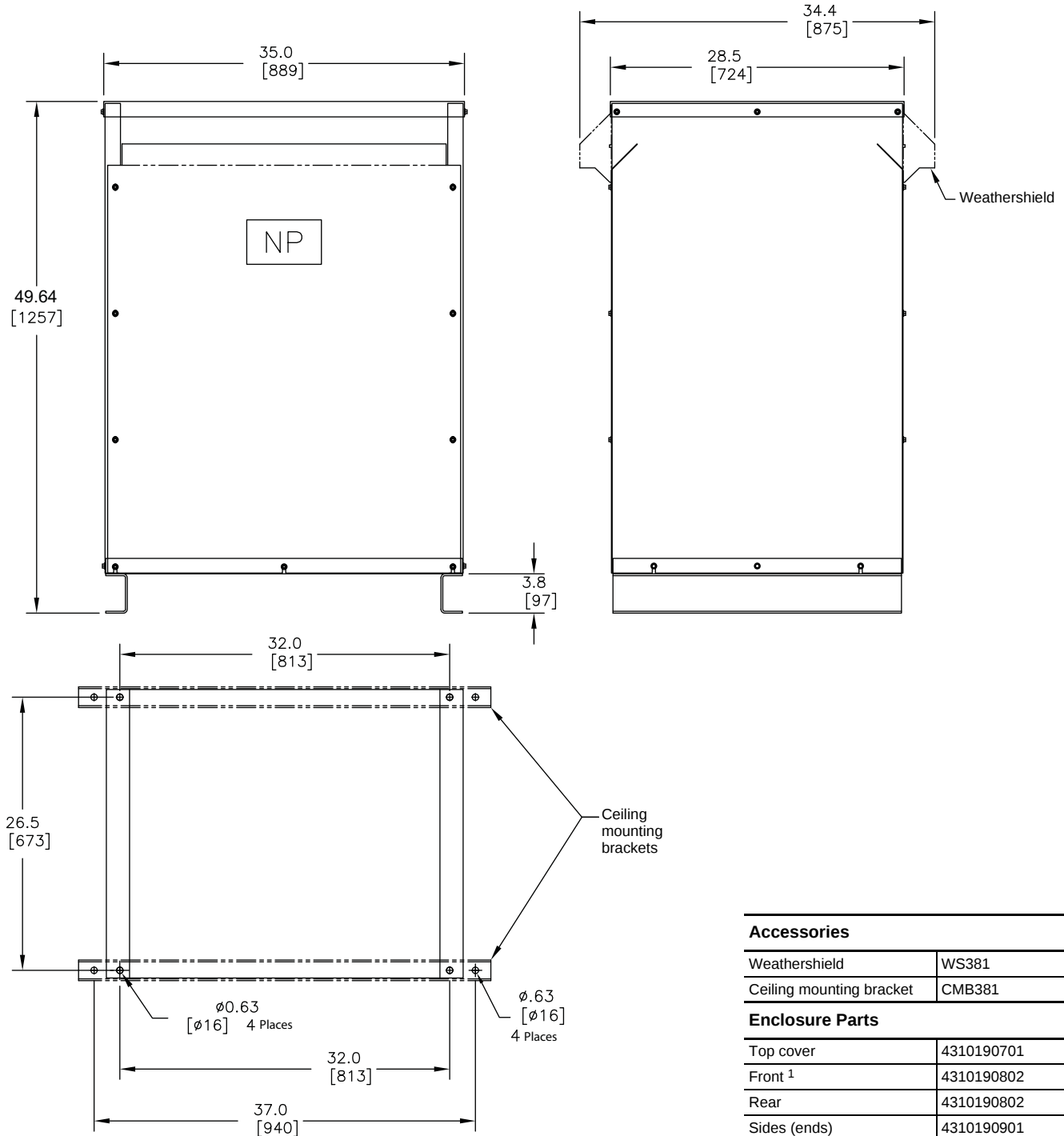
Weathershield	WS380
Ceiling mounting bracket	CMB380

Enclosure Parts

Top cover	4310189001
Front ¹	4310189102
Rear	4310189102
Sides (ends)	4310189201
Base	4310189550

¹ When replacing a front panel, specify the transformer part number and "with nameplate and labels" on the order.

