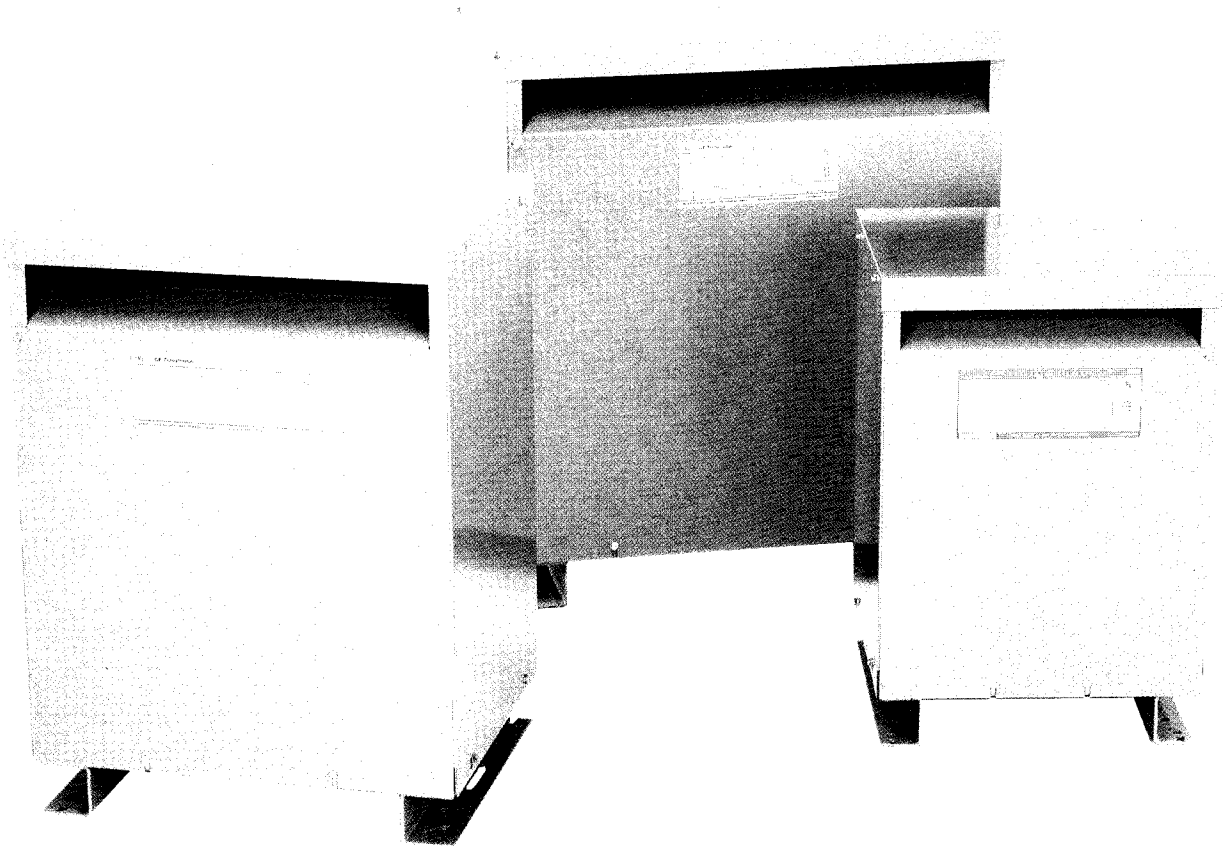
GE Non-linear Dry-type Transformers

UL K factor transformers

GE's UL K factor transformers set new standards



Harmonics have been around for decades, most notably in specialized industrial applications. During this time, GE researched and addressed the effects of harmonic waveform distortion on transformers, resulting in the development of the first industrial Drive Isolation Transformers (DITs).

Commercial power systems also have contained harmonics for many years, especially in the form of fluorescent lighting. These harmonics occur at conduction angles, which promote significant cancellation. GE general purpose dry-type transformers accommodate such low levels of harmonic distortion.

Today, new types of loads produce different levels of harmonics in commercial power systems. These loads generate harmonic current with little cancellation and no filtering, so overall harmonic levels are higher.

New standards of safety — and performance

Increased harmonics affect transformers in a number of ways. The UL K factor addresses the two most important effects on product safety: additional harmonic coil heating and increased neutral bar current carrying capability.

