

DESCRIPTION

PRODUCT COVERED:

USR, CNR Component - Transformers, Class 2, Class 3 Inherently Limited, Model Nos. VPP10-250, VPP12-200, VPP16-150, VPP20-120, VPP24-100, VPP28-090, and VPP36-070.

GENERAL:

These transformers are provided with two primary and two secondary windings. The secondary windings are isolated from the primary. The primary is connected in parallel (tie 3 to 6 and 1 to 4) for 120 V input and in series (tie 4 to 3) for 240 V input. The secondary is to be connected in series or parallel depending on the output needed.

RATINGS:

Model:	VPP10-250		
Primary:	120/240 V, 50/60 Hz		
	V	(A)	VA
Secondary (series)	10.0	0.25	2.5
Secondary (parallel)	5.0	0.5	2.5
Model:	VPP12-200		
Primary:	120/240 V, 50/60 Hz		
	V	(A)	VA
Secondary (series)	12.6	0.2	2.5
Secondary (parallel)	6.3	0.4	2.5
Model:	VPP16-150		
Primary:	120/240 V, 50/60 Hz		
	V	(A)	VA
Secondary (series))	16.0	0.15	2.5
Secondary (parallel)	8.0	0.3	2.5
Model:	VPP20-120		
Primary:	120/240 V, 50/60 Hz		
	V	(A)	VA
Secondary (series)	20.0	0.12	2.5
Secondary (parallel)	10.0	0.24	2.5
Model:	VPP24-100		
Primary:	120/240 V, 50/60 Hz		
	V	(A)	VA
Secondary (series)	24.0	0.1	2.5
Secondary (parallel)	12.0	0.2	2.5
Model:	VPP28-090		
Primary:	120/240 V, 50/60 Hz		
	V	(A)	VA
Secondary (series)	28.0	0.09	2.5
Secondary (parallel)	14.0	0.18	2.5
Model:	VPP36-070		
Primary:	120/240 V, 50/60 Hz		
	V	(A)	VA
Secondary (series)	36.0	0.07	2.5
Secondary (parallel)	18.0	0.14	2.5

CONSTRUCTION DETAILS:

The transformer or transformers shall be constructed in accordance with the following items. See also, Section General, Construction Details. Markings - Refer to Section General.

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

For use only in complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

These transformers have been judged on the basis of the required spacings in the Standard for Class 2 and Class 3 Transformers (UL 1585), Sec. 21, and Canadian Standard C22.2 No. 66-1988, Specialty Transformers.

Conditions of Acceptability -

1. The windings employ a Class 130 (B) insulation system. Temperature testing shall be conducted in the end product.
2. The suitability of the pin terminals and mounting means shall be determined in the end-use product.
3. The Rated Output Heating test was conducted in a 25°C ambient on an open bench. Temperature testing shall be considered in the end product if used in a higher ambient or an enclosure that would limit airflow.
4. The core is not provided with a grounding means. The need to ground the core shall be determined in the end use product.
5. The following table outlines the "Class" of the transformers base on the output voltage. See the notes indicated for the engineering considerations:

Model	Output Connected	See Note
VPP10-250	Series	A
VPP10-250	Parallel	A
VPP12-200	Series	B
VPP12-200	Parallel	A
VPP16-150	Series	B
VPP16-150	Parallel	A
VPP20-120	Series	B
VPP20-120	Parallel	A

Model	Output Connected	See Note
VPP24-100	Series	C
VPP24-100	Parallel	B
VPP28-090	Series	C
VPP28-090	Parallel	B
VPP36-070	Series	C
VPP36-070	Parallel	B

Notes:

A - The measured open circuit voltage did not exceed 15 V ac rms, and therefore is considered to supply "Class 2".

B - The measured open circuit voltage exceeds 15 V rms, but not 30 V rms. Therefore this transformer is considered to supply "Class 2 Not Wet, Class 3 Wet." This indicates that Class 3 wiring is required to be used, in accordance with Article 725 of the National Electrical Code, if the wiring extends into areas where wet contact is likely.