Enclosure 24D—Dry-Type Transformer



Accessories

Weathershield	WS381
Ceiling mounting bracket	CMB381

Enclosure Parts

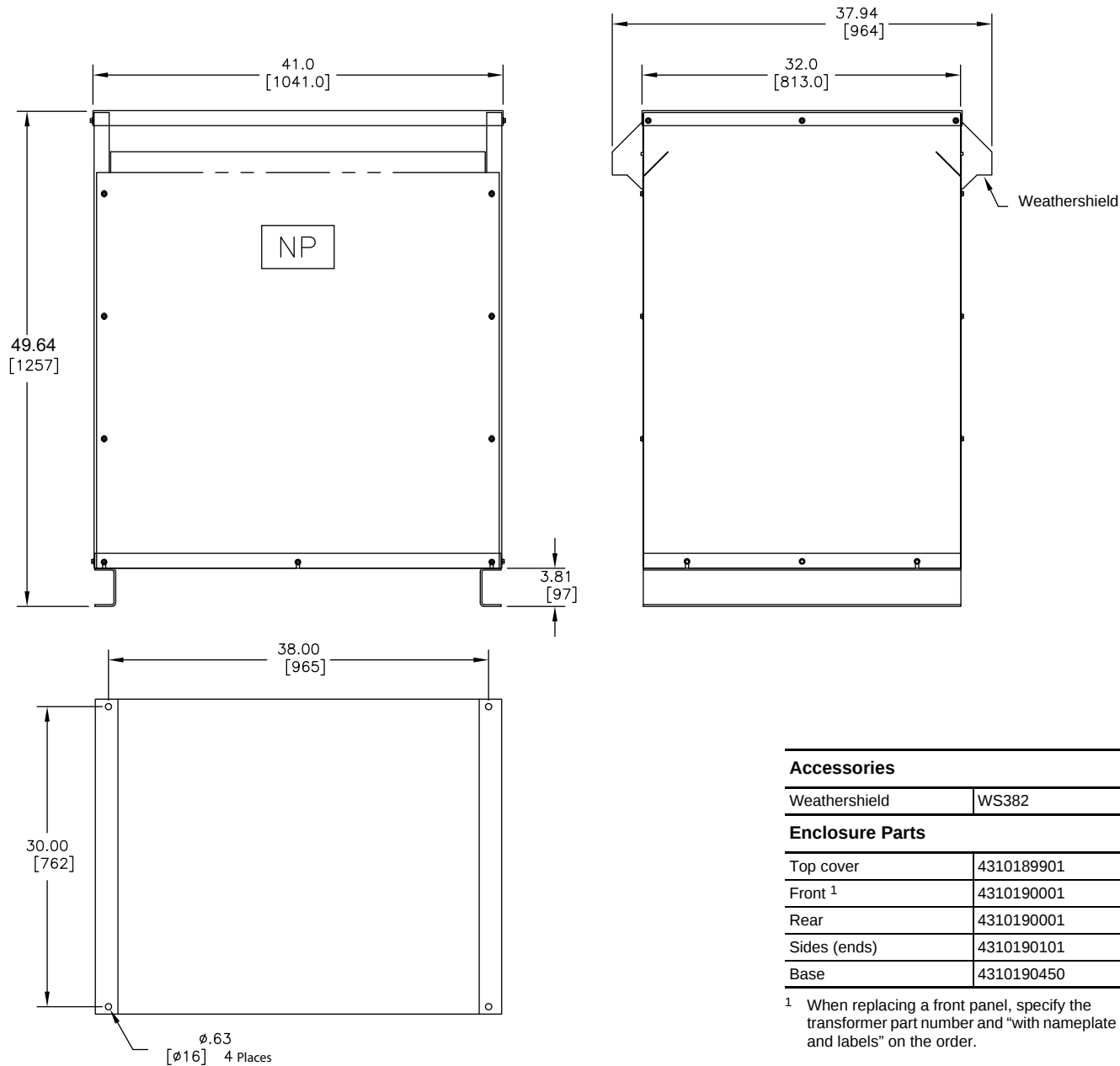
Top cover	4310190701
Front ¹	4310190802
Rear	4310190802
Sides (ends)	4310190901
Base	4310191250

¹ When replacing a front panel, specify the transformer part number and "with nameplate and labels" on the order.