GE UL K factor transformers not only meet UL test requirements, they also ensure that harmonics do not compromise performance.

Transformer impedance values hold to traditional levels so short circuit let through current will not increase. Interrupting current ratings of downstream equipment remain the same.

Inrush values, too, are maintained, which assists in protective device coordination.

Full performance comes in a compact package to make installation easier.

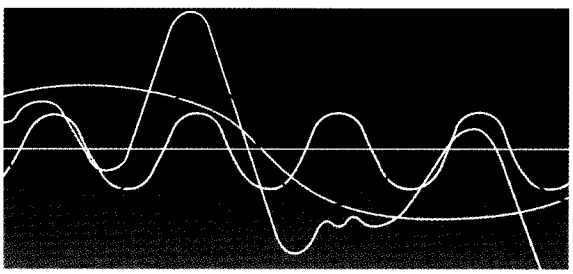
Electrostatic shielding cost-effectively provides unsurpassed electrical noise attenuation.

We've been perfecting our designs for more than 70 years, so you know that GE transformers — including our UL K factor transformers — will give you superior performance and value.

The nature of harmonics

An ideal power supply provides voltage in the form of a sine wave. This sine wave cycle, called the fundamental frequency, occurs at a frequency of 60 times per second.

When this sine wave voltage is connected to a load whose impedance remains constant — a *linear* load — the current drawing will maintain the form of a sine wave. When you connect a *non-linear* load — one in which impedance varies within each cycle — the current drawn will take the form of a distorted sine wave. Mathematical analysis quantifies



this distortion. The distorted sine wave is converted into a series of sine waves at frequencies that are multiples of the fundamental (e.g., 3rd, 5th, etc.). These sine waves are called harmonics.

The UL K factor testing program

UL has established a K factor program that addresses two product safety issues.

First is the ability of a transformer to withstand additional coil heating for a given level of harmonic distortion. Testing procedures are derived from ANSI/IEEE C57.110-1986.

Special conductor cross-sectional area and coil winding geometry are just two of the means by which GE minimizes additional harmonic heating. The result is a line of cool running transformers that pass UL test procedures with room to spare.

Second, UL addresses increased neutral current from harmonic triplens (i.e., 3rd, 9th, etc., harmonics).

GE passes this test with neutral bars sized for 200% of secondary phase current.

Selection and ordering

1. **Review the power distribution system.** Look for potential problems. Are there significant unfiltered electronic loads? Is there significant harmonic cancellation? Do power factor correcting capacitors set up a harmful resonant condition? Is upstream harmonic distortion within IEEE-519 guidelines?

2. **Determine kVA requirement.** Calculate required transformer kVA as you normally would for linear load applications.

3. **Estimate the category of harmonic distortion and select transformer from the table below.**

Load description	Harmonic distortion level	Transformer selection
Non-linear lighting with high harmonic cancellation, few electronic devices with switch mode power supplies.	Low	GE general purpose dry-type transformers.
50% of connected load from electronic devices with switch mode power supplies.	Moderate	GE 115° C low-temperature-rise transformers or GE UL K factor transformers rated K=4.
100% of connected load from electronic devices with switch mode power supplies.	High	GE 80° C low-temperature-rise transformers or GE UL K factor transformers rated K=13.

Although theoretical calculations and test data support the use of K=4 for 50% and K=13 for 100% connected non-linear loads in typical commercial applications, some specifications call for transformers with ratings of K=20 or more. Such applications represent severe total harmonic distortion, perhaps 100% or more! Those who have determined the need for these extended ratings can select from GE's K=20 and K=30 UL K factor listed transformers.

Other voltages are available. Please contact the factory for price and availability. Transformer enclosures are rated NEMA 2.

Weathershield Kits make the transformers rainproof (NEMA 3R enclosure). They are UL approved for customer installation. The kits are supplied with tamper-resistant hardware and are available on most transformers. Utilize the appropriate dimension from the desired transformer to obtain the corresponding kit from the tables below.

Wall Mounting Brackets are available on some transformers. Again, utilize the appropriate dimensions to select one from the tables below. Each set consists of two brackets.