C - The measured open circuit voltage exceeds 30 V rms, but not 100 V rms. Therefore this transformer is considered to supply "Class 3". This indicates that Class 3 wiring is required to be used, in accordance with Article 725 of the National Electrical Code.

MODEL NO. VPP10-250 - FIG. 1

Model No. VPP10-250 also represents Model Nos. VPP12-200, VPP16-150, VPP20-120, VPP24-100, VPP28-090, and VPP36-070.

1. Insulation system - R/C (OBJY2), by TRIAD MAGNETICS (E50476), Type B3, Class B. Varnished with Ripley epoxy resin No. 468-2FC. System as follows:

Transformer Winding Insulation -

Location	Material	(in.)	Layers
PRI Outerwrap	Polyester Film Tape	0.002	1
SEC Outerwrap	Polyester Film Tape	0.002	1
PRI-PRI	Polyester Film Tape	0.002	2
PRI-SEC	Bobbin	N/A	N/A
SEC-SEC	Polyester Film Tape	0.002	2
PRI Crossover Lead	Bobbin slots & Polyester Film Tape	0.002	1
PRI-Core & SEC-Core	Bobbin/Bobbin Cover	N/A	N/A

2. Core - 'EI' Laminated sheet steel, overall 1-1/8 by 1-5/8 by 1-5/16 in.
3. Primary/Secondary Coils - Random wound enameled copper wire.
4. Bobbin/Bobbin Cover - R/C (QMFZ2), by E I Dupont, Type FR-530, three flange construction. Bobbin min. 0.03 in. thick.
5. Transformer Pin Type Terminals - Square, 0.025 in. thick. Pressed into bobbin min. 0.2 in and mechanically secured an soldered to coil leads.

DESCRIPTION

PRODUCT COVERED:

USR, CNR - Transformers, Class 2, Class 2/3, or Class 3, Inherently Limited or Noninherently Limited. For details of specific models, see Tables I.

GENERAL:

These transformers are provided with two primary and two secondary windings (except Model VPL25-1900 has only one secondary winding). The secondary windings are isolated from the primary. The primary is connected in parallel for 115 V input or in series for 230 V input. The secondary is to be connected in series or parallel depending on the desired output.

USR indicates that the unit was evaluated to the requirements in the Standard for Class 2 and Class 3 Transformers, UL 1585, Fourth Edition.

CNR indicates investigation to the Canadian Standard for Specialty transformer, C22.2 No. 66, Third Edition.

RATINGS:

Table I

See	Model:	VPS36-2200		
Note	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	36	2.2	80
N, B	Secondary (parallel)	18	4.4	80
	Model:	VPS20-2200		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, B	Secondary (series)	20	2.2	43
N, A	Secondary (parallel)	10	4.4	43
	Model:	VPS24-1800		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	24	1.8	43
N, B	Secondary (parallel)	12	3.6	43
	Model:	VPS28-1500		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	28	1.5	43
N, B	Secondary (parallel)	14	3.0	43

Table I (Continued)

See	Model:	VPS36-1200		
Note	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	36	1.2	43
N, B	Secondary (parallel)	18	2.4	43
	Model:	VPS20-1250, VPL20-1200		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, B	Secondary (series)	20	1.25	25
N, A	Secondary (parallel)	10	2.5	25
	Model:	VPS24-1000, VPL24-1100		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	24	1.0	25
N, B	Secondary (parallel)	12	2.0	25
	Model:	VPL25-1000		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	25.2	0.99	25
N, B	Secondary (parallel)	12.6	1.98	25
	Model:	VPS28-900, VPL28-900		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	28	0.9	25
N, B	Secondary (parallel)	14	1.8	25

Table I (Continued)