Premium 30 Energy Efficient Transformers

Technical Data

Enclosure 25D—Dry-Type Transformer



Accessories

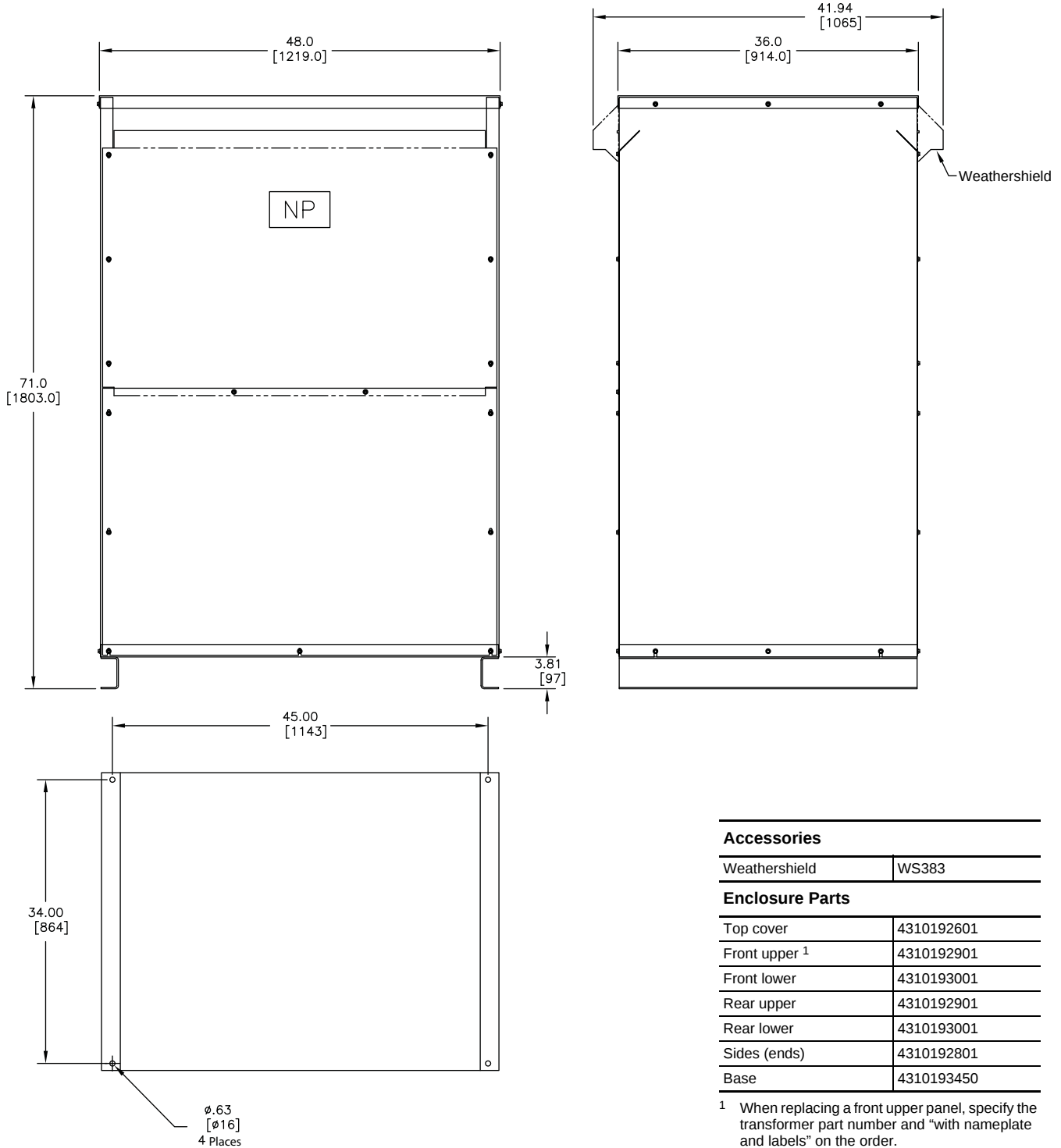
Weathershield	WS382
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Enclosure Parts

Top cover	4310189901
Front ¹	4310190001
Rear	4310190001
Sides (ends)	4310190101
Base	4310190450

¹ When replacing a front panel, specify the transformer part number and "with nameplate and labels" on the order.

Enclosure 30D—Dry-Type Transformer



Accessories

Weathershield	WS383
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Enclosure Parts

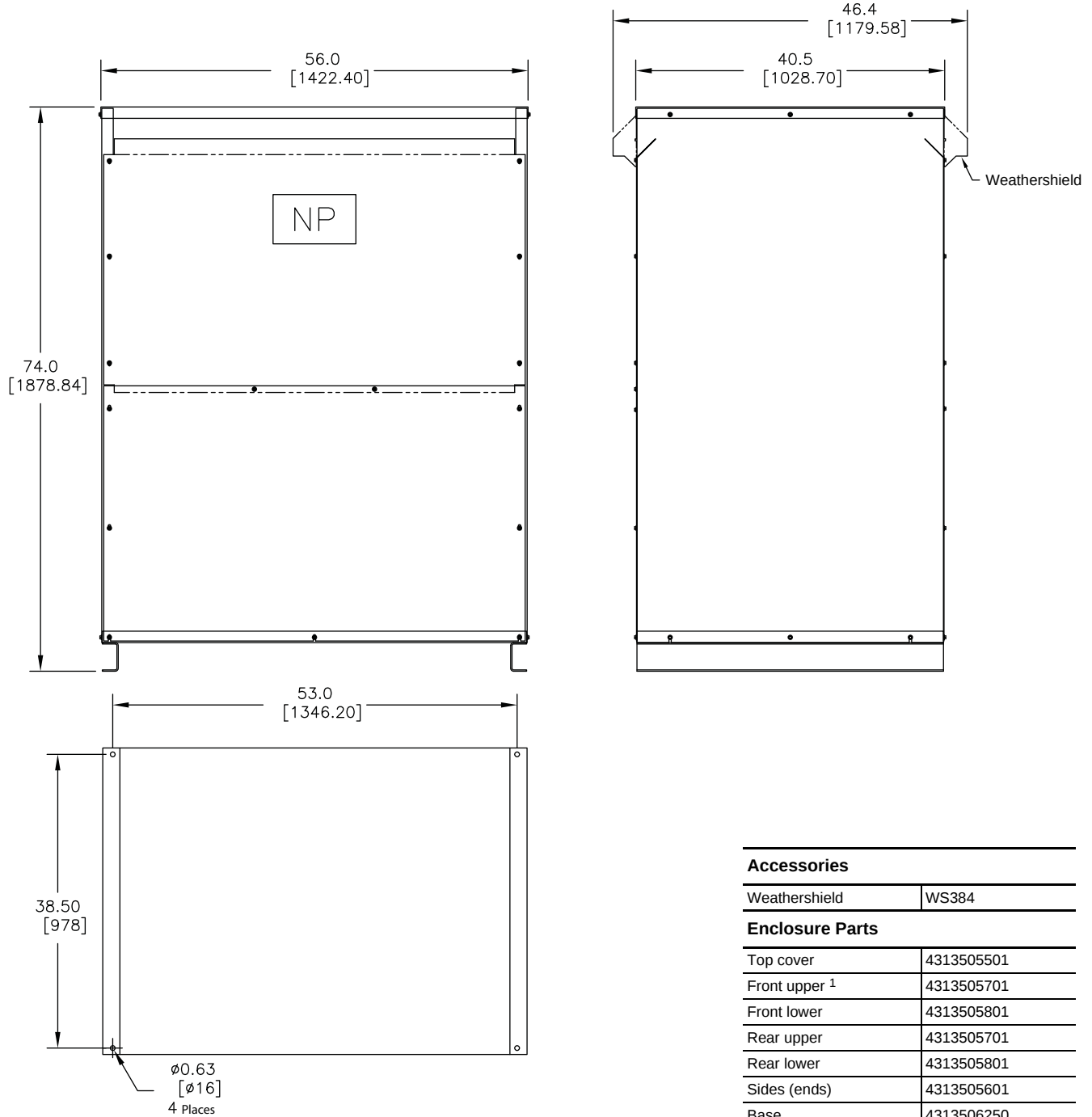
Top cover	4310192601
Front upper ¹	4310192901
Front lower	4310193001
Rear upper	4310192901
Rear lower	4310193001
Sides (ends)	4310192801
Base	4310193450