Aluminum K Factor Transformers

Width	Weathershield Kit Catalog Number
18.99	9T18Y4317G11
24.03	9T18Y4317G05
32.03	9T18Y4317G06
35.03	9T18Y4317G07
38.47	9T18Y4317G08
42.50	9T18Y4317G09
47.50	9T18Y4317G10
60.00	9T18Y4317G14

Depth	Bracket Catalog Number
16.55	9T18Y5042
18.05	9T18Y5042
23.68 & height = 35.73	9T18Y5043

Copper K Factor Transformers

Width	Weathershield Kit Catalog Number
17.13	9T18Y4319G02
22.38	9T18Y4319G04
32.25	9T18Y4319G06
34.75	9T18Y4319G08
39.00	9T18Y4319G10
42.13	9T18Y4319G12
46.50	9T18Y4319G14
53.38 & depth = 36.88	9T18Y4319G16

Depth	Bracket Catalog Number
19.88	9T18Y4320G03
20.00 , 23.50	9T18Y4320G04

Three-phase, K = 4 *Aluminum*

kVA	Catalog Number	480 Volts Delta to 208Y/120 Volts Dimensions			Taps	Approx. Net Wt. (lbs)	Sound (dB)
		Height	Width	Depth			
150°C Rise							
15	9T23Q3461G03	27.35	18.99	16.55	6	185	45
30	9T23Q3462G03	32.23	24.03	18.05	6	300	45
45	9T23Q3463G03	32.23	24.03	18.05	6	325	45
75	9T23Q3464G03	39.98	32.03	23.68	6	605	50
112.5	9T23Q3465G03	45.98	35.03	23.68	6	775	50
150	9T23Q3466G03	47.98	38.47	28.93	6	1030	55
225	9T23Q3467G03	51.75	42.50	30.25	6	1370	55
300	9T23B3468G03	58.38	47.50	34.75	6	2300	60
500	9T23B3469G03	76.00	60.00	50.00	4	4190	64
115°C Rise							
15	9T23Q3462G13	32.23	24.03	18.05	6	300	45
30	9T23Q3463G13	32.23	24.03	18.05	6	325	45
45	9T23Q1663G13	35.73	32.03	23.68	6	465	50
75	9T23Q3464G13	39.98	32.03	23.68	6	605	50
112.5	9T23Q3465G13	45.98	35.03	23.68	6	775	50
150	9T23Q3466G13	47.98	38.47	28.93	6	1030	55
225	9T23Q3467G13	51.75	42.50	30.25	6	1370	55
300	9T23B3468G13	58.38	47.50	34.75	6	2300	60
500	9T23B3469G13	76.00	60.00	50.00	4	4190	64
80°C Rise							
15	9T23Q3462G83	32.23	24.03	18.05	6	300	45
30	9T23Q3463G83	32.23	24.03	18.05	6	325	45
45	9T23Q1663G83	35.73	32.03	23.68	6	465	50
75	9T23Q3465G83	45.98	35.03	23.68	6	775	50
112.5	9T23Q3466G83	47.98	38.47	28.93	6	1030	55
150	9T23Q3467G83	51.75	42.50	30.25	6	1370	55
225	9T23B3468G83	58.38	47.50	34.75	6	2300	60
300	9T23B3469G83	76.00	60.00	50.00	4	4190	64