See	Model:	VPS36-700, VPL36-700		
Note	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	36	0.7	25
I, B	Secondary (parallel)	18	1.4	25
	Model:	VPP10-500, VPL10-500		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, A	Secondary (series)	10	0.5	5.0
I, A	Secondary (parallel)	5	1.0	5.0
	Model:	VPP12-400, VPL12-400		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, B	Secondary (series)	12.6	0.4	5.0
I, A	Secondary (parallel)	6.3	0.8	5.0
	Model:	VPL14-360		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, B	Secondary (series)	14	0.36	5.0
I, A	Secondary (parallel)	7	0.71	5.0
	Model:	VPP16-310, VPL16-300		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, B	Secondary (series)	16	0.31	5.0
I, A	Secondary (parallel)	8.0	0.62	5.0
	Model:	VPP20-250, VPL20-250		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, B	Secondary (series)	20	0.25	5.0
I, A	Secondary (parallel)	10	0.5	5.0
	Model:	VPP24-210, VPL24-210		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, C	Secondary (series)	24	0.21	5.0
I, B	Secondary (parallel)	12	0.42	5.0

Table I (Continued)

See	Model:	VPP28-180, VPL28-180		
Note	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, C	Secondary (series)	28	0.18	5.0
I, B	Secondary (parallel)	14	0.36	5.0
	Model:	VPP36-140, VPL36-140		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, C	Secondary (series)	36	0.14	5.0
I, B	Secondary (parallel)	18	0.28	5.0
	Model:	VPP10-1000, VPL10-1000		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, A	Secondary (series)	10	1.0	10
I, A	Secondary (parallel)	5	2.0	10
	Model:	VPP12-800, VPL12-800		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, B	Secondary (series)	12.6	0.8	10
I, A	Secondary (parallel)	6.3	1.6	10
	Model:	VPP16-620, VPL16-600		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, B	Secondary (series)	16	0.63	10
I, A	Secondary (parallel)	8	1.26	10
	Model:	VPP20-500, VPL20-500		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, B	Secondary (series)	20	0.5	10
I, A	Secondary (parallel)	10	1.0	10
	Model:	VPP24-420, VPL24-400		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, C	Secondary (series)	24	0.42	10
I, B	Secondary (parallel)	12	0.84	10

Table I (Continued)

See	Model:	VPP28-360, VPL28-350		
Note	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, C	Secondary (series)	28	0.36	10
I, B	Secondary (parallel)	14	0.72	10
	Model:	VPP36-280, VPL36-300		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, C	Secondary (series)	36	0.28	10
I, B	Secondary (parallel)	18	0.56	10
See	Model:	VPP10-2000		
Note	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, A	Secondary (series)	10	2.0	20
N, A	Secondary (parallel)	5	4.0	20
	Model:	VPP12-1600		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, B	Secondary (series)	12.6	1.6	20
N, A	Secondary (parallel)	6.3	3.2	20
	Model:	VPP16-1250		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, B	Secondary (series)	16	1.25	20
N, A	Secondary (parallel)	8	2.5	20
	Model:	VPP20-1000		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, B	Secondary (series)	20	1.0	20
N, A	Secondary (parallel)	10	2.0	20
	Model:	VPP24-830		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, C	Secondary (series)	24	0.83	20
N, B	Secondary (parallel)	12	1.66	20

Table I (Continued)