¹ When replacing a front upper panel, specify the transformer part number and "with nameplate and labels" on the order.

Premium 30 Energy Efficient Transformers

Technical Data

Enclosure 31D—Dry-Type Transformer



¹ When replacing a front upper panel, specify the transformer part number and "with nameplate and labels" on the order.

Wiring Diagrams

Voltage Code “3”

	Primary Voltage (V)	(2) 2.5% FCAN and (4) 2.5% FCBN Taps	Secondary Voltage (V)
	504	1	208Y/120
	492	2	
	480	3	
	468	4	
	456	5	
	444	6	
	432	7	

0° Phase Shift Voltage Codes “248”, “208”, “247”, and “246”

Voltage Codes 248 and 208

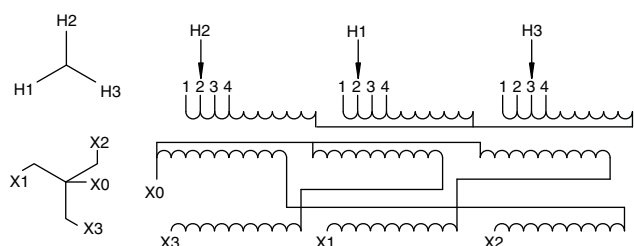
Voltage Codes 247 and 246

Voltage Code “248”			
Primary Voltage (V)	(2) 2.5% FCAN and (4) 2.5% FCBN Taps	Secondary Voltage (V)	
630	1	208ZZ120	
615	2		
600	3		
585	4		
570	5		
555	6		
540	7		
Voltage Code “208”			
Primary Voltage (V)	(2) 2.5% FCAN and (4) 2.5% FCBN Taps	Secondary Voltage (V)	
504	1	208ZZ120	
492	2		
480	3		
468	4		
456	5		
444	6		
432	7		
Voltage Code “247”			
Primary Voltage (V)	(1) 2.5% FCAN and (2) 2.5% FCBN Taps	Secondary Voltage (V)	
252	1	208ZZ120	
240	2		
228	3		
216	4		
Voltage Code “246”			
Primary Voltage (V)	(1) 2.5% FCAN and (2) 2.5% FCBN Taps	Secondary Voltage (V)	
218	1	208ZZ120	
208	2		
198	3		
188	4		

Premium 30 Energy Efficient Transformers

Technical Data

30° Phase Shift Voltage Codes “256”, “255”, “254”, and “253”



Voltage Code “256”		
Primary Voltage (V)	(1) 2.5% FCAN and (2) 2.5% FCBN Taps	Secondary Voltage (V)
630	1	208Y/120
600	2	
570	3	
540	4	
Voltage Code “255”		
Primary Voltage (V)	(1) 2.5% FCAN and (2) 2.5% FCBN Taps	Secondary Voltage (V)
504	1	208Y/120
480	2	
456	3	
432	4	
Voltage Code “254”		
Primary Voltage (V)	(1) 2.5% FCAN and (2) 2.5% FCBN Taps	Secondary Voltage (V)
252	1	208Y/120
240	2	
228	3	
216	4	
Voltage Code “253”		
Primary Voltage (V)	(1) 2.5% FCAN and (2) 2.5% FCBN Taps	Secondary Voltage (V)
218	1	208Y/120
208	2	
198	3	
188	4	