Three-phase, K = 13 *Aluminum*

kVA	Catalog Number	480 Volts Delta to 208Y/120 Volts Dimensions			Taps	Approx. Net Wt. (lbs)	Sound (dB)
		Height	Width	Depth			
150°C Rise							
15	9T23Q3471G03	32.23	24.03	18.05	6	300	45
30	9T23Q3472G03	32.23	24.03	18.05	6	325	45
45	9T23Q3473G03	35.73	32.03	18.05	6	465	50
75	9T23Q3474G03	39.98	32.03	23.68	6	605	50
112.5	9T23Q3475G03	45.98	35.03	23.68	6	775	50
150	9T23Q3476G03	47.98	38.47	28.93	6	1030	55
225	9T23Q3477G03	51.75	42.50	30.25	6	1370	55
300	9T23B3478G03	58.38	47.50	34.75	6	2300	60
500	9T23B3479G03	76.00	60.00	50.00	4	4190	64
115°C Rise							
15	9T23Q3471G13	32.23	24.03	18.05	6	300	45
30	9T23Q3472G13	32.23	24.03	18.05	6	325	45
45	9T23Q3473G13	35.73	32.03	23.68	6	465	50
75	9T23Q3475G13	45.98	35.03	23.68	6	775	50
112.5	9T23Q3476G13	47.98	38.47	28.93	6	1030	55
150	9T23Q3476G14	47.98	38.47	28.93	6	1030	55
225	9T23B3478G13	58.38	47.50	34.75	6	2300	60
300	9T23B3479G13	76.00	60.00	50.00	4	4190	64
80°C Rise							
15	9T23Q3471G83	32.23	24.03	18.05	6	300	45
30	9T23Q3472G83	32.23	24.03	18.05	6	325	45
45	9T23Q3474G83	39.98	32.03	23.68	6	605	50
75	9T23Q3475G83	45.98	35.03	23.68	6	775	50
112.5	9T23Q3476G83	47.98	38.47	28.93	6	1030	55
150	9T23Q3477G83	51.75	42.50	30.25	6	1370	55
225	9T23B3479G84	76.00	60.00	50.00	4	4190	64
300	9T23B3479G83	76.00	60.00	50.00	4	4190	64

Three-phase, K = 20 *Aluminum*

kVA	Catalog Number	480 Volts Delta to 208Y/120 Volts Dimensions			Taps	Approx. Net Wt. (lbs)	Sound (dB)
		Height	Width	Depth			
150°C Rise							
15	9T23Q3481G03	32.23	24.03	18.05	6	300	45
30	9T23Q3482G03	32.23	24.03	18.05	6	325	45
45	9T23Q3483G03	35.73	32.03	18.05	6	465	50
75	9T23Q3484G03	39.98	32.03	23.68	6	605	50
112.5	9T23Q3485G03	45.98	35.03	23.68	6	775	50
150	9T23Q3486G03	47.98	38.47	28.93	6	1030	55
225	9T23Q3487G03	51.75	42.50	30.25	6	1370	55
300	9T23B3488G03	58.38	47.50	34.75	6	2300	60
115°C Rise							
15	9T23Q3481G13	32.23	24.03	18.05	6	300	45
30	9T23Q3482G13	32.23	24.03	18.05	6	325	45
45	9T23Q3483G13	35.73	32.03	23.68	6	465	50
75	9T23Q3485G13	45.98	35.03	23.68	6	775	50
112.5	9T23Q3486G13	47.98	38.47	28.93	6	1030	55
150	9T23Q3487G13	51.75	42.50	30.25	6	1370	55
225	9T23B3488G13	58.38	47.50	34.75	6	2300	60
300	9T23B3489G13	76.00	60.00	50.00	4	4190	64
80°C Rise							
15	9T23Q3481G83	32.23	24.03	18.05	6	300	45
30	9T23Q3482G83	32.23	24.03	18.05	6	325	45
45	9T23Q3484G83	39.98	32.03	23.68	6	605	50
75	9T23Q3485G83	45.98	35.03	23.68	6	775	50
112.5	9T23Q3486G83	47.98	38.47	28.93	6	1030	55
150	9T23Q3487G83	51.75	42.50	30.25	6	1370	55
225	9T23B3489G83	76.00	60.00	50.00	4	4190	64

Three-phase, K = 30 *Aluminum*

kVA	Catalog Number	480 Volts Delta to 208Y/120 Volts Dimensions			Taps	Approx. Net Wt. (lbs)	Sound (dB)
		Height	Width	Depth			
150°C Rise							
15	9T23Q3491G03	32.23	24.03	18.05	6	300	45
30	9T23Q3492G03	32.23	24.03	18.05	6	325	45
45	9T23Q3493G03	35.73	32.03	23.68	6	465	50
75	9T23Q3494G03	45.98	35.03	23.68	6	775	50
112.5	9T23Q3495G05	47.98	38.47	28.93	6	1030	50
150	9T23Q3496G03	47.98	38.47	28.93	6	1030	55
225	9T23B3498G03	58.38	47.50	34.75	6	2300	60
300	9T23B3499G03	76.00	60.00	50.00	4	4190	64
115°C Rise							
15	9T23Q3491G13	32.23	24.03	18.05	6	300	45
30	9T23Q3492G13	32.23	24.03	18.05	6	325	45
45	9T23Q3493G13	35.73	32.03	23.68	6	465	50
75	9T23Q3495G13	45.98	35.03	23.68	6	775	50
112.5	9T23Q3496G13	47.98	38.47	28.93	6	1030	55
150	9T23Q3497G13	51.75	42.50	30.25	6	1370	55
225	9T23B3499G14	76.00	60.00	50.00	4	4190	64
300	9T23B3499G13	76.00	60.00	50.00	4	4190	64
80°C Rise							
15	9T23Q3491G83	32.23	24.03	18.05	6	300	45
30	9T23Q3492G83	32.23	24.03	18.05	6	325	45
45	9T23Q3494G83	39.98	32.03	23.68	6	605	50
75	9T23Q3496G83	47.98	38.47	28.93	6	1030	55
112.5	9T23Q3497G83	51.75	42.50	30.25	6	1370	55
150	9T23B3498G83	58.38	47.50	34.75	6	2300	60
225	9T23B3499G83	76.00	60.00	50.00	4	4190	64