See Model:	VPP28-720			
Note Primary:	115/230 V ac, 50/60Hz			
	V	(A)		VA
I, C Secondary (series)	28	0.72		20
N, B Secondary (parallel)	14	1.44		20
Model:	VPP36-560			
Primary:	115/230 V ac, 50/60Hz			
	V	(A)		VA
I, C Secondary (series)	36	0.56		20
I, B Secondary (parallel)	18	1.12		20
See Model:	VPP12-2400			
Note Primary:	115/230 V ac, 50/60Hz			
	V	(A)		VA
N, B Secondary (series)	12.6	2.4		30
N, A Secondary (parallel)	6.3	4.8		30
Model:	VPP16-1900			
Primary:	115/230 V ac, 50/60Hz			
	V	(A)		VA
N, C Secondary (series)	16	1.9		30
N, B Secondary (parallel)	8	3.8		30
Model:	VPP20-1500			
Primary:	115/230 V ac, 50/60Hz			
	V	(A)		VA
N, C Secondary (series)	20	1.5		30
N, B Secondary (parallel)	10	3.0		30
Model:	VPP24-1250			
Primary:	115/230 V ac, 50/60Hz			
	V	(A)		VA
N, C Secondary (series)	24	1.25		30
N, B Secondary (parallel)	12	2.5		30
Model:	VPP28-1060			
Primary:	115/230 V ac, 50/60Hz			
	V	(A)		VA
N, C Secondary (series)	28	1.06		30
N, B Secondary (parallel)	14	2.12		30

Table I (Continued)

See	Model:	VPP36-820		
Note	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
I, C	Secondary (series)	36	0.82	30
I, B	Secondary (parallel)	18	1.64	30
	Model:	VPP24-2330		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, B	Secondary (series)	24	2.33	56
N, A	Secondary (parallel)	12	4.66	56
	Model:	VPP28-2000		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	28	2.0	56
N, B	Secondary (parallel)	14	4.0	56
	Model:	VPP36-1560		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	36	1.56	56
N, B	Secondary (parallel)	18	3.12	56
See	Model:	VPL25-1900		
Note	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, B	Secondary (series)	25.2	1.984	50
	Secondary (parallel)	-	-	-

Table I (Continued)

See	Model:	VPL28-1700		
Note	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	28	1.786	50
N, B	Secondary (parallel)	14	3.572	50
	Model:	VPL36-1400		
	Primary:	115/230 V ac, 50/60Hz		
		V	(A)	VA
N, C	Secondary (series)	36	1.389	50
N, B	Secondary (parallel)	18	2.778	50

Notes:

N - Noninherently Limited

I - Inherently Limited

A - The measured open circuit voltage did not exceed 15 V ac rms, and therefore is considered to supply "Class 2".

B - The measured open circuit voltage exceeds 15 V rms, but not 30 V rms. Therefore this transformer is considered to supply "Class 2 Not Wet, Class 3 Wet." This indicates that Class 3 wiring is required to be used, in accordance with Article 725 of the National Electrical Code, if the wiring extends into areas where wet contact is likely.

C - The measured open circuit voltage exceeds 30 V rms, but not 100 V rms. Therefore this transformer is considered to supply "Class 3". This indicates that Class 3 wiring is required to be used, in accordance with Article 725 of the National Electrical Code.

MODEL DIFFERENCES:

The VPS Series is **constructed** identical to the VPL Series except **different insulation system and** the VPS series is provided with input and output Quick Connect Terminal connections and the VPL series is provided with input and output lead wire connections. The VPP Series is provided with Pin-type Terminals.

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

For use only in complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

These transformers have been judged on the basis of the required spacings in the Standard for Class 2 and Class 3 Transformers (UL 1585, Fourth Edition, Dated April 23, 1998), Sec. 21, and Canadian Standard C22.2 No. 66-1988, Specialty Transformers.

Conditions of Acceptability -

1. These transformers employ a Class B (130°C) insulation system.
2. A strain relief test was not conducted on these units.
3. The suitability of the pin terminals and mounting means shall be determined in the end-use product.
4. This suitability of the male quick-disconnect terminals and their dimensions (for compliance with UL310) shall be determined in the final application.
5. The suitability of the lead wires, type 1015, rated VW-1, 600V, 105°C. 18AWG for 50VA models, 22 AWG for all other models, shall be determined in the final application.
6. For non-inherently limited models, a suitably rated Listed fuse shall be provided in the end product, in the secondary, as noted in ILL. 1.