Premium 30 Energy Efficient Transformers Technical Data

Lug Kits

Mechanical Lug Kits

Catalog No ¹	\$ Price Per Kit	Lugs Per Kit	Wire Range	Cap Screws	Current Range	Grounding Lugs Per Kit	Wire Range	Bonding Lugs Per Kit	Wire Range
Single-Phase Primary, Single-Phase Secondary, Three-Phase Delta Primary, Three-Phase Delta Secondary									
DASKP100	28.00	3	1/0–14 STR.	1/4 x 1 in	Up to 100 A	Not applicable	Not applicable	Not applicable	Not applicable
DASKP250	51.00	3	350 kcmil–6 STR.	3/8 x 2 in	101 to 250 A				
DASKP400	91.00	3	600 kcmil–4 STR. (2) 250 kcmil–1/0 STR.	3/8 x 2 in	201 to 400 A				
DASKP600	182.00	6	600 kcmil–4 STR. (2) 250 kcmil–1/0 STR.	3/8 x 2 in	601 to 800 A				
DASKP1000	272.00	9	600 kcmil–2 STR.	3/8 x 2 in	601 to 800 A				
DASKP1200	363.00	12	600 kcmil–2 STR.	3/8 x 2 in	801 to 1200 A				
Single-Phase Primary and Secondary, Three-Phase Wye Secondary, Three-Phase Delta with Center Tap									
DASKGS100	79.00	5	1/0–14 STR.	1/4 x 1 in	Up to 100 A	1	4) 2/0 to 14 STR.	1	2 to 14 STR.
DASKGS250	118.00	5	350 kcmil–6 STR.	3/8 x 2 in	101 to 250 A	1	4) 2/0 to 14 STR.	1	2 to 14 STR.
DASKGS400	184.00	5	600 kcmil–4 STR. (2) 250 kcmil–1/0 STR.	3/8 x 2 in	201 to 400 A	1	4) 2/0 to 14 STR.	1	1/0 to 14 STR.
DASKGS600	370.00	10	600 kcmil–2 STR.	3/8 x 2 in	601 to 800 A	1	(4) 350 kcmil to 6 STR.	1	250 kcmil to 6 STR.
DASKGS1000	521.00	15	600 kcmil–2 STR.	3/8 x 2 in	601 to 800 A	1	(4) 350 kcmil to 6 STR.	1	250 kcmil to 6 STR.
DASKGS1200	672.00	20	600 kcmil–2 STR.	3/8 x 2 in	801 to 1200 A	1	(4) 350 kcmil to 6 STR.	1	250 kcmil to 6 STR.
DASKGS2000	824.00	25	600 kcmil–2 STR.	3/8 x 2 in	801 to 2000 A	1	(4) 350 kcmil to 6 STR.	1	250 kcmil to 6 STR.

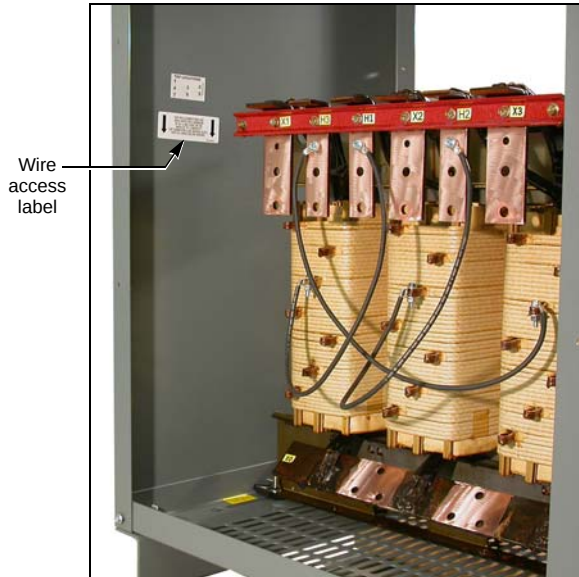
¹ Subject to minimum billing and freight charges when not ordered with transformer.

Premium 30 Energy Efficient Transformers

Bending Radius

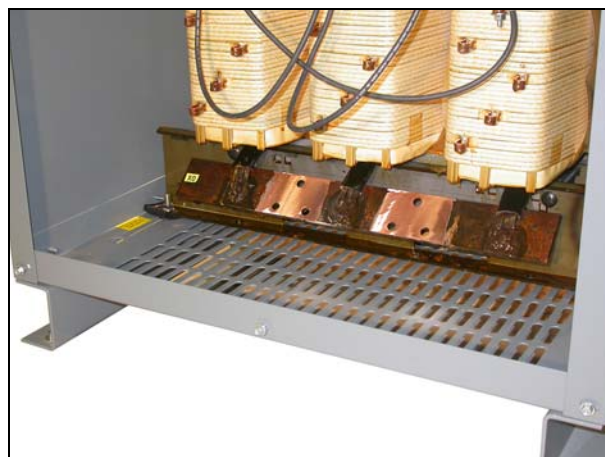
Bending Radius

Transformers must supply adequate bending radius for multiple cable options per National Electrical Code (NEC) 312.6 (called out in NEC 450.12 *Terminal Wiring Space*). Premium 30 transformers provide bending radius for 250% primary cables and multiple feeds on secondary cables. The wire access area is clearly defined by labels on both the inside and the outside of the transformer compartment.



200% Landing of XO (Neutral)

The neutral landing pad on Premium 30 transformers is able to handle multiple lugs to provide a greater than 200% neutral. The landing pad has a 1.75 in., NEMA two-hole lug capability. It is angled at 45° to allow access from either side (left or right) of the unit.



Standard Features

Ventilated Clearance

All Premium 30 transformers comply with the NEC requirements for ventilation clearances. NEC Section 450.9 *Ventilation* states that "...The required clearances shall be clearly marked on the transformer."