Three-phase, K = 4 *Copper*

kVA	Catalog Number	480 Volts Delta to 208Y/120 Volts Dimensions			Taps	Approx. Net Wt. (lbs)	Sound (dB)
		Height	Width	Depth			
150°C Rise							
15	9T23Q9561G03	29.00	17.13	19.38	6	230	45
30	9T23Q9562G03	34.00	22.38	19.88	6	335	45
45	9T23Q9563G03	34.00	22.38	19.88	6	385	45
50	9T23C9430G03	34.00	22.38	19.88	6	440	45
75	9T23Q9564G03	45.50	34.75	23.50	6	580	50
112.5	9T23Q9565G03	45.50	34.75	23.50	6	760	50
150	9T23Q9566G03	49.00	39.00	23.00	6	1015	50
225	9T23Q9567G03	57.00	42.13	26.00	6	1390	55
300	9T23C9468G03	63.00	46.50	30.88	6	1715	55
400	9T23C9436G03	72.75	53.38	36.88	6	2670	60
500	9T23C9469G03	72.75	53.38	36.88	6	2670	60
115°C Rise							
15	9T23Q9562G13	29.00	17.13	19.38	6	230	45
30	9T23Q9563G13	34.00	22.38	19.88	6	335	45
45	9T23Q9482G13	34.00	22.38	19.88	6	440	45
50	9T23C9430G13	34.00	22.38	19.88	6	440	45
75	9T23Q9564G13	41.50	32.25	20.00	6	595	50
112.5	9T23Q9565G13	49.00	39.00	23.00	6	1015	50
150	9T23Q9566G13	57.00	42.13	26.00	6	1390	55
225	9T23Q9567G13	63.00	46.50	30.88	6	1715	55
300	9T23C9468G13	72.75	53.38	36.88	6	2670	60
400	9T23C9436G13	72.75	53.38	36.88	6	2670	60
500	9T23C9469G13	76.75	53.38	44.38	6	4115	64
80°C Rise							
15	9T23Q9562G83	34.00	22.38	19.88	6	335	45
30	9T23Q9563G83	34.00	22.38	19.88	6	440	45
45	9T23Q9482G83	45.50	34.75	23.50	6	580	50
50	9T23C9430G83	45.50	34.75	23.50	6	580	50
75	9T23Q9565G83	45.50	34.75	23.50	6	760	50
112.5	9T23Q9566G83	49.00	39.00	23.00	6	1060	50
150	9T23Q9567G83	57.00	42.13	26.00	6	1390	55
225	9T23C9468G8	63.00	46.50	30.88	6	1715	55
300	9T23C9469G83	72.75	53.38	36.88	6	2670	60
400	9T23C9436G83	76.75	53.38	44.38	6	4115	64
500	9T23C9440G83	80.00	61.00	44.38	4	5030	64