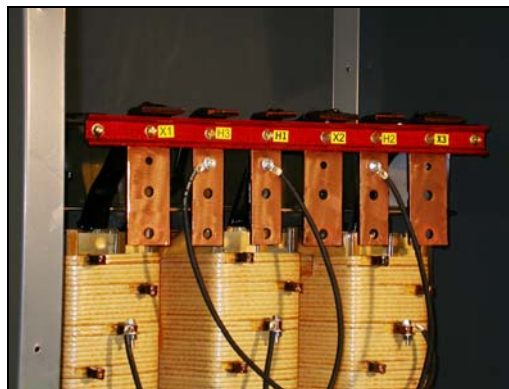
- Premium 30 transformers clearly state the minimum clearance required by NEC Section 450.9 via a separate label on the front of the transformer
- Premium 30 transformers require a three-inch clearance for ventilated openings—the industry norm is six inches—reducing the overall transformer footprint



Largest Terminals in the Industry

With the largest terminals in the industry, Square D™ brand transformers provide the space necessary to accomplish a quick and clean installation without compromising the overall footprint.

- Primary terminals are sized to handle lugs for 250% of nameplate current
- Secondary terminals are sized to handle lugs for 125% of nameplate current
- All terminal pads are designed to handle two-hole lugs
- Terminals are clearly labeled on the terminal board for ease of installation
- AL9CU mechanical lug kits are available
 - Three-lug kits—selected by wire range
 - Five-lug kits plus ground lug—selected by wire range



Premium 30 Energy Efficient Transformers

Standard Features

Packaging

The packaging for Square D™ brand transformers is designed to provide maximum protection, easy removal and handling of the unit, and minimal environmental impact.

- Protective cardboard cover
 - Protects unit during shipment
 - Protects unit after arrival on site (can be used as a cover after installation until transformer is put into service)
 - Can be recycled
- Pallet designed for easy removal and minimal environmental impact
 - Two metal braces can be recycled with other metal scrap from construction site
 - Incorporates only two wood blocks—well below wood content for typical industry pallets
 - Wood blocks are attached with standard wood screws for easy removal
- Four cardboard corner protectors help protect transformer corners from dents and scratches during transportation and installation
- Contains no plastic
- Label for forklift operators demonstrates proper placement for forklift transportation
- Can be moved by hand cart
- Compact space requirements during transportation and at the construction site with a shipping footprint that is only slightly larger than the transformer footprint



Premium 30 Energy Efficient Transformers Standard Features

Product Ordering

Schneider Electric manufactures made-to-order Premium 30 products to meet the specific needs of particular applications. The Square D Transformer Product Selector/Configurator page below is used to derive part numbers for these applications.

Transformer Product Selector Page

General Requirements		1
Transformer Phase Quantity		1
Frequency		60Hz
Transformer Type		EE Premium 30
Transformer Rating		15kVA
Phase Shift		Not Required
Transformer Primary Voltage		480V Delta
Transformer Secondary Voltage		208Y/120V
Transformer Temperature Rise		115 Deg C
Primary Taps		
Transformer Winding Material		Copper
Enclosure Material		Standard
Enclosure Type		NEMA 2
XFMR Electrostatic Shield		Non-Shielded
Sound Level		
Certified Test Data		Not Required
Thermal Switch		None
Kit and Accessories		Kit and Accessories

Transformer Type	Transformer Rating	Transformer Primary Voltage	Transformer Secondary Voltage	Certified Test Data
EE Premium 30 NL K9 EE Premium 30 Harmonic Mitigating EE Premium 30 GP	15kVA 30kVA 45kVA 75kVA 112.5kVA 150kVA 225kVA 300kVA	480V Delta Level One	208V Delta 240V Delta 480V Delta 600V Delta	Not Required NEMA ST-20 NEMA ST-20 W/ IZ TEST NEMA ST-20 W/ SOUND TEST NEMA ST-20 W/ IZ_SOUND TEST NEMA ST-20 W/ IZ-HARMONIC TEST

- Temperature Rise: based on product type
- Winding Material: only option is Copper
- Sound Level: based on product type

Premium 30 Energy Efficient Transformers

Specifications

Specifications

Part 1—General

1.1 Work Included

- A. Premium 30 Efficient transformers—with internal losses @ 35% loading reduced by 30% when using temperature and material correction factor to 75 °C per NEMA TP 1.
- B. Load Mix: Transformer shall be UL 1561 Listed to feed a mix of equipment load profiles such as computers without derating or significant degradation of efficiency.

1.2 References

- A. ANSI/IEEE
 - 1. C57.110-1998—IEEE Recommended Practice for establishing transformer capability when feeding non-sinusoidal load currents
 - 2. 1100—IEEE Recommended Practice for Powering and Grounding Sensitive Electronic Equipment
- B. ANSI/NEMA
 - 1. ST 20—Dry Type Transformers for General Applications
 - 2. 250—Enclosure for Electrical Equipment (1000 Volts Maximum)
 - 3. NEMA Premium Low Voltage Transformer Program
- C. Efficiency Standards
 - 1. NEMA TP 1—Guide for Determining Energy Efficiency for Distribution Transformers
 - 2. NEMA TP 2—Standard Test Method for Measuring Energy Consumption of Distribution Transformers
 - 3. NEMA Premium Low Voltage Transformer Program
- D. Seismic Standards
 - 1. International Building Code (IBC)
 - 2. California Building Code (CBC)
 - 3. Tri-axial shake table test results conducted in accordance with the AC156 test protocol (Acceptance Criteria for Seismic Qualification Testing of Nonstructural Components)
- E. International Standards Organization (ISO)
 - 1. ISO 9001:2000—Quality Management System
 - 2. ISO 14001:2004—Environmental Management System
- F. Underwriters Laboratories (UL)
 - UL 1561—Dry-Type General Purpose and Power Transformers
- G. NFPA 70—National Electrical Code

1.3 Prior Approval and Submittal Documentation

- A. Submit product data including the following:
 - 1. Copy of ISO 9001:2000 Certification of manufacturing operation
 - 2. Copy of ISO 14001:2004 Certification of manufacturing operation
 - 3. Confirmation that transformer(s) are UL 1561 Listed
 - 4. Construction details including enclosure dimensions, kVA rating, primary and secondary nominal voltages, voltage taps, unit weight
 - 5. Basic performance characteristics including insulation class, temperature rise, core and coil materials, impedance and audible noise level, unit weight, inrush data RMS

- 6. Efficiency Data
 - a. No load and full load losses will be calculated per NEMA ST 20 test methods.
 - b. Efficiency Curves
 - (1) Linear loads
 - (2) Data per the non-linear load test program
- 8. Documentation describing nonlinear load test program
- 9. Documentation that materials used for shipment packaging meet the environmental requirements identified in section 1.4 below. Provide a representative picture of the packaging materials.
- B. Description of manufacturer's factory non-linear load test program.
 - See Section 2.4

1.4 Packaging for Shipment

- A. Transformers shall be packaged for shipment using materials that will have the least environmental impact.
 - 1. Transformer Wrapping
 - Transformers (15–25 kVA) shall be protected by cardboard protective material
 - Biodegradable materials required for protective wrapping
 - 2. Transformer Shipping Base
 - Transformers shall be shipped on a base that uses wood

1.5 Delivery, Storage, and Handling

- A. Store in a warm, dry location with uniform temperature. Cover ventilation openings to keep out dust, water, and other foreign material.
- B. Handle transformers using lifting eyes and/or brackets provided for that purpose. Protect against unfavorable external environments such as rain and snow during handling.

Part 2—Product

2.1 Basis of Design

- A. Transformers shall be designed to an efficiency standard higher than the lowest legal standard for the purpose of contributing to LEED Energy and Atmosphere (Optimize Energy Performance) and utility rebates.
- B. Transformers designed to the lowest legal efficiency standard, thus not providing the contributions listed above, are not acceptable for meeting the requirements of this specification.

2.2 Acceptable Manufacturers/Products

- A. Schneider Electric
- B. Approved others

2.3 Product

- A. The transformer shall be UL 1561 Listed
- B. All insulating materials are to exceed NEMA ST 20 standards and be rated for a 220 °C or 200 °C UL component recognized insulation system.
- C. Neither the primary nor the secondary temperature shall exceed [220 °C] [200 °C] at any point in the coils while carrying their full rating of non-sinusoidal load. Transformers are to be UL Listed and labeled for [K-9] [K-13] as defined as the sum of fundamental and harmonic $I_h(pu)^2h^2$ per UL 1561.
 - 1. K-9 Transformers evaluated by the UL K-Factor evaluation shall be listed for [115 °C] [130 °C] average temperature rise.
 - 2. K-13 Transformers evaluated by the UL K-Factor evaluation shall be listed for 150 °C average temperature rise.

Premium 30 Energy Efficient Transformers Specifications

- D. K-Factor rated transformers shall have an impedance range of 3% to 5%, and shall have a minimum reactance of 2% in order to help reduce neutral current when supplying loads with large amounts of third harmonic current.
- E. Transformers Taps
 - 1. General Purpose: 15 to 300 kVA
 - a. shall have a minimum of six 2.5% full capacity primary taps: two above normal and four below normal for 480 V and 600 V primaries
 - b. shall have a minimum of three 5% full capacity primary taps: one above normal and two below normal for 208 V and 240 V primaries
 - 2. K-Rated: 15 to 300 kVA
 - a. shall have a minimum of six 2.5% full capacity primary taps: two above normal and four below normal for 480 V and 600 V primaries
 - b. shall have a minimum of three 5% full capacity primary taps: one above normal and two below normal for 208 V and 240 V primaries
 - 3. Harmonic Mitigating: 15 to 300 kVA 0° Phase Shift
 - a. shall have a minimum of six 2.5% full capacity primary taps: two above normal and four below normal for 480 V and 600 V primaries
 - b. shall have a minimum of three 5% full capacity primary taps: one above normal and two below normal for 208 V and 240 V primaries
 - 4. Harmonic Mitigating: 15 to 300 kVA 30° Phase Shift
 - a. shall have a minimum of three 5% full capacity primary taps: one above normal and two below normal for all primary voltages
- F. The maximum temperature of the top of the enclosure shall not exceed 50 °C rise above a 40 °C ambient.
- G. Construction: Windings shall be continuous-wound aluminum or copper with brazed or welded terminations.
- H. Insulation and Varnish Systems: UL recognized 220 °C or 200 °C class; epoxy polyester impregnation.
- I. Maximum winding temperature rise: 115 °C, 130 °C, or 150 °C in a 40 °C maximum ambient.
- J. The transformer shall have a Basic Impulse Level of 10 kV BIL.
- K. Impedance shall be the manufacturer's standard.
- L. No load losses:
 - 1. 15 kVA: 55 W
 - 2. 30 kVA: 90 W
 - 3. 45 kVA: 125 W
 - 4. 75 kVA: 165 W
 - 5. 112.5 kVA: 230 W
 - 6. 150 kVA: 290 W
 - 7. 225 kVA: 435 W
 - 8. 300 kVA: 560 W

Premium 30 Energy Efficient Transformers Specifications

- L. Three-phase transformer efficiency, total losses, shall not exceed losses @ 35% and 75 °C per the NEMA Premium program tested per 10 C.F.R. Part 431 ("Test Procedures for Distribution Transformers").