Three-phase, K = 13 *Copper*

kVA	Catalog Number	480 Volts Delta to 208Y/120 Volts Dimensions			Taps	Approx. Net Wt. (lbs)	Sound (dB)
		Height	Width	Depth			
150°C Rise							
15	9T23Q9571G03	29.00	17.13	19.38	6	230	45
30	9T23Q9572G03	34.00	22.38	19.88	6	335	45
45	9T23Q9573G03	34.00	22.38	19.88	6	385	45
50	9T23C9431G03	34.00	22.38	19.88	6	440	45
75	9T23Q9574G03	45.50	34.75	23.50	6	580	50
112.5	9T23Q9575G03	45.50	34.75	23.50	6	760	50
150	9T23Q9576G03	49.00	39.00	23.00	6	1015	50
225	9T23Q9577G03	57.00	42.13	26.00	6	1390	55
300	9T23C9478G03	63.00	46.50	30.88	6	1715	55
400	9T23C9437G03	72.75	53.38	36.88	6	2670	60
500	9T23C9479G03	76.75	53.38	44.38	6	4115	64
115°C Rise							
15	9T23Q9571G13	29.00	17.13	19.38	6	230	45
30	9T23Q9572G13	34.00	22.38	19.88	6	335	45
45	9T23Q9573G13	34.00	22.38	19.88	6	440	45
50	9T23C9431G13	45.50	34.75	23.50	6	580	45
75	9T23Q9575G13	41.50	32.25	20.00	6	595	50
112.5	9T23Q9576G13	49.00	39.00	23.00	6	1015	50
150	9T23Q9576G14	57.00	42.13	26.00	6	1390	55
225	9T23Q9478G13	63.00	46.50	30.88	6	1775	55
300	9T23C9479G13	72.75	53.38	36.88	6	2670	60
400	9T23C9437G13	76.75	53.38	44.38	6	4115	64
500	9T23C9441G13	76.75	53.38	44.38	6	4115	64
80°C Rise							
15	9T23Q9571G83	34.00	22.38	19.88	6	335	45
30	9T23Q9572G83	34.00	22.38	19.88	6	440	45
45	9T23Q9574G83	45.50	34.75	23.50	6	580	50
50	9T23C9431G83	45.50	34.75	23.50	6	580	50
75	9T23Q9575G83	45.50	34.75	23.50	6	760	50
112.5	9T23Q9576G83	57.00	42.13	26.00	6	1390	50
150	9T23Q9577G83	63.00	46.50	30.88	6	1715	55
225	9T23C9479G84	63.00	46.50	30.88	6	1715	55
300	9T23C9479G83	72.75	53.38	36.88	6	2670	60
400	9T23C9437G83	76.75	53.38	44.38	6	4115	64
500	9T23C9442G83	80.00	61.00	44.38	4	5030	64

Three-phase, K = 20 *Copper*

kVA	Catalog Number	480 Volts Delta to 208Y/120 Volts Dimensions			Taps	Approx. Net Wt. (lbs)	Sound (dB)
		Height	Width	Depth			
150°C Rise							
15	9T23Q9581G03	29.00	17.13	19.38	6	230	45
30	9T23Q9582G03	34.00	22.38	19.88	6	335	45
45	9T23Q9583G03	34.00	22.38	19.88	6	440	45
50	9T23C9432G03	34.00	22.38	19.88	6	440	45
75	9T23Q9584G03	45.50	34.75	23.50	6	760	50
112.5	9T23Q9585G03	45.50	34.75	20.00	6	790	50
150	9T23Q9586G03	57.00	42.13	26.00	6	1390	55
225	9T23Q9587G03	63.00	46.50	30.88	6	1715	55
300	9T23C9488G03	72.75	53.38	36.88	6	2670	60
400	9T23C9438G03	72.75	53.38	36.88	6	2670	60
500	9T23C9443G03	80.00	61.00	44.38	4	5030	64
115°C Rise							
15	9T23Q9581G13	29.00	17.13	19.38	6	230	45
30	9T23Q9582G13	34.00	22.38	19.88	6	385	45
45	9T23Q9583G13	45.50	34.75	23.50	6	580	50
50	9T23C9432G13	45.50	34.75	23.50	6	580	50
75	9T23Q9585G13	45.50	34.75	23.50	6	760	50
112.5	9T23Q9586G13	49.00	39.00	23.00	6	1015	50
150	9T23Q9587G13	57.00	42.13	26.00	6	1390	55
225	9T23Q9488G13	72.75	53.38	36.88	6	2670	60
300	9T23C9489G13	72.75	53.38	36.88	6	2670	60
400	9T23C9438G13	76.75	53.38	44.38	6	4115	64
500	9T23C9444G13	80.00	61.00	44.38	4	5030	64
80°C Rise							
15	9T23Q9581G83	34.00	22.38	19.88	6	335	45
30	9T23Q9582G83	34.00	22.38	19.88	6	440	45
45	9T23Q9584G83	45.50	34.75	23.50	6	580	50
50	9T23C9432G83	45.50	34.75	23.50	6	760	50
75	9T23Q9585G83	49.00	39.00	23.50	6	1015	50
112.5	9T23Q9586G83	57.00	42.13	26.00	6	1390	55
150	9T23Q9587G83	63.00	46.50	30.88	6	1715	55
225	9T23C9489G83	72.75	53.38	36.88	6	2670	60
300	9T23C9434G83	72.75	53.38	36.88	6	2670	60
400	9T23C9438G83	80.00	61.00	44.38	4	5030	64

Three-phase, K = 30 *Copper*

kVA	Catalog Number	480 Volts Delta to 208Y/120 Volts Dimensions			Taps	Approx. Net Wt. (lbs)	Sound (dB)
		Height	Width	Depth			
150°C Rise							
15	9T23Q9591G03	29.00	17.13	19.38	6	230	45
30	9T23Q9592G03	34.00	22.38	19.88	6	335	45
45	9T23Q9593G03	34.00	22.38	19.88	6	440	45
50	9T23C9433G03	34.00	22.38	19.88	6	440	45
75	9T23Q9595G03	45.50	34.75	23.50	6	760	50
112.5	9T23Q9596G05	49.00	39.00	23.00	6	1015	50
150	9T23Q9596G03	57.00	42.13	26.00	6	1390	55
225	9T23Q9498G03	63.00	46.50	30.88	6	1715	55
300	9T23C9499G03	72.75	53.38	36.88	6	2670	60
400	9T23C9439G03	76.75	53.38	44.38	6	4115	64
500	9T23C9445G03	80.00	61.00	44.38	4	5030	64
115°C Rise							
15	9T23Q9591G13	29.00	17.13	19.38	6	230	45
30	9T23Q9592G13	34.00	22.38	19.88	6	385	45
45	9T23Q9593G13	45.50	34.75	23.50	6	580	50
50	9T23C9433G13	45.50	34.75	23.50	6	580	50
75	9T23Q9595G13	45.50	34.75	23.50	6	760	50
112.5	9T23Q9596G13	57.00	42.13	26.00	6	1390	55
150	9T23Q9597G13	63.00	46.50	30.88	6	1715	55
225	9T23Q9499G14	72.75	53.38	36.88	6	2670	60
300	9T23C9499G13	72.75	53.38	36.88	6	2670	60
400	9T23C9439G13	80.00	61.00	44.38	4	5030	64
80°C Rise							
15	9T23Q9591G83	34.00	22.38	19.88	6	335	45
30	9T23Q9592G83	34.00	22.38	19.88	6	440	45
45	9T23Q9594G83	45.50	34.75	23.50	6	760	50
50	9T23C9433G83	45.50	34.75	23.50	6	760	50
75	9T23Q9596G83	49.00	39.00	23.00	6	1015	50
112.5	9T23Q9597G83	63.00	46.50	30.88	6	1715	55
150	9T23Q9498G83	72.75	53.38	36.88	6	2670	60
225	9T23C9499G83	72.75	53.38	36.88	6	2670	60
300	9T23C9435G83	80.00	61.00	44.38	4	5030	64

Product Specification

Three Phase Dry-Type Transformers for Non-Linear Loading

1.0 GENERAL

1.1 For non-linear loads with significant harmonic distortion, furnish GE dry-type transformers designed for low temperature rise and suitable for non-linear loading or GE dry-type transformers that are UL K factor listed.

1.2 If K factor is specified,transformers shall be rated in accordance with UL K factor test procedures.

2.0 CONSTRUCTION

2.1 Coils shall be of continuous wound construction. A UL insulation system using non-moisture absorbing varnish is required.

2.2 A UL recognized 220°C insulation system shall be used. Windings shall not exceed indicated temperature rise at rated full load.

2.3 Universal taps shall be provided on aluminum wound coils where the primary shall contain two 2.5% (or 3.1%) above nominal and four 2.5% (or two 3.1%) below nominal full capacity taps. On copper wound coils, the primary shall contain two 2.5% (or 3.0%) above nominal and four 2.5% (or two 3.0%) below nominal full capacity taps.

2.4 Neutral bars shall be sized for at least 200% ampacity of secondary phase conductors.

2.5 A full length copper electrostatic shield shall be included, producing an average effective coupling capacitance of 30 picofarads between primary and secondary. Electrical noise attenuation shall average 120 dB common mode and 30 dB normal mode, 1–500KHz range. Noise attenuation measurements using the insertion loss method shall not be considered.

2.6 The core shall be constructed of high grade silicon steel with flux density sufficiently below saturation point.

2.7 The enclosure shall be constructed of heavy gauge steel. The finish shall consist of degreasing, phosphate cleaning, and electrodeposition or electrostatic baking. ANSI 61 gray finish coat.

3.0 STANDARDS

3.1 Transformers shall be UL 1561 listed. When K factor is specified, transformers shall be UL K factor listed.

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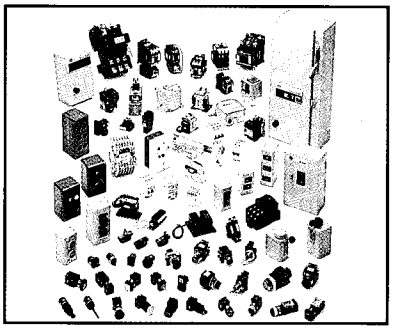
A



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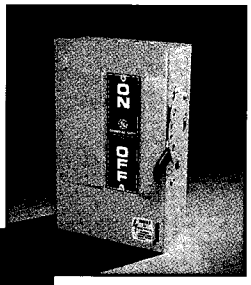

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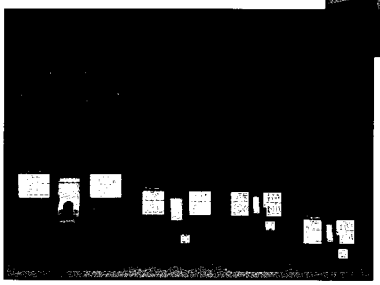

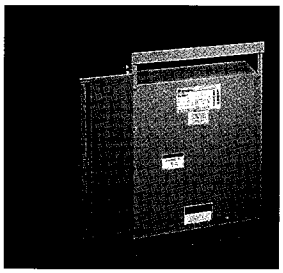

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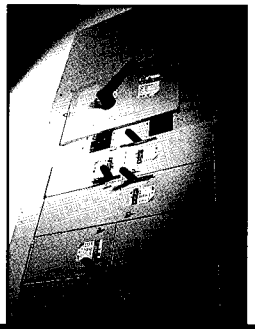

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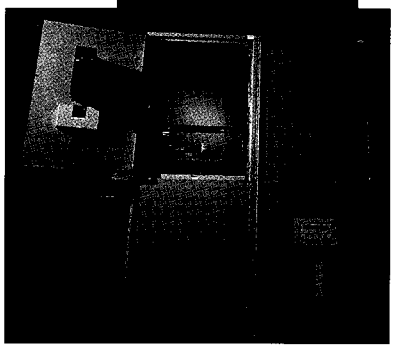

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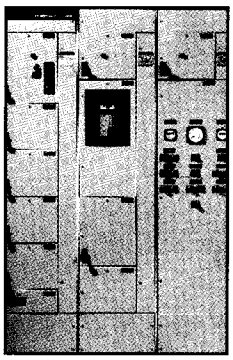

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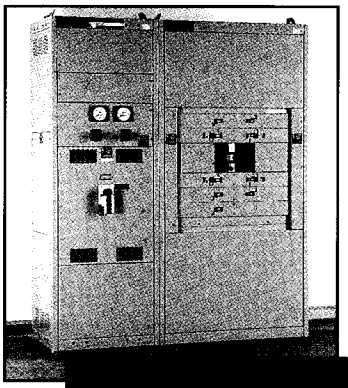

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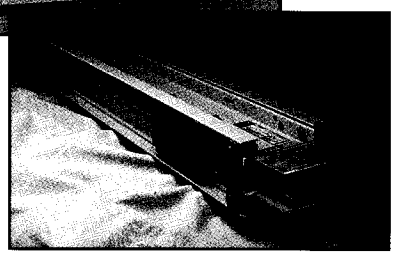

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