Shall not exceed

1.	15 kVA:	97.88%	112.30 W	121.28 W
2.	30 kVA:	98.24%	185.52 W	200.35 W
3.	45 kVA:	98.38%	256.42 W	276.93 W
4.	75 kVA:	98.59%	362.89 W	391.92 W
5.	112.5 kVA:	98.73%	500.31 W	540.33 W
6.	150 kVA:	98.80%	576.14 W	622.22 W
7.	225 kVA:	98.95%	764.14 W	825.26 W
8.	300 kVA:	99.02%	1010.010 W	1090.81 W

- M. Enclosure type shall be NEMA 2 with a minimum manufacturing clearance of three inches to comply with NEC, 450.9 *Ventilation*.

— Optional NEMA 3R with adding of weather shields (part number must be supplied on drawings and unit).

- N. K-Rated—Electrostatic shield: Each transformer winding shall have an independent, single, full-width electrostatic shield arranged to minimize interwinding capacitance. (This is an option for standard transformers.)

- O. Sound levels (kVA rating: sound level)

1. Standard Units

- 15-50 kVA: 45 dB
- 51-150 kVA: 50 dB
- 151-300 kVA: 55 dB
- Option for 3 dB or 6 dB below standard

2. Harmonic Mitigating and K-Rated Units

- 15-50 kVA: 42 dB
- 51-150 kVA: 47 dB
- 151-300 kVA: 52 dB
- Option for 6 dB below standard

- P. All terminals, including those for changing taps, must be readily accessible by removing a front cover plate.

- Q. Terminal must be sized to accommodate lugs for the following cable ranges.

Primary Current Range (Amperes)	Lug Wire Range	Lugs Per Terminal ¹	Minimum Bending Radius (Inches)
40 and below	1/0 - 14 STR.	1	5.5
41-89	350 kcmil - 6 STR.	1	12
90-136	600 kcmil - 4 STR. or (2) 250 kcmil - 1/0 STR.	1	15
137-271	600 kcmil - 4 STR. or (2) 250 kcmil - 1/0 STR.	2	16
272-417	600 kcmil - 2 STR.	3	18
418-626	600 kcmil - 2 STR.	4	19
627-723	750 kcmil - 3/0 STR.	5	24
723-965	750 kcmil - 3/0 STR.	6	24
966-1390	750 kcmil - 3/0 STR.	9	24
1391-1807	750 kcmil - 3/0 STR.	12	24
1808-2085	750 kcmil - 3/0 STR.	15	24
2086-2800	750 kcmil - 3/0 STR.	18	24

¹ Excludes XO terminal

Premium 30 Energy Efficient Transformers Specifications

Secondary Current Range (Amperes)	Lug Wire Range	Lugs Per Terminal ¹	Minimum Bending Radius (Inches)
42 and below	1/0 - 14 STR.	1	5.5
43–136	350 kcmil - 6 STR.	1	12
137–271	600 kcmil - 4 STR. or (2) 250 kcmil - 1/0 STR.	1	15
272–417	600 kcmil - 4 STR. or (2) 250 kcmil - 1/0 STR.	2	16
418–723	600 kcmil - 2 STR.	3	18
724–904	600 kcmil - 2 STR.	4	19
904–1205	750 kcmil - 3/0 STR.	5	24
1206–1390	750 kcmil - 3/0 STR.	6	24
1391–1807	750 kcmil - 3/0 STR.	7	24
1808–2085	750 kcmil - 3/0 STR.	9	24
2086–2780	750 kcmil - 3/0 STR.	12	24

¹ Excludes XO terminal

R. The transformer shall have a landing for 200% rated neutral which must accommodate twice the number of lugs specified in Secondary Current Range above.

2.4 Harmonic Test Plan

A. NEMA ST 20

1. Open Circuit Test (no load losses)
 - a. Use for both linear and non-linear
 - b. Measure power
2. Short Circuit Test (load losses)
 - a. Short primary winding
 - (1) Linear Test
 - (a) Complete with linear profile through secondary windings
 - (2) Non-Linear Test
 - (a) Complete with non-linear profile through secondary windings

Harmonic Profile (K-7 Load)

Harmonic Number	Rated % Current	Phase Shift (°)		
		A	B	C
1	100.0	0	120	240
3	81.0	0	0	0
5	60.6	0	240	120
7	37.0	0	120	240
9	15.7	0	0	0
11	2.4	0	240	120
13	6.3	0	120	240
15	7.9	0	0	0

(b) Measure power

B. Take data and graph efficiency per NEMA ST 20.

1. Graph 1—Linear Loads: 0–100% loads
 2. Graph 2—Non-linear Profile K-9: 0–100% loads
- C. Test Plans measuring Power In and Power Out will not be accepted since procedures are not covered by any standard.